

## **Executive Summary**

### **Introduction**

Under the ISTEA, as defined in 450:320 (b) of the Metropolitan Planning Regulations published in the Federal Register on October 28, 1993, federal funds may only be programmed for projects such as a new general purpose highway on a new location or adding general purpose lanes that significantly increase capacity for a Signal Occupant Vehicle (SOV) in nonattainment areas if the project results from a Congestion Management System (CMS) meeting the requirements of 23 CFR Part 500. A CMS is designed to document the way in which the requirements for programming federal funds for projects that increase SOV carrying capacity in nonattainment areas are met. The CMS study must cover all reasonable available travel demand reduction and travel demand management strategies for the area and demonstrate how effective these strategies can be at eliminating the need for additional SOV capacity. If the analysis demonstrates that new SOV capacity is warranted, strategies to manage the facility must be incorporated into the proposed facility.

The purpose of this Executive Summary is to provide the following:

- C A run through of current conditions in the project area,
  - C A description of the intended project,
  - C A description of the CMS evaluation process,
  - C A summary of the CMS evaluation and study
- Traffic volume in the Penns Neck area is affected

recommendations and

- C An overview of the commitments (by NJDOT and others) to strategies that are reasonable and complementary to the facility and project area.

### **Current Conditions & Project Description**

In 1984 the New Jersey Department of Transportation (NJDOT) implemented a study of the 20 mile section of the Route 1 corridor between Lawrence Township, Mercer County and New Brunswick, Middlesex County. The corridor was divided into sections, and alternative improvements in each section were developed. The alternative improvements were analyzed and presented in a series of feasibility studies. In some sections the recommendations were accepted and NJDOT began implementing the final concept, but in other sections the alternatives are still under consideration. One of these sections is the Penns Neck Area.

Penns Neck is an established community just east of Route 1 along both sides of County Route 571 (Washington Road). The Penns Neck Circle is located at the intersection of Washington Road and Route 1. To the South of the circle, the Dinky Railroad crosses over Route 1 and to the north are signalized intersections at Fisher Place and Harrison Street. Just north of Harrison Street, Route 1 crosses over the Millstone River, into Middlesex County. Most of the land west of Route 1 is owned by Princeton University. The David Sarnoff Laboratory is located in the northeast corner of Penns Neck, South of the Millstone River and East of Route 1.

by Route 1 which runs north-south and County

Route 571 which runs east-west. The two roads intersect at the Penns Neck Circle. The conflict between the north-south and east-west traffic movements at the Penns Neck Circle contributes to the congestion in the entire Penns Neck area.

Washington Road is an important east-west route in the Penns Neck Area. West of Route 1, the two lane road provides access to Princeton Borough and Princeton University. East of Route 1 Washington Road extends through the community of Penns Neck to a point 500 feet west of the railroad tracks where the roadway bends abruptly to the north. From this point the road crosses over the Northeast Corridor rail lines (Amtrak). This small 0.3 mile segment of roadway/bridge is New Jersey State Route 64. East of the rail lines the roadway is named Princeton-Hightstown Road. The road begins with two lanes and then widens to a 4-lane undivided highway east of Clarksville Road. Together, these roads are designated as County Route 571 that connects Princeton and Hightstown and is heavily used by local commuters. It also connects Route 1 in the Princeton area to Hightstown in the vicinity of New Jersey Turnpike, Interchange 8.

Route 1 is a major north-south route for both local and regional traffic. Route 1 presently experiences heavy traffic flows which result in significant delays at the many signalized intersections along the corridor. Route 1 is typically a 6-lane divided highway with 12-foot travel lanes, a 2-foot inner shoulder and no outer shoulder. Congested conditions prevail during the peak travel periods through the project area. Because Route 1 is a signalized arterial, the **Step 1** - A steering committee was formed to coordinate the work performed and to obtain

capacity of the traffic signals control not only the entire section of Route 1 but also the intersecting cross streets such as Washington Road and Harrison Street. These intersections operate near or over capacity conditions during the peak periods. This causes extensive queuing and delays, contributing to the deterioration of overall traffic flow, operational conditions and increased travel time for both Washington Road (Route 571) and Route 1. This results in the inability to efficiently accommodate traffic movements to and from other roadways and the surrounding land uses.

For these reasons, a design concept was developed for the Penns Neck area to remove the traffic signals along Route 1 and provide an overpass structure for Route 571 to cross over Route 1 with connecting ramps. Following the completion of the roadway improvement project, the major source of delay will be eliminated, the traffic signals, while still maintaining the east-west connectivity.

### **The CMS Evaluation Process**

The Delaware Valley Regional Planning Commission (DVRPC) is the Metropolitan Planning Organization (MPO) who has jurisdiction over Mercer County. At a May 16, 1997 meeting between DVRPC and NJDOT it was agreed that NJDOT will sponsor the CMS study process with the process being done in accordance with the requirements of DVRPC. In preparing the CMS Study a four (4) step process was formulated. The following is a description of this process.

input from other key regional transportation agencies. This committee is to include

representatives from NJDOT, DVRPC, Mercer and Middlesex Counties, Federal Highway Administration (FHWA), N.J. Transit, Federal Transportation Administration (FTA), West Windsor Planning Board, Princeton Regional Planning Board, Plainsboro Planning Board, Middlesex-Somerset-Mercer Regional Council, Inc (MSM) and the Greater Mercer TMA.

The first steering committee meeting reviewed the history of the project and any supporting traffic studies. The objective was to document existing and future congestion levels and traffic growth. DVRPC presented a systems-wide picture of where the project falls on the NJ CMS (the project is located in two CMS corridors - US 1 and CR 571).

Lastly, DVRPC presented a screening of improvement strategies, using a systems-wide approach, to identify applicable strategies in the corridor. The committee reviewed the strategies and based on local considerations determined the level of study necessary for the individual strategies. See Table E-1 for the results of the first steering committee meeting relevant to the type of analysis to be performed for each strategy.

**Step 2-** NJDOT's consultant, Frederic R. Harris, Inc., established performance measures which are applicable to the strategies, identified the appropriate methodologies, and conducted a preliminary evaluation of strategies. A presentation was made to the steering committee on the evaluation process, assumptions and preliminary results.

A public meeting was held on November 5, 1997 as part of the CMS process. The purpose of this

meeting was to introduce the project to the public and present the preliminary results of the strategy evaluation. A formal presentation was given, followed by a question and answer period. DVRPC distributed a survey requesting public opinion regarding preferences among the CMS strategies. Results of the survey are tabulated and shown in the Final CMS Study Report.

**Step 3 -** The committee reviewed the results of the analysis and a concurrence was reached that there is no acceptable alternative to an SOV widening.

The committee then develop a preliminary list of travel demand management strategies that **Acompliment@the project**, help manage or reduce the impacts of traffic to improve system performance and extend the service life of the proposed facility. Those complementary strategies will then be incorporated into the CMS process for more detailed analysis, selection and/or implementation.

**Step 4 -** The complementary strategies were identified as commitments to the project implementation or for further action as part of the project. Commitments were developed to sufficient detail to outline the funding source, the time frame for which the commitment will be implemented, the lead agency to carry the commitment forward and approximate cost. These commitments were presented to the steering committee for review.

With concurrence from the committee, the commitments to be instituted as part of the CMS process were incorporated into the CMS Study and the report was finalized.

### **Summary of the CMS Evaluation**

As in the first step of the CMS process, a detailed assessment of existing and future operating conditions was initiated. Based on such conditions it was determined that the project area has insufficient capacity that severely impacts traffic flow.

**TABLE E-1  
CMS STRATEGY IDENTIFICATION**

Strategy	Type of Study	Coordinate with Strategy #
<b>Mode Shift</b>		
1. Carpool/Vanpool	Quantitative	2, 9, 11
2. Guaranteed Ride Home	Quantitative	1, 9, 11
3. Paratransit Services	Quantitative	
4. Transit Marketing	Qualitative	
5. Pedestrian Improvements	Qualitative	
6. Bicycle Improvements	Qualitative	19
7. Park and Ride	Qualitative	
<b>PARKING MANAGEMENT</b>		
8. Parking Regulations/Ordinances	Not to be Studied	
9. Preferential HOV Parking	Quantitative	1, 2, 11
<b>TDM</b>		
10. Transportation Management Associations (TMA)	Qualitative	
11. Ride Matching	Quantitative	1, 2, 9
12. Telecommuting	Quantitative	
<b>GROWTH MANAGEMENT</b>		
13. Activity Centers	Qualitative	14
14. Land Use Policies/Regulations	Qualitative	13
<b>ACCESS MANAGEMENT</b>		
15. Median Control	Qualitative	
16. Driveway Controls	Qualitative	
<b>TRANSIT SERVICE/OPERATIONS IMPROVEMENTS</b>		
17. Transit Coordination	Not to be Studied	
18. New Transit Service	Quantitative	
19. Bicycle Improvements at Rail Stations	Qualitative	6
20. Transit Enhancement/Expansion	Qualitative	

**TABLE E-1  
CMS STRATEGY IDENTIFICATION**

Strategy	Type of Study	Coordinate with Strategy #
<b>TRAFFIC OPERATION IMPROVEMENTS</b>		
21. Intersection & Roadway Widening	Quantitative	22
22. Channelization	Quantitative	21
23. Traffic Surveillance and Control System	Quantitative	
24. Ramp Metering	Not to be Studied	

*Route 571 - Penns Neck Area  
Congestion Management System*

25. Computerized Signal System	Quantitative	27
26. Elimination of Bottlenecks	Not to be Studied	
27. Coordinate & Upgrade Traffic Signals	Quantitative	25
28. One-way Streets	Not to be Studied	
<b>INCIDENT MANAGEMENT</b>		
29. Incident Detection/Verification	Qualitative	30, 31
30. Emergency Response Time Improvements	Qualitative	29, 31
31. Alternative Routing Techniques	Qualitative	29, 30
32. Construction Management	Qualitative	
<b>ALTERNATIVE WORK HOURS</b>		
33. Staggered Work Hours/Flexible Work Schedules	Quantitative	34
34. Compressed Work Weeks	Quantitative	33
<b>TRANSIT CAPITAL IMPROVEMENTS</b>		
35. Expand Parking at Rail Stations	Not to be Studied	
<b>INTELLIGENT TRANSPORTATION SYSTEMS</b>		
36. Traveler Information Services	Not to be Studied	
<b>GENERAL PURPOSE LANES</b>		
37. SOV Roadway Widening	Quantitative	

To determine the most appropriate improvement measure, a CMS analysis was conducted. This was accomplished through an analysis (both quantitatively and qualitatively) of projected traffic conditions in the corridor and evaluation of the impacts of various congestion management system strategies.

It was anticipated that strategies analyzed in this fashion may only result in a small reduction in congestion that may be too fine to measure using available techniques. Therefore, the Committee determined certain strategies may be grouped and evaluated collectively.

The original grouping of strategies outlined at the first steering committee meeting was modified to help better evaluate the potential benefits of such strategies. Upon further examination of the strategies, it was concluded that these strategies could be organized into 8 groups. These eight groups include a car/vanpool program, pedestrian/bicycle facilities, transit improvements, physical improvements, traffic signal improvements, advanced traffic control, travel behavior modifications and growth and development modifications. From these 8 groupings three distinct categories of strategies were formed. These categories are Mode Shift, Traffic Improvements and Travel Demand Reduction.

**Need for SOV Capacity Improvement**

The next step in the CMS process was to determine if reasonable travel demand strategies could be implemented that may eliminate the need for the SOV capacity increase. It was determined that in order to achieve acceptable operating

conditions through the project area a trip reduction of approximately 50% would need to be achieved. It was determined that, even if all of the strategies were to be combined, the resulting total would not meet the required trip reduction to eliminate the need for an SOV widening. Results of the analysis are summarized below.

**SUMMARY OF RESULTS**

<b>STRATEGY</b>	<b>RANGE OF TRIP REDCT.</b>
<b>Mode Shift</b>	<b>2.7% to 5.5%</b>
<b>Car/Vanpool</b> <b>Pedestrian/Bicycle</b> <b>Transit</b>	
<b>Traffic Improvemts</b>	<b>0%</b>
<b>Physical</b> <b>Traffic Signal</b> <b>Advanced Traffic</b>	
<b>Trvl Dmd Reduction</b>	<b>1.9% to 3.0%</b>
<b>Growth &amp; Develp.</b> <b>Travel Behavior</b>	
<b>TOTAL CHANGE</b>	<b>4.6 - 8.5%</b>

**Complementary Strategies**

The most effective TDM programs are comprised of several complementary and coordinated strategies. Certain strategies were determined to provide a measure of operational, safety, or mobility improvement and enlist public support. These strategies will play a role in managing the area's travel demand and complement the SOV capacity increase. Thus, if such strategies are implemented along with the project improvements, the potential to increase the service life of the improvements, provide a means of managing future travel demand and providing a better quality of life through the project area can be realized.

The following is a brief description of the project commitments determined during the CMS process.

**Commitment #1 - Pedestrian and Bicycle Improvements;** The leading concern of area residents is the implementation of pedestrian and bicycle facilities. With the removal of the traffic signals under the proposed project, Route 1 may act as a barrier for pedestrian access across Route 1. The Steering Committee has agreed that the need for such facilities to provide a connection between Penns Neck and Princeton is essential, as well as, to achieve the goal of improving mobility through the project area. A commitment to incorporating strategies into the proposed facility will include the following:

*C Sidewalk/Bicycle Mobility* - The proposed project will include facilities for

bicycles/pedestrians along a proposed Bypass providing a connection between the two communities. A 5 foot wide sidewalk will be constructed for the length of a Bypass.

The Steering Committee also recommended and NJDOT has committed to including paved shoulders for bicycle travel on the proposed facility.

*C Route 1 Pedestrian/Bicycle Crossing* - NJDOT has committed to providing a feasibility study to accommodate pedestrian access across Route 1 relative to the residential neighborhoods. The feasibility study will establish the need for the crossing and determine if such a crossing is supported by area residents. If the feasibility study determines the crossing is warranted, a location for the crossing will be determined. Implementation of the crossing would then occur with the construction of the project. The crossing would be located between the Dinky railroad bridge and Washington Road.

*C Bicycle lockers at Princeton Junction & Dinky train stations* - The Steering Committee recommended and NJDOT has committed to increase awareness of the existing program as a project commitment. This commitment would best be addressed after the project construction is complete.



**Commitment #2 - Central Jersey Transportation Forum;** A majority of local concerns were related to the regional traffic impacts due to planned roadway improvement projects, area development, and transit improvements. The Steering Committee discussed the concerns of the local residents and agreed that such issues need to be addressed to effectively manage future traffic conditions in the area. However, it was also agreed that this is beyond the scope of this CMS Study. Many studies regarding these issues have been performed over the past several years. The committee felt that these previous investigations should be integrated as a means to address regional issues.

To do this, a Central Jersey Transportation Forum is recommended. This Forum would address a number of issues facing Central New Jersey, such as the need for better traffic management, truck traffic, population forecasts, roadway projects such as Route 92 and provide the much needed coordination effort between member agencies. The Forum will result in a transportation action plan and priority of projects for NJDOT and allow the Counties/Municipalities to form a mechanism to aid in the decisions made at both the State and Local levels.

**Commitment #3 - Ridesharing Program;** The Steering Committee recommended and NJDOT has committed to continue current levels of funding for TMAs to administer and market these services. In addition, the Steering Committee recommended and NJDOT has committed to the following expansion of the program.

- C Placement of signs along the project, Routes 571 and Route 33 to promote the toll free rideshare assistance telephone number.
- C Provide preferential parking for people who carpool to the Princeton Junction train station. This commitment should be contingent on the completion of the Hamilton Train station and an assessment of its impact on the Princeton Junction train station.
- C Funding for the TMA to provide rideshare matching services and supply registration forms can be absorbed through the existing TMA/NJDOT grant.

#### Alternate Work Schedules

The Steering Committee recommended a commitment to providing seed money for interested large employers along the study area to develop and implement an alternate work schedule program with their TMA. The Smart Moves Challenge Grant program is a potential funding source for this.

#### **Commitment #4 - Transit Service**

##### Transit Marketing

- C A commitment to provide funding for marketing a vanpool program will be provided.
- C A commitment to provide additional funding for mass distribution of information to targeted residential areas near the study area is to be included as a commitment.

##### Coordination of Regional Transit Feeder Service

- C A commitment is made to develop a coordinated east-west shuttle system that

might connect East Windsor, Princeton Junction Station, Sarnoff Center, Princeton University, Princeton residential areas and CBD, outlying Princeton employment sites (Institute, hospital) and the Dinky. This could

**Commitment #5 - Signing Program;** The Steering Committee has recommended and NJDOT has committed to a signing program to be performed jointly by NJDOT and the Princetons. The signing program is to investigate whether traffic between Route 1 and Princeton can be more efficiently directed to its destination. Sign construction would be funded separately, by NJDOT as part of the Route 1 Penns Neck roadway improvements.

**Commitment #6 - Traffic Monitoring Program** - To document the distribution of traffic prior to and following the construction of the proposed project, the steering committee has recommended and Middlesex County has committed to a traffic monitoring program as part of the CMS process. The traffic monitoring program will conduct seven day-24 hour traffic counts through the use of Automatic Traffic Recorders (ATR=s) at key locations in the project area.

Counts will be taken prior to construction of the proposed project to establish a base case for traffic volumes. Counts will subsequently be taken at 1 year intervals for a period of three years after construction of the project is complete. At the conclusion of each counting period results will be summarized in a report of findings. A meeting will be held with the local officials to present the report and discuss findings.

be further pursued as part of the Central Jersey Transportation Forum and as part of the TMA Core Program.

### **Conclusion**

The construction of a general purpose lane, was found to be the most effective method of addressing future travel demands in the study area. During the process of this determination, it was found that other supporting strategies proved to be appropriate for the corridor. The Table below shows a summary of the recommended strategies for implementation as part of the Penns Neck CMS process.

## Summary of Commitments

No	Commitment	Funding Source	Time Frame	Lead Agency	Approx. Cost
1	Pedestrian/Bicycle Improvements				
	-Millstone Sidewalk/Bicycle Mobility	NJDOT Const. Funds	w/Project Construction	NJDOT	\$285,000
	-Route 1 ped./bicycle crossing C Feasibility Study	NJDOT Dgn. Funds	w/Project Design	NJDOT	\$50,000
	-Route 1 ped./bicycle crossing C Implementation	NJDOT Const. Funds	w/Project Construction	NJDOT	\$600,000
	-Bicycle lockers	NJDOT	Post Project Construction	NJ Transit	\$10,000
2	Central Jersey Transportation Forum	Public Partnership	Multi-year	DVRPC/ NJTPA	\$350,000
3	Ridesharing Program	NJDOT Core Prog.	Multi-year	TMA	\$150,000/yr
4	Transit Service	NJDOT/NJ Transit Core Prog.	2yr. Study/ Implement	TMA	\$35,000
5	Signing Program Coordination	NJDOT Dgn. Funds	w/Project Design	NJDOT	\$20,000
6	Traffic Monitoring Program	Mercer Co./ NJDOT	Multi-year	Mercer Co.	\$10,000/yr.
<b>Total</b>					\$1,510,000