# Personal Rapid Transit (PRT)
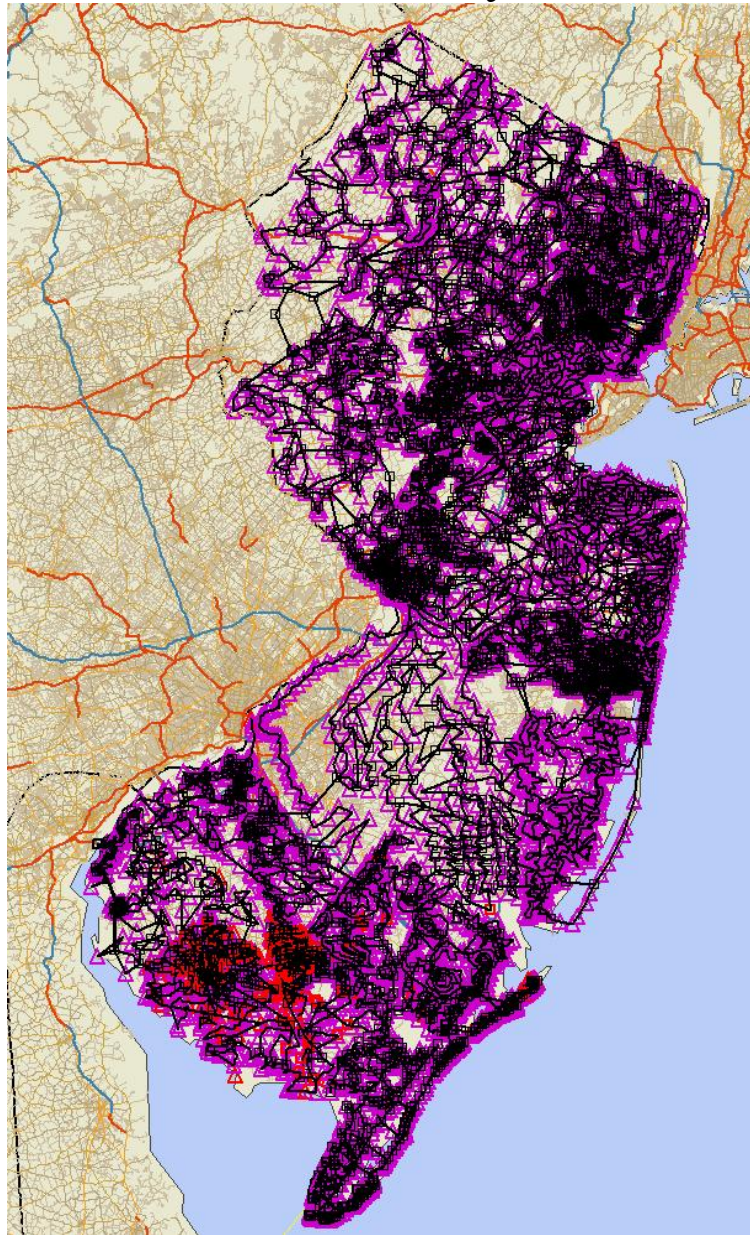
for

# New Jersey



By

Orf 467 Transportation Systems Analysis, Fall 2004/5
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# P.R.T: The New Mass Transit

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# What is PRT?

The modern concept of Personal Rapid Transit (PRT) surfaced in the late 1960's after being introduced and endorsed in a report by Housing and Urban Development. The paper, in effect, lead to several efforts in academia and both the private and public sectors that would form the quantitative framework for the PRT network of today. Collaborating with the United States, Japan, France, and West Germany also helped in developing the logistics of PRT networks. Particularly in the last decade, there has been a resurgence in both the interest and the efforts to incorporate PRT into mass transit systems in the country today.

PRT exists as a network of one-way tracks allowing passengers to commute from station to station via individual pods. Unlike the transportation systems of today, the user of PRT can individually select her destination station and be transported non-stop. Direction changes and forks in travel routes are accommodated by interchanges within the PRT track. A central computer system optimizes the flow of traffic along the track and into/out of each station. The entire network operates seamlessly to provide the passenger with efficient point to point travel access.

There exists a strong belief among many scholars, politicians, and businessmen that PRT will in the future be able to solve most transportation problems (congestion, pollution, etc) with moderate to low cost. On the other hand, some critics are quick to label any proposed PRT system as being inefficient and overly-expensive. These critics often declare the size of the PRT vehicles and system are ill-equipped to handle high density travel areas and would be difficult to either build around existing structures and facilities, or to incorporate into modern cities.

Over the last few decades, many improvements to proposed networks have dispelled fears regarding PRT and silenced disbelievers. The vast improvements of computer technology have increased the reliability of proposed systems and allowed for more detailed and intricate PRT networks. As the computing power of microchips has increased exponentially since the 1960's, the cost of these microchips has also decreased exponentially due to private competition and the general availability of materials. Simple changes like automated fare collection and GPS have now greatly reduced labor cost, dropping the long-term marginal cost of PRT operation to nearly zero. With this in mind, PRT has been transformed into a realistic and efficient method of transportation.

Some believe that PRT would be unable to legitimately compete with traditional forms of mass transit. On the contrary, PRT exists as an on-demand service and would provide a more efficient method of transportation than do the busses, trains, and subways of today. The on-demand nature of PRT prevents the gathering of large groups in stations, the largest bottleneck in today's mass transit systems. Since PRT stations will be spaced from five to ten miles apart on average, passengers will be afforded several departure and arrival locations for each trip. Most important, however, is the fact that PRT is not subject to traffic, weather, peak hours, or accidents.

## History of PRT

"One after another, the various federally funded PRT showcases either fizzled or bombed terribly, exceeding budgets, and exhibiting an array of unforeseen technical problems – some of which seemed to be inherent in the concept." (Light Rail Now! Publication Team)  In the late 1970s, West Virginia University at Morgantown constructed a PRT system with 8.7 miles or roadway and 5 stations for $126 million, about $319 million today adjusted for inflation.  This figure of about $89 million per-route mile did not include costs that would be seen in an urban situation such as real estate acquisition, environmental mitigation.  After this project, federal interest in PRT waned due to the seeming infeasible utilization of this technology in a non-academic setting.

Twenty years later, PRT enthusiast J. Edward Anderson convinced a major military hardware contractor, Raytheon, to invest in the idea.  Soon after, the Northeastern Illinois Regional Transportation Authority bought heavily into a proposed 3.5 mile triple-looping layout with about 8 stations and 40 cars.  In 1998, however, problems began to surface as costs began to soar above the initial estimates of $23 million/mile.  The RTA quickly put the project on hold and eventually scratched the idea completely.  Luckily, PRT proponents would get another chance to study the proposed effectiveness of PRT six years later.

In October of 2004, a bill was passed in the state of New Jersey to appropriate $75,000 for a feasibility study of the PRT system as a supplement to rail transportation and to alleviate congestion.  Although this appropriation seems modest, it does show that the state government is interested in investigating alternative transportation options.  The legislature recognizes that the transportation system of New Jersey is both crucial and fundamental to the long term economic success of the state.  In the past, New Jersey has benefited from being an early adopter of new technologies by implementing a combination of public and user-fee funded roads and an extensive bus system.  Accordingly, the State finds it necessary to continue to investigate new types of service that have the potential to provide a fast, inexpensive travel option and reduce pollution from motor vehicle travel.

## The System

The proposed PRT networks of today must be controlled by a central computer system that is specifically designed to handle a large number of passengers while preventing congestion at interchanges and merge points.  Most transit systems' effectiveness is measured in terms of train availability and accuracy of schedule.  Dr. Anderson, founder of Skyweb Express, remarks that dependability, rather than availability, is a more meaningful measure of value because it indicates the number of person-hours not delayed due to operation failures.  When analyzing a PRT system, there should exist at most 3 undependable hours per 1000 person-hours of operation in order for the system to be considered.  This number is easily attainable through PRT's sophisticated communication implementation.  If there is a problem ahead in the track, for example, the vehicles behind the problem can be commanded to slow down.  The central computer can detect vehicles that have stopped through GPS and reroute accordingly.

### The Trip

The trip experience for a passenger is efficient and convenient. The entire PRT process is automated, allowing for almost zero labor cost in stations. In PRT travel, a passenger enters the station, chooses her destination from a computer, pays a fee, and receives a ticket. After she enters the first open car, the central computer examines the flow of the passing cars for an opening. When appropriate, the car is given the command to accelerate. At interchanges, the computer selects the optimal route and instructs the car. When the car finally comes to a complete stop at the destination station, the doors unlock and the passenger is allowed to exit.

### A PRT Network in New Jersey

Is PRT feasible for the state of New Jersey? In an attempt to answer this question, our class has generated a vast network of stations and interchanges that serve approximately 90% of all destinations in the state. This simulation will paint a picture as to the scale of a project that would dramatically change the way people are moved through the state.

# New Jersey Coastline

The Eastern Coast of New Jersey is composed of several counties including, Burlington, Ocean, and Monmouth Counties. These counties are the 1st, 2nd, and 6th largest counties in New Jersey, respectively. In particular, Monmouth and Ocean County accounted for 20% of the growth in New Jersey from 1990-2000. Combined, the three counties take up approximately 1,239,549 acres of land and have a population of 1,575,311 persons. Monmouth is composed of densely populated areas, but a good portion of its land is dedicated to farmland, 10% of the land is undeveloped public open space, and there are 27 miles of pristine beaches. Most of Ocean County's land is used for resorts and large attractions, such as amusement parks and army bases. Burlington's land use is principally limited to agriculture. Blueberries, cranberries, and timber are among the produce of the county.

Even though these three counties have varying populations and land uses, their main mode of transportation remains the automobile. Ocean County relies heavily on its network of motor vehicle highways for transportation. Its public transportation system is very limited and all tourists and visitors are advised to rent a car. Monmouth and Ocean County, because of their recent sudden increase in population growth, are investing in the MOM Rail Service, which is a network of railways that would provide direct connection to the dense areas of the counties, as opposed to the current railway that just lies along the perimeters of the county, but this system may prove to be inefficient. Eighty percent of all commuting in Burlington is by automobile. It is evident that this region is in need of a change in local transportation means in order to maintain a comfortable quality of life for its residents and visitors.

In the last decade, PRT has been increasingly considered as a solution to mass transit problems today. Especially for a region like Monmouth and Ocean counties where 20% of the state's growth has occurred in 14.7% of the land area of the state, traffic congestion is becoming an increasingly pressing issue. Because the system is controlled by computers, PRT is easily

adaptable to fluxes in demand and increases in population.  The mean travel time has increased by six minutes for commuters in Ocean County alone in the past 10 years.  Since middle New Jersey is seen as an increasingly attractive place to live for commuters to New York and parts of upper New Jersey, the transportation problems will just compound.  New Jersey Transit is proposing a new rail line for Middlesex, Ocean, and Monmouth counties in an effort to accommodate travelers, but this new rail line is only a temporary and partial solution.  Over 75 % of travelers ride alone to work in a car as opposed to taking public transportation or car pooling.  Because PRT gives the feeling of a personal ride to work, it will be seen as appealing to these workers and also solve the congestion problems of the region.  Also, implementing PRT in the region will solve air quality problems, making the quality of life for this region higher.  While the Burlington, Ocean, and Monmouth county region already attracts more and more residents each year, PRT would alleviate traffic issues which over half of surveyed residents in the counties indicated were of either the primary or secondary concern to them for their county's future.

# Burlington County



## Land Use in Burlington County

Burlington County is the largest county in New Jersey, extending 827 square miles or 524,160 acres.  It is composed of forty political subdivisions – three cities, six boroughs, and thirty-one townships. In the year 2001 census data showed about 432,000 residents living in Burlington County. The population distribution is shown below:
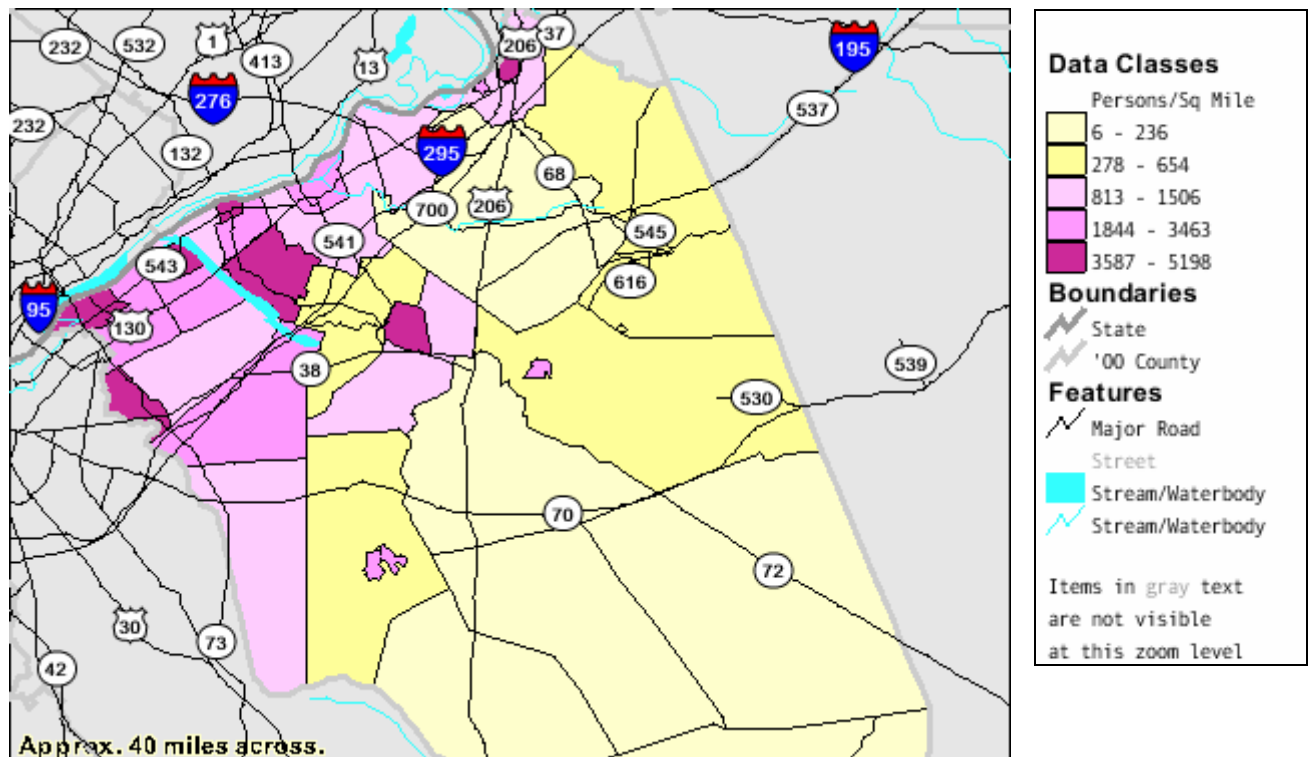
Burlington is known for its extensive forests, wildlife, and other natural attractions. Its main economic production is cranberries. Extensive amounts of land are used for farming and produce purposes and cranberry production. Burlington has the largest number of acres devoted to farming and produces the second largest number of cranberries in the nation. The largest blueberries in the world are also grown here.

### Description of Existing Transit Service

The present transit situation of Burlington County does not boast much serviceability. Eighty-one percent of the residents use car travel, while four percent use the bus system, eleven percent carpool, and two percent have the good fortune to work at home. The map below shows the mean travel times of different regions within Burlington County.
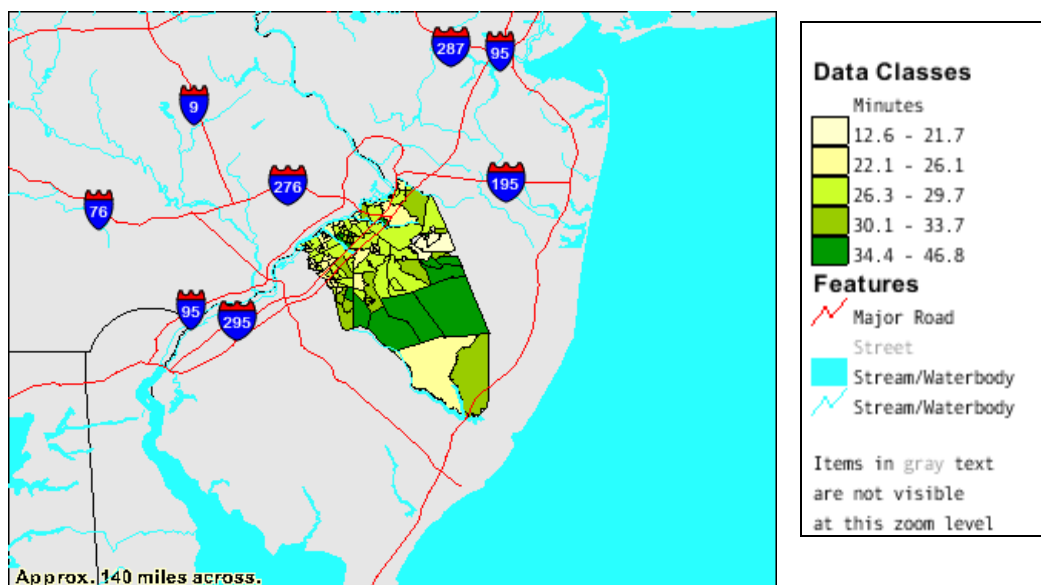
Though Burlington does have close access to the major I-295 and I-95 highways, this is not enough to comfortably deal with the Burlington traffic. Numerous traffic construction projects are in order for the Burlington County area.

| Date | Construction Projects |
|---|---|
| Thru December 2004 | NJ Turnpike @ area between Interchange 3 and Interchange 4 – Sound wall construction with three lanes open at 45 mph. |
| Thru December 2004 | Routes 30, 38, 70, 73, and I-295 – various intersecting streets in various townships – ongoing traffic signal work with lane closures. |
| Thru December 2004 | Bridgeboro Road (CR 613) @ Creek Road – Delran Township – One lane alternating traffic for intersection improvements. |
| Thru December 2004 | Marne Highway (CR 573) @ area between Hartford Road and Larchmont Blvd – Mount Laurel Township – Road closures and delays to replace bridge. |
| Thru December 2004 | Race Street @ Rancocas Creek – Southampton Township – Bridge work. |
| Thru December 2004 | I-295/N&SB @ Route 38 to Route 561 – Lane closures for road work land shifts. |
| Thru January 2005 | Route 9 @ Garden State Parkway to W. Greenbush Road – Bass River Township – Bridge work. |
| Thru January 2005 | Evesboro-Medford Road (CR 618) @ area from Greentree Road to quarter-mile east to Troth Road – Evesham Township – Road widenening and drainage improvements. |
| 12/20/09 – 12/24/04 | Rt. 130/SB @ Dultys Lane – Burlington Township – Single lane closure and SB Ramp closure 9am-3:30pm for pavement repair. |
| 12/20/04 – 12/24/04 | I-295/N&SB @ Exit 34 to Exit 40 – Mount Laurel Township – Single lane closure 8pm-6am for ongoing construction. |

Hypothetically it would cost about the same amount of money to implement a new PRT system. The Burlington County Transit Service prides itself on meager bus system that offers free bus travel to senior citizens and disabled residents. They receive their funds from Casino, State, and Federal grants as well as county revenue. A light-rail system, Riverline, also provides many residents with an easier commute to Trenton and the greater NJ Transit railroad system.

## Proposed PRT Network in Burlington
### Size and coverage of the network
The PRT network we created for Burlington County has 300 stations and 300 intersections. Looking at the population density map, it is easy to see where the PRT stations will be more densely located. Our system will also service rural areas with many station locations; we feel this is important because farming is such a large part of the Burlington County culture. Burlington is an interesting county in its extensive farm culture so we expect more people in rural areas to demand the use of the PRT network. Unlike other counties like Ocean County to the east, which did not make rural areas as much of a priority, we made sure to offer rural stations in Burlington. The stations are also efficiently connected by one-way tracks in various directions to permit a constant high volume of flow and to also service as many stations as effectively as possible.
### Service to Employment
For employment purposes the PRT network in Burlington can be used for transfer from rural areas to city centers and vice versa. Burlington experienced a large growth period in the 1980s when the number of jobs within the county increased a dramatic 54% in the trade industry and a 90% increase in service sector jobs. There will be a huge flow of residents to the service

and trade jobs within the county. Overall, about 180,000 people are employed within Burlington County. Some major employers within Burlington County are Lockheed Martin in Moorestown and Cendant Mortgage in Mt. Laurel. Also, Burlington is in close proximity of the Trenton area that attracts Burlington residents with its greater job opportunities.

**Service to Shopping**

Burlington shopping attractions vary throughout the county. Most shopping is concentrated in larger cities rather than the townships. The PRT network we have will provide the transport necessary to bring people from their township residences to the larger cities for shopping attractions, and then back home again. Some major shopping attractions are the Burlington Center Mall in Burlington, NJ, the Moorestown Mall in Moorestown, NJ, and the Columbus Mart, a three-story antique mall.

**Service to Recreation**

Burlington County, known for its wildlife, has many recreational attractions in unpopulated areas. Families and friends are constantly traveling to more rural areas to camp, fish, canoe, hike, or swim. This is another reason for our choosing to place stations in rural as well as suburban and urban areas.

**Service to Education**

By placing stations near schools we have also made the Burlington County PRT network an effective substitution for the school bus system. Parents should feel comfortable sending their children on the PRT system for school commute. This will limit the number of two-way commutes that parents make every morning and afternoon for their children, thereby reducing the amount of traffic on the road during rush hour times.

**Service to Housing**

Burlington County has many large and small areas that have residential communities. We have placed PRT stations in all of these areas so there can be effective travel to and from the communities as well as between.

## Value of PRT to Burlington County's Future

PRT will connect all areas and all people to every location in Burlington County as well as across New Jersey. Now the Burlington County Transit System only services malls on Wednesdays and doctor's offices and hospitals on Mondays, Tuesdays, and Fridays between 10 am and 2 pm (reservations are recommended). These limiting times hinder the population, especially the elderly who rely heavily on BCTS for transport in place of driving themselves. Rather than servicing only certain areas on specific days, our PRT system will serve 90% of Burlington County every day of the week. The entire population will benefit from the dramatic increase in public transportation services.

# Monmouth County

## Overview

Monmouth County was recently picked as the "Third Best Place to Live" by *Money Magazine* out of 300 national communities. Additionally, the county's attention to economic health has helped it earn a Triple A rating from Moody's & Fitch and Standard and Poor's. These two honors reflect the kind of lifestyle Monmouth County has to offer.

Monmouth County has turned into one of the nation's most attractive locations to live. Tourism was one of the county's original business sectors and continues to be a critical part of the county's great economic strength, but with the arrival of a wealthy and well educated population, professional sectors and commerce have grown drastically. The county is now very strong in the computer sciences, telecommunications, biotechnology and finance.

In order to retain its rural essence while growing, the county has also preserved nearly 20,000 acres of farmland and open space and is continuing to add to that acreage. The following tables summarize Monmouth County's land usage.

**Total Land Area**

| | |
|---|---|
| Area (mi2) | 471.57 (301,805 acres) |
| Rank in NJ | 6th |
| Percent of NJ | 6.2% |

**Public Open Space**

| | |
|---|---|
| Federal (acres) | 1,668 |
| State (acres) | 12,843 |
| County (acres) | 19,200 |
| Municipal (acres) | 8,400 |
| Total acreage | 42,111 (13.95% of county) |

## Public Transit Services

New Jersey Transit's North Jersey Coast line provides passenger rail provides daily service from 13 locations in Monmouth County to Newark and Manhattan as well as a connection to Amtrak rail services.

In addition, New Jersey Transit provides bus service from Monmouth County to other major employment centers in New Jersey and New York. Suburban and Academy busses also provide daily service to Jersey City and midtown Manhattan. A local bus service is available for transit throughout the county.

The Monmouth County Special Citizen's Area Transportation (S.C.A.T.) offers transportation throughout the Monmouth County area for Senior citizens and residents with special needs.

Another option for those traveling between Monmouth County and New York are the ferry services operating between Highlands, Atlantic Highlands, Keyport and Manhattan.

## Size and Coverage of PRT Network for Monmouth County

The PRT network for Monmouth County is dividend into five regions. Each one of these regions is basically a network of concentric shapes. The region is outlined with a directional

path, and then within each region are concentric paths of approximately the same shape but smaller and smaller in size, until the center of the region is covered. The concentric paths are then each connected outward and inward about every half mile using interchanges. Additionally, the concentric paths for each region alternate in direction making it more efficient and easier to move to your desired location. The five regions are then connected at their borders by interchanges to complete the network. The least populated and simplest of the five regions is show below so you can get an idea of the network. The three concentric paths are highlighted in red so they stand out while the interchanges and interchange paths are still grey and the stations are still blue.
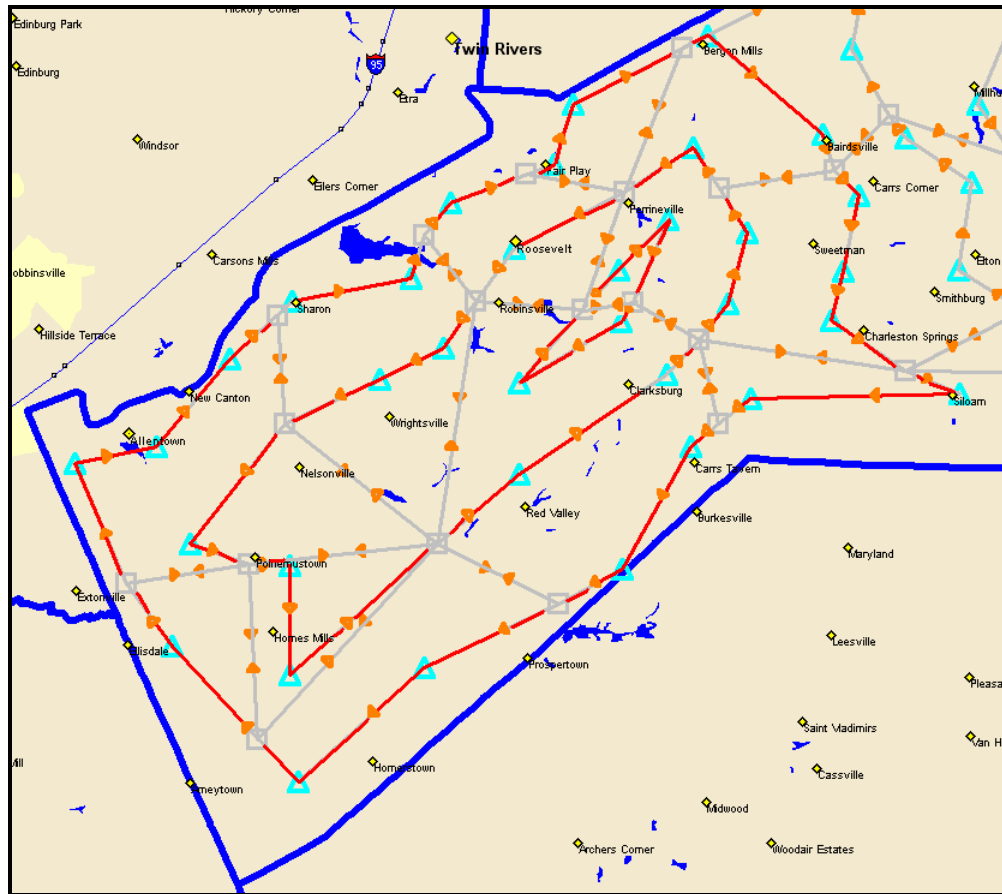


You can see from the previous diagram the concentric paths are traveling in alternating directions as pointed out by the orange directional arrows.. A map of the entire county is given below with the outlines of the five network regions highlighted in red. The previous picture is the leftmost region in the picture below. It is the most sparsely populated region of the county and thus has the fewest stations and interchanges. As you approach the coast the population density increases greatly.
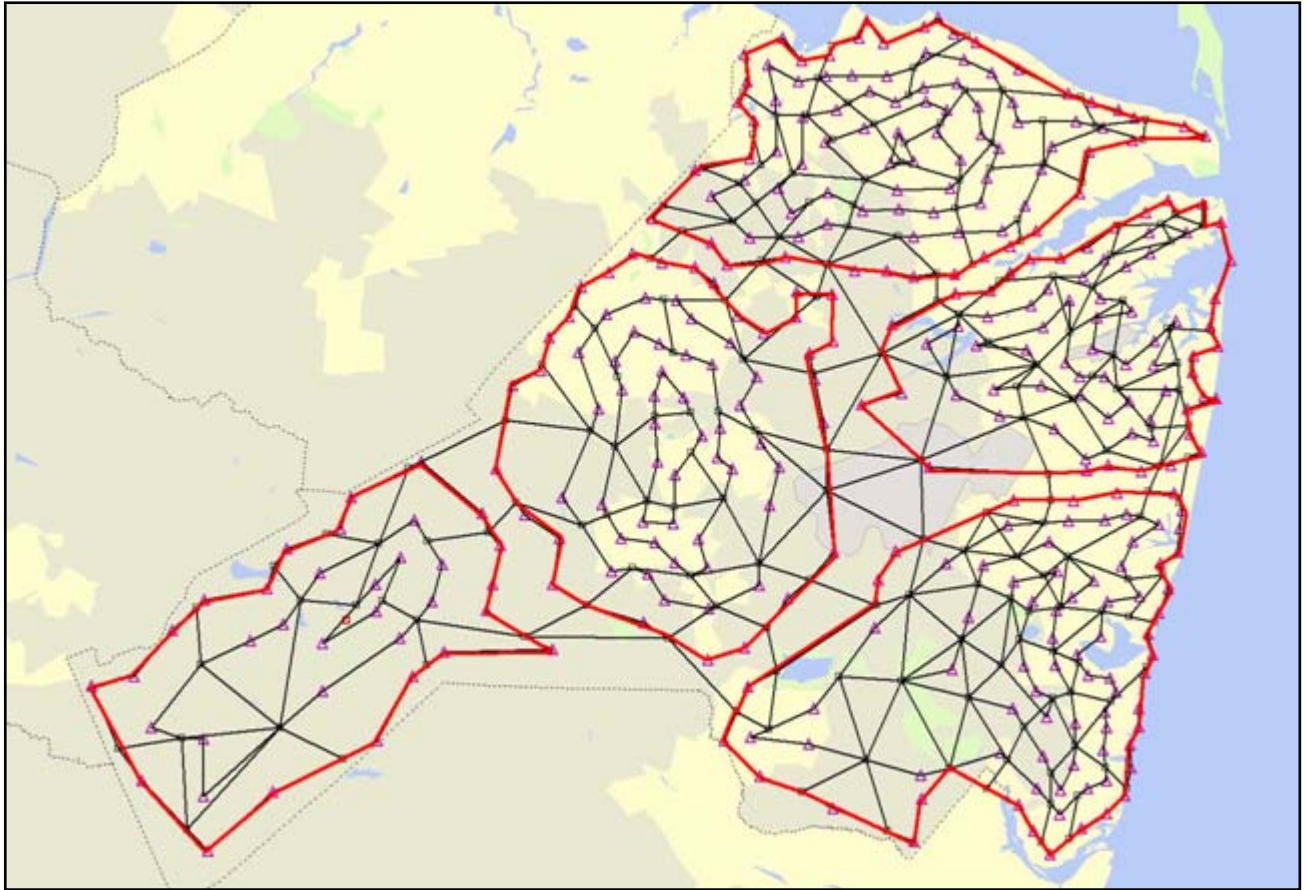
Shown on the next page is a close up of the region roughly in the middle of the county with its four directionally alternating concentric paths once again highlighted in red.
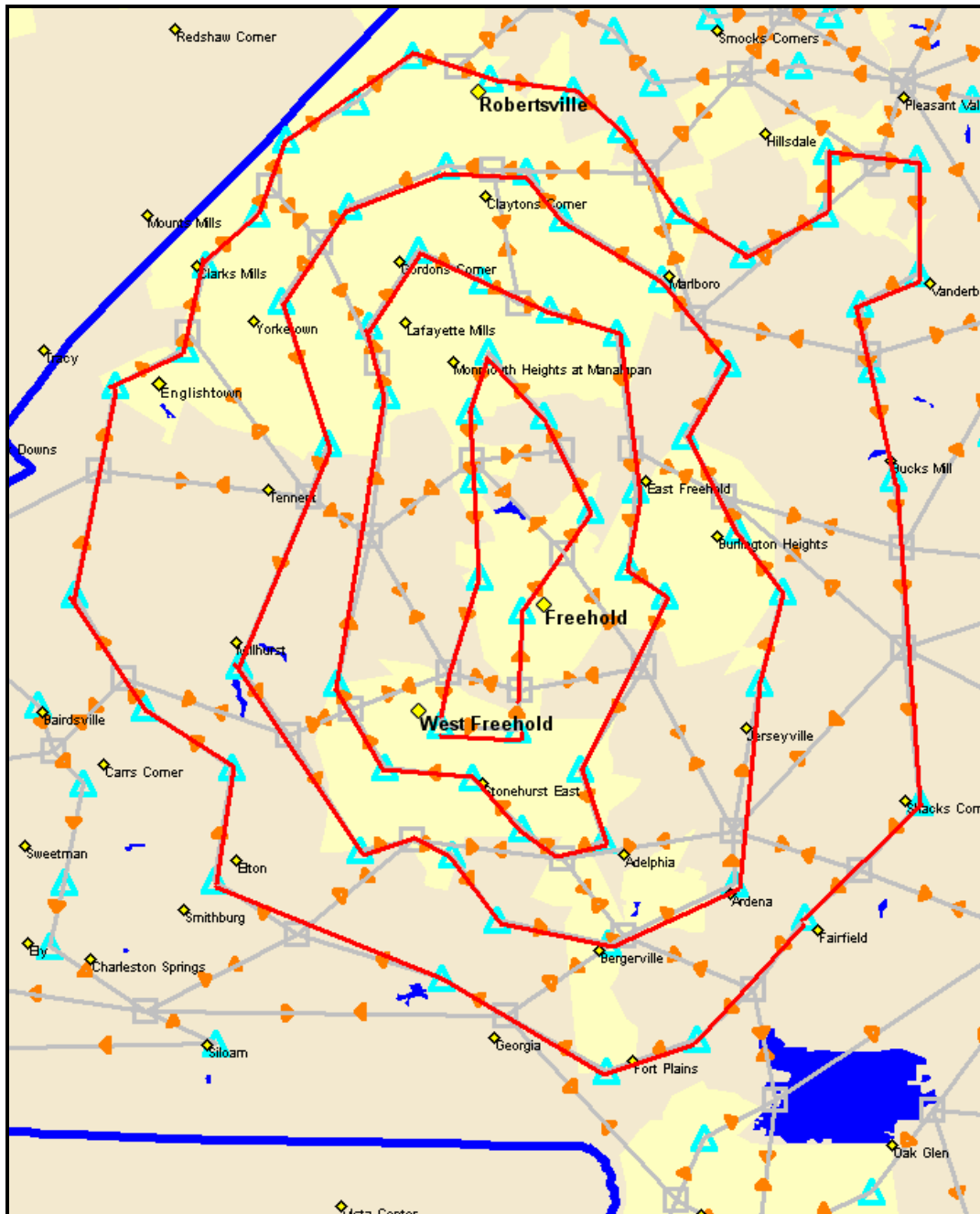
Once again, you see how the paths change directions, making it much more efficient to travel across. In total, the PRT network has 348 stations connected by 195 interchanges and 976 links servicing about 90% of the estimated 632,000 residents of Monmouth County.

## **PRT Service to Housing**

The PRT network serves approximately 90% of the residents in Monmouth County. The ten highest populated cities in Monmouth County are given in the following table along with the number of stations in each city and the population per station.

| City Service | Population | # Stations | Avg./Station |
|---|---|---|---|
| 1. Middletown | 66,783 | 15 | 4452 |
| 2. Freehold | 51,023 | 29 | 1759 |
| 3. Howell | 50,237 | 12 | 4186 |
| 4. Marlboro | 39,525 | 10 | 3953 |
| 5. Neptune | 33,768 | 16 | 2111 |
| 6. Long Branch | 31,548 | 9 | 3505 |
| 7. Hazlet | 21,364 | 6 | 3561 |
| 8. Asbury Park | 16,901 | 11 | 1536 |
| 9. Holmdel | 16,877 | 15 | 1125 |
| 10. Tinton Falls | 15,951 | 6 | 2659 |

The average population per station for the ten largest cities is 2,885. If you compare that to the average population per station for the ten smallest cities, you would expect it to be much larger. The average population per station is 736 for the ten smallest cities listed below.

| City Service | Population | # Stations | Avg./Station |
|---|---|---|---|
| 1. Allenhurst | 718 | 2 | 359 |
| 2. Roosevelt | 936 | 1 | 936 |
| 3. Deal | 1,056 | 2 | 528 |
| 4. Shrewsbury | 1,098 | 2 | 549 |
| 5. Farmingdale | 1,592 | 4 | 398 |
| 6. Englishtown | 1,820 | 3 | 607 |
| 7. Allentown | 1,882 | 4 | 471 |
| 8. Sea Girt | 2,114 | 4 | 529 |
| 9. Avon-By-The-Sea | 2,242 | 2 | 1121 |
| 10. Monmouth Beach | 3,724 | 2 | 1862 |

## PRT Service to Employment

The top ten employers in the region are all serviced by the PRT network and employ over 34,000 people. The following table lists the top ten employers in Monmouth County.

| Employer | Number of Employees |
| --- | --- |
| 1. Meridian Health System | 7,500 |
| 2. AT&T | 5,900 |
| 3. U.S. Army Communications | 5,462 |
| 4. County of Monmouth<br>Hall of Records | 3,564 |
| 5.Foodarama Supermarkets Inc. | 2,418 |
| 6. CentraState Healthcare Systems | 2,100 |
| 7. Monmouth Medical Center | 2,061 |
| 8. Lucent Technologies | 1,806 |
| 9. Bayshore Community Health Service | 1,700 |
| 10. Naval Weapons Station Earle | 1,500 |

There is clearly a sufficient need of PRT access to these areas of employment as seen by the numbers above. Monmouth County has a total civilian labor force of 306,052 of which 288,171 are employed, giving the county an unemployment rate of 5.8%.

## PRT Service to Recreation

Monmouth County has 27 miles of beautiful beaches for swimming and surf fishing and its bays, lagoons, and inland waterways are ideal for recreational boating, most of which are serviced directly by the PRT network.

The Monmouth County Park System, boasting 12,000 acres of parkland, offers some sort of outdoor activity for everyone. The park system with 36 different park areas open to the public offer opportunities for fishing, watching, swimming, hiking etc. work as a model for county parks nationwide. In addition to county parks, Monmouth County has national and state parks including Allaire State Park, Gateway National Recreation Area, Monmouth Battlefield State Park, and Telegraph Hill State Park which include wildlife refuges.

Monmouth County is also the county in New Jersey with the largest population of horses, devoting approximately 19,000 acres to equine activities. Accordingly, competitive horse racing is very prominent in Monmouth County's Freehold Raceway and Monmouth Park Racetrack. Other popular attractions include drag racing at Raceway Park in Englishtown as well as stock car races at Wall Stadium.

Monmouth County also has numerous movie theaters. Below is a mapping of the county's 8 movie theater locations, all of which are serviced through the PRT network.
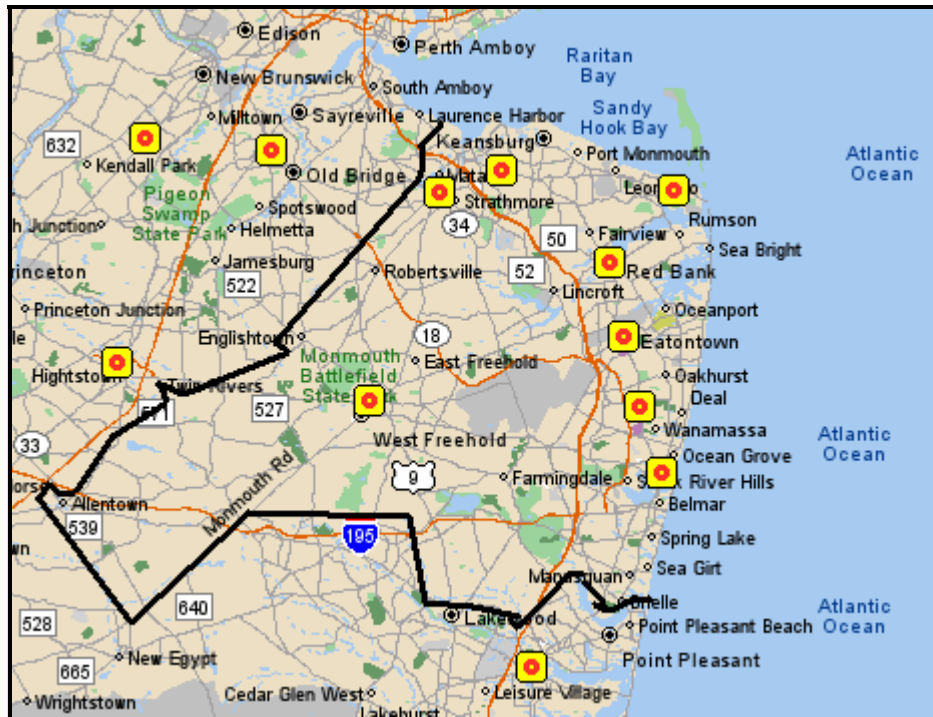
There are also 16 public golf courses in Monmouth County, including 6 operated by the Monmouth County Park System. Two of the golf courses are even ranked among the top 50 in the nation. In addition, there are also several private courses. The locations of the Golf courses serviced are shown on the following county map.
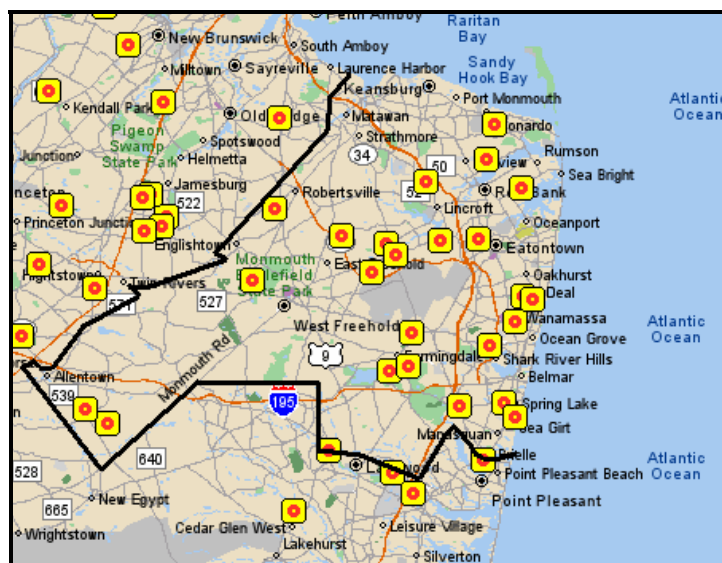


What's more, there is no need in having to find a ride home after having a little too much to drink at one of Monmouth County's many nightclubs; you can get home safe and sound

through the PRT network.  The PRT network also serves a number of museums, spas, and sporting venues so there is something for everyone in Monmouth County.

## PRT Service to Education

Monmouth County's public school system along with parochial and private facilities include 167 elementary, middle, and high schools, 11 vocational schools, and two charter schools.  Almost every school is directly serviced by a PRT station, so students in all Monmouth County schools can be confident that educational resources will be available to them.

In 1967 The Monmouth County Board of Chosen Freeholders founded Brookdale Community College.  Brookdale Community College, located in Lincroft, offers associate degrees in over 50 programs as well as noncredit classes in many areas of interest.  It is fully accredited by the commission on higher Education.

Monmouth County has one major university.  Monmouth University, founded in 1933, is a private and coeducational institution of higher learning.  Located within walking distance of the Atlantic Ocean in West Long Branch, New Jersey, the 153-acre campus features 53 buildings, including historic landmarks and state-of-the-art facilities.   Monmouth University offers more than 50 undergraduate and graduate degree programs to more than 6,300 total students, with over 4,000 of them being full time undergraduates.  Since only 1750 students reside on campus, the remaining students need could use the PRT network for transit into school.  The location of the 2 universities that are serviced by the PRT network is shown on the map below.
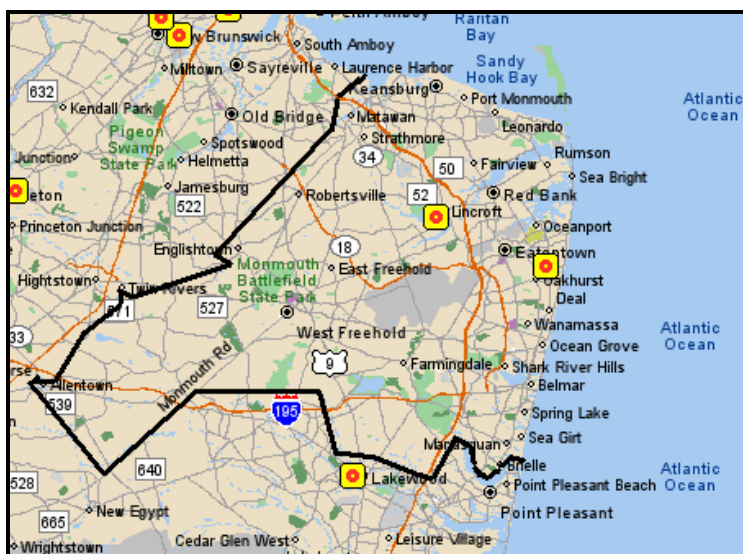


## PRT Service to Shopping

If you like to shop, then Monmouth Counties PRT network has you covered.  It serves all the major shopping areas and malls.  The locations of Monmouth County's malls are shown on the following map.
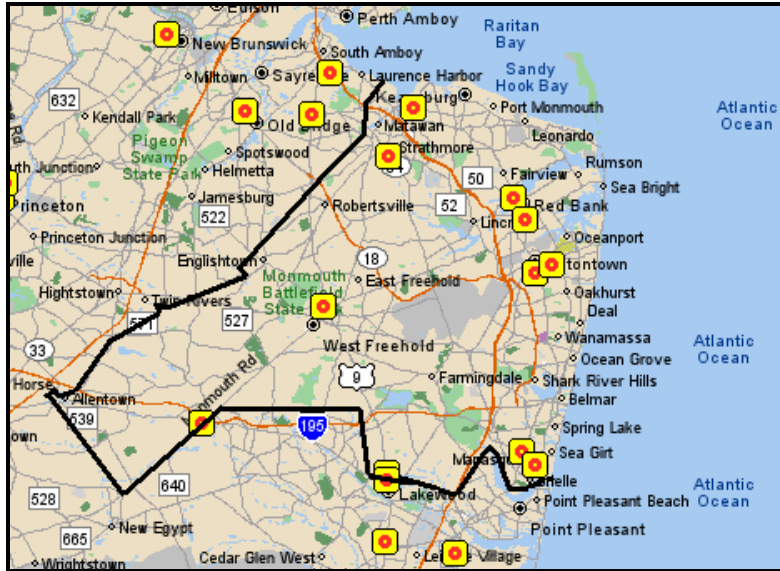
## Value of PRT to the future evolution and vitality of the County

Monmouth County is currently ranked 10th out of the top 200 markets in the nation for job creation and is growing twice as fast in key employment sectors. This high level of growth has made Monmouth County one of the most desirable places in the nation to live and invest in. This level of growth would only be helped by introducing a large scale PRT service in the county. It would make it a more attractive place to live, and easy access to businesses would make property value increase tremendously. There is clearly a market for the PRT network, and it would make transit around Monmouth County much more enjoyable.

 Although Monmouth County's professional sector and commerce are growing, tourism remains a large part of Monmouth County's economy as seen from the following table.

**Visitor Spending**

| | |
|---|---|
| Total visitor spending (billions) | $1.79 |
| Restaurant (millions) | $559 |
| Lodging (millions) | $118 |
| Automobile (millions) | $263 |
| Recreation (millions) | $146 |
| Transportation (millions) | $12 |
| Retail (millions) | $577 |
| Jobs created (thousands) | 45.2 |

This PRT network would only make Monmouth County an even more attractive place for tourists to come and visit. They could come to Monmouth County and not have to worry about how to get to the local attractions, just worry about what they want to see.

### Land Use in Monmouth County

Located on the east coast of central New Jersey, Monmouth County is the sixth largest county in the state. With a land area of 301,805 acres (471.57 square miles), Monmouth County makes up approximately 6.2% of New Jersey. The coastal and northern parts of the county are the most densely populated while more than 80 percent of the agricultural land in the county is located in one municipality—Upper Freehold Township—in the southwest part of the county. Public open space comprises 10.63% of the county (32,111 acres). Monmouth County shares county lines with Middlesex County to the north and Ocean County to the south. To the east, the county has fifty-three miles of bay and ocean shoreline. Also a part of the county, eight small islands dot the coast.
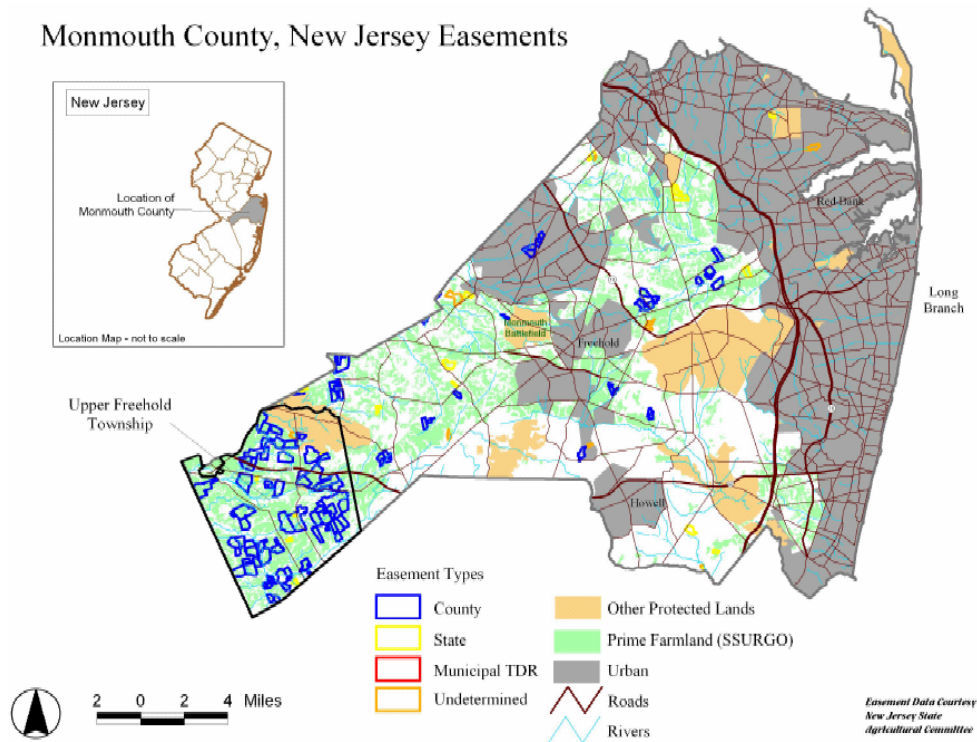


| Number of Municipalities | 53 |
|---|---|
| Cities | 2 |
| Townships | 15 |
| Boroughs | 35 |
| Villages | 1 |

### Description of Transit Service

Currently Monmouth County's public transportation system includes passenger rail services, intrastate bus services, metro-area bus services, senior transportation, and ferry services. Monmouth County is served by the North Jersey Coast Line rail of the New Jersey

Transit rail system.  The railway provides service to Newark, Newark International Airport, and Manhattan's Penn Station from 13 locations in the county.  Amtrak's services are available from the Newark station.  New Jersey Transit also provides bus services to major employment centers in northern New Jersey and New York.  Commuters can take New Jersey Transit, Suburban, or Academy buses to access Newark, Jersey City, and Manhattan's Port Authority Bus Terminal and Wall Street via the Route 9 corridor.  Academy Bus Lines provides bus service to Wall Street or the Port Authority Bus Terminal from the PNC Bank Arts Center park/ride facilities and other park/ride facilities along the Garden State Parkway.  New Jersey Transit offers limited bus service to New York from Englishtown, Manalapan, Marlboro, Matawan, Aberdeen, and Freehold.  Local bus service throughout the county is available, and limited bus service is available from certain areas to Philadelphia, Pennsylvania.  As an additional option for transportation to New York, a ferry service operates between Highlands, Atlantic Highlands, and Manhattan daily.  Monmouth County offers Special Citizen's Area Transportation (S.C.A.T.) to senior citizens and residents with special needs for transportation to medical appointments, area stores, or other locations.

Currently, New Jersey Transit is in the process of planning a new passenger rail system to better serve Middlesex, Monmouth, and Ocean County.  Though the New Jersey Coast Line rail provides service to these counties, the service is limited to the coastline and inconvenient for potential passengers that live more centrally in these counties.  Currently authorities are evaluating the environmental impact of the three proposed rail routes.  The preferred alternative, the Lakehurst to Monmouth Junction alignment, would connect with then Northeast Corridor and serve the fasted growing sections of Monmouth County.

In 2003, McLaughlin & Associates, a national survey research firm, conducted a survey of people in the tri-country area to learn more about the residents' attitudes toward the proposed Monmouth-Ocean-Middlesex (MOM) rail passenger project. Nearly 2/3 of the respondents placed reducing traffic, improving mass transit, or managing growth as the most or second most important issue facing their county, and 89% said that road and traffic congestion is a problem for their area. Over half of the people surveyed responded that someone in their house would be likely to take this new rail service and would like a station located near their home. Three-fourths of the respondents agreed that something needs to be done to manage area growth and congestion.

## Description of the PRT network

As Monmouth County is close to the large job market in New York City and Northern New Jersey, the county has been cited as one of the most desirable areas to live for commuters. Unfortunately, because of the large population increases, current transportation services have proved to be entirely inadequate. Proposed increases in New Jersey Transit rail services, such as the MOM project, would alleviate some traffic congestion, but these projects present only a short term solution to a long-term problem. Because the MOM survey indicates the concern that residents have for ways to reduce traffic congestion and manage growth, the Personal Rapid Transit (PRT) system for inter- and intra-county travel would most likely be well received. PRT would provide personal transportation for commuters, schoolchildren, shoppers, and others without congestion. As the population grows, PRT can expand its services accordingly without the increased congestion that occurs on roads or the crowding on rail services.

## Size and coverage of the network

The proposed PRT network for Monmouth County would provide service to the 615,301 residents. The stations are arranged to give the most coverage in the most densely populated areas; however, even in the more rural areas of the county, PRT stations still provide service. Approximately 95% of the counties residents should have a PRT station within ½ mile of their home. PRT stations are located at the entrance to subdivisions or neighborhoods if possible to avoid creating PRT tracks through houses whenever feasible in an effort to preserve the local character of neighborhoods. The distance to each station might be a bit longer, but the longer distance comes with a trade-off of not having a PRT station and tracks in front of houses. For much of the county, the PRT tracks are arranged in interconnecting loops (as seen below), so that passengers do not have to travel an enormous distance out of the way to reach a station that is located upstream from their station along the one-way guideway.
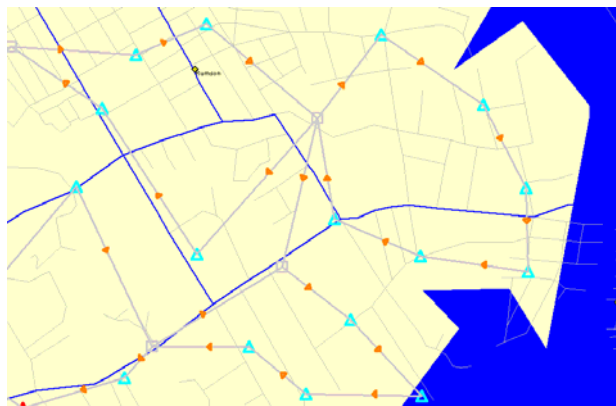
## Service to Employment

Approximately 66.1% of the residents age 16 or older in Monmouth County 311,406 of 471,156) are in the labor force. According to a 2003 survey, the county ranks 10th of the top 200 markets in the nation for job creation and is growing more than twice as fast in key employment sectors. Therefore, it is even more important to develop an efficient and comprehensive system that provides service to all parts of the county. Approximately 65% of the work commuters work inside the county, so the PRT network must provide transportation to the major employers in the county as well as connections to other counties for people who work outside the county. Because of its comprehensive service in business districts, PRT provides service to all of the major employers in Monmouth County (listed below), and the PRT system for New Jersey provides interconnected service throughout the state.

| | |
|---|---|
| 1. U.S. Army Communications-Electionics Command and Fort Monmouth | 6,000 |
| 2. Meridian Health System (Riverview and Jersey Shore Medical Centers) | 5,300 |
| 3. AT&T | 4,900 |
| 4. Lucent Technologies | 4,800 |
| 5. County of Monmouth Hall of Records | 3,310 |
| 6. Monmouth Medical Center | 2,392 |
| 7. Naval Weapons Station | 3,200 |
| 8. CentraState Healthcare System | 1,800 |
| 9. Foodarama Supermarkets Inc. | 1,550 |
| 10. Bayshore Community Health Service | 1,400 |

The breakdown of jobs by industry for the civilian citizen population of the county is listed below.

| | |
|---|---|
| Agriculture, foresty, fishing and hunting, and mining | 1,104 |
| Construction | 19,046 |
| Manufacturing | 24,325 |
| Wholesale trade | 11,102 |
| Retail trade | 35,372 |
| Transportation and warehousing and utilities | 15,835 |
| Information | 15,320 |
| Financing, insurance, real estate, and rental and leasing | 32,448 |
| Professional, scientific, management, administrative, and waste management services | 35,865 |
| Educational, health and social services | 57,326 |
| Arts, entertainment, recreation, accommodation and food services | 18,865 |
| Other services | 12,113 |
| Public Administration | 15,901 |

## Service to Shopping

According to New Jersey Travel and Tourism Data in 1997, visitors to Monmouth County spent a total of $1.68 billion dollars on lodging, restaurants, automobiles, recreation, transportation, and retail. In that year, approximately $577 million was spent in retail alone. These numbers have undoubtedly increased in the past eight years as the county faces an ever-growing demand from its increasing population. It is important to preserve the vitality of

businesses in the county as spending in the county has provided jobs and funds (from taxes collected on purchases) for the local area.

*Impact of Visitor Spending in 1997*

| | |
|---|---|
| Jobs (thousands) | 45.2 |
| Payroll (millions) | $781.0 |
| State taxes (millions) | $224.5 |
| Local taxes (millions) | $82.0 |

The proposed PRT for Monmouth County provides service to shopping centers, both enclosed malls, every borough, and all the coastal developments to ensure that residential and tourist spending will continue to support a vibrant economy.

## Service to Recreation

Monmouth County offers a range of opportunities for recreational activities. The 27 miles of beaches offer more than enough opportunity for swimming and fishing, and the bays, lagoons, and inland waterways offer opportunities for boating as well. The Atlantic Highland Municipal Marina, the largest municipally own marina in the state, offers convenient mooring space for the county. Sandy Hook, part of Gateway National Park, has beaches, one of the remaining marine forests, and a historical treasure trove. The Monmouth County Park System operates six golf courses in addition to several private courses. Also 36 different park areas (more than 11,000 acres) offer places for fishing, birding, swimming, and passive recreation.

For other entertainment, Monmouth County supports stock car races at Wall Stadium, drag racing at Raceway Park and competitive horse racing at Freehold Raceway and Monmouth Park Racetrack. Historic sites such as the Historic Allaire Village, Longstreet Farm, and The Galleria also attract tourists. The Monmouth Arts Center and Count Basie Theatre, the Algonquin Arts Theatre, the Lumia Theater, the PNC Bank Arts Center, and numerous other local stages bring in music, drama, and comedy entertainment throughout the year.

The PRT system for Monmouth County takes into consideration the recreational needs of the residents and tourists. It provides service out to the beaches for summer excursions as well as stations close to other attractions such as golf courses and concert venues.

## Service to Education

Monmouth County has 63 public schools for the 135,557 children that are enrolled in preschool through high school in the county. Also, 30,358 student residents in the county attend either college or graduate school.

| | |
|---|---|
| Nursery School, Preschool | 15,179 |
| Kindergarten | 9,864 |
| Elementary School | 76,252 |
| High School | 34,262 |
| College or Graduate School | 30,358 |

The proposed PRT transportation would eliminate the need for bus transportation to schools because there is a PRT station located at or near every school in the district. The PRT system could be programmed to recognize the days that school is in session and equip the station with extra transport cars at dismissal time for children to take home. Though it might not

accommodate every child trying to leave at exactly the same time, children leave in shifts much like schools do now with first load and second load buses. Though the children would be unaccompanied, it would be safe because the transport vehicles would take children straight from school to a station near their home, much like a bus stop. This system would be extremely efficient and reliable and allow the school district to allocate its busing funds toward educational tools.

### Service to Housing

Out of 300 national communities, Monmouth County was selected as the third best place to live by Money Magazine. As such, it has become an increasingly popular place to live and together with Ocean County accounted for 20 % of the total population growth in New Jersey in the 1990s. Monmouth County has 224,236 households total, an average household size of 2.70, and an average family size of 3.24. The breakdown of households by type is listed below.

| Family households (families) | 160,233 |
|---|---|
| With own children under 18 years | 79,538 |
| Married-couple family | 130,550 |
| With own children under 18 years | 65,422 |
| Female householder, no husband present | 22,456 |
| With own children under 18 years | 11,273 |
| Non-family households | 64,003 |
| Householder living alone | 53,456 |
| Householder 65 years and over | 21,449 |

Assuming that 95% of the households are served by the proposed Monmouth County PRT system, 213,024 households can access a PRT station within ½ mile of residence. However, the number of households served is probably much higher because the stations are located more frequently in the more densely populated areas than in the areas with less housing. Some stations might be a bit farther away that would otherwise be desired, but stations were located on the outskirts of the neighborhoods as much as possible so as not to disturb the integrity of the neighborhoods.

### Value of PRT to the future evolution and vitality of the County

As Monmouth County is one of the fastest growing counties in New Jersey, transportation is becoming a major issue for the county. Already congestion has become a problem for commuters as more than ¾ of commuters drive to work alone. The existing infrastructures cannot support the kind of growth that the county is experiencing which is why a system like PRT would be an extremely attractive option for the county. PRT would give the personalized comfort of a car to work but without the hassle of driving on evermore congested roadways. The operation of a comprehensive PRT system would not have nearly the detrimental impact on the environment that a new rail line and new roads would have on the community.

# Hunterdon County

Hunterdon County is the 8th largest county in New Jersey in terms of land area. It occupies 430 square miles and is home to over 40,000 households. However, its population in

the 2000 Census was only 122,000, making it the 3$^{rd}$ least dense county in New Jersey. It is a primarily rural county, consisting of 14 townships and 10 boros (See Figure 1HT).



**Figure HT1: Township Map**


## Land Use Description

Hunterdon County is one of the most rural parts of New Jersey, but it is also one of the fastest growing counties. In 1972, 4.5% of the county was developed. In 1995, this number increased to 22%. This increase is dramatic; however, much of the land is still undeveloped and has a large growth potential.

Most of the rural areas are located toward the southern sections of the county. The suburban areas (with high density commercial and residential) are located mostly in the central region, namely in the Flemington area and in the Route 78/202 corridors as shown in Figure HT2. Most commercial and corporate offices are located in these suburban centers off of the highways. Other residential developments (not in suburban areas) tend to be relatively isolated from one another and from shopping, other businesses, and schools.
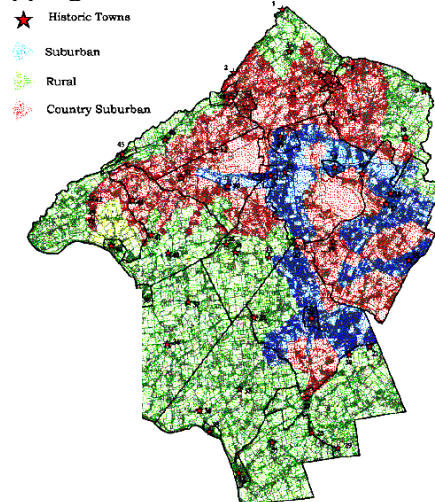


**Figure HT2: Land Use Map**

The isolation of most residential areas creates a drastic need for an effective transportation network.  The existing transportation network in Hunterdon County seeks to satisfy this need in a variety of different ways.

## Current Transit Service in the County

Although other transportation options exist, most people in Hunterdon County travel by automobile.  Hunterdon County has an intricate system of roads to accommodate the automobile traffic.  Total roadway miles equal 1,653 (as shown in Table HT1), but only 242 of these are under the counties jurisdiction.  I-78 and US 202 are both major highways that pass through Hunterdon County.

| Type | Mileage |
|------|---------|
| County Roadways | 242 |
| US Roadways | 53 |
| Interstate Roadways | 44 |
| State Roadways | 98 |
| Municipal Roadways | 1,103 |
| Privately-Owned Roads | 113 |
| Total | 1,653 |

**Table HT1: County Roads**

Other transportation options include bus and rail service.  The bus service in Hunterdon County is referred to as "The Link".  Originally designed for senior citizens and for teenagers not quite old enough to drive, the system now serves all county residents.  Discounts are offered to senior citizens and others for transportation to medical appointments, nutrition sites, and places of employment.  The Link currently consists of 30 vehicles (buses, see Figure HT3) traveling 19 routes for a total of 700 trips/day.  These 19 routes are variations of two main lines, one running N-S, the other running E-W through the county (Figure HT4 and HT5).



**Figure HT3: Link Vehicle**



**Figure HT4: N-S Main Line**



**Figure HT5: E-W Main Line**

The Link system runs Monday to Friday from 7am to 11pm. Fares for the general public are 10¢ per zone mile with a one way trip minimum of 75¢. Students pay $1.50 round trip maximum amount. As mentioned earlier, additional discounts apply for seniors, people with disabilities, and predetermined income eligible citizens. The Link also offers a Flemington Shuffle service. This is a route that runs from one end of Flemington to the other servicing various retail and commercial businesses. The cost for the Flemington Shuffle is $1.00 per round-trip.

The passenger rail service in Hunterdon County consists of the New Jersey Transit Raritan Valley Line. The line runs from High Bridge to Newark stopping in Hunterdon County with the High Bridge, Annandale, Lebanon, and Whitehouse stations as shown in Figure HT6. Few people actually use the service due to the sparse train scheduling. Only four eastbound trains run in the morning, and only one runs in the afternoon.
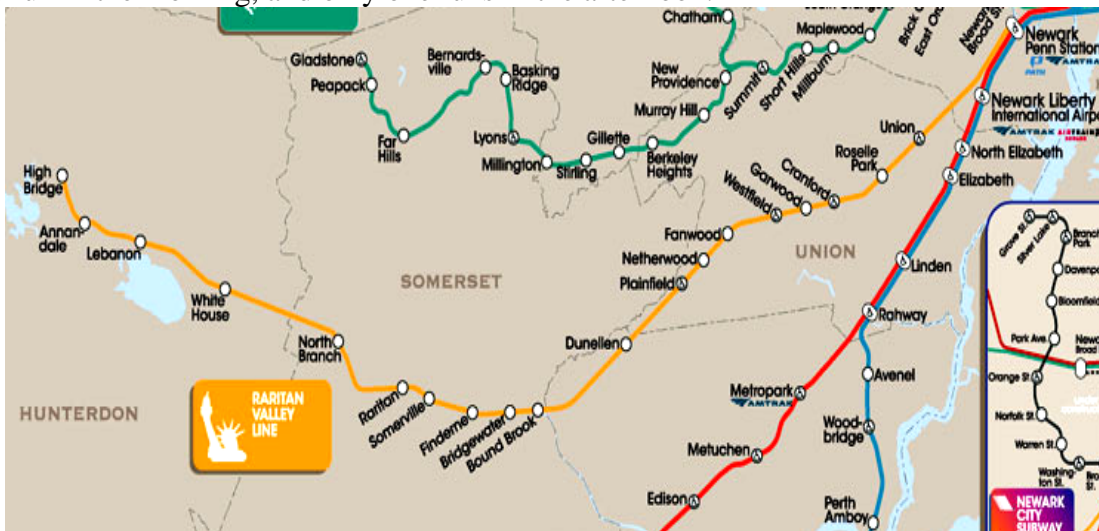


**Figure HT6: Raritan Valley Line**

### Description of Personal Rapid Transit Network in Hunterdon County

A proposed transportation system, Personal Rapid Transit (PRT), will help connect the isolated regions of Hunterdon County and serve the already developed regions more efficiently than the automobile. The PRT network for Hunterdon County will service most of the population of 130,000 with 191 stations. In highly populated areas such as High Bridge, Lambertville, and Flemington, stations are only a mere 3/8 mile walk away. One can hop on main tracks from these off-line stations and go anywhere in the state at any time. But large cities aren't the only ones represented. Small towns throughout the county such as Mechlings Corner and Milford also have sufficient service.

The 191 stations are joined by one-way guideway designed to connect in a network for maximum rider convenience. Even though the system is one-way, hundreds of loops are incorporated into the system to prevent traveling out of one's way to reach a destination. For example, in order to get to Clinton from Flemington, one will not have to follow a one-way track all the way through Frenchtown.



Most stations in Hunterdon County are one-way stations as shown to the left. The station is located off-line in order to avoid interruption of the main route. However, in order to prevent the problem of excess

travel time, 11 two-way stations were created.  A two-way station is a station which one line services one side of the station and another line services the opposite side.  These lines are headed in opposite directions. Two-way stops create shorter loops at a relatively small cost to increase the benefit of the system to all riders.

Most of the PRT stations (one-way and two-way) are located in the developed northern and eastern parts of the county, and the stations are sparser near the rural south.  The system is designed for the current population; however, more stations can be added in the south (or elsewhere) as development occurs in the future.  With the current PRT station layout, most daily trips around the county will be accommodated.  Employment, shopping, recreation, and school trips can all be undertaken without the standard traffic delays present with automobiles.

## Service to Employment

In Hunterdon County, only 41% of the county's labor force works within the county according to the 2000 U.S. Census.  Adequate transportation between counties is a must, especially for Hunterdon County residents.  PRT is planned to connect the entire state of New Jersey in order to support employment trips.  Currently the average travel time to work is 33.5 minutes, three minutes higher than the state average.  With incorporation of a state-wide PRT network, both the Hunterdon County average and the state average will go down.

Of the 41% that work in Hunterdon County, most people work for small businesses.  Very few large companies reside in this rural county.  Two of the largest companies include Foster Wheeler, Inc. and Merck & Co., both of which are serviced by the PRT network.  A list of all of the major employers of Hunterdon County in 2001, along with location, number of employees, and proximity to PRT is shown in Table HT2 on the next page.  Employers located outside of Hunterdon County or employers whose locations could not be determined are listed as unknown.  As shown in Table HT2, most major businesses located in Hunterdon County will be serviced by PRT.

## Service to Shopping

PRT serves all major shopping districts in the county.  The densest retail shopping district is in Flemington and the Raritan Township area.  Six stations service downtown Flemington for shops such as Flemington Floral, Gift Pac, Thrift Drug, and NoLoes Music Box.  The Flemington Mall can also be accessed by PRT.  The only other major shopping district in Hunterdon County is in Lambertville.  Table HT3 shows a list of companies serviced in Lambertville along with more companies serviced in Flemington.

| Flemington | | | Lambertville | |
|---|---|---|---|---|
| American Tire | Gift Pac | Ramada Inn | Delvue Cleaners | National Auto Supply |
| Circle Diner | Healthcare | Star Ledger | Hood Floors | River Horse Brewing Co. |
| Clothing Mansion | Kries Jewelry | Stryker Paints | J Finkle & Son Hardware | The Station |
| Dansk Outlet | Minicheck 5& 10 | The Ark | Lambertville Ceramics | |
| Flemington Mall | Noloes Music Box | Thrift Drug | McDonald Kitchen & Bath | |

### Table HT3: Shopping Districts

| Employer | Municipality | # of Employees | PRT Service? |
|---|---|---|---|
| 3M | Raritan Twp. | 170 | Unknown |
| A.M. Best | Tewksbury Twp. | 250–500 | Yes |
| ADP | Clinton Twp. | 100–249 | Unknown |
| Atlantic Spring | Raritan Twp. | 100-249 | Yes |
| Bemis Co. | Flemington | 100-249 | Yes |
| BOC, Inc. | Lebanon | 250-499 | Unknown |
| Burlington Coat Factory | Flemington | 100-249 | Yes |
| ChubbInsurance Co. | Readington | 1,500 | Yes |
| Curtis Specialty Papers | Milford | 100-249 | Closed, 2003 |
| ExxonMobil Research & Eng. | Clinton Twp. | 500-999 | No |
| Fibermark Inc. | Milford | 100-249 | Yes |
| Flemington Car & Truck | Raritan Twp. | 293 | Yes |
| Flemington Dept. Store | Raritan Twp. | 100-249 | Yes |
| Foster Wheeler | Union Twp. | >1500 | Yes |
| Georgia Pacific | Milford | 100-249 | Unknown |
| Hitran Corp. | Raritan Twp. | 130 | Yes |
| Hunterdon Care Center | Raritan Twp. | 175 | No |
| Hunterdon County | Flemington | 500-999 | Yes |
| Hunterdon Hills Playhouse | Union Twp. | 100-249 | No |
| Hunterdon Medical Center | Raritan Twp. | 1600 | Yes |
| Ingersoll Rand Tool & Hoist Div. | Clinton Twp. | 150 | Yes |
| Ino Therapeutics | Union Twp. | 100-249 | Unknown |
| Interstate Iron Works | Readington Twp. | 100-249 | Yes |
| Johanna Foods | Raritan Twp. | 250-499 | Yes |
| Kitchen Magic | Bloomsbury | 100-249 | Unknown |
| Kullman Industries | Clinton Twp. | 250-499 | Yes |
| Lambertville Station | Lambertville | 100-249 | Yes |
| Magnesium Elektron Inc. | Kingwood Twp. | 120 | No |
| Merck & Co. | Readington Twp. | 1800 | Yes |
| New York Life | Clinton Twp. | 400 | Unknown |
| Quik Chek | Readington Twp. | n/a | Unknown |
| Raritan Valley Disposal | Raritan Twp. | 100-249 | Unknown |
| Readington Farms | Readington Twp. | 100-249 | Yes |
| Shop-Rite of Hunterdon | Clinton & Raritan Twps. | 440 | Yes |
| Smurfit-Stone Container | Kingwood Twp. | 125 | Unknown |
| Sprint | Clinton Twp. | 148 | Yes |
| Tekni-Plex Inc. | Flemington | 100-249 | Unknown |
| WalMart | Franklin Twp. | 200 | Yes |
| Wedco | Bethlehem Twp. | 250-499 | Unknown |

### Table HT2: PRT Service to Large Businesses
Source: Hunterdon Economic Partnership

## Service to Recreation

Hunterdon County is home to over 6,400 acres of county parks. There are 22 Parks with approximately 20 additional preserves, areas, trails and other properties owned by the County and opened to the public for use. Five of these are state parks, and three of them are all serviced by PRT. Round Valley, Spruce Run, and Vorhees State Parks are at least close (<3/8 mile) to one PRT station.

Besides state parks, Hunterdon County also offers other alternatives for recreation. Several wineries and golf courses exist in the rural southern part of the county. Unionville and Alba Vineyards are both serviced by PRT stations. Hunterdon County is home to five golf courses, of which three are close to PRT (Olde York Country Club, Copper Hill Country Club, and Oak Hill Golf Club).

## Service to Education

A new transportation network must be able to transport children to schools across the county. Hunterdon County has approximately 35,000 school-age children, as shown below in Table HT4.

| Type | Preschool | Kindergarten | Elementary | High School | College |
|---|---|---|---|---|---|
| Enrollment | 3,190 | 1,676 | 15,233 | 6,587 | 4,876 |

Data per 2000 U.S. Census

**Table HT4: School Enrollment**

The 15,000 elementary school students attend 42 different elementary schools in the county. Many of these students can take PRT to school since many of these learning places are within walking distance of a station. Lambertville Public, Milford Boro, and Barley Sheaf are only a few examples of the many institutions served.
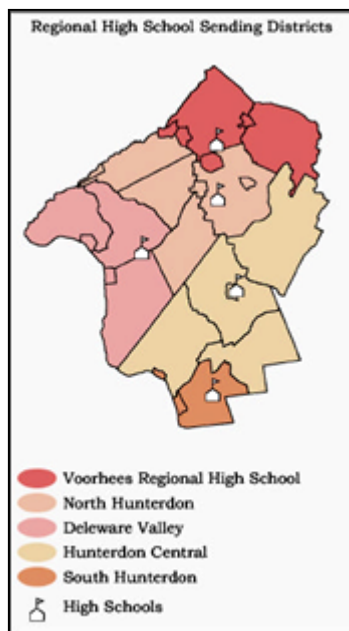
Five different high schools house thousands of Hunterdon County students. All of these high schools except South Hunterdon have direct PRT station access. South Hunterdon, however, is a small school located in a rural area with few students (See Table HT 5)

**Regional High School Sending Districts**

- Voorhees Regional High School
- North Hunterdon
- Deleware Valley
- Hunterdon Central
- South Hunterdon
- High Schools

| School | Enrollment |
|---|---|
| Delaware Valley | 813 |
| Hunterdon Central | 2,326 |
| Hunterdon North and Vorhees Regional | 2,250 |
| Hunterdon South | 382 |

**Table HT5: High School Enrollment**

### Service to Housing

Approximately 45,000 total households reside in Hunterdon County, with many of them residing in one of the three large residential areas. Clinton, Raritan, and Readington Township each have dense residential areas to house the 2.62 average county household size in 2000.

| Township | Population |
|---|---|
| Clinton | 12,957 |
| Raritan | 19,809 |
| Readington | 15,803 |

*Per 2000 Census

**Table HT6: Largest Areas**

Several PRT stations have been located within the many subdivisions of these townships to ensure equal access to the transportation system. Apartment complexes are also serviced in dense and not-as-dense regions. For example, both the Hurst and Kirschner Apartments in Lambertville are located within walking distance of a PRT station. In such a rural county, it is hard to ensure PRT service to everyone. The residents are so spread out in the rural areas that some grouping must be done in order to be cost-effective.

### Value of PRT to Future Evolution of the County

In a rural county, an effective transportation system is necessary to connect the undeveloped with the developed regions and to provide a degree of continuity to the area. PRT offers several advantages and can be just as efficient as (if not more than) the automobile. In Hunterdon County, PRT will be more effective than the current Bus Transit System, The Link. The Link system is set to a schedule, while PRT conforms to the rider's schedule. Also, The Link is only available within Hunterdon County. A state-wide PRT system gives options to the 59% that commute to work in other counties. Although small in population, Hunterdon County is growing, and its transportation system needs to grow with it. Already, the average household makes 10 trips per day, and only four of those are for work purposes. The convenience of PRT will make a major impact upon implementation and will continue to have this effect in the future.

# Mercer County

## Land Use

Mercer County encompasses the City of Trenton, Townships of East Windsor, Ewing, Hamilton, Hopewell, Lawrence, Princeton, Washington, and West Windsor, and the Boroughs of Hightstown, Hopewell, Pennington, and Princeton. Mercer County is home to 350,761 (as of 2000) people. 41.71% of Mercer County's 146,426 acres is currently developed with 31,816 acres being used for agriculture and more than 8,400 acres is designated for recreational use. It has 3 airfields and 3,202 hotel, motel and resort rooms.

## Description of Current County Transit Service

For public transportation Mercer County depends mostly on New Jersey Transit (NJT). NJT provides bus, rail and light rail services accommodating over 725,500 daily trips on 237 bus routes, two light rail lines and 11 commuter rail lines. It has 161 rail stations, 28 light rail stations and more than 17,000 bus stops. NJT operates 2,027 buses, 711 trains and 45 light rail vehicles. NJT provides nearly 223 million passenger trips each year. Of the 237 bus routes only 13 routes service Mercer County and only the Northeast Corridor and Princeton Branch of NJT's rail provide service to Mercer County.



Here's a chart that shows the current transit use by workers 16 years of age and older and commute times (as you can see the current transit system is hardly used):

| Transportation to work | Mercer County NJ | | | US |
|---|---|---|---|---|
| | Number | | | |
| Workers 16 and over | 163,300 | | | |
| | Number | Pct | Pct | Pct |
| Public transportation | 11,000 | 7 | 10 | 5 |
| Car, truck, van or motorcycle | 138,000 | 84 | 84 | 88 |
| Walk | 7,300 | 5 | 3 | 3 |
| Work at home | 5,200 | 3 | 3 | 3 |

| Commuting Time | Number | Number | Number |
|---|---|---|---|
| **Average travel time to work (minutes)** | 27 | 30 | 26 |
| **Average travel time to work using public transportation** | 68 | 57 | 48 |
| **Average travel time to work using other transportation** | 24 | 27 | 24 |

Other transportation options are SEPTA (if you're trying to get from/ to Trenton to/from Philadelphia), Local commuter shuttles and the Camden/Trenton River LINE light rail.

## Description of the PRT network in the County

*4. Size and coverage of the network*
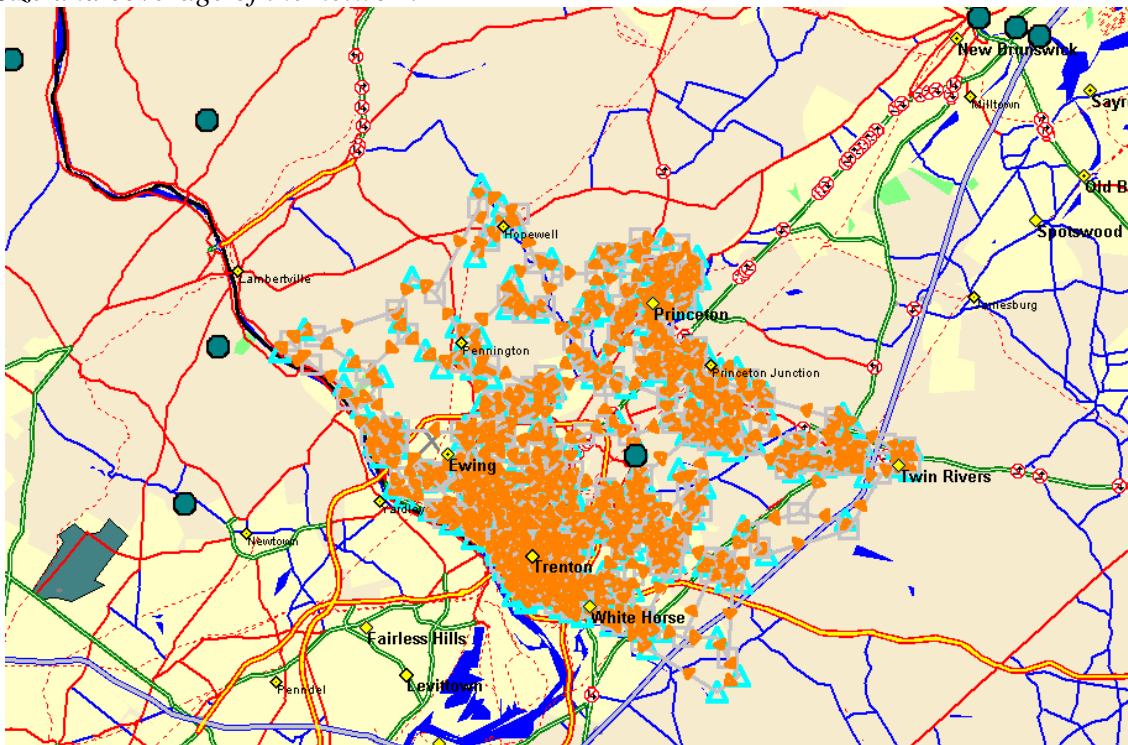


The Mercer County PRT network would cover all of Mercer County major cities and most small towns. More stations will be placed in heavily populated areas in order increase serviceability and less stations will be placed in sparsely populated areas in order to reduce number empty or unused PRT vehicles, though, as the network becomes widely used, more stations in rural areas could be built. The current network has 319 stations with 369 miles of track. I estimate that the current PRT network would service 85 to 90% of the Mercer County population.

*2. Service to Employment*

Historically, Mercer was an industrial based economy, leading to the slogan, "Trenton Makes, The World Takes". Currently, Mercer County employs 176,351 people. With most of the employment opportunities coming from companies in manufacturing, wholesale trade, retail trade, health care and social assistance and professional, scientific and technical services. Companies such as Merrill Lynch, Sarnoff, and Bristol-Myers are located in Mercer County. In fact, Mercer County is home to more "dot com" companies than Silicon Valley. With this in mind the Mercer County PRT network has most of it's stations located in and around all major metropolitan areas where most job opportunities originate. Using this strategy of placing stations near major metropolitan areas, the Mercer County PRT system will be able to service many if not all of the major business that call Mercer County home.

*3. Service to Shopping*



Mercer County major shopping centers include: Quakerbridge Mall, the Princeton Market Fair, Mercer Mall, Capital Plaza, Independence Mall, Twin Rivers Shopping Center, Lawrence Shopping Center, Palmer Square and the Princeton Shopping Center. In additions to these shopping centers, many of the townships have "main street" shopping as found on Princeton's Nassau Street, or in Hightstown, Hopewell and Pennington. The proposed PRT network will serve all major shopping centers with stations near or even inside each center and have stations on or near the "main street[s]" of all major cities.

*5. Service to Recreation*

Mercer County has four public golf courses, five ice hockey rinks, four tennis facilities, and the Delaware River, Carnegie Lake, Mercer County Park Marina and D&R Canal system offer boating and leisurely strolling opportunities. Belle Mountain is the site of winter skiing. There are a plethora of museums in Mercer County including: the NJ State Museum, Ellarslie, Princeton University Art Museum, Hopewell Museum, Howell Living Farm, Kuser Farm Museum, Morven, Bainbridge House and The Old Barracks. There's the newly renovated War Memorial, home of The Greater Trenton Symphony, features music, drama and dance. The McCarter Theatre, Mill Hill Playhouse, Washington Crossing Open Air Theater and Hopewell Dinner Theatre have outstanding performances. There's also Waterfront Stadium, home of the Trenton Thunder, and Sovereign Bank Arena. Because of the strategic location of the PRT stations, most if not all of Mercer County's great recreational opportunities will be serviced by a PRT station within walking distance.

6. *Service to Education*



Mercer County is home to nine public school districts that house 94 schools, employ 3,597 teachers and have 50,029 students. Mercer County also has 21 private school and six colleges and/or universities, including TCNJ, Rider University and Princeton University. The Mercer County PRT network will definitely service all schools by having stations either within walking distance or right on campus.

7. *Service to Housing*



Mercer County is home to 350,761 people and has 136,986 housing units with 125,111 actually occupying the housing units. The way the Mercer County PRT network is set up, it would service as many residents as possible. Each station is place roughly a half a mile apart giving each station a quarter mile radius of serviceability. That way people would at most have to travel a quarter of a mile to reach the station closest to them. The rural areas of Mercer County aren't serviced as much, however as those areas become developed PRT stations could be added.
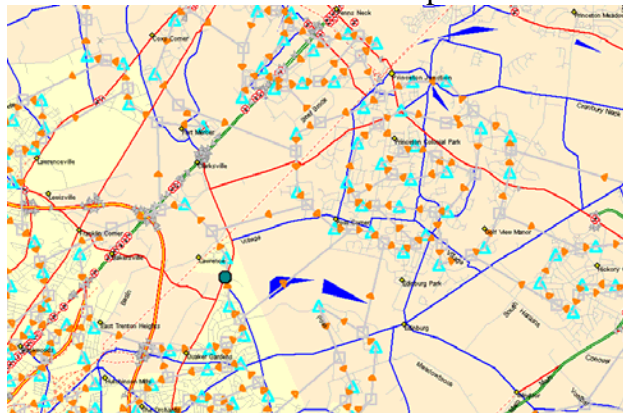


**What the PRT system would look like in Trenton**

On the next page is an example of the Mercer County PRT network I set up. It shows that residential communities, businesses offices, educational buildings and recreational centers can all be efficiently serviced by a PRT system.
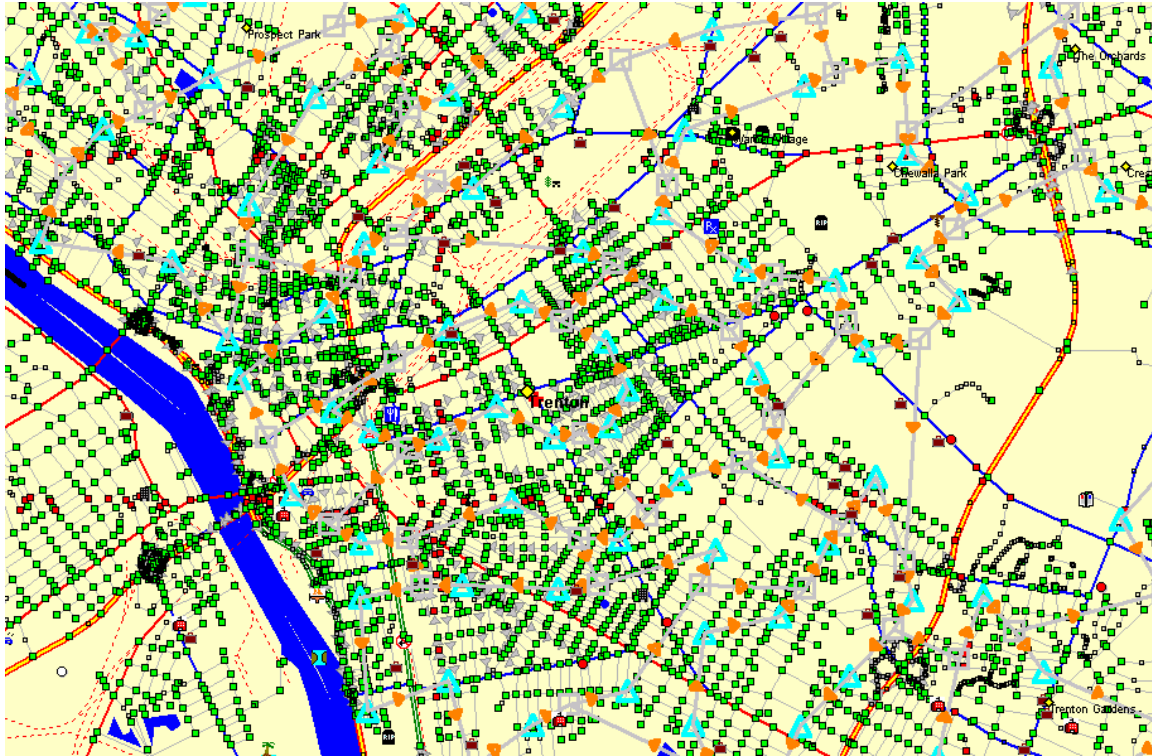
In this image, one can see how stations place roughly a half a mile apart create an intricate web of serviceability, which reaches out to most if not all major and minor points of interest in Trenton. No current type of public transportation in Mercer County comes close to providing as much service as a PRT network would provide.

## Value of PRT to the future evolution and vitality of the County
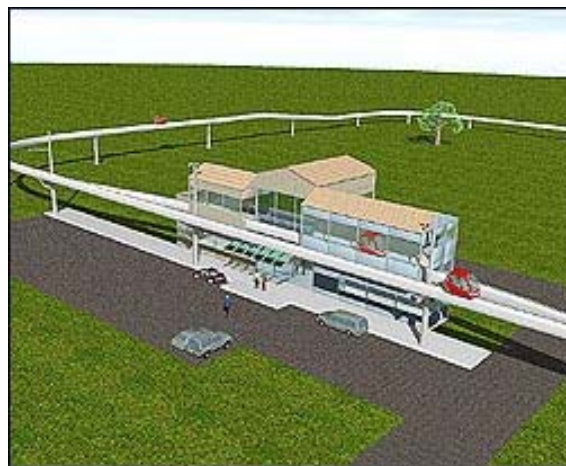


The Mercer County PRT network would greatly influence the future evolution and vitality of the county. The PRT network would alleviate many of the traffic problems plaguing

this great county and also cut down on pollution. This PRT network could allow one to traverse Mercer County effortlessly, smoothly and safely. With a PRT network one doesn't have to deal with other passengers, like in a crowded bus or train, they can simply choose to travel alone or with people they know. A PRT vehicle would allow people to do work on their way to work. No more accidents from people trying to talk on your cell phone and drive at the same time or from people spilling in the car. No more waiting hours for a delayed train or broken down bus. Ideally, this PRT network would operate so efficiently that it would make cars obsolete. The PRT network will be affordable for everyone. A Mercer County PRT network would propel Mercer County public transportation into the future and give the residents of Mercer County efficient and reliable service.

# Union County

Union County New Jersey was established in 1857 and was the last of all New Jersey counties to be created. Union is situated along the eastern coast of the United States south of New York.  The Arthur Kill waterway separates the southern half of Union County from Staten Island, New York while Newark Bay separates the northern half of Union County from Hudson County New Jersey.  Close to 70% of the land is used for commercial, residential, and industrial purposes while the other 30% is either undeveloped or recreational.  Union County is the second smallest county in New Jersey larger only than the neighboring Hudson County.  Even though it is the 2nd largest county in New Jersey having only 103.4 square miles, Union has the 6th highest population for the state, which explains why Union almost has the highest population density for the state.  This makes one what modes of transportation people are using to travel through such a densely populated region of New Jersey?

Union County currently has an extensive transportation network for such a small county consisting of a world-renowned cargo port, an international airport, highway systems, major rail lines and bus routes, but there is always room for

| COMMUTING TO WORK | | |
|---|---|---|
| Workers 16 years and over .............. | 238,606 | 100.0 |
| Car, truck, or van - - drove alone.............. | 169,325 | 71.0 |
| Car, truck, or van - - carpooled................. | 27,686 | 11.6 |
| Public transportation (including taxicab) ......... | 25,294 | 10.6 |
| Walked................................... | 7,729 | 3.2 |
| Other means................................ | 2,880 | 1.2 |
| Worked at home ............................ | 5,692 | 2.4 |
| Mean travel time to work (minutes)[1] ............ | 28.7 | (X) |

improvement.  Highways that are currently in operation are the NJ Turnpike, Garden State Parkway, and Routes 1,9, 22, 24, and 78.  The three major rail lines being used by Union are the Northeast Corridor, the North Jersey Line, and the Raritan Valley Line.  Linden Airport is located in Linden, New Jersey, which is located in the southeastern half of Union County.  In 2003 there were 29 million passengers that traveled in and out of Newark Liberty International Airport.[1]  These passengers either traveled on one of the three rail lines in Union or drove on one of the many major highways crossing the county to reach the airport.  However, when one takes into account that each year approximately 213 million vehicles travel on the NJ Turnpike[2] traffic problems will surely arise.  But where is the alternative for people who don't want to travel on these busy roads?  The only alternative existing today are three rail lines and bus routes.  However, these rail lines only hit the major cities in Union and do not offer the preciseness of

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[1] Port Authority of NY and NJ
[2] New Jersey Turnpike Authority

origin and destination travel that cars allow. The Northeast Corridor Line only offers service to 3 out of the 21 municipalities in Union County. Buses are somewhere in between car and rail travel, because they offer more stops and travel to more destinations than trains, however the travel times are slower than travel by car and rail because buses must stop at every stop while simultaneously having to deal with the same road conditions as cars. So, roads offer complete access to any origin destination in Union County but traffic problems arise rapidly increasing driving risks and travel delays. Trains allow for safe and fast travel, but do not even come close to giving transportation access to the entire Union County population. Buses allow for more detailed access than trains, but travel times are vastly inferior to the other two modes of transportation. There is a way to get the best of all three modes of transportation.

Personal Rapid Transit (PRT) combines the advantages of bus, train, and car without any of their disadvantages. It is an alternative mode of transportation that allows people to travel non-stop from origin to destination without traffic or accessibility problems. PRT can service the entire population of Union allowing for any origin/destination combination. The system consists of midsized vehicles traveling on one-way tracks that service off-line stations. These offline stations allow for other vehicles to pass the station while passengers are being picked up at that station. One of the main differences between PRT and train and bus travel is that PRT vehicles are on demand rather than on fixed schedules. PRT can service all of the airports, schools, recreational facilities, large corporations, and retail areas in Union County more efficiently than cars, buses, or trains.
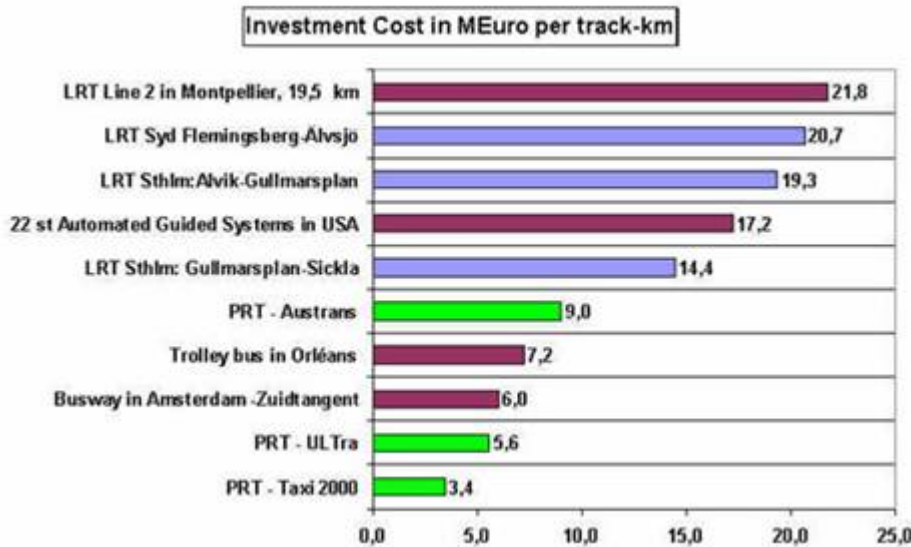
Union County should adopt PRT for a variety of reasons. PRT optimizes transportation planning in that it combines the positive characteristics of other modes of transportation while minimizing their respective negative characteristics. Buses take too long because of all the stops they

Investment Cost in MEuro per track-km

| | |
|---|---|
| LRT Line 2 in Montpellier, 19,5 km | 21,8 |
| LRT Syd Flemingsberg-Alvsjo | 20,7 |
| LRT Sthlm:Alvik-Gullmarsplan | 19,3 |
| 22 st Automated Guided Systems in USA | 17,2 |
| LRT Sthlm: Gullmarsplan-Sickla | 14,4 |
| PRT - Austrans | 9,0 |
| Trolley bus in Orléans | 7,2 |
| Busway in Amsterdam -Zuidtangent | 6,0 |
| PRT - ULTra | 5,6 |
| PRT - Taxi 2000 | 3,4 |
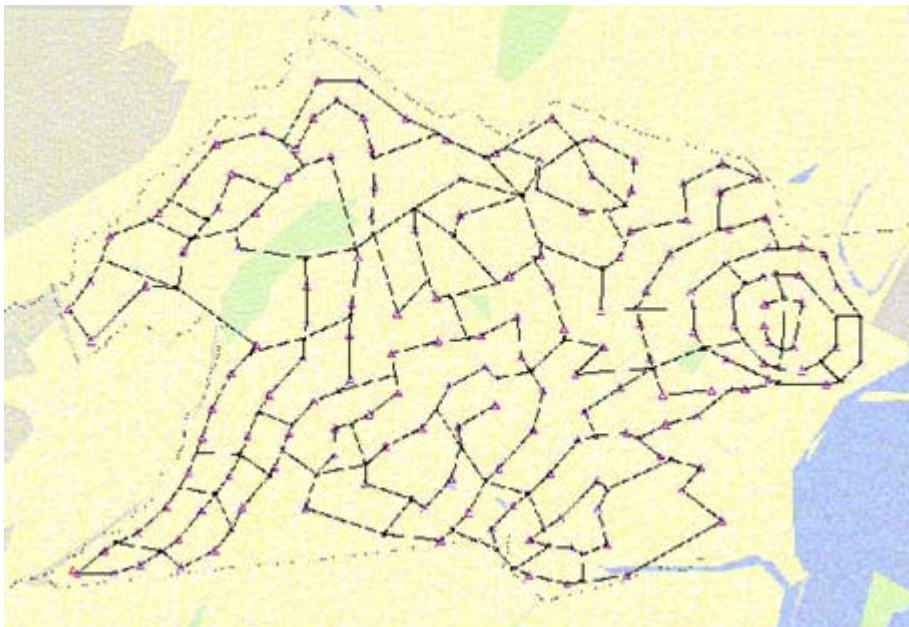
make and they still have to cope with the same road conditions and traffic that cars do. Cars aren't as safe and are continuously exposed to traffic delays and accidents. Trains can only take you near where you want to go. A PRT system allows for faster travel times because of its non-stop travel on elevated one-way tracks. The PRT network covers the entire county meaning that all county inhabitants have access within a 3/8 mile walk from their residence. Once they arrive at the station, they pay a small fee and get in one of the automated PRT vehicles waiting for them. After they enter in their destination and leave the offline station, the trip is non-stop from origin to destination. The benefit of offline stations is that they do not require traffic to stop when other passengers are being loaded in at stations; passing vehicles simply pass by them.

After they arrive at their destination they realize that their ride took much less time than it would have via car, bus, or train. In Union County, 238,606 people travel to work each day and the average intra-county travel time to work is approximately 28.7 minutes.[3] To understand how slow that is, imagine a worst-case scenario, which is that you have to travel from the top right corner of Union to the bottom left corner of Union by car (we will approximate Union County to be a square box 10mi. by 10mi., diagonal is 14mi.). If you traveled 14 miles in 28.7 minutes, you would be averaging a speed of almost 30 miles per hour. PRT networks can achieve speeds higher without the hassle of traffic lights, traffic jams, and accidents that might otherwise occur on the road. On top of having quicker travel times PRT networks are very flexible in terms of construction. It is simple to integrate the network into existing infrastructure because the network can blend into its surroundings. The nature of a PRT network allows additions at any time without impeding current network flow. PRT networks are an extremely inexpensive investment compared to that of other modes of transportation. On top of all of these benefits, PRT is environmentally friendly. The electrically powered vehicles cause no pollution or noise and are much more efficient and quieter than fuel powered cars or buses. Currently 82.6% of working Union residents commute to work via car.[4] In high population densities like Union County a PRT system could drastically reduce street traffic volumes to tolerable levels.

The PRT proposal for Union County consists of a series of concentric circular paths around the largest municipalities that are connected together through smaller towns by increasingly linear pathways. As population density decreases from east to west, the concentric grids are abandoned for a more linear network. The reason for this change is that there are fewer stations per unit area the further west you go resulting in longer paths that are needed to connect each station. Circular tracks aren't as reasonable in low population density areas as in high population density areas because there is no need for the addition mobility received from circular tracks.

What follows from the east to west track patter is a change in mobility. The further south and east you go, the more mobility and freedom you encounter. Even though this pattern exists, all patrons can still be served and all locations are accessible within a 3/8-mile radius. Approximately 470,000 Union County residents will have access to 162 stations scattered throughout the county. The highest concentration of stations is in Elizabeth because it is the largest city in Union County. This municipality has 31 stations with an average of 3,968 passengers per day. The next highest concentration of stations is in the Rahway and Linden regions of southeastern Union County. This region has 17 stations with an average of 3,888 passengers per day. The remaining PRT stations are uniformly distributed throughout the rest of

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[3] U.S. Census Bureau
[4] U.S. Census Bureau

the county and each station serves close to 2,500 people per day. There are 90 interchanges that serve as connections to other parts of the PRT network. This proposed PRT network would serve all residential, commercial, retail, and recreational sites in Union.

Union County is a very commercially active county. It is home to many of our country's major corporations. Due to the fact that there are over 70,000 people or approximately 39.8% of the work force[5] employed in pharmaceuticals and medical research, many people must travel to Merck & Co. every day because it has its headquarters in Rahway, one of Union's twenty-one main municipalities. Schering-Plough another major pharmaceutical company has its headquarters in Kenilworth, New Jersey. These two pharmaceutical powerhouses alone generate thousands of trip productions each day that add to the clutter of the roadways. Over 75,000 people work in the information and technology industry within Union[6]. Many trips are created every day to and from Lucent Technologies a major telecommunications corporation who has their headquarters in Murray Hill, NJ. In Linden, General Motors has an automobile assembly plant. Food services and retail trade are another major industry within Union County accounting for about 16% of Union employees. Major companies in this industry include Wakefern Food Corp located in Elizabeth, Deep Foods Inc., and Fass Food Ingredients LLC. PRT could significantly decrease traffic congestion and aid in the mass amount of home-based work trips generated each day.

There are also thousands of home-based recreation trips generated each day in Union. In Union County, there are three golf courses and over 30 parks to visit. Union County Arts Center is a multi-purpose venue for the performing arts located in Rahway. The Arts Center attracts a variety of people from Union and the surrounding counties because of the diverse selection of viewing material. Events like viewings of the movie "Bridge of the River Kwai" all the way to performances from comedian Colin Quinn can be seen. The Trailside Nature and Science Center is located in the Watchung Reservation. It is home to New Jersey's first natural history museum, and it hosts family workshops and summer camps.

| SCHOOL ENROLLMENT | | |
|---|---|---|
| Population 3 years and over enrolled in school.................... | 136,230 | 100.0 |
| Nursery school, preschool..................... | 11,242 | 8.3 |
| Kindergarten............................. | 7,787 | 5.7 |
| Elementary school (grades 1-8)................ | 60,223 | 44.2 |
| High school (grades 9-12)..................... | 28,762 | 21.1 |
| College or graduate school ................... | 28,216 | 20.7 |

Jersey Garden's Outlet Mall has over 170 stores and is New Jersey's largest outlet mall containing major brand names including Nike, Guess, Gap, Nautical, Ralph Lauren, Tommy Hilfiger, and Victoria's Secret. Large malls like Jersey Gardens are ideal locations for large PRT stations because there is a passenger demand and can easily be integrated into the large building structures.

Union County has over 136,000 of its citizens over the age of three enrolled in school.[7] This accounts for hundreds of thousands of home-based school trips generated each day. Union has 160 schools



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5 U.S. Census Bureau
6 U.S. Census Bureau
7 U.S. Census Bureau

that serve approximately 78,000 students from nursery school through the eighth grade. At this age, most children are driven to school by their parents and after they drop their kids off, the mother or father drives home alone resulting in only one truly productive trip. PRT would eliminate unproductive trips by allowing the children to be transported directly to school in a safe vehicle that only stops at their desired destination. In Union County alone there are 28,216 students enrolled in college or graduate school. Kean University is the college for 13,000 undergraduates in Union. Of those 13,000 undergraduates, only 9.2% of the undergraduate population lives on campus while the remaining 11,800 students travel to Kean from off-campus locations.[8] Union County College is a community college that serves 10,000 students in locations across the county. The main campuses are located in Cranford, Plainfield, Scotch Plains, and Elizabeth. Due to the fact that there are college campuses scattered all over Union county, and that drinking and driving occurs a majority of the time with college students, PRT offers a safe transportation alternative for all college students. Also, students that aren't fortunate enough to have cars are at the mercy of bus schedules that often inconvenience passengers. PRT will allow students to safely travel when and exactly where they desire.

Union County contains 192,945 housing units with an average family size of approximately 3.28 people.[9] A PRT network would be a great amenity to all of the households because almost 260,000 people travel to work each day. PRT would service all housing units in Union County with less than a 3/8-mile walk to the closest station.

Union County needs PRT because as the county grows and its population density continuously increases people will need an alternative source of transportation. PRT is inexpensive, efficient, safe, clean, and most importantly it helps to decrease current roadway congestion allowing for faster travel times on the road and on the PRT network. The fact that PRT can service everyone in the county should be enough, but when you combine all of the other advantages and benefits associated with PRT there is no reason not to adopt this proposal.

# Cape May County

Cape May County supports only a population of 105,000 people out of New Jersey's total population of 8,640,000. Although much of the northern and western areas of the county contain large stretches of wilderness and open space, the eastern coast has a relatively high population density, especially in the areas of Ocean City, Wildwood, and Cape May (see Figure 1 and Figure 2.) The county represents only approximately 1% of the total population, however, Cape May County is the second most popular tourist destination in New Jersey based upon revenue produced from tourism (Cape May County Department of Tourism.) This alone makes it an area for which it is essential to have a transportation network to provide access not only to everyday attractions (work, school, recreational locales, etc.) for the residents of the county but for visitors from all over the state.

In terms of existing   ndeveloped  on systems for the county, Cape May lacks strong options for consumers of public transportation. New Jersey Transit does serve the region with buses to other parts of the state, however it does not provide the region with railroad service. While buses do provide a public alternative to travel by car, they may be overlooked by travelers who would prefer not to travel on the same roads as cars in a much less personal environment than cars. The Cape May Seashore Lines, which travel from Cape May Point, at the southern tip

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[8] www.Kean.edu
[9] U.S. Census Bureau

of the county to Tuckahoe, at the Northern end of the county, do provide Cape May County with some railroad service. The problem with the Cape May Seashore Lines is that they provide only limited access to the people of Cape May. The tracks only provide a route directly through the center of Cape May County. They do not serve the eastern coastal areas, which are densely populated and littered with attractive destinations for travelers. Even for those whose destinations lie along this track, most residents of the county would be forced to drive to get anywhere near this railroad line. The lack of viable and extensive public transportation options in the Cape May County region calls for a new system, such as PRT, to fill the gap in the transportation market.

The PRT network for Cape May County is designed to make areas with high population densities and/or large numbers of attractions easy to navigate in that the network allows for quick changes of direction in these areas and enough stops to satisfy the people who frequent these areas. In less populated areas, the emphasis is on being able to reach a direct route to other areas of the county. These "highways," many of which mimic the routes of existing roads, allows for quick travel between large distances. In this way, if a user from a rural town decides to take a trip across the county or to a popular attraction such as the Wildwood area, he or she might only have to suffer a minor detour in the first mile of the trip and then would reach a stretch of the PRT system that is relatively direct between a large number of points in the county. The PRT system for Cape May County is not designed for a person who wants to travel a distance of about a mile unless it is within an area with a large number of attractions.

While the population of Cape May County in terms of permanent, all-year residents, Cape May County's population during the summer months is much higher – nearly six times as much (Figure 3.) This suggests that, during the summer months, not only will a significant amount of people need to reach Cape May, but they will most likely make frequent trips to tourist or recreational attractions such as the shore. With the problems of parking a car over the summer months, PRT provides an attractive solution to seasonal traveling. For the tourism industry alone, PRT allows for easy access to densely visited areas at the peak of the tourist season.

In terms of more everyday transportation, the Cape May PRT network is just as useable. The county's number one private employer, the Burdette Tomlin Memorial Hospital (see Figure 4,) located in Middle Township, is easily accessed through the county PRT network and lies within ¼ of a mile – a very feasible walking distance – from the the nearest PRT station. The Cape May County Courthourse nearby lies within 1/5 of a mile from the nearest PRT station. Barring areas of the county that are almost completely ndeveloped and unvisited, such as Great Cedar Swamp and Timber and Beaver Swamp in the central area of the county, the PRT network for Cape May County has stations within 3/8 of a mile from virtually every origin and destination. The accessability of the system is significantly greater in urban locales and places with large number of attractions. Figure 5 provides rough estimates of the average population served by each station in the towns of Wildwood, Cape May, and Villas, as well as estimated numbers of non-home trip attractions per day for these locations. In Villas, a predominately residential town with relatively few attractions to non-residents, the average population of the town served by PRT stations is relatively high, while the number of non-home trip attractions per day is relatively low. By contrast, Wildwood and Cape May serve a smaller population at each station while they produce many more non-home trip attractions. Even though more of Villas' population has to use fewer stations, one has to take into consideration that in areas like Cape May and Wildwood, where people come from significant distances to see the attractions, the

volume of people served by attractions far outweighs the population in these towns. The convenience to these tourists of these intricate systems in attractive areas will pay for itself by putting money into the PRT system and the individual towns themselves.

Cape May County enrolls roughly 4,650 children in secondary schools (see Figure 6.) With a total of 516 stations in the county, the average number of secondary school children per station is only nine. Similarly the 10,900 children enrolled in primary schools in Cape May County (Figure 6) correspond to an average of twenty-one children per station. When one considers that rides to school through the PRT system could be shared among two, three, or even four children at their most convenient station, the number of rides per station needed to satisfy this demand is relatively low.

The PRT network for Cape May County presents a new option for commuters to work in a market that is almost exclusively dominated by commuters who drive themselves to work. A total of 80% of commuters in the county drive themselves to work, 9% drive in carpool, and only 2% use public transportation as a means to travel to work on a regular basis (Figure 7.) In this market, the PRT system proposes an quick, efficient means of transportation sharing benefits both of cars and of public transportation. PRT provides a personal vehicle to the consumer while providing him or her with the benefits of automation and trips without traffic or stops. Commuters could relax or focus on their work while traveling. They would not have to deal with the hassle of driving themselves or with the inconvenience and inflexibility of existing public transportation. Figure 8 lists mean time it takes for commuters to reach their workplaces in each municipality of the county, citing the average for the entire county as 23.2 minutes. Without stopping or any traffic jams, the PRT system could most likely improve on this time. With the current use of public transportation options in Cape May being so minimal, this PRT network would provide consumers with a better, more comprehensive public option.

The PRT network for Cape May County provides a new alternative for those seeking a viable public transportation option as well as a more efficient means of transport than car use throughout the county, especially during the busy summer months.

Figure 1



Map of Cape May County showing municipalities
Courtesy of Cape May County Planning Department

Figure 2

| | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | % of Change Since 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| Avalon | 197 | 343 | 313 | 428 | 695 | 1,283 | 2,162 | 1,809 | 2,143 | 18.5% |
| Cape May | 2,999 | 2,637 | 2,583 | 3,607 | 4,477 | 4,392 | 4,853 | 4,668 | 4,034 | -13.6% |
| Cape May Point | 121 | 104 | 126 | 198 | 263 | 204 | 255 | 248 | 241 | -2.8% |
| Dennis Township | 1,639 | 1,615 | 1,877 | 1,981 | 2,327 | 2,635 | 3,989 | 5,574 | 6,492 | 16.5% |
| Lower Township | 1,106 | 1,455 | 1,705 | 2,737 | 6,332 | 10,154 | 17,105 | 20,820 | 22,945 | 10.2% |
| Middle Township | 2,760 | 3,430 | 3,889 | 4,599 | 6,718 | 8,725 | 11,373 | 14,771 | 16,405 | 11.1% |
| North Wildwood | 807 | 2,049 | 1,921 | 3,158 | 3,598 | 3,914 | 4,714 | 5,017 | 4,935 | -1.6% |
| Ocean City | 2,512 | 5,525 | 4,672 | 6,040 | 7,618 | 10,575 | 13,949 | 15,512 | 15,378 | -0.9% |
| Sea Isle City | 564 | 850 | 773 | 993 | 1,393 | 1,712 | 2,644 | 2,692 | 2,835 | 5.3% |
| Stone Harbor | 159 | 363 | 383 | 670 | 834 | 1,089 | 1,187 | 1,025 | 1,128 | 10.0% |
| Upper Township | 1,272 | 1,657 | 1,675 | 1,922 | 2,539 | 3,413 | 6,713 | 10,681 | 12,115 | 13.4% |
| West Cape May | 967 | 1,048 | 943 | 897 | 1,030 | 1,005 | 1,091 | 1,026 | 1,095 | 6.7% |
| West Wildwood | 0 | 178 | 146 | 237 | 207 | 235 | 360 | 453 | 448 | -1.1% |
| Wildwood | 2,790 | 5,330 | 5,150 | 5,475 | 4,690 | 4,110 | 4,913 | 4,484 | 5,436 | 21.2% |
| Wildwood Crest | 161 | 738 | 661 | 1,772 | 3,011 | 3,483 | 4,149 | 3,631 | 3,980 | 9.6% |
| Woodbine | 1,406 | 2,164 | 2,111 | 2,417 | 2,823 | 2,625 | 2,809 | 2,678 | 2,716 | 1.4% |
| County Total | 19,460 | 29,486 | 28,928 | 37,131 | 48,555 | 59,554 | 82,266 | 95,089 | 102,326 | 7.6% |

Courtesy of Cape May County Planning Department

Figure 3

**Population**

| | Winter | Summer |
|---|---|---|
| **1980** | 82,068 | 545,600 |
| **1990** | 95,089 | 624,000 |
| **2002** | 104,000 | 619,329 |
| **2003** | 104,837 | 624,397 |

Population of Cape May in winter vs. summer (all-year population vs. summer population)
Courtesy of Cape May County Chamber of Commerce

## Figure 4

### Cape May County 10 Largest Private Employers

| | |
|---|---|
| Burdette Tomlin Memorial Hospital | 1,100 |
| Acme Markets | 600 |
| Cold Spring Fish & Supply | 500 |
| WAWA | 485 |
| Holy Redeemer Visiting Nurse | 250 |
| Super Fresh | 250 |
| Shop Rite | 200 |
| Victoria Manor Nursing Center | 170 |
| Lutheran Home at Ocean View | 145 |
| Snow's Doxsee Inc. | 140 |

Courtesy of Cape May County Chamber of Commerce

## Figure 5

| | Estimated Population Served at Each Station | Estimated Non-Home Trip Attractions per Day per Station |
|---|---|---|
| Cape May | 70 | 2000 |
| Wildwood | 80 | 2500 |
| Villas | 450 | 600 |

Estimation of residential population served by each station versus estimation of non-home trip attractions per day per station for selected towns.

## Figure 6

### School Enrollments

#### ● Public

| | Elementary | Secondary |
|---|---|---|
| **1980** | 4,689 | 7,138 |
| **1990** | 9,436 | 3,407 |
| **2000** | 10,141 | 4,761 |
| **2003** | 9,580 | 4,240 |

● **Non-Public**

|      | **Elementary** | **Secondary** |
|------|----------------|---------------|
| **1980** | 539 | 1,418 |
| **1990** | 1,485 | 303 |
| **2000** | 1,304 | 415 |
| **2002** | 1,321 | 396 |
| **2003** | 1,333 | 404 |

*Home schooling enrollment is not included in the above figures.*

School enrollment in Cape May County
Courtesy of Cape May County Chamber of Commerce

Figure 7
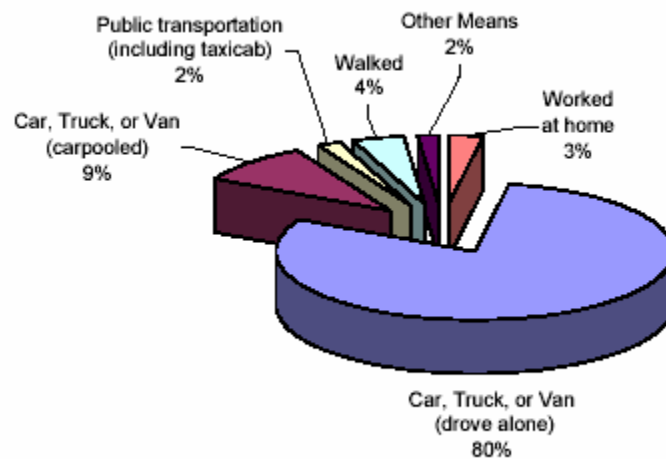


Means of traveling to work in Cape May County
Courtesy of Cape May County Planning Department

Figure 8

| Municipality | Mean Travel Time (Minutes) |
|---|---|
| Avalon | 28.7 |
| Cape May | 17.4 |
| Cape May Point | 24.1 |
| Dennis Township | 23.2 |
| Lower Township | 23.5 |
| Middle Township | 21.1 |
| North Wildwood | 20.8 |
| Ocean City | 26.2 |
| Sea Isle City | 22.0 |
| Stone Harbor | 24.6 |
| Upper Township | 25.6 |
| West Cape May | 22.9 |
| West Wildwood | 25.3 |
| Wildwood | 21.5 |
| Wildwood Crest | 20.9 |
| Woodbine | 18.3 |
| | |
| *County Total* | 23.2 |

# MIDDLESEX COUNTY

## Land Use

**Location:** Middlesex County is located in the heart of New Jersey and stretches from the Rahway River south to Mercer and Monmouth Counties and from Raritan Bay on the Atlantic Ocean west to Somerset County. The county is 374 square miles in size, encompasses 25 municipalities and includes extensive industrial, office, and residential areas.
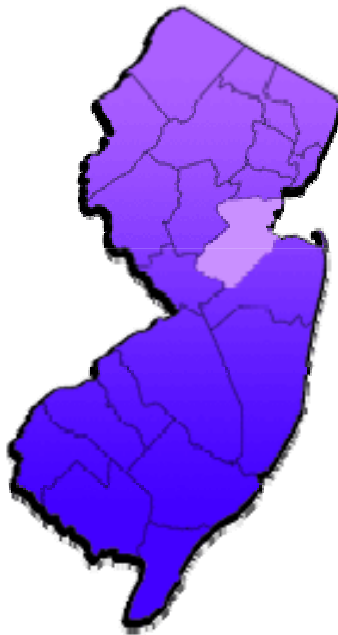
| Municipality | Square Miles | % of County |
|---|---|---|
| Cateret | 4.9 | 1.5 |
| Cranbury | 13.5 | 4.2 |
| Dunellen | 1.0 | 0.3 |
| East Brunswick | 22.5 | 7.0 |
| Edison | 30.4 | 9.6 |
| Helmetta | 0.9 | 0.3 |
| Highland Park | 1.9 | 0.6 |
| Jamesburg | 0.9 | 0.3 |
| Metuchen | 2.8 | 0.9 |
| Middlesex | 3.5 | 1.1 |
| Milltown | 1.6 | 0.5 |
| Monroe | 42.2 | 13.3 |
| New Brunswick | 5.6 | 1.8 |
| North Brunswick | 12.1 | 3.8 |
| Old Bridge | 39.1 | 12.3 |
| Perth Amboy | 6.0 | 1.9 |
| Piscataway | 19.1 | 6.0 |
| Plainsboro | 12.0 | 3.8 |
| Sayreville | 17.1 | 5.3 |
| South Amboy | 1.8 | 0.6 |
| South Brunswick | 41.1 | 12.9 |
| South Plainsfield | 8.3 | 2.6 |
| South River | 2.9 | 0.9 |
| Spotswood | 2.4 | 0.8 |
| Woodbridge | 24.5 | 7.7 |

**Educational Facilities:** 175 public schools, five county vocational-technical schools, and over 70 parochial and private schools serve the approximately 100,000 primary and secondary school students. Post secondary institutions include:
- DeVry University (North Brunswick): offering career-oriented undergraduate programs
- Middlesex County College (Edison): a two year education center for academic and technical training
- Rutgers, The State University (New Brunswick, Piscataway): offering graduate level studies
- The New Jersey Agricultural Experiment Station (New Brunswick): a nationally recognized research center
- The Forrestal Campus of Princeton University (Plainsboro)
- University of Medicine and Dentistry of New Jersey (New Brunswick)

**Housing and Population:** Middlesex County has been one of the fastest growing counties in the state, growing from 629,982 in 1970 to 717,949 in 1999. This close to 14% increase in population is evident in the 45.7% increase in housing units from 1970 including new homes and

apartments. As of 1990, the county has approximately 250,174 housing units for an average of 784 units per square mile.

**Medical Centers:** Middlesex County has five major hospitals with a total bed space of 1,900. They include:
- JFK Medical Center (Edison)
- Raritan Bay Medical Center (Old Bridge)
- Raritan Bay Medical Center (Perth Amboy)
- Robert Wood Johnson University Hospital (New Brunswick)
- St. Peters University Hospital (New Brunswick)

**Recreation:** The Middlesex County Department of Parks and Recreation operates 18 county parks encompassing 6,600 acres. Of these parks, thirteen contain active recreational facilities and five others are conservation areas or are being held for future recreational development. Through the Open Space Trust Fund, 5,000 acres of open space has been acquired and 3,400 acres of farmland have been preserved. Middlesex County has three golfing facilities operated by the Middlesex County Improvement Authority. They include the:
- Tamarack Golf Course (East Brunswick)
- Meadows At Middlesex (Plainsboro)
- Raritan Landing Gold Course (Piscataway)

County parks offer a wide range of facilities, such as East Jersey Olde Towne, a collection of restored, reconstructed and replica buildings from the 18th and 19th centuries located in Johnson Park, and Plays in the Park, held at the Stepehn J. Capestro Theater in Roosevelt Park. The County also has numerous private recreational complexes.

**Shopping:** Middlesex County boasts over 75 shopping centers and two major malls; the Menlo Park Mall and the Woodbridge Center.

| Land Use Description | Square Miles | % of County |
|---|---|---|
| Residential – Low Density | 7.8 | 2.31 |
| Residential – Moderate Density | 65.12 | 19.28 |
| Residential – High Density | 7.73 | 2.29 |
| Residential – Total | 80.65 | 23.88 |
| Commercial – Urban | 9.61 | 2.85 |
| Commercial – Suburban | 3.92 | 1.16 |
| Commercial – Total | 13.53 | 4.01 |
| Industrial | 21.26 | 6.29 |
| Recreational | 27.31 | 8.09 |
| Agricultural | 41.88 | 12.40 |
| Forested | 82.85 | 24.53 |
| Wetlands | 70.28 | 20.81 |
| Land Area – Total | 337.76 | 90.25 |
| County Area – Total | 374.25 | 100.00 |
| Developed Land – Total | 179.25 | 47.90 |
| Undeveloped Land – Total | 195.00 | 52.10 |

## Existing Transit Service

**NJ Transit Train:** Operates the state's commuter rail network. Features 11 lines in three divisions with the ability to transfer between all lines except for between the Atlantic City Rail Line. The divisions include the:
- Hoboken Division: includes service on the Morris & Essex and Montclair-Boonton lines to and from Penn Station New York and lines operating to and from Hoboken Terminal on the Morris & Essex, Main/Bergen, Pascack Valley and Montclair-Boonton lines
- Newark Division: includes the Northeast Corridor, North Jersey Coast, and Raritan Valley lines operating to and from Newark Penn Station, Hoboken Terminal, and Penn Station New York
- Atlantic City Rail Line: operates between the seaside resort city and Philadelphia, serving points in between

**PATH (Port Authority Trans-Hudson):** Rail service across the Hudson River into New York.

**Amtrak:** Fast interstate train service.

**NJ Transit Bus:** Close to 1000 bus routes servicing all major areas; residential, commercial, recreational and industrial.

**Seastreak Ferry:** Year-round weekday and weekend fast passenger ferry service to Wall Street and East 34th Street in Manhattan.

**Commuter Shuttles:** Four separate dedicated commuter shuttle lines servicing New Brunswick, North Brunswick, South Brunswick, Cranbury, Metuchen and Edison.

**Suburban Bus Transit:** Aims to satisfy the transportation needs for the growing motor coach industry and is one of the largest bus companies in the United States. They transport over ten million passengers per year stressing their first-class safety standards and provide:
- Commuter service from central New Jersey to Manhattan
- Shuttle Bus Service
- Daily Service to Atlantic City Casino and Hotels
- Charter services

**Academy Motor Coach:** The largest privately owned transportation company in the United States. Tailored service for events such as:
- Conventions
- Corporate transfers
- Sports teams
- Parades
- Major sporting events
- Private charters

# PRT Network

**Size and Coverage:** The goal of the design of the network was to achieve total county coverage with no user being further than a quarter-mile from a PRT station. The network spans the entire 318 square miles of the county and reaches every residential, commercial, educational, recreational and industrial area in the county. With one-way direction track it was important to create a network in which no unnecessary circuitous paths would be needed for a user to get from any one station to another. The resulting network consists of various small loops connected by interchanges which should alleviate any unnecessarily long routes. The network consists of 269 stations, 117 interchanges and represents approximately 435 miles of guideway.
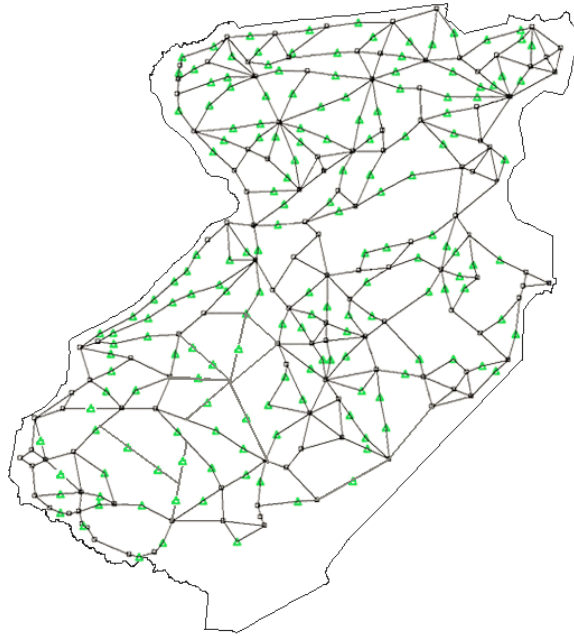


**Service to Employment:** With total county coverage the PRT network is able to bring service from the user's resident to their place of employment.

**Top Ten Major Employers:**

| Company | Number of Employees |
|---|---|
| Bristol-Myers Squibb | 3,200-3,499 |
| Merrill Lynch & Company | 3,250-3,499 |
| Telcordia Technology | 3,000-3,249 |
| Prudential Insurance Company | 2,750-2,999 |
| Robert Wood Johnson University Hospital | 2,750-2,999 |
| Johnson & Johnson | 2,500-2,749 |
| JFK Medical Center | 2,500-2,749 |
| Silverline Building Products | 2,500-2,749 |
| Raritan Bay Medical Center | 2,250-2,499 |
| St. Peter's University Hospital | 2,250-2,499 |

**Map of Middlesex County
Industrial Parks**
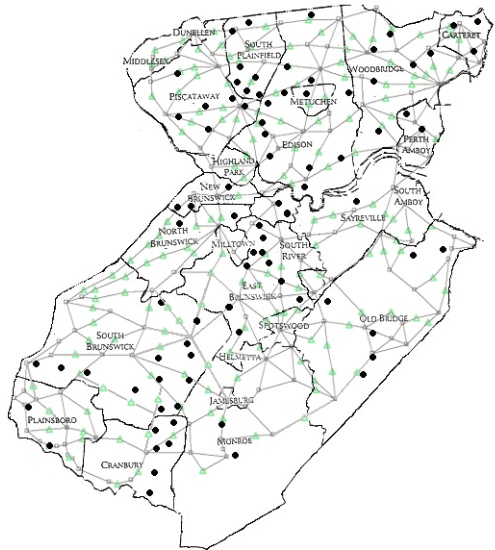


**Service to Shopping:**

**Map of Middlesex County
Shopping Centers**
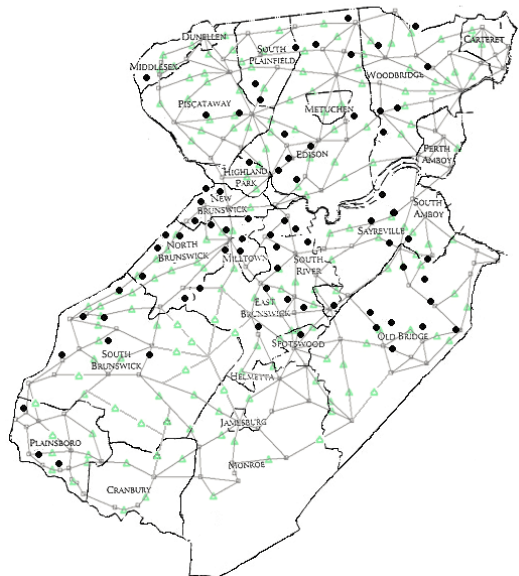
**Service to Hotels and Conference Centers:**



Map of Middlesex County Hotels and Conference Centers
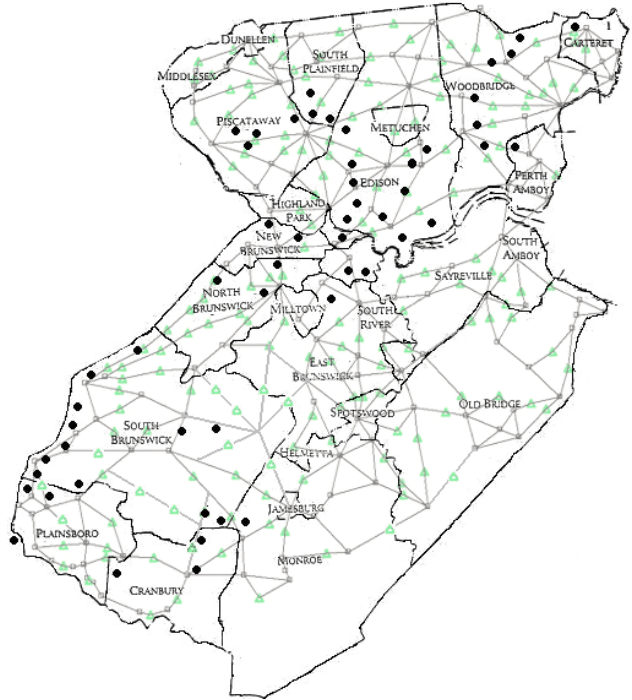
**Transport to Work:**

| | |
|---|---|
| Car, Truck or Van | 85.5% |
| Drove Alone | 75.40% |
| Car Pooled | 11.10% |
| Public Transit | 8.70% |
| Bus or Trolley Bus | 3.60% |
| Streetcar/Trolley | 0.00% |
| Subway/Elevated | 0.30% |
| Railroad | 4.40% |
| Ferryboat | 0.00% |
| Taxi Cab | 0.30% |
| Motorcycle | 0.00% |
| Bicycle | 0.20% |
| Walked | 2.80% |
| Other Means | 0.60% |
| Worked at Home | 2.10% |

**Travel Time to Work:**

| | |
|---|---|
| < 5 Minutes | 11.40% |
| 10-14 Minutes | 12.90% |
| 15-19 Minutes | 13.30% |
| 20-24 Minutes | 12.30% |
| 25-29 Minutes | 5.20% |
| 30-34 Minutes | 1.70% |
| 35-44 Minutes | 7.30% |
| 45-59 Minutes | 9.60% |
| 60-89 Minutes | 9.50% |
| > 90 Minutes | 16.80% |

**Value of the PRT System:** Taking a look at the available data, it becomes clear that the automobile would be the PRT System's greatest competition for users. A large portion of the PRT System's usage would home-based work trips and the vast majority of the population not only takes personal automobiles into work but mostly travels alone. An effective PRT System would combine the convenience and privacy of the automobile with the speed and ease of light rail travel. Congestion on the county's motorways is becoming a more serious problem which the current public transit services are not adequately handling. Being one of the fastest growing counties in the State, Middlesex County will feel the extra burden of an increased population more than most. A PRT System will go a long way in alleviating the existing, and future, load on the motorways and help sustain the rapid and exciting growth the County has benefited from.

# Sussex County

1. Land Use Description

Sussex County is situated at the extreme top of New Jersey and has not become very industrialized due to its geographic location, climate and rugged landscape. The Kittatinny Mountains span its entire northwest edge and the heavily-wooded New Jersey Highlands dominate the eastern part of the county. The hilly aspect of the county encourages vacationing rather than permanent settlement. Throughout the 521 square miles of the county, there are 144,000 people (40,600 students) in 50,800 households. Sussex has thousands of acres devoted to State parks. Rock strewn hills make farming very difficult and explain the higher number of dairy cattle.

2. Description of the Transit Service in the County

New Jersey Transit does not have a rail line that extends into Sussex County. However, there is a small bus line that serves the more heavily populated area of the county. As the picture to the right shows, the bus line travels through the boroughs of Newtown, Sparta, Andover, Lafayette and Franklin where a large portion of the county's population resides. This bus lines stops at major attractions such as shopping districts, the Sussex County Community College, the Newton Hospital and, of course, Wal-Mart.


Sussex County Transit Bus Route Map

3. Description of the PRT Network in the County
    a. Size and Coverage of the Network

        Because of the rural nature of the county, significantly populated areas are few and far between. Therefore, the ratio of track length to number of stations might be higher than many other counties. The goal of the network is to have roughly 90% of all destinations in the county be within a 3/8 mile radius of a station. To accomplish this task, 174 stations were necessary with most placed in the boroughs of the major townships.

        Another major goal is to connect these stations in such a way as to attempt to minimize the length of track while keeping the travel time low between stations that are relatively close. This is best accomplished by creating loops in the system and connecting smaller loops to each other through a network of larger loops. In total, 104 interchanges are sufficient to create an effective network. The figure below shows the entire PRT system for Sussex County. Triangles represent stations and squares are interchanges. The line connecting them is a one-way guideway with traffic flowing in the direction of the orange arrow.
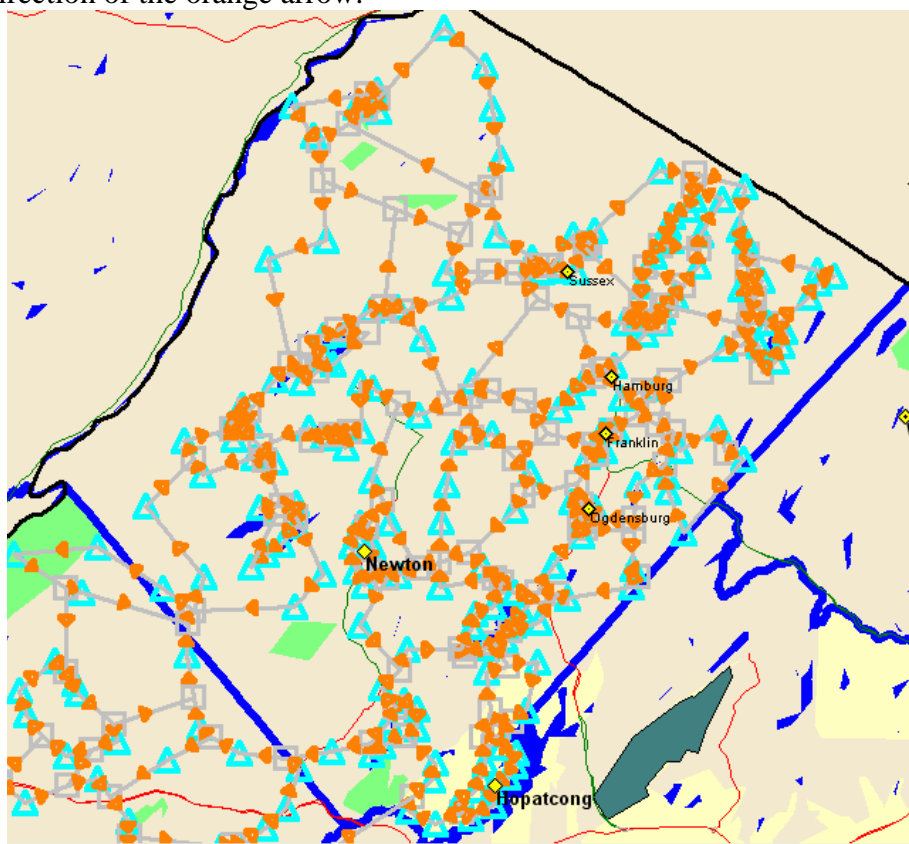


b. Service to Employment

        Detailed information about the commerce of Sussex County was not readily available on the Internet. However, due to the nature of the county, it is apparent that the majority of the industry occurs within the major townships, as a large proportion of the land is undeveloped. Another significant section of the economy of the county is in tourism with skiing and vacationing resorts two popular attractions. Sections of the economy that also fall within other categories of this report, such as recreation, education, and shopping, will be explored in greater detail in those respective sections. Newton

Memorial Hospital is the only hospital in the county and therefore one of the major employers.  The picture below is a computer drawing of the hospital with a PRT station adjacent to the front entrance.



c. Service to Shopping

As with the employment centers, the major commercial areas are also within the borders of the towns in Sussex County.  An effective PRT system throughout this area would have stations within close distance to the most frequented shopping areas.  An online visitor's guide for the county revealed that the most visited commercial centers were as follows:

| Shopping Area | Town |
| --- | --- |
| Menlo Park Mall | Edison |
| Olde Lafayette Village | Lafayette |
| Extreme Paintballz | Vernon |
| McAfee Ski & Snowboard | Vernon |
| North Country Outfitters | Lafayette |
| The Lafayette Mill Antiques Center | Lafayette |
| Lafayette Clayworks | Branchville |
| Sparta Shopping District | Sparta |
| Sussex Shoppping District | Sussex |
| Newton Shopping District | Newton |
| Franklin Wal-Mart | Franklin |

Each of these places has a PRT station located within walking distance that connects to the main grid, easily transporting shoppers from their neighborhoods to these locations.

d. Service to Recreation

       The landscape of Sussex County lends itself to being a fantastic area for outdoor recreation.  A large ski resort and a handful of beautiful golf courses attract visitors from New Jersey, Pennsylvania and New York.  There is even a professional minor league baseball team to entertain local residents and visitors.  For those who prefer indoors, there are museums and a theater in various towns.  The table below summarizes these attractions:

| Recreational Area | Town |
|---|---|
| Mountain Creek Ski Resort | Vernon |
| Space Farms Zoo and Museum | Sussex |
| Sterling Hill Mining Museum | Ogdensburg |
| Franklin Mineral Museum | Franklin |
| New Jersey Cardinals Baseball | Augusta |
| Skylands Ice World | Stockholm |
| Wild West City | Netcong |
| Hidden Valley Resort | Vernon |
| Tri-State Actors Theater | Branchville |
| Waterloo Village | Stanhope |
| Ballyowen Golf Club | Hardyston |
| Bear Brook Golf Club | Newton |
| Crystal Springs Resort | Vernon |
| Lake Mohawk Golf Club | Sparta |
| Newton Country Club | Newton |
| Rolling Greens Golf | Newton |

Once again, PRT stations are strategically located close to these major attractions.

e. Service to Education

       Big yellow school busses may become obsolete in Sussex County.  Throughout the towns and boroughs of the county there are twenty-five educational institutions with student enrollments of over 400.  One of these is Sussex County Community College in Newton with a full-time enrollment of 1300 and a part-time enrollment of almost 2000.  An informational website about primary and secondary schools called GreatSchools.net provided enrollment information for all schools in the county.  The larger ones are listed on the table below:

| School Name | Town | Enrollment |
| --- | --- | --- |
| Kittatinny Reg High School | Newton | 1302 |
| Newton High School | Newton | 810 |
| Halsted St. | Newton | 400 |
| Florence M. Burd | Newton | 431 |
| Marian Mc Keown | Newton | 469 |
| Merriam Ave. | Newton | 479 |
| Durban Ave | Hopatcong | 436 |
| Ellen T Briggs | Hopatcong | 394 |
| Hudson Maxin | Hopatcong | 407 |
| Tulsa Trail Elementary School | Hopatcong | 432 |
| Hopatcong Middle School | Hopatcong | 668 |
| Hopatcong Middle School | Hopatcong | 836 |
| Sussex Middle School | Sussex | 659 |
| High Point Regional High School | Sussex | 1234 |
| Wallkill Valley Reg. High School | Hamburg | 841 |
| Franklin Elementary School | Franklin | 575 |
| Hardyston Township | Franklin | 778 |
| Ogdensburg | Ogdensburg | 396 |
| Frankford Township | Branchville | 744 |
| Helen Morgan | Sparta | 690 |
| Sparta Alpine | Sparta | 862 |
| Sparta Middle School | Sparta | 964 |
| Sparta High School | Sparta | 1046 |
| Sparta City Technical High School | Sparta | 698 |
| Sussex County College | Newton | 3300 |

While exact data about student's home locations cannot be obtained, reasonable assumptions about district regions were made to assure that the homes of all students are within walking distance to a station with a timely path to their school.

f. Service to Housing

Perhaps the most important station placements are those to the residential districts. If PRT was incorporated on such a large scale, other forms of transportation would undoubtedly shrink in usage considerably. It is in the county's best interest to build stations such that the largest amount of its citizens have walking access from their homes. In some extreme cases it might not be economically feasible to place a station near a home if there are not many other destinations nearby so the goal is to reach approximately 90% of the counties 50,800 housing units. The U.S. Census Data from 2000 listed the top townships in the county by the number of households. The ten largest towns are listed below:

| Township | Total Housing Units |
| --- | --- |
| Franklin Borough | 1997 |
| Hamburg Borough | 1233 |
| Highland Lake | 2283 |
| Hopatcong Borough | 6190 |
| Lake Mohawk | 3940 |
| Newton Town | 3425 |

| | |
|---|---|
| Stanhope Borough | 1419 |
| Sussex Borough | 961 |
| Ogdensburg Borough | 903 |
| Vernon Valley | 560 |

The number of stations placed in each of these townships is a function of the total population as well as how densely packed these housing units are. PRT stations are connected in such a way that the a large residential district with multiple stations is linked in a small loop which is then connected to the surrounding attractions.

4. Value of PRT to the future evolution and vitality of Sussex County

The Sussex County Chamber of Commerce reports that approximately 60% of the workforce in the county commutes to growing commercial and industrial centers outside of the county. Their vision is to bring more businesses into the county to increase its vitality. PRT in Sussex County would help make this vision a reality.

A major reason that there are not many businesses in the county is accessibility. There is not much of a public transportation system in the county, nor are there major highways. The construction of a PRT system would represent an opportunity for growth and restructuring of the Sussex County economy. New commercial and industrial (and residential) centers could be planned concurrently with the planning of the PRT. Stations could be strategically placed in currently underdeveloped locations with great growth potential. Businesses would be very temped to relocate there due to the ideal location with respect to the new PRT stations.

Another major effect that PRT will have on this region is to change a region that was previously unable to be developed and transform it into an area with great potential. With so great a proportion of the county rugged and mountainous, accessibility has always been an issue holding back development. Elevated guideways with a very small physical connection to the ground below can more easily and cheaply traverse this type of terrain, granting fast-flowing access to virtually any part of the county.

This greater access does come with a price, however. Many of the current residents choose to live in Sussex County due to its rural, natural environment. Having PRT guideways spanning across all parts of the county will give rise to much objection from environmentalists and current residents. Much more planning and forecasting would have to be done to determine the most effective way to utilize the new PRT technology in such a manner as to jumpstart the economy of the county yet at the same time maintain its beautiful landscapes.

# Warren County

### Land Use Description:

The County of Warren occupies an area of 365 square miles, is 32 miles long with an average width of 13 miles, and ranks ninth in size among the state's twenty-one counties. Within the County is some of the most undeveloped, rugged terrain in New Jersey. The landscape is characterized by a series of ridges and valleys, ranging from 100 to 1,600 feet above sea level. Mountain ranges and ridges, which divide fertile river valleys, include Kittatinny Mountain, Jenny Jump Mountain, Scott's Mountain and Pohatcong Mountain. Fertile valleys have enabled the county to become an important agricultural district in the Garden State. Over 50% of the county is undeveloped woodland, with wetlands comprising another 25%. Warren County land

use is primarily agricultural with very few urban areas.  However, the Warren County chamber of commerce has zoned certain districts for the following purposes: urban enterprise, business improvement districts, and educational zones (including a 2 and 4 year college and public and private secondary schools). The growing workforce has brought about recent changes to Warren County, creating more commercial development.   To further diversify its economy, the Phillipsburg Redevelopment Agency has retained a private developer with plans to redevelop vacant brown fields into a modern industrial park, fully integrated with the downtown and riverfront, which boasts a new boat ramp and parking facilities

## Land Use Summary



Acres — Urban Area, Woodland Coverage, Parkland, Nonprofit Open Space, Wetlands, Barren Land
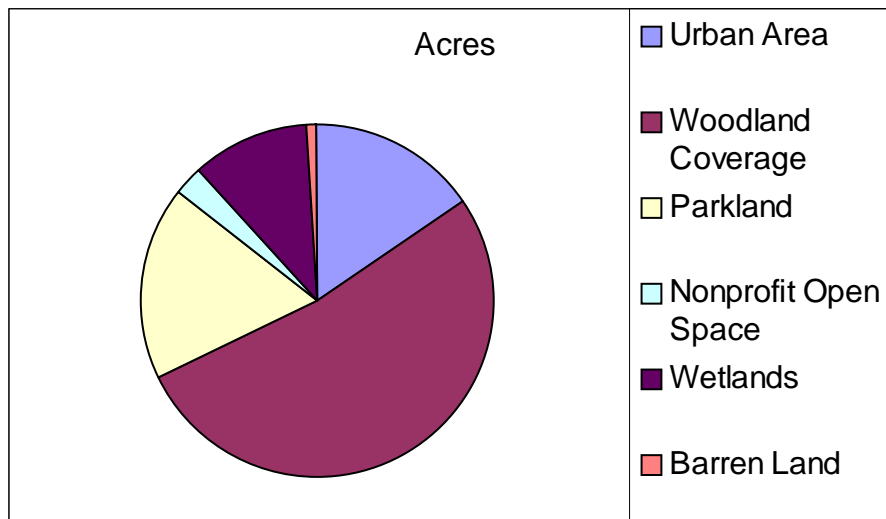
## Description of Existing Transit Systems:

Transportation has played an important role in the development of the county since its beginning. The first road which was constructed in1960 from Pahaquarry to Kingston, N.Y., over which they transported the proceeds of their mining ventures. This road, the first commercial highway built in the United States, is still in existence today. It traverses through the Delaware National Water Gap.  Transportation continues to play an important role in the county's evolution. Interstate highways I-78 and I-80 cross the county, opening the area to many new residents who commute daily to their jobs in metropolitan New Jersey. Meanwhile, commercial and industrial areas are being created along the highway corridors, as Warren County's proximity to New York, Philadelphia and New Jersey's most heavily populated areas, along with the quality of life the county offers, make it an attractive area for homes and businesses.

## Overview of PRT in Warren County

Warren County has a current population of 102,766.  Being one of the smallest counties in New Jersey, Warren has a unique transportation demand.  The projected growth, however, for over the next 15 years, predicts a 25% rise in the population.  Accommodating for this increase is an important part of land use planning.  The Warren County Personal Rapid Transit system is designed with growth in mind.  By improving the transportation in the area, it is an investment for the future economic and residential development of county municipalities.

| Warren County Townships | Total Housing Units |
|---|---|
| Allamuchy township | 1,774 |
| Blairstown township | 2,136 |
| Greenwich township | 1,477 |
| Independence township | 2,210 |
| Knowlton township | 1,135 |
| Lopatcong township | 2,429 |
| Mansfield township | 2,415 |
| Pohatcong township | 1,411 |
| Washington township | 2,174 |
| White township | 1,770 |

The Distribution of 50 Residential PRT Stations serves the 10 Residential Townships with service with ¼ mile of a Station. More rural areas will not have the same access to PRT stations. However, 65% of the counties population lives within dense enough township areas to be conveniently served by residential PRT Stations.
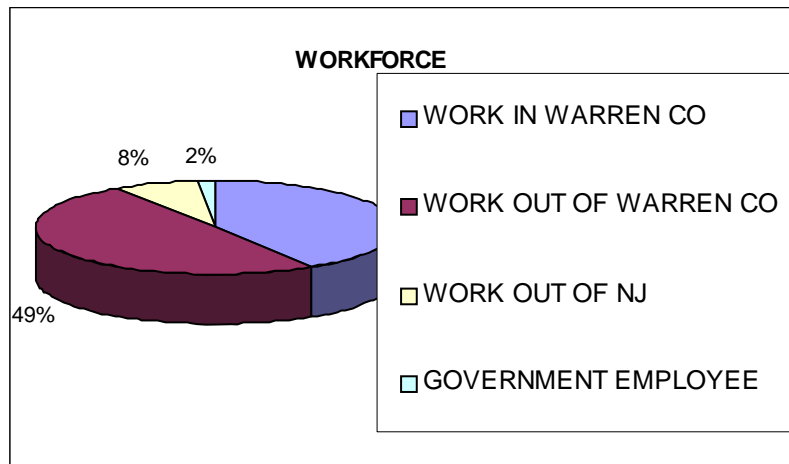


| Manufacturing Firms | 168 |
|---|---|
| Farms | 730 |
| Labor Force | 55,100 |

**Major Employers**          **Town**
Warren Hospital                    Phillipsburg
Hackettstown Community Hospital  Hackettstown
M&M Mars Inc.                      Hackettstown
Warren County Community College  Washington

Farm and Manufacturing labor comprise the majority of the needs for PRT Service to employment. The Warren County PRT Systems serves 155 of the 168 manufacturing firms and provides access to all farms above 500 acres with a workforce greater than 75. Considering that almost half of Warren County's workforce commutes out of county it is exceedingly important to coordinate and connect well with other counties and provide comprehensive residential PRT service.

Service to educational facilities is the second greatest objective in PRT Service. Warren county is home to two colleges and 35 public schools, all of which are serviced by PRT. The goal of PRT for Warren County is to remove all vehicular traffic to and from school. Listed below are the major school facilities and their enrollment.

| School | Township | Enrollment |
|---|---|---|
| Belvidere High School | Belvidere | 568 |
| Blairstown Elementary School | Blairstown | 755 |
| Franklin Township Consolidated | Washington | 357 |
| Great Meadows Reg. Middle School | Great Meadows | 494 |
| Independence Township Central | Great Meadows | 350 |
| Stewartsville Elementary School | Stewartsville | 454 |
| The Greenwich School | Stewartsville | 447 |
| Hackettstown Middle School | Hackettstown | 402 |
| Hackettstown High School | Hackettstown | 921 |
| Knowlton Township Elementary School | Delaware | 364 |
| Lopatcong Elementary School | Phillipsburg | 737 |
| Mansfield Township Elementary School | Port Murray | 746 |
| N. Warren Reg. High School | Blairstown | 998 |
| Oxford Central | Oxford | 356 |
| Green Street | Phillipsburg | 624 |
| Phillipsburg Middle School | Phillipsburg | 690 |
| Phillipsburg High School | Phillipsburg | 1475 |
| Pohatcong Township Elementary School | Phillipsburg | 389 |
| Warren Hills Reg. Middle School | Washington | 752 |
| Warren Hills Reg. High School | Washington | 1340 |
| Washington Memorial Elementary School | Washington | 383 |
| Brass Castle | Washington | 401 |
| White Township Cons. | Belvidere | 444 |
| Warren County Community College | Washington | 2400 |

Commercial and Recreational PRT Service was designed using target locations. All malls, shopping centers, and recreational attractions with over 500 trips per day have a PRT station dedicated for that purpose. Listed below are the most locations of PRT Stations for the largest commercial developments and recreational sites.

RECREATION:

| Attraction | Town |
|---|---|
| Well-Sweep Herb Farm | Port Murray |
| Phillipsburg River Outpost | Phillipsburg |
| Land of Make Believe Theme Park | Hope |
| King's Road Vineyard and Winery | Asbury |
| Brass Rode Spa and Salon | Blairstown |
| Alba Vineyard & Winery | Milford |
| Apple Mountain Golf & Country Club | Oxford |
| Hawk Pointe Golf Club | Washington |
| Double D Guest Ranch | Blairstown |
| Shippen Manor Museum | Oxford |

COMMERCIAL ZONES:

| Shopping | Town |
|---|---|
| Phillipsburg Mall | Phillipsburg |
| Millbrook Village | Blairstown |
| Phillipsburg Shopping District | Phillipsburg |
| NJ Antique Barn | Hope |
| Belvidere Shopping District | Belvidere |
| Downtown Hackettstown | Hackettstown |
| Albanese Sports Gallery | Belvidere |
| Marshall's Farm Market | Delaware |

# Hudson County
## Land Use

Transportation planning in Hudson County has always been a challenge because there is a wide range of land use patterns. In Jersey City, there are heavy downtown urban areas, mixed use areas along the Hudson River and dense residential areas along the Palisades. Hudson County also serves as a gateway between New Jersey and New York City. The diagram below shows land use patterns.



Generalized Existing Land Use
Hudson County
New Jersey
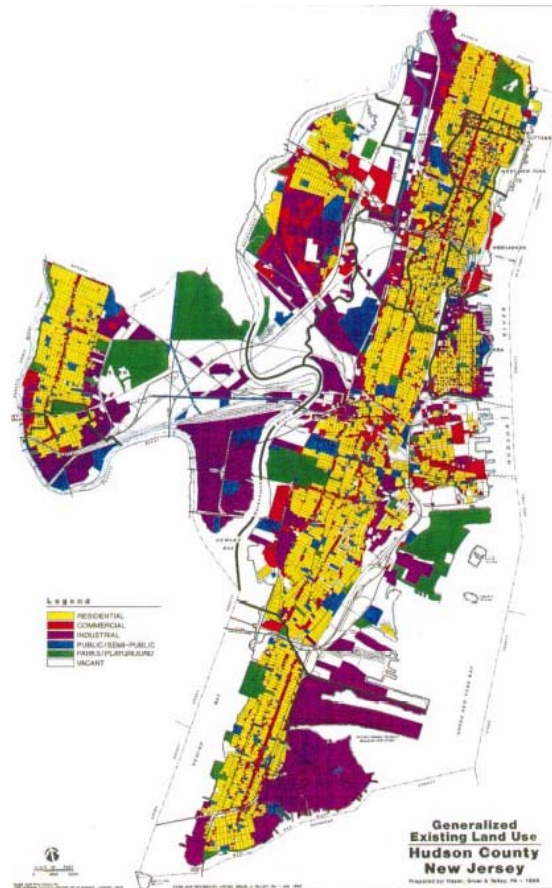
Hudson County has addressed the reliance on public transportation by continuing to improve their system and recently has made efforts to integrate different forms of transportation into a network. However, the situation could be improved with a countywide PRT network.

**Table II-3**
**Population Density, 2000**
**Hudson County Municipalities,**
**Northeast Urban Counties and New Jersey**

| Geographic Area | Population | Land Area (sq. miles) | Density (persons/sq.mile) |
|---|---|---|---|
| Bayonne | 61,842 | 5.6 | 11,004 |
| East Newark | 2,377 | 0.1 | 23,770 |
| Guttenberg | 10,807 | 0.2 | 56,879 |
| Harrison | 14,424 | 1.2 | 11,823 |
| Hoboken | 38,577 | 1.3 | 30,376 |
| Jersey City | 240,055 | 14.8 | 16,144 |
| Kearny | 40,513 | 9.1 | 4,432 |
| North Bergen | 58,092 | 5.2 | 11,193 |
| Secaucus | 15,931 | 5.9 | 2,705 |
| Union City | 67,088 | 1.3 | 52,825 |
| Weehawken | 13,501 | 0.8 | 15,883 |
| West New York | 45,768 | 1.0 | 44,870 |
| **Hudson County** | **608,975** | **46.6** | **13,068** |
| Bergen County | 884,118 | 234.1 | 3,776 |
| Essex County | 793,633 | 126.2 | 6,286 |
| Passaic County | 489,049 | 185.0 | 2,643 |
| Union County | 522,541 | 103.2 | 5,060 |
| **State of New Jersey** | **8,414,350** | **7,416.9** | **1,134** |

*Source: U.S. Bureau of the Census, 2000*

## Current Transit Service in Hudson County

Currently, Hudson County is served by the Hudson-Bergen Light Rail Transit System. This is shown on the next page.

The HBLRT system provides the backbone for transportation in Hudson County. It is a 20.6 mile light rail line through Hudson County that provides a link between the southern end of Bayonne, the Jersey City waterfront and the Vince Lombardi Park and Ride on the New Jersey Turnpike. It provides accessibility to current and future employment and population centers along the Hudson River Waterfront, Hoboken, Jersey City and Bayonne, as well as redevelopment projects throughout the county. It provides access to retail centers such as Bergenline Avenue and Newport Center. It is integrated with other forms of transportation such as bus routes and park and ride lots.

The county is also served by the NJ Transit Midtown Direct commuter trains, NJ Transit and private buses (shown in diagram below), the Port Authority Trans-Hudson rapid transit system and the cross-Hudson ferry/water taxi system. These transportation systems are represented in the diagrams below. This first diagram shows the rail lines. Only three NJ
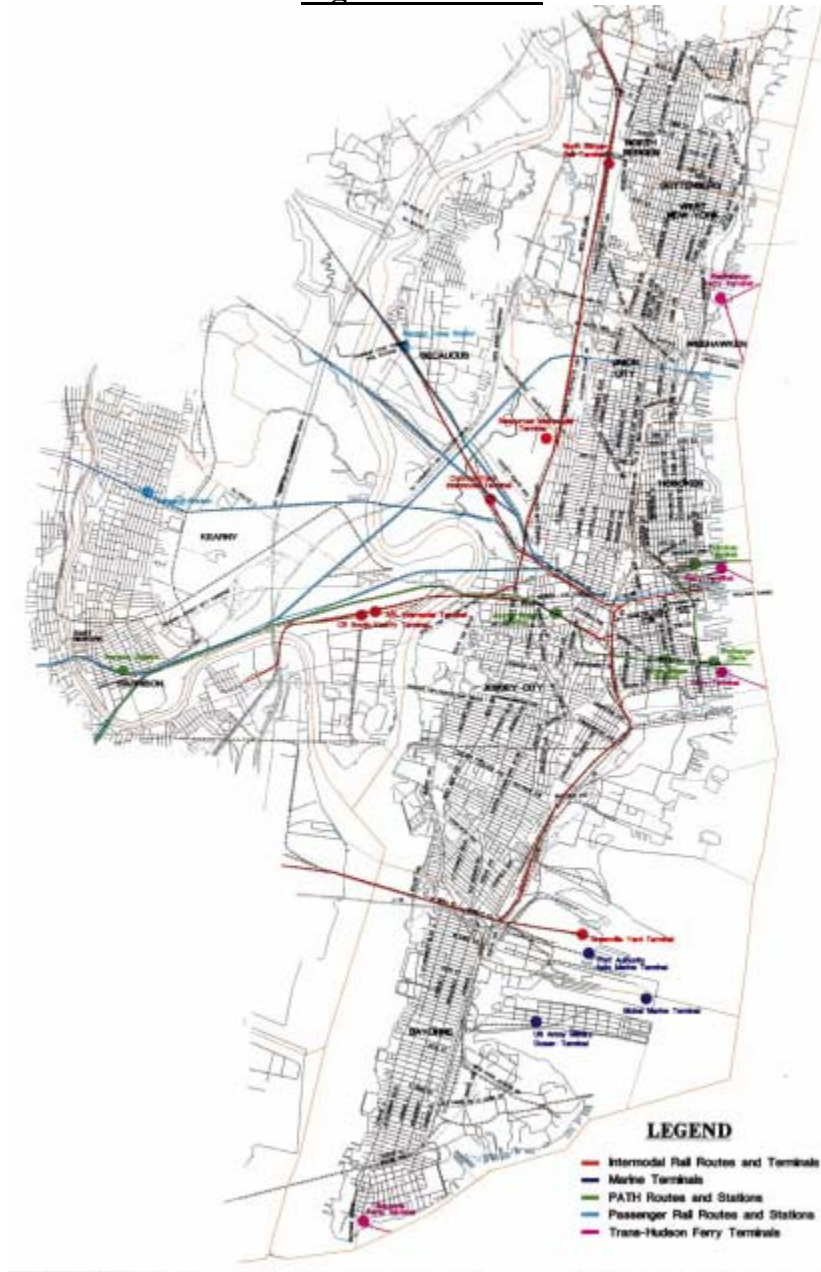
Transit commuter stations are located in Hudson County – the Arington Station, the Harmon Cove Station and the Hoboken Terminal.  The majority of commuters to and from Manhattan use the PATH rapid transit system.  The PATH system consists of four lines through Hudson County, each of which is also served by NJ Transit bus lines.  The HBLRT connects to trans-Hudson services via the PATH line and by bus, thereby increasing access between Hudson County and New York City.

These efforts have improved transportation throughout Hudson County, but a PRT network would offer an improvement since it would not have the integration problems that still plague the current system.  This system was built over time with new additions being added periodically.  Integrating light rail trains, for example, with buses and commuter lines has been difficult, and requires various transfers.  A PRT network would be an affordable and efficient solution to this problem.  The cost would compare favorably to current plans.  The total cost for the HBLRT and related improvements has reached over $1 billion dollars.  A PRT network on the other hand can be built for a few million dollars per mile.  A more precise cost would need to be determined based on the density of the stations.

# Bus Routes



LEGEND

— Internal Hudson County Bus Routes
— Bus Routes Through Hudson County

SCHOOR DEPALMA
Engineers and Design Professionals

HUDSON COUNTY MASTER PLAN
TRANSPORTATION ELEMENT

**EXISTING BUS SERVICE**

## Light Rail Routes



**LEGEND**
- Intermodal Rail Routes and Terminals
- Marine Terminals
- PATH Routes and Stations
- Passenger Rail Routes and Stations
- Trans-Hudson Ferry Terminals

Work is under way to integrate all modes of transportation into a coordinated network in an effort to promote economic growth and minimize congestion.

There is also an extensive network of highway and local roads throughout Hudson County. The network of highways, freeways, principal and minor arteries is shown below.

LEGEND
- Interstate Highways
- Other Freeways and Expressways
- Other Principal Arterials
- Minor Arterials
- Urban Collectors

SCHOOR DEPALMA
Engineers and Design Professionals

HUDSON COUNTY MASTER PLAN
TRANSPORTATION ELEMENT
**FUNCTIONAL ROADWAY CLASSIFICATIONS**

The PRT network would serve to reduce pollution and accidents due to vehicular traffic. Both are problems due to the congestion that exists on Hudson County roads. A major congestion problem exists due to through traffic to New York City. Major highways that pass through Hudson include the NJ Turnpike, This has the effect of increasing commute and delivery times as well as reduced productivity and decreased quality of life for residents. Efforts have

been made to increase the number of park and ride lots, but the potential for this type of approach is questionable. A PRT network would undoubtedly reduce congestion.
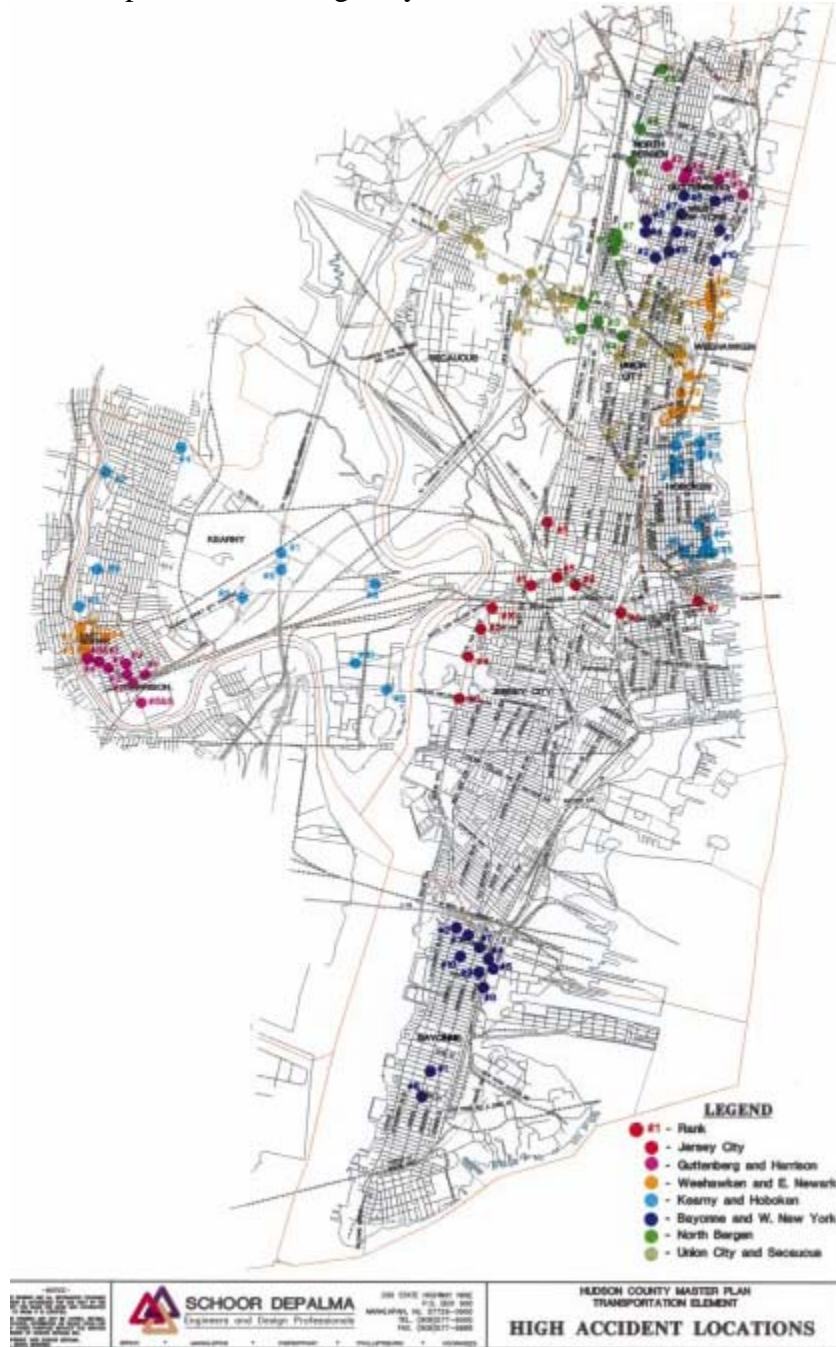
Average Daily Traffic Volumes

**Table IV-2**
**Existing Average Daily Traffic Volumes**
**Hudson County**

| Roadway | Section | ADT | Year |
|---|---|---|---|
| NJ Rt. 3 | Btn. Meadowlands Pkwy & Paterson Plank Rd. | 138,000 | 1995 |
| I-95 NJ Tpk. (West) | Btn. Exit 15E & 15W | 120,300 | 1989 |
| NJ Rt. 495 | Btn. NJ Rt. 1 & 9 & Lincoln Tunnel | 117,000 | 1978 |
| NJ Rt. 495 | Lincoln Tunnel | 109,800 | 1995 |
| NJ Rt. 3 | Btn. County Line & NJ Tpk. | 108,300 | 1985 |
| I-95 NJ Tpk (East) | Btn. Exit 16E & 17E | 102,700 | 1995 |
| I-95 NJ Tpk. (West) | Btn. Exit 15W & 16W | 98,900 | 1995 |
| NJ Rt. 3 | Btn. NJ Tpk. & NJ 495 | 89,400 | 1983 |
| I-280 | Btn. Exits 15 & 16 | 87,800 | 1993 |
| I-95 NJ Tpk. (East) | Btn. Exit 15E & 16E | 84,600 | 1989 |
| NJ Rt. 139 | Holland Tunnel | 76,000 | 1987 |
| I-95 NJ Tpk. (East) | Just South of County Line | 66,700 | 1995 |
| Paterson-Plank Rd. | Btn. Terminal Rd. (Park Pl.) & West Side Ave. | 65,100 | 1995 |
| NJ Rt. 1 & 9 | North of Pulaski Skyway | 63,700 | 1992 |
| NJ Rt. 1 & 9 | Tonnelle Ave. Btn NJ495 & CR681 | 53,700 | 1986 |
| NJ Rt. 440 | Btn. CR 602 & NJ Tpk. Rt. 1 & 9 | 48,200 | 1985 |
| I-78 Turnpike Ext. | Btn. Exit 14A & 14B | 46,500 | 1995 |
| NJ Rt. 1 & 9 | Tonnelle Ave. Btn. CR 653 & NJ495 | 45,800 | 1993 |
| I-78 Turnpike Ext. | Btn. Exit 14B & Rt. 139 | 43,900 | 1995 |
| NJ Truck Rt. 1 & 9 | Btn. Communipaw Ave. & NJ Rt. 139 | 39,800 | 1995 |
| JFK Blvd. | Btn. Winkle & St. Pauls Ave. | 38,600 | 1995 |
| Jersey City Tpk. | Btn. NJ Tpk. & Belleville Tpk. | 37,600 | 1995 |
| JFK Blvd. | Within the Lincoln Tunnel loop | 37,000 | 1995 |
| NJ Rt. 1 & 9 | Tonnelle Ave. Btn. 70th & 71st Sts. | 36,300 | 1991 |
| NJ Truck Rt. 1 & 9 | Btn. Tpk & Communipaw Ave. | 33,800 | 1985 |
| JFK Blvd. | Btn. 55th & 57th St. | 30,700 | 1995 |
| NJ Rt. 440 | Btn. I-78 & CR 602 | 30,200 | 1991 |
| JFK Blvd. | Btn. I-78 & West 63rd St. | 29,700 | 1995 |
| NJ Rt. 7 | Btn. NJ 139 & Newark Tpk. | 29,200 | 1979 |
| JFK Blvd. | Btn. 20th & 21st St. | 28,000 | 1995 |
| Observer Hwy. | Btn. Newark Ave. & Willow Ave. | 27,100 | 1995 |
| JFK Blvd. | Btn. Bowers & Lincoln Sts. | 27,000 | 1995 |
| County Ave. | Btn. NJT exit & Dorigo Ln. | 26,100 | 1995 |
| Park Ave. | Btn. 18th & the RR | 26,000 | 1995 |
| JFK Blvd. | Btn. Lexington & Glendenny Ave. | 25,700 | 1995 |
| Willow St. | Btn. 18th & the RR | 24,500 | 1995 |
| Newark Ave. | Btn. Waldo Ave. & I-78/RR | 24,100 | 1995 |
| Garfield Ave. | Btn. Caven Pt. & Bay View Ave. | 21,700 | 1995 |
| JFK Blvd. | Btn. 85th & 87th Sts. | 21,200 | 1995 |
| JFK Blvd. | Btn. 55th & 56th St. | 20,900 | 1995 |
| Paterson-Plank Rd. | At River View Park (So. of Bowers St.) | 20,100 | 1995 |
| JFK Blvd. | Btn. 51st & 54th St. | 18,900 | 1995 |
| Viaduct | Btn. Manhattan Ave. & Madison St. | 18,400 | 1995 |
| Ocean Ave. | Btn. Myrtle & Claremont Ave. | 17,700 | 1995 |
| Paterson-Plank Rd. | Btn. Columbia Ave. & the RR | 17,000 | 1995 |
| Pennsylvania Ave. | East of Central Ave. | 16,300 | 1995 |
| County Rd. | Btn Rt. 1&9 & I-95 East | 15,400 | 1995 |
| NJ Rt. 7 | Btn. Newark Tpk. & County Line | 14,400 | 1986 |
| Route 440 | At the Bayonne Bridge | 14,300 | 1995 |
| Bergenline Ave. | Btn. 48th & 50th St. | 13,500 | 1995 |
| Palisade Ave. | Btn. 18th Ave. & Washington Ave. | 11,900 | 1995 |
| Hillside Rd. | East of JFK Blvd. | 11,400 | 1995 |
| Paterson-Plank Rd. | At Washington Park (So. of 2nd St) | 11,200 | 1995 |
| JFK Blvd. | Btn. Wall St. & Bulls Ferry Rd. | 10,700 | 1995 |
| Secaucus Rd. | Btn. 16th St. & Michael Dermott Pl. | 10,700 | 1995 |
| JFK Blvd. | Btn. North & Linden St. | 8,900 | 1995 |
| Washington Ave. | Btn. 8th & 9th St. | 8,600 | 1995 |
| Hackensack-Plank Rd. | Just south of Approach Rd. to Lincoln Tn. | 5,800 | 1995 |
| Communipaw St. | Btn. Monitor St. & the RR | 1,500 | 1995 |
| Pershing Rd. | South of JFK Blvd. East | 1,300 | 1995 |

## High Accident Areas

By decreasing the traffic congestion, the problem of traffic accidents would be alleviated. As shown in the map of traffic accidents below, there is a high concentration of accidents in East Newark, Guttenberg and Harrison. These accidents are commonly caused by the proximity to

highways.  For example, I-280 passes through Harrison and numerous accidents are directly caused by the traffic and passes on this highway.



LEGEND
#1 - Rank
- Jersey City
- Guttenberg and Harrison
- Weehawken and E. Newark
- Kearny and Hoboken
- Bayonne and W. New York
- North Bergen
- Union City and Secaucus

HUDSON COUNTY MASTER PLAN
TRANSPORTATION ELEMENT
**HIGH ACCIDENT LOCATIONS**

SCHOOR DEPALMA
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### Description of PRT network in County
### Size and coverage of the network

The Hudson County PRT network consists of 140 stations and will have 118.45 miles of guide way. The generally follow a grid like pattern to improve the accessibility of the network between the infinite origin and destination pairs that can exist.  Ideally, each point on the network should be accessible by every other point and convenient forward and return routes for

each origin and destination pair should exist.  By using a grid pattern, route distances and occurrences of backtracking are minimized.   The network is shown below.
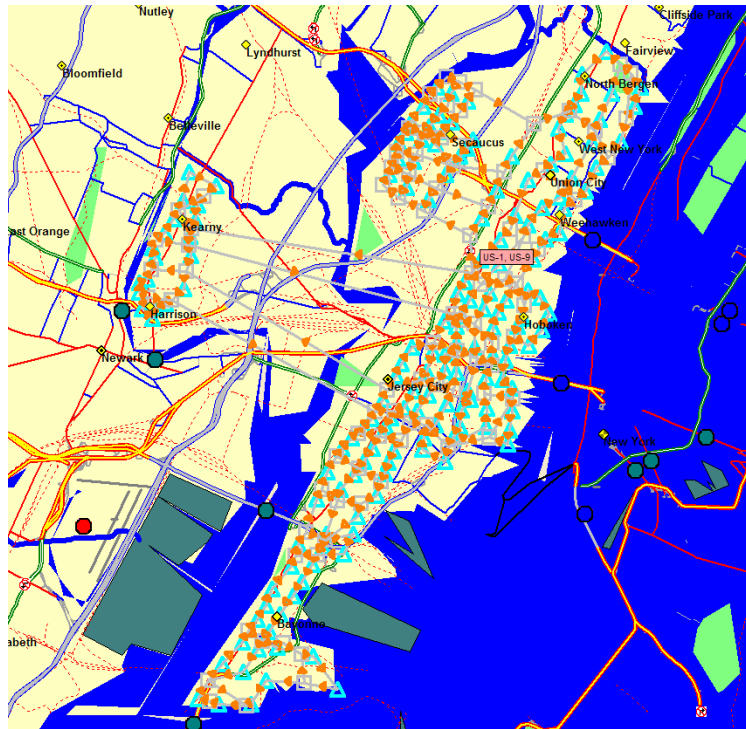


## Service to Employment and Shopping

In Hudson County, 271,770 people are employed.  Of these, 55% drive to work while 33.6% use public transportation.  The mean travel time to work is 32.6 minutes.  With a PRT network, commute times will be improved

| EMPLOYMENT STATUS | | |
|---|---:|---:|
| Population 16 years and over | 486,268 | 100.0 |
| In labor force | 297,702 | 61.2 |
| Civilian labor force | 297,531 | 61.2 |
| Employed | 271,770 | 55.9 |
| Unemployed | 25,761 | 5.3 |
| Percent of civilian labor force | 8.7 | (X) |
| Armed Forces | 171 | - |
| Not in labor force | 188,566 | 38.8 |
| Females 16 years and over | 250,754 | 100.0 |
| In labor force | 137,278 | 54.7 |
| Civilian labor force | 137,227 | 54.7 |
| Employed | 124,430 | 49.6 |
| Own children under 6 years | 42,833 | 100.0 |
| All parents in family in labor force | 22,872 | 53.4 |
| COMMUTING TO WORK | | |
| Workers 16 years and over | 264,544 | 100.0 |
| Car, truck, or van - - drove alone | 111,109 | 42.0 |
| Car, truck, or van - - carpooled | 34,519 | 13.0 |
| Public transportation (including taxicab) | 88,926 | 33.6 |
| Walked | 22,637 | 8.6 |
| Other means | 2,709 | 1.0 |
| Worked at home | 4,644 | 1.8 |
| Mean travel time to work (minutes)[1] | 32.6 | (X) |

The network has seamless coverage to all of the major employers shown below. The flow of PRT cars will be set up such that demands for transportation during the afternoon rush hour are met. We will use the employment numbers at each place of business to determine with precision exactly how many cars will be needed and at what time.

**Table V-4**
**Major Private Sector Employers, 1999**
**Hudson County**

| Employer | Number of Employees | Location |
|---|---|---|
| UPS | 2,200 | Secaucus |
| ADP Brokerage Service Division | 2,000 | Jersey City |
| Donaldson Lufkin & Jenrette Pershing Division | 2,000 | Jersey City |
| Jean Nicole, Inc. | 2,000 | Secaucus |
| Liz Claiborne, Inc. | 1,800 | North Bergen |
| Jersey City Medical Center | 1,770 | Jersey City |
| APA Transport Corp. | 1,500 | North Bergen |
| Lehman Brothers, Accounts Payable | 1,400 | Jersey City |
| Local 2 – 406 PACE | 1,385 | Bayonne |
| APA Turck Leasing Corp. | 1,300 | North Bergen |
| Bayonne Hospital | 1,200 | Bayonne |
| St. Mary Hospital | 1,200 | Hoboken |

*Source: Hudson County Economic Development Corporation, November 1999*

In addition to the largest employers listed above, there are numerous other employers and retail establishments. These are listed in their entirety at (http://www.hudsonedc.org/hudson-employers.pdf). A brief excerpt of this list is shown below. The PRT network will provide service with large employers and retailers as the highest priority. Cars serving retailers will be designed with increased cargo space for carrying purchased items and other cargo.

## Detailed Employer and Number of Employees for Each City

| BAYONNE, NJ 07002 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp |
| American Clothing Enterprises LTD 885 Broadway | (201) 395-0888 | 5932 | 150 |
| ASAHI GLASS FLUOROPOLYMERS USA INC. 229 E. 22$^{ND}$ Street | (201) 858-8900 | 2821 | 150 |
| Bayonne Hospital 29$^{th}$ Street Ave E | (201) 858-5000 | 8062 | 1164 |
| Bookazine Co. Inc(Del CORP) 75 Hook Road | (201) 339-7777 | 5192,2741 | 180 |
| CASCHEM INC. 40 Ave A | (201) 858-7900 | 2869 | 135 |
| Clark Stek-O Corp 148 5$^{th}$ Street | (201) 437-0770 | 2891 | 100 |
| Dynamic Handling Corp. 150 Pulaski Street | (201) 963-3535 | 4225 | 126 |
| Flortek Corp. 39 W 55$^{th}$ Street | (201) 436-7700 | 2273,2752,2782 | 100 |
| Gel Spice Company Inc. 48 Hook Rd | (201) 339-0700 | 2099,5149,5145 | 120 |
| Goodtimes Entertainment Limited 59 E 1$^{st}$ Street | (201) 436-0050 | 3695 | 400 |
| Gordon Terminal Service Co. of PA. 2 HOOK ROAD | (201) 437-8300 | 4225,7389 | 100 |
| The Great Atlantic & Pacific Tea Co Inc. 175 Ave. A & W 6$^{th}$ Street | (201) 823-0202 | 5411 | 120 |
| The Haddad Apparel Group Ltd. 90 E 5$^{th}$ Street | (201) 339-8883 | 5136,5137 | 200 |
| Harry J. Rashti & Co., Inc. 74 Lexington Ave. | (201) 858-8111 | 2369 | 135 |
| Ideal Window Manufacturing Inc. 27 Kennedy Blvd | (201) 437-4300 | 3089,3442 | 127 |
| Imperial Bag & Paper Co. Inc. 59 Hook Road | (201) 437-7440 | 5087, 5113 | 100 |
| Inserra Inc. 583 Avenue C | (201) 437-6000 | 5411 | 220 |
| International Matex Tank Terminals 250 E 22$^{nd}$ Street | (201) 437-2200 | 4226 | 120 |
| Killer Films Inc. North Bldg 82 RR 440 | (201) 243-1950 | 7812 | 300 |
| Maidenform Inc. 154 Avenue E | (201) 436-9200 | 2341,2342,4225 | 600 |
| Muralo Company Inc. 148 E. 5$^{th}$ Street | (201) 437-0770 | 5198 | 180 |
| NCC Industries Inc. DE 154 Avenue E. | (201) 436-9200 | 2342,2341 | 346 |
| NAVY Exchange Service Command 32 Constitution Road | (201) 437-8497 | 5399,9711 | 120 |
| The Wats Room 285 Broadway FL 2 | (201) 823-3949 | 8732 | 110 |
| Unilever Bestfoods Foodservice 99 Avenue A | (201) 339-6800 | 2035 | 175 |

| GUTTENBERG,NJ 07093 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp |
| Palisade Operations LLC<br>6819 Boulevard E. | (201) 868-3600 | 8051 | 100 |

| HARRISON,NJ 07029 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp |
| CS Osborne Company Inc.<br>125 Joseph Street | (973) 483-3232 | 5085 | 200 |
| Campbell Foundry Co.<br>800 Bergen Street | (973) 483-5480 | 3321, | 100 |
| Citicorp North America Inc.<br>450 Mamaroneck Ave | (914) 899-7000 | 6021 | 700 |
| Engelhard Corporation<br>1 W Central Ave. | (9730268-7800 | 3339 | 102 |
| H J Heinz Company<br>257 Essex Street | (973) 484-8810 | 4225 | 155 |
| Inner Secrets Inc.<br>1000 1st Street | (973) 485-0500 | 2342,2341 | 200 |
| M Tucker Co. Inc.<br>900 S 2nd Street | (973) 484-1200 | 5046,5113 | 120 |

| HOBOKEN, NJ    07030 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp. |
| ACADEMY BUS TOURS INC<br>1515 Jefferson St | (201) 420-7000 | 4142-01<br>4131-01 | 250 |
| Applied Housing Management Co. Inc.<br>1228 Washington St. | (201) 420-0157 | 6531 | 130 |
| CIBER INC.<br>5 Marine View Plaza | (201) 795-3601 | 7379-0200 | 195 |
| CITY OF HOBOKEN<br>94 Washington St. | (201) 420-2027 | 9121-04 | 145 |
| GRAY LINE INTL., HUDSON TRANSIT<br>1500 Clinton St. | (201) 714-9445 | 4131-9901 | 250 |
| HENKEL CORP<br>1301 Jefferson St | (201) 659-1200 | 2844-05, 5169-16 | 100 |
| HOBOKEN FREE PUBLIC LIBRARY<br>500 Park Avenue | (201) 420-2346 | 8231-0000 | 150 |
| HOBOKEN BOARD OF EDUCATION<br>1115 Clinton Street | (201) 420-2162 | 8211-03<br>9411-0000 | 120 |
| HOPES<br>124 Grand St. | (201) 656-3711 | 8399-0101 | 113 |
| HUDSON SEWING INC. (VISION TEXTILES)<br>1500 Hudson Street | (201) 795-5200 | 2253 | 300 |
| JOHN WILEY & SONS INC.<br>Waterfront Corporate Ctr. | (201)748-6147 | 2731-2721 | 100 |
| MIZUHO SECURITIES USA INC.<br>111 River Street | (201)626-1000 | 6211-6021 | 180 |
| NJ TRANSIT CORP.<br>1 Hudson Pl. | (201) 714-2746 | 4013-9904 | 700 |
| SHIPCO TRANSPORT INC.<br>80 Washington Street | (201)216-1500 | 4731-8742 | 100 |
| ST MARY HOSPITAL<br>308 Willow Ave | (201) 714-8900 | 8062-02, 8011-01 | 1200 |
| STEVENS INSTITUTE OF TECHNOLOGY<br>1 Castle Point Terr. | (201) 216-5000 | 8221-01 | 500 |

| HOBOKEN, NJ    07030 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp. |
| SUMITOMO TRUST & BANKING CO. USA<br>111 River Street | (201)420-9470 | 6021 | 112 |
| TTI TEAM TELECOM INTERNATIONAL<br>2 Hudson Street | (201) 795-3883 | 4813-4812 | 400 |
| UNIPOWER SYSTEMS USA CORP.<br>129 Washington St. | (201) 963-8844 | 7371-0300 | 100 |
| UNIVERSAL FOLDING BOX CO.<br>551 13th ST. | (201) 659-7373 | 2652-01,<br>2653-01 | 140 |

| JERSEY CITY, NJ   07097 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp. |
| Garban LLC<br>545 Washington Blvd | (201) 369-5658 | 6211 | 200 |
| United States Postal Service<br>80 County Rd | (201) 714- 6390 | 4311 | 3,500 |
| Port Jersey Distribution Service<br>2 Colony Rd | (732) 274- 9371 | 4226 | 120 |

| JERSEY CITY, NJ 07302 | | | |
|---|---|---|---|
| Company Name and Address | Phone | Sic Code | # Emp. |
| 21st Century Rail Inc.<br>150 Warren St | (201) 324-1800 | 8741 | 100 |
| Aegis Insurance Company<br>10 Exchange Place | (201) 521- 1200 | 6411 | 158 |
| Alger Fund<br>30 Montgomery St | (201) 547- 3650 | 6211 | 200 |
| American Express Banking Corp.<br>90 Hudson Street | (201) 209-5600 | 6082,6021,6099 | 400 |
| American Family Enterprises<br>10 Exchange Pl. | (201) 369- 4860 | 5963 | 105 |
| Anthem Worldwide Lines LTD<br>30 Montgomery St | (201) 324- 1166 | 4513 | 175 |
| Associated Electric& Gas<br>10 Exchange PL. | (201) 521-4524 | 6399 | 160 |
| BJ's Wholesale Club, Inc<br>396 Marin Blvd. | (201) 798-0500 | 5399 | 150 |
| BTM Information Service, Inc<br>34 Exchange Pl. | (201) 413-8330 | 8741 | 400 |
| Bank of Tokyo- Mitsubishi Trust Company<br>34 Exchange Pl. | | 6022 | 400 |
| Bon Secours New Jersey Health System,<br>Inc<br>25 McWilliams Pl. | (201) 418-1000 | 8741 | 579 |
| Cable & Wireless Internet Service Inc.<br>1 Evertrust Pl., 32 Exchange Pl. | (201) 633-3300<br>(201) 220-5538 | 4813 | 200 |
| Check Free Service Corp<br>10 Exchange Pl. | (201) 332-0202 | 7374 | 300 |
| Control Associates, LP<br>10 Exchange Pl. | (201) 451-8510 | 8742 | 200 |
| Coop Rabobank Center Raiff<br>10 Exchange Pl. | (201) 499- 5200 | 6081 | 200 |
| DB Capital Markets Corp.<br>10 Exchange Pl. | (201) 946-2200 | 6211 | 340 |
| DAI- ICHI KANGO Bank LTD<br>95 Christopher Columbus D | (212) 466-5200 | 6099 | 180 |

## Service to Recreation

PRT network recreation area coverage throughout Hudson county will be designed such that the majority of areas of parks and open spaces are covered. The cars that cover these areas will be specially equipped with retractable windows so that passengers can ride through the park in an open air setting.
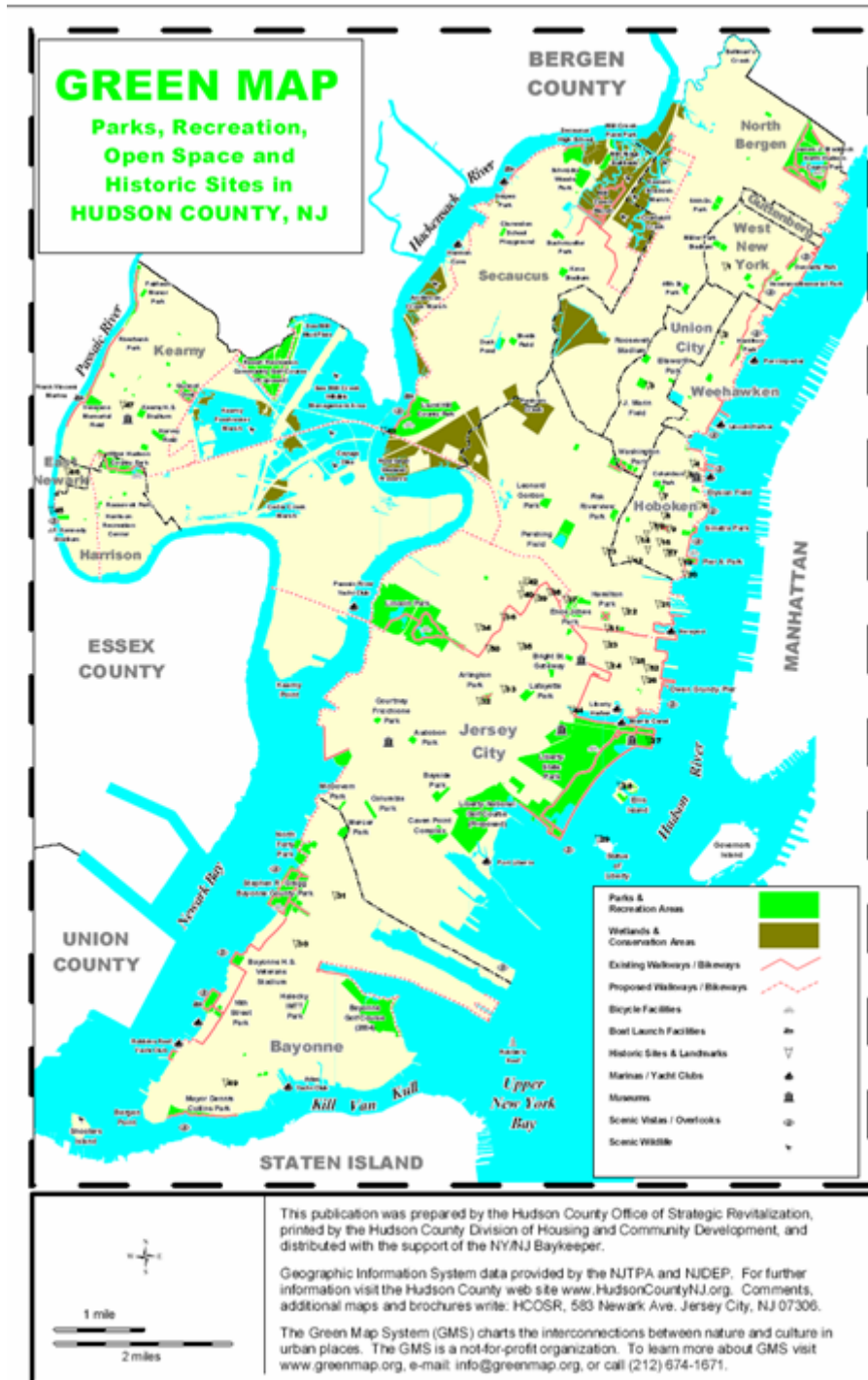
## Service to Education

The PRT network will also serve the majority of schools throughout Hudson County. The cars that are primarily used to bring children to school will be specially equipped with numerous safety features to ensure their security. The school system is described in the statistics below.

| SCHOOL ENROLLMENT | | |
|---|---:|---:|
| Population 3 years and over enrolled in school.................... | 157,624 | 100.0 |
| Nursery school, preschool...................... | 9,743 | 6.2 |
| Kindergarten.................................. | 8,251 | 5.2 |
| Elementary school (grades 1-8)................ | 64,475 | 40.9 |
| High school (grades 9-12).................... | 33,724 | 21.4 |
| College or graduate school ................... | 41,431 | 26.3 |

Education
- 77 Public Elementary Schools
- 6 Middle Schools
- 18 High Schools
- 39 Elementary Parochial Schools
- 11 Secondary Parochial Schools
- Non Public Schools:
  9 Kindergarten - 8th Grade
  2 9th-12th Grade
  6 Kindergarten - 12th Grade
- 11 Charter Schools
- 1 Regional Day School (7th and 8th Grade Special Needs)
- 3 Vocational & Technical Schools
Source: Hudson County Superintendent of Schools, August 2001

Institutes of Higher Education

Hudson County Community College:
Jersey City and West New York.
Associate degree programs.

- New Jersey City University: Jersey City.
Undergraduate and graduate degree programs.

- Stevens Institute of Technology: Hoboken
Undergraduate and graduate degree programs.

- Saint Peter's College: Jersey City.
Undergraduate and graduate degree programs.

## Service to Hospitals

The network will also cover the numerous hospitals throughout the region. There will be special cars equipped to handle medical emergencies. These cars will be able to respond to calls almost immediately and will be able to shuttle patients quickly to hospitals.

**HOSPITALS**

There are eleven hospitals in Hudson County:

| | | |
|---|---|---|
| Christ Hospital | 201-795-8200 | 176 Palisade Avenue Jersey City, NJ 07306 |
| Bayonne Hospital | 201-858-5000 | 29 East 29th Street Bayonne, NJ 07002 |
| Greenville Hospital | 201-547-6100 | 1825 Kennedy Blvd. Jersey City, NJ 07305 |
| Jersey City Medical Center | 201-915-2000 | 355 Grand Street Jersey City, NJ 07302 |
| Meadowlands Medical Center | 201-392-3100 | 55 Meadowland Pkwy Secaucus, NJ 07094 |
| Meadowview Hospital | 201-319-3500 | 595 County Road Secaucus, NJ 07094 |
| Palisades Medical Center | 201-854-5000 | 7600 River Road North Bergen, NJ 07047 |
| St. Francis Hospital Emergency Room Services Only | 201-418-1000 | 25 McWilliams Place Jersey City, NJ 07302 |
| St. Mary's Hospital | 201-418-1000 | 308 Willow Avenue Hoboken, NJ 07030 |
| West Hudson Hospital | 201-955-7000 | 206 Bergen Avenue Kearny, NJ 07032 |

# Morris County

## Land Use

Because Land Use determines the design of the PRT Network, it is important to first understand the different land uses and zoning restrictions of Morris County. Most of Morris County's agricultural acres and protected farms are located in one township-Washington in the southwestern part of the county, which contains about one-third of the remaining farmland in the county. Total farmland is 66,000 acres. There are several large blocks of easements in this area. Eastern and central sections of the county are heavily urbanized. 23 million square feet of office space and 39 million square feet of industrial space in Corporate and Industrial sites throughout the urbanized parts of the country compose the majority of the county's employment.

## Existing Transportation Management and Systems

The Division of Transportation Management of Morris County oversees all methods of transportation including bus, rail, vehicle, airtraffic, bicycle and pedestrian, and carpooling. The county encourages ridership of its bus fleet making stops frequently; however, the inability of the bus to maintain its schedule has been the most common complaint. Riders would rather have the convenience of a reliable schedule than an over-abundance of routes and stopping points. PRT would be able to solve some of the scheduling problems, by being able to predict with relative certainty the waiting time at any given station. Morris County does provide interactive bus scheduling online, but when the schedule is unreliable the efficiency is lost. PRT allows commuters to make real time decisions about location and time of arrival. Two main commuter rail systems operate in Morris Co. Three NJ TRANSIT rail lines serve the entire county. The Morristown Line and Gladstone Branch both have service to New York's Penn Staton, Newark-Broad Street Station, and Hoboken. The Boonton Line provides service to Hoboken and with the addition of connections to New York, Newark, and Montclair, commuter rail travel has increased by thirty percent. The PATH system operates 24 hours a day between Newark, Jersey City, Hoboken, and Manhattan. Freight Rail is an important to not only the industrial sector, but also alleviates freight traffic on the roadways. The <u>Morristown & Erie Railway</u>, <u>Norfolk Southern Railway</u>, and the <u>New York, Susquehanna, and Western Railway</u> all provide service to Morris County based manufactures. The Morristown & Erie Railway provides service throughout most of Morris County and served the county for over 100 years, proving to be one of the most successful freight lines in New Jersey. There are a total of 9 freight lines in the county.

In order to encourage alternate modes of transportation and alleviate the pressure on the roads, In 1998 Morris CO Division of Transportation launched the Bicycle and Pedestrian Element of the Morris County Master Plan to improve conditions for bicyclists and pedestrians. The plan, advanced by the Bicycle and Pedestrian Public Advisory Committee and other community representatives. Their objectives are to develop an integrated system/ network of bicycle and pedestrian facilities for commuting purposes, increase the safety of these modes, and encourage and promote bicycling and walking as viable alternatives to driving. In addition, Morris Co. has implemented a program to assisted disabled person with county-wide transportation. MAPS is a special transportation service in Morris County for senior citizens and persons with disabilities. MAPS uses small buses, vans, and station wagons to provide transportation to medical facilities, education or employment sites, adult day care centers, and other locations. Most MAPS vehicles are equipped to accommodate wheelchairs. Morristown Airport is located in Hanover Township and is used as a private airport for corporate and

personal aircraft and is the county's largest airport. It serves 54 of the nation's Fortune 500 companies.

Morris County DOT has several systems to help alleviate traffic congestion and educate and alert vehicular commuters. TransOptions is a non-profit Transportation Management Association (TMA) whose mission is to reduce traffic congestion, improve air quality, and provide commuter services and options for northwestern New Jersey, including not only Morris county but Sussex, Warren, Passaic, suburban Essex, and Union counties. Metrocommute, a private corporation subsidized by the county, provides customized real-time traffic and transit reports through its web site, and via e-mail and text alerts to subscribers' desktops, pagers, and mobile phones. By defining a travel profile, users can quickly obtain the information they need. The Morris County Employee Vanpool Program is a service available to county government employees and its agencies. There are a number of routes available which all end at the courthouse in Morristown.  The most comprehensive resource for travel information is the Morris County Transit Guide Online.

## Morris County PRT Plan

Morris County has seen a sharp increase in growth rates by the time of the 2000 Census. Morris County is one of the nation's most wealthy counties. It is one of the fastest growing counties in the New York metropolitan region with an area of 469 square miles and according to the U.S. Census Bureau a year 2000 population of 470,212, comprising about 6 percent of the population of the state and making it the 10th most populated state. However, with the sudden increase in residential population, the County has seen considerable development in the economic sector.  With the addition of new companies and the growth of old, Morris County's transportation systems have faced strain.  The urban and residential development has grown faster than the transportation infrastructure supporting it. The proposed Personal Rapid Transit System would service all major employers both public and private, commercial developments, educational zones, and recreational districts.  The transit system would be able to cover 90% of all county-wide and state-wide (with the cooperation of other County PRT Developers) point to point travel.  The system is designed to provide on demand service to any point on the network with a maximum than a five minute waiting period in non peak hours and ten minutes during peak rush hours.

A total of 240 stations would service each of the 39 municipalities. The distribution of these stations is contingent upon the residential population, employment density, commercial floor space, education, and recreational venues.  This region has enough population density and attraction locations to justify and extensive county wide PRT network, excluding no area more than 3 square miles.  Personal Rapid Transit would integrate well with the existing transportation infrastructure while bringing substantial improvement to the quality of personal travel through out the county.

## PRT Service Areas

The largest contingent of PRT Travel in Morris County will be the service to Employment.  Morris County has a blend of corporate headquarters, office/business parks, and firms involved in research and development.  The county contains headquarters and major employment sites (over 100 employees per site) for 54 of the nation's Fortune 500 companies and 8 Global 500.  Each one of these employment sites has a designated PRT Station.  These stations alone comprise 40% of the county's PRT stations.  Service to Industrial Sites and Distribution Companies are also included in the PRT network.  Over 75 % of all commuter

traffic can be accommodated by the network because of proximity to workplace. Commercial districts, providing employment and both shopping destinations and attractions, are another area of the PRT development.  A table of major employment centers and commercial districts is provided below with data concerning travel distributions and PRT station information.

PRT Stations will be located within half of a mile of 20 out of the 28 Parks in Morris County, which is over 13,000 acres of Park Land accessible by PRT.  Other recreational areas indirectly serviced by PRT are movie theatres and amusement parks. Mostly located near all shopping malls and commercial centers, these recreational sites are inextricably intertwined with the PRT commercial service network.  All public county meeting areas for each of the 39 municipalities are located within 1/3 mile of a PRT station. Morris county as 122,655 enrolled students over the age of 3: 16% Kindergarten and Pre-K, 64% Grades 1-12, and 20% College. The goal of the PRT network is to necessarily serve every school, currently the design accommodates 80% of all schools within ¼ mile.  All colleges and all secondary schools with an enrollment over 500 have convenient PRT station proximity.  Some of the smaller rural community schools may be up to a mile away from the nearest station. Tables of Major Education facilities and related PRT service information are provided below.
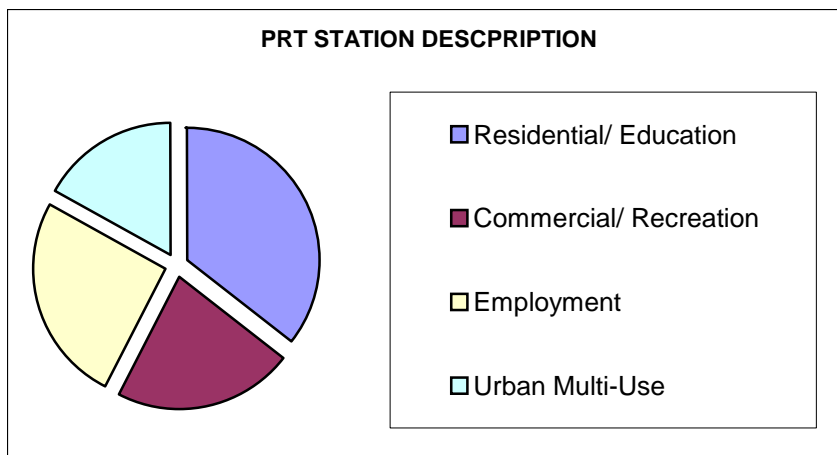
Finnally, the most important component of PRT is the residential service.  Without convenient access from the residential communities the PRT system would necessarily fail.  It is the backbone of the PRT Network.  Over 50% of the stations in Morris County are located primarily for residential proximity.  Due to the rural nature of certain parts of the county, not all areas are serviceable within ¼ mile of a station, but at least 90% of the county residence are a maximum of ½ mile from a PRT station.  The majority of residences however are in dense enough areas to be serviced by PRT to any possible employment, commercial, educational, and residential destination with ¼ mile. Residential stations range from service of 800 possible passengers to 1,200 within a ¼ to ½ mile of the station, depending on density of the municipality.

## Residential Municipalities and PRT Stations

| | | |
|---|---|---|
| Mountain Lakes | 4,305 | 2 |
| Netcong | 2,589 | 2 |
| Parsippanny | 45,389 | 21 |
| Pompton Plains | 13,449 | 8 |
| Riverdale | 2,392 | 3 |
| Randolph | 24,193 | 10 |
| Rockaway | 23,447 | 13 |
| Springtown | 5,392 | 4 |
| Stirling | 4,392 | 3 |
| Washington | 17,592 | 12 |
| Wharton | 3,382 | 4 |
| Whippany | 7,492 | 6 |

| MUNICPALITY | Population | # STATIONS |
|---|---|---|
| Boontown | 12,496 | 7 |
| Brookside | 2,400 | 2 |
| Budd Lake | 798 | 5 |
| Butler | 7,420 | 5 |
| Chatham | 18,564 | 15 |
| Chester | 9,245 | 6 |
| Denville | 15,824 | 9 |
| Dover | 18,188 | 7 |
| East Hanover | 11,393 | 5 |
| Flanders | 14,300 | 9 |
| Florham Park | 8,857 | 4 |
| Gillette | 5,362 | 4 |
| Jacksonville | 2,384 | 1 |
| Lake Hiawatha | 793 | 2 |
| Lake Hoptacong | 698 | 1 |
| Landing | 2,374 | 2 |
| Ledgewood | 1,239 | 1 |
| Lincoln Park | 10,980 | 4 |
| Long Valley | 8,777 | 8 |
| Lyonsville | 983 | 1 |
| Madison | 16,522 | 7 |
| Mendham | 5,300 | 6 |
| Mill Brook | 2,420 | 3 |
| Millington | 3,479 | 3 |
| Montiville | 20,773 | 12 |
| Morris Plains | 5,988 | 5 |
| Morristown | 27,980 | 33 |
| Mount Arlington | 3,449 | 2 |

## PRT Station Location and Uses



PRT STATION DESCPRIPTION

- Residential/ Education
- Commercial/ Recreation
- Employment
- Urban Multi-Use

## Major Employment Centers of Morris County

8.  Mack-Cali Business Campus, Parsippany & Hanover Townships

    Tenants:  Deloitte & Touche, Sanyko, Prudential, Cendant, Kraft Foods

Serviced by Morris PRT Station No. 71, Estimated 2,000 trips/day

2. Morris Corporate Center, Parsipanny

    Tenants: AT&T, Aventis, Oracle, Mercedes Benz, AIG Insurance, DeGussa Corp

Serviced by Morris PRT Station No. 59, Estimated 2,500 trips/day

9.  Park Avenue at Morris County, Florham Park

    Tenants: Pricewaterhouse Coopers, Merrill Lynch, Accenture, McKinsey & C0

Serviced by Morris PRT Station S38, Estimated 3,000 trips/day

10. Center at Morris County, Parsippany

    Tenants: The Gale Company, JP Morgan Investments

Service by Morris PRT Station S61, Estimated 800 trips/day

5.Giralda Farms, Madison/ Chatham

    Tenants: Schering-Plough, Wyeth, Maersk, Atlantic Mutual

Servied by Morris PRT Stations S31 and S19, Estimated 800 trips/day per local

11. Montville Business Center, Montille

     Tenants: Amerisource, MCI, Savin, Einstein Moomjy, US JVC Corp

Serviced by Morris PRT Station S89, Estimated 1,000 trips/ day

12. International Trade Center, Mount Olive

     Tenants: BASF, UPS, Federal Express, Seiko, BMW

Serviced by Morris PRT Station S233 and S232, Estimated 2,500 trips/day

# Education Statistics

| COLLEGES | Enrollment | PRT STATION |
|---|---|---|
| County College of Morris | 8,590 | S71 |
| Drew University | 1,558 | S207 |
| Fairleigh Dickinson Univ | 2,690 | S108 |
| College of St. Elizabeth | 1,337 | S42 |

## Secondary Education:

| MUNICPALITY | No Of Students Enrolled |
|---|---|
| Boontown | 616 |
| Brookside | 556 |
| Budd Lake | 734 |
| Butler | 784 |
| Chatham | 715 |
| Chester | 586 |
| Denville | 935 |
| Dover | 564 |
| East Hanover | 962 |
| Flanders | 935 |
| Florham Park | 564 |
| Gillette | 656 |
| Jacksonville | 962 |
| Landing | 683 |
| Ledgewood | 788 |
| Lincoln Park | 1239 |
| Long Valley | 789 |
| Lyonsville | 983 |
| Madison | 1295 |
| Mendham | 1099 |
| Mill Brook | 943 |
| Millington | 1136 |
| Montiville | 1452 |
| Morris Plains | 973 |
| Morristown | 1452 |
| Mount Arlington | 672 |
| Mountain Lakes | 593 |
| Netcong | 782 |
| Parsippanny | 1139 |
| Pompton Plains | 1452 |
| Riverdale | 1347 |
| Randolph | 1423 |
| Rockaway | 1192 |
| Washington | 1019 |
| TOTAL | 122,248 Students |

**The future of PRT in Morris County**
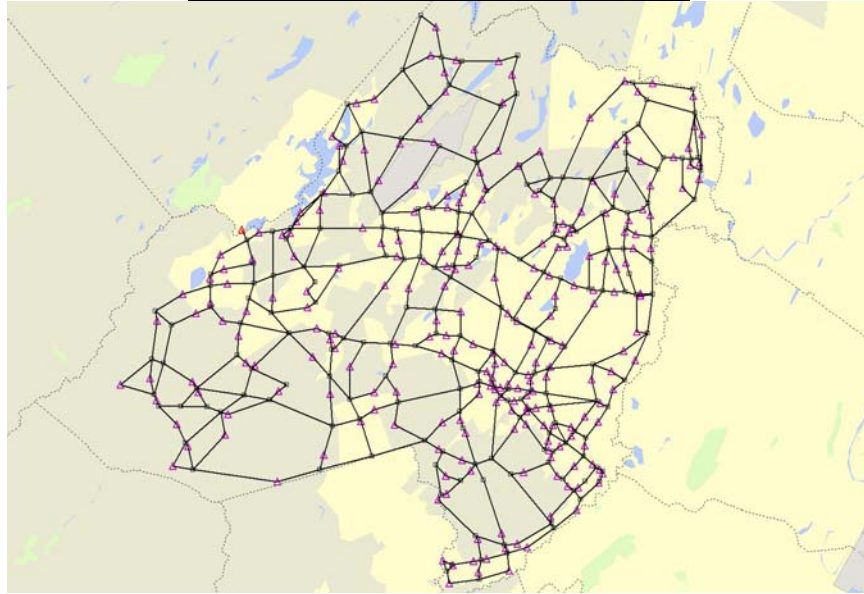


As the Base Model for the Morris County Model is Established, Growth can be easily accommodated through the expansion of the network. Foreseeable developments because of PRT in Morris County are decreased community times, increases in sales revenue at commercial and recreational venues due to increased accessibility.

# Atlantic County

In Atlantic County, we have a bold vision for the future of transportation. With our strong tourism and recreational draw, Atlantic county is a perfect place to utilize the mass transit possibilities of Personal Rapid Transit. PRT will give unparalleled mobility to over a quarter of a million Atlantic County residents, as well as the 35 million vacationers and leisure seekers. In Atlantic County, a huge number of people will be able to utilize the dynamic network of PRT tracks providing access to all of our various recreational attractions, from our world famous boardwalk and Casinos to the our first class golf courses and beautiful national parks.

Atlantic County encompasses 561 square miles has a diverse mix of industries. Employing 119,759 in a variety of industries, most notably casino and resort services, but also in manufacturing and agricultural sectors.

**ROAD MILEAGE**:
State: 6,671 miles
County: 373.23 miles
Garden State Parkway (toll road): 31 miles
Atlantic City Expressway (toll road): 29 miles

Atlantic County has over 7,000 miles of road, with two major toll roads. 791 miles of PRT track would provide access to the same area, a considerable decrease in miles needed. With over 95,004 households, a very large number of home-school, home-work, and home-shopping trips will occur everyday, most likely around a million a day.

Atlantic County has paltry public transportation options. The only universal option is the Atlantic City Line of the New Jersey Transit train system, and this offers no connectivity with New Jersey, going into Pennsylvania before it intersects another transit method. Atlantic County is ripe for PRT, having a large number of visitors from other counties who travel into and out of the county for recreational purposes at an incredibly large rate. For the incredible number of visitors Atlantic County, it is hard to believe that the only method of gaining entrance from New Jersey is taking transit to a different state. Adding the connectivity of PRT with surrounding counties would open up the recreational opportunities of Atlantic County to all of New Jersey.

Our PRT network in Atlantic County had two main focuses in design. The first is our residential areas, with a concentric connected circle layout for tracks. The concentric circles connect to others through in going and outgoing links joining different sized circles and the networks that connect to other circular networks.
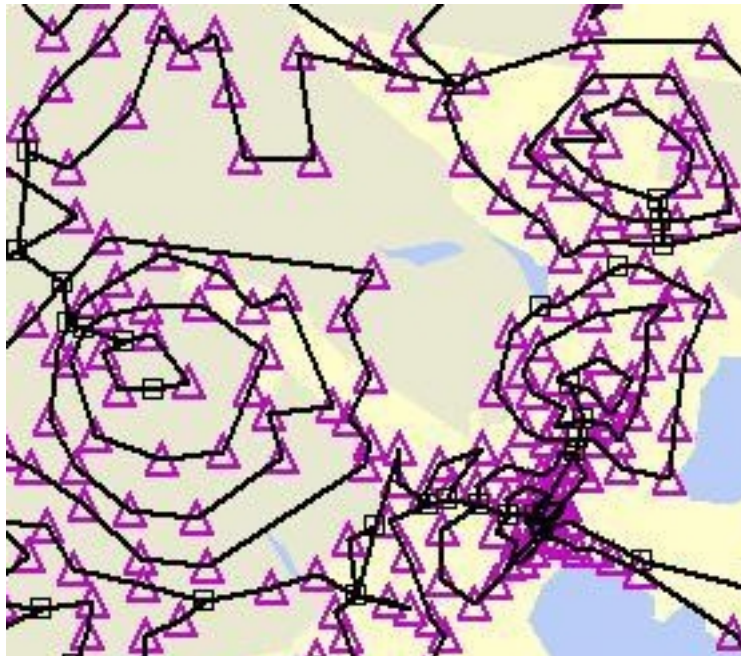
Stations are placed with an emphasis on destinations needed by those who are either very young or very old, with an emphasis on schools, hospitals, and shopping areas.

**HOSPITALS:**
Atlantic City Medical Center, Atlantic City
Atlantic City Medical Center, Mainland Division
Kessler Memorial Hospital, Hammonton
Shore Memorial Hospital, Somers Point
Betty Bacharach Rehabilitation Hospital, Pomona
Children's Seashore House, Atlantic City

**COLLEGES**:
Richard Stockton College, Pomona
Atlantic Cape Community College, Mays Landing

In dense areas, there is always a station ¼ of a mile away. In less dense areas, the station placement can be as far as ½ mile. This network design helps facilitate the movement in a particular township, and between townships.

The second was for Atlantic City itself. Atlantic City is connected through a two pearl necklace strands that are interlinked every few blocks. The PRT network runs in Parallel paths that move in different directions. These paths come together at transfer points where the PRT vehicle can either continue on its path or turn around and go back on the other way. It operates rather like a freeway or expressway that you may have to turn around if your destination is on the other side of the road.

Our selection of stops in Atlantic City included all of the normal desitnations that would be necessary in a residential setting, but also including stops along the boardwalk at the various Casinos and Resorts. Wherever possible, the PRT network is placed on the inland side of a resort to preserve ocean views.
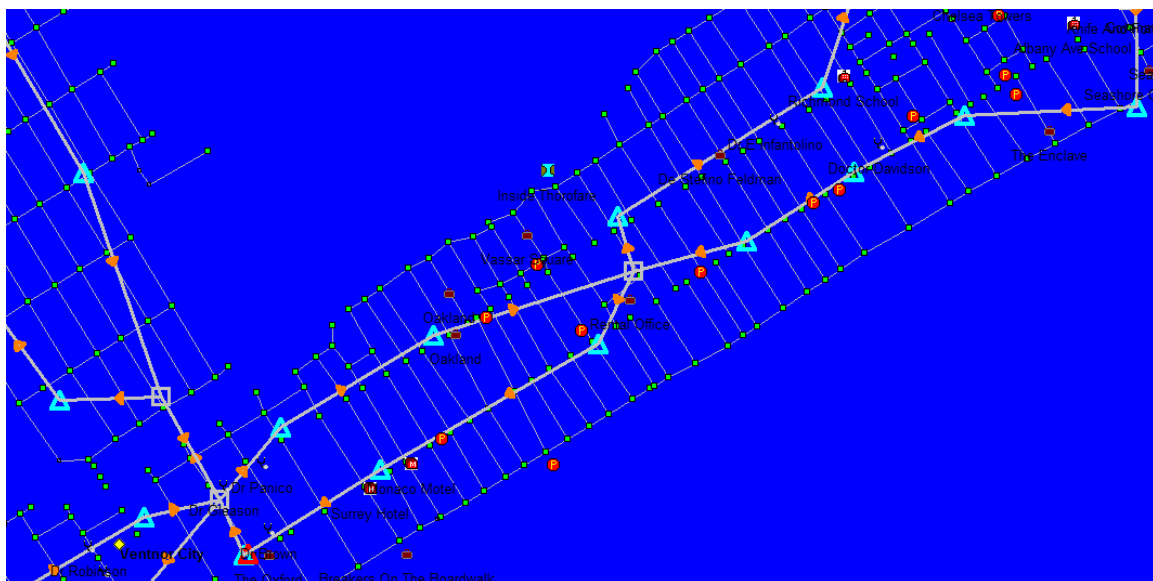
Because of the large number of vacationers coming into Atlantic City, the demand for PRT vehicles will be no higher than in other counties. The extra needed cars that will be needed come from outlying counties, and stay in the city as long as the vacationer does, which is often only for the day. The system works perfectly for Atlantic County, because the county does not need extra vehicle even though it benefits from an incredible increase in accessibility.

As Atlantic County, and Atlantic City tries to reinvent itself as a premiere vacation place, providing an alternative mode of transportation is so important. To increase the number of guests without having to install additional parking, accomadate more day trippers, and make Atlantic City a more easily accessible location for all of New Jersey, PRT is a necessity. In the face of no available public transportation available aside from traveling to Philadelphia, it is difficult to imagine the number of visitors to Atlantic City to increase by a large percentage. Anyone who has been caught in the traffic on the Atlantic City Expressway knows the dire need of Alternative transportation other than a crowded in and outgoing road.

PRT in Atlantic County, when used in conjunction with other county PRT networks, promises to be a boom for the county and a boom for New Jersey as a whole.

## OCEAN COUNTY
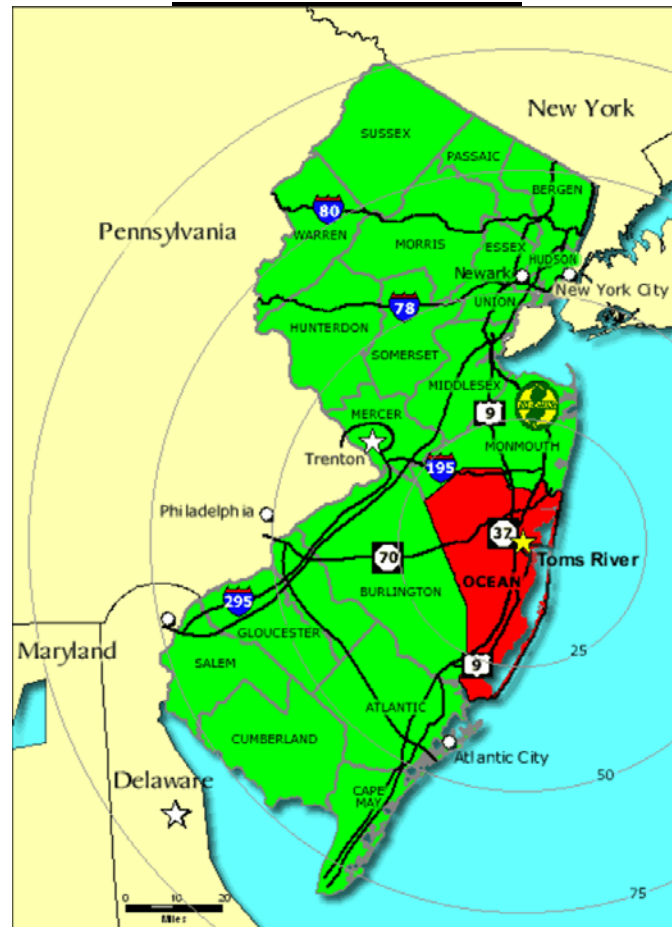


### Land Use

Ocean County is the second largest county in the state of New Jersey. Formerly part of Monmouth County before it was divided into two sections, over the past century Ocean County

has developed into a resort county but still has charming maritime villages like Tuckerton Seaport. It also houses some of the major New Jersey attractions, including the major army base of Fort Dix, Six Flags, Wildlife Safari (a drive-thru animal park), Hurricane Harbor Water Park, and the minor league baseball team of the Lakewood Blueclaws. Today's population is a little over 500,000 in the 33 municipalities. The following chart provides an accurate census taken by the Ocean County government.

### POPULATION – Census 2000

| | |
|---|---|
| Total | 510,916 |
| Male | 242,596 |
| Female | 268,320 |
| Median Age | 41 |
| Persons per Household | 2.55 |
| 2000 Density (Population /Sq. Mi.) | 800.68 |
| | |
| U.S. Census 2002 Population Estimate | 537,065 |
| U.S. Census 2003 Population Estimate | 546,081 |

The 500,000 people include younger citizens that enjoy the close proximity to the nearby urban centers of New York and Philadelphia for their daily commutes. The total number of working citizens is as follows:

### EMPLOYMENT-NJ Department of Labor, 2004

| | |
|---|---|
| 2003 Potential Labor Force | 241,166 |
| 2003 Actual No. Residents Employed | 227,426 |
| 2003 Unemployment Rate | 5.7% |

This census shows that a majority of the work-eligible residents do have jobs. This is the reason for a large number of commuters traveling to their job on a daily basis; to have almost half of the population traveling daily can create large traffic problems. The other citizens are either students or elderly citizens. The chart below shows the distribution of the population by age.

### 2000 Population by Age
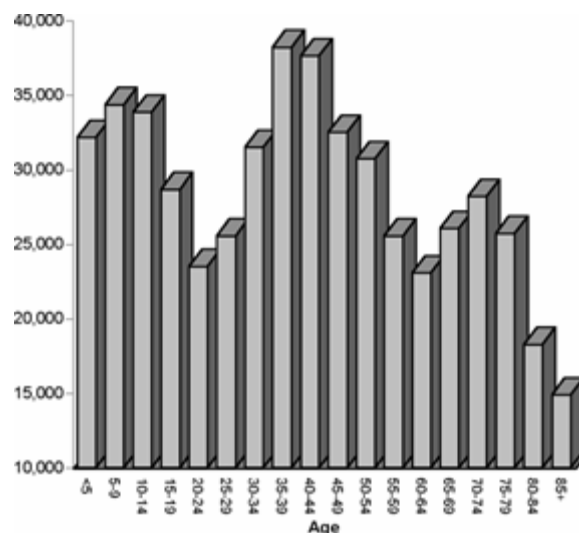
The county also attracts elderly retirees looking to escape the crowded nearby cities and enjoy New Jersey's more relaxed beach culture.

Ocean County has not always been a popular county. It was not until the suburbanization of the 1950s that its population dramatically increased. The following chart portrays the huge influx of permanent residents into Ocean County.

## Population Growth 1930 – 2000
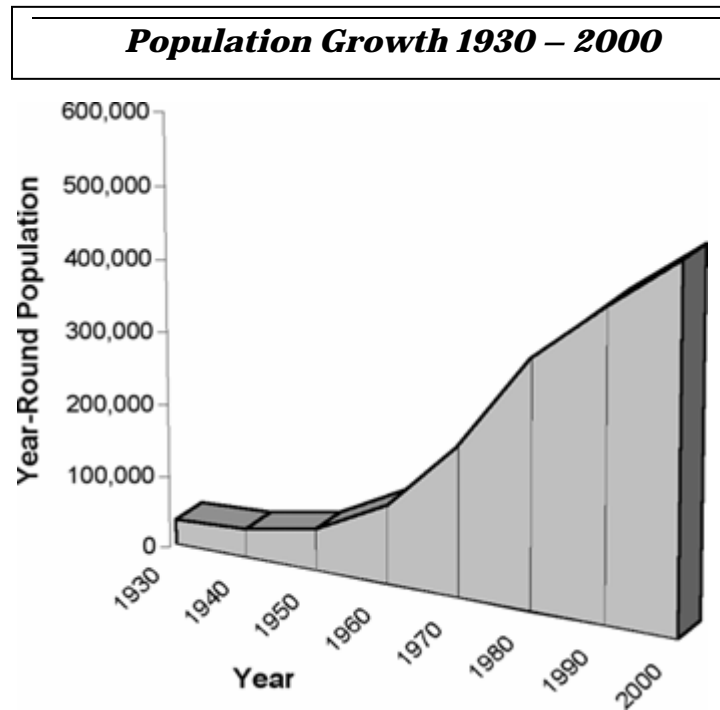


Development of Ocean County first started along the coastal areas and through the corridor of the Garden State Parkway, which runs along the east edge of the county. Major county highways have created some development on east-west corridors from the Garden State Parkway, such as County Highways 526 and 528. The accelerated growth of the population was too fast for the county to match in public transit and road development and construction. Traffic is a huge issue for Ocean County. Our PRT system hopes to solve this problem.

Ocean County Highway System

LEGEND

The increased population has not lead to the very devastating affects of fast development.  State forests and parks protect huge tracts of land.  This will ensure good land development in the future by limiting over-development.  The Forsythe National Wildlife Refuge is also located in Ocean County, encompassing 21,000 acres of land. The total 23 county parks include 4600 acres.

The overall land use of Ocean County can be summarized by the following table from the Ocean County Government website.

| *LAND USE (Parcels):* | __1994__ | __2004__ |
|---|---|---|
| Vacant | 52,687 | 36,513 |
| Residential | 191,608 | 224,167 |
| Farm Regular | 288 | 265 |
| Farm Qualified | 468 | 501 |
| Commercial | 5,817 | 6,160 |
| Industrial | 456 | 406 |
| Apartment | 378 | 373 |
| Communications Equipment | n/a | 41 |
| Exempt total | 18,859 | 15,782 |
| **Total Ratables & Exempt** | **270,561** | **284,208** |

From this it is obvious that a large portion of the land is residential; thus, Ocean County has plenty of residents that must travel on a daily basis, whether to work, shopping, recreational activities, or any other attractions.

**Description of Transit Service in the County**

Ocean County relies almost completely on its extensive system of motor vehicle highways to transport visitors and residents throughout the county. It is not known for its public

transport system. In fact, when visitors look into going to Ocean County they are always told to have a car or rent one because public transportation is so limited. Ocean County is also a major proponent of MOM Rail Service, a new project underway to serve Monmouth, Ocean, and Middlesex Counties. These three counties, labeled the tri-county area, have all experienced incredible increases in their populations in the last 30 years. However, they are poorly located for commuter travel to New York and Philadelphia. Located in a hole in the NJ Transit system, residents cannot make use of any of the major rail lines. And the bus and highway system are inefficient for the large numbers of commuters traveling outside their home county. MOM is a mass transit system that has multiple rail routes to provide transportation along heavily trafficked corridors and popular commute routes to both job and entertainment attractions such as parks and malls.

## Description of PRT Network in Ocean County
### Size and coverage of the network

The PRT network we created for Ocean County services all residential and business areas, from the beach resorts on the east to Fort Dix and other less densely populated communities on the west. We have made sure that within each community the PRT network stations are within a quarter of a mile of every potential trip production and attraction. For example, Point Pleasant Beach is a resort community; however, besides having hotels along the beach, there are also amusement parks, restaurants, museums, galleries, shops, hospitals, and schools that need to be served by a transport network. At the moment the hotels along the beach offer complimentary shuttle services to transport its visitors from the beach to the downtown area. Obviously, there already exists a need for a transportation service throughout Pt. Pleasant Beach for its visitors. If our PRT network were included in the Pt. Pleasant Beach community, both residents and visitors would be served. It could replace alternative transport systems that take people from the beach to downtown and vice versa.

### Service to Employment

Most residents of Ocean County travel outside of the region for work. The table below shows the number of Ocean County residents that travel to work in 2000 and the distribution of their travel times.

Not only has the number of working residents increased in the last ten years (as shown in the graph of population growth over time) but also the mean travel time to work has increased by about six minutes since 1990 (shown in the right-hand column of the above table). Ocean County residents need a more efficient mode of transportation to work.

The MOM passenger rail service that Ocean is looking to install is all a part of the huge transportation initiative Ocean County has started. The two local areas of attraction for job opportunities are Trenton to the west and Monmouth County to the northeast. There is also a huge movement of Ocean County residents to New York and Philadelphia. The MOM rail service looks to provide transport to the NJ Transit Northeast Corridor line to expedite this process. Job opportunities within the county have also been increasing dramatically within the last decade. For example, with the influx of residents the health care industry has matched the demand, thus providing more jobs with its own growth.

A PRT network could satisfy both transit sectors unlike the MOM passenger rail, which would only provide efficient long distance service, not local service. With the one-way tracks our PRT network efficiently moves users to their destination. Although it may appear to have

circuitous routes, the travel time is much less with its diverse number of routes and computer-operated pods.

**Service to Shopping**

As stated above, a majority of the shopping in Ocean County is not located right on the beach where most people visit. There is a great need for east-west movement of those busy shoppers. In our PRT network we have created multiple east-west routes that effectively transfer the population between the two areas. Also, there are not as many large settlements in the western or southern areas of Ocean County because of state forests and farming and such. People who live in those areas want to go to larger city centers for their shopping needs. The PRT network services these people, as well, moving them along fairly direct routes from rural to more suburban areas.

**Service to Recreation**

Ocean County has multiple recreational attractions, from small minigolf courses along the beach to large amusement parks like Six Flags in the west, state parks, water sport attractions, and multiple other recreational venues. People of all ages want to experience various recreational activities, and they would like to get there quickly and easily. The PRT network we created has service to specific recreational attractions or station locations very near. Visitors to the attractions would not be disappointed by travel time or long pedestrian commutes. By locating our stations effectively and by hand we have eliminated long pedestrian commutes.

**Service to Education**

We did not create the Ocean County PRT system purely for visitor use. Our main focus was on those that live there permanently. By servicing the local permanent resident households we also have to service numerous school children. All of the schools within Ocean County are conveniently located near a PRT station. We felt that it was crucial to limit the walking time of students from the PRT stations for safety and security purposes, as well as overall convenience. Parents should feel comfortable allowing their children to use the PRT system for school commutes in place of the traditional bus. This will also limit the travel time of the adults. Instead of making the two-way journey to school and back twice a day, their child now can make that journey only once a day.

**Service to Housing**

The PRT network for Ocean County has stations located in or near residential communities. Some houses had to be left out of the network, as in they are not within walking distance, but they are still nearby PRT stations and can be easily accessed by car. We chose to eliminate some areas because it would not be cost-effective to put stations there. The PRT network still serves a majority of the population even though it may not be all of Ocean County. Most homeowners will be satisfied by the transit system. It can effectively take them to other housing areas, the beach, shopping, and other trip attractions.

## Summary of PRT Network for Ocean County

**Size and coverage of the network**

The PRT network for Ocean County services most trip productions and attractions with 1000 stations and 1000 railway intersections. The total track for Ocean County is about 500 miles. We estimate that our PRT system can serve about ninety percent of the population. We believe that with our system we can take passengers from any origin to any destination.

POSSIBLE ATTRACTIONS in OCEAN COUNTY

| | |
|---|---|
| Albert Music Hall | Lakehurst Naval Air Warfare Center |
| Barnegat Bay Decoy & Baymen's Museum, Inc. | Navy Lakehurst Historical Society |
| Barnegat Light House | Ocean County Artist Guild |
| Black Beard's Cave | Ocean County Carousel of Music |
| Black Whale Cruises | Ocean County College |
| Blast Fun Park | Ocean County Historical Society |
| Brick Township History | Ocean County Historical Society at Monmouth Collage |
| Brookville Boy Scout Camp | Point Pleasant History Site |
| Casino Pier and Waterworks | Popcorn Park Zoo |
| Cooper Environmental Center | The River Lady, Riverboat Tours |
| Fantasy Island Amusement Park | Robert J. Novins Planetarium |
| Forked River Mountains Coalition | Six Flags Great Adventure |
| Fun Town Pier | Strand Theater |
| Garden State Philharmonic Orchestra | Surflight Theatre |
| Gateway to the Jacques Cousteau National Estuarine Research Reserve | Toms River Seaport Society |
| Georgian Court College | Tuckerton Seaport |
| Island Beach State Park | Wells Mills County Park |
| Jenkinson's Aquarium & Boardwalk | |

# Somerset County

| Somerset County, New Jersey (21 Subdivisions) | | | |
|---|---|---|---|
| Population: | **297,490** | Land Area: | **304.69** miles$^2$ |
| Housing Units: | **112,023** | Water Area: | **0.36** miles$^2$ |
| State: | **New Jersey** | Total Area: | **305.05** miles$^2$ |
| | | Population Density: | **976.38** [*] |
| | | Housing Density: | **367.67** [*] |

## Overview

As one of the oldest counties in New Jersey, Somerset is found in the center of New Jersey and its diverse geographical, developmental, and social qualities act like a hub for the rest of the state. Established in 1688, the historical significance can be found in many towns, and as a result the county draws a large number of visitors from surrounding locations.
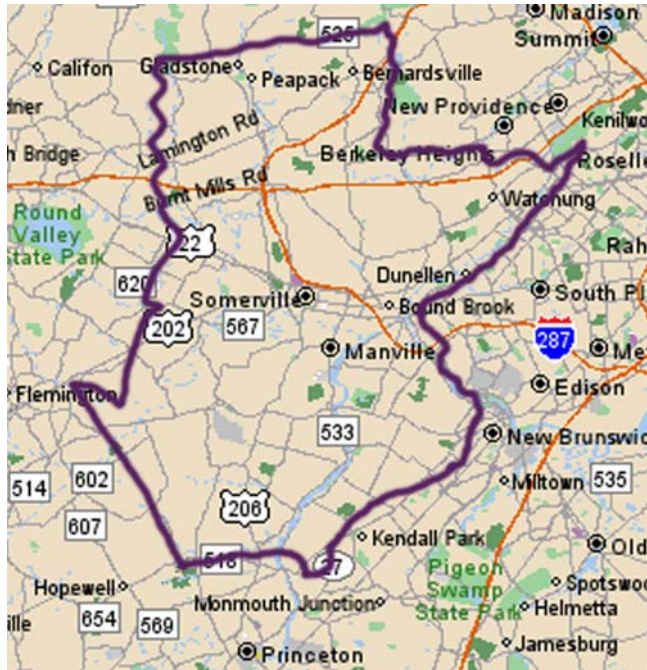
The county has an estimated population of slightly over 300,000, and is divided into 21 municipalities. Somerset is especially noted for its "fine residential communities, beautiful parks, excellent shopping areas, extensive farmlands, numerous historic sites and outstanding business and industry," causing it to be one of the fasting growing counties in the state. Somerset balances a mix of urban/suburban communities and rural landscapes which creates varied educational, commercial, and recreational opportunities. Through its Agricultural Development Program, the county has preserved more than 20,000 acres of farmland and open space, and holds environmental preservation as one of its top priorities.

### Public Transit Services



For residents of Somerset county, the average trip to work is 30.1 one minutes. Residents use a variety of means of transportation. The New Jersey Transit train system services the counties adjacent to Somerset, and an extensive network of highways and roads connect the county. In addition there are public buses which run routes throughout towns in the county that currently help local residents get from one place to another.

### Somerset PRT Design Structure
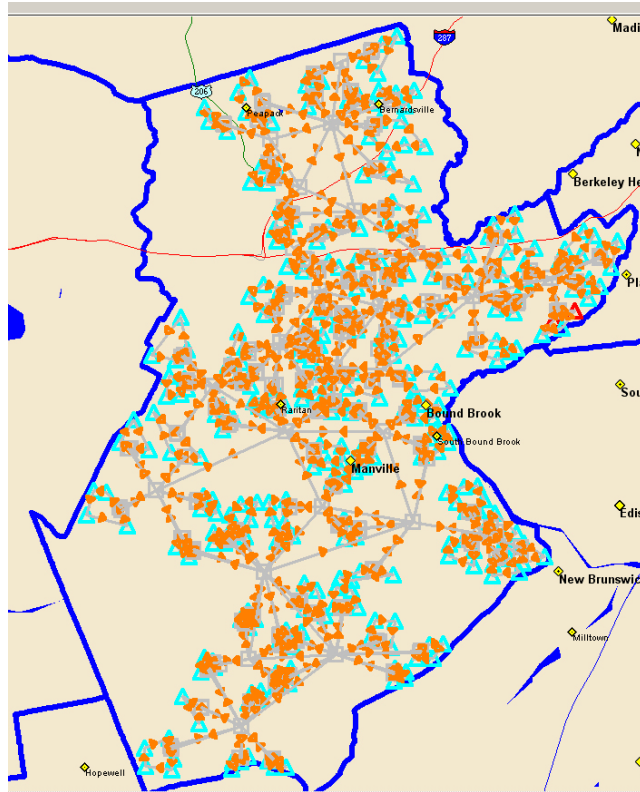
From a geographic standpoint, Somerset is quite typical of New Jersey. The county is made up of groups of suburban areas, separated by large amounts of land in between. In my estimation, there are a variety of formats to design the PRT system based on the type of county structure. For instance, in a continuous suburban and commercial area (without large stretches of unused land), such as in southern California, a PRT system would be best set up by having a grid that allowed the user to travel to any point, without having to waste stations on unused land. Some sort of a circular network with concentric circles would probably be the best method to direct flow. In sharp contrast, a rural setting would feature spread out stations that were connected in a very large grid. This would allow users to travel between cities by the most direct route.
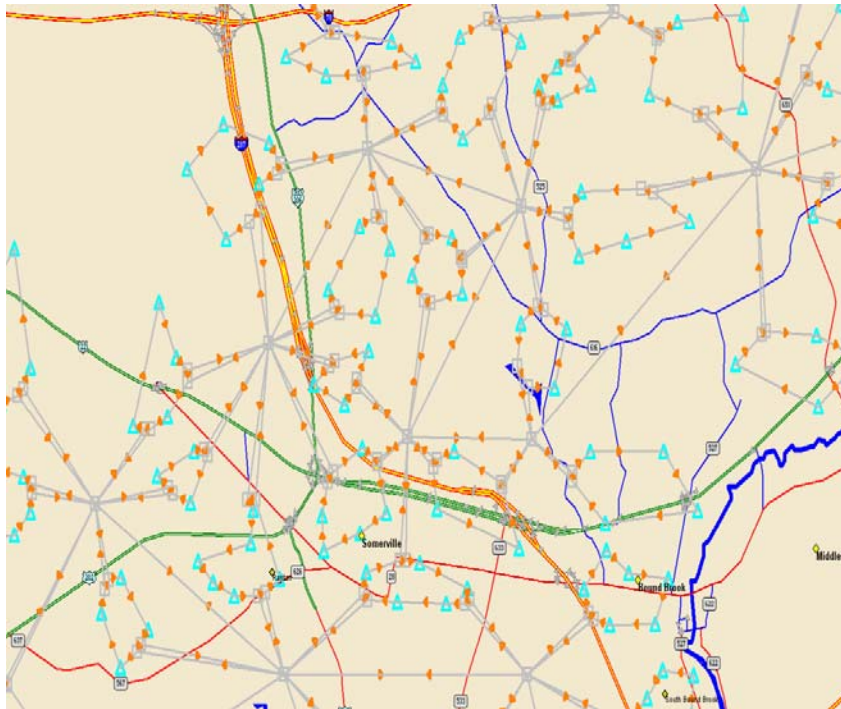
In Somerset, however, we face a combination of the two. We are looking at small suburban and commercial areas, separated by unused land, and thus the best method is a combination of circular networks combined with a "hub and spoke" technique. Around smaller, local towns, such as in the southern part of Somerset, we've created circular nodes. This allows users to travel between different locations in the town. Such a system is advantageous for people who wish to travel within the local area only, such as to run local errands. If the network were configured differently, it would be likely that someone who wished to travel a mile in one direction might have to travel several miles in the opposite direction to successfully come to the correct point. The existence of small circular networks ensures that it is easy for people to travel locally easily and quickly.
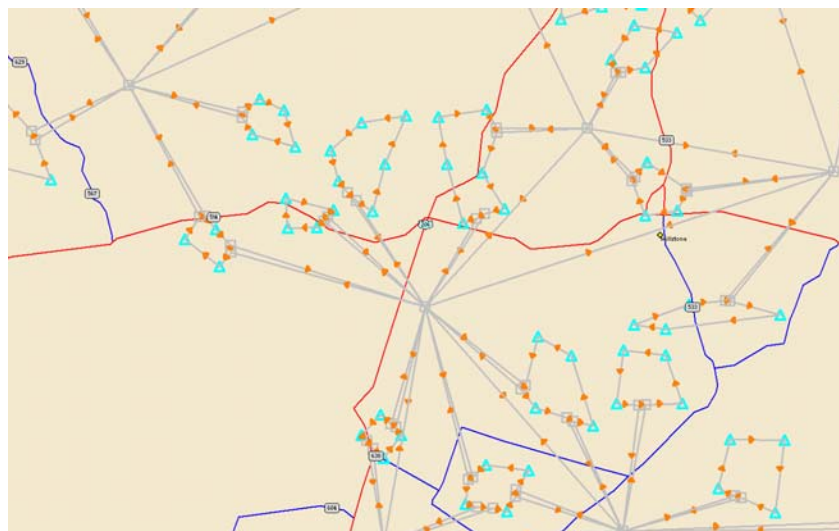
The stations within each circle are strategically located near shopping centers and in the middle of major residential areas.  In general, we've tried to keep the stations from interfering with the existing infrastructure of the county, such as not placing stations where buildings are located when at all possible. In addition, the PRT exists as a competition to the existing road system, rather than replaces it. In order for a PRT system to be created, it would need to offer an alternate means of travel, still allowing individuals to use their old methods of mobility.

Connecting each of these local circles is a system of hubs and spokes. It allows the separated suburban and commercial communities to act like individual points, which can allow individuals to travel across the entire county by the quickest route, by going through the minimal number of interchanges and stations. This means that if someone in southern Somerset were trying to travel to northern Somerset, he would travel on the local circle of stations in southern Somerset until he was in a position to travel north. Then he would go from hub to hub until he arrived at the local circle in northern Somerset, at which point he could travel around the circle to a more precise station.

The hub-spoke structure also links up well with the surrounding counties. Somerset is bordered on the east by New Brunswick, which is a large city that will require a large network of stations. There will be a smooth transition between the PRT network of Somerset county and that in New Brunswick where the spoke-hub system is gradually converted into a more efficient grid for high density areas. In addition, there are many other points on the county border where the Somerset system will have to be integrated to other counties. Both the local circular networks and the hubs will interact between neighboring counties.

### PRT Service to Housing

Based on population densities, we estimate that the PRT network will be able to service about 80%-95% of the residential community. More stations in the area could be constructed to fill the demand in the rural areas of Somerset, but it would be costly with little return. With 573 stations throughout the county, the average population per station is 539.3.

### PRT Service to Employment

The PRT system is set up specifically to bring people from their residential communities to work every day. The spoke-hub network has been built so that the three largest working cities, Somerset, Somerville, and Bound Brook can be easily accessed by the residential areas. Specifically circular nodes have been placed surrounding the cities, which are directly linked to the local hub network.

### PRT Service to Recreation

We envision that the PRT network will provide access to recreational activities throughout the county. Below is a map of the movie theatres throughout Somerset:
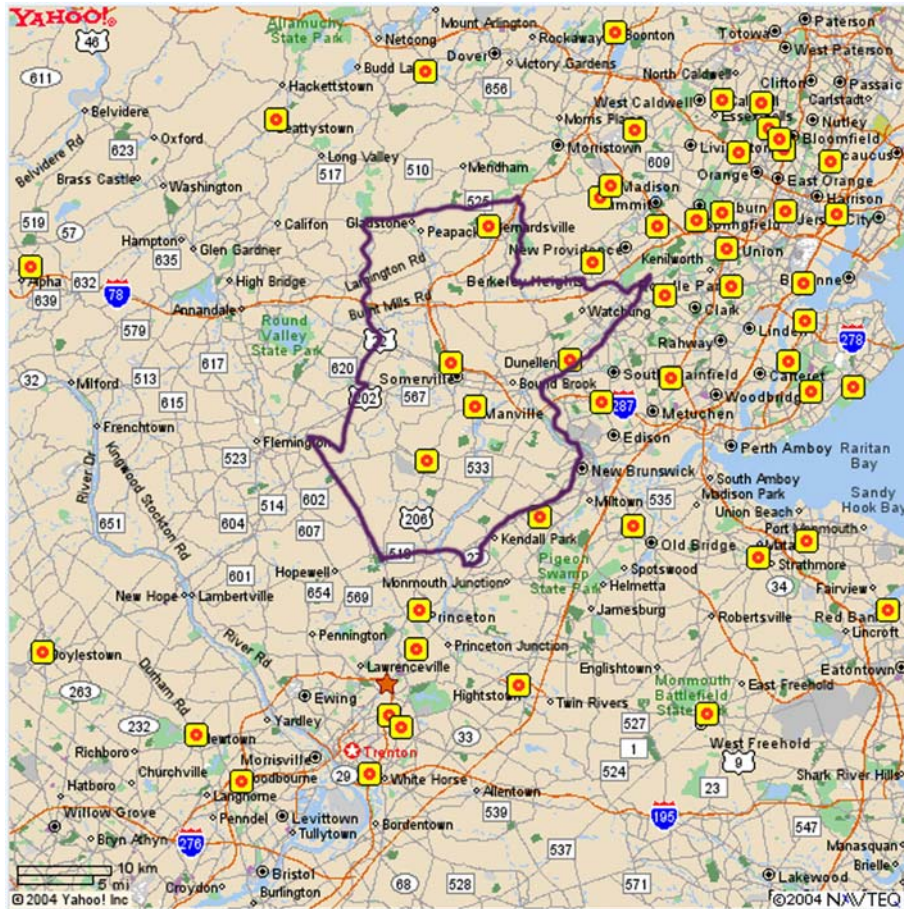
In addition to placing stations near movie theaters, we've also placed them in key social areas, where there is nightlife. We hope that such a system will decrease the number of drunk-driving accidents.


## PRT Service to Education


With only one community college in the county, we've taken special care to design the PRT system to route students easily to the county college. In addition there six libraries throughout the county shown below:

The PRT system in Somerset has been designed so that stations are located next to each of these libraries, allowing users to get there with ease.
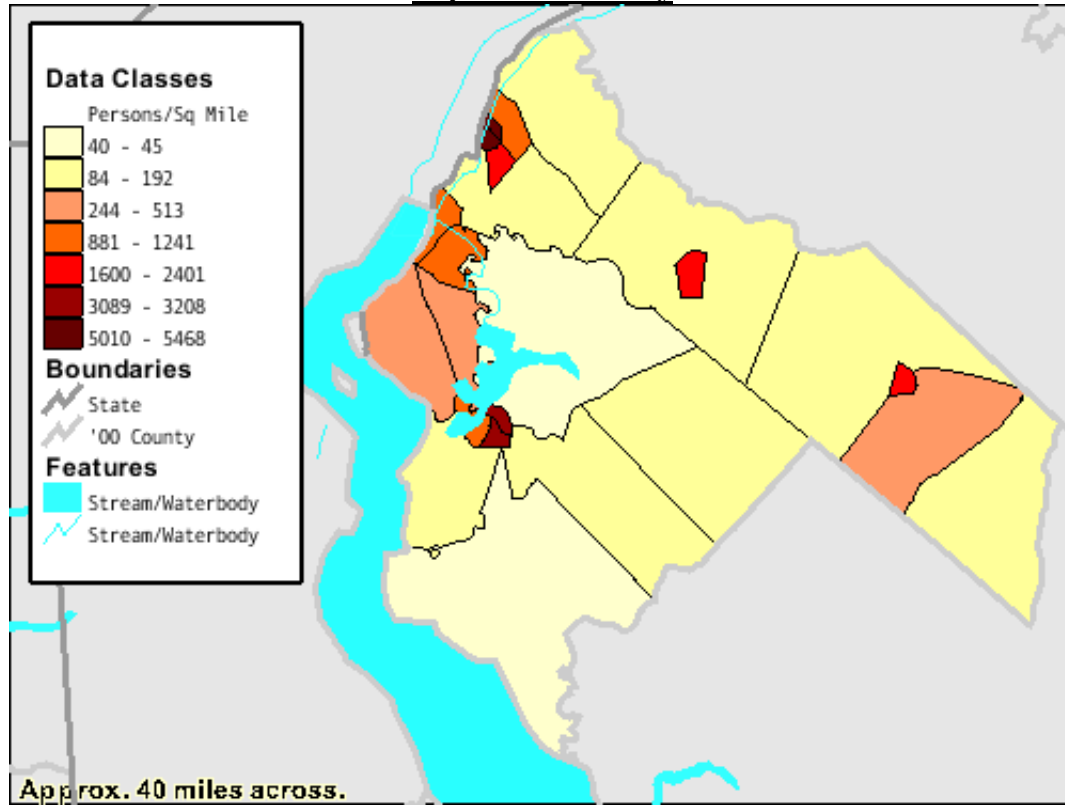
## Salem County
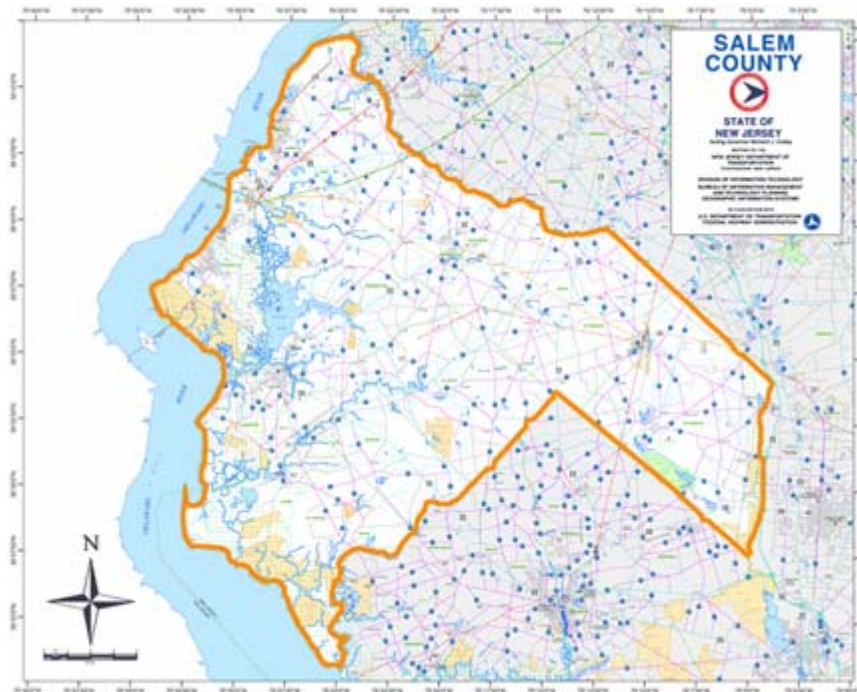
## Land Use

Salem is slightly smaller than the average county in New Jersey, encompassing 338 square miles. But, with less sixty-five thousand people, Salem is the least densely populated county in New Jersey. Consequently, the majority of Salem's South-Eastern half is rural and farmable land. The North-Western half, along the coast, is the most rural area. Wilmington, DE is less than fifteen miles away, Philadelphia, PA is within thirty-five miles and Atlantic city is sixty-five miles south. In addition, Salem is the oldest county in New Jersey, and is the home of many historical attractions.

## Population Density



**Data Classes**

Persons/Sq Mile
- 40 - 45
- 84 - 192
- 244 - 513
- 881 - 1241
- 1600 - 2401
- 3089 - 3208
- 5010 - 5468

**Boundaries**
- State
- '00 County

**Features**
- Stream/Waterbody
- Stream/Waterbody

Approx. 40 miles across.

## Transit System

The current transit system is very dependant on individual car travel, and the infrastructure illustrates this. This is a result of a low-density population distribution, which does not warrant profits for statewide public transportation of the traditional sort. There are only two New Jersey Transit busses that service the area (#401 & #468). The travel time distribution reflects the agrarian, farmer based employment that is the norm in the western half of the state. It is also noteworthy that a large portion of the non-farming employed work across the river in Delaware or in Philadelphia, and the majority of their commute takes place outside of Salem county.

# Highway Infrastructure



# Travel Time Distribution
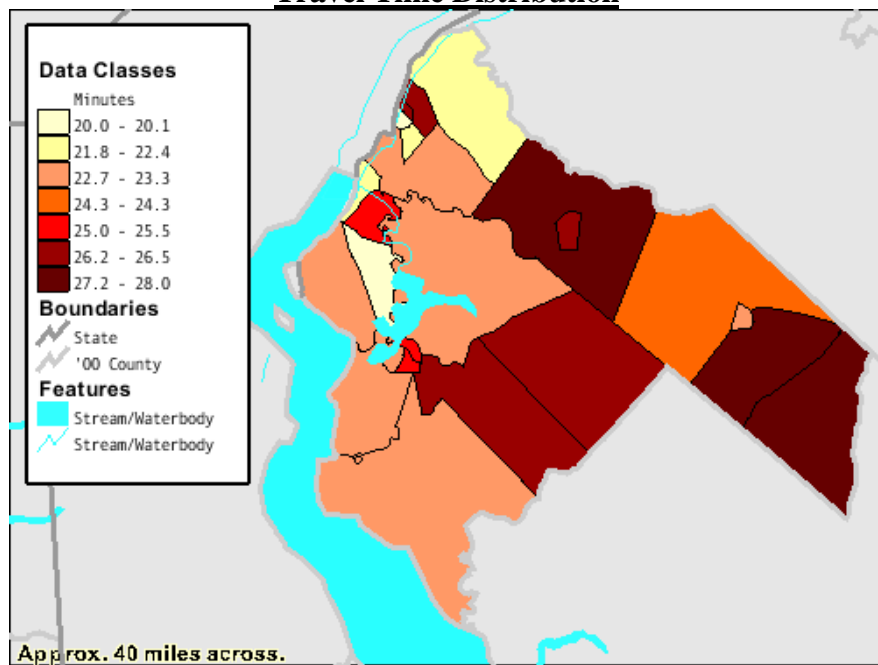
## PRT Network Coverage

The Salem PRT network consists of less than 300 stations and interchanges, reflecting the rural nature of the county. The majority of the stations are located on the west coast, in the urban areas of Salem and Pennington. Nonetheless, the spread-out network of the rural East is connected to the dense PRT network of the West so that travel across the county is extremely easy. There is also a line along the Delaware Memorial Bridge which facilitates the out of state commuters. The tracks are all one-way, in order to completely rule out traffic and congestion issues, but are nonetheless completely interconnected, allowing a traveler to get to any station from any other in the network.

## Service to Employers

The PRT network services all the largest employers in Salem County. The DuPont and PSE&G power plants, as well as the Mannington Paper Mill are all easily accessible via PRT. The Memorial Hospital is also included in the network.

## Major Employers

| | | | |
|---|---|---|---|
| PSEG | 1,965 | SalemCare | 130 |
| E.I. duPont | 1,450 | Woodstown National Bank | 130 |
| Mannington Mills | 860 | Walt's Bus Service | 130 |
| Memorial Hospital of Salem County | 800 | PSEG Nuclear Training | 114 |
| Conectiv | 529 | SJ Transportation Co | 80 |
| Anchor Glass | 361 | Cumberland Dairy | 80 |
| SJ Hospital Systems-Elmer | 350 | Unico Services | 77 |
| The GEON Company | 200 | Spark's Electric, Inc | 75 |
| B & B Poultry | 168 | First National Bank of Elmer | 69 |
| Ganes Chemicals | 155 | PG&E Generating | 66 |
| Ranch Hope | 145 | MAC Specialty Coatings | 58 |
| Wire-Pro, Inc | 130 | Franklin Savings Bank | 55 |

## Service to Education

Salem County has fifteen school districts, eighteen elementary schools, five middle schools, six high schools and two colleges. The PRT network services all the high schools and the colleges. While the schools for younger students are easily accessible because of their proximity to residential areas, it is expected that the majority of youth travelers will be of high school age. For students who are not old enough to drive, but old enough to travel by public transit, this will eliminate the need for their parents to make numerous commutes every morning and afternoon.

## Educational Institutions

Colleges:
Salem Community College
Salem County Technical Institute

High Schools:
Salem County Tech
Penns Grove High School
Pennsville Memorial High School
Salem High School
Schalick High School
Woodstown High School

## Service to Residential Areas

Urban residents will find that the PRT network completely covers their residential areas, allowing them to walk to a nearby station and take it all the way to work, as opposed to driving to a public transportation stop, parking and driving back at night.

## Service to Commercial Areas

The commercial areas of Salem County are generally located in the urban North-West. There are farmer's markets as well spread out along the country side on the East. All of these major commercial areas, from the Cowtown flea market to the Mall in Pennington are accessible via PRT. This allows residents of the rural areas to easily travel into the city, make their purchases and return home without the hassle of driving and parking a car or waiting for the infrequent busses.

## Service to Recreation

The PRT network connects the vast majority of recreational areas. Some of the more prominent ones are the Fort Mott State park and the theatres of Salem County. Fort Mott State Park is 104 acres along the Delaware River, and surrounds the 100-year-old fort and Finn's Point National Cemetery is nearby. The Appel Farm and Music Center is an arts center that provider 35,000 people, adults and children alike, annually with arts education, concerts and exhibits. The Davidow Theatre at Salem County Community College hosts ballets, plays, musical and concerts as well, in addition to the Oakwood Summer Theatre which presents shows in July and august.

## Major Recreational Areas

Appel Farms Arts & Music Center
Cowtown Rodeo and Cowtown Flea Market
Davidow Theater
Finns Point Lighthouse
Oakwood Summer Theater
YMCA of Salem County
Penn Bowl, Pennsville
Wood Lanes Bowling Center, Woodstown

Marinas:
Penn Salem Marina, Salem

Salem Boat Exchange, Salem

Golf Courses:
Centerton Golf Club
Holly Hills Golf Club
Ron Jaworski's Wild Oaks Country Club

Parks:
Camp Crocket Country Park
Fort Mott State Park
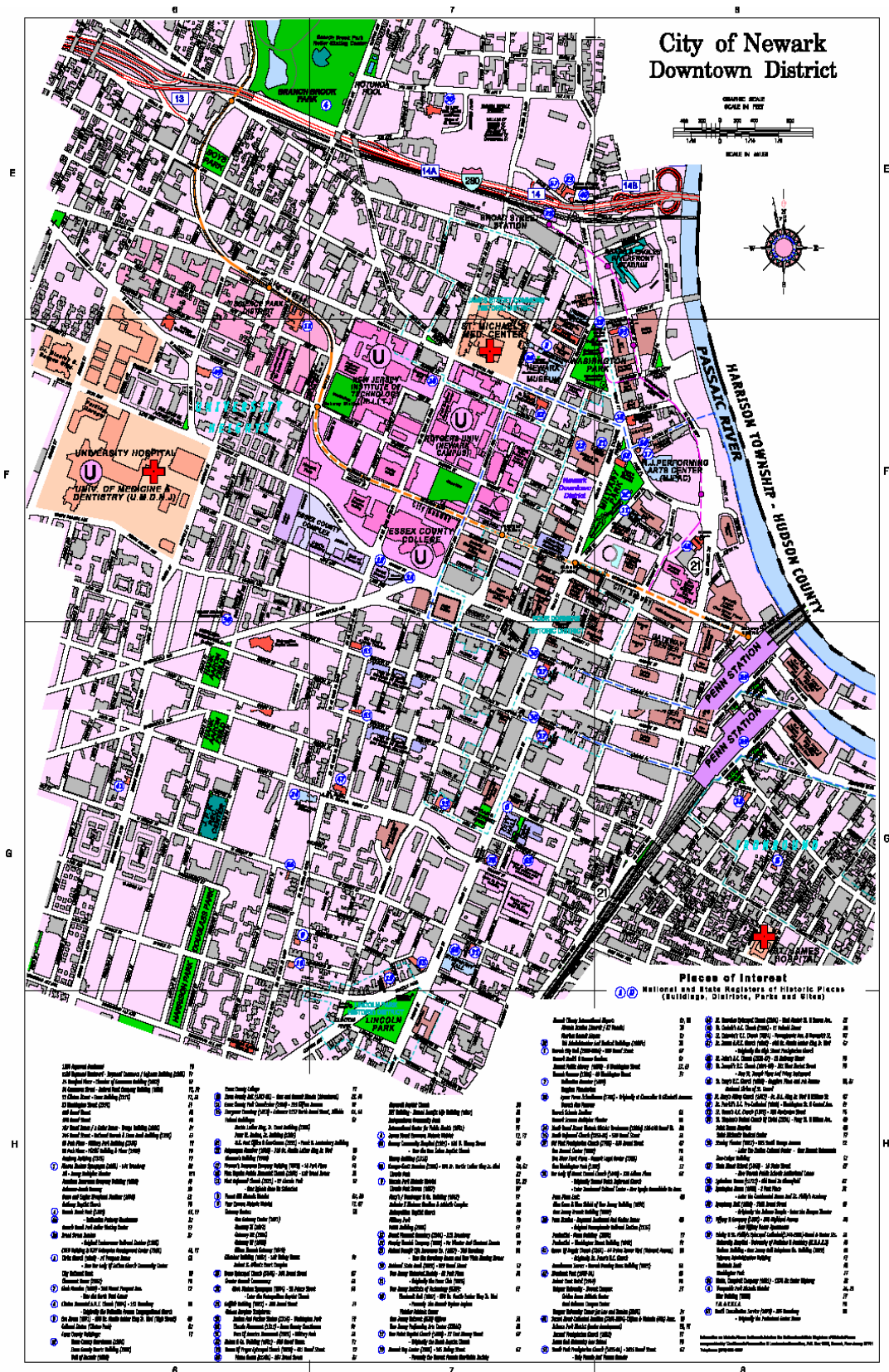New Jersey Coastal Heritage Trail

# Essex County

## Land Use

Essex county has a total population of 793,633 people.  Its total area is 126 square miles and the population density is 6285.4 people per square mile.
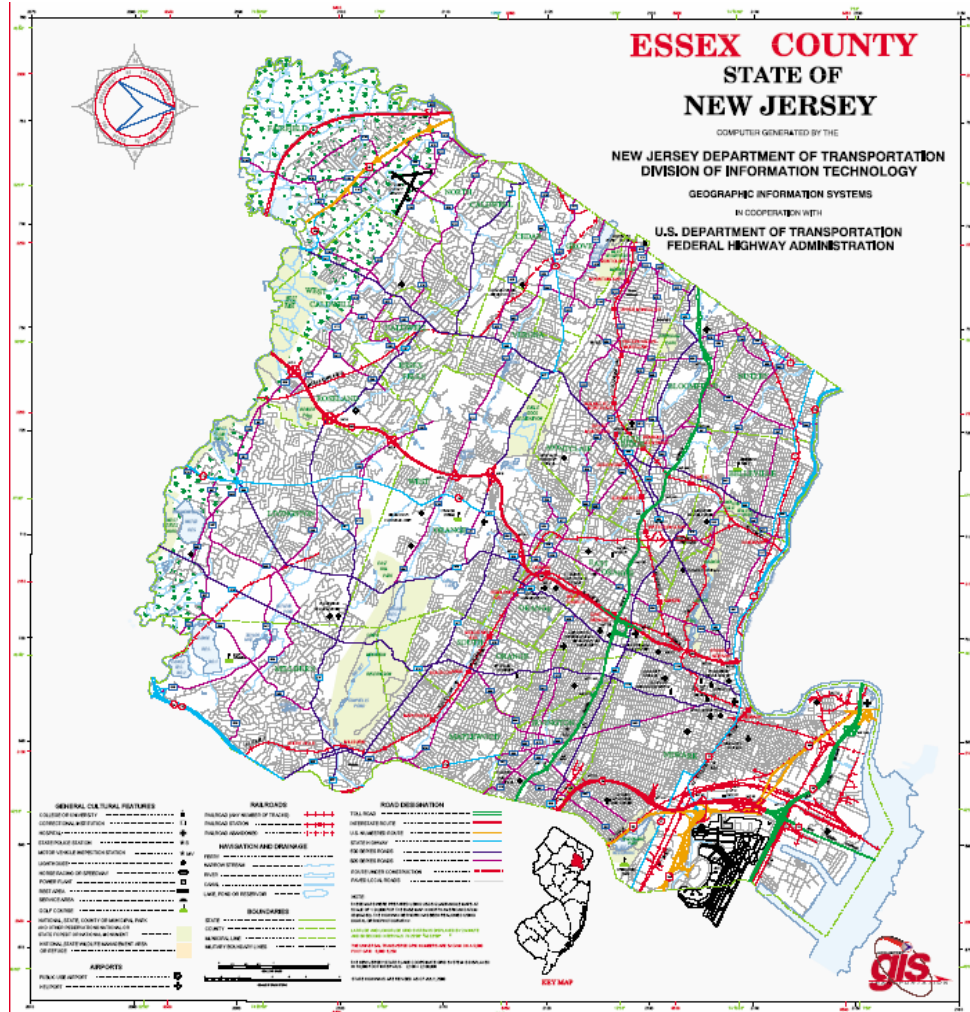


Essex county is the home of the city of Newark.  Newark has a population of 273,546 people and a total land area of 23.8 square miles.

City of Newark Downtown District

**Existing Transportation System**

The primary forms of transportation in Essex and personal vehicles. NJ Transit serves Essex county with two lines – the Morristown line which travels through the southern portion of Essex county and the Montclair Boonton line which travels from the southeast to the north. However, transportation through Essex county is dominated by personal vehicles with 73.5% of the work force commuting to work by car and just 18.6% using public transportation.

**NJ Transit Lines**
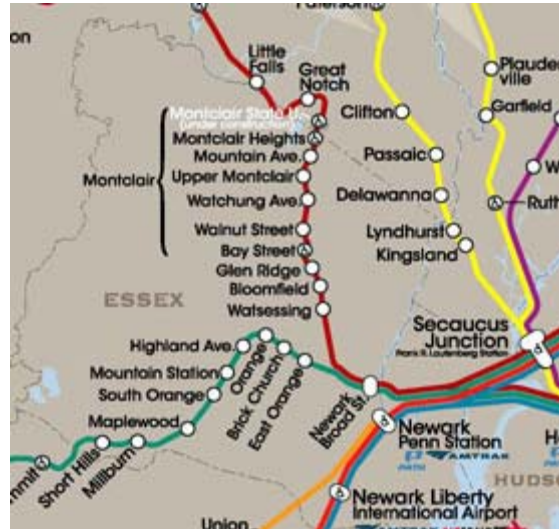


Newark is served by a City Subway system (shown below), which links residents in the north as well as in nearby suburbs. It is centered on Newark Penn Station, which is the largest transportation terminal in the state. Other major lines in Newark include the Air Train which provides service between Newark Liberty International Airport, terminals and NJ Transit trains. There are also numerous NJ Transit bus routes throughout Newark. Newark Liberty International Airport serves 37 airlines, making 300,000 flights, which amounts to 30 million passengers a year.

**NJ Transit – Newark**

## Description of PRT Network
### Size and Coverage of the network

The PRT network consists of 766 stations and interchanges. The total length of the guide way is 357.52 miles. A grid like pattern was used around dense urban areas such as Newark. While a loop structure was used in less dense areas.
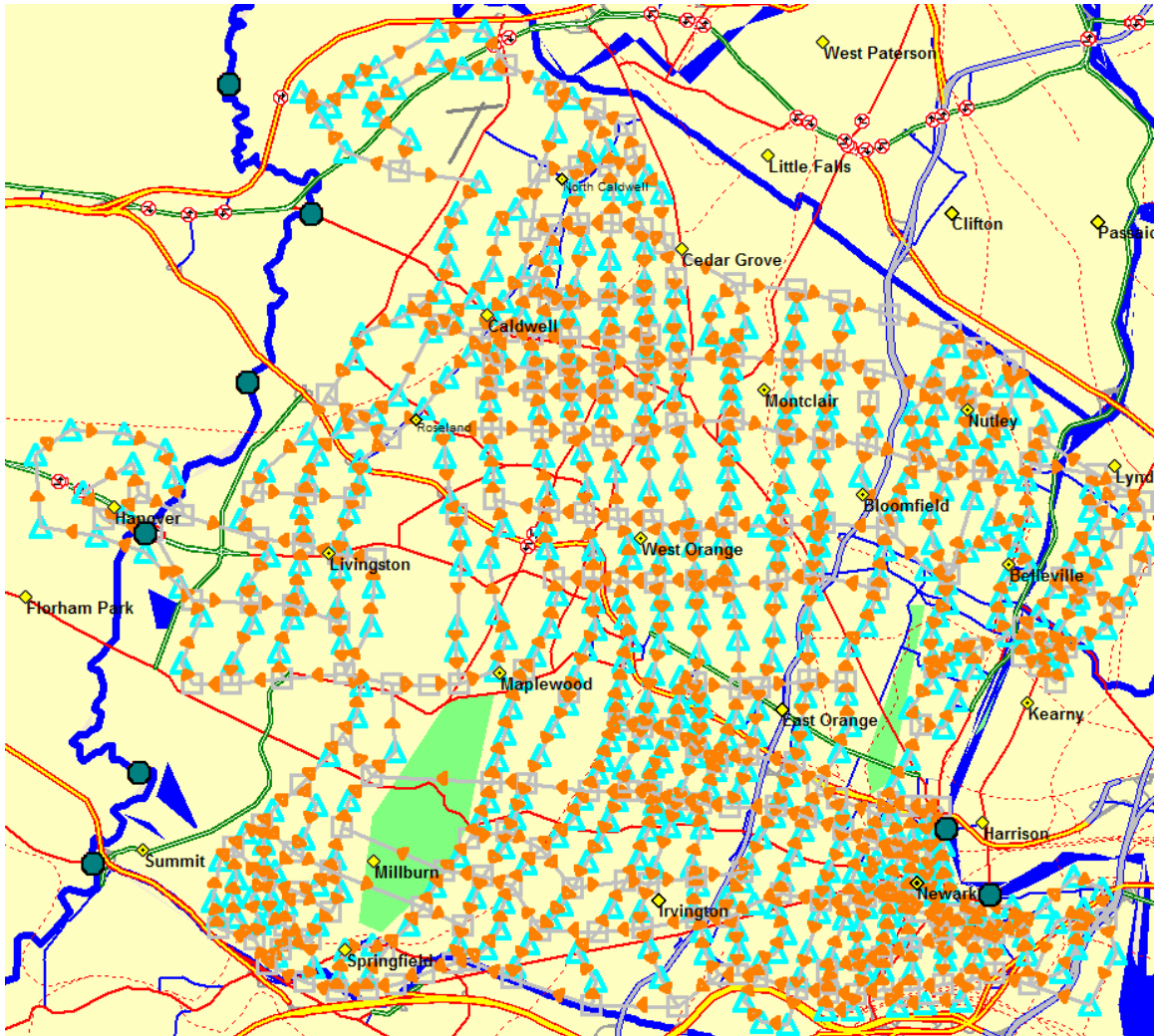
## Service to Employment

Employers are scattered throughout Essex county and the primary form of transportation in by personal vehicle. The total work force includes 370,939 people. The mean travel time to work is 31.2 minutes. This would be significantly decreased by using a PRT network.

| EMPLOYMENT STATUS | | |
|---|---|---|
| Population 16 years and over . . . . . . . . . . . . | 608,592 | 100.0 |
| In labor force . . . . . . . . . . . . . . . . . . . . . . . . . | 370,939 | 61.0 |
| Civilian labor force. . . . . . . . . . . . . . . . . . . . . . . | 370,810 | 60.9 |
| Employed . . . . . . . . . . . . . . . . . . . . . . . . . | 336,390 | 55.3 |
| Unemployed . . . . . . . . . . . . . . . . . . . . . . . . | 34,420 | 5.7 |
| Percent of civilian labor force . . . . . . . . . . . | 9.3 | (X) |
| Armed Forces. . . . . . . . . . . . . . . . . . . . . . . . . . . | 129 | - |
| Not in labor force. . . . . . . . . . . . . . . . . . . . . . . . | 237,653 | 39.0 |
| Females 16 years and over . . . . . . . . . . . . . | 326,401 | 100.0 |
| In labor force . . . . . . . . . . . . . . . . . . . . . . . . . | 183,594 | 56.2 |
| Civilian labor force. . . . . . . . . . . . . . . . . . . . . . . | 183,561 | 56.2 |
| Employed . . . . . . . . . . . . . . . . . . . . . . . . . | 166,740 | 51.1 |
| Own children under 6 years. . . . . . . . . . . . . | 63,704 | 100.0 |
| All parents in family in labor force . . . . . . . . . . . . . | 37,505 | 58.9 |
| COMMUTING TO WORK | | |
| Workers 16 years and over . . . . . . . . . . . . . . | 328,214 | 100.0 |
| Car, truck, or van - - drove alone. . . . . . . . . . . . . | 201,772 | 61.5 |
| Car, truck, or van - - carpooled. . . . . . . . . . . . . . | 39,295 | 12.0 |
| Public transportation (including taxicab) . . . . . . . . | 61,185 | 18.6 |
| Walked. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 13,922 | 4.2 |
| Other means. . . . . . . . . . . . . . . . . . . . . . . . . . . | 2,934 | 0.9 |
| Worked at home . . . . . . . . . . . . . . . . . . . . . . . . | 9,106 | 2.8 |
| Mean travel time to work (minutes)[1] . . . . . . . . . . . | 31.2 | (X) |

In Newark, NJ which serves as the home of numerous large corporations, the PRT network will provide seamless coverage to all of the companies with priority of service being determined by number of employers. PRT cars will be routed precisely with rush hour transportation demand being taken into account. It will be possible to have PRT service to accommodate the exact work schedule of each employee. The following is a list of major employers that will receive PRT service

Prudential Financial

Verizon

Public Service Electric & Gas Company

Horizon Blue Cross Blue Shield of New Jersey

Continental Airlines

MBNA

McCarter & English

Sills Cummis Epstein & Gross

Gibbons, Del Deo, Dolan, Griffinger & Vecchione

University Hospital

Rutgers University

University of Medicine & Dentistry of New Jersey

New Jersey Institute of Technology

Gateway Security

NJ Transit

RBP Member Directory

## Service to Shopping

The PRT network will provide service to all major malls and shopping centers throughout Essex County.  Coverage of shopping centers will primarily cover those with supermarkets and other high volume establishments.  Major malls include the Cedar Mall Plaza and Livingston Mall, each in Livingston, as well as the Mall at Short Hills in township of Short Hills.  The Mall at Short Hills is one of the most famous malls of NJ due to its wide selection of designer items and draws traffic from throughout the tri-state area.  Numerous lines and cars will be allocated to serve this traffic, especially during the holiday seasons.  Cars serving retailers will be designed with increased cargo space for carrying purchased items and other cargo.

## Service to Recreation

PRT network recreation area coverage throughout Essex county will be designed such that the majority of areas of parks and open spaces are covered.  The cars that cover these areas will be specially equipped with retractable windows so that passengers can ride through the park in an open air setting.

| Anderson | 14.85 | Belleville Ave. & N. Mountain Ave., Montclair |
| Becker | 147 | Roseland |
| Belleville | 32.70 | Belleville Ave., Belleville |
| Branch Brook | 359.72 | Park Ave. & Lake St., Newark |
| Brookdale | 121.41 | Watchung Ave., Bloomfield; Grove St., Montclair |
| Eagle Rock Reservation | 408.33 | Prospect Ave. & Eagle Rock Ave., West Orange |
| Francis A. Byrne Golf Course | 167.71 | Pleasant Valley Way & Mt. Pleasant Ave., West Orange |

| | | |
|---|---|---|
| Glenfield | 20.01 | Bloomfield Ave. & Maple Ave., Montclair |
| Grover Cleveland | 41.61 | Brookside Ave. & Runnymede Rd., Essex Fells |
| Hendricks Field Golf Course | 124.99 | Franklin Ave. & Belleville Ave., Belleville |
| Independence | 12.69 | Van Buren St. & Walnut St., Newark |
| lrvington | 24.38 | Grove St. & Lyons Ave., Irvington |
| lvy Hill | 19.96 | Mt. Vernon Pl. & Seton Hall University, Newark |
| Mills Reservation | 157.19 | Normal Ave. & Reservoir Dr., Cedar Grove |
| Orange | 47.63 | Center St. & Harrison St., Orange |
| Riker Hill Art Park | 204.68 | Beaufort Ave., Livingston |
| Riverbank | 10.77 | Market St. & Van Buren St., Newark |
| South Mountain Reservation | 2047.14 | So. Orange Ave. & Cherry Lane, West Orange |
| Vailsburg | 30.32 | So. Orange Ave. & Oraton Pkwy., Newark |
| Verona | 54.32 | Bloomfield Ave. & Lakeside Ave., Verona |
| Walter Kidde Dinosaur | 16 | Livingston, Roseland |
| Watsessing | 69.67 | Bloomfield Ave. & Conger St., Bloomfield |
| Weequahic | 311.33 | Elizabeth Ave. & Meeker Ave., Newark |
| West Essex | 1361.33 | Eagle Rock Ave., & Passaic River |
| West Essex Trail | 23.35 | Fairview Ave., near Verona High School, Verona |
| West Side | 31.36 | So. 13th St. & 18th Ave., Newark |
| Yanticaw | 28.75 | Centre St. & Park Dr., Nutley |

The PRT network will also provide service to within a quarter mile to numerous popular restaurants as listed below.

**Adega Grill**
Newark

**American Bistro**
Nutley

**Aldo's Cucina**
Wayne

**The Appian Way**
Orange

**Arthur's Downtown**
Newark
**Bacchus Chop House and Wine Bar**
Fairfield
**Blue Sky American Bistro & Café**
Montclair
**Bruschetta Restaurant**
Fairfield
**Cabrina's Fine Italian Food**
Nutley
**Chelsea Grille**
Montclair
**The Cloverleaf Tavern**
Caldwell
**Corso 98**
Montclair
**Desert Moon Fresh Mexican Grill**
West Caldwell
**Essex House Restaurant**
West Orange
**Evergreen Restaurant**
Montclair
**Highlawn Pavilion**
West Orange
**Huddle Inn**
Fairfield
**Il Tulipano**
Cedar Grove
**Liberté Restaurant**
Montclair
**MaizeRestaurant – Robert Treat Hotel**
Newark
**The Manor**
West Orange
**Nanina's in the Park**
Belleville
**The Newark Club**
Newark
**Palazzo**
Montclair
**The Park Pub**
Nutley
**Piccola Italia**
Orange
**Seabra's Marisqueira**

Newark
**Taro Restaurant**
Montclair
**Terrazza Ristorante**
Nutley
**Top Notch Restaurant**
Montclair
**Vinnie's Pizzeria & Restaurant**
Bloomfield
**Wok N Grill**
West Orange

## Service to Education

Currently transportation service for K-12 schools is provided by school buses and personal vehicles. The PRT network will reduce the need for these forms of transportation and will therefore decrease pollution and congestion. The cars that are primarily used to bring children to school will be specially equipped with numerous safety features to ensure their security. The school system is described in the statistics below.

| SCHOOL ENROLLMENT | | |
|---|---|---|
| Population 3 years and over enrolled in school.................... | 221,424 | 100.0 |
| Nursery school, preschool...................... | 18,361 | 8.3 |
| Kindergarten.................................... | 12,044 | 5.4 |
| Elementary school (grades 1-8)................. | 95,942 | 43.3 |
| High school (grades 9-12)...................... | 47,393 | 21.4 |
| College or graduate school.................... | 47,684 | 21.5 |

The PRT network in Newark will serve all major colleges as listed below.

- Rutgers, The State University; Newark
- Rutgers University - School of Law; Newark
- Essex County College; Newark
- New Jersey Institute of Technology; Newark
- New Jersey College of Medicine and Dentistry; Newark
- Seton Hall Law School; Newark

It will also serve all public and private schools in Newark as listed below with priority determined by school size.

*Biggest public high schools in Newark:*

- **BARRINGER** (Students: 1,776; Location: 90 PARKER ST; Grades: 09 – 12)
- **EAST SIDE** (Students: 1,438; Location: 238 VAN BUREN ST; Grades: 09 – 12)
- **WEST SIDE HIGH** (Students: 1,176; Location: 403 SOUTH ORANGE AVE; Grades: 09 – 12)
- **MALCOLM X SHABAZZ HIGH** (Students: 1,160; Location: 80 JOHNSON AVE.; Grades: 09 – 12)
- **WEEQUAHIC** (Students: 935; Location: 279 CHANCELLOR AVE; Grades: 09 – 12)
- **ESSEX CTY V N 13TH ST NWK** (Students: 701; Location: 300 N 13TH ST; Grades: 09 – 12)
- **WEST MARKET STREET CENTER** (Students: 699; Location: 91 WEST MARKET STREET; Grades: 09 – 12)
- **TECHNOLOGY HIGH** (Students: 634; Location: 223 BROADWAY; Grades: 09 – 12)
- **SCIENCE HIGH** (Students: 548; Location: 40 RECTOR ST; Grades: 09 – 12)
- **ARTS** (Students: 522; Location: 556 M. L. KING BLVD.; Grades: 09 – 12)

*Private high schools in Newark:*

- **ST. BENEDICT PREP** (Students: 530; Location: 520 MARTIN LUTHER KING BLVD; Grades: 7 – 12; Boys only)
- **OUR LADY OF GOOD COUNSEL H S** (Students: 310; Location: 243 WOODSIDE AVENUE; Grades: 9 – 12)
- **ST VINCENT ACADEMY** (Students: 304; Location: 228 WEST MARKET STREET; Grades: 9 – 12; Girls only)
- **CHAD SCIENCE ACADEMY** (Students: 301; Location: 370 S 7TH ST; Grades: 7 – 12)

- **JERSEY PREPARATORY SCHOOL** (Students: 45; Location: 31 CENTRAL AVENUE; Grades: 9 – 12)
- **INDEPENDENCE HIGH SCHOOL** (Students: 44; Location: 179 VAN BUREN STREET; Grades: 9 – 12)

*Biggest public primary/middle schools in Newark:*

- **ANN STREET** (Students: 1,105; Location: 30 ANN ST; Grades: KG – 08)
- **DR WILLIAM H HORTON** (Students: 937; Location: 291 N 7TH ST; Grades: KG – 08)
- **GEORGE WASHINGTON CARVER** (Students: 925; Location: 333 CLINTON PL; Grades: KG – 08)
- **LUIS MUNOZ MARIN MIDDLE** (Students: 892; Location: 663 BROADWAY; Grades: 05 – 08)
- **WILSON AVE** (Students: 879; Location: 19 WILSON AVE; Grades: PK – 08)
- **LOUISE A. SPENCER** (Students: 866; Location: 66 MUHAMMAD ALI BLVD; Grades: PK – 08)
- **ABINGTON AVE** (Students: 864; Location: 209 ABINGTON AVE; Grades: PK – 08)
- **RAFAEL HERNANDEZ SCHOOL** (Students: 814; Location: 345 BROADWAY; Grades: PK – 08)
- **VAILSBURG MIDDLE SCHOOL** (Students: 808; Location: 107 IVY STREET; Grades: 06 – 08)
- **THIRTEENTH AVE** (Students: 804; Location: 359 THIRTEENTH AVE; Grades: PK – 08)

*Biggest private primary/middle schools in Newark:*

- **SACRED HEART ELEMENTARY SCHOOL** (Students: 825; Location: 24 HAZELWOOD AVENUE; Grades: PK – 8)
- **ST MICHAEL SCHOOL** (Students: 641; Location: 27-29 CRITTENDEN ST; Grades: KG – 8)
- **THE CHAD SCHOOL** (Students: 435; Location: 308 S 9TH ST; Grades: PK – 6)
- **BLESSED SACRAMENT SCHOOL** (Students: 403; Location: 600 CLINTON AVE; Grades: PK – 8)
- **ST LUCY FILIPPINI ACADEMY** (Students: 337; Location: 142 JEFFERSON ST; Grades: PK – 8)
- **ST CASIMIR ACADEMY** (Students: 300; Location: 366 EAST KINNEY STREET; Grades: PK – 8)
- **ACADEMY OF ST. BENEDICT** (Students: 294; Location: 124 NIAGARA; Grades: PK – 8)
- **QUEEN OF ANGELS ELEM SCHOOL** (Students: 283; Location: 44 IRVINE TURNER BLVD; Grades: PK – 8)
- **ST ROSE OF LIMA SCHOOL** (Students: 282; Location: 540 ORANGE STREET; Grades: KG – 8)
- **ST ROCCO SCHOOL** (Students: 272; Location: 21 ASHLAND STREET; Grades: PK – 8)

## Service to Housing

The PRT network will serve residential areas with priority of service being determined by population density and trip production potential.

| | | |
|---|---:|---:|
| Total housing units.................... | 301,011 | 100.0 |
| UNITS IN STRUCTURE | | |
| 1-unit, detached............................. | 103,183 | 34.3 |
| 1-unit, attached ............................. | 11,848 | 3.9 |
| 2 units ......................................... | 43,847 | 14.6 |
| 3 or 4 units ................................... | 48,235 | 16.0 |
| 5 to 9 units ................................... | 19,146 | 6.4 |
| 10 to 19 units................................. | 16,509 | 5.5 |
| 20 or more units ............................. | 57,987 | 19.3 |
| Mobile home.................................. | 221 | 0.1 |
| Boat, RV, van, etc.......................... | 35 | - |

# Northern New Jersey
## Land Use

Northern New Jersey is a diverse area characterized by urban, suburban, and rural zones. In the east, the suburbs of New York City extend into New Jersey, creating a condensed ex-urban and suburban environment. The west side of the state, however, is vastly different from the east containing mostly undeveloped land. The area on the West, termed the Skylands Region has greatly different land use zoning than the densely populated east. Considering the diversity of the transportation needs of the counties in Northern New Jersey, the Personal Rapid Transit system must by site specific to each counties needs. PRT will be useful for Sussex County because it will encourage growth in many of the undeveloped Mountainous regions. Warren County as well will be more accessible for intra-county commuting, encouraging development inside the county. In the east, Bergen County which is the most populated county in the state, needs the PRT system to manage the increasing traffic volume. Passaic County has differentiated land use between the northern and southern areas, and will be served by the PRT system by enabling transportation from the residentially zoned north to the urban development in the south of the county. Hudson County has been plagued by traffic congestion and possible solutions have proved unsuccessful. PRT will drastically improve the flow between commercial, residential, and recreational land use zones. Essex County is home to a New Jersey's second largest city, PRT will be the best supplement to the existing heavy rail system traversing across the county to New York City. PRT will facilitate development in the urban areas of Newark by improving transportation into and throughout the city.

## Description of Transit Service in Northern NJ

The largest existing transportation infrastructure in place is the interstate and state highway system. Northern New Jersey is infamous for traffic congestion as well as other highway development problems. The Garden State Parkway and the New Jersey Turnpike are toll roads which cross through the region allowing efficient north-south flow of traffic. Each county has traffic management systems designed to help with the increasing traffic congestion plaguing the eastern region out skirting New York City. Newark, in Essex County, is the home of New Jersey's only international airport serving most of the state's airline traffic. For years NJ Transit has been serving the region with extensive rail lines and buses systems. Four of these rail lines serve the east side of the northern region currently. The differences between the eastern and western part of the region, however, vary considerably. The western most counties are served by only bus lines, the central areas light rail and bus, whereas the east has heavy and light rail and an extensive bus service.

## Summary Description of the PRT Network for the Region

The total size of the PRT network is 2770 stations and the total guide way is 2298.96 miles in length. Based on the implementation of PRT networks throughout the Northern NJ region it is clear that this form of transportation would have a positive impact on society for numerous reasons. First, it is economical. The PRT network will decrease congestion and commute times. This will have improve the economy by allowing more time for their workday as well as by decreasing delivery times. The PRT service will be convenient for residents to use on a daily basis for tasks such as going to school, shopping and recreation. This will improve the quality of life for all residents. PRT will also improve traffic safety throughout the region by decreasing the number of accidents that occur. Another positive impact of PRT will be on the

environment. With less congestion and traffic will come decreased pollution. PRT should certainly be considered as an option to serve the transportation needs of Northern New Jersey.

## Conclusion

Through all the hard work and long hours, the proposed PRT network includes 10,597 stations and 18,022 miles of guideway. Although this might seem like an overly ambitions amount of proposed guideway, it should be noted that the number is far less than half of the existing roads in New Jersey alone. Conservative estimates peg the total cost of the project at around $10 billion. And although $10 billion might sound like a lot of money, it is quite the small price to pay for efficient and effective transportation for everyone.

## Links

http://quickfacts.census.gov
http://getnj.com
http://appelfarm.org
http://conectiv.com
http://cooperhealth.org
http://dupont.com
http://hometownlocator.com
http://mannington.com
http://mhschealth.com
http://newjerseyvisitorsnetwork.com
http://pepcoholdings.com
http://pseg.com
http://salemcc.edu
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www.jenkinsons.com/aquarium
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http://www.co.burlington.nj.us/departments/transportation/bcts/schedule/index.html
http://www.hometownlocator.com/City/Burlington-New-Jersey.cfm
http://transportationchoices.com/trafficalerts.htm#burlingtonalerts