

Journey-to-Work Trends in the Delaware Valley Region, 1970 - 1990



DIRECTION 2020

A Region on the Rise

**JOURNEY-TO-WORK TRENDS
IN THE DELAWARE VALLEY REGION
1970 - 1990**

Direction 2020 Report #5



**DELAWARE VALLEY
REGIONAL PLANNING COMMISSION**

**The Bourse Building
21 South 5th Street, Philadelphia, Pa 19106**

June 1993

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



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

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Publication Abstract

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ABSTRACT

Journey-to-Work data for the Delaware Valley Region from the 1990 Census is summarized at the county level and compared with similar data from the 1970 and 1980 censuses. Changes in the distribution of resident workers, commuting patterns, means of transportation, travel times, and employment are analyzed.

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EXECUTIVE SUMMARY

This report analyzes work trips made in the Delaware Valley region, and is based on 1990 county-to-county commuting flows published by the U.S. Census Bureau. The 1990 results are compared with the flows observed in 1980 and 1970. The report describes:

- the distribution of population, resident workers, and employment by county throughout the region;
- county-to-county commuting patterns, including both residents who commute to jobs outside the region and non-residents who commute to jobs within the region;
- the means of transportation used to travel to work; and
- the time required for the trip.

Approximately 2.4 million workers resided in the Delaware Valley region in 1990, a figure which is 16 percent higher than the corresponding number for 1980. This growth is higher than that for population, which was only 3 percent for the decade, and reflects the increased share of households with multiple wage earners. During the 1970s the number of employed residents grew by 6 percent, while the population declined by 2 percent. About 30 percent of these workers commuted to jobs in Philadelphia, down from 36 percent in 1980 and 44 percent in 1970. Reverse commuting from Philadelphia to suburban job sites has remained stable since 1970, fluctuating between 4 and 5 percent of the region's work force. Reflecting the continuing shift of population and employment to the suburbs, suburb-to-suburb commutation has increased 29 percent since 1980, and now constitutes 59 percent of all work trips taken by residents. This share has increased steadily from 48 percent in 1970 and 56 percent in 1980.

The share of resident workers commuting to locations outside the region is small, but has grown steadily from 4 percent in 1970 to 6 percent in 1990. Major external destinations included Wilmington for residents of Chester, Delaware, Philadelphia, and Gloucester counties; Atlantic City for residents of Burlington, Camden, and Gloucester counties; and New York City for residents of Bucks, Philadelphia, Burlington, and Mercer counties. The number of non-residents working in the region increased by 83 percent between 1980 and 1990. However, the region is still a net exporter of workers, with about 9,800 more residents going outside the region for work than the number of non-residents coming in. Including both outbound trips taken by resident to external job sites and inbound trips taken by non-residents to job sites within the region are included, the census indicated that there were approximately 279,000 round trips taken daily for work purposes across the boundaries of the DVRPC region in 1990. This represents 11 percent of all work trips taken in the region, and is up from 8 percent in 1980 and 6 percent in 1970.

More than two-thirds (68%) of the region's residents drove alone to work in 1990, up from 59 percent in 1980. This share rises to 76 percent when only residents of the suburban counties are considered. For Philadelphia residents the share was 45 percent. Ridesharing declined from

18 percent in 1980 to 12 percent in 1990. Ridesharing was slightly higher in Philadelphia (13%) than in the suburban counties (12%). Use of public transportation during the 1980s declined from 14 to 12 percent. More than one-fourth (29%) of Philadelphia's resident workers used public transportation to commute to work, but the average in the suburban counties was only 5.0 percent. About 133,600 of the region's residents walked to work in 1990, representing 5 percent of the work force. In 1980 this share was 7 percent. The number of residents who worked at home increased by 73 percent during the 1980s and in 1990 totaled 56,100 workers, representing 2 percent of the work force.

The average time required to travel to work, excluding those who worked at home, changed only slightly since the previous census, declining from 25.3 minutes in 1980 to 24.6 minutes in 1990. Most of the reduced time can be explained by modal shifts from public transportation to automobiles in Philadelphia, Delaware, and Camden counties.

The information is based on data obtained by the Census Bureau from a 17 percent sample of households, and as such is subject to sampling error. Since respondents were asked about work trips taken during the census week, with the exception of employment, the data include neither workers who were sick, on vacation, or temporarily unemployed; nor information on trips to second jobs. Total employment in the region, after adjustments for absences and multiple jobs, increased by 17 percent, from 2.28 million jobs in 1980 to 2.66 million in 1990.

I. INTRODUCTION

Since its inception in 1965, the Delaware Valley Regional Planning Commission (DVRPC) has maintained a transportation data base for the nine counties comprising the region (See Figure 1). These data are derived mainly from the decennial census, which includes a component on work commutation based on returns from a detailed questionnaire sent to approximately 17 percent of households. This report provides a look at the changes in the distribution of resident workers, commuting patterns, means of transportation, travel times, and employment that have occurred at the county level since 1970.

The Delaware Valley region as a whole is a mature region that is growing only slowly. As can be seen in Table 1, the population increased by about 160,000 or 3 percent between 1980 and 1990. However, this represented a turnaround, as the region's population had dropped by 100,000, or 2 percent, during the 1970s.

Within the region significant changes are taking place. Although the rate of decline has slowed, Philadelphia is still losing residents, approximately 100,000 or 6 percent between 1980 and 1990. The loss was 13 percent during the 1970s. Population growth in the eight suburban counties has accelerated with a gain of 260,000 new residents, or 8 percent, during the 1980s. Suburban growth rates were similar on both sides of the Delaware River, with the Pennsylvania suburbs increasing by 7 percent and those in New Jersey by 8 percent. In contrast, growth between 1970 and 1980 was 160,000 or 5 percent, with the New Jersey counties growing roughly twice as fast as the Pennsylvania suburban counties (7% versus 4%).

While population may have been static, employment was not. Census employment, which represents the number of people whose primary work site is within the region and who worked during the census week, increased by 360,000, or 17 percent. This is roughly three times the increase seen during the 1970s. Philadelphia arrested the slide in employment observed during the 1970s, and managed to finish the 1980s with the same number of jobs with which it started the decade. As with population, growth in suburban employment was comparable between Pennsylvania and New Jersey during the 1980s, 26 and 28 percent, respectively. However, during the 1970s employment in the Pennsylvania suburbs went up by 28 percent, in contrast to the 10 percent on the New Jersey side of the river. This is just the opposite of what happened with respect to population. During the 1970s the population growth occurred in the Pennsylvania suburbs and the employment growth in New Jersey.

Although the last twenty years have seen a pronounced shift of residents and jobs from the city to the suburbs, Philadelphia still represents the largest single concentration of population and employment in the region. However, since 1970 some interesting changes in these distributions have occurred. At the beginning of this twenty-year period, Philadelphia had 38 percent of the region's population and 45 percent of the jobs, but at the end of the period the city's share of regional population was essentially the same as its share of the employment, approximately 31 percent. This is a consequence of the rapid growth in suburban jobs that has taken place.

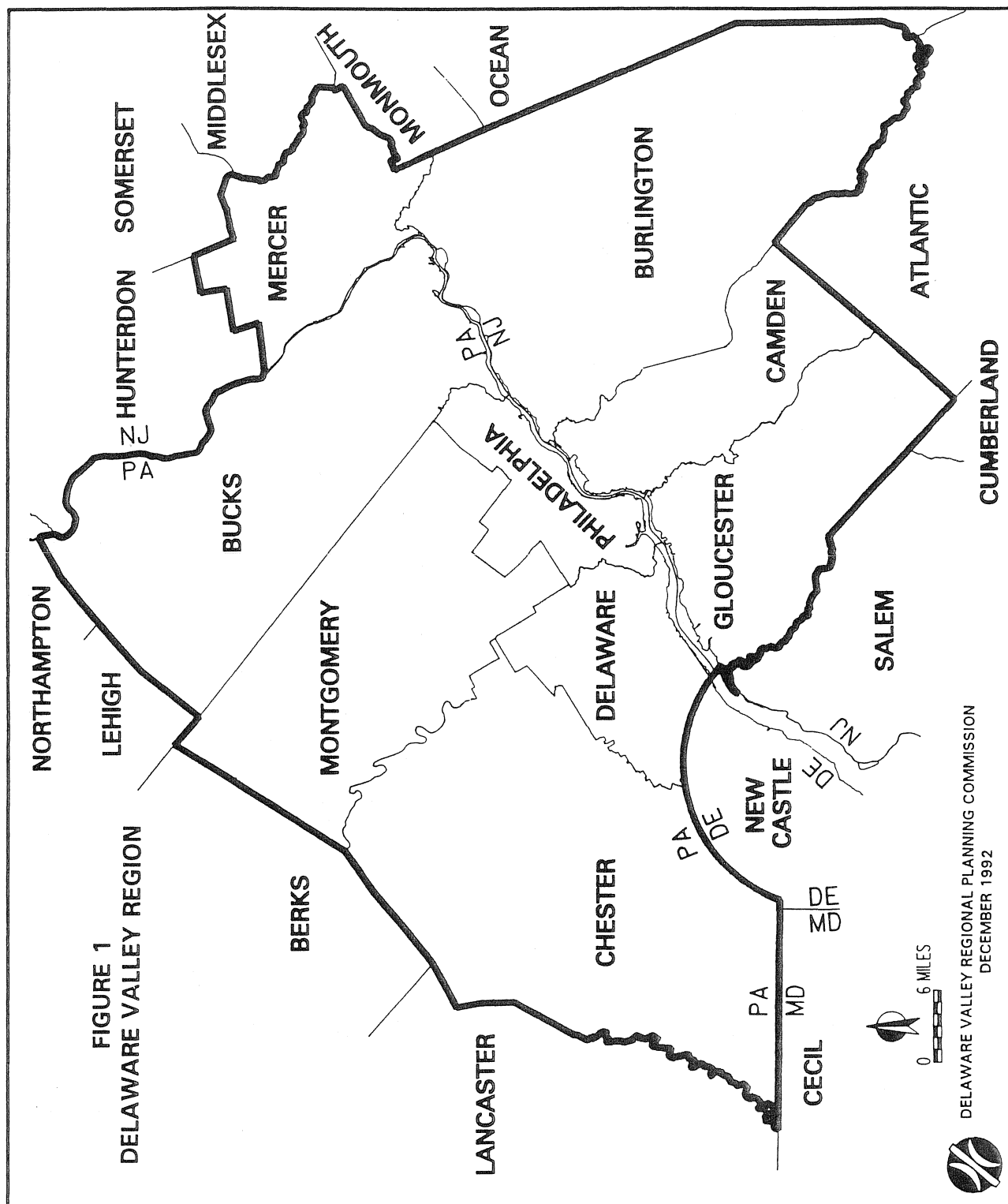


Table 1

POPULATION AND EMPLOYMENT GROWTH IN THE DELAWARE VALLEY REGION
(Thousands)

County of Residence	Population				Employment					
	Year			Percent Change	Year			Percent Change		
	1970	1980	1990		1970	1980	1990			
Bucks	417	479	541	15.0	12.9	117	170	221	45.5	29.7
Chester	278	317	376	14.0	18.9	85	123	176	45.3	43.1
Delaware	603	555	548	-8.0	-1.3	162	181	207	11.6	14.5
Montgomery	624	644	678	3.1	5.4	259	325	407	25.4	25.1
Philadelphia	1,950	1,688	1,586	-13.4	-6.1	876	760	761	-13.3	0.1
PA Total	3,872	3,683	3,729	-4.9	1.3	1,500	1,560	1,772	4.0	13.6
Burlington	323	363	395	12.2	9.0	113	125	171	10.4	37.5
Camden	456	472	503	+3.4	6.6	157	171	207	8.7	21.3
Gloucester	173	200	230	15.8	15.1	48	56	78	18.7	38.1
Mercer	304	308	326	1.2	5.8	150	165	205	9.5	24.3
NJ Total	1,256	1,342	1,454	+6.8	8.3	468	517	661	10.4	28.0
Region Total	5,128	5,025	5,183	-2.0	3.1	1,968	2,076	2,434	5.5	17.2

Note: Numbers may not add because of rounding
Source: U.S. Bureau of the Census

The Census Bureau gathers journey-to-work data by asking its respondents where they worked during the previous week, and matching the results with their places of residence. This method does not account for people who for whatever reason were absent from work during the census week, and second, since the question refers to the primary place of employment, it does not include information on second jobs.

A third factor is also present, as the job worked during the census week may be a temporary assignment, and if the job is far removed from the usual place of work, the work trip indicated may not represent daily commutation. This probably has little impact on commutation flows within the region and to/from counties adjacent to the region, but it can explain trips to/from more distant locations, such as Allegheny County or even Los Angeles County in California.

Finally, a fourth factor relates to problems in coding. The census coding firmly establishes the home end of the work trip, but locating the work end can be more difficult. The postal address may not coincide actual municipality in which the job site is located. There may be confusion between a borough and a township when both have the same name, and some suburban office parks sprawl across municipal boundaries.

These factors are responsible for the adjustments made to employment in Section VI. However, the discussion on resident workers (Sec. II), commuting patterns (Sec. III), means of transportation (Sec. IV), and travel time (Sec. V) is limited to employees who worked during the census week.

II. RESIDENT WORKERS

Resident workers tally workers where they live, in contrast to *employment*, which tallies them where they work. Hence, the distribution of resident workers represents the distribution of work trip origins, and that of employment represents destinations.

Since 1980 the highest growth rates in the region occurred in Chester and Gloucester counties, each gaining about 35 percent (See Table 2). However, because of their larger bases, the largest absolute increases in resident workers occurred in Bucks County on the Pennsylvania side of the region, and in Camden County on the New Jersey side. These results are displayed graphically in Figures 2 and 3 for the Pennsylvania and New Jersey counties, respectively.

Although Bucks County had the highest absolute increases, adding about 60,000 employed residents in each decade, the rate of increase has slowed from 35 percent to 27 percent. Chester County, on the other hand, maintained its growth rate at about 35 percent for both decades, but saw its absolute increase jump from 38,000 new workers to 50,000. In the 1970s Delaware County with its heavy industrial employment base, saw only minimal increases in its work force, about 10,000 or 4 percent. In the 1980s the county, though still not a high growth area, managed to add 20,000 additional residents to the work force, almost doubling the rate of increase. Montgomery, whose work force is only exceeded in size by Philadelphia, saw a slight slowing of the rate of increase, from 21 percent in the 1970s to 16 percent in the 1980s. This amounted to about 50,000 new workers in each decade. Philadelphia arrested its slide and put back 32,000 of the 134,000 resident workers it lost in the 1970s.

In the 1970s Burlington County had the largest absolute increase of the four New Jersey counties, adding 32,000 to the work force. Although 39,000 were added in the 1980s, the county fell behind Camden County, which added 42,000. In percentage terms, the increase remained constant, adding about 24 percent in each decade. Camden County, in contrast, doubled its rate of increase, from 11 percent in the 1970s to 22 percent in the 1980s. The latter represents an addition of 42,000 workers. Gloucester County, with the highest growth rate in New Jersey for both decades, added 29,000 resident workers during the 1980s. Mercer County added five percentage points to its rate of increase, going from 12 to 17 percent, which represents about 24,000 workers added during the 1980s.

Figure 4 compares the number of resident workers in Philadelphia with those in the Pennsylvania and New Jersey suburban counties. While Philadelphia slid during the 1970s and recovered slightly during the 1980s, the suburban counties grouped by state grew significantly in each of the two decades. The aggregate suburban growth rate on the Pennsylvania side was almost constant at about 20 percent in each decade, but on the New Jersey side the aggregate rate increased from 17 to 23 percent. This translates to increases of 32,000 resident workers in Philadelphia, 179,000 in the Pennsylvania suburbs, and 134,000 in the New Jersey suburbs.

Table 2

**RESIDENT WORKER GROWTH IN THE
DELAWARE VALLEY REGION**

County of Residence	Year			Percent Change	
	1970	1980	1990	'70-'80	'80-'90
Bucks	162,886	219,876	279,551	35.0	27.1
Chester	106,902	145,120	195,507	35.8	34.7
Delaware	231,255	241,314	261,607	4.3	8.4
Montgomery	251,137	304,326	352,960	21.2	16.0
Philadelphia	741,998	608,391	640,577	-18.0	5.3
PA Total	1,494,178	1,519,027	1,730,202	1.7	13.9
Burlington	133,887	165,874	205,132	23.9	23.7
Camden	172,969	192,374	234,532	11.2	21.9
Gloucester	62,798	82,046	110,693	30.7	34.9
Mercer	123,815	138,963	162,920	12.2	17.2
NJ Total	493,469	579,257	713,277	17.4	23.1
Region Total	1,987,647	2,098,284	2,443,479	5.6	16.5

Source: U.S. Bureau of the Census



Figure 2
GROWTH OF RESIDENT WORKERS
IN THE PENNSYLVANIA SUBURBS

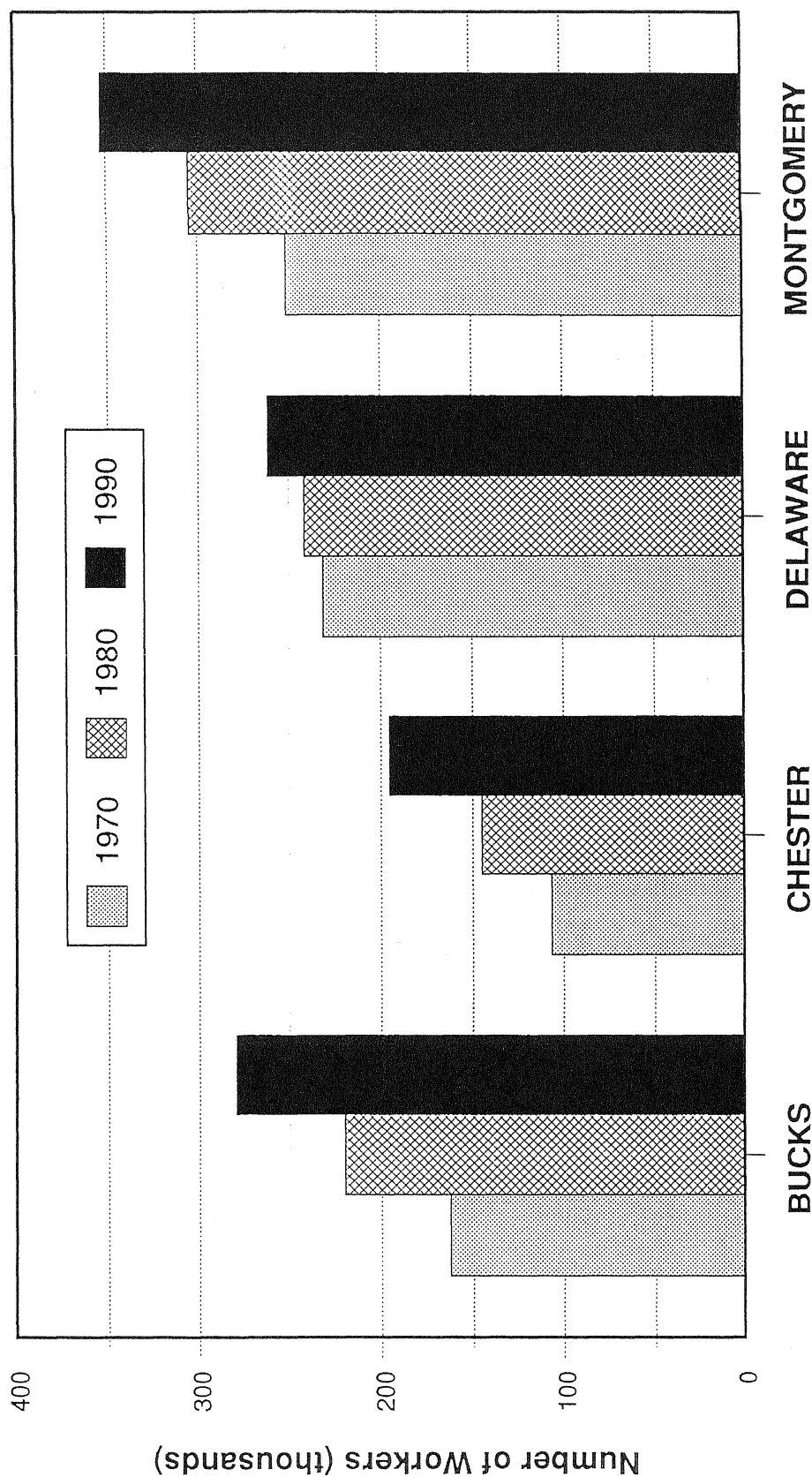


Figure 3
GROWTH OF RESIDENT WORKERS
IN THE NEW JERSEY SUBURBS

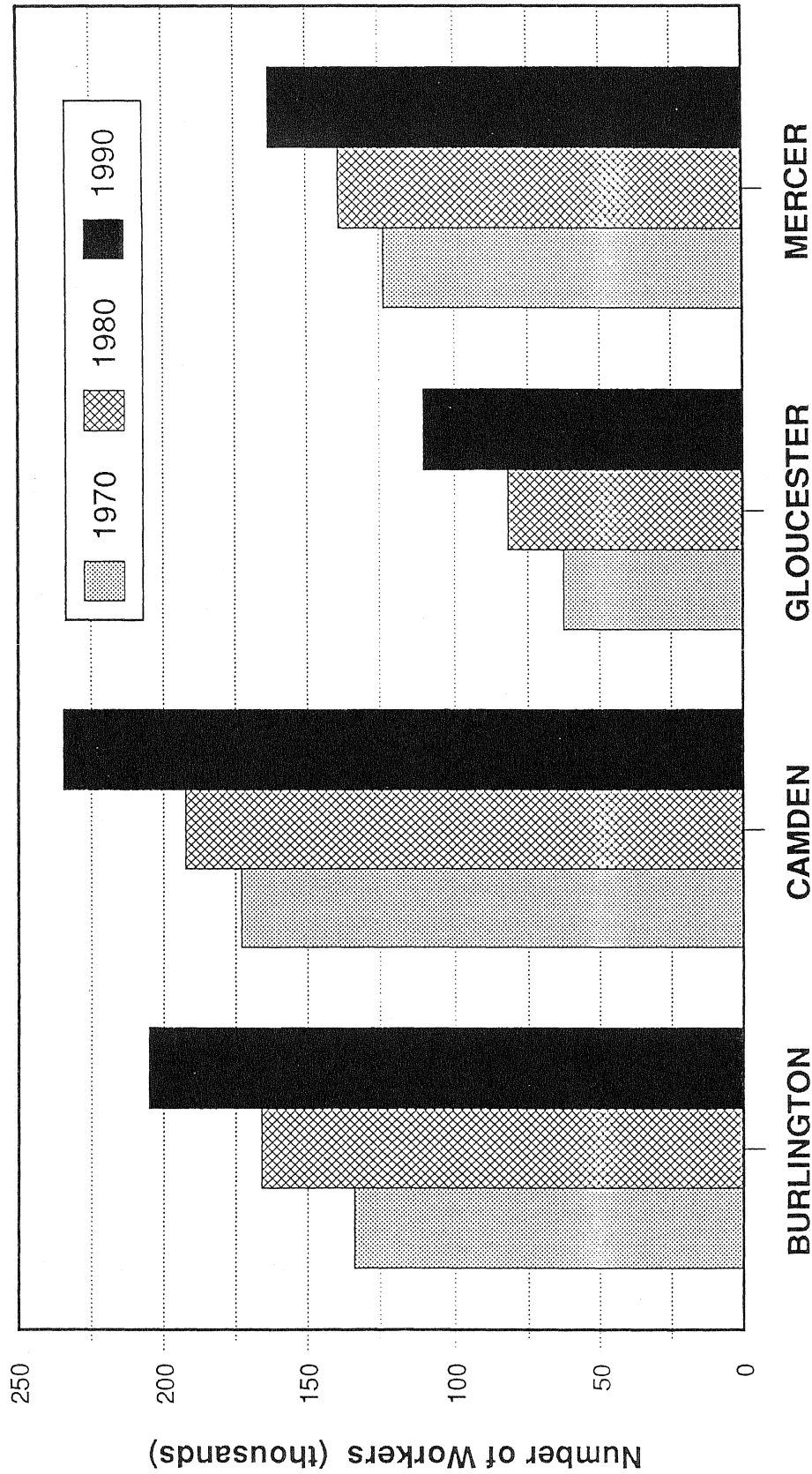


Figure 4
GROWTH OF RESIDENT WORKERS
IN THE DELAWARE VALLEY REGION

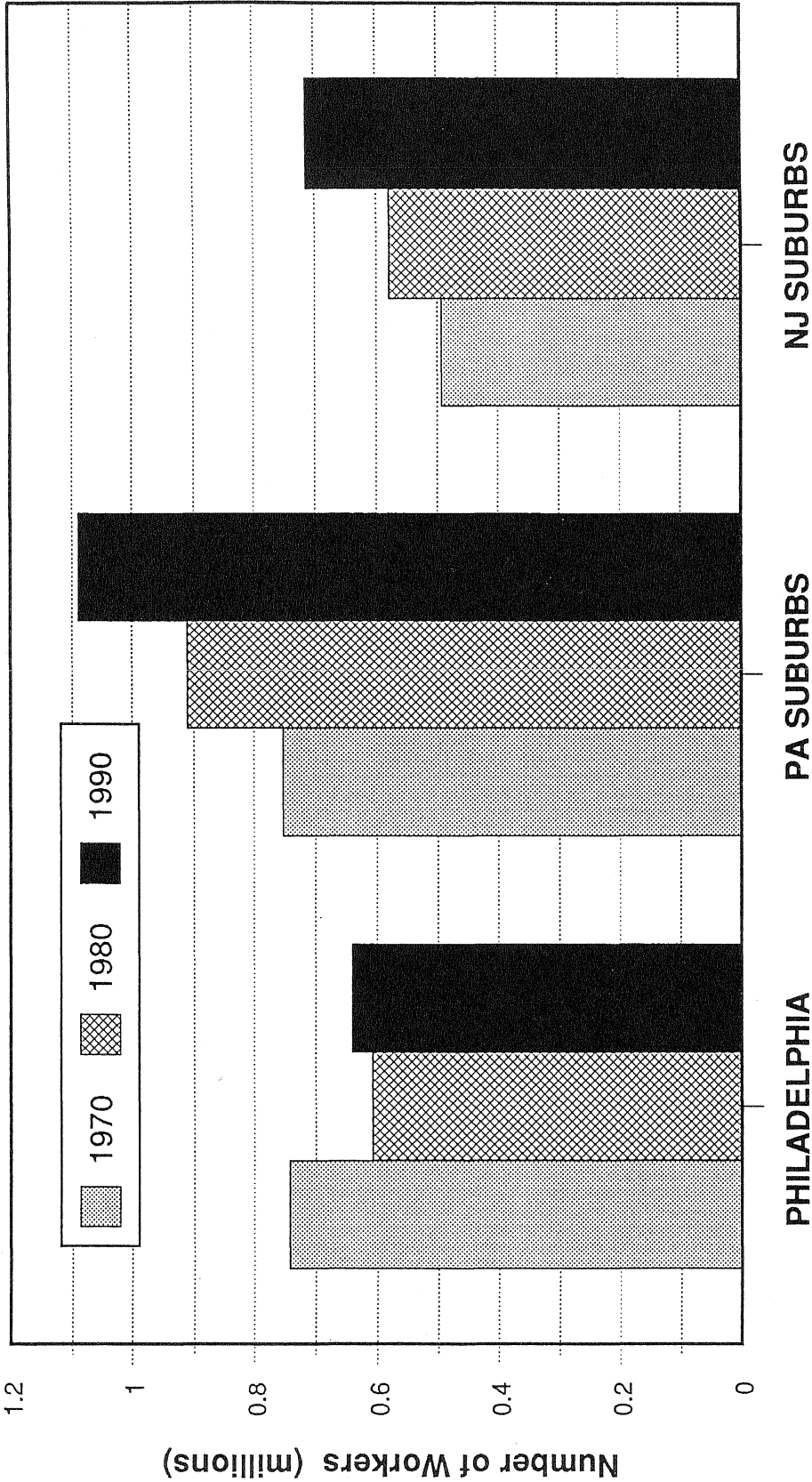


Table 3

**COMMUTING PATTERNS IN THE DELAWARE VALLEY REGION
(Workers)**

Place of Residence	Place of Work	Year			Percent Change	
		1970	1980	1990	'70-'80	'80-'90
Phila. PA Suburbs NJ Suburbs	Phila.	635,478	519,442	513,167	-18.3	-1.2
		159,782	162,055	158,071	1.4	-2.5
		69,999	69,473	70,124	-0.8	0.9
Phila. Total		865,259	750,970	741,362	-13.2	-1.3
Phila. PA Suburbs NJ Suburbs	PA Suburbs	70,559	68,526	98,443	-2.9	43.7
		517,288	681,035	825,608	31.7	21.2
		14,591	18,043	28,029	23.7	55.3
PA Suburbs Total		602,438	767,604	952,080	27.4	24.0
Phila. PA Suburbs NJ Suburbs	NJ Suburbs	25,056	11,444	18,250	-54.3	59.5
		38,659	25,515	44,559	-34.0	74.6
		382,461	447,388	542,734	17.0	21.3
NJ Suburbs Total		446,176	484,347	605,543	8.6	25.0
Phila. PA Suburbs NJ Suburbs	Elsewhere	10,905	8,979	10,717	-17.7	19.4
		36,451	42,031	61,387	15.3	46.1
		26,418	44,353	72,390	67.9	63.2
Elsewhere Total		73,774	95,363	144,494	29.3	51.5
Region Total		1,987,647	2,098,284	2,443,479	5.6	16.5



III. COMMUTING PATTERNS

In addition to knowing the distribution of resident workers, which indicates where commuters start their trips, it is important from a transportation perspective to know the location of their workplaces. Although Philadelphia still provides the largest concentration of employment, the percentage of the region's labor force working in Philadelphia has steadily declined from 44 percent in 1970 to 30 percent in 1990. Approximately 59 percent of the 2.4 million resident workers in the region now take work trips that are intersuburban in nature. Table 3 summarizes the trends of commutation patterns since 1970. Tables and maps providing more information on commuting patterns throughout the region can be found in Appendices I through V.

Of the 741,000 regional residents who were employed in Philadelphia in 1990, 69 percent reside within the city, 21 percent come from the Pennsylvania suburbs, and 9 percent come from New Jersey. Neither the absolute numbers nor the percentage shares have changed significantly since 1980. Virtually all of the growth in commutation trips is now taking place in the suburbs.

Employment in the four Pennsylvania suburban counties grew by 34 percent during the 1980s, reaching 952,00 by 1990. Approximately 87 percent come from suburban jurisdictions in Pennsylvania, 10 percent from Philadelphia, and 3 percent from New Jersey. Although New Jersey had the smallest share, it showed the largest increase in percentage terms (55%).

Employment in the New Jersey portion of the region increased by 24 percent to 606,000, with 90 percent coming from New Jersey, 7 percent from the Pennsylvania suburbs, and 3 percent from Philadelphia. As in the Pennsylvania suburbs, the largest percentage increase came from commuters crossing the Delaware River.

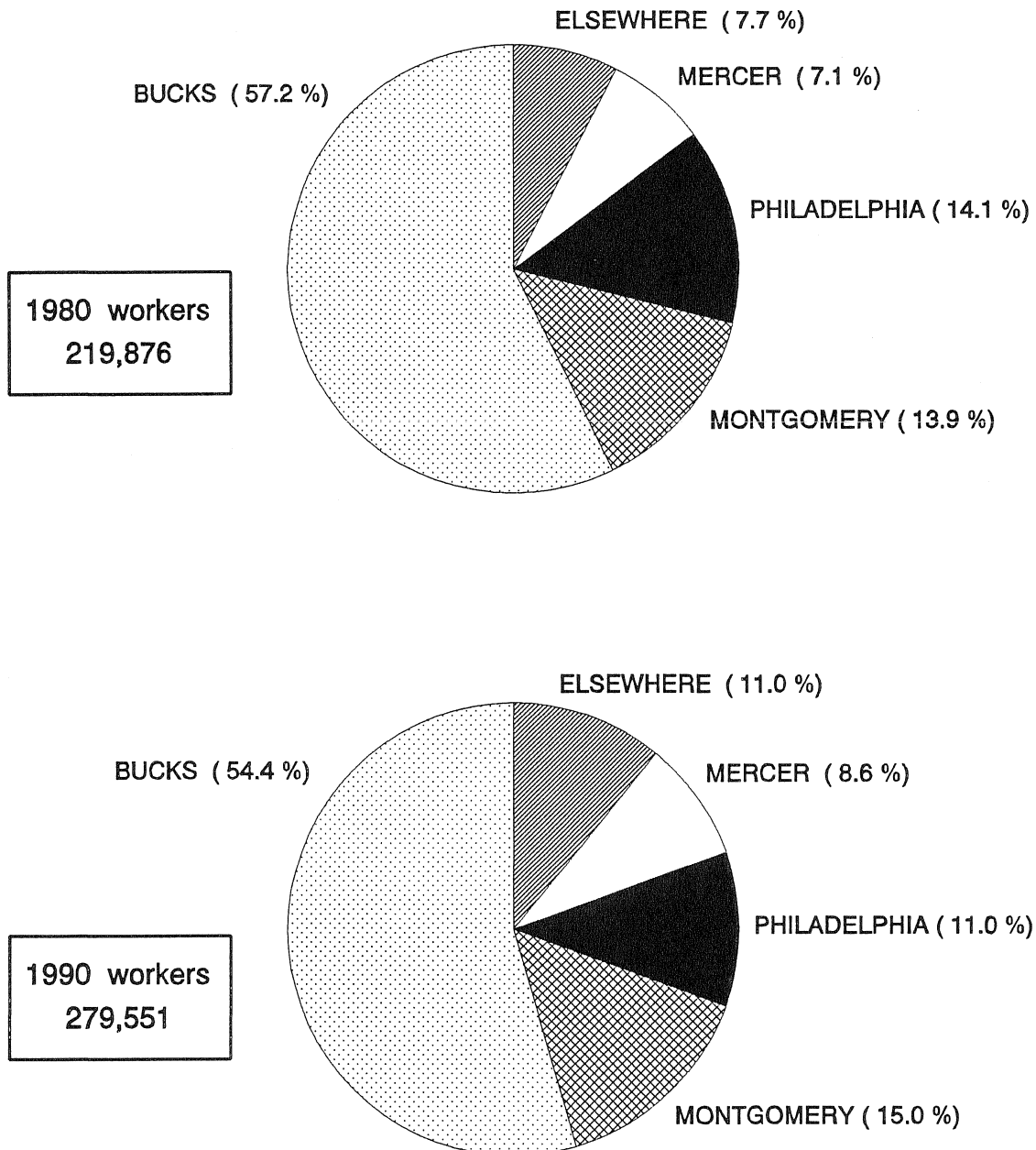
Since 1980, reverse commuting from Philadelphia has increased by 44 percent to the Pennsylvania suburbs and by 59 percent to the New Jersey suburbs. On the Pennsylvania side of the region, the outbound flow is now 62 percent of that coming into the city. However, in spite of its higher growth rate, the outbound flow from Philadelphia to New Jersey is a more modest 26 percent of the trips coming from New Jersey. Altogether approximately one-third of the commuters on the traditional radial routes linking the suburbs with the city are now traveling in the reverse direction (117,000 out of 345,000). In 1980 this ratio was about one-fourth (80,000 out of 310,000).

The number of resident workers commuting to jobs outside the region increased by 50 percent in the decade between 1980 and 1990, with most of the increase occurring on the New Jersey side of the region. External commutation from New Jersey locations is stimulated by the relative ease of access to major employment centers, such as Atlantic City and New York.

The remainder of this section of the report provides a more detailed description of Delaware Valley commuting patterns on a county by county basis.

Figure 5

BUCKS COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Bucks County

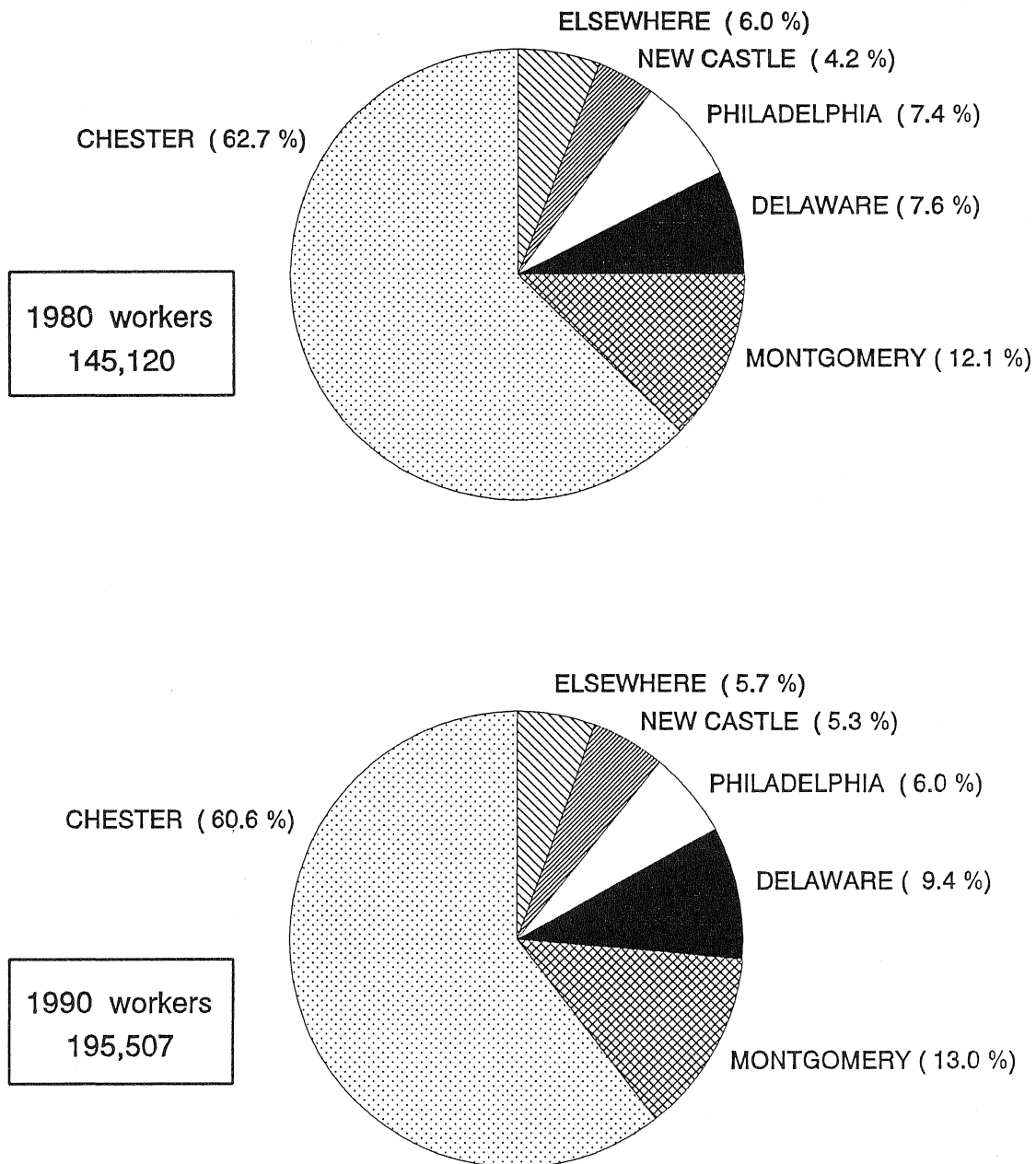
Bucks County is the northernmost county in the Delaware Valley region with densities that decline markedly from south to north. The lower portion of the county, which has access to deep water on the Delaware River and to mainline rail service, is a mature area with heavy industry that is now experiencing some decline. Most of the significant residential and commercial development is now taking place in the middle portion. During the 1980s, Bucks County supplanted Delaware County as having the third largest number of resident workers in the region, after Philadelphia and Montgomery County. The upper portion of the county is still largely rural and undeveloped.

Bucks County has traditionally served as a bedroom area for Philadelphia, and while this role is still important, an increasing number of residents are now commuting to jobs in New Jersey. Bucks is clearly benefitting from its location opposite Trenton and quick access to jobs in the Princeton area. The number of work trips to Middlesex County has increased by 205 percent since 1980, and that to Somerset County by 382 percent. These two counties now attract almost one-fourth (24%) of all Bucks County residents who work outside the region. The county enjoys easy access to NJ TRANSIT rail stations via I-95 and US 1, and in recent years the county has sent significant numbers of workers to New York City. However, although commutation to New York City grew by 76 percent during the 1980s, the share has remained stable at 14 percent of external commuters. The distribution of Bucks County resident workers by place of work is shown in Figure 5. Salient features are stated below.

- In 1990, 280,000 workers resided in Bucks County, an increase of 27 percent from 1980 and 72 percent from 1970.
 - About 54 percent of the workers are employed in Bucks County, down from 57 percent in 1980, but the same share as in 1970.
 - Neighboring Montgomery County attracted 15 percent of the workers and has supplanted Philadelphia as the second most popular work destination.
 - The number of resident workers commuting to Philadelphia has remained static at about 31,000. However, because of the overall increase in county workers, this share has declined from 14 percent in 1980 to 11 percent in 1990.
 - Mercer County was the destination of 9 percent of the workers, up from 7 percent in 1980. In terms of absolute numbers, this represented an increase of 8,000 since 1980.
 - Commuting to workplaces outside the region increased by 75 percent since 1980, and now represents about 7 percent (19,000 workers) of the county's work force.
-

Figure 6

CHESTER COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Chester County

Chester County is the westernmost county in the region and the most rural of the five Pennsylvania counties. New development has focussed at the eastern end of the county, but is extending westward along the corridor defined by the Main Line (US 30).

Considering the Pennsylvania counties only, Chester County sends the smallest share of its workers to Philadelphia and the largest share to external work sites, primarily because of its distance from Philadelphia and its proximity to the State of Delaware. The county has the smallest work force, but ranks first in terms of percentage growth. The pattern is representative of the rapid growth now occurring in outlying areas.

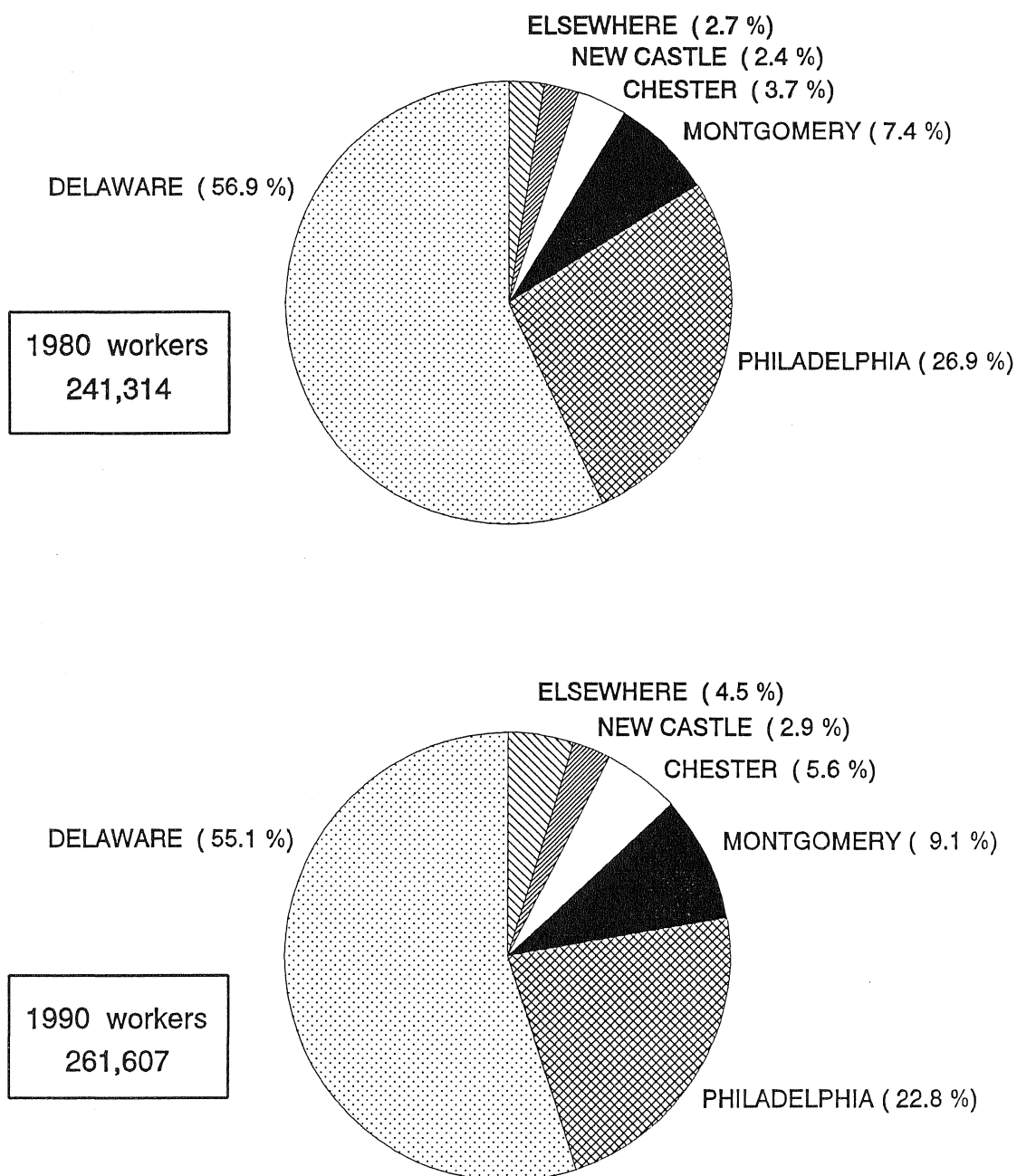
Montgomery County attracts the largest share of county residents who seek work outside Chester County. This is logical not only because of their long common border, but also because of the early industrial development of the Schuylkill Valley and the more recent growth seen around King of Prussia.

The distribution of Chester County resident workers by place of work is shown in Figure 6 and highlighted below.

- In terms of resident workers, Chester County is the fastest growing county in the region; in each of the past two decades its resident work force has increased by 35 percent.
 - About 61 percent of the 196,000 employed residents worked within the county, and 13 percent commuted to Montgomery County. Other major destinations included Delaware (9%), Philadelphia (6%), and New Castle (5%) counties.
 - The ranking of the top four destination counties has not changed since 1980, although it should be noted that the number commuting to New Castle County has increased by 71 percent, and to Delaware and Montgomery counties by 66 and 44 percent, respectively.
 - Almost 12,000 residents commuted to Philadelphia, representing a 10 percent increase from 1980 and 49 percent from 1970.
 - External commuters amounted to 9 percent of the total in 1990, almost unchanged from 1980 and 1970. The majority of these traveled to the Wilmington area (New Castle County) (56%) in 1980, up from 44 percent in 1980 and 48 percent in 1970, and now totals more than 10,000 workers. Counties to the west (Lancaster and Berks) attracted 21 percent in 1990, up from 18 percent in 1980, but down from 26 percent in 1970.
-

Figure 7

DELAWARE COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Delaware County

By virtue of its small size and close proximity to Center City Philadelphia, Delaware County is the most urbanized of the suburban counties and sends the highest share of its work force to Philadelphia. It also has the second lowest growth rate of the region's counties.

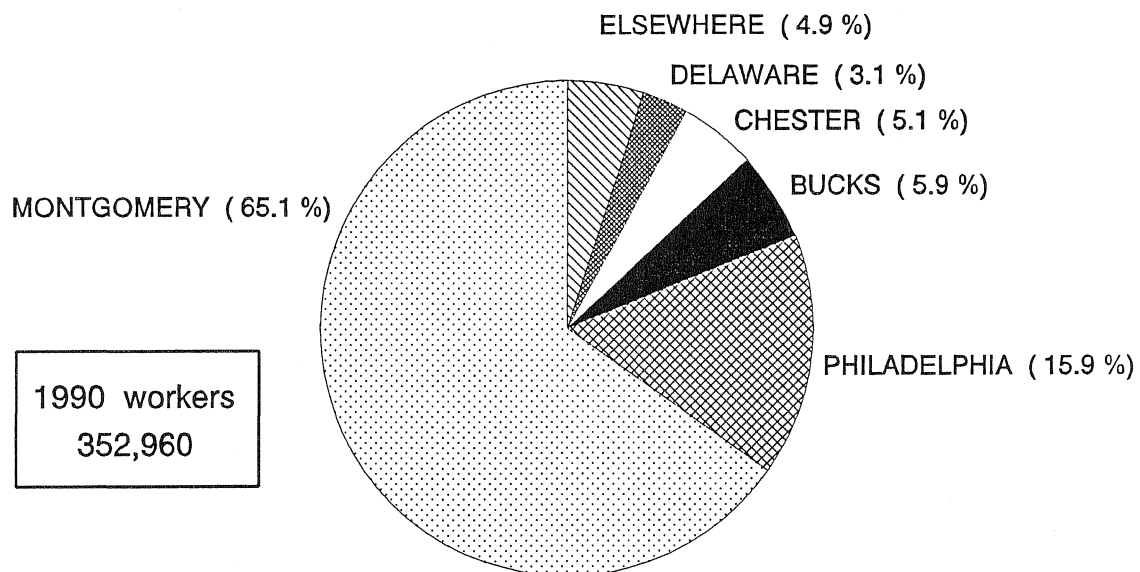
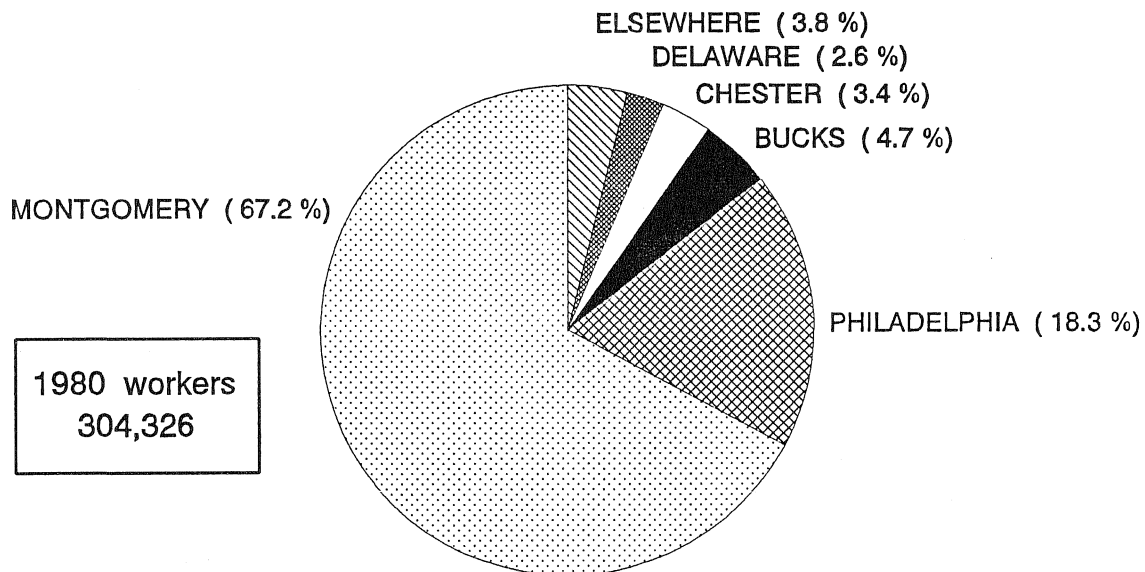
The eastern end of the county developed early as suburbs to supply workers to Philadelphia and the heavy industry located along the Delaware River. Although Philadelphia is still the largest single attraction, commuters are traveling in increasing numbers both north to Montgomery County and south to the Wilmington area.

Changes in the distribution of resident workers by county are shown in Figure 7 and highlights listed below.

- The number of resident workers in Delaware County is relatively stable, having only increased by 8 percent during the 1980s, and by 4 percent during the 1970s.
 - About 55 percent of the employed residents worked within the county, and almost 60,000 (23%) commuted to Philadelphia. The share working locally has not changed significantly since 1970, but that commuting to Philadelphia has declined from 30 percent in 1970 and 27 percent in 1980.
 - Other major work places included Montgomery County (9%) and Chester County (6%).
 - The ranking by county of the top workplaces has not changed since 1970, although since 1980 the number of work trips to Philadelphia has declined by 8 percent. In that same period, commutation to Chester County increased by 63 percent, and that to Montgomery County by 34 percent.
 - About 12,000 residents, or 5 percent of the total, traveled to external work sites, representing an increase of 40 percent since 1980. The data from the 1990 census indicate that 62 percent of these work in New Castle County. During the 1980s, commutation to New Castle County increased by 29 percent, from 5,800 to 7,600 workers, and representing an acceleration from the 13 percent increase experienced during the 1970s.
-

Figure 8

MONTGOMERY COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Montgomery County

Close proximity to Center City Philadelphia and good railroad service stimulated early suburban development in Montgomery County. Later development has tended to move outward along the Schuylkill Expressway, the Pennsylvania Turnpike, and US 202, and includes major employment centers at King of Prussia and Fort Washington. The northern end of the county is still largely undeveloped. Rapid growth is now occurring along US 422 Expressway, but much of the stimulated commutation stays within Montgomery County.

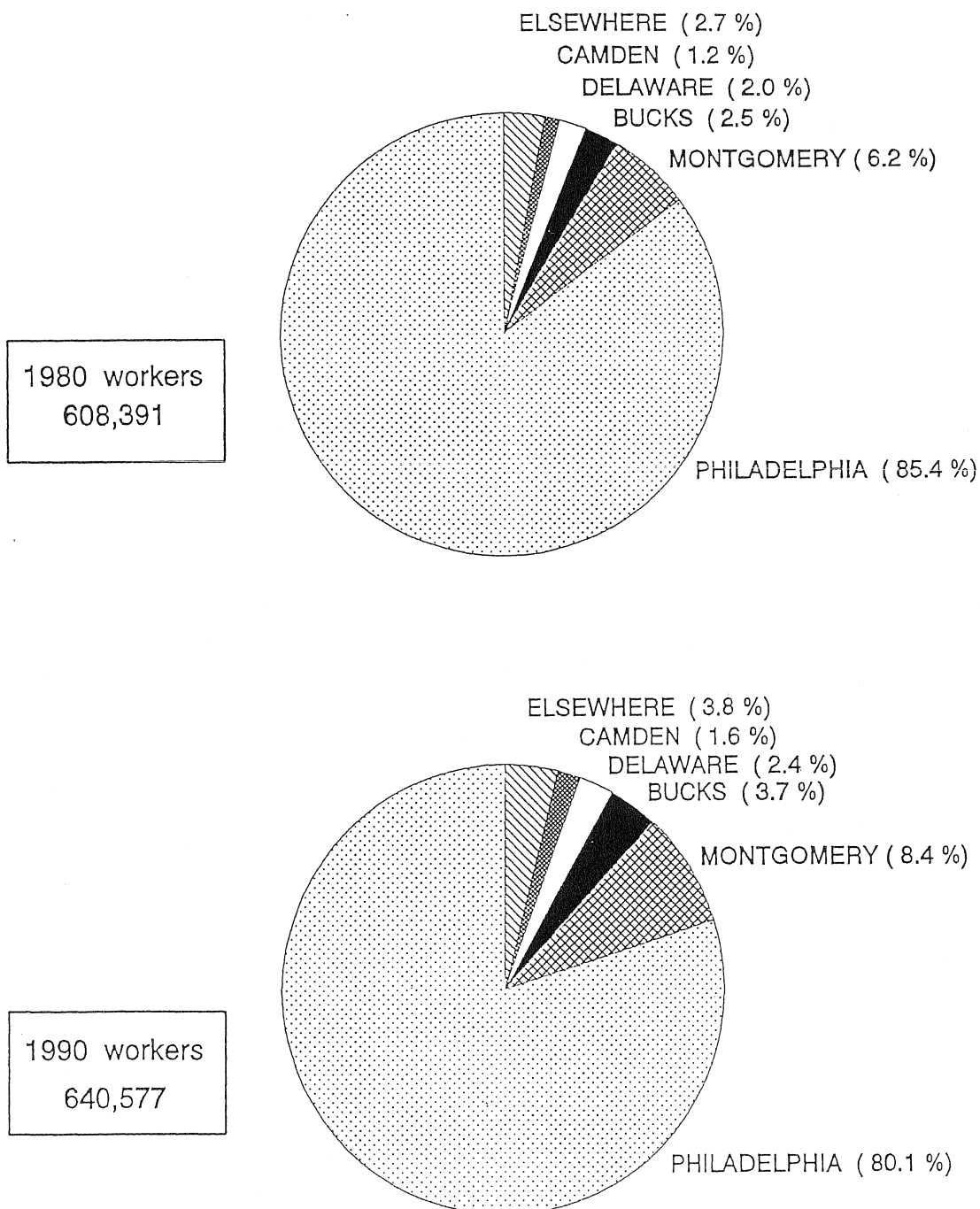
Of the suburban counties, Montgomery County has the largest work force, but sends the smallest share to work sites outside the DVRPC region. Only Philadelphia and Mercer counties keep a larger share of their work forces at home. The only county outside the region to attract as much as one percent of the resident workers in 1990 was Berks, which abuts Montgomery County on its northwest side.

Reflecting its relatively mature development, Montgomery County has the third lowest growth rate in the region, after Philadelphia and Delaware County. The distribution is shown in Figure 8 with highlights listed below.

- The number of resident workers (353,000) has increased by 16 percent since 1980, a slowdown from the 21 percent growth observed during the 1970s.
 - About 65 percent worked within the county and 16 percent, or 56,000, commuted to Philadelphia. Neither sharer has changed significantly since 1970.
 - About 6 percent traveled to Bucks County and 5 percent to Chester County, representing increases of 46 and 70 percent, respectively, since 1980. Although the numbers have increased, the rankings of major workplaces by county have not changed since 1970.
 - Only about 3 percent of employed residents commuted to work sites outside the region. In 1990 about 32 percent of these traveled to Berks County, which includes Reading, up from 25 percent in 1970.
-

Figure 9

PHILADELPHIA RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Philadelphia County

Philadelphia represents the urban center of the region with the largest population and the largest employment. Because of its mature development, it is experiencing the lowest growth rate of any of the region's counties. It has the largest share of employed residents working locally, and sends the smallest share outside the region.

Though office employment is still strong in Center City, the loss of manufacturing jobs in the peripheral portions of the city have weakened the employment base. Some new development has occurred in Northeast Philadelphia along Roosevelt Boulevard (US 1).

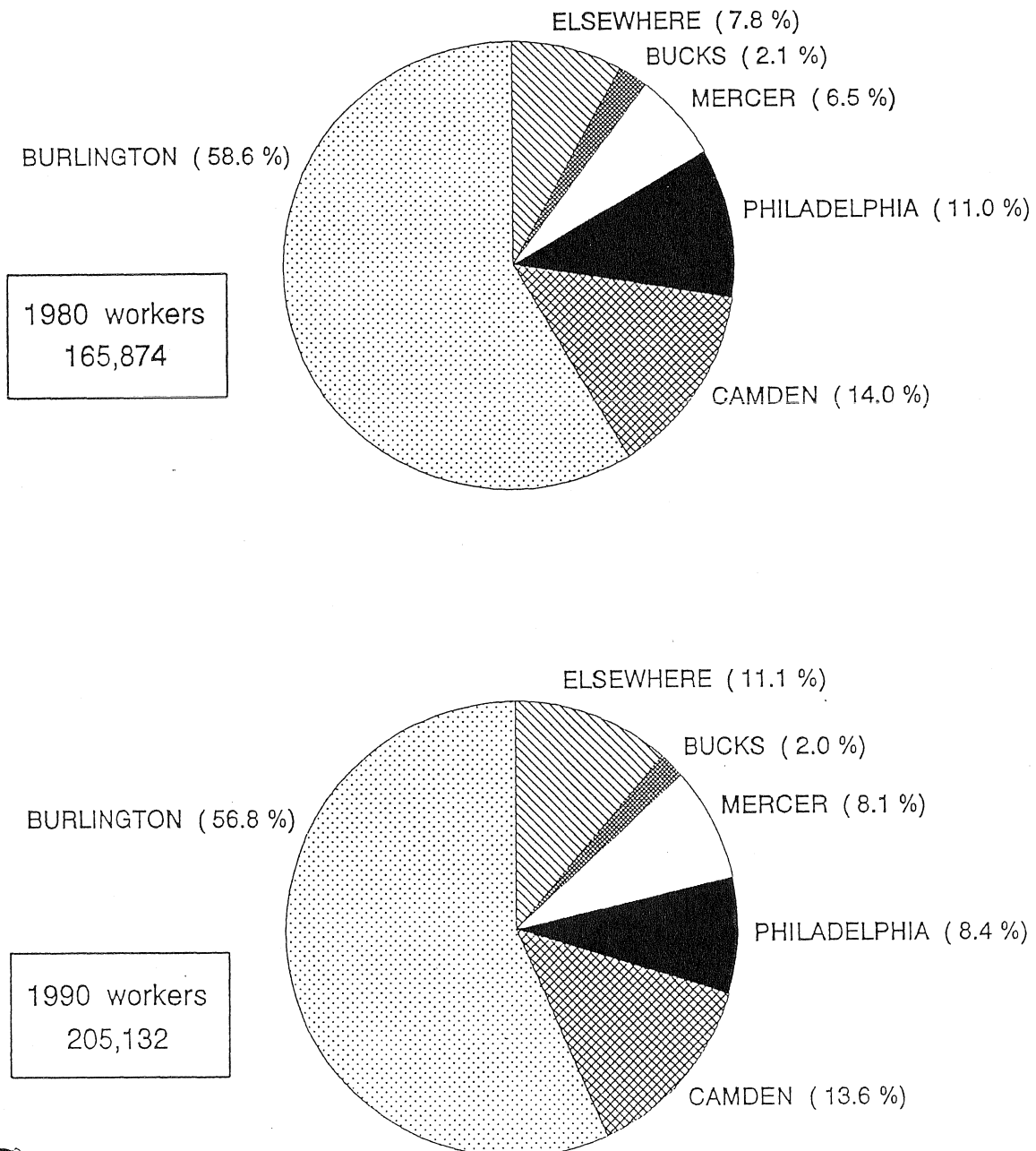
Reverse commuting has become an increasingly important phenomena, and has served to partially balance traffic flows on radial highways and transit lines. Montgomery County attracts the largest share, but Bucks, Delaware, and Camden counties are also important recipients of Philadelphia resident workers.

Commuting patterns for 1980 and 1990 are shown in Figure 9 and highlights are listed below.

- Though relatively stable, the number of resident workers has increased by 5 percent since 1980 to 641,000. This represents a turnabout from the 1970s, when the number of resident workers declined by 18 percent. In 1990, 26 percent of the region's resident workers lived in Philadelphia.
 - About 80 percent worked within the city; however, the number commuting to suburban destinations has increased by 43 percent since 1980 and in 1990 totaled 127,000.
 - About 8 percent of the workers commute to Montgomery County (42 percent of reverse commuters) and 4 percent work in Bucks County. These rankings have not changed since 1980. Bucks County has replaced Delaware County as the third most important work destination in the 1970s.
 - The four Pennsylvania suburban counties attracted about 15 percent of the resident workers, and the four New Jersey counties about 3 percent. In 1980 these counties attracted 11 and 2 percent of the workers, respectively, and in 1970, 10 and 3 percent.
 - Only about 2 percent of Philadelphia resident workers traveled outside the region for work, a share which has not changed significantly since 1970.
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Figure 10

BURLINGTON COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Burlington County

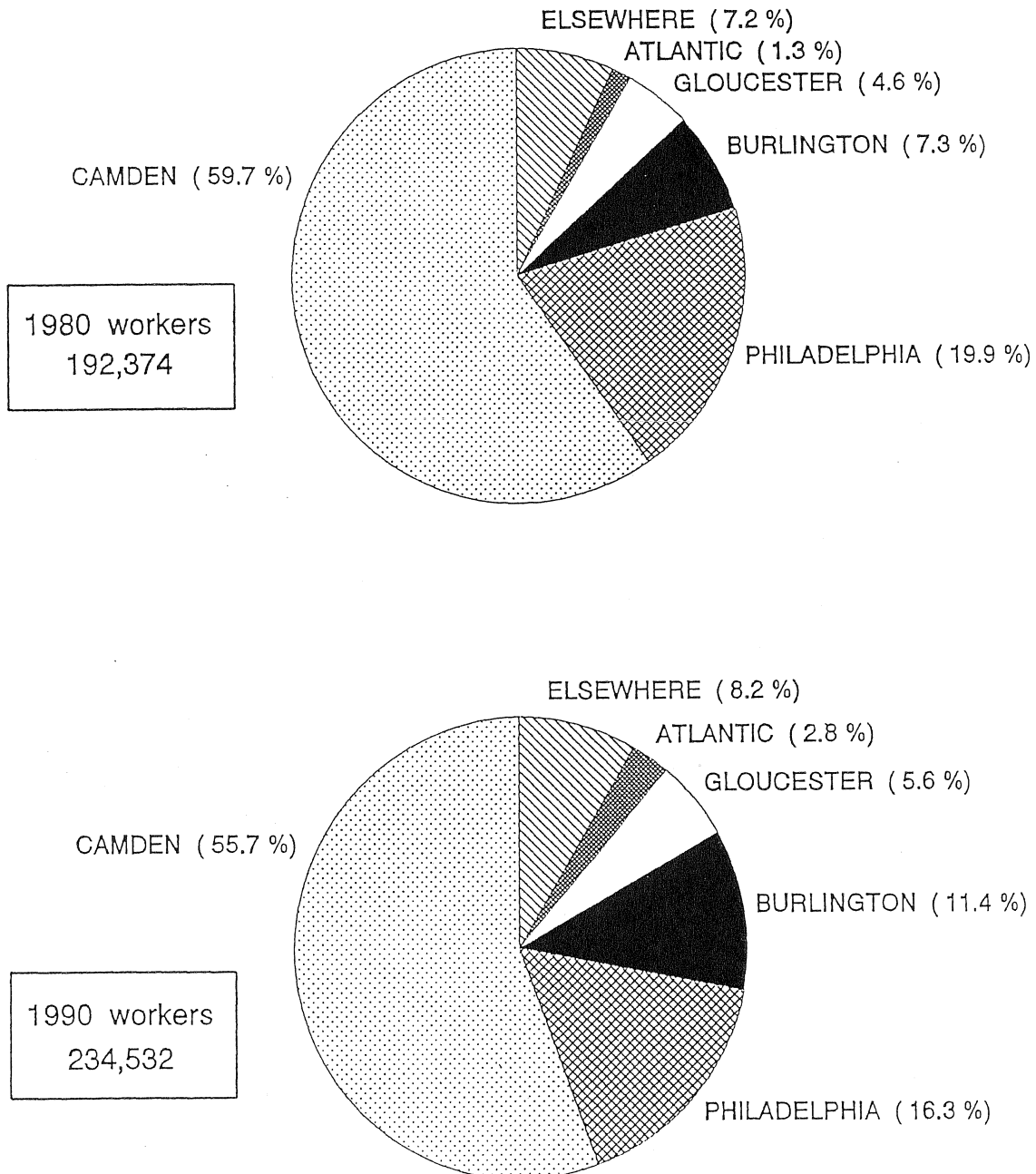
Burlington County sends its workers in a variety of directions; south to Camden County, west to Philadelphia, north to Trenton, and southeast to Atlantic City. Philadelphia still ranks third as a work destination for Burlington County residents. Commutation to Philadelphia grew by 21 percent during the 1970s, but declined by 6 percent during the 1980s. However, aside from Philadelphia, growth patterns have been stable since 1970. Commutation to jobs in the New Jersey suburbs grew by about 23 percent and to the Pennsylvania suburbs by about 45 percent in each of the two decades since 1970.

During the 1980s the number of workers commuting to adjacent Camden and Bucks counties grew by 20 and 16 percent, respectively. Growth in traffic to more distant counties in the region grew faster, with the number going to Delaware County doubling during the 1980s and to Gloucester increasing by 58 percent, but the absolute numbers are still small. Commutation to counties external to the region constitute the fastest growing portion of the pie. The distribution is shown in Figure 10, and highlights are listed below.

- The number of resident workers increased by 24 percent during each of the last two decades.
 - About 57 percent (116,000) worked within the county, 14 percent (28,000) commuted to Camden County, and 8 percent (17,000) to Philadelphia. Another 8 percent (17,000) traveled to Mercer County. These rankings have not changed since 1980, although Mercer County came close to displacing Philadelphia as the third most common destination. The number of work trips to Mercer County has grown by 56 percent since 1980. In 1970 Philadelphia was the second most popular destination, attracting more workers than Camden County.
 - In the last decade external commutation has increased by 77 percent and now amounts to 8 percent of the total. In 1990 Middlesex County, the most important external destination, attracted almost 3,000 workers, up 119 percent from 1980. Rapid growth occurred in Atlantic and Ocean counties, each attracting about 2,000 workers from Burlington County. About 1,200 workers commuted to New York City, up 12 percent from 1980. During the 1970s, commutation to work sites outside the region grew by 83 percent, with Ocean, Middlesex, and Monmouth counties receiving most of the increase.
-

Figure 11

CAMDEN COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Camden County

As the most urbanized of the New Jersey counties and by virtue of its location directly across the Delaware River from Center City Philadelphia, Camden County has the largest work force and sends the most commuters to Philadelphia. However, this flow is stable at about 38,000, but constitutes a declining share of the total. Taken collectively, the number of trips going beyond Philadelphia to Montgomery, Delaware, and Bucks counties has increased by 64 percent since 1980, and now amounts to 4 percent of the total, although none of the individual shares are large enough to show on a pie chart.

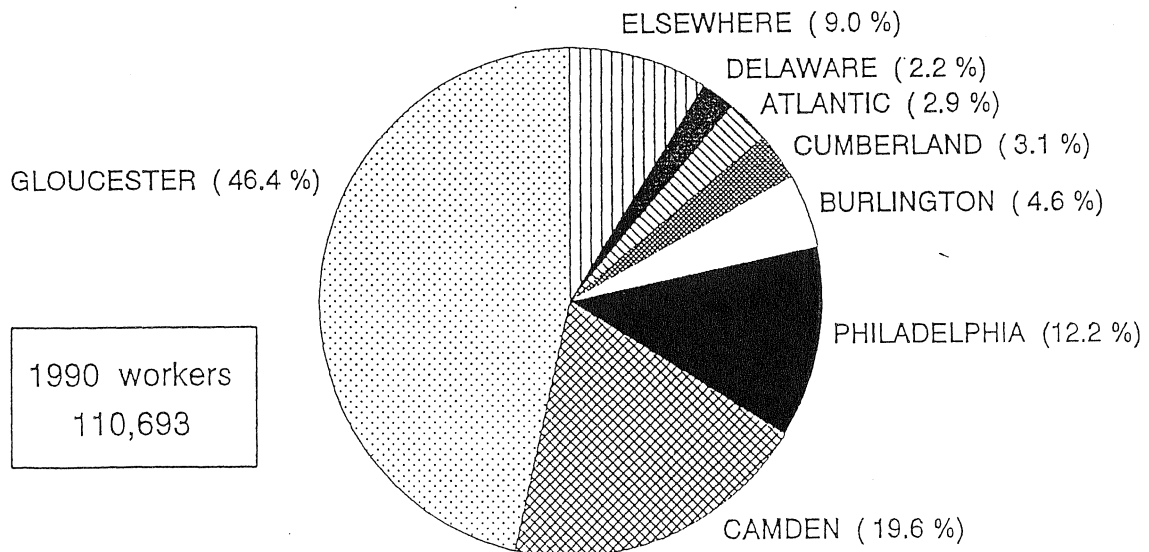
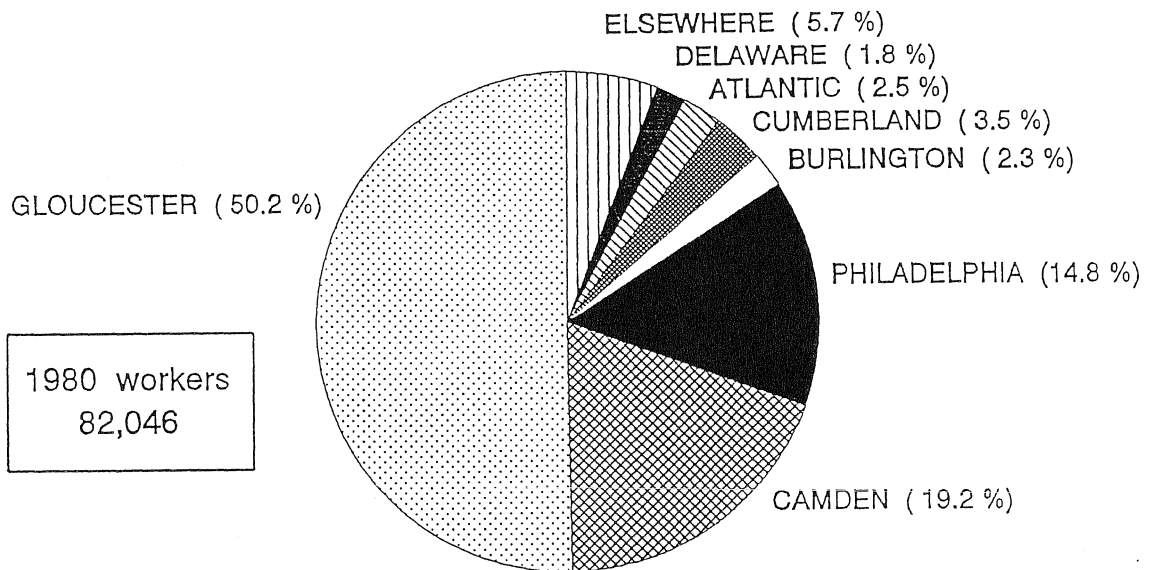
Relatively few of the county's residents work outside the region, although an increasing number are being attracted to Atlantic City.

Distribution is shown in Figure 11 and highlights are listed below.

- During the 1980s the number of resident workers increased by 22 percent to 235,000. The increase during the 1970s was 11 percent.
 - Approximately 56 percent worked within the county, down from 60 percent in 1970 and 1980, while 16 percent commuted daily to Philadelphia. The share commuting to Philadelphia has shrunk steadily from 24 percent in 1970 to 20 percent in 1980 and 16 percent in 1990.
 - Burlington County attracted 11 percent of the resident workers and Gloucester County 6 percent. While the number of residents commuting to Philadelphia has remained static since 1980, the number traveling to Burlington County has increased by 90 percent and those to Gloucester County by 48 percent. The rankings of the top four work locations have not changed since 1970.
 - About 6 percent commuted to external work sites, with Atlantic County capturing 46 percent of this traffic. Work commutation to Atlantic County increased by 161 percent during the 1980s. This major shift in commutation patterns has been caused by the rapid growth of the casino industry during the 1980s.
-

Figure 12

GLOUCESTER COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Gloucester County

Gloucester County has the smallest work force of any of the region's counties, and is the only one that employs less than 50 percent at home. Almost 32 percent work in either Philadelphia or Camden County. These commuting patterns reflect both the county's relatively close-in location to Philadelphia and Camden, and heavy investment in new housing stock during the 1970s and 1980s.

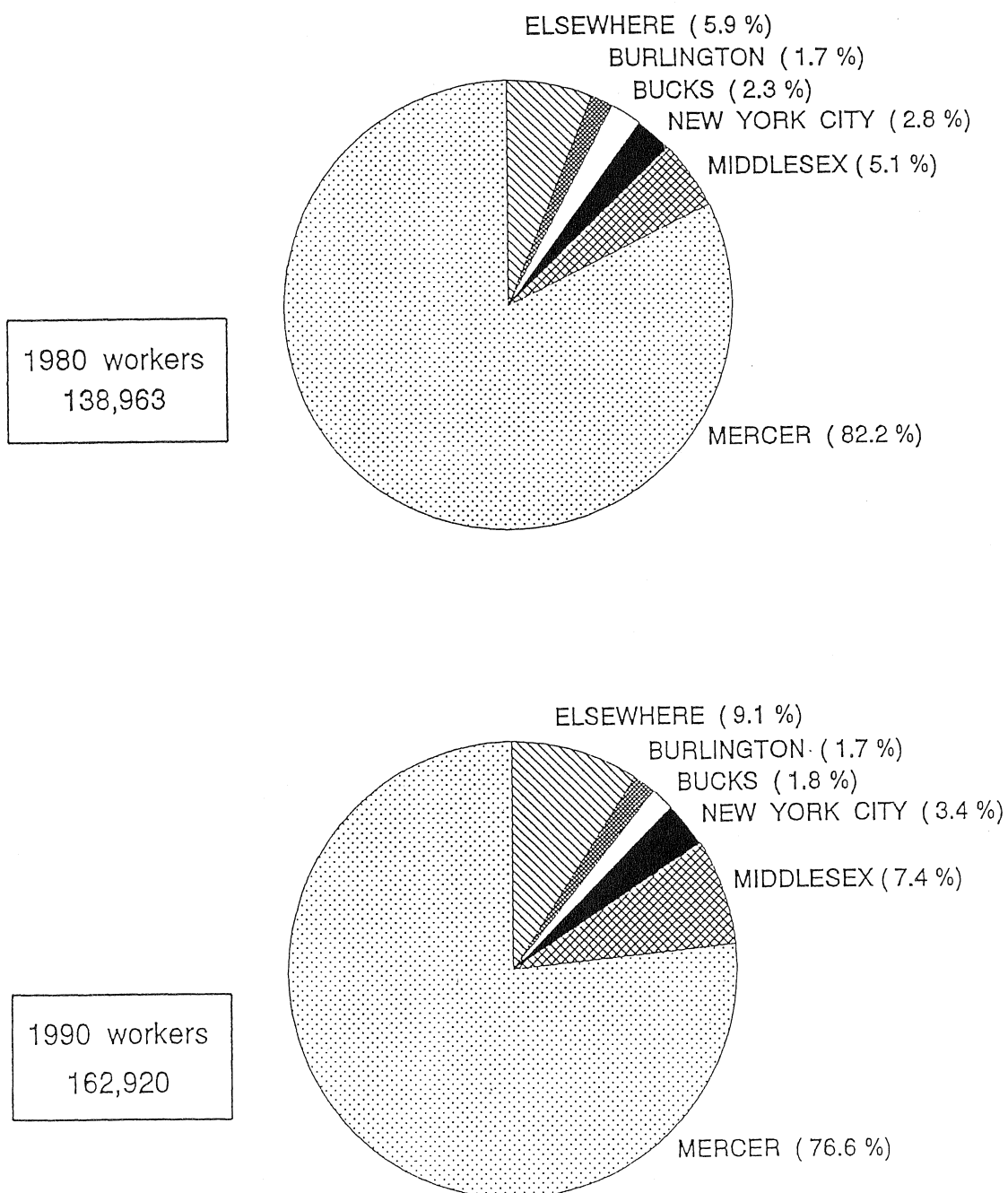
In common with Camden County, Atlantic City is attracting an increasing number of resident workers from Gloucester County due to casino gambling. Historically, Gloucester has sent significant numbers of its residents to Cumberland and Salem counties for work. This traffic is still there, but it is stable and is now a declining share of the total.

The distribution of work trip destinations by county is shown in Figure 12, with highlights listed below.

- The number of resident workers has increased significantly during the last two decades, from 63,000 in 1970 to 111,000 workers in 1990, representing a growth of 31 percent during the 1970s and 35 percent during the 1980s.
 - Only 46 percent commuted in 1990 to work sites within the county, down from 52 percent in 1970 and 50 percent in 1980.
 - Outside of Gloucester County itself, Camden County was the most important work location, attracting 20 percent of the county's resident workers. In 1970 the share commuting to Camden was 16 percent.
 - Almost 14,000 (12%) of the total resident workers commuted to Philadelphia in 1990, down from 19 percent in 1970 and 15 percent in 1980.
 - The number commuting to Burlington County has increased 173 percent since 1980 and now represents almost 5 percent of the total.
 - The ranking of work trip destinations has not changed since 1980, although the growth has been uneven. Camden County passed Philadelphia as the second most important work destination during the 1970s.
 - Almost 12 percent of the workers commuted to work sites outside the region, with most of these workers distributed among Atlantic, Cumberland, and Salem counties.
-

Figure 13

MERCER COUNTY RESIDENT WORKERS DISTRIBUTION BY PLACE OF WORK



Mercer County

Mercer County contains the state capitol, Trenton, which is a major employment center, and has a northward orientation toward New York. High technology employers in the vicinity of Princeton also attract many workers from Mercer and surrounding counties, and some of this development spills over into southern Middlesex County.

Within the region, Bucks and Burlington counties hold the most important work destinations, but neither flow is very large, and that to Bucks County is actually declining. Of the counties in the region it sends the smallest share of its workers to Philadelphia. Mercer County is a net importer of workers as the number of jobs in the county exceeds the number of resident workers by 25 percent.

Figure 13 compares the 1980 and 1990 commuting patterns for the county, and which are summarized below.

- The number of resident workers in Mercer County has increased by 17 percent since 1980 to 163,000 workers. This is the smallest growth observed among the four New Jersey counties. Even so, this represents an increase above the 12 percent growth observed during the 1970s.
 - The county ranks second in the region in its ability to provide jobs for its own residents, with 77 percent finding work within the county; at the same time it sends the largest fraction (18%) outside the region. The share working within the county has declined from 84 percent in 1970 and 82 percent in 1970; and commuting to locations outside the region has increased from 9 percent in 1970 and 13 percent in 1980.
 - The most common workplaces within the region are in Bucks and Burlington counties, each attracting about 3,000 workers, or 2 percent of the resident workers, a pattern which has not changed significantly since 1970.
 - In 1990, only 1,200 residents, or less than 1 percent, commuted to Philadelphia.
 - Many workers traveled to jobs outside the region, with Middlesex County attracting 12,000 (7% of the total), New York City 5,600 (3%), and Somerset County 3,300 (2%). These shares have grown steadily over the past two decades.
-

Table 4

EXTERNAL COMMUTING PATTERNS

Residents Who Worked Outside the Region

County of Residence	Year			Percent Change	
	1970	1980	1990	'70-'80	'80-'90
Bucks	8,222	11,059	19,328	34.5	74.8
Chester	9,230	13,606	18,400	47.4	35.2
Delaware	9,103	8,688	12,207	-4.6	40.5
Montgomery	9,896	8,678	11,452	-12.3	32.0
Philadelphia	10,905	8,979	10,717	-17.7	19.4
PA Total	47,356	51,010	72,104	7.7	41.4
Burlington	4,747	8,704	15,400	83.4	76.9
Camden	5,462	9,673	14,252	77.1	47.3
Gloucester	5,615	8,481	12,927	51.0	52.4
Mercer	10,594	17,495	29,811	65.1	70.4
NJ Total	26,418	44,353	72,390	67.9	63.2
Region Total	73,774	95,363	144,494	29.3	51.5

Non-Residents Who Worked Inside the Region

County of Work	Year			Percent Change	
	1970	1980	1990	'70-'80	'80-'90
Bucks	3,091	5,051	10,493	63.4	107.7
Chester	4,320	7,945	15,708	83.9	97.7
Delaware	5,030	7,011	9,862	39.4	40.7
Montgomery	8,261	11,831	22,892	43.2	93.5
Philadelphia	11,222	9,186	19,882	-18.1	116.4
PA Total	31,924	41,024	78,837	28.5	92.2
Burlington	3,795	3,829	8,152	0.9	112.9
Camden	3,636	4,216	7,065	16.0	67.6
Gloucester	2,222	2,933	7,571	32.0	158.1
Mercer	12,171	21,454	33,072	76.3	54.2
NJ Total	21,824	32,432	55,860	48.6	72.2
Region Total	53,748	73,456	134,697	36.7	83.4



External Commuting Patterns

The last decade has seen a rapid increase in commutation across the boundaries of the DVRPC region. The number of regional residents that travel daily to jobs outside the region now totals more than 144,000, an increase of 52 percent from 1980, an increase almost double the 29 percent rate observed during the 1970s. Non-resident workers who worked within the region, is slightly smaller (135,000), but is growing even faster (83%) during the 1980s and 37 percent during the 1970s. Work trip origins and destinations for external commutation are shown in Table 4.

Mercer County is the largest exporter of labor from the region, with almost 30,000 residents commuting daily to external work sites. Bucks County ranked a distant second, sending 19,000 residents outside the region, and close behind is Chester County with 18,000. In percentage terms Burlington, Bucks, and Mercer counties experienced the fastest growth in external commuting, 77, 75, and 70 percent, respectively, between 1980 and 1990. All three are on the fringe of the commuter shed for New York (1,200, 2,800, and 5,600 from the three counties, respectively), but other destinations are playing a role as well. Bucks is sending workers north to Lehigh County, and east to Hunterdon and Middlesex counties (2,000, 2,300, and 2,900 workers, respectively); Burlington sends workers to Atlantic, Ocean, and Middlesex counties (2,200, 2,100, and 3,000, respectively); and Mercer sends workers to Monmouth, Middlesex, and Somerset counties (1,800, 12,100, and 3,300, respectively). Mention should also be made of the number of jobs created during the 1980s in the Wilmington area, which has drawn increased commutation from Chester and Delaware counties (10,400 and 7,600, respectively).

Mercer County is also the biggest importer of labor from outside the region, attracting 33,000 workers per day. As the state capital and with its location on the edge of the region, perhaps this result is not surprising. The largest number (10,300) come from Middlesex County, but Monmouth, Somerset, and Hunterdon counties also send significant numbers of workers (5,100, 4,400, and 3,500, respectively). Montgomery County ranks second with 23,000 workers, and Philadelphia third with 20,000. Berks and Lehigh counties are the biggest contributors of workers to Montgomery County (11,000 and 3,500, respectively); and New Castle and Atlantic counties send 4,700 and 1,100, respectively, to Philadelphia. Chester County ranks fourth in commutation from outside the region. Chester County's workers come from Lancaster, New Castle, and Berks counties (5,200, 3,500, 3,100, respectively). Ranked in terms of percentage increase since 1980, the counties with the fastest growth were Gloucester (158%), Philadelphia (116%), Burlington (113%), and Bucks (108%). Except for Philadelphia, these are counties starting from relatively low bases. Gloucester County's workers come from Salem, Cumberland, and Atlantic counties (3,100, 1,700, and 1,000, respectively); Burlington's come from Ocean and Atlantic counties (2,400 and 800, respectively); and Bucks's from Lehigh and Northampton counties (3,800 and 1,900, respectively).

Table 5
PERCENT DISTRIBUTION OF RESIDENT WORKERS
BY MEANS OF TRANSPORTATION

County of Residence	Resident Workers		Drive Alone		Vanpool, Carpool		Public Transp.		Other Means	
	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990
Bucks	219,876	279,551	71.3%	80.6%	19.0%	10.9%	3.7%	2.8%	6.0%	5.8%
Chester	145,120	195,507	69.6	78.8	17.6	10.1	3.8	2.8	9.0	8.2
Delaware	241,314	261,607	60.9	70.9	18.4	12.1	12.9	9.2	7.8	7.8
Montgomery	304,326	352,960	68.9	78.9	16.7	10.0	6.3	4.1	8.1	7.0
Philadelphia	608,391	640,577	40.7	44.7	16.6	13.2	30.0	28.5	12.7	13.6
Total PA	1,519,027	1,730,202	56.8	65.3	17.3	11.6	16.2	13.6	9.7	9.5
Burlington	165,874	205,132	68.2	78.0	19.1	12.2	3.4	2.6	9.3	7.1
Camden	192,374	234,532	64.7	71.8	18.5	13.3	10.6	8.6	6.2	6.3
Gloucester	82,046	110,693	70.2	79.0	20.4	12.6	2.9	2.5	6.5	5.9
Mercer	138,963	162,920	63.5	71.5	19.1	12.7	7.5	6.2	9.9	9.6
Total NJ	579,257	713,277	66.2	74.7	19.1	12.7	6.7	5.4	8.0	7.2
Total Region	2,098,284	2,443,479	59.4%	68.0%	17.8%	12.0%	13.6%	11.2%	9.2%	8.9%



IV. MEANS OF TRANSPORTATION

One of the more important transportation-related questions asked on the census concerns the means used to travel to work. The responses refer to the primary mode used and were aggregated by DVRPC into the following four categories: drove alone; carpool/vanpool; public transportation; and other means. Drove alone includes all who traveled in a single-occupant vehicle. Commuters who share driving, carry passengers, or ride with others are categorized as carpool/vanpool. Public transportation includes buses, streetcars, commuter trains, and subway/elevated trains. Other means commonly refers to walking, bicycles, motorcycles, taxis or working at home, but can include less ordinary modes, such as ferryboats and helicopters. Table 5 and Figure 14 compare the modes used in 1990 with those used in 1980. Additional information regarding means of transportation can be found in Appendices VI and VII.

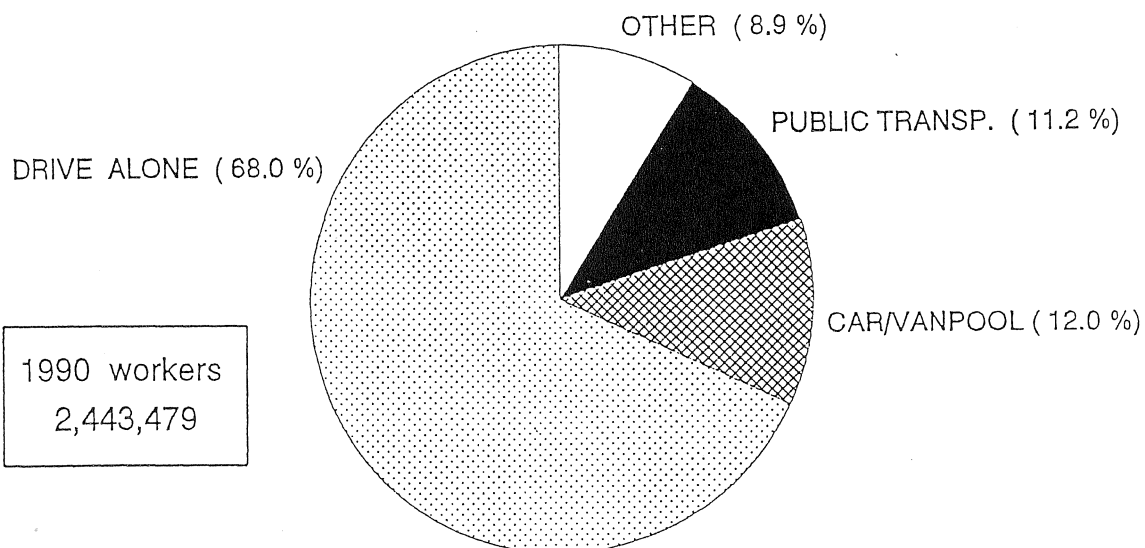
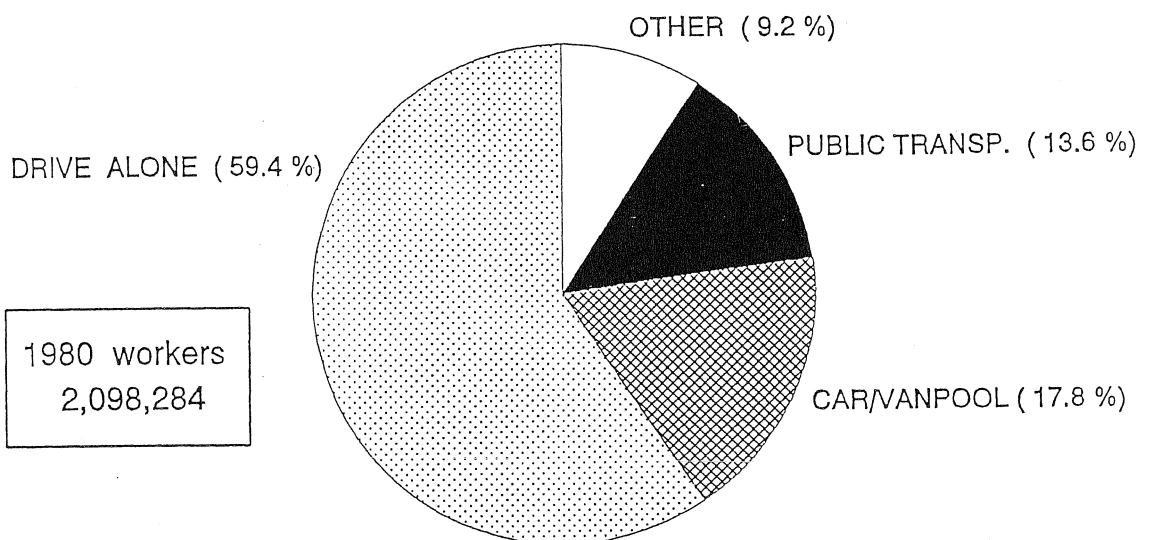
The most striking changes between 1980 and 1990 are the increase in the use of single-occupant vehicles for work trips and the decline in ridesharing. The number of residents driving alone increased 33 percent to 1,662,000, raising the modal share by 9 percentage points to 68 percent. The number using carpools or vanpools fell by 22 percent to 292,000. The modal share is now 12 percent, down from 18 percent a decade earlier. Also, the use of public transportation has declined by 4 percent to 273,000, for a modal share of 11 percent, down from 14 percent in 1980. About 9 percent of commutation trips fall into the *other means* category, which is unchanged from 1980. Preliminary information released by the Bureau of the Census indicates that the movement toward single-occupant vehicles and away from ridesharing is a nationwide trend.

There are several underlying causes for these changes, the most important being the increase in the number of automobiles available for commuting. For the past several decades growth in automobile ownership has been significantly steeper than the growth in population and employment. Also the perceived cost of driving (out-of-pocket cost) is seen by many as being less than the cost of taking public transportation. Further, the continuing shift of jobs from the cities to suburban locations with their abundance of free parking means that many workers now find it much easier to drive than to take transit or join a carpool.

Drove Alone

This is the mode of choice for over two-thirds (68%) of the region's resident workers. This represents 1.6 million commuters. The share would be even higher if it were not for Philadelphia, where the share of resident workers using single-occupant automobiles is limited to 45 percent. In every other county in the region, the share is over 70 percent, the highest being Bucks County with 81 percent. Among the suburban counties, Delaware, Camden, and Mercer counties have the lowest shares of workers driving alone, averaging about 71 percent in each of the three counties. These are the most urbanized of the suburban counties. In 1980 only Bucks and Gloucester counties had shares above 70 percent, and in Philadelphia the drove-alone share was 41 percent.

Figure 14
MEANS OF TRANSPORTATION TO WORK



Similar results are seen when the modal share is analyzed by the place of work. Less than one-half (48%) of employees who worked in Philadelphia drove alone, although when Philadelphia residents are excluded from the data this share rises to 63 percent. More than four-fifths (81%) of the commutes from one suburban location to another are in single-occupant vehicles, and for those going to locations outside the DVRPC region the share is 75 percent.

Carpool/Vanpool

In all nine counties in the region the share using carpools or vanpools varies between 10 and 13 percent, down from the 17 to 20 percent range observed a decade earlier. For the region as a whole, the number of workers ridesharing has declined from about 370,000 in 1980 to 290,000 in 1990. In spite of the narrow range, the tendency to rideshare increases with the degree of urbanization. Chester and Montgomery counties are at the low end of the range, and Philadelphia, Camden, and Mercer are at the high end.

Four-fifths of those ridesharing are in two-person carpools, with the average pool carrying only 2.2 persons. Only 2 percent are in vanpools carrying more than five persons. Nevertheless, pooling does take significant numbers of vehicles off the highway during peak periods.

Public Transportation

The share commuting on public transportation ranges from 2 percent in Gloucester County to 28 percent in Philadelphia. This represents a small decline from 1980, when the share for public transportation ranged from 3 percent (Gloucester) to 30 percent (Philadelphia). The number of resident workers using transit declined in every county except Chester, Philadelphia, and Gloucester, though ridership in several other counties was almost static. The reasons that ridership increased in a few counties are varied. Chester and Gloucester counties experienced the fastest growth in resident workers during the 1980s, up 35 percent; SEPTA expanded rail service to western Chester County in several steps during the latter half of the decade; and employment in Center City Philadelphia has increased. Delaware and Montgomery counties experienced significant declines in ridership, 22 and 24 percent respectively. The number of resident workers in Delaware County is only growing slowly, although Montgomery County showed moderate growth (16%).

Ridership on individual submodes is shown in Table 6 for 1980 and 1990. Though overall transit riding in the region is down 4 percent from 1980 to 1990, riding on bus and trolley (light rail) lines has moved in the other direction and increased 3 percent. Ridership on subway/elevated lines (which include SEPTA's Market-Frankford, Broad Street, and Norristown lines; and PATCO's Lindenwold Line) has fallen 4 percent, but the major loss has occurred on the Regional Rail lines (commuter rail), where ridership has fallen by 20 percent. Reasons for the latter include cessation of service on several lines, fare increases, and multi-month service disruptions caused by strikes and bridge failures. Some care should be exercised when interpreting these results, as they are based on answers supplied by respondents, who may not fully understand the distinctions governing the submode classification.

Table 6

COMMUTATION BY PUBLIC TRANSPORTATION (Workers)

County of Residence	Total Public Transportation			Submode								
	Transportation			Bus, Trolley		Subway, Elevated		Regional Rail				
	1980	1990	%Change	1980	1990	%Change	1980	1990	%Change			
Bucks	8,114	7,710	-5.0	1,085	1,050	-3.2	179	334	86.6	6,850	6,326	-7.6
Chester	5,512	5,550	0.7	915	1,005	9.8	44	183	315.9	4,553	4,362	-4.2
Delaware	31,164	24,138	-22.5	10,307	9,456	-8.3	7,092	5,931	-16.4	13,765	8,751	-36.4
Montgomery	19,123	14,594	-23.7	4,360	3,562	-18.3	842	1,258	49.4	13,921	9,774	-29.8
Philadelphia	182,265	182,878	0.3	116,998	126,591	8.2	48,316	44,901	-7.1	16,951	11,386	-32.8
Total PA	246,178	234,870	-4.6	133,665	141,664	6.0	56,473	52,607	-6.8	56,040	40,599	-27.6
Burlington	5,631	5,417	-3.8	3,949	2,750	-30.4	753	1,301	72.8	928	1,366	47.2
Camden	20,319	20,135	-0.9	8,050	7,651	-5.0	7,391	7,581	2.6	4,878	4,903	0.5
Gloucester	2,354	2,727	15.8	1,844	1,684	-8.7	304	587	93.1	206	456	121.4
Mercer	10,395	10,083	-3.0	6,923	5,089	-26.5	63	200	217.5	3,409	4,794	40.6
Total NJ	38,699	38,362	-0.9	20,766	17,174	-17.3	8,512	9,669	13.6	9,421	11,519	22.3
Total Region	284,877	273,232	-4.1	154,431	158,838	2.9	64,985	62,276	-4.2	65,461	52,118	-20.4

Source: 1990 Census (STF-3), Table P49



Delaware Valley Regional Planning Commission

Other Means

Though this is a catchall category, taxis, bicycles, motorcycles, walked, and worked at home constitute the principal components. The shares observed in the counties for *Other Means* range from 6 to 14 percent, not significantly different from those observed in 1980. Philadelphia is the only location with a share greater than 10 percent. It can be seen from Table 7 that the primary reason behind Philadelphia's large share is more people walking to work. The shorter trip lengths in the city make walking more practical.

Walking still constitutes the largest submode in this category, although it has declined by 3 percent since 1980 - Philadelphia and Camden were the only counties to record an increase. In 1990, almost 134,000 residents of the Delaware Valley region, or 5 percent of the total, walked to work. Almost one-half of these resided in Philadelphia.

The number of regional residents working at home almost doubled between 1980 and 1990, with the latest census reporting 56,000 residents, or 2 percent of the total, in this submode. Personal computers and fax machines are perhaps now turning telecommuting into a reality.

Table 7

**COMMUTATION BY OTHER MEANS
(Workers)**

County of Residence	Total Other Means		Taxi		Bicycle		Motor Cycle		Walked		Other		Worked at Home	
	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990
Bucks	13,290	16,112	46	116	593	658	509	259	7,422	6,876	837	1,290	3,882	6,913
Chester	13,119	16,068	120	145	443	312	229	247	7,860	7,647	714	1,128	3,753	6,589
Delaware	18,820	20,438	172	99	649	635	314	304	13,266	12,698	1,130	1,414	3,291	5,288
Montgomery	24,727	24,790	359	272	1,081	607	546	307	15,581	11,920	1,192	1,389	5,967	10,295
Philadelphia	77,376	87,209	479	816	2,516	3,637	694	558	63,615	66,446	2,823	4,049	7,249	11,703
Total PA	147,332	164,617	1,176	1,448	5,281	5,849	2,292	1,675	107,744	105,587	6,696	9,270	24,142	40,788
Burlington	15,410	14,625	111	103	631	659	395	201	10,600	8,140	1,181	1,258	2,492	4,264
Camden	11,954	14,832	92	200	495	595	295	171	6,973	7,476	1,714	1,798	2,385	4,592
Gloucester	5,350	6,574	43	68	241	237	140	134	3,139	2,851	515	883	1,272	2,401
Mercer	13,742	15,638	191	115	838	754	215	166	9,796	9,550	549	1,012	2,155	4,041
Total NJ	46,456	51,669	437	486	2,205	2,245	1,045	672	30,508	28,017	3,959	4,951	8,304	15,298
Total Region	193,788	216,286	1,612	1,934	7,486	8,094	3,337	2,347	138,252	133,604	10,655	14,221	32,446	56,086

Source: 1990 Census (STF-3), Table P49



Delaware Valley Regional Planning Commission

V. TRAVEL TIME

The Journey-to-Work census package includes information on the time workers spend traveling to their jobs. Such knowledge provides insight into how well the transportation system is working and whether congestion is a worsening problem. Although modal specific data are not yet available, information on the distribution of travel times by county of residence is available and is shown in Appendix VIII. The total number of responses is slightly less than the number of employed residents, probably because not all workers queried by census takers answered the question on travel time. After removing those who worked at home from the pool, the share of work trips in each of the grouped time ranges was calculated, together with the average travel time for each county. The results are shown in Table 8.

For the region as a whole, the average commuting time required by residents to reach their jobs was 24.6 minutes. For the most part, there was little variation between counties. In six of the nine counties, the average travel time fell between 23.7 and 24.5 minutes. Of the suburban counties, only Montgomery and Mercer counties had lower averages, with travel times approaching 22 minutes.

The largest difference lay between Philadelphia and the other counties. City residents required on average 27.4 minutes to reach their workplace, 3.7 minutes longer than their suburban counterparts. This difference may not seem like much, but when the distribution of trips by time is displayed graphically (Figure 15) the distinction is seen as very real. Whereas 30 percent of the trips by suburban residents took less than 15 minutes, only 20 percent of the trips by city residents did so. At the other end of the scale, 46 percent of the city trips took longer than 30 minutes, in contrast to 34 percent for those living outside Philadelphia. The heavier use of public transportation in the city probably accounts for most of the extra travel time, as bus trips tend to take longer than comparable trips by automobile. Little difference was seen between the Pennsylvania and New Jersey suburban counties.

Table 8 also shows that the changes observed in travel times since 1980 are small, with the regional average going from 25.3 minutes in 1980 to 24.6 minutes in 1990. All of the decline has occurred in just three counties: Philadelphia (-2.7 minutes); Delaware (-1.1); and Camden (-0.7). These are the most urbanized of the region's counties, and were the only counties in 1980 to carry more than ten percent of their work trips on public transportation. However, this share is declining, and as work trips shifted from public transportation to automobiles, average trip times declined. Times in the other six counties increased slightly, with the largest increase occurring in Chester County (+1.6 minutes).

Approximately 7 percent of the region's commuters, or 165,000, reported they took more than one hour to travel to work in 1990, although this share has declined from 8 percent in 1980. The share requiring more than 1½ hours to reach their work sites in 1990 was only about 1 percent, or 26,000, but these commuters have an impact on congestion and air quality beyond

Table 8

DISTRIBUTION OF WORK TRIPS BY TRAVEL TIME
(Travel Time in Minutes)

1980

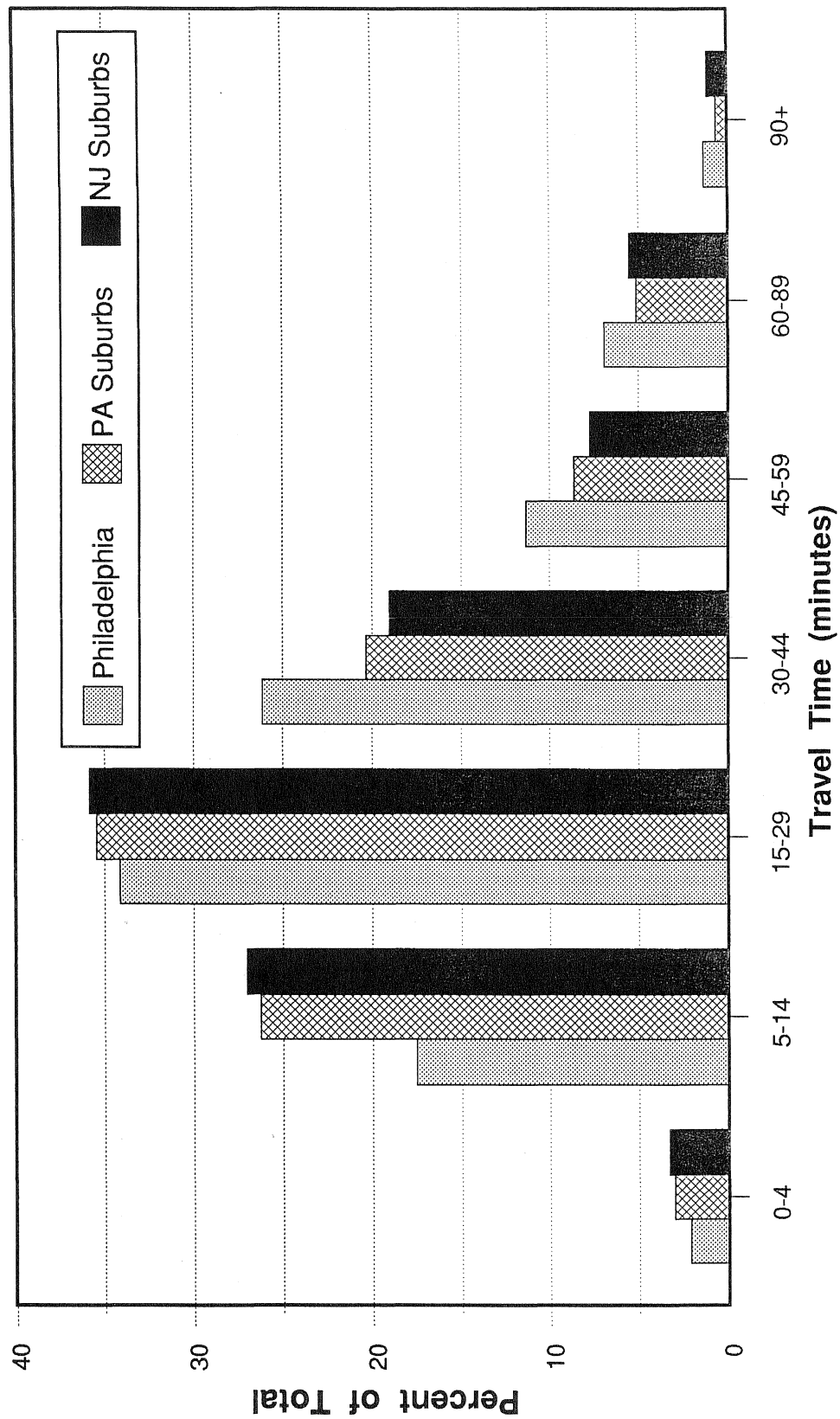
County of Residence	Share of Trips in Specified Time Range						Tot. Trips	Avg. Time
	<5	5-14	15-29	30-44	45-59	>60		
Bucks	2.9%	27.5%	37.2%	17.6%	7.0%	7.8%	215,433	24.0
Chester	3.7	29.9	36.7	16.6	7.0	6.2	141,664	22.3
Delaware	2.2	22.9	34.9	22.3	10.1	7.6	239,206	25.6
Montgomery	3.4	31.8	35.9	17.0	6.4	5.7	298,824	21.9
PA Suburbs	3.0	28.1	36.0	18.5	7.6	6.8	895,127	23.5
Philadelphia	1.8	15.5	31.8	26.7	12.2	12.1	599,745	29.8
PA Total	2.5	23.0	34.3	21.8	9.4	8.9	1,494,872	26.0
Burlington	4.3	28.2	32.9	19.0	8.1	7.5	163,795	24.0
Camden	2.5	24.2	37.9	20.5	8.0	6.9	188,659	24.4
Gloucester	4.4	28.0	31.9	20.7	7.9	7.1	81,493	23.9
Mercer	3.0	30.4	42.7	14.1	3.1	6.7	137,130	21.7
NJ Total	3.4	27.4	36.7	18.5	6.8	7.0	571,077	23.6
Total Region	2.8%	24.2%	35.0%	20.9%	8.7%	8.4%	2,065,949	25.3

1990

County of Residence	Share of Trips in Specified Time Range							Tot. Trips	Avg. Time
	<5	5-14	15-29	30-44	45-59	60-89	>90		
Bucks	3.0%	26.4%	35.7%	18.9%	8.4%	6.4%	1.2%	272,638	24.2
Chester	3.5	26.3	35.0	19.9	8.6	5.9	0.8	188,918	23.9
Delaware	2.7	23.2	35.3	23.2	10.3	4.7	0.5	256,319	24.5
Montgomery	3.3	28.6	35.8	19.7	7.9	4.3	0.5	342,665	22.5
PA Suburbs	3.1	26.3	35.5	20.4	8.7	5.2	0.7	1,060,540	23.7
Philadelphia	2.2	17.6	34.2	26.2	11.4	7.0	1.4	628,874	27.4
PA Total	2.8	23.1	35.0	22.6	9.7	5.9	1.0	1,689,414	25.1
Burlington	3.9	27.1	33.3	19.3	8.9	6.3	1.2	200,868	24.1
Camden	2.8	24.7	38.0	20.2	8.0	5.6	0.8	229,940	23.7
Gloucester	3.8	26.2	31.8	22.4	9.2	5.8	0.8	108,292	24.3
Mercer	3.2	31.1	38.8	15.0	5.1	4.8	2.1	158,879	22.1
NJ Total	3.4	27.1	35.9	19.1	7.8	5.6	1.2	697,979	23.6
Total Region	2.9%	24.2%	35.3%	21.5%	9.2%	5.8%	1.1%	2,387,393	24.6



Figure 15
1990 DISTRIBUTION OF TRAVEL TIME TO WORK



their numbers because of the long distances they are traveling. Mercer County reported the highest share (2.1%) in this category, probably because of commutation to northern New Jersey and New York. The smallest shares (0.5%) were reported from Delaware and Montgomery counties. In general, the New Jersey counties reported a higher share of resident commuters taking these truly long trips than did the Pennsylvania counties.

VI. EMPLOYMENT

Census Employment

Employment counts workers at the place of work, whereas *resident workers*, or employed persons, counts workers where they live. The census provides information on employment, but measures it by counting the number of people who reported for work during the census week. This does not account for those who did not work for reasons of illness or vacation, and it also does not count second jobs. Some discrepancies may also occur with respect to place of work, as the census assigns workers to where they worked during the census week, which could differ from their usual place of work. Coding problems could also result in workers being assigned to the wrong jurisdiction.

Keeping these caveats in mind, Table 7 shows trends in employment by county observed since 1970. *Census employment* is that enumerated directly in the Census Transportation Planning Package. [At the county level it is represented by the bottom row in the tables contained in Appendix II, County to County Commuting Patterns.] The region as a whole fared considerably better during the 1980s than during the 1970s. Regional employment increased by 17 percent over the last decade, up sharply from the 6 percent experienced earlier. The major changes occurred in Philadelphia, which arrested its slide and held employment steady after a decline of 13 percent during the 1970s. As a group employment in the four Pennsylvania suburban counties increased 26 percent during the 1980s, which is down slightly from the 28 percent growth recorded during the previous decade. In contrast, employment in the New Jersey counties, which had grown by only 10 percent during the 1970s, grew by 28 percent during the 1980s. Thus, during the 1970s growth rates in the Pennsylvania suburbs were almost three times as high as those in New Jersey, but during the 1980s, growth rates were about even.

In absolute terms, Montgomery County had the largest net gain in employment, adding 82,000 jobs, followed by Chester County with 53,000, Bucks with 51,000, and Burlington with 47,000. The employment base in Philadelphia (761,000) is the largest in the region, but it scarcely changed over the decade. Altogether, the region had 357,000 more jobs in 1990 than it did in 1980. In contrast, the net gain during the 1970s was 109,000 jobs.

Adjusted Employment

As mentioned earlier, the census employment estimates do not represent the total number of jobs in a geographic area. This results from the exclusion of second jobs and those temporarily absent from the workplace. Therefore, the census estimates should be adjusted upward to reflect the total number of jobs in each jurisdiction.

Table 9

**CENSUS EMPLOYMENT ESTIMATES
(Workers)**

County of Residence	Year			Percent Change	
	1970	1980	1990	'70-'80	'80-'90
Bucks	117,067	170,284	220,820	45.5	29.7
Chester	84,622	122,964	175,975	45.3	43.1
Delaware	162,242	181,036	207,309	11.6	14.5
Montgomery	259,209	325,158	406,931	25.4	25.1
Philadelphia	876,481	760,156	761,244	-13.3	0.1
PA Total	1,499,621	1,559,598	1,772,279	4.0	13.6
Burlington	112,761	124,544	171,279	10.4	37.5
Camden	157,164	170,904	207,286	8.7	21.3
Gloucester	47,589	56,495	78,012	18.7	38.1
Mercer	150,486	164,836	204,826	9.5	24.3
NJ Total	468,000	516,779	661,403	10.4	28.0
Region Total	1,967,621	2,076,377	2,433,682	5.5	17.2



The first step was to adjust the number of employed residents upward to account for those who were temporarily absent from the workplace. A revised table of 1990 county to county commutation patterns was prepared using factors based on absentee rates reported by the Census for each county. Overall, this adjustment increased the number of employed residents for the region by 2.16 percent. Summing the columns in the revised table then gives the number of employees holding primary jobs in each county.

The next step involved adjusting employment upward to reflect multiple jobholding, using data obtained through special questions asked periodically in the Current Population Survey. This survey is conducted for the Bureau of Labor Statistics by the Bureau of the Census using a national sample of about 60,000 households. Supplementary questions on multiple jobholding were asked in May 1989 and May 1991, and in both years, the national multiple jobholding rate--the proportion of all employed persons with two or more jobs--was 6.2 percent. However, the rate varies by employment sector, ranging from 4.7 percent for construction workers to 9.3 percent for those working in government. DVRPC's regional employment file contains data suitably disaggregated by county and by sector. Data for each county were factored to bring the county totals into alignment with the adjusted census totals, and then data for each sector were adjusted upward to reflect multiple jobholding.

Finally, employment estimates at the municipal level were adjusted to account for coding discrepancies and to bring the estimates into agreement with other employment data obtained from the U.S. Bureau of Labor Statistics, Dun and Bradstreet, and municipal tax records. A similar boost had also been necessary in 1980.

These adjustments are tabulated by county and sector in Appendix IX, and in Table 10 summarized and compared with the adjusted employment for 1980. For the region as a whole the upward adjustment from the census employment amounted to 10.8 percent, including 2.6 percent for absences, 6.4 percent for multiple jobs, and 1.8 percent adjustment for coding problems. In 1990 there were about 2,697,000 jobs in the Delaware Valley region, compared to 2,282,000 in 1980. The 1990 adjusted employment was 837,000 in Philadelphia, 1,131,000 in the Pennsylvania suburbs, and 729,000 in the New Jersey suburbs. The comparable 1980 figures for adjusted employment were 836,000 in Philadelphia, 882,000 in the Pennsylvania suburbs, and 565,000 in New Jersey.

Table 10

TOTAL EMPLOYMENT
Adjusted for Absences, Multiple Jobs, and Coding Problems

County of Residence	1980 Employment			1990 Employment		
	Census	Adjusted	%Diff.	Census	Adjusted	%Diff.
Bucks	170,284	189,069	11.0	220,820	245,345	11.1
Chester	122,964	134,362	9.3	175,975	197,750	12.4
Delaware	181,036	197,818	9.3	207,309	230,459	11.2
Montgomery	325,158	360,399	10.8	406,931	457,500	12.4
Philadelphia	760,156	835,812	10.0	761,244	836,874	9.9
PA Total	1,559,598	1,717,460	10.1	1,772,279	1,967,928	11.0
Burlington	124,544	136,086	9.3	171,279	191,342	11.7
Camden	170,904	186,746	9.3	207,286	227,932	10.0
Gloucester	56,495	61,732	9.3	78,012	86,079	10.3
Mercer	164,836	180,116	9.3	204,826	223,948	9.3
NJ Total	516,779	564,680	9.3	661,403	729,301	10.3
Region Total	2,076,377	2,282,140	9.9	2,433,682	2,697,229	10.8



APPENDICES

- I. Distribution of Residents Who Worked during the Census Week by County of Residence and Place of Work, 1970 - 1990**
- II. County to County Commuting Patterns, 1970 - 1990**
- III. DVRPC Residents Who Worked Outside the DVRPC Region during the Census Week, 1980, 1990**
- IV. Non-Residents Who Worked Inside the DVRPC Region during the Census Week, 1980, 1990**
- V. Maps of Commuting Patterns in the DVRPC Region, 1980, 1990**
- VI. Distribution of Residents Who Worked during the Census Week by Means of Transportation, 1980, 1990**
- VII. Distribution of Residents Who Worked during the Census Week by Place of Work and Means of Transportation, 1990**
- VIII. Distribution of Work Trips Taken during the Census Week by Travel Time, 1990**
- IX. Employment by County and Sector Adjusted for Absences and Multiple Jobs, 1990**

Appendix I

Distribution of Residents Who Worked during the Census Week by County of Residence and Place of Work 1970 - 1990

Appendix I

**BUCKS COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	87,608	125,851	152,140	43.7	20.9
Chester	404	894	2,044	121.3	128.6
Delaware	1,638	1,361	2,000	-16.9	47.0
Montgomery	18,751	30,628	41,886	63.3	36.8
Philadelphia	27,196	30,896	30,692	13.6	-0.7
Total PA	135,597	189,630	228,762	39.8	20.6
Burlington	2,353	1,881	3,888	-20.1	106.7
Camden	2,232	1,395	2,799	-37.5	100.6
Gloucester	580	233	614	-59.8	163.5
Mercer	13,902	15,678	24,160	12.8	54.1
Total NJ	19,067	19,187	31,461	0.6	64.0
Total Region	154,664	208,817	260,223	35.0	24.6
Lehigh	1,363	1,301	2,031	-4.5	56.1
Middlesex	NA	942	2,869		204.6
Northampton	1,267	1,080	892	-14.8	-17.4
Hunterdon	1,159	1,262	2,343	8.9	85.7
New York City	NA	1,592	2,804		76.1
Other	4,433	4,882	8,389	10.1	71.8
Total External	8,222	11,059	19,328	34.5	74.8
Total Trips	162,886	219,876	279,551	35.0	27.1



Appendix I (Cont.)

**CHESTER COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	282	460	1,083	63.1	135.4
Chester	66,527	91,017	118,433	36.8	30.1
Delaware	7,168	10,998	18,301	53.4	66.4
Montgomery	11,670	17,585	25,411	50.7	44.5
Philadelphia	7,891	10,733	11,771	36.0	9.7
Total PA	93,538	130,793	174,999	39.8	33.8
Burlington	700	90	613	-87.1	581.1
Camden	1,615	466	1,027	-71.1	120.4
Gloucester	667	121	230	-81.9	90.1
Mercer	1,152	44	238	-96.2	440.9
Total NJ	4,134	721	2,108	-82.6	192.4
Total Region	97,672	131,514	177,107	34.6	34.7
Berks	689	1,050	1,729	52.4	64.7
Cecil	274	198	479	-27.7	141.9
New Castle	4,422	6,051	10,354	36.8	71.1
Lancaster	1,714	1,393	2,060	-18.7	47.9
Other	2,131	4,914	3,778	130.6	-23.1
Total External	9,230	13,606	18,400	47.4	35.2
Total Trips	106,902	145,120	195,507	35.8	34.7



Appendix I (Cont.)

**DELAWARE COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	955	816	1,994	-14.6	144.4
Chester	4,734	8,937	14,558	88.8	62.9
Delaware	121,594	137,338	144,062	12.9	4.9
Montgomery	16,686	17,854	23,934	7.0	34.1
Philadelphia	70,206	64,828	59,652	-7.7	-8.0
Total PA	214,175	229,773	244,200	7.3	6.3
Burlington	1,317	441	1,246	-66.5	182.5
Camden	3,928	1,677	2,699	-57.3	60.9
Gloucester	1,028	667	976	-35.1	46.3
Mercer	1,704	68	279	-96.0	310.3
Total NJ	7,977	2,853	5,200	-64.2	82.3
Total Region	222,152	232,626	249,400	4.7	7.2
New Castle	5,166	5,838	7,556	13.0	29.4
Salem	84	277	283	229.8	2.2
York	NA	202	103		-49.0
New York City	NA	175	347		98.3
Other	3,853	2,196	3,918	-43.0	78.4
Total External	9,103	8,688	12,207	-4.6	40.5
Total Trips	231,255	241,314	261,607	4.3	8.4

Appendix I (Cont.)

**MONTGOMERY COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	8,488	14,325	20,986	68.8	46.5
Chester	5,900	10,525	17,920	78.4	70.3
Delaware	5,897	7,773	10,933	31.8	40.7
Montgomery	158,986	204,673	229,923	28.7	12.3
Philadelphia	54,489	55,598	55,956	2.0	0.6
Total PA	233,760	292,894	335,718	25.3	14.6
Burlington	1,632	532	1,484	-67.4	178.9
Camden	3,089	1,643	2,808	-46.8	70.9
Gloucester	883	225	474	-74.5	110.7
Mercer	1,877	354	1,024	-81.1	189.3
Total NJ	7,481	2,754	5,790	-63.2	110.2
Total Region	241,241	295,648	341,508	22.6	15.5
Berks	2,499	3,070	3,670	22.8	19.5
Lancaster	82	172	162	109.8	-5.8
Lehigh	633	773	1,390	22.1	79.8
New Castle	513	282	580	-45.0	105.7
Northampton	665	196	326	-70.5	66.3
Other	5,504	4,185	5,324	-24.0	27.2
Total External	9,896	8,678	11,452	-12.3	32.0
Total Trips	251,137	304,326	352,960	21.2	16.0



Appendix I (Cont.)

**PHILADELPHIA COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	9,926	15,531	23,866	56.5	53.7
Chester	2,301	3,117	5,303	35.5	70.1
Delaware	17,474	12,009	15,161	-31.3	26.2
Montgomery	40,858	37,869	54,113	-7.3	42.9
Philadelphia	635,478	519,442	513,167	-18.3	-1.2
Total PA	706,037	587,968	611,610	-16.7	4.0
Burlington	4,617	2,329	4,820	-49.6	107.0
Camden	13,738	7,326	10,083	-46.7	37.6
Gloucester	2,505	852	1,394	-66.0	63.6
Mercer	4,196	937	1,953	-77.7	108.4
Total NJ	25,056	11,444	18,250	-54.3	59.5
Total Region	731,093	599,412	629,860	-18.0	5.1
Atlantic	2,942	370	949	-87.4	156.5
New York City	NA	934	1,135		21.5
New Castle	822	555	1,158	-32.5	108.6
Lehigh	613	139	188	-77.3	35.3
Northampton	1,339	164	241	-87.8	47.0
Other	5,189	6,817	7,046	31.4	3.4
Total External	10,905	8,979	10,717	-17.7	19.4
Total Trips	741,998	608,391	640,577	-18.0	5.3



Appendix I (Cont.)

**BURLINGTON COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	2,550	3,584	4,148	40.5	15.7
Chester	88	128	503	45.5	293.0
Delaware	465	807	1,612	73.5	99.8
Montgomery	1,291	1,935	3,007	49.9	55.4
Philadelphia	16,002	18,186	17,142	13.6	-5.7
Total PA	20,396	24,640	26,412	20.8	7.2
Burlington	85,700	97,172	116,439	13.4	19.8
Camden	14,244	23,209	27,941	62.9	20.4
Gloucester	1,099	1,411	2,229	28.4	58.0
Mercer	7,701	10,738	16,711	39.4	55.6
Total NJ	108,744	132,530	163,320	21.9	23.2
Total Region	129,140	157,170	189,732	21.7	20.7
Atlantic	848	1,195	2,168	40.9	81.4
Middlesex	597	1,352	2,958	126.5	118.8
Monmouth	307	643	1,070	109.4	66.4
New York	NA	1,097	1,231		12.2
Ocean	398	1,189	2,099	198.7	76.5
Other	2,597	3,228	5,874	24.3	82.0
Total External	4,747	8,704	15,400	83.4	76.9
Total Trips	133,887	165,874	205,132	23.9	23.7



Appendix I (Cont.)

**CAMDEN COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	654	1,259	2,223	92.5	76.6
Chester	213	261	863	22.5	230.7
Delaware	1,915	2,139	2,754	11.7	28.8
Montgomery	1,964	1,983	3,835	1.0	93.4
Philadelphia	41,634	38,224	38,252	-8.2	0.1
Total PA	46,380	43,866	47,927	-5.4	9.3
Burlington	8,739	14,040	26,712	60.7	90.3
Camden	103,751	114,846	130,616	10.7	13.7
Gloucester	5,631	8,836	13,076	56.9	48.0
Mercer	3,006	1,113	1,949	-63.0	75.1
Total NJ	121,127	138,835	172,353	14.6	24.1
Total Region	167,507	182,701	220,280	9.1	20.6
Atlantic	1,732	2,502	6,540	44.5	161.4
Cumberland	663	811	982	22.3	21.1
Middlesex	154	281	673	82.5	139.5
New Castle	321	434	794	35.2	82.9
Salem	734	986	740	34.3	-24.9
Other	1,858	4,659	4,523	150.8	-2.9
Total External	5,462	9,673	14,252	77.1	47.3
Total Trips	172,969	192,374	234,532	11.2	21.9



Appendix I (Cont.)

**GLOUCESTER COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	165	238	952	44.2	300.0
Chester	98	108	521	10.2	382.4
Delaware	799	1,511	2,442	89.1	61.6
Montgomery	426	558	1,412	31.0	153.0
Philadelphia	11,701	12,136	13,501	3.7	11.2
Total PA	13,189	14,551	18,828	10.3	29.4
Burlington	734	1,895	5,179	158.2	173.3
Camden	10,140	15,759	21,708	55.4	37.7
Gloucester	32,801	41,161	51,372	25.5	24.8
Mercer	319	199	679	-37.6	241.2
Total NJ	43,994	59,014	78,938	34.1	33.8
Total Region	57,183	73,565	97,766	28.6	32.9
Atlantic	780	1,666	3,182	113.6	91.0
Cumberland	2,214	2,847	3,388	28.6	19.0
New Castle	397	791	1,029	99.2	30.1
Salem	1,649	2,692	2,694	63.3	0.1
Other	575	81	2,634	-85.9	3151.9
Total External	5,615	8,077	12,927	43.8	60.0
Total Trips	62,798	81,642	110,693	30.0	35.6



Appendix I (Cont.)

**MERCER COUNTY RESIDENT WORKERS
DISTRIBUTION BY PLACE OF WORK**

Place of Work	1970	1980	1990	%Change	
				'70-'80	'80-'90
Bucks	3,348	3,169	2,935	-5.3	-7.4
Chester	37	32	122	-13.5	281.3
Delaware	262	89	182	-66.0	104.5
Montgomery	316	242	518	-23.4	114.0
Philadelphia	662	927	1,229	40.0	32.6
Total PA	4,625	4,459	4,986	-3.6	11.8
Burlington	3,174	2,335	2,746	-26.4	17.6
Camden	791	367	540	-53.6	47.1
Gloucester	173	56	76	-67.6	35.7
Mercer	104,458	114,251	124,761	9.4	9.2
Total NJ	108,596	117,009	128,123	7.7	9.5
Total Region	113,221	121,468	133,109	7.3	9.6
New York City	NA	3,957	5,586		41.2
Hunterdon	529	547	1,116	3.4	104.0
Middlesex	4,650	7,108	12,137	52.9	70.8
Monmouth	763	981	1,834	28.6	87.0
Somerset	1,074	1,758	3,266	63.7	85.8
Other	3,578	3,144	5,872	-12.1	
Total External	10,594	17,495	29,811	65.1	70.4
Total Trips	123,815	138,963	162,920	12.2	17.2



Appendix II

County to County Commuting Patterns 1970 - 1990

Appendix II

COUNTY TO COUNTY COMMUTING PATTERNS
Persons Who Worked During the Census Week

County of Residence	Year	County of Employment										Total
		Bucks	Chester	Delaw.	Mont.	Phila.	Burlin.	Cam.	Glouc.	Mercer	Elsewh.	
Bucks	1970	87,608	404	1,638	18,751	27,196	2,353	2,232	580	13,902	8,222	162,886
	1980	125,851	894	1,361	30,628	30,896	1,881	1,395	233	15,678	11,059	219,876
	1990	152,140	2,044	2,000	41,886	30,692	3,888	2,799	614	24,160	19,328	279,551
Chester	1970	282	66,527	7,168	11,670	7,891	700	1,615	667	1,152	9,230	106,902
	1980	460	91,017	10,998	17,585	10,733	90	466	121	44	13,606	145,120
	1990	1,083	118,433	18,301	25,411	11,771	613	1,027	230	238	18,400	195,507
Delaware	1970	955	4,734	121,594	16,686	70,206	1,317	3,928	1,028	1,704	9,103	231,255
	1980	816	8,937	137,338	17,854	64,828	441	1,677	667	68	8,688	241,314
	1990	1,994	14,558	144,062	23,934	59,652	1,246	2,699	976	279	12,207	261,607
Mont.	1970	8,488	5,900	5,897	158,986	54,489	1,632	3,089	883	1,877	9,896	251,137
	1980	14,325	10,525	7,773	204,673	55,598	532	1,643	225	354	8,678	304,326
	1990	20,986	17,920	10,933	229,923	55,956	1,484	2,808	474	1,024	11,452	352,960
Phila.	1970	9,926	2,301	17,474	40,858	635,478	4,617	13,738	2,505	4,196	10,905	741,998
	1980	15,531	3,117	12,009	37,869	519,442	2,329	7,326	852	937	8,979	608,391
	1990	23,866	5,303	15,161	54,113	513,167	4,820	10,083	1,394	1,953	10,717	640,577
Burlington	1970	2,550	88	465	1,291	16,002	85,700	14,244	1,099	7,701	4,747	133,887
	1980	3,584	128	807	1,935	18,186	97,172	23,209	1,411	10,738	8,704	165,874
	1990	4,148	503	1,612	3,007	17,142	116,439	27,941	2,229	16,711	15,400	205,132
Camden	1970	654	213	1,915	1,964	41,634	8,739	103,751	5,631	3,006	5,462	172,969
	1980	1,259	261	2,139	1,983	38,224	14,040	114,846	8,836	1,113	9,673	192,374
	1990	2,223	863	2,754	3,835	38,252	26,712	130,616	13,076	1,949	14,252	234,532
Gloucester	1970	165	98	799	426	11,701	734	10,140	32,801	319	5,615	62,798
	1980	238	108	1,511	558	12,136	1,895	15,759	41,161	199	8,481	82,046
	1990	952	521	2,442	1,412	13,501	5,179	21,708	51,372	679	12,927	110,693
Mercer	1970	3,348	37	262	316	662	3,174	791	173	104,458	10,594	123,815
	1980	3,169	32	89	242	927	2,335	367	56	114,251	17,495	138,963
	1990	2,935	122	182	518	1,229	2,746	540	76	124,761	29,811	162,920
Elsewhere	1970	3,091	4,320	5,030	8,261	11,222	3,795	3,636	2,222	12,171	—	53,748
	1980	5,051	7,945	7,011	11,831	9,186	3,829	4,216	2,933	21,454	—	73,456
	1990	10,493	15,708	9,862	22,892	19,882	8,152	7,065	7,571	33,072	—	134,697
Total	1970	117,067	84,622	162,242	259,209	876,481	112,761	157,164	47,589	150,486	73,774	1,744,494
	1980	170,284	122,964	181,036	325,158	760,156	124,544	170,904	56,495	164,836	95,363	2,541,363
	1990	220,820	175,975	207,309	406,931	761,244	171,279	207,286	78,012	204,826	144,494	3,144,494

Appendix III

**DVRPC Residents Who Worked Outside the DVRPC Region
during the Census Week
1980, 1990**

Appendix III

**DVRPC RESIDENTS WHO WORKED OUTSIDE
THE REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Bucks	Middlesex, NJ	942	2,869	204.6
	New York City	1,592	2,804	76.1
	Hunterdon, NJ	1,262	2,343	85.7
	Lehigh, PA	1,301	2,031	56.1
	Somerset, NJ	349	1,681	381.7
	Northampton, PA	1,080	892	-17.4
	Monmouth, NJ	82	428	422.0
	Essex, NJ	na	417	-
	Morris, NJ	na	332	-
	Luzerne, PA	na	308	-
	Berks, PA	149	303	103.4
	Franklin, PA	na	302	-
	New Castle, DE	78	273	250.0
	Union, NJ	131	266	103.1
	Bergen, NJ	na	223	-
	Warren, NJ	na	215	-
	Ocean, NJ	107	183	71.0
	Hudson, NJ	na	162	-
	Dauphin, PA	na	118	-
	Atlantic, NJ	33	113	242.4
	Other	3,953	3,065	
Total		11,059	19,328	74.8
Chester	New Castle, DE	6,051	10,354	71.1
	Lancaster, PA	1,393	2,060	47.9
	Berks, PA	1,050	1,729	64.7
	Cecil, MD	198	479	141.9
	York, PA	27	231	755.6
	New York City	111	189	70.3
	Allegheny, PA	na	143	-
	Lehigh, PA	132	126	-4.5
	Salem, NJ	136	123	-9.6
	Baltimore (city), MD	na	109	-
	Dauphin, PA	na	104	-
	Other	4,508	2,753	
Total		13,606	18,400	1098.4



Delaware Valley Regional Planning Commission

Appendix III (Cont.)

**DVRPC RESIDENTS WHO WORKED OUTSIDE
THE REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Delaware	New Castle, DE	5,038	7,556	50.0
	New York City	175	347	98.3
	Salem, NJ	277	283	2.2
	Atlantic, NJ	134	254	89.6
	Berks, PA	105	190	81.0
	Lancaster, PA	165	136	-17.6
	Cape May, NJ	58	134	131.0
	Dauphin, PA	na	129	-
	Dist. of Columbia	na	117	-
	York, PA	202	103	-49.0
	Other	2,534	2,958	
Total		8,688	12,207	40.5
Montgomery	Berks, PA	3,070	3,670	19.5
	Lehigh, PA	773	1,390	79.8
	New Castle, DE	282	580	105.7
	New York City	451	578	28.2
	Northampton, PA	196	326	66.3
	Middlesex, NJ	90	304	237.8
	Luzerne, PA	na	217	-
	Lancaster, PA	172	162	-5.8
	Somerset, NJ	na	156	-
	Dauphin, PA	na	142	-
	Atlantic, NJ	117	136	16.2
	Lycoming, PA	na	136	-
	Hunterdon, NJ	na	126	-
	Franklin, PA	na	119	-
	Los Angeles, CA	na	117	-
	Dist. of Columbia	na	114	-
	Allegheny, PA	na	108	-
	Essex, NJ	na	107	-
	Other	3,527	2,964	
Total		8,678	11,452	32.0



Delaware Valley Regional Planning Commission

Appendix III (Cont.)

**DVRPC RESIDENTS WHO WORKED OUTSIDE
THE REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Philadelphia	New Castle, DE	555	1,158	108.6
	New York City	934	1,135	21.5
	Atlantic, NJ	370	949	156.5
	Middlesex, NJ	213	342	60.6
	Luzerne, PA	na	317	—
	Cape May, NJ	142	295	107.7
	Bergen, NJ	na	268	—
	Berks, PA	188	255	35.6
	Lycoming, PA	na	251	—
	Northampton, PA	164	241	47.0
	Lancaster, PA	135	228	68.9
	Dauphin, PA	na	211	—
	Hudson, NJ	na	200	—
	Lehigh, PA	139	188	35.3
	Baltimore (city), MD	na	168	—
	Morris, NJ	na	161	—
	Allegheny, PA	na	160	—
	Dist. of Columbia	na	148	—
	Ocean, NJ	207	148	-28.5
	Franklin, PA	na	141	—
	Somerset, NJ	90	141	56.7
	Hunterdon, NJ	14	140	900.0
	Schuylkill, PA	na	134	—
	Essex, NJ	na	129	—
	Norfolk area, VA	na	115	—
	Cumberland, PA	na	112	—
	Other	5,828	2,982	
Total		8,979	10,717	19.4



Appendix III (Cont.)

**DVRPC RESIDENTS WHO WORKED OUTSIDE
THE REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Burlington	Middlesex, NJ	1,352	2,958	118.8
	Atlantic, NJ	1,195	2,168	81.4
	Ocean, NJ	1,189	2,099	76.5
	New York City	1,097	1,231	12.2
	Monmouth, NJ	643	1,070	66.4
	Essex, NJ	na	686	—
	Somerset, NJ	127	518	307.9
	New Castle, DE	85	421	395.3
	Bergen, NJ	na	362	—
	Union, NJ	145	359	147.6
	Morris, NJ	na	294	—
	Cumberland, NJ	216	280	29.6
	Salem, NJ	299	239	-20.1
	Hudson, NJ	na	178	—
	Hunterdon, NJ	66	164	148.5
	Cape May, NJ	18	102	466.7
	Other	2,272	2,271	
Total		8,704	13,129	50.8
Camden	Atlantic, NJ	2,502	6,540	161.4
	Cumberland, NJ	811	982	21.1
	New Castle, DE	434	794	82.9
	Salem, NJ	986	740	-24.9
	Middlesex, NJ	281	673	139.5
	New York City	566	562	-0.7
	Morris, NJ	na	307	—
	Bergen, NJ	na	283	—
	Cape May, NJ	91	283	211.0
	Ocean, NJ	233	268	15.0
	Monmouth, NJ	237	226	-4.6
	Union, NJ	81	215	165.4
	Hudson, NJ	na	180	—
	Essex, NJ	na	176	—
	Somerset, NJ	64	118	84.4
	Dist. of Columbia	na	109	—
	Other	3,387	1,796	
Total		6,286	12,456	98.2



Delaware Valley Regional Planning Commission

Appendix III (Cont.)

**DVRPC RESIDENTS WHO WORKED OUTSIDE
THE REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Gloucester	Cumberland, NJ	2,847	3,388	19.0
	Atlantic, NJ	1,666	3,182	91.0
	Salem, NJ	2,692	2,694	0.1
	New Castle, DE	791	1,029	30.1
	Cape May, NJ	89	366	311.2
	Middlesex, NJ	50	254	408.0
	Ocean, NJ	45	187	315.6
	Monmouth, NJ	72	181	151.4
	New York City	144	118	-18.1
	Other	85	1,420	
Total		8,396	11,399	35.8
Mercer	Bergen, NJ	na	108	-
	Middlesex, NJ	7,108	12,137	70.8
	New York City	3,957	5,586	41.2
	Somerset, NJ	1,758	3,266	85.8
	Monmouth, NJ	981	1,834	87.0
	Essex, NJ	na	1,160	-
	Hunterdon, NJ	547	1,116	104.0
	Union, NJ	627	945	50.7
	Ocean, NJ	293	582	98.6
	Morris, NJ	na	559	-
	Bergen, NJ	na	542	-
	Hudson, NJ	na	451	-
	Atlantic, NJ	96	159	65.6
	Passaic, NJ	na	113	-
	Other	2,128	1,361	
Total		17,495	29,919	71.0

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Delaware Valley Regional Planning Commission

Appendix IV

**Non-Residents Who Worked Inside the DVRPC Region
during the Census Week
1980, 1990**

Appendix IV

**NON-RESIDENTS WHO WORKED INSIDE
THE DVRPC REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Lehigh, PA	Bucks	2,125	3,832	80.3
Northampton, PA		721	1,929	167.5
Hunterdon, NJ		668	875	31.0
Berks, PA		218	825	278.4
New Castle, DE		92	251	172.8
Ocean, NJ		186	242	30.1
Middlesex, NJ		169	201	18.9
Atlantic, NJ		91	135	48.4
Lancaster, PA		79	129	63.3
Somerset, NJ		61	112	83.6
Carbon, PA		na	109	—
Other		641	1,853	189.1
Total		5,051	10,493	107.7
Lancaster, PA	Chester	3,019	5,174	71.4
New Castle, DE		2,503	3,514	40.4
Berks, PA		1,502	3,140	109.1
Cecil, MD		398	796	100.0
Schuylkill, PA		na	453	—
Lehigh, PA		132	243	84.1
Northampton, PA		21	119	466.7
Other		370	2,269	513.2
Total		7,945	15,708	97.7



Appendix IV (Cont.)

**NON-RESIDENTS WHO WORKED INSIDE
THE DVRPC REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
New Castle, DE	Delaware	5,854	6,188	5.7
Salem, NJ		44	394	795.5
Berks, PA		267	383	43.4
Lancaster, PA		100	369	269.0
Cecil, MD		226	258	14.2
Atlantic, NJ		164	186	13.4
Cape May, NJ		62	119	91.9
Other		294	1,965	568.4
Total		7,011	9,862	40.7
Berks, PA	Montgomery	7,751	10,966	41.5
Lehigh, PA		1,759	3,506	99.3
New Castle, DE		542	903	66.6
Allegheny, PA		na	867	—
Northampton, PA		378	847	124.1
Lancaster, PA		227	617	171.8
Atlantic, NJ		119	251	110.9
Luzerne, PA		na	177	—
Ocean, NJ		99	172	73.7
York, PA		77	171	122.1
Schuylkill, PA		na	170	—
Monmouth, NJ		107	154	43.9
Cape May, NJ		119	151	26.9
Middlesex, NJ		33	150	354.5
Somerset, NJ		30	148	393.3
Carbon, PA		na	145	—
Hunterdon, NJ		87	145	66.7
Salem, NJ		37	108	191.9
Other		466	3,244	596.1
Total		11,831	22,892	93.5



Appendix IV (Cont.)

**NON-RESIDENTS WHO WORKED INSIDE
THE DVRPC REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
New Castle, DE	Philadelphia	3,055	4,697	53.7
Atlantic, NJ		1,205	1,120	-7.1
Cape May, NJ		725	715	-1.4
Lancaster, PA		181	690	281.2
Berks, PA		355	657	85.1
Salem, NJ		338	490	45.0
Ocean, NJ		518	467	-9.8
Lehigh, PA		215	458	113.0
Cumberland, NJ		272	405	48.9
Allegheny, PA		na	366	-
Middlesex, NJ		244	343	40.6
Cecil, MD		88	324	268.2
Monmouth, NJ		219	307	40.2
Luzerne, PA		na	205	-
Northampton, PA		129	198	53.5
Dauphin, PA		na	172	-
Schuylkill, PA		na	156	-
Essex, NJ		na	153	-
Baltimore (city), MD		na	145	-
Bergen, NJ		na	135	-
Baltimore, MD		na	135	-
Hunterdon, NJ		93	133	43.0
Somerset, NJ		161	128	-20.5
Montgomery, MD		na	124	-
Kent, DE		na	122	-
York, PA		56	122	117.9
Carbon, PA		na	107	-
Other		1,332	6,808	411.1
Total		9,186	19,882	116.4



Appendix IV (Cont.)

**NON-RESIDENTS WHO WORKED INSIDE
THE DVRPC REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Ocean, NJ	Burlington	1,681	2,419	43.9
Atlantic, NJ		521	806	54.7
Monmouth, NJ		319	626	96.2
Middlesex, NJ		269	483	79.6
Salem, NJ		102	326	219.6
Cumberland, NJ		65	285	338.5
New Castle, DE		133	254	91.0
Cape May, NJ		77	220	185.7
Essex, NJ		na	172	—
Bergen, NJ		na	115	—
Other		662	2,446	269.5
Total		3,829	8,152	112.9
Atlantic	Camden	1,661	1,853	11.6
Salem		377	724	92.0
Cumberland		559	594	6.3
New Castle		421	558	32.5
Ocean		338	532	57.4
Cape May		240	513	113.8
Middlesex		101	311	207.9
Monmouth		207	282	36.2
Other		312	1,698	444.2
Total		4,216	7,065	67.6



Appendix IV (Cont.)

**NON-RESIDENTS WHO WORKED INSIDE
THE DVRPC REGION DURING THE CENSUS WEEK**

County of Residence	County of Work	1980	1990	%Change
Salem	Gloucester	261	3,052	1069.3
Cumberland		1,001	1,734	73.2
Atlantic		604	1,024	69.5
New Castle		253	562	122.1
Cape May		95	174	83.2
Other		719	1,025	42.6
Total		2,933	7,571	158.1
Middlesex	Mercer	6,754	10,264	52.0
Monmouth		3,404	5,102	49.9
Somerset		3,114	4,376	40.5
Ocean		2,655	3,933	48.1
Hunterdon		2,659	3,518	32.3
Union		608	811	33.4
Essex		na	689	—
Morris		na	531	—
Atlantic		128	326	154.7
Hudson		na	304	—
Bergen		na	296	—
Passaic		na	280	—
Warren		na	250	—
Cumberland		67	153	128.4
Northampton		50	101	102.0
Other		2,015	2,138	6.1
Total		21,454	33,072	54.2

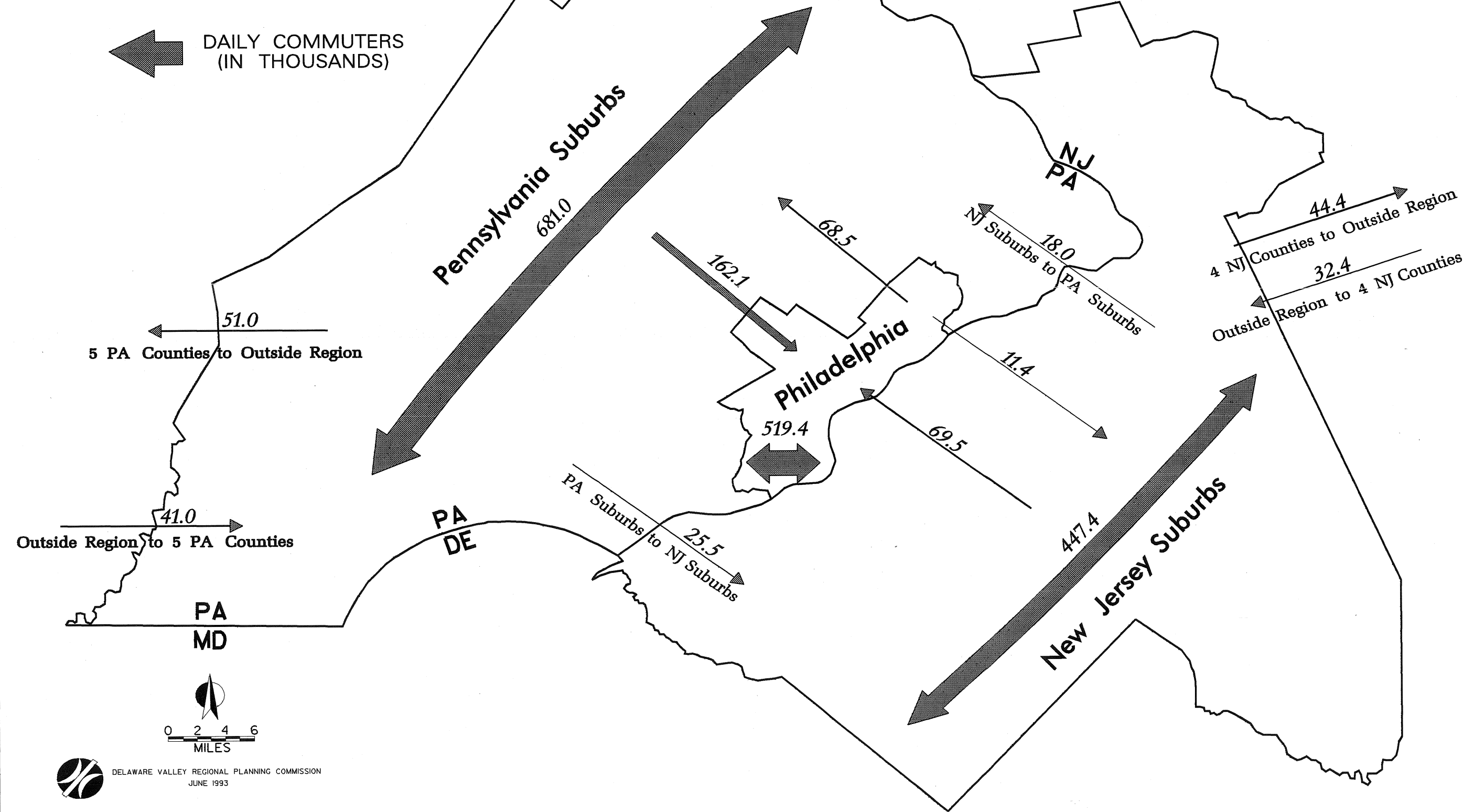
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Appendix V

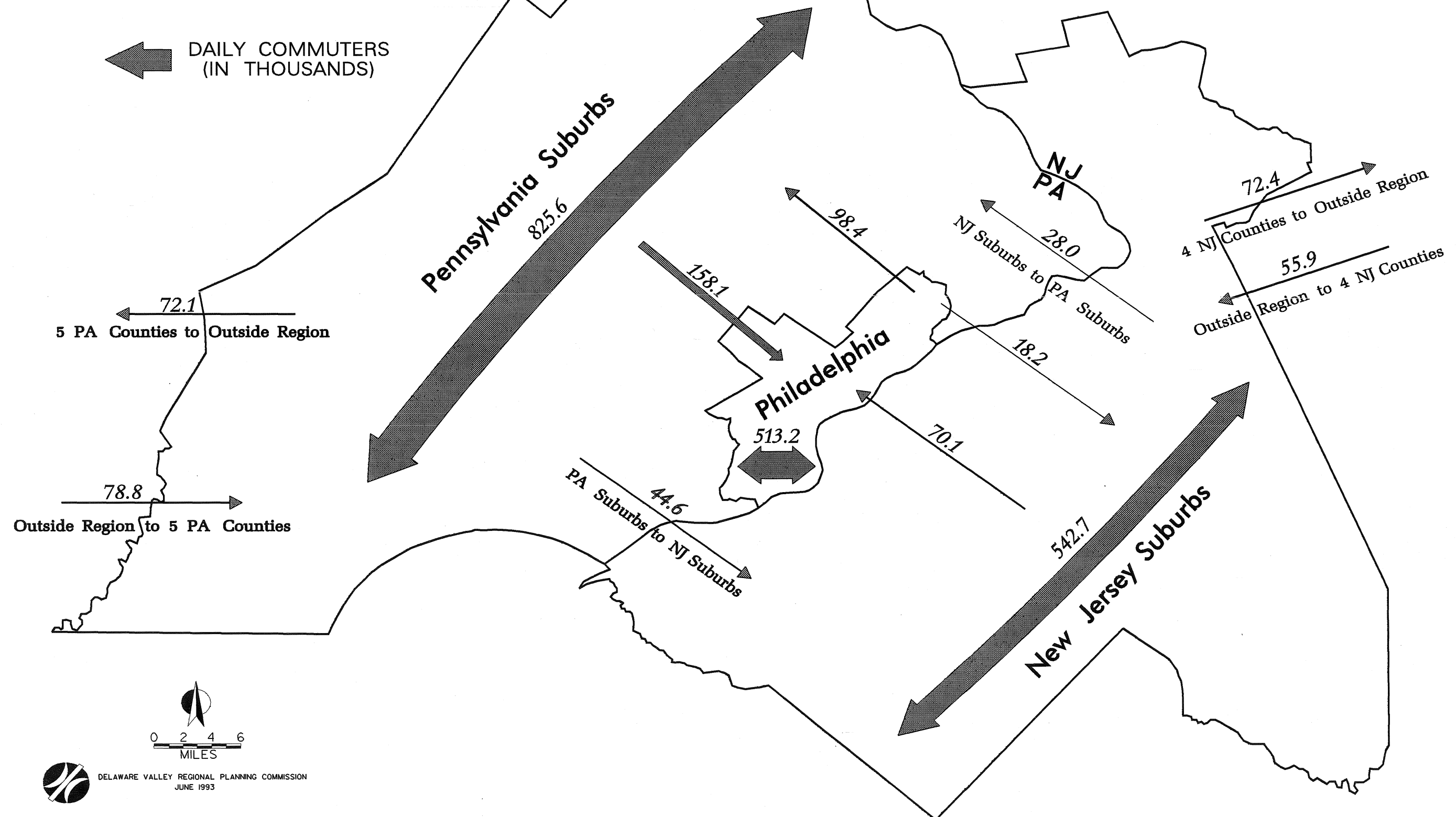
Maps of Commuting Patterns in the DVRPC Region 1980,1990

Appendix V 1980 COMMUTING PATTERNS IN THE DELAWARE VALLEY REGION



Appendix V (Cont.)

1990 COMMUTING PATTERNS IN THE DELAWARE VALLEY REGION



Appendix VI

Distribution of Residents Who Worked during the Census Week by Means of Transportation 1980, 1990

Appendix VI

DISTRIBUTION OF PERSONS WHO WORKED DURING THE CENSUS WEEK
BY MEANS OF TRANSPORTATION

County of Residence	Total Resident Workers			Drive Alone			Vanpool, Carpool			Public Transp.			Other		
	1980	1990	% Chng.	1980	1990	% Chng.	1980	1990	% Chng.	1980	1990	% Chng.	1980	1990	% Chng.
Bucks	219,876	279,551	27.1	156,752	225,298	43.7	41,720	30,431	-27.1	8,114	7,710	-5.0	13,290	16,112	21.2
Chester	145,120	195,507	34.7	100,988	154,100	52.6	25,501	19,789	-22.4	5,512	5,550	0.7	13,119	16,068	22.5
Delaware	241,314	261,607	8.4	146,855	185,360	26.2	44,475	31,671	-28.8	31,164	24,138	-22.5	18,820	20,438	8.6
L.Gnt.	304,326	352,960	16.0	209,725	278,380	32.7	50,751	35,196	-30.6	19,123	14,594	-23.7	24,727	24,790	0.3
Phil.	608,391	640,577	5.3	247,892	286,068	15.4	100,858	84,422	-16.3	182,265	182,878	0.3	77,376	87,209	12.7
Tot. PA	1,519,027	1,730,202	13.9	862,212	1,129,206	31.0	263,305	201,509	-23.5	246,178	234,870	-4.6	147,332	164,617	11.7
Burlin.	165,874	205,132	23.7	113,147	160,023	41.4	31,686	25,067	-20.9	5,631	5,417	-3.8	15,410	14,625	-5.1
Camden	192,374	234,532	21.9	124,477	168,438	35.3	35,624	31,127	-12.6	20,319	20,135	-0.9	11,954	14,832	24.1
Glouc.	82,046	110,693	34.9	57,626	87,476	51.8	16,716	13,916	-16.8	2,354	2,727	15.8	5,350	6,574	22.9
Mercer	138,963	162,920	17.2	88,266	116,525	32.0	26,560	20,674	-22.2	10,395	10,083	-3.0	13,742	15,638	13.8
Tot. NJ	579,257	713,277	23.1	383,516	532,462	38.8	110,586	90,784	-17.9	38,699	38,362	-0.9	46,456	51,669	11.2
Tot. Region	2,098,284	2,443,479	16.5	1,245,728	1,661,668	33.4	373,891	292,293	-21.8	284,877	273,232	-4.1	193,788	216,286	11.6



Delaware Valley Regional Planning Commission

Appendix VII

Distribution of Residents Who Worked during the Census Week by Place of Work and Means of Transportation 1990

Appendix VII

1990 DISTRIBUTION OF BUCKS COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	145,227	120,747	16,144	473	0	84	88	156	557	6,149	829
Chester	2,044	1,747	251	0	0	7	0	0	0	25	14
Delaware	2,000	1,695	217	0	0	34	0	0	0	31	23
Montgomery	41,886	37,157	4,250	65	0	49	14	54	31	155	111
Philadelphia	30,692	22,434	3,810	313	220	3,732	0	12	6	125	40
Total PA	221,849	183,780	24,672	851	220	3,906	102	222	594	6,485	1,017
Burlington	3,888	3,590	268	0	0	0	0	11	0	13	6
Camden	2,799	2,432	276	9	0	25	0	0	0	22	35
Gloucester	614	534	77	0	0	0	0	0	0	3	0
Mercer	24,160	20,947	3,065	24	0	32	0	26	31	15	20
Total NJ	31,461	27,503	3,686	33	0	57	0	37	31	53	61
Total Region	253,310	211,283	28,358	884	220	3,963	102	259	625	6,538	1,078
Hunterdon	2,343	2,039	270	0	0	0	0	0	13	20	1
Lehigh	2,031	1,838	177	0	0	0	0	0	0	16	0
Middlesex	2,869	2,486	344	0	0	39	0	0	0	0	0
New York City	2,804	383	102	119	71	2,038	7	0	0	61	23
Northampton	892	831	58	0	0	0	0	0	3	0	0
Other	7	0	0	0	0	0	7	0	0	0	0
Total External	10,946	7,577	951	119	71	2,077	14	0	16	97	24
Total Trips	264,256	218,860	29,309	1,003	291	6,040	116	259	641	6,635	1,102



Appendix VII (Cont.)

1990 DISTRIBUTION OF CHESTER COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor- cycle	Bicycle	Walked	Other
Bucks	1,083	922	120	9	0	9	0	5	0	18	0
Chester	111,844	90,256	12,715	603	15	122	94	195	244	6,890	710
Delaware	18,301	16,270	1,669	46	0	139	0	2	15	125	35
Montgomery	25,411	23,016	1,960	83	15	111	26	31	19	116	34
Philadelphia	11,771	6,531	965	178	129	3,846	5	0	11	81	25
Total PA	168,410	136,995	17,429	919	159	4,227	125	233	289	7,230	804
Burlington	613	517	62	0	0	10	0	0	0	7	17
Camden	1,027	859	127	5	0	18	0	0	0	13	5
Gloucester	230	220	10	0	0	0	0	0	0	0	0
Mercer	238	206	24	8	0	0	0	0	0	0	0
Total NJ	2,108	1,802	223	13	0	28	0	0	0	20	22
Total Region	170,518	138,797	17,652	932	159	4,255	125	233	289	7,250	826
Berks	1,729	1,539	169	10	0	0	0	0	0	8	3
Cecil	479	444	27	0	0	0	0	8	0	0	0
Lancaster	2,060	1,627	389	3	0	1	0	6	2	22	10
New Castle	10,354	9,132	1,151	26	0	7	0	0	8	19	11
Other	3,778	2,580	400	35	8	102	12	0	13	350	278
Total External	18,400	15,322	2,136	74	8	110	12	14	23	399	302
Total Trips	188,918	154,119	19,788	1,006	167	4,365	137	247	312	7,649	1,128



Appendix VII (Cont.)

1990 DISTRIBUTION OF DELAWARE COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	1,994	1,589	314	12	11	32	5	3	0	15	13
Chester	14,558	12,556	1,569	111	30	104	0	0	8	117	63
Delaware	138,774	103,529	17,260	4,513	151	290	53	183	488	11,428	879
Montgomery	23,934	20,215	2,379	588	49	177	15	52	35	390	34
Philadelphia	59,652	33,966	7,709	4,129	5,512	7,805	16	48	92	203	172
Total PA	238,912	171,855	29,231	9,353	5,753	8,408	89	286	623	12,153	1,161
Burlington	1,246	1,045	137	0	17	10	0	0	0	32	5
Camden	2,699	2,274	249	8	62	36	0	12	0	47	11
Gloucester	976	821	125	11	0	0	0	0	0	11	8
Mercer	279	194	64	0	0	15	0	0	0	0	6
Total NJ	5,200	4,334	575	19	79	61	0	12	0	90	30
Total Region	244,112	176,189	29,806	9,372	5,832	8,469	89	298	623	12,243	1,191
New Castle	7,556	6,389	1,105	14	6	0	0	6	0	29	7
New York	347	77	12	8	40	207	0	0	0	3	0
Salem	283	236	47	0	0	0	0	0	0	0	0
York	103	71	32	0	0	0	0	0	0	0	0
Other	3,918	2,428	654	64	54	77	10	0	12	419	201
Total External	12,207	9,201	1,850	86	100	284	10	6	12	451	208
Total Trips	256,319	185,390	31,656	9,458	5,932	8,753	99	304	635	12,694	1,399



Appendix VII (Cont.)

1990 DISTRIBUTION OF MONTGOMERY COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	20,986	18,841	1,795	61	0	32	5	30	33	124	65
Chester	17,920	15,818	1,818	86	0	61	0	30	15	79	13
Delaware	10,933	9,470	1,023	93	11	188	16	0	7	89	36
Montgomery	219,628	182,115	22,534	1,735	93	475	205	224	500	10,819	928
Philadelphia	55,956	38,250	6,160	1,497	1,064	8,553	31	13	28	263	97
Total PA	325,423	264,494	33,330	3,472	1,168	9,309	257	297	583	11,374	1,139
Burlington	1,484	1,322	143	0	0	7	0	0	0	12	0
Camden	2,808	2,368	314	0	9	80	0	0	0	21	16
Gloucester	474	420	28	0	0	18	0	0	0	8	0
Mercer	1,024	838	134	15	0	10	0	0	0	27	0
Total NJ	5,790	4,948	619	15	9	115	0	0	0	68	16
Total Region	331,213	269,442	33,949	3,487	1,177	9,424	257	297	583	11,442	1,155
Berks	3,670	3,115	497	0	0	0	0	10	0	22	26
Lancaster	162	141	15	0	0	0	0	0	0	6	0
Lehigh	1,390	1,246	125	9	0	0	0	0	10	0	0
New Castle	580	547	25	0	0	0	0	0	0	8	0
Northampton	326	283	33	0	0	0	0	0	0	10	0
Other	5,324	3,641	559	64	83	359	0	0	7	421	191
Total External	11,452	8,973	1,254	73	83	359	0	10	17	467	217
Total Trips	342,665	278,415	35,203	3,560	1,260	9,783	257	307	600	11,909	1,372



Appendix VII (Cont.)

1990 DISTRIBUTION OF PHILADELPHIA COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	23,866	16,807	4,530	1,173	193	225	6	7	22	349	554
Chester	5,303	3,459	783	692	62	193	0	0	0	74	40
Delaware	15,161	8,634	2,321	2,656	738	460	29	0	20	192	111
Montgomery	54,113	35,211	8,942	7,013	832	821	70	52	64	844	264
Philadelphia	501,464	203,722	63,373	112,315	42,249	8,486	670	499	3,444	64,001	2,705
Total PA	599,907	267,833	79,949	123,849	44,074	10,185	775	558	3,550	65,460	3,674
Burlington	4,820	3,526	690	334	136	32	0	0	0	67	35
Camden	10,083	6,527	1,658	964	467	67	15	0	39	254	92
Gloucester	1,394	929	279	137	22	0	0	0	10	9	8
Mercer	1,953	1,472	263	54	0	151	0	0	0	0	13
Total NJ	18,250	12,454	2,890	1,489	625	250	15	0	49	330	148
Total Region	618,157	280,287	82,839	125,338	44,699	10,435	790	558	3,599	65,790	3,822
Atlantic	949	456	106	326	5	47	0	0	0	0	9
Lehigh	188	102	69	7	0	0	0	0	0	10	0
New Castle	1,158	832	152	59	0	68	0	0	0	38	9
New York	1,135	254	95	90	87	547	0	0	0	42	20
Northampton	241	150	18	44	21	0	0	0	0	8	0
Other	7,081	4,069	1,151	735	91	286	27	0	39	532	152
Total External	10,752	5,863	1,591	1,261	204	948	27	0	39	630	190
Total Trips	628,909	286,150	84,430	126,599	44,903	11,383	817	558	3,638	66,420	4,012



Appendix VII (Cont.)

1990 DISTRIBUTION OF BURLINGTON COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	4,148	3,646	474	0	0	10	0	5	0	13	0
Chester	503	415	70	0	13	0	0	0	0	5	0
Delaware	1,612	1,354	232	0	0	0	0	0	0	22	4
Montgomery	3,007	2,628	332	27	0	17	0	0	0	3	0
Philadelphia	17,142	11,812	2,093	864	1,207	1,041	0	0	8	57	60
Total PA	26,412	19,855	3,201	891	1,220	1,068	0	5	8	100	64
Burlington	112,175	88,358	13,610	896	27	24	85	144	583	7,556	892
Camden	27,941	24,936	2,629	158	6	34	18	12	36	68	44
Gloucester	2,229	2,028	158	11	0	0	0	0	0	22	10
Mercer	16,711	13,450	2,927	183	0	14	0	37	26	46	28
Total NJ	159,056	128,772	19,324	1,248	33	72	103	193	645	7,692	974
Total Region	185,468	148,627	22,525	2,139	1,253	1,140	103	198	653	7,792	1,038
Atlantic	2,168	1,755	307	45	0	37	0	0	0	2	22
Middlesex	2,958	2,468	433	31	0	0	0	0	0	26	0
Monmouth	1,070	850	201	0	0	0	0	0	0	11	8
New York	1,231	493	145	445	30	113	0	0	0	5	0
Ocean	2,099	1,570	488	30	0	0	0	3	0	8	0
Other	5,874	4,284	968	55	13	77	0	0	0	291	186
Total External	15,400	11,420	2,542	606	43	227	0	3	0	343	216
Total Trips	200,868	160,047	25,067	2,745	1,296	1,367	103	201	653	8,135	1,254



Appendix VII (Cont.)

1990 DISTRIBUTION OF CAMDEN COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor- cycle	Bicycle	Walked	Other
Bucks	2,223	1,905	244	19	16	29	0	0	0	0	10
Chester	863	624	154	27	30	21	0	0	0	0	7
Delaware	2,754	2,227	380	27	57	9	0	0	0	29	25
Montgomery	3,835	3,011	560	42	74	85	0	0	10	32	21
Philadelphia	38,252	20,216	5,104	1,738	6,450	4,292	5	23	21	110	293
Total PA	47,927	27,983	6,442	1,853	6,627	4,436	5	23	31	171	356
Burlington	26,712	22,575	3,426	451	29	10	12	29	25	27	128
Camden	126,024	95,399	16,660	4,175	817	216	172	108	518	6,981	978
Gloucester	13,076	10,795	1,805	291	6	0	5	6	11	41	116
Mercer	1,949	1,506	422	16	0	0	0	5	0	0	0
Total NJ	167,761	130,275	22,313	4,933	852	226	189	148	554	7,049	1,222
Total Region	215,688	158,258	28,755	6,786	7,479	4,662	194	171	585	7,220	1,578
Atlantic	6,540	4,536	1,111	621	48	144	0	0	0	15	65
Cumberland	982	867	108	7	0	0	0	0	0	0	0
Middlesex	673	512	127	9	0	0	0	0	8	17	0
New Castle	794	674	120	0	0	0	0	0	0	0	0
Salem	740	485	248	0	0	0	0	0	0	0	7
Other	4,523	3,147	653	227	55	99	6	0	2	197	137
Total External	14,252	10,221	2,367	864	103	243	6	0	10	229	209
Total Trips	229,940	168,479	31,122	7,650	7,582	4,905	200	171	595	7,449	1,787



Appendix VII (Cont.)

1990 DISTRIBUTION OF GLOUCESTER COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	952	749	197	0	0	0	0	0	0	0	6
Chester	521	461	55	0	0	0	0	0	0	5	0
Delaware	2,442	2,221	197	0	15	0	0	0	9	0	0
Montgomery	1,412	1,170	216	0	5	0	0	0	0	15	6
Philadelphia	13,501	8,926	2,601	789	548	414	7	8	0	34	174
Total PA	18,828	13,527	3,266	789	568	414	7	8	9	54	186
Burlington	5,179	4,418	670	34	0	0	0	0	0	15	42
Camden	21,708	18,911	2,317	253	0	8	7	36	36	66	74
Gloucester	48,971	39,720	5,415	447	12	0	38	84	184	2,585	486
Mercer	679	526	147	0	0	0	0	0	0	6	0
Total NJ	76,537	63,575	8,549	734	12	8	45	120	220	2,672	602
Total Region	95,365	77,102	11,815	1,523	580	422	52	128	229	2,726	788
Atlantic	3,182	2,494	582	80	0	13	0	0	0	5	8
Cumberland	3,388	2,996	332	38	0	0	0	0	0	8	14
New Castle	1,029	807	214	0	0	2	0	6	0	0	0
Salem	2,694	2,165	510	6	0	0	0	0	0	3	10
Other	2,634	1,925	467	37	7	13	8	0	8	110	58
Total External	12,927	10,387	2,105	161	7	28	8	6	8	126	90
Total Trips	108,292	87,489	13,920	1,684	587	450	60	134	237	2,852	878

Appendix VII (Cont.)

1990 DISTRIBUTION OF MERCER COUNTY RESIDENT WORKERS DURING
THE CENSUS WEEK BY PLACE OF WORK AND MEANS OF TRANSPORTATION

Place of Work	Total Trips	Drove Alone	Vanpool, Carpool	Bus, Trolley	Subway Elev.	Reg. Rail	Taxi	Motor-cycle	Bicycle	Walked	Other
Bucks	2,935	2,238	599	30	26	0	9	2	8	9	14
Chester	122	99	23	0	0	0	0	0	0	0	0
Delaware	182	125	44	0	0	0	0	0	0	13	0
Montgomery	518	454	33	0	0	0	0	0	0	31	0
Philadelphia	1,229	761	116	9	6	310	0	0	0	27	0
Total PA	4,986	3,677	815	39	32	310	9	2	8	80	14
Burlington	2,746	2,503	219	6	0	0	0	0	6	0	12
Camden	540	421	64	15	12	28	0	0	0	0	0
Gloucester	76	76	0	0	0	0	0	0	0	0	0
Mercer	120,720	89,198	16,347	4,168	24	125	76	152	695	9,201	734
Total NJ	124,082	92,198	16,630	4,189	36	153	76	152	701	9,201	746
Total Region	129,068	95,875	17,445	4,228	68	463	85	154	709	9,281	760
Hunterdon	1,116	913	156	17	0	0	0	0	9	8	13
Middlesex	12,137	10,582	1,291	61	0	109	14	0	17	27	36
Monmouth	1,834	1,566	238	0	0	0	0	0	0	13	17
New York	5,586	705	353	695	86	3,649	14	0	0	32	52
Somerset	3,266	2,700	553	0	0	0	2	0	0	0	11
Other	5,872	4,206	645	89	47	580	0	12	19	185	89
Total External	29,811	20,672	3,236	862	133	4,338	30	12	45	265	218
Total Trips	158,879	116,547	20,681	5,090	201	4,801	115	166	754	9,546	978



Appendix VIII

Distribution of Work Trips Taken during the Census Week by Travel Time 1990

Appendix VIII

1990 DISTRIBUTION OF WORK TRIPS BY TRAVEL TIME
(Travel Time In Minutes)

County of Residence	Number of Trips in Specified Time Range											Worked at Home	Total Responses	Avg. Time
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-59	60-89	>90		
Bucks	8,256	29,340	42,745	44,572	36,502	16,124	32,760	8,472	10,360	22,899	17,337	3,271	272,638	24.2
Chester	6,702	21,433	28,284	28,132	25,589	12,387	23,192	6,690	7,651	16,328	11,073	1,457	188,918	23.9
Delaware	6,919	23,975	35,597	38,202	36,026	16,183	36,925	9,489	13,172	26,298	12,171	1,362	256,319	24.5
Montgomery	11,149	42,028	55,954	53,770	47,314	21,453	42,249	11,753	13,509	26,952	14,896	1,638	342,665	22.5
PA Suburbs	33,026	116,776	162,580	164,676	145,431	66,147	135,126	36,404	44,692	92,477	55,477	7,728	1,060,540	23.7
Philadelphia	13,654	41,190	69,507	84,367	91,576	39,253	116,116	20,800	27,834	71,721	43,927	8,929	628,874	27.4
PA Subtotal	46,680	157,966	232,087	249,043	237,007	105,400	251,242	57,204	72,526	164,198	99,404	16,657	1,689,414	25.1
Burlington	7,890	24,403	29,945	28,773	26,526	11,648	24,814	6,551	7,329	17,852	12,730	2,407	200,868	24.1
Camden	6,364	22,798	33,965	37,904	35,682	13,741	32,156	6,223	7,958	18,500	12,776	1,873	229,940	23.7
Gloucester	4,096	13,539	14,817	14,019	13,910	6,537	15,005	4,043	5,197	9,944	6,315	870	108,292	24.3
Mercer	5,102	19,410	29,928	29,721	23,335	8,538	16,642	3,375	3,822	8,072	7,599	3,335	158,879	22.1
NJ Subtotal	23,452	80,150	108,655	110,417	99,453	40,464	88,617	20,192	24,306	54,368	39,420	8,485	697,979	23.6
Total Region	70,132	238,116	340,742	359,460	336,460	145,864	339,859	77,396	96,832	218,566	138,824	25,142	2,387,393	24.6

Appendix IX

Employment by County and Sector Adjusted for Absences and Multiple Jobs 1990

Appendix IX

1990 EMPLOYMENT BY COUNTY AND SECTOR
(Number of Jobs)

County	Agric	Mining	Constr.	Mnfg	Transp	Wholesale	Retail	F.I.R.E.	Service	Govmnt	Military
Bucks	4,696	428	17,111	43,585	7,064	13,721	48,451	13,305	73,330	22,972	682
Chester	9,250	310	13,333	33,343	8,917	10,710	29,680	15,987	57,299	18,850	72
Delaware	2,003	373	13,814	31,837	9,916	10,102	44,828	16,813	78,135	22,527	112
Montgomery	6,855	511	28,511	81,926	15,126	28,594	77,209	42,499	146,985	28,540	743
Philadelphia	754	330	19,952	83,670	39,851	45,557	113,455	75,520	300,690	152,142	4,953
PA Subtotal	23,559	1,952	92,721	274,361	80,873	108,684	313,623	164,124	656,439	245,031	6,561
Burlington	1,987	25	10,922	22,748	8,396	11,505	34,033	14,537	49,366	19,611	18,210
Camden	1,457	187	11,630	28,529	9,951	17,209	41,825	16,234	73,741	26,832	336
Gloucester	3,110	99	6,107	13,480	3,498	5,531	17,942	3,655	21,165	11,396	95
Mercer	1,509	109	6,861	28,847	7,341	8,418	27,986	13,885	73,162	55,715	114
NJ Subtotal	8,063	421	35,520	93,605	29,187	42,664	121,787	48,311	217,435	113,554	18,754
Total Region	31,622	2,372	128,241	367,967	110,060	151,348	435,410	212,435	873,875	358,585	25,315