







APRIL 2002



# 1960 - 2000 TRAVEL TRENDS IN THE PHILADELPHIA CENTRAL BUSINESS DISTRICT



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April 2002



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

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



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

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

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#### **EXECUTIVE SUMMARY**

This report assesses trends between 1960 and 2000 in highway traffic volumes and public transportation ridership entering and leaving the Philadelphia Central Business District (CBD). These traffic volumes are expressed in terms of both vehicle-trips and person-trips crossing each of the four Philadelphia CBD screen lines. The CBD is defined by four screen lines: Callowhill and South Streets to the north and south respectively, and the Delaware and Schuylkill Rivers to the east and west respectively. Average weekday screen line traffic counts collected in 2000 are compared with similar data collected in 1995 and 1960. There has been no highway construction or transit facility or disruption of traffic since 1995. However, some restructuring of transit service has taken place which does not affect traffic trends significantly, consequently there is strong comparability across the years since 1995.

The major findings are:

1,664,000 total person-trips crossed the four screen lines of the Philadelphia CBD on an average weekday in 2000. The total number of person-trips in 2000 is about 0.5 percent less than the 1995 total of 1,672,000, but about 5.7 percent more than the 1960 total of 1,574,000. These traffic volumes were split between 1,222,000 person-trips in vehicles (cars, vans or trucks) with the remaining 442,000 person-trips on public transportation.

The decrease in weekday person-trips was spread unevenly between transit and highway. Public transit crossings decreased by 42,000 person-trips (8.7%) over the last five years while highway crossings gained about 25,000 highway person-trips (2.9%) since 1995. Transit lost 17,000 more daily person-trips than highway gained. Transit's share of all the person-trips entering and leaving the Philadelphia CBD shrank from 53 percent to 29 percent to 27 percent in 1960 and 1995 and 2000 respectively.

Regional rail posted increasing public transit ridership crossing into the CBD up 11% since 1995. Total person-trips on the regional rail (77,000) are up from 1995 trips (70,000). Regional rail crossings the West Screen Line (Schuylkill River) have grown 7 percent, while the North Screen Line (north of Callowhill Street) crossings grew about 15 percent since 1995. The subway-elevated lost a total of about 29,000 daily person-trips (from 269,000 to 241,000), down about 11 percent since 1995. Broad Street Subway crossings of the North Screen Line have declined about 18,000 daily person-trips, nearly a 13 percent loss since 1995. The bus-trolley system lost about 21,000 daily person-trips (from 145,000 to 124,000), down about 14 percent since 1995. While all the screen lines were down in bus related person-trips, the west screen contributed over half the total loss, losing 12,000 person-trips, a 20 percent decline since 1995.

Total North Screen Line crossings, which had the highest volume of the screen lines, grew 0.5 percent. This represents increase of about 4,000 daily person-trips (686,000 to 690,000). An increase in highway person-trips of about 22,000 person-trips more than offset the decrease in transit of about 18,000 person-trips. The South Screen Line grew about 3.7 percent, an increase of about 15,000 daily person-trips (385,000 to 400,000). Transit declined about 4,000 daily person-trips, while highway person-trips increased about 19,000. The East Screen Line (Benjamin Franklin Bridge over the Delaware River) decreased about 0.8 percent, a reduction of about 3,000 daily person-trips (155,000 to 154,000). Public transit's loss of about 3,000 daily person-trips was more than highway's 2,000 person trip increase over the bridge. West Screen Line crossings have declined by about 5.4 percent since 1995, a reduction of about 24,000 daily person-trips, while transit collectively lost about 17,000 daily riders along the West Screen Line.

The total number of vehicles entering and leaving the Philadelphia CBD in 2000 accounted for over one million vehicular trips per weekday (1,020,000). This compares to 988,000 and 617,000 weekday crossings in 1995 and 1960 respectively. This is an increase of 3.2 percent from 1995. Reversing a past trend, the vehicular increase on local streets (17,000 vehicles) just edged the increase on the interstate facilities (15,000 vehicles).

### I. INTRODUCTION

The Delaware Valley Regional Planning Commission (DVRPC) conducts periodic monitoring of travel trends and patterns throughout the nine-county area since its predecessor agency, The Penn-Jersey Transportation Study, conducted the first collection of travel data for the region in 1960. That initial data base included several screen line and cordon line counts used to study travel movements entering and leaving specific areas such as the Philadelphia Central Business District (CBD) or Center City Philadelphia. The collected data was also used to measure traffic crossing county boundaries or major geographical barriers, such as the Schuylkill and Delaware rivers. The collected data is used in at least three ways: to assess transportation trends in and out of the Philadelphia CBD, to calibrate the DVRPC transportation simulation model, and to estimate Vehicle Miles Traveled (VMT) in order to determine air quality conformity.

The Philadelphia CBD is the hub of the regional public transportation network. The regional rail system, the subway-elevated system, and most of the region's bus system passes through the CBD, transporting suburban workers to Center City Philadelphia jobs and moving city residents to suburban opportunities. Just like the public transportation, the highway network also uses Center City Philadelphia as the hub of its far flung highway network. The Schuylkill Expressway (I-76) and the major East Coast highway (I-95) both help define the west and east boundaries of the CBD with the Vine Expressway (I-676) connecting the two and defining the north boundary.

The DVRPC recognizes the importance of the Philadelphia CBD to the region's economy and the need to continuously monitor travel trends in and out of the CBD as a means of increasing the service and efficiency of the region's transportation system. DVRPC's staff conducts comprehensive screen line counts for both highway and public transportation users every five years. The four CBD screen lines defining the cordon line have been defined as follows:

North: Just north of Callowhill StreetSouth: Just south of South StreetEast: Delaware River (Benjamin Franklin Bridge)West: Schuylkill River

The screen lines, with locations for highway and public transportation counts are shown on the following map. The population of the Philadelphia CBD has grown from about 46,000 in 1990 to about 49,000 in 2000. In 1990 the CBD contained about 280,000 jobs, of which 105,000 were in the service sector; 50,000 were government positions; and 45,000 were in the financial, insurance and real estate sector. Although the CBD's share of regional employment has declined over the years, the 2.2 square mile area still holds the largest concentration of jobs in the Delaware Valley Region. About 240,000 workers commute to the CBD on an average weekday, representing about 10 percent of the regional total. Journey-to-work data from the 1990 Census indicate that 48 percent of these workers use cars to reach their jobs, and 44 percent travel by public transportation. Most of the remainder live near their jobs and walk.

This report presents the 2000 public transportation ridership and highway traffic counts which were collected for the Philadelphia CBD Cordon Line and compares the data with previously collected information on cordon crossings for 1960 and 1995. It should be noted that few minor changes in highway or transit patterning or service have occurred between 1995 and 2000. There have been a few bus route alterations: extending Route 25 south along Christopher Columbus Blvd. to Pier 70 in 1998; shifting Route 5 from Columbus Blvd. back to 2<sup>nd</sup> and 3<sup>rd</sup> Streets. The counts in 1995 and 2000 are generally compatible and they represent stable travel patterns across all the screen lines of the Philadelphia CBD.

The highway traffic counts were taken in January and April 2000. The public transportation counts relied on data collection from the respective transit operators. PATCO and NJ Transit bus and rail counts were based on recent turnstile or farebox counts which were then aggregated into specific route and time categories. SEPTA bus and rail counts were based on ride checks taken in part by contract with the DVRPC for this report. The Market-Frankford Line Ridership Census (2000) and Broad Street Line Ridership Census (1998) counts are performed to alternate with the bi-annual Regional Rail Ridership Census (2001). In every case the most recent available data was used.

Map 1 PHILADELPHIA CBD – 2000 SCREENLINE COUNT LOCATIONS GARDEN ST SPRING 611 CALLOWHILL ST 33 2 47М 47 61 47М <sub>ST</sub> 23 VINE 676 30 🗧 ST RACE ÉRRNARD. ST CHERRY Stran 1 ARCH ST 1 + 3**7** 57 FILBERT JFK BLVD MARKET t. ST 3 MFSE -ST 5 57 5 sτ 5 . ST ST ST F ST CHESTNUT ST HL. H ΗĽ ΗL 3TH 0TH H<sub>2</sub>8 HL HLC 21ST 0TH 19TH 8TH 22 HTTI F 5TH WALNUT ST LOCUST ST 24TH √6117 SPRUCE ST *ST* P/NE LOMBARD ST 27TH S TANEY 26TH south 7 7 7 12 st 47M 47M 47 23 23 -----📕 🄶 🕇 T 🕇 **↓** Traffic Count <sup>2</sup> Bus Route Subway Surface Routes Subway–Elevated One–way Street 🛨 🚽 Subway 1 MFSE DELAWARE VALLEY REGIONAL PLANNING COMMISSION APRIL 2002 + Rail Line **Regional Rail** 







#### **II. DATA COLLECTION AND STUDY METHOD**

The highway traffic counts used in this study on the North, South, and West Screen Lines were taken by DVRPC field crews at the locations indicated on the preceding map. East Screen Line counts were collected by the Delaware River Port Authority (DRPA), which owns and operates the Benjamin Franklin Bridge and collects traffic data on a regular basis. Transit ridership from New Jersey was based on data collected by the operators, PATCO and NJ Transit.

#### A. Highway Traffic Counts

DVRPC staff counted vehicles on highways and bridges by direction and by hour of the day. Highway counts covered the full 24-hour period. Appropriate seasonal and area travel pattern factors, as provided by the Pennsylvania Department of Transportation (PennDOT) and developed by DVRPC, were applied to the raw counts to convert them to annual average daily traffic (AADT) estimates. Person trip volumes were derived from the vehicular counts using multipliers for vehicle occupancy established for each of the four CBD screen lines

The East Screen Line is unique since access in or out of the Philadelphia CBD is limited to the Benjamin Franklin Bridge. In 1992 DRPA changed the toll collection procedure on its bridges, raising the toll for automobiles from \$0.90 collected in each direction to \$2.00, and since January 2000 raised to \$3.00, collected only from the westbound vehicles. Consequently, vehicle counts supplied by the DRPA are taken in the westbound direction only. Westbound flow is assumed to be balanced by an equivalent eastbound flow, with the daily volume being about twice the westbound count. The hourly highway counts from the bridge are adjusted based on historic multipliers to derive hourly counts from the sum total provided by the DRPA.

#### **B.** Public Transportation Ridership

SEPTA operates the transit services that connect the Philadelphia CBD with the rest of the City and the Pennsylvania suburbs. For this report, SEPTA collected ridership data for its buses and trolleys through ride checks, where on/off passenger counts are tallied at specified stops along the border of the CDB. The DVRPC contracted with SEPTA to take these counts at specific spots along the screen lines into the CBD, targeting specific routes which had not been recently included in systemic checks. These counts took place between February and May of 2001. SEPTA took ridership counts on the Market-Frankford subway-elevated and the Broad Street subway in 2000 and 1998 respectively. Care was taken to see that riders were properly apportioned between the Broad Street Line and the Broad-Ridge Spur.

Regional rail ridership was also obtained from SEPTA and is based on data collected for their 2001 Regional Rail Census. These counts were taken during the first part of 2001. The passenger counts for the North Screen Line were taken north of Market East Station, while the West Screen Line counts were collected at 30<sup>th</sup> Street Station. The West Screen Line counts were adjusted based on relative platform boardings at the two center city stations, to reflect passengers crossing the Schuylkill River boundary of the West Screen Line.

PATCO is a subsidiary of DRPA and operates a rail transit line, the Lindenwold Line, across the Benjamin Franklin Bridge between Philadelphia and New Jersey. NJ Transit also operates bus service over the Benjamin Franklin Bridge to and from New Jersey, plus a few trips via the Walt Whitman Bridge and Broad Street. The PATCO and NJ Transit counts were compiled from farebox counts and zonal data compiled in early 2001. Transit counts were complete from 6:00 am to 12:00 midnight and data was sparse during the late hours of 12:00 to 5:00 am.

#### **III. TRENDS IN THE PHILADELPHIA SCREEN LINE TRAFFIC VOLUME**

#### A. North Screen Line

The North Screen Line was located just north of Callowhill Street so that the entire length of the Vine Expressway (I-676) would be included inside the Center City Cordon Line. The screen line includes traffic on the eastbound on-ramp (24<sup>th</sup> St.) to the Vine Expressway from the Benjamin Franklin Parkway, though the expressway itself does not cross the screen line. Much of this traffic is through traffic exiting Center City either via the Benjamin Franklin Bridge (I-676) or I-95. The screen line also includes volume on I-95 as well as numerous local roads.

Since 1960, as shown in Table 1, total vehicular screen line volumes crossing the North Screen Line have increased 70.6 percent. Between 1995 and 2000 traffic grew from 396,000 to 414,000 vehicles per day for a total of 18,000 more vehicles per day than in 1995. Of that increase, only about 2,000 vehicles were added to the interstate facilities and about 16, 000 vehicles were been added to the local streets. The growth has been evenly spread across nineteen stations representing local streets. The largest gains are at Columbus Blvd., 5<sup>th</sup>, 15<sup>th</sup>, 19<sup>th</sup>, and 21<sup>st</sup> Streets with daily volumes around 2,000 vehicles each.

The Benjamin Franklin Parkway, which handles traffic from Kelly and West River Drives in Fairmont Park, as well as from the Schuylkill Expressway via Spring Garden Street is the busiest of the local streets handling 42,000 vehicles per day, a 6.2 percent decrease from 1995. Traffic on Broad Street (PA 611), the second busiest arterial lost about 100 vehicles per day (0.1%). Columbus Boulevard., the third busiest arterial, had an increase of about 2,000 vehicles per day. Of the remaining streets, the busiest are 21<sup>st</sup> and 22<sup>nd</sup> Streets with volumes around 10,000 and 9,000 vehicles per day.

The North Screen Line serves as the border for both highway counts and public transportation ridership counts. Passengers had to be aboard the vehicle, whether it was an automobile or a transit bus when crossing Callowhill Street in order to be counted. Regional rail and subway-elevated counts were based on SEPTA conductor counts aboard trains north of Market East Station. Based on these counts, average weekday transit ridership declined 8.6 percent since 1995 or at a compound average of 1.8 percent per year since 1995 (see Table 2).

	Average Daily Traf		Volume <sup>1</sup>	Annual C	hange
Location	1960	1995	2000	1960-2000	1995-2000
Columbus Blvd. <sup>2</sup>	31,096	19,428	21,231	-0.9%	1.8%
Front St. <sup>3</sup>	na	444	571	na	5.2%
2nd St.	8,432	5,479	5,913	-0.9%	1.5%
3rd St.	4,426	3,973	4,547	0.1%	2.7%
4th St.	6,402	4,931	4,823	-0.7%	-0.4%
5th St.	10,540	8,133	10,904	0.1%	6.0%
6th St.	11,286	7,638	8,397	-0.7%	1.9%
7th St.	5,059	7,647	7,864	1.1%	0.6%
8th St.	3,794	5,466	5,753	1.0%	1.0%
9th St.	3,896	1,246	1,399	-2.5%	2.3%
Ridge Ave.	8,643	3,969	4,033	-1.9%	0.3%
10th St.	6,640	3,168	3,146	-1.9%	-0.1%
11th St.	5,902	4,480	4,084	-0.9%	-1.8%
12th St.	7,062	4,236	5,881	-0.5%	6.8%
13th St.	5,275	4,530	4,896	-0.2%	1.6%
Broad St. (PA 611)	28,100	30,053	29,957	0.2%	-0.1%
15th St.	8,018	6,382	8,224	0.1%	5.2%
16th St.	12,332	7,318	7,891	-1.1%	1.5%
17th St.	4,642	4,489	5,793	0.6%	5.2%
18th St.	4,658	5,262	6,683	0.9%	4.9%
19th St.	3,798	4,311	7,212	1.6%	10.8%
20th St.	6,036	6,355	7,242	0.5%	2.6%
21st St.	8,018	7,909	10,343	0.6%	5.5%
Ben Franklin Pkwy.	31,950	44,463	41,686	0.7%	-1.3%
22nd St.	13,715	9,883	9,240	-1.0%	-1.3%
TOTAL LOCAL STREETS	239,720	211,193	227,712	-0.1%	1.5%
Delaware Expwy (I-95) <sup>4</sup>	0	171 401	173 013	na	0.2%
24th St ramp to I-676	2 982	13 081	13 260	3.8%	0.3%
TOTAL INTERSTATE	2,982	184,482	186,273	10.9%	0.2%
TOTAL SCREEN LINE	242,702	395,675	413,985	1.3%	0.9%

#### Table 1. Highway Vehicle Trips Crossing the Philadelphia CBD North Screen Line

<sup>1</sup> 1995 and 2000 highway counts counts represent Annual Average Daily Traffic volumes.

<sup>2</sup> Name changed from Delaware Ave. to Columbus Blvd. in 1993.

<sup>3</sup> Not counted before 1995.

<sup>4</sup> I-95 opened through CBD in 1979.

The regional rail ridership has grown about 3,500 riders per day since 1960 (31,000 vs. 34,500) and increased about 4,500 weekday riders since 1995 (30,000 vs. 34,500) for an annual average increase of 2.8 percent. Ridership on the Market Frankford Subway-Elevated has declined since 1960 when the average weekday count was 90,000, 1995 when the count was 58,000, to the 2000 count of 50,000. This is a total decrease of 44 percent and an average decrease of 1.5 percent annually since 1960. The Broad Street Subway and the Broad-Ridge Spur has decreased a total of 47 percent, decreasing at an annual average rate of 2.7 since 1960. Bus ridership fell 10 percent since 1995, with only four routes, 5, 23, 33, and C buses, posting increases of about 600 daily riders. Approximately 60 percent of the transit riders crossing the North Screen Line were carried by the subway-elevated lines with the remaining 40 percent of the transit riders carried on bus-trolley routes and the regional rail. Transit ridership counts and annual change for public transportation are shown in Table 2 with fixed rail subway-elevated and regional rail in bold letters.

Highway and public transit travel trends for the North Screen Line are illustrated in Figure 1. Between 1995 and 2000, transit trips across the screen line declined 1.8 percent per year while highway trips grew 0.9 percent per year. The combined total person trip crossings grew about 0.1 percent annually during these five years. All transit trips are shown as person-trips, while Table 1 depicts highway trips in terms of vehicular traffic volume.

		1960	1995	2000	Annual C	hange
Route	Location	Count	Count	Count	1960-2000	1995-2000
25 <sup>1</sup>	Columbus Blvd.	na	na	183	na	na
5 <sup>2</sup>	Columbus Blvd.	8,968	388	455	-7.2%	3.2%
Q <sup>3</sup>	Front St.	628	na	na	na	na
MFSE	At I-95	90,332	58,462	49,822	-1.5%	-3.1%
57 <sup>4</sup>	3rd/4th Sts.	na	2,477	2,118	na	-3.1%
50 <sup>5</sup>	4th/5th Sts.	8,899	na	na	na	na
47, 47m <sup>6</sup>	8th/Franklin Sts.	13,904	4,898	4,874	-2.6%	-0.1%
61	8th/11th Sts.	13,133	2,361	1,783	-4.9%	-5.5%
RRD	East of 9th St.	31,047	30,007	34,514	0.3%	2.8%
BRS	9th St.	17,379	7,356	6,726	-2.3%	-1.8%
23	11th/12th Sts.	18,552	3,677	3,698	-4.0%	0.1%
BSS	Broad St.	119,112	71,285	62,185	-1.6%	-2.7%
С	Broad St.	11,581	4,907	5,001	-2.1%	0.4%
2	16th/17th Sts.	12,433	2,640	2,349	-4.1%	-2.3%
33	19th/20th Sts.	14,449	7,390	7,805	-1.5%	1.1%
7,32 <sup>7</sup> , 48	21st/22nd Sts.	18,567	12,305	9,158	-1.8%	-5.7%
38 <sup>8</sup> , 76 <sup>9</sup>	Ben Franklin Pkwy.	na	2,951	2,225	na	-5.5%
TOTAL SCREI		378,984	211,104	192,896	-1.7%	-1.8%

## Table 2. Public Transportation Trips Crossing th Philadelphia CBDNorth Screen Line

<sup>1</sup> Route 25 extended south from Spring Garden St. to Pier 70 in 1998.

<sup>2</sup> Route 5 shifted to Columbus Blvd. in 1993; returned to 2nd/3rd Sts. in 1998.

- <sup>3</sup> Route Q discontinued after 1960.
- <sup>4</sup> Route 57 extended through Center City in 1993.
- <sup>5</sup> Route 50 discontinued in 1993.
- <sup>6</sup> Route 47m established in 1993.
- <sup>7</sup> Route 32 formerly Route A (Local).
- <sup>8</sup> Route 38 rerouted from Vine St./JFK Blvd. to Ben Franklin Pkwy. in 1983.
- <sup>9</sup> Route 76 extended across North Screenline in 1990



	F	Person Trip	S	Compound Annual Cl		
_	1960	1995	2000	60-00	95-00	
Transit	378,984	211,104	192,896	-1.7%	-1.8%	
Highway	291,241	474,810	496,782	1.3%	0.9%	
TOTAL	670,225	685,914	689,678	0.07%	0.1%	

#### **B. South Screen Line**

Total highway vehicle trips across the Philadelphia CBD South Screen Line have increased 90 percent (135,000 vehicles) per weekday since 1960 and by 5.6 percent (16,000 vehicles) since 1995 (see Table 3). Similar to the North Screen Line, most of the increase (70%) is spread along the local streets rather than on interstate facilities, reflecting near capacity conditions of the interstate highway facilities as well as the abundance of local streets compared to interstates along this screen line. About 7,700 trips of the additional 16,000 occurred on Broad Street and about 5,000 trips occurred on I-95. The boost on Broad Street reflects its reconstruction as the Avenue of the Arts which upon completion, has seen Year 2000 volumes nearly match the 1960 volume of about daily 24,000 vehicles. Traffic on Columbus Blvd. has increased about 500 vehicles to 24,800 per day. These two facilities constitute nearly one third of the vehicular traffic crossing the screen line.

Travel on public transportation facilities, as shown in Table 4, has fallen in every mode and the screen line has lowest percentage of traffic carried by transit (13%). The Broad Street Subway is the only subway or rail service operating across the South Screen Line with declines in ridership from 44,000 in 1960, to 26,000 in 1995, to 25,000 in 2000. In spite of this decline, the Broad Street Subway still constitutes 48 percent of the transit riders crossing the screen line, up from 1995's 46 percent. Bus travel has declined 10 percent. The heaviest carrier, the #17 bus with 8,923 riders in 1995 and 6,686 riders in 2000, has lost 25 percent of its daily riders. Only the #47m bus and the #23 bus have posted increases of about 350 and 650 daily riders respectively. Figure 2 shows the total transit and highway person-trips crossing the South Screen Line. Between 1995 and 2000 transit trips declined by 1.5 percent per year while highway trips grew by 1.1 percent. Total trip crossings grew about 0.7 percent per year during these five years (385,000 vs. 400,000).

	Average Daily Traffic Volume <sup>1</sup>		Annual Change		
Location	1960	1995	2000	1960-2000	1995-2000
27th St/Schuykill Ave	2,343	4,535	3,823	1.2%	-3.4%
Taney St <sup>2</sup>	na	102	177	na	11.7%
26th St	106	133	212	1.8%	9.8%
24th St <sup>2</sup>	na	1,610	1,653	na	0.5%
Grays Ferry Ave	4,475	3,743	2,868	-1.1%	-5.2%
22nd St	6,498	6,362	5,459	-0.4%	-3.0%
21st St	3,727	7,559	6,002	1.2%	-4.5%
20th St	6,070	5,602	4,910	-0.5%	-2.6%
19th St	5,010	3,456	3,038	-1.2%	-2.5%
18th St	4,686	4,190	5,015	0.2%	3.7%
17th St	4,578	6,608	5,125	0.3%	-5.0%
16th St	5,538	6,379	5,852	0.1%	-1.7%
15th St	5,117	3,775	6,183	0.5%	10.4%
Broad St (PA 611)	24,898	16,249	23,912	-0.1%	8.0%
13th St	4,047	3,747	3,890	-0.1%	0.8%
12th St	4,579	4,387	4,418	-0.1%	0.1%
11th St	3,823	4,313	4,696	0.5%	1.7%
10th St	4,646	4,297	6,167	0.7%	7.5%
9th St	2,878	7,312	5,544	1.7%	-5.4%
8th St	4,047	5,303	4,800	0.4%	-2.0%
7th St	4,583	4,868	4,855	0.1%	-0.1%
6th St	5,010	4,855	4,311	-0.4%	-2.3%
5th St	5,914	6,158	6,615	0.3%	1.4%
4th St	4,374	4,590	6,555	1.0%	7.4%
3rd St	5,117	5,003	7,003	0.8%	7.0%
2nd St	4,788	3,599	7,276	1.1%	15.1%
Front St	1,597	4,528	3,746	2.2%	-3.7%
Columbus Blvd <sup>3</sup>	24,092	24,439	24,793	0.1%	0.3%
TOTAL LOCAL STREETS	152,541	157,702	168,899	0.3%	1.4%
Delaware Expwy. (I-95) <sup>4</sup>	na	113,630	118,393	na	0.8%
TOTAL SCREEN LINE	152,541	271,332	287,293	1.6%	1.1%

## Table 3. Highway Vehicle Trips Crossing the Philadelphia CBDSouth Screen Line

<sup>1</sup> 1995 and 2000 highway counts counts represent Annual Average Daily Traffic volumes.

<sup>2</sup> Not counted before 1995.

<sup>3</sup> Name changed from Delaware Ave. to Columbus Blvd. in 1993.

<sup>4</sup> I-95 opened through CBD in 1979.

		1960	1995	2000	Annual	Change
Route	Location	Count	Count	Count	1960-2000	1995-2000
7.40		44 500	4 000	0.045	0.00/	0.00/
7, 12	Grays Ferry AV./22nd S	11,593	4,602	3,215	-3.2%	-6.9%
17	19th/20th Sts.	15,720	8,923	6,686	-2.1%	-5.6%
2	16th/17th Sts.	8,279	2,409	2,000	-3.5%	-3.7%
27, 32 <sup>1</sup>	15th/Broad Sts.	na	na	672	na	na
С	Broad St.	4,273	2,212	2,187	-1.7%	-0.2%
BSS	Broad St.	44,235	26,059	25,251	-1.4%	-0.6%
23	11th/12th Sts.	14,096	2,209	2,884	-3.9%	5.5%
47m <sup>2</sup>	8th/9th St.	na	463	814	na	11.9%
47 <sup>3</sup>	7th/8th Sts.	12,736	5,247	4,585	-2.5%	-2.7%
50 <sup>4</sup>	4th/5th	10,586	na	na	na	na
57 <sup>5</sup>	3rd/4th Sts.	na	4,110	3,654	na	-2.3%
5 <sup>6</sup>	2nd/3rd Sts.	8,662	na	na	na	na
Q <sup>7</sup>	Front St.	1,213	na	na	na	na
25 <sup>8</sup>	Columbus Blvd.	na	na	158	na	na
TOTAL SC	REEN LINE	131,393	56,234	52,106	-2.3%	-1.5%

## Table 4. Public Transportation Trips Crossing th Philadelphia CBDSouth Screen Line

<sup>1</sup> Routes 27 and 32 extended south to Carpenter St. in 1997.

<sup>2</sup> Route 47m established in 1993; southbound service added in 1995.

<sup>3</sup> Route 47 shifted from 8th/9th Sts. in 1993.

<sup>4</sup> Route 50 discontinued in 1993.

<sup>5</sup> Route 57 extended through Center City in 1993.

<sup>6</sup> Route 5 truncated at Society Hill in 1993.

<sup>7</sup> Route Q discontinued after 1960.

<sup>8</sup> Route 25 extended south to Pier 70 in 1998.



## Figure 2. Philadelphia CBD South Screen Line

	Person Trips			Compound Annual Change		
	1960	1995	2000	60-00	95-00	
Transit	131,393	56,234	52,106	-2.3%	-1.5%	
Highway	183,050	329,299	347,624	1.6%	1.1%	
TOTAL	314,443	385,533	399,730	0.6%	0.7%	

#### C. East Screen Line

The Benjamin Franklin Bridge (I-676, US 30) provides the only entry into the Philadelphia CBD from the east for both highway and public transit modes. The bridge, which opened in 1926, carries the PATCO rail line (subway-elevated) from Lindenwold Station into the Philadelphia CBD and buses operated by NJ Transit. DRPA supplied vehicle traffic counts used in this report, based on tolls collected in the westbound direction.

The number of highway vehicles crossing the Benjamin Franklin Bridge, as shown in Table 5, has increased about 50 percent from 66,000 in 1960 to 99,000 in 2000. The 2000 traffic count is nearly the same as the 1995 count of 97,000 vehicles per day. The highway traffic count did increase slightly, about 2,000 vehicles per day, a 0.3 annual average change.

Ridership on the NJ Transit buses has continued to decline from 34,000 riders in 1960, to 7,000 in 1995, to 6,000 in 2000. This is an average decline of 4.1 percent annually since 1960 and an average decline of 2.3 percent per year since 1995. In contrast, PATCO has seen an average increase of 1.6 percent annually since 1960, though this rate has peaked, with an average decline of 1.4 percent annually since 1995. Total transit ridership has been declining along this screen line, with a loss of about 3,000 daily riders since 1995. The ratio of bus-trolley to subway-elevated has remained constant from 1995 to 2000 with subway-elevated providing about 83 percent of the crossing trips then and now. The Camden Transportation Center which opened in 1989 has made it easier for Bus riders to transfer to PATCO for the trip across the river and into the Philadelphia CBD.

Figure 3 shows the total transit and highway person-trips crossing the East Screen Line between 1995 and 2000. Transit trips declined by 1.5 percent per year while highway trips grew by 0.3 percent. Total trip crossings did not change significantly during these five years (155,000 vs. 154,000).

		1960	1995	2000	Ann	ual Change
Route	Location	Count	Count	Count	1960-2000	1995-2000
HIGHWAY VEHIC	LE TRIPS (AADT)					
Ben Franklin Bridg	e(I-676/US 30)	66,145	97,090	98,734	1.0%	0.3%
TRANSIT TRIPS	(Avg. Weekday Count)					
NJ TRANSIT Bus	Ben Franklin Bridge	34,147	7,194	6,395	-4.1%	-2.3%
PATCO	Ben Franklin Bridge	17,432	35,592	33,234	1.6%	-1.4%
TOTAL TRANSIT	TRIPS	51,579	42,786	39,629	-0.7%	-1.5%

## Table 5. Highway Vehicle Trips and Transit Trips Crossing thePhiladelphia CBD East Screen Line



	I	Person Trips		Compound /	Annual Change	)
	1960	1995	2000	60-00	95-00	
Transit	51,579	42,786	39,629	-0.7%	-1.5%	
Highway	79,374	112,042	113,939	0.9%	0.3%	
TOTAL	130,953	154,828	153,568	0.4%	-0.2%	

#### D. West Screen Line

The section of the Schuylkill River outlining the West Screen Line is crossed by six bridges, five highways, one regional railroad and a transit tunnel. This screen line has experienced the largest loss of person-trips since 1995 (5.4%). The screen line traffic volumes have declined in both highway and transit crossings, 8,000 and 17,000 person-trips lost respectively.

Table 6 shows that since 1995 the screen line has declined in total highway vehicle traffic volume, 0.6 percent. None of the roads experienced any significant increase, though the Vine expressway gained about 1,100 and JFK Boulevard lost about 250 vehicles per day. Since 1960 the number of highway vehicle trips increased, but this may be explained by the completion of the Vine Expressway (I-676) in 1991 which has boosted volumes. Over half of the highway traffic (58%) is carried by the Vine Expressway, which is the entry into the Philadelphia CBD from the Schuylkill Expressway (I-76).

The West Screen Line public transportation is served by several bus routes, regional rail, subway-surface trolleys and the Market Frankford Subway-Elevated line, which collectively have declined about 9.6 percent in daily riders (174,000 vs. 157,000) since 1995. The Market Frankford line which serves West Philadelphia and Delaware County has declined from 71,000 to 63,000 riders per day, a 2.1 percent per year loss.

Subway-surface trolleys have also declined an average of 5.0 percent annually, but the regional rail increased about 3,000 daily riders, an increase of 1.4 percent per. Bus ridership on the four routes crossing at Market Street (31, 61 Exp., 124, 125) have increased about 500 riders per day, while the #27 bus which uses the Vine Expressway was unchanged. These routes providing the only growth in person-trips across the screen line.

Figure 4 depicts the 1960, 1995, and 2000 West Screen Line traffic crossings by travel mode. Transit trips declined from 272,00 in 1960 to 157,000 in 2000, about 42 percent decrease. In contrast, highway trips increased from 187,000 to 264,000 per day about 41 percent increase. Overall, the total number of person-trips crossing the West Screen Line have decreased from 459,000 in 1960 to 421,000 in 2000, about 8 percent decline. See Table 7 for comparative summary counts with other screen lines.

		1960	1995	2000	Ann	ual Change
Route / Location		Count	Count	Count	1960-2000	1995-2000
HIGHWAY VEHICLES <sup>1</sup>						
JFK Blvd. (PA 3)		18,165	13,880	13,618	-0.7%	-0.4%
Market St. (PA 3)		19,513	23,017	22,617	0.4%	-0.4%
Chestnut St.		19,782	15,098	14,151	-0.8%	-1.3%
Walnut St.		20,104	21,714	19,104	-0.1%	-2.5%
South St.		17,950	25,995	22,791	0.6%	-2.6%
TOTAL LOCAL STREETS		95,514	99,704	92,281	-0.1%	-1.5%
Vine Expwy. (I-676/US 30) <sup>2</sup>		60,235	126,542	127,658	1.9%	0.2%
TOTAL VEHICLES		155,749	226,246	219,939	0.9%	-0.6%
TRANSIT TRIPS (Avg. Wee	kday Count)					
12, 40, 90 <sup>3</sup>	South St.	9,509	2,179	1,612	-4.3%	-5.8%
9, 21 <sup>4</sup> , 42	Chestnut/Walnut Sts.	29,434	14,719	11,743	-2.3%	-4.4%
31, 61 Exp. <sup>5</sup> , 124 <sup>6</sup> , 125 <sup>7</sup>	Market St.	6,010	2,358	2,890	-1.8%	4.2%
Subway-Surface	Market St.	57,045	38,651	29,928	-1.6%	-5.0%
MFSE	Market St.	102,903	70,604	63,486	-1.2%	-2.1%
RRD	North of JFK Blvd.	49,800	39,829	42,788	-0.4%	1.4%
27	Vine Expwy.	10,346	2,200	2,205	-3.8%	0.0%
44, 121 <sup>8</sup>	Vine Expwy./JFK Blvd	6,735	3,487	2,740	-2.2%	-4.7%
TOTAL TRANSIT TRIPS		271,782	174,027	157,392	-1.4%	-2.0%

## Table 6. Highway Vehicle Trips and Transit Trips Crossing thePhiladelphia CBD West Screen Line

<sup>1</sup> 1995 and 2000 highway counts counts represent Annual Average Daily Traffic volumes.

<sup>2</sup> I-676 (Vine Expwy.) completed in 1991.

<sup>3</sup> Extended across West Screenline in 1990.

<sup>4</sup> Route 21 formerly Route D.

<sup>5</sup> Route 61 Express included in Route 61 before 1995.

<sup>6</sup> Route 124 established in 1989.

<sup>7</sup> Route 125 formerly Route 45.

<sup>8</sup> Route 121 formerly Route 49 and before that Route 44G.



Travel Mode

		Person T	rips	Compound A	nnual Change	
	1960	1995	2000	60-00	95-00	
Transit	271,782	174,027	157,392	-1.4%	-2.0%	
Highway	186,899	271,495	263,927	0.9%	-0.6%	
TOTAL	458,681	445,522	421,319	-0.2%	-1.1%	

#### E. Total Screen Line Traffic Volumes

The ridership for public transit and highway person-trips crossing the Philadelphia CBD Cordon Line in 2000 were tabulated and compared to 1960 and 1995 crossings in order to assess the long and short term trends for each travel mode. Table 7 shows the number of trips by mode and screen line and the changes in person-trips that occurred between 1960, 1995, and 2000. The changes recorded are total percent changes, not annual percentages which are used in other tables of this report.

The forty year period from 1960 to 2000 has seen the total number of people crossing the Philadelphia CBD Cordon Line grow about 5.7 percent from about 1.57 million person-trips per day in 1960 to about 1.66 million in 2000. Between 1960 and 1995, the total person-trips crossing the CBD Cordon Line grew about 6.2 percent from 1.57 to 1.67 million, but from 1995 to 2000 total person-trips have declined 0.4 percent from about 1.67 to 1.66 million.

The highway person-trips since 1995 have increased about 2.9 percent. The number of people crossing the Philadelphia CBD Cordon Line daily on highway facilities has increased from 0.74 million in 1960, to 1.19 million in 1995, to 1.22 million in 2000. The number highway vehicle trips crossing the CBD Cordon Line increased by 2.4 percent since 1995, from 0.99 vehicles in 1995 to 1.02 million vehicles in 2000. The difference in changes between person and vehicle trips is attributable to vehicular occupancy rates crossing the various screen lines.

The 1995 report found the highway increases attributable to growth on Interstate facilities, however, this is not the case between 1995 and 2000. Vehicular growth on interstate highways between 1995 and 2000 has been about 2.9 percent (516,100 vs. 531,000 vehicles) while growth on local streets has been about 3.6 percent (472,000 vs. 489,000 vehicles). While a local street like Broad Street (7,500 at the South Screen Line) may have had a large increase, the total growth was produced by smaller increases on many local roads. Many of the interstate facilities had small total and relative increases, owing in part to being near capacity.

The number of persons riding public transit over the last forty years, as shown in Figure 7, declined 47 percent from 834,000 to 442,000. A smaller decrease of 8.7 percent occurred in the last five years from 484,000 to 442,000. Public transit's share of total crossings persons has declined from 53 percent in 1960, to 29 percent in 1995, to 27 percent in 2000. The bus-trolley mode has experienced the greatest loss during the 40 year period (237,000) shrinking from 361,000 person-trips to 124,000 person-trips.

	Nort 1960	th Screen 1995	Line 2000	Soutl 1960	h Screen 1995	Line 2000	Eas 1960	st Screen 1995	Line 2000	West 1960	Screen 1995	Line 2000	TC 1960	DTAL CBD 1995	2000
Regional Rail Subway-Elevated Bus-Trolley TRANSIT HIGHWAY	31,047 226,823 121,114 378,984 291,241	30,007 137,103 43,994 211,104 474,810	34,514 118,733 39,649 192,896 496,782	na 44,235 87,158 131,393 183,050 3	na 26,059 30,175 56,234 329,299	na 25,251 26,855 52,106 347,624	na 17,432 34,147 51,579 79,374	na 35,592 7,194 42,786 112,042	na 33,234 6,395 39,629 113,939	49,800 102,903 119,079 271,782 186,899 2	39,829 70,604 63,594 71,495 2	42,788 63,486 51,118 157,392 263,927	80,847 391,393 361,498 833,738 740,564	69,836 269,358 144,957 484,151 1,187,646	77,302 240,704 124,017 442,023 1,222,272
TOTAL	670,225	685,914	689,678	314,443 3	385,533	399,730	130,953	154,828	153,568	458,681 4	45,522 4	421,319	1,574,302	1,671,797	1,664,295
	Summ; <sup>Nc</sup>	ary of (	Change In Line	s in We	ekda uth Scre	y Perso en Line 1995-2000	n Trip:	S Cros	sing th sing th	e Philac w	delph est Scree	ia CBD en Line 995-2000	<b>Cordo</b>	n Line	2000
Regional Rail	11	1.2%	15.0%		na	na		na	na	-14.	1%	7.4%	.4.	4%	10.7%
Subway-Elevated	-47	7.7%	-13.4%	ώ	1%	-3.1%	90	.6%	-6.6%	-38.	3%	-10.1%	-38.	5% -`	10.6%
Bus-Trolley	-67	7.3%	-9.9%	-69-	2%	-11.0%	-81	.3%	-11.1%	-57.	1%	-19.6%	-65.	%2	14.4%
TRANSIT	-45	9.1%	-8.6%	-60	3%	-7.3%	-23	3.2%	-7.4%	-42.	1%	-9.6%	-47.	%0	-8.7%
HIGHWAY	22	0.6%	4.6%	89.	9%	5.6%	40	.5%	1.7%	41.	2%	-2.8%	65.	%0	2.9%

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CHANGE

The subway-elevated lines have also declined from 1960 to 2000 (151,000) going from 391,000 to 240,000 person-trips per day. The bright spot within transit has been that regional rail ridership, down 4.4 percent since 1960 (81,000 vs. 77,000 persons per day), has increased by 10.6 percent since 1995 (70,000 vs. 77,000).





_		Person Trip	)S	Compound Ann	ual Change
	1960	1995	2000	60-00	95-00
Transit	833,738	484,151	442,023	-1.6%	-1.8%
Highway	740,564	1,187,646	1,222,272	1.3%	0.6%
TOTAL	1,574,302	1,671,797	1,664,295	0.14%	-0.1%

### IV. HOURLY VARIATIONS IN THE PHILADELPHIA CBD CORDON LINE DAILY TRAFFIC CROSSINGS

Since the highway and public transit counts were collected by hour, it was possible to analyze the hourly variation in trip making to and from the Philadelphia CBD. Although vehicular counts on the Benjamin Franklin Bridge were taken only in the westbound direction, an hourly variation for eastbound counts was based on historic travel patterns. In this section counts are assigned by the time representing the ending hour in which they occur. Hourly variation in traffic for the individual screen lines are shown in Appendix A.

#### A. Hourly Variations in Highway Traffic

The 2000 hourly highway volumes are displayed in Figures A-1, A-7, A-10, and A-13 in Appendix A. Figure 6 shows the total hourly variations in highway vehicle trips crossing all screen lines. The morning inbound peak typically occurs during the hour ending at 9 a.m. and is more compact than the afternoon peak which occurs during the hour ending at 6 p.m. There is a mid-day "trough" between peaks and typically it is the afternoon peak where the most variation in shape occurs. The morning inbound peak is about 60 percent and the outbound peak about 40 percent of the total traffic crossing the cordon. The afternoon peak reverses these proportions with 43 percent of inbound traffic and 57 percent of outbound traffic crossing the cordon. The total cordon volume for the p.m. peak time is about 6 percent larger than the a.m. volume.

Daily traffic patterns typically show a narrower morning peak. In the afternoon school trips usually occur earlier than work trips, whereas in the morning they tend to coincide. Shopping, social, and recreational trips are more likely to take place in the afternoon and this tends to broaden the afternoon peak and introduce greater variability.

The highway hourly counts are all listed in Appendix B. Counts for the North, South, East, and West Screen Lines are shown in Tables B-1, B-7, B-10, and B-13 in Appendix B respectively. One measure of peaking is provided by looking at the ratio of the peak A.M and P.M. one hour volume to the total 24 hour volume for that direction, expressed as a percentage. The A.M. inbound and P.M. outbound peak times were the hours ending with 9:00 a.m. and 6:00 p.m. The values at these peak hours can be summarized as follows:

<u>Screen Line</u>	<u>AM Peak (inbound)</u>	<u>PM Peak (outbound)</u>
North	8.6%	8.4%
South	7.2%	7.6%
East	12.1%	11.2%
<u>West</u>	<u>6.9%</u>	<u>7.2%</u>
TOTAL	8.2%	8.2%

The peak hour share of total highway traffic crossing the Philadelphia CBD Cordon Line is 8.2 percent in the a.m. peak and 8.2 percent in the p.m. peak, with the total volume is a bit greater in the p.m. Differences in the peak percent with the above summary and Figure 6 are explained by slightly different totals derived taking the largest hourly value for each screen line in the summary above and the total of the collective peak of all screen lines. The large peak percentage crossing the East Screen Line is due mainly to commuting from New Jersey suburban counties. The Benjamin Franklin Bridge, the only highway access on the east almost necessitates a higher peak share given its exclusivity. The North, South, and West Screen Lines display similar inbound and outbound peaking characteristics.

#### B. Hourly Variations in Public Transportation Ridership

The hourly variations in passenger volumes crossing screen lines on public transit are depicted by screen line and submode in Appendix A with 24 hour counts in Appendix B. Total transit trips by submode are displayed in Figure 7. The percent carried in each peak by mode are similar with regional rail being greater, though the subway-elevated carries over half the peak volume into or out of the Philadelphia CBD. The A.M. inbound and P.M. outbound peak times were the hours ending with 9:00 a.m. and 6:00 p.m. The transit peak hour shares across individual screen lines are summarized below:

<u>Screen Line</u>	AM Peak (inbound)	PM Peak (outbound)
North	16.2%	17.5%
South	18.3%	17.4%
East	29.3%	30.9%
<u>West</u>	<u>18.0%</u>	<u>18.1%</u>
TOTAL	18.3%	18.9%


Hour of the Day

#### 2000 Highway Peak Hour Volume by Direction

	Vehicles per Day	Peak Traffic	Percent
Inbound Outbound	508,912 511,040	40,581 41,923	8.0% 8.2%
TOTAL	1,019,952	82,504	8.1%



### 2000 Transit Peak Hour Volume by Direction

	Transit Trips Per Day	AM Peak Hour Trips	PM Peak Hour Trips	Percent of F AM	Peak Hour PM
Inbound	222,043	40,605	11,416	18.3%	5.1%
Outbound	219,333	14,499	41,548	6.6%	18.9%
TOTAL	441,376	55,104	52,964	12.5%	12.0%

One characteristic distinguishes transit ridership from highway traffic patterns is that transit's share carried during the peak hour is more than double that of highway's share. The morning and evening peaks are sharper and the mid-day troughs are lower than peak hour highway traffic volumes. The exceptions to the 9:00 a.m. inbound and 6:00 p.m. outbound pattern occurs with the bus-trolley volumes crossing the West Screen Line exhibiting inbound and outbound peaks at 10:00 a.m. and 5:00 p.m. respectively. The causes of this difference in peaking for bus-trolley trips on the West Screen Line may be attributable to a prevalence of non-work trips and local activity between West Philadelphia and the Philadelphia CBD. Generally speaking, the bus-trolley mode has lower peaks than the other modes owing to its prevalence of non-work trips.

Both highway and transit peaks have the greatest peak hour share of trips crossing the East Screen Line. Transit is noticeably spiked at the peaks with mid-day ridership counts only one-tenth the peak volume counts. This trend was also evident in the 1995 data. The lowest peak hour share has shifted from the South Screen Line in 1995 to the North Screen Line in 2000.

There are a number of differences in the total hourly ridership patterns crossing the Philadelphia CBD Cordon Line examined by transit mode (see figures A-17 to A-19). The sharpest peaking is seen on the regional rail lines where the peak hour carries about one quarter of the total volume in either direction and where mid-day ridership is only 10 percent of that carried during the peaks. Ridership on subway-elevated lines is only slightly less peaked compared with regional rail, though the total subway-elevated volume is more than double that of the regional rail. The peak hour share for the subway-elevated is about 20 percent and the mid-day ridership is about a fourth of the peak. Riders on the bus and trolley lines are much more evenly distributed over the day, with the peaks being much less pronounced. While many bus routes have "Nite Owl" service after 10 p.m., counts provided by SEPTA do not reflect this. The bustrolley inbound and outbound peaks are about twice the volumes of the respective mid-day troughs, reflecting the high percentage of local and non-work related trips.

It is worth noting on the regional rail cordon line volumes that reverse commuting is evident in the mini p.m. outbound - p.m. inbound peaks within the primary a.m. inbound - p.m. outbound peaks. The a.m. reverse commute peak represents about 15 percent of the total volume. The p.m. reverse commute peak is flatter reflecting a longer peak in the opposite direction. The subway-elevated also shows this reverse commute peaking in the a.m. with an earlier peak in the p.m. The a.m. reverse peak is about one quarter of the traditional inbound volume. The Market Frankford West Screen Line crossings account for half of this reverse commute. Commutes to the growing job market in the western suburbs are facilitated with the 69<sup>th</sup> Street Terminal destination of the outbound a.m. MFSE. The bus-trolley volumes are relatively flat, with reverse commute volumes maintaining a steady 30 to 40 percent of the hourly total. There is no precipitous drop off during the mid-day, and the traditional peaks at best are only twice the opposite direction volumes. This is keeping with the bus-trolley mode serving a major non-work transportation function though out Philadelphia CBD and the region.

# C. Accumulation

The hourly accumulation of highway vehicle trips and public transportation riders in the Philadelphia CBD is shown in Figure 8. Basically, this figure tracks the transient population of vehicles and persons in the CBD as they enter and leave during the course of an average weekday. The population of both persons and vehicles builds rapidly until about 10 a.m. and then it builds slowly to a maximum from 12:00 a.m. to 1:00 p.m., though peak numbers are essentially the same from 11:00 a.m. to 2:00 p.m. After 1:00 p.m. however, there is a gradual outflow in the volume of vehicles and passengers until about 4:00 p.m. when the evening commute to homes outside the Philadelphia CBD begins. About 7:00 PM the rate of decrease in the CBD population slows down considerably.

At the mid-day peak, Center City Philadelphia accumulates about 131,000 more persons and 43,600 more vehicles than it does at night, when the resident population becomes about 50,000. The Philadelphia CBD accumulation at mid-day has about 60 percent of the people (80,000) arriving by public transit with the other 40 percent (51,700) arriving in private vehicles. In 2000 more than half the public transit accumulation into the Philadelphia CBD were carried by subway-elevated (43,400), with regional rail (19,700) and bus-trolley (18,000) splitting the remainder. Person accumulation using public transportation into the Philadelphia CBD has decreased about 9 percent since 1995. The maximum hourly accumulation of vehicle trips in 2000 (43,600) grew about 3 percent since 1995. The total day time population of the Philadelphia CBD is estimated at approximately 190,000 including non-motorized traffic (walk, bicycles). This amounts to more than three times the night population.

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#### 2000 Maximum Hourly Acumulation by Vehicle and Person Trips

#### **Maxium Hourly Accumulation**

Accumulation of Persons	131,756
Transit Person-Trips	80,016
Highway Person-Trips	51,740
Highway Vehicle-Trips	43,600

# **APPENDIX A**

2000 Hourly Variation in Traffic Crossing the	
Philadelphia CBD Screen Lines	-1 - A-12















Hour of the Day



Figure A-8: 2000 Hourly Variations in Broad Street Subway Trips Crossing the South Screen Line























A-10



Figure A-18: 2000 Hourly Variation in Total Subway-Elevated Trips Crossing the Philadelphia CBD Cordon Line



A-11



Figure A-19: 2000 Hourly Variation in Total Bus and Trolley Trips

# APPENDIX B 2000 Hourly Counts by Screen Line and Mode ..... B-1 - B-18

Table B-1
2000 HOURLY HIGHWAY VEHICLE COUNTS
NORTH SCREEN LINE

Ending	Inbound	Outbound	Total
1 AM	1,893	2,769	4,662
2	1,409	1,742	3,151
3	1,205	1,253	2,458
4	1,153	1,114	2,267
5	1,596	1,470	3,066
6	3,755	3,000	6,755
7	10,465	7,197	17,662
8	17,336	10,675	28,011
9	18,061	11,654	29,715
10	13,532	9,831	23,363
11	11,452	9,630	21,082
12 PM	10,781	10,108	20,889
1	11,151	10,260	21,412
2	11,575	11,799	23,375
3	13,163	13,190	26,353
4	12,782	16,038	28,820
5	14,210	16,994	31,204
6	13,455	17,187	30,642
7	11,760	13,076	24,835
8	8,155	9,527	17,683
9	6,556	8,314	14,870
10	5,701	7,085	12,786
11	4,785	5,829	10,614
12 AM	3,673	4,641	8,314
Total	209,603	204,382	413,985

# Table B-22000 HOURLY REGIONAL RAIL COUNTSNORTH SCREEN LINE

Ending	Inbound	Outbound	Total
5	132	0	132
6	393	63	456
7	1,495	409	1,904
8	2,373	1,158	3,531
9	4,201	1,288	5,489
10	1,709	507	2,216
11	817	220	1,037
12 PM	731	337	1,068
1	411	358	769
2	459	465	924
3	500	677	1,177
4	558	1,144	1,702
5	829	2,922	3,751
6	1,051	3,719	4,770
7	781	1,499	2,280
8	285	907	1,192
9	265	564	829
10	230	349	579
11	153	227	380
12 AM	49	187	236
1	33	48	81
2	0	10	10
Total	17,456	17,058	34,514

Table B-3
2000 HOURLY MARKET-FRANKFORD COUNTS
NORTH SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6 AM	762	275	1,037
7	2,324	760	3,084
8	5,230	1,144	6,374
9	4,793	870	5,663
10	1,819	574	2,393
11	1,031	616	1,647
12 PM	962	627	1,589
1	916	956	1,872
2	776	1,016	1,792
3	1,399	1,309	2,708
4	1,497	2,322	3,819
5	1,258	3,423	4,681
6	874	5,117	5,991
7	512	2,241	2,753
8	258	894	1,152
9	264	722	986
10	237	428	665
11	248	470	718
12 AM	224	357	581
1	46	271	317
Total	25,430	24,392	49,822

Table B-4
2000 HOURLY BROAD STREET SUBWAY COUNTS
NORTH SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6 AM	727	95	822
7	2,220	608	2,828
8	5,012	2,513	7,525
9	3,445	3,489	6,934
10	1,655	1,785	3,440
11	1,331	1,511	2,842
12 PM	1,447	1,156	2,603
1	1,477	1,364	2,841
2	1,752	1,283	3,035
3	2,563	1,154	3,717
4	2,658	2,440	5,098
5	2,092	2,801	4,893
6	1,429	4,613	6,042
7	830	2,285	3,115
8	683	1,091	1,774
9	554	647	1,201
10	528	665	1,193
11	420	679	1,099
12 AM	257	614	871
1	1	316	317
Total	31,081	31,104	62,185

Ending	Inbound	Outbound	Total
6 AM	61	5	66
7	207	58	265
8	561	97	658
9	580	119	699
10	290	34	324
11	136	42	178
12 PM	113	71	184
1	138	113	25
2	115	112	227
3	153	199	352
4	328	363	691
5	237	767	1,004
6	206	846	1,052
7	127	332	459
8	52	185	237
9	42	42	84
Total	3,346	3,380	6,726

### Table B-6 2000 HOURLY BUS COUNTS NORTH SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6	36	13	49
7	1,238	321	1,559
8	2,047	754	2,801
9	2,779	1,135	3,914
10	1,887	795	2,682
11	1,510	1,001	2,511
12 PM	1,203	1,239	2,442
1	1,501	1,284	2,785
2	1,309	1,396	2,705
3	1,316	1,513	2,829
4	1,716	2,144	3,860
5	1,479	2,129	3,608
6	1,048	2,402	3,450
7	634	1,887	2,521
8	403	1,170	1,573
9	16	52	68
10	0	0	0
Total	20,122	19,235	39,357

Table B-7
2000 HOURLY HIGHWAY VEHICLE COUNTS
SOUTH SCREEN LINE

1 AM 2 3 4 5	1,914 1,224 1,046	1,872 1,352	3,786
2 3 4 5	1,224 1,046	1,352	
3 4 5	1,046		2,576
4 5	4 000	1,148	2,194
5	1,026	1,101	2,127
	1,632	1,476	3,107
6	3,931	2,878	6,809
7	6,654	5,217	11,871
8	9,028	7,977	17,005
9	10,234	8,428	18,662
10	8,427	8,039	16,466
11	7,095	7,561	14,657
12 PM	7,285	7,807	15,091
1	7,679	8,194	15,873
2	7,861	8,527	16,388
3	8,498	9,322	17,820
4	10,455	10,093	20,548
5	10,109	10,855	20,964
6	8,466	11,181	19,648
7	6,495	8,777	15,272
8	5,837	6,516	12,353
9	5,062	5,674	10,735
10	4,705	4,862	9,567
11	3,815	4,124	7,939
12 AM	2,879	2,956	5,835
Total	141,357	145,936	287,293

# Table B-82000 HOURLY BROAD STREET SUBWAY COUNTSSOUTH SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6 AM	246	123	369
7	775	504	1,279
8	2,180	977	3,157
9	2,566	700	3,266
10	965	488	1,453
11	470	407	877
12 PM	503	445	948
1	400	497	897
2	484	554	1,038
3	579	770	1,349
4	926	1,345	2,271
5	753	1,427	2,180
6	596	2,086	2,682
7	332	688	1,020
8	212	480	692
9	181	293	474
10	121	382	503
11	147	252	399
12 AM	101	182	283
1	34	80	114
Total	12,680	12,571	25,251

# Table B-9 2000 HOURLY BUS COUNTS SOUTH SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6 AM	107	4	111
7	923	178	1,101
8	2,127	437	2,564
9	2,374	455	2,829
10	1,359	385	1,744
11	1,134	466	1,600
12 PM	853	471	1,324
1	822	721	1,543
2	825	865	1,690
3	848	1,093	1,941
4	945	1,457	2,402
5	770	1,719	2,489
6	637	2,213	2,850
7	391	907	1,298
8	249	718	967
9	0	48	48
10	0	0	0
Total	14,364	12,137	26,501

Hour				
Ending	Inbound	Outbound	Total	
1 AM	353	832	1,185	
2	219	324	543	
3	166	288	454	
4	173	143	316	
5	338	116	454	
6	1,182	171	1,353	
7	4,554	649	5,203	
8	5,981	1,652	7,632	
9	4,754	1,872	6,625	
10	3,435	1,659	5,095	
11	2,610	2,070	4,680	
12 PM	2,283	2,378	4,660	
1	2,286	2,680	4,966	
2	2,186	2,702	4,887	
3	2,543	3,450	5,993	
4	2,758	3,848	6,605	
5	2,811	4,683	7,494	
6	2,741	5,543	8,284	
7	2,483	3,470	5,954	
8	1,784	2,551	4,334	
9	1,308	2,306	3,614	
10	1,131	1,970	3,100	
11	733	1,903	2,636	
12 AM	551	2,115	2,666	
Total	49,361	49,373	98,734	

Table B-11
2000 HOURLY NJ TRANSIT BUS COUNTS
EAST SCREEN LINE

Ending	Inbound	Outbound	Total
6 AM	67	55	122
7	298	85	383
8	670	146	816
9	484	116	600
10	158	77	235
11	162	109	271
12 PM	142	92	234
1	110	119	229
2	132	121	253
3	106	167	273
4	139	240	379
5	135	546	681
6	113	570	683
7	89	234	323
8	86	142	228
9	65	106	171
10	77	58	135
11	72	48	120
12 AM	64	32	96
1	44	20	64
2	8	20	28
3	6	4	10
4	25	1	26
5	23	12	35
Total	3,275	3,120	6,395

EndingInboundOutboundTo6 AM1724771,322891,85,0542195,95,3471885,101,2311621,11560209112 PM323240113233762223236533303543443131,3721,53533,2563,62825,5325,71772,0042,819776299864071081235119119312AM66146				
6 AM 172 47   7 1,322 89 1,   8 5,054 219 5,   9 5,347 188 5,   10 1,231 162 1,   11 560 209 1   12 PM 323 240 1   1 323 376 2   2 232 365 3   3 303 543 4   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   91 198 12AM 66 146	nding	Inbound	Outbound	Total
7 1,322 89 1,   8 5,054 219 5,   9 5,347 188 5,   10 1,231 162 1,   11 560 209 1   12 PM 323 240 1   1 323 376 2   2 232 365 3   3 303 543 4   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   81 235 11 91 198   12 AM 66 146 46	S AM	172	47	219
8 5,054 219 5,   9 5,347 188 5,   10 1,231 162 1,   11 560 209 1   12 PM 323 240 1   1 323 376 2   2 232 365 3   3 303 543 4   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   91 198 12 AM 66 146	•	1,322	89	1,411
9 5,347 188 5,   10 1,231 162 1,   11 560 209 1   12 PM 323 240 1   1 323 376 2   2 232 365 3   3 303 543 4   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   11 91 198 12 AM 66	\$	5,054	219	5,273
10 1,231 162 1,   11 560 209   12 PM 323 240   1 323 376   2 232 365   3 303 543   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   11 91 198 12 AM 66	)	5,347	188	5,535
11 560 209   12 PM 323 240   1 323 376   2 232 365   3 303 543   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   11 91 198 12 AM 66 146	0	1,231	162	1,393
12 PM 323 240   1 323 376   2 232 365   3 303 543   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   91 198 12 AM 66 146	1	560	209	769
1 323 376   2 232 365   3 303 543   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   91 198 12 AM 66 146	2 PM	323	240	563
2 232 365   3 303 543   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   91 198 12 AM 66 146		323	376	699
3 303 543   4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   11 91 198 12 AM 66 146	2	232	365	597
4 313 1,372 1,   5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762 9   9 86 407 10   10 81 235 11   91 198 12AM 66 146	\$	303	543	846
5 353 3,256 3,   6 282 5,532 5,   7 177 2,004 2,   8 197 762   9 86 407   10 81 235   11 91 198   12 AM 66 146	L .	313	1,372	1,685
6 282 5,532 5,   7 177 2,004 2,   8 197 762   9 86 407   10 81 235   11 91 198   12 AM 66 146	5	353	3,256	3,609
7 177 2,004 2,   8 197 762   9 86 407   10 81 235   11 91 198   12 AM 66 146	;	282	5,532	5,814
8   197   762     9   86   407     10   81   235     11   91   198     12 AM   66   146	•	177	2,004	2,181
9 86 407   10 81 235   11 91 198   12 AM 66 146	}	197	762	959
10 81 235   11 91 198   12 AM 66 146	)	86	407	493
11   91   198     12 AM   66   146	0	81	235	316
<b>12 AM</b> 66 146	1	91	198	289
	2 AM	66	146	212
<b>1</b> 21 53		21	53	74
<b>2</b> 21 53	2	21	53	74
<b>3</b> 21 53		21	53	74
<b>4</b> 21 53	ŀ	21	53	74
<b>5</b> 21 53	;	21	53	74

# Table B-12

Table B-13
2000 HOURLY HIGHWAY VEHICLE COUNTS
WEST SCREEN LINE

Ending	Inbound	Outbound	Total
1 AM	1,295	1,853	3,148
2	824	1,132	1,956
3	588	786	1,374
4	643	764	1,407
5	906	973	1,879
6	1,850	1,879	3,729
7	5,036	4,489	9,526
8	7,294	6,289	13,583
9	7,529	5,950	13,479
10	6,268	5,818	12,086
11	5,793	5,487	11,280
12 PM	5,944	5,768	11,712
1	6,169	6,066	12,235
2	6,210	6,451	12,661
3	6,435	6,852	13,287
4	6,847	7,511	14,358
5	7,116	7,897	15,013
6	7,277	8,008	15,285
7	6,163	6,333	12,495
8	5,203	5,443	10,646
9	4,198	4,666	8,863
10	3,674	4,384	8,058
11	3,045	3,673	6,718
12 AM	2,285	2,876	5,161
Total	108,592	111,348	219,939

Hour Ending	Inbound	Outbound	Total
5 AM	0	14	14
6	4	79	83
7	1,468	237	1,705
8	5.114	511	5.625
9	5,503	1,630	7,133
10	1,761	370	2,131
11	674	343	1,017
12 PM	545	302	847
1	461	310	771
2	491	466	957
3	475	573	1,048
4	721	1,832	2,553
5	969	6,308	7,277
6	1,215	6,783	7,998
7	717	601	1,318
8	379	435	814
9	247	231	478
10	230	124	354
11	222	115	337
12 AM	142	105	247
1	44	36	80
2	1	0	1
Total	21,383	21,405	42,788

Table B-15
2000 HOURLY MARKET-FRANKFORD COUNTS
WEST SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6 AM	896	142	1,038
7	2,086	823	2,909
8	4,911	1,884	6,795
9	4,287	2,640	6,927
10	2,040	1,395	3,435
11	1,339	1,036	2,375
12 PM	1,338	1,155	2,493
1	1,529	1,365	2,894
2	1,335	1,585	2,920
3	1,923	1,543	3,466
4	2,511	2,938	5,449
5	2,500	3,407	5,907
6	2,263	4,201	6,464
7	1,105	2,236	3,341
8	745	1,416	2,161
9	568	806	1,374
10	517	513	1,030
11	401	771	1,172
12 AM	390	691	1,081
1	41	214	255
Total	32,725	30,761	63,486

# Table B-162000 HOURLY BUS AND TROLLEY COUNTSWEST SCREEN LINE

Hour			
Ending	Inbound	Outbound	Total
6 AM	33	122	155
7	1,387	757	2,144
8	3,029	1,840	4,869
9	4,246	1,870	6,116
10	1,988	1,591	3,579
11	1,318	1,230	2,548
12 PM	1,089	1,099	2,188
1	1,379	1,434	2,813
2	1,443	1,309	2,752
3	1,294	1,661	2,955
4	1,488	2,828	4,316
5	1,742	3,603	5,345
6	1,702	3,466	5,168
7	1,035	2,039	3,074
8	499	2,547	3,046
9	0	50	50
10	0	0	0
Total	23,672	27,446	51,118
## 1960 - 2000 Travel Trends in the Philadelphia Central Business District

## Publication No. : 02012

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Geographic Area Covered: Philadelphia Central Business District

**Key Words:** Traffic count, Public Transportation ridership, Regional Rail, subway elevated, buses, trolleys, cordon line, screen lines, travel trends, vehicle trips, person trips.

## ABSTRACT

This report assesses the 1960 - 2000 trends in highway traffic volumes and public transportation ridership entering and leaving the Philadelphia Central Business District (CBD). These traffic volumes are expressed in terms of both vehicle trips and person trips crossing each of the four Philadelphia CBD screen lines. Average weekday screen line traffic counts collected in 2000 are compared with similar data collected in 1995 and 1960.

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