

**PENNS NECK AREA EIS**

**“WORKING” PROBLEM STATEMENT (VERSION 4E.2)**

*The following problem statement is a “working” document intended to communicate the general nature of the mobility issues facing the Penns Neck area. The issues and perceptions contained in the problem statement are intended to form the basis for a detailed analysis and statement regarding the “purpose and need” for some action or actions to address these mobility issues. Further detailed study and documentation of existing conditions will quantify the extent to which the issues contribute to or are affected by mobility constraints in the Penns Neck area. It is anticipated that the “working problem statement” will evolve as detailed data becomes available.*

**STUDY AREA**

The study area for the Penns Neck Area EIS has been structured into overlapping regions. The **primary study area** is composed of the municipalities of Plainsboro Township, Princeton Borough, Princeton Township, and West Windsor Township. This area approximates a five-mile radius from the intersection of Route 1 and Washington Road in West Windsor Township. The primary study area boundary is defined flexibly, so as to permit the inclusion of significant origins and destinations located on the fringe of the five-mile radius and to respond to the technical needs of the EIS study. The **secondary study area**, which is composed of twenty municipalities in Mercer, Middlesex and Somerset Counties <sup>1</sup>, provides a regional context regarding demographics and travel patterns. Unless specifically noted otherwise, references to the study area should be understood to mean the primary study area. Finally, the study area for considering specific impacts from actions/alternatives investigated in the EIS will be determined by the nature of the action/alternative under consideration and the potentially impacted resource.

**STATEMENT OF PROBLEM**

**Context** – The context in which the Penns Neck Area EIS is undertaken represents a complex policy framework that requires a balancing of transportation, environmental, community, and development needs. The study area contains many unique and important natural, cultural, historic, community, and economic resources that should be protected and enhanced. As demonstrated by population and employment trends, the study area is also a focal point for growth and development. Since 1990, the primary study area has added 16,904 people and 13,598 jobs. Table 1 illustrates population and employment trends in the primary study area. Appendix A provides a regional context for these trends by illustrating demographic changes in the secondary study area. There are approximately 56,000 workers employed in the primary study area. With the exception of the approximately 17,000 jobs concentrated

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in the Princeton Borough central business district, these jobs are located in worksites on or near the Route 1 corridor. More than half of the primary study area’s employment, or 31,000 jobs, are located in West Windsor and Plainsboro Townships, mainly between Route 1 and the Northeast Corridor rail line. There are two primary nodes of employment. One employment node is located in West Windsor Township and includes work sites on Alexander Road and in the Carnegie Center office complex. A second node is located in Plainsboro Township and includes work sites on Plainsboro Road and Scudders Mill Road, as well as in the Forrestal Center office complex. The number of workers employed in West Windsor and Plainsboro is equal to that of a small city, such as the City of New Brunswick, which has 32,000 jobs. In addition, **there are an additional X,XXX,XXX square feet of single-use, low-density, campus-style office buildings approved for construction in the primary study area. This will result in approximately x,xxx additional jobs.**

The pattern of development in the study area is decentralized and auto-oriented. The dominant land use pattern throughout the study area is single-use commercial and office development, built at low density, with free parking, and residential subdivisions. In addition, the pedestrian and bicycle network in the primary study area is incomplete. These conditions result in low usage and mode share for transit, pedestrian and bicycle travel to and from employment and other destinations in the primary study area. While the transit

		Population Change		
		1990	2000	1990-2000
				Abs. Change
				Percent Change
Plainsboro	14,213	20,215	6,002	42%
Princeton Boro	12,016	14,203	2,187	18%
Princeton Twp	13,198	16,027	2,829	21%
West Windsor	16,021	21,907	5,886	37%
Total	55,448	72,352	16,904	30%
		Employment Change		
		1990	1999	1990-1999
				Abs. Change
				Percent Change
Plainsboro	8,033	13,999	5,966	74%
Princeton Boro	18,857	16,670	(2,187)	-12%
Princeton Twp	4,417	8,264	3,847	87%
West Windsor	11,114	17,086	5,972	54%
Total	42,421	56,019	13,598	32%

Sources: US Census Bureau, NJ Dept. of Labor

and walking mode share for residents of West Windsor and Princeton Borough is higher than in many surrounding municipalities, the dominant mode of travel to and from employment and other

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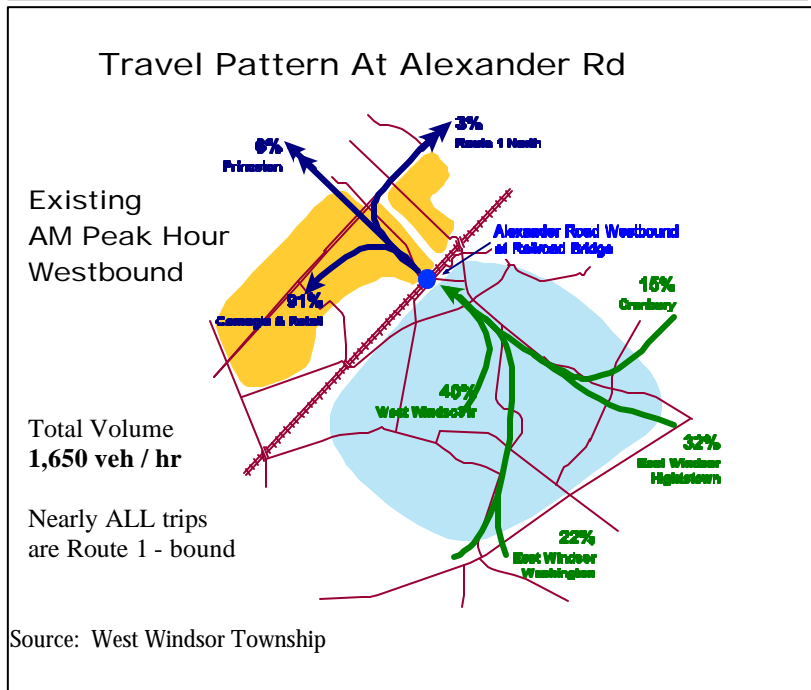
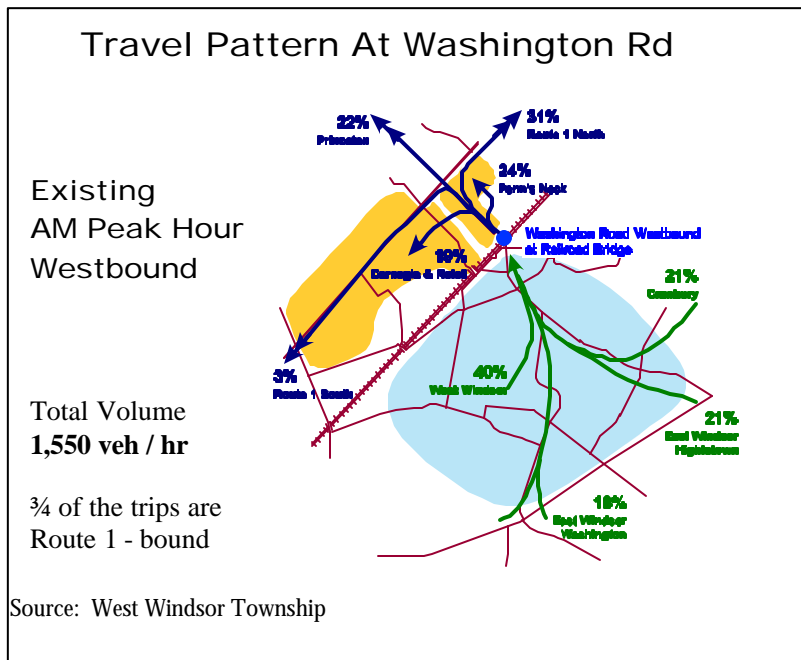
destinations in the study area is single-occupant automobile. The average occupancy of vehicles accessing employment

destinations in the primary study area is X.XX persons per vehicle.

This reliance on single occupant automobile use to access work sites in the study area on existing transportation infrastructure has impaired mobility across all modes of travel, and delays due to traffic congestion occur in many locations. This has frustrated residents, employees and visitors in the primary study area. With construction of X,XXX,XXX sq. ft. of additional office space, already approved by local planning boards, it is reasonable to anticipate that travel conditions will worsen.

Data provided by West Windsor Township indicates that the distribution of existing traffic on Washington Road and Alexander Road reflects the importance of the previously described

employment nodes. In the morning peak period, 55% of existing traffic on Washington Road is destined for the Sarnoff Corporation and Route 1 north; 22% is destined for Princeton Borough and points to the northwest; and 22% is destined for Carnegie Center and Route 1 south. On Alexander Road, 91% of existing morning peak period traffic is destined for Carnegie Center and Route 1 south.



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(If possible, the 91% Alexander Road figure will be further disaggregated to differentiate between Carnegie Center traffic and Route 1 south traffic).

**Road-related issues** – Employment and other destinations along or near Route 1 are major peak period traffic generators. The existing roadway system lacks the connectivity of a grid system and funnels traffic onto a few principal roads. The major north-south transportation artery in the study area, Route 1, is classified in NJDOT’s State Highway Access Management Code as an “accessible principal arterial.” It functions both as an inter-regional auto and truck corridor and as a local access road for properties fronting the highway. While capital investments made in the past two decades attempted to improve traffic flow along Route 1, much of the benefits were offset by additional access points. In addition, the few parallel connector roads adjacent to either side of Route 1 are ineffective alternatives to the use of Route 1 for reaching employment and other destinations in the primary study area.

The east-west road system does not efficiently distribute traffic to and from employment centers in the primary study area, due to varying road widths, lane drops, lack of turning lanes, and discontinuities. Many routes pass through residential and college neighborhoods and business districts, do not meet existing peak period traffic demand, and function at impaired levels of service.. These roads include: Harrison Street/Ewing Street (from Route 1 to U.S. 206) which functions at XXX, CR571/Washington Road (from the Hightstown By-pass to Nassau Street) which functions at XXX, Alexander Road (from C.R. 571 via the railroad bridge to Mercer Street) which functions at XXX, and Meadow Road (from Clarksville Road to Route 1/Canal Pointe Boulevard) which functions at XXX.

Traffic traveling north-south on Route 1 and east-west, accessing and crossing Route 1 at the Washington Road, Fisher Place, Harrison Street intersections and other signalized intersections in the primary and secondary study area, creates traffic queues during peak travel periods. Motorists also use local residential streets to avoid the congestion. Route 1 operates at level of service XXX between Scudders Mill Road in Plainsboro Township and Alexander Road in West Windsor Township, impairing effective performance of both its through traffic and local access functions during peak hours. Travel delays on Route 1 average XXX at the Washington Road intersection and XXX at the Harrison Street intersection. Travel delays on Washington Road average XXX. Travel delays on Harrison Street average XXX. In addition to causing travel delays for motorists and truck

drivers, traffic queues during peak hours on both local roads and Route 1, deteriorate air quality (needs a parameter), pose safety hazards for motorists, pedestrians and bicyclists and are believed by local officials to impede the ability of emergency personnel to respond effectively. Data provided by Plainsboro Township indicates that transport time from an emergency call in Plainsboro Township to the Princeton Medical Center takes an additional 3 minutes during the evening peak period. This represents a 20% increase in travel time.

**Infrastructure condition issues** – There are two structurally deficient bridges in the study area that must be repaired or replaced. One of these bridges is the Route 1 bridge over the Millstone River located just north of the Route 1/Harrison Street intersection which has a sufficiency rating of 55 on a scale of 0 to 100. This bridge carries 80,000 vehicles per day on Route 1 and is a critical link in the regional highway network. The second of these bridges is the Alexander Road bridge over the Northeast Corridor rail line in Princeton Junction, which has a sufficiency rating of 3.3. NJDOT has accepted responsibility for repairing or replacing this structure; however, it has directed West Windsor Township to examine and select a preferred alignment and approaches from among alternatives. Alexander Road is a key travel corridor to major employment and retail destinations. Approaches on the east side of the NEC rail line traverse residential neighborhoods and significant controversy exists regarding the location of its replacement.

**Transit-related issues** – The pattern of development in the study area encourages dependency on auto use and imposes constraints on providing a comprehensive network of public transportation services. The existing public transit network includes commuter rail service on the Northeast Corridor rail line with a stop at the Princeton Junction Train Station, rail shuttle service via the “Dinky” from the Princeton Junction station to Princeton Borough, express commuter bus service to New York City, three local bus routes and a variety of public and private shuttle services providing access to and from the Princeton Junction Train Station.

While the public transportation network includes most major transit modes, the characteristics of service, including number of routes, frequency of service, hours of operation, required transfers and travel times, are less than optimal due primarily to the pattern of development in the study area. The major transit facility, the Princeton Junction train station on the Northeast Corridor rail line, serves a dual function. First, it is heavily used by commuters traveling out of the area to destinations north

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and south. While use of the station for this purpose is high, waiting lists for parking permits and over-capacity conditions on some peak hour trains indicates that existing demand is greater than current system capacity.

The second function served by the station is to distribute commuters and visitors traveling into the study area to a variety of purposes. Because the origins and destinations of employees and visitors coming into the study area are dispersed, use of the NEC rail line and Princeton Junction station by those traveling to destinations in the study area is limited. **Only XXX of the 56,000 employees working in the study area utilize the Princeton Junction Train Station and connecting transit services to access their work destinations.**

The Dinky operation, which serves residential markets in Princeton Borough and Township, downtown commercial development in Princeton Borough and Princeton University has limited parking capacity in Princeton Borough. In addition, service in both directions is

<b>Bus and Shuttle Services in the Primary Study Area</b>	
<b>Bus/Shuttle</b>	<b>Service Characteristics</b>
600 Bus	<b>Route:</b> North-South Along Route 1 from Trenton to Plainsboro <b>Frequency:</b> 30 min. – 6AM to 8PM <b>Destinations served:</b> Quakerbridge Mall, Nassau Park shopping center, Marketfair Mall, Carnegie Center office complex, P. Junction train station, Princeton Meadows shopping center (Plainsboro), Forrestal Center office complex, Princeton Forrestal Village * Transfer required to travel E-W <b>Ridership:</b> 1000 daily weekday riders
605 Bus	<b>Route:</b> From Quakerbridge Mall to Montgomery Shopping Center <b>Frequency:</b> 75 min. – 7:30AM to 8PM <b>Destinations served:</b> Montgomery Shopping Center, Princeton Shopping Center, Princeton Senior housing, Griggs Farm residences, Palmer Square (Princeton Borough), Princeton Dinky station, Marketfair Mall, Nassau Park shopping center, Mercer Mall, Quakerbridge Mall <b>Ridership:</b> 450 daily weekday riders
606 Bus	<b>Route:</b> From Washington Township to Princeton Borough via Hamilton, Lawrence and Trenton <b>Frequency:</b> variable, approx. 30 min. – 6AM to midnight <b>Destinations served:</b> serves destinations in Hamilton Township, Hopewell Township, Lawrence Township, Princeton Borough and Township, the City of Trenton and Washington Township, including: Hamilton Square, Hamilton Rail Station, Mercerville, Ames Shopping Center, Palmer Square, Lucent Technologies in Hopewell Township (1 AM trip & 1 PM trip) ETS, Bristol Myers-Squibb, Mercer County Community College, Princeton Seniors housing and Project Freedom (Washington Twp.) <b>Ridership:</b> averages 30 riders per trip (Daily ridership number?)
976 "Wheels" Shuttle	<b>Route:</b> Various residential developments in Lawrence and West Windsor Townships to Princeton Junction Train Station <b>Frequency:</b> Timed to meet outbound peak hour trains from 6-8:30AM and 5:30-8:30PM <b>Destinations served:</b> Residential developments along Province Line, Quakerbridge and Clarksville Roads <b>Ridership:</b> 120 daily riders
"Train Link" Shuttle	<b>Route:</b> Private employer shuttle to and from Princeton Junction Train Station <b>Frequency:</b> Timed to meet peak hour trains <b>Destinations served:</b> Various employment destinations in Princeton Forrestal Center <b>Ridership:</b> 80 daily riders
East Windsor Shuttle	<b>Route:</b> Municipally-operated shuttle between East Windsor and Princeton Junction Train Station <b>Frequency:</b> Timed to meet peak hour trains <b>Destinations served:</b> Twin Rivers, Highstown and other East Windsor residential neighborhoods <b>Ridership:</b> N/A
<b>Note:</b> There are a variety of smaller private and public shuttles that provide service to and from the Princeton Junction Train Station.	

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constrained by its single-stop, single-track, single-train infrastructure, which does not meet every Northeast Corridor train stopping at Princeton Junction. The Dinky is used primarily by study area residents traveling to destinations outside of the study area. (Include supporting data sentence)

There are three local bus routes and three primary shuttle services operating in the study area. The local bus routes are long and sometimes circuitous. Frequency of service on these routes varies from approximately every 30 minute on the 600 and 606 bus to every 75 minutes on the 605 bus. Bicycles may be carried on all local bus services. The three shuttle services operating in the primary study area serve residential and employment destinations in the primary and secondary study area and are scheduled to meet peak period trains at Princeton Junction train station.

**Pedestrian and bicycle issues** – According to the 1990 Census, 51% of workers living in Princeton Borough walk or bike to work. In Princeton Township, 14% walk or bike to work. In Plainsboro and West Windsor, the percentage is only slightly more than 1%. There are various reasons why pedestrian and bicycle travel is not more widely used to access employment and other destinations in the study area. While the terrain and local topography of the primary study area are conducive to pedestrian and bicycle travel, infrastructure is lacking. The sidewalk network, including cross walks, in the Penns Neck, Princeton Junction, and the train station area is incomplete and many pedestrian routes are unsafe. There are few striped bicycle lanes and separate bike paths in the primary study area. The bicycle network is disconnected and travel between major origins and destinations is difficult.

There is also a lack of safe and convenient pedestrian and bicycle routes for students to walk and bike to schools and recreational facilities. Furthermore, while the existing intersection at Washington Road provides at-grade access across Route 1, heavy auto traffic and frequent turning movements make traveling by foot or by bicycle across Route 1, to inter-municipal destinations within five miles, neither easy nor safe. Finally, there are few bicycle amenities to serve those who choose to travel by this means. For instance, according to the Greater Mercer Transportation Management Association, there is a thirty person waiting list for bicycle lockers at the Princeton Junction train station. These conditions impair pedestrian and bicycle mobility in the primary study area.

**Demand Management Issues** – As in other comparable suburban areas, travel demand management strategies are not widely used. There are few incentives or impositions to foster alternative commute patterns.

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Alternative work arrangements such as telecommuting and compressed work week arrangements are limited. Employer-sponsored flex-time policies do exist, (but are not early and late enough to shift travel out of peak periods – make empirical if possible); and flex-time makes car and van-pooling more difficult. Presently, there are a limited number of car and van-pool programs operating in the study area. Finally, government agencies offer few incentives to employers to support the initiation of travel demand management strategies, and the incentives that do exist require extensive record-keeping.

**Community resources** – The above-referenced transportation-related problems affect neighborhood character and the integrity of the study area’s many natural, cultural, historic, community, and economic resources. These resources include, but are not limited to:

1. The Millstone River and its watershed;
2. Little Bear Brook;
3. The Delaware and Raritan Canal State Park;
4. The Delaware and Raritan Canal;
5. Lake Carnegie;
6. The Washington Road Elm Allée (extending from Route 1 to the Delaware and Raritan Canal);
7. The Princeton Baptist Church of Penns Neck;
8. The Red Lion Inn on Washington Road in Penns Neck;
9. The Cemetery at the Princeton Baptist Church of Penns Neck and the Schenck-Covenhoven Cemetery in the Princeton University fields off Washington Road, in West Windsor;
10. Natural areas, including forests and wetlands in the study area;
11. Archaeological sites in the study area;
12. The Aqueduct Mills Historic District in West Windsor and Plainsboro;
13. The Covenhoven-Silvers-Logan House in West Windsor;
14. The Princeton Operating Station in West Windsor;
15. Residential neighborhoods throughout the study area;
16. Princeton University; and
17. Businesses and institutions located in the study area.

Because these resources are held dear, they present a limitation on the range and design of solutions to address the identified transportation problems.

### **Notes:**

<sup>1</sup> The secondary study area municipalities include: East Windsor Township, Hightstown Borough, Hopewell Borough, Hopewell Township, Lawrence Township, Pennington Borough, Princeton Borough, Princeton

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Township, Washington Township, and West Windsor Township in Mercer County; Cranbury Township, Jamesburg Borough, Monroe Township, Plainsboro Township, and South Brunswick Township in Middlesex County; and Franklin Township, Hillsborough Township, Millstone Borough, Montgomery Township and Rocky Hill Borough in Somerset County.

**Appendix A**

**Penns Neck Area EIS "Working" Problem Statement**

**Population and Employment Trends in Penns Neck Area EIS Secondary Study Area**

			1990-2000	1990-2000			1990-1999	1990-1999
	1990	2000	Abs. Change	Percent Change	1990	1999	Abs. Change	Percent Change
<b>Mercer</b>								
East Windsor	22,353	24,919	2,566	11%	6,516	5,141	(1,375)	-21%
Hightstown Borough	5,126	5,216	90	2%	2,746	3,309	563	21%
Hopewell Borough	1,968	2,035	67	3%	451	469	18	4%
Hopewell Township	11,590	16,105	4,515	39%	3,014	1,474	(1,540)	-51%
Lawrence Township	25,787	29,159	3,372	13%	21,496	23,103	1,607	7%
Pennington Borough	2,537	2,696	159	6%	1,105	2,513	1,408	127%
Princeton Borough	12,016	14,203	2,187	18%	18,857	16,670	(2,187)	-12%
Princeton Township	13,198	16,027	2,829	21%	4,417	8,264	3,847	87%
Washington Township	5,815	10,275	4,460	77%	1,961	2,491	530	27%
West Windsor Township	16,021	21,907	5,886	37%	11,114	17,086	5,972	54%
<b>Middlesex County</b>								
Cranbury Township	2,500	3,227	727	29%	7,715	14,758	7,043	91%
Jamesburg Borough	5,294	6,025	731	14%	1,336	3,312	1,976	148%
Monroe Township	22,255	27,999	5,744	26%	1,697	2,963	1,266	75%
Plainsboro Township	14,213	20,215	6,002	42%	8,033	13,999	5,966	74%
South Brunswick Twp	25,792	37,734	11,942	46%	13,443	20,904	7,461	56%
<b>Somerset County</b>								
Franklin Township	42,780	50,903	8,123	19%	24,328	33,345	9,017	37%
Hillsborough Township	28,808	36,634	7,826	27%	3,497	5,358	1,861	53%
Millstone Borough	450	410	(40)	-9%	46	53	7	15%
Montgomery Township	9,612	17,481	7,869	82%	5,951	8,647	2,696	45%
Rocky Hill Borough	693	662	(31)	-4%	493	373	(120)	-24%
<b>Regional Total</b>	<b>260,493</b>	<b>327,689</b>	<b>67,196</b>	<b>26%</b>	<b>133,762</b>	<b>177,211</b>	<b>43,449</b>	<b>32%</b>
City of Trenton	88,675	85,403	(3,272)	-4%	23,225	24,652	1,427	6%
City of New Brunswick	41,711	48,573	6,862	16%	22,971	24,331	1,360	6%

**Sources:** US Census Bureau, NJDOL