

## Section 2

# Alternatives Evaluation

USACE determines that the primary purpose of the New Jersey Turnpike Authority's (NJTA's) proposed Route 92 project, as discussed in Section 1, is to:

**Improve regional mobility, especially east-west mobility, for the central New Jersey area in and around southwestern Middlesex County and northeastern Mercer County.**

As described in Section 1.4.2, the strong suburban land development trends observed in the study region over the past two decades, especially in the vicinity of Princeton, created a significant demand for both north-south and east-west travel capacity in the region, resulting in congestion in many parts of the existing area road network (see Transportation, Section 3.7). Analysis of the road network in the study area using a detailed traffic model indicates that greater capacity is needed in the road network now, and even more so in the future. Because no major east-west route currently exists in southwestern Middlesex County that adequately diverts "through" traffic from local roads, both local and regional development activity continues to add cars and trucks to the increasingly stressed local and secondary (county) road system.

Improvements in the road network that meet the following objectives would help improve regional mobility, relieve traffic congestion, and improve quality of life for residents living and traveling on local roads.

- Allow north-south traffic to divert from US Route 1 to US Route 130 and the New Jersey Turnpike by providing additional east-west highway capacity, thereby reducing traffic congestion on local east-west roads and US Route 1, and improving mobility in southeastern Middlesex County and northeastern Mercer County.
- Establish a road system that acts to reserve local streets for *local traffic* and circulation, by providing new linkage for *through traffic* moving between US Route 1, US Route 130, and the New Jersey Turnpike, and minimizing adverse impacts on existing communities from through traffic and truck traffic using local streets.
- Reduce the presence of non-local truck traffic on the local roadway network and shift such traffic to a connector highway.
- Seek to minimize the potential to contribute to sprawl development in the project region by limiting new direct road access to undeveloped land.

### 2.1 Alternatives Examined

The alternative actions available to the US Army Corps of Engineers (USACE) during the regulatory review process are: to issue a permit in response to the NJTA request, issue a permit subject to conditions, or to deny a permit.

The National Environmental Policy Act (NEPA) requires that a review be conducted of alternative approaches to meeting the need for and objectives of the project (as described in Section 1 and above). Alternatives are evaluated in this section with respect to their ability to meet the project purpose and their environmental impacts. Alternatives can be differentiated by the degree to which they meet the project purpose (i.e., generally, to improve mobility on the road network). The alternatives also differ in the degree to which they cause impacts to the natural environment (e.g., wetlands, wildlife, and waterways), and the built environment (e.g., land use effects, displacement of homes and businesses, noise impacts). Finally, each of these alternatives can differ in the degree to which it may cause secondary impacts that can result from possible induced land use development.

NJTA has authority only to implement proposed Route 92 (or a modification thereof, such as the sub-alternatives discussed in Section 2.6.1.1 below). NJTA highway facilities are paid for by toll revenues collected from its users; these funds are not co-mingled with transportation funds for non-toll roadways. (Non-toll roadways are under the jurisdiction of NJDOT, counties, or municipalities.) NJTA toll revenues cannot be used for maintenance projects, unless they involve Turnpike facilities. Nevertheless, NEPA guidance (46 FR 18026) requires that alternatives beyond the capability of the project sponsor to implement should be evaluated in an EIS as long as they are reasonable and potentially effective alternatives. Thus, other state or local sponsors would be needed to implement many of the alternatives.

In this EIS the following review process was used to evaluate the alternatives:

- Alternatives that are similar in their ability to fulfill the project purpose but that are found to have comparatively greater adverse environmental impact are not recommended for further detailed analysis. Differentiating impacts among the alternative projects included wetland fill, loss of permanently protected farmland, loss of protected parklands/preserve, residential and commercial dislocation, contribution to sprawl development, and inability to meet basic project purpose.
- The consistency of alternatives with smart growth planning principles and the NJ State Development and Redevelopment Plan, and the potential for the transportation improvement to contribute to sprawl were assessed in the alternatives screening process.
- Alternatives that exhibit low effectiveness in achieving traffic improvement pursuant to the traffic modeling analysis are not considered for further analysis.
- Pursuant to alternatives analysis, those alternatives that best meet the project purpose, on a comparative basis, and exhibit a comparable or lower level of adverse environmental impact, on a comparative basis, are then evaluated in additional detail with respect to their impacts in Section 4.

Five types of alternatives are evaluated in this section:

**1. No Action.** This alternative is a consequence of USACE denying a permit for the proposed project. Under this alternative, no action would be taken beyond completing other roadway projects for which funds have already been committed and that meet permit requirements. Specifically, NJTA proposed Route 92 would not be constructed, nor would any other major traffic network improvement alternative be implemented as part of this project.

**2. Transportation demand management (TDM) measures.** TDM measures are focused on reducing the number of single occupancy vehicles that contribute to congestion on roadways through measures such as ride-sharing, flex hours, and public transit.

**3. Existing local and county roadway capacity improvements.** This category includes alternatives that improve the capacity of existing local and county roads by widening existing roads and improving intersections. As recommended by the North Jersey Transportation Planning Authority (NJTPA) for transportation accessibility and mobility analyses, these alternatives constitute a category of alternatives known as Transportation System Management (TSM) measures (improvements to the existing roadway system that make it function more effectively).

**4. Improvements to existing regional system.** This category includes improvements to the existing regional roadway system, specifically US Route 1.

**5. New roadway facilities.** The category includes construction of new roadways.

Within each of these five broad categories, the following specific alternatives are evaluated:

1. No Action
  - No permit issued and no implementation of the NJTA proposed action (i.e., no implementation of the proposed regional roadway capacity improvements)
2. Transportation Demand Management
  - Ridesharing-Carpooling/Vanpooling Programs
  - Alternative Work Hours
  - Parking Management
  - High Occupancy Vehicle (HOV) Lanes
  - Transit Support Services, Including Park-and-Ride Facilities
  - Public Transit Operational Improvement
  - Bicycle and Pedestrian Facilities
  - Transportation Management Association Involvement

3. Existing Local and Secondary (County) Roadway Capacity Improvements (New Lanes on Existing Roads or Intersection Improvements)
  - US Environmental Protection Agency (USEPA) Suggested Modified No-Build Alternative
  - Route 522 Widening (with and without extension to New Jersey Turnpike)
  - Dey Road Widening
  - Plainsboro–Cranbury Road Widening
  - Cranbury Neck Road Widening
  - Composite Local Roadway Improvements Program
4. Improvements to the Existing Regional Roadway System
  - US Route 1 Widening in South Brunswick
  - US Route 1 Widening in South Brunswick with Signal Removals
5. New Roadway Facilities
  - NJTA Proposed Route 92 with Terminus at Route 1, including sub-alternatives
  - USEPA Suggested Alignment
  - Dey Road Parallel Alignment
  - Plainsboro-Cranbury Road Parallel Alignment
  - South Brunswick Alignment – Modified

Each of these alternatives is discussed in separate subsections below. Most of the alternatives discussed herein were evaluated previously in NJTA documents (1994 Draft Environmental Impact Statement [Harris, 1994], prepared under NJ Executive Order No. 215, and the 1999 USACE Section 404 Permit Application [Harris, 1999]). The prior material forms the basis for the evaluation presented below, with updating as needed.

## **2.2 No Action Alternative**

Under the No Action alternative, the US Army Corps of Engineers would not issue a permit to discharge fill material into waters of the United States (wetlands) for the proposed roadway construction; specifically, NJTA proposed Route 92 would not be implemented. No new linkage between US Route 1 and the New Jersey Turnpike would be added to the existing roadway network in southern Middlesex County, nor would major highway construction occur to fulfill the purpose of the project (i.e., to improve regional mobility).

The No Action alternative provides the baseline against which all other alternatives are evaluated. The No Action alternative assumes that the study area's existing transportation network remains as it currently exists. It also assumes that the highway system improvements discussed below, that currently have funding commitments and that will meet permit requirements, will be implemented. Highway projects that have funding commitments but that are not completed (i.e., committed projects) are included as background conditions in the analyses prepared for this EIS so that cumulative impacts may be assessed. In addition, committed projects are included as background

conditions because the EIS is designed to evaluate the effects of projects 20 years in the future, so as to include the effects of existing land use and population changes in measuring effectiveness and impacts.

The No Action alternative includes a number of roadway system improvements that were recently completed (hence not included as background conditions in earlier environmental studies). Completed transportation system improvements include: addition of a right-hand turning lane from southwest-bound Dey Road to northwest-bound Scudders Mill Road; widening of US Route 1 from four to six lanes from Adams Lane in North Brunswick Township to the intersection with US Route 130; addition of a major NJTA park-and-ride lot adjacent to the US Route 130/Route 32 intersection; the Route 133 Hightstown Bypass, and widening the New Jersey Turnpike to seven lanes per direction north of Interchange 11 (increasing regional north-south travel capacity).

The No Action alternative includes as a background condition the implementation of the Penns Neck Improvements, for which funds have been committed by the New Jersey Department of Transportation (NJDOT). While the Penns Neck Improvements will improve traffic flow on US Route 1 (by eliminating signalized intersections) and provide localized east-west mobility in West Windsor, traffic modeling conducted for this EIS shows that these improvements alone do not address the regional traffic flow issues in southwestern Middlesex County and northeastern Mercer County because they do not provide connectivity between US Route 1 and the New Jersey Turnpike, or improve regional mobility. Traffic modeling also shows that current congestion along the US Route 1 corridor *north* of the Penns Neck Improvements would not be reduced by the implementation of those improvements, because that project is designed to address local, but not regional, traffic problems (see Transportation, sections 3.7 and 4.2.7).

Under the No Action alternative, increasing traffic congestion characteristic of significant portions of the existing local and regional roadway network would continue, and would worsen in future years as population, employment, and vehicular use increase. Based on traffic modeling, increasing levels of regional through traffic, including heavy truck traffic, would be experienced on the local road system, which would make the affected neighborhoods less amenable to walking and bicycling and decrease the attractiveness of the area's community centers.

Based on traffic and air quality modeling for the year 2028, air pollution from vehicular traffic would decrease substantially under the No Action alternative. This is because federally mandated reduction in motor vehicle emissions are expected to outweigh the effect of increased traffic and congestion. Improvements to the regional traffic network, such as those considered in the Alternatives Analysis, would reduce emissions still further, because of reductions that would occur in vehicle miles traveled and improvements in vehicle speeds. (See sections 3.7 and 4.2.7 for additional detail.)

Under the No Action alternative, traffic modeling conducted for this EIS shows that vehicle hours of travel associated with trips in the region would increase, causing

further delay in local and regional commutation, freight movement, and general travel. Among all alternatives examined, the No Action alternative would result in the greatest increase in Vehicle Hours of Travel and among the greatest increases in Vehicle Miles Traveled in year 2028. It exhibits the lowest average network speed, attributable to overloading the capacity of the existing road system in the project area. The No Action alternative would result in total saturation of the existing roadway network, and significant declines in the level of service on existing roads (see Section 1 and Section 4.2.7). Based on this analysis, the No Action alternative has been found to be not responsive to project goals and objectives and would not be effective in addressing the region's traffic congestion.

## **2.3 Transportation Demand Management**

This section summarizes the analyses of Transportation Demand Management (TDM) measures as strategies to assist and complement capacity improvement alternatives in reducing traffic congestion. TDM measures are focused on reducing single occupancy vehicles on roadways (i.e., ride-sharing, park and ride facilities, alternative work hours, improved transit capacity, etc.).

The Transportation Demand Management (TDM) strategy addresses transportation problems and promotes a partnership between government and businesses. TDM measures are designed to affect travel demand by reducing the need to travel, increasing vehicle occupancy or the use of other modes, or by moving trip times outside of peak travel hours. These measures generally address peak hour travel situations by reducing either the number of total work trips or the number of Single Occupancy Vehicle (SOV) work trips taken during the peak hours. TDM alternative transportation methods include park-and-ride lots, carpools/vanpools, flexible work hours (including telecommuting), transit and parking management alternatives. As discussed below, the analysis of TDM-related strategies concludes that, although beneficial in terms of supplying traffic relief (reduction of vehicle trips), these strategies alone do not significantly meet the need for improved regional mobility. It is noted that some of these strategies are in use in the study area at present and current traffic conditions already reflect implementation of these strategies. Nevertheless, taken together, these strategies can turn SOV trips into shared trips and reduce congestion. NJTA indicates that it supports implementation of TDM measures, as indicated by its establishment of park-and-ride facilities at New Jersey Turnpike interchanges including Interchange 8A.

### **Ridesharing-Carpooling/Vanpooling Programs**

Ridesharing includes the use of both carpooling (use of private vehicles between several people) and vanpooling (use of a single designated van). It may be company-sponsored, third-party or owner-operated. Ridesharing can lessen congestion by reducing overall vehicular traffic, thus reducing VMT, air pollution and energy consumption. Those participating in the ridesharing program will likely have reduced commuting costs and travel-related effects on their personal vehicle. Companies may reduce needed parking space. In the study area, rideshare matching services are provided by Keep Middlesex Moving (KMM), a program of the Middlesex and Monmouth County Transportation

Management Association (TMA). KMM provides information assistance to promote a variety of TDM services in Middlesex County and participates in RIDEPRO, the New Jersey Department of Transportation free electronic ride matching service. The KMM database matches one's commute patterns (origin, destination, start and stop times) with others in its database to find a suitable match. KMM has 625 commuters registered in its ridesharing database, of whom about half have been matched and use the system.

Although rideshare services such as KMM are established in the study area, the exact extent of total carpooling is not clear. In general, carpooling/vanpooling has been shown to not significantly reduce vehicular traffic, even in areas of high population. Studies in the United States of the effectiveness of TDM measures have estimated that approximately 1.5-4% traffic reduction may result from the implementation of ridesharing. (For example, a 2000 analysis of the Puget Sound, Washington vanpool program, the largest public vanpool fleet in North America at the time of the study, concluded that vanpooling in the region had accommodated a 2% share of the commute market). In an effort to make this strategy more effective, many transit/carpool incentives have been explored and implemented elsewhere. Transit/carpool incentives, economic incentives for using these alternative modes, are usually provided by individual employers or through regional programs. These incentives can be provided in several forms: subsidized vanpool services, free or reduced parking fees, or tax advantages (in the form of a pre-tax deduction for use of ridesharing or public transportation for commuting). The overall impact of this strategy is measured through a reduction in SOV vehicle trips that may otherwise increase roadway congestion. In the project study area, participation in ridesharing is currently possible, but the suburb-to-suburb nature of travel patterns in the study area tends to limit the potential of ride-sharing. As noted in the State "Congestion Buster Task Force" final report, October 2002, the number of New Jersey workers driving alone increased from 1990 to 2000 but the number carpooling decreased during that time period. This appears to be attributable to the increasing number of businesses moving to the suburbs, resulting in greater worker dispersment. In conclusion, ridesharing, while beneficial, would not alone significantly address the existing traffic congestion in the area, particularly the truck traffic.

### **Alternative Work Hours**

Flex-time allows deviation from the standard 8-hour, 5-day work week. Whether the work arrangement is categorized as a modified hour or a modified work place category, both decrease the total and peak period trips to lessen the peak travel periods. This decrease allows the transportation system to have a greater commuter travel time period without additional peak capacity. The modified work-hours arrangement involves compressed work weeks, flex-time, and staggered work hours. A compressed work week allows employees to work their regularly scheduled hours in fewer days per week, rather than the normal five days. Flex-Time allows employees to select the hours they work each week. Flex-Time (staggered work hours) allows employees to work 8-hour shifts with varying starting and ending times and may alleviate approximately 1-1.5% of existing peak traffic, according to studies of the effectiveness of TDM measures. Flex-Time does not affect total traffic volume. The modified work place category involves telecommuting and the utilization of regional work centers. Telecommuting allows

employees to perform their regular work duties at home, either full or part-time, entirely eliminating the commute trip, or at an established telecommuting center which would be closer to their home than their usual work location. Regional Work Centers are suburban locations where employees can work at a location closer to home. Although beneficial in reducing peak vehicular travel and traffic congestion by about 1-1.5%, this strategy would not alone result in a significant reduction of east-west SOV travel in the project study area, nor would it reduce truck traffic.

### **Parking Management**

The parking management strategy involves any plan by which parking space is provided, controlled, regulated, or restricted. This plan typically involves changes to job location parking by the limiting of available parking, implementation of a parking cost increase, removal of parking spaces, application of restrictions (time of day, duration etc.), and the control of parking required for new development (by, for example, zoning codes/ordinances). It can also include so-called "Parking Cash-out" programs, whereby office workers give up employer-provided parking spaces in exchange for their equivalent monetary value. Such actions are likely to encourage individuals to participate in a carpool/vanpool arrangement. This strategy would not significantly reduce the need for additional travel capacity in the study area because most of the major parking demands are north of the study area in the metropolitan employment centers of New York City, Newark, etc.

### **HOV Measures**

For the purpose of maintaining travel speed and avoiding traffic congestion, High Occupancy Vehicle (HOV) lanes have been implemented. HOV lanes are reserved for use of carpools, vanpools, buses, and sometimes motorcycles and are most effective during peak travel periods. The introduction of a new HOV system may involve an added lane or restrictions on use of existing lanes. By increasing the average number of people per vehicle and reducing the total number of vehicle trips, HOV lanes can result in more efficient travel times. HOV lanes are most effective where many vehicles travel between a common set of origins and destinations to allow ridesharing. Because of the strong north-south orientation of the most heavily traveled roads in the area, this strategy is more applicable to the New Jersey Turnpike and Route 1 corridors and less applicable to the east-west roads in the study area. An HOV lane for Route 1 would present safety problems because of the numerous exits (weaving may increase congestion). Moreover, the history of HOV lanes in New Jersey has not been a success (partly because of existing scattered travel patterns). It appears that HOV measures would not produce significant benefit in the study area.

### **Public Transit Improvements**

#### ***Transit Support Services including Park-and-Ride Facilities***

This strategy involves improvements to existing facilities and construction of new facilities that offer public transportation. These services include bus stops, transit centers, rail lines and park-and-ride lots. Park-and-ride lots are locations where individuals park their vehicles and continue their commute through an established

alternative transportation mode such as transit lines, carpools/vanpools buses or other forms of public transportation. Park-and-ride lots are available and may potentially reduce 1-3% of existing traffic during morning and evening peak travel hours. This strategy requires the acquisition of public property. Two park-and-ride lots are located in the main project study area, one at the intersection of Route 130 and Route 32 and the other at College Road East and Research Way (Forrestal Center). There are several other nearby park-and-ride lots in Plainsboro and on Route 27, at the west boundary of the study area. For effective and significant relief of traffic congestion, these transit facilities must be extensively utilized. In the study area, park-and-ride facilities are oriented to accommodate commuters traveling in a north-south direction to and from New York City and Newark (as well as other high employment areas).

***Public Transit Operational Improvements***

Transit operational improvement alternatives can be implemented for the purpose of reducing transit travel times and improving schedule reliability. Such operational improvements include measures that primarily increase the comfort, reliability, and safety/security of transit service vehicles. Additional transit service improvements include modifications to service routing and current schedules (including express routes), additional stop locations, improved transit-related roadways and lower fares to attract more riders. The application of traffic operations such as signal priority for transit vehicles, bus turnouts, and modifications to the location or frequency of stops may allow more efficient continuous and convenient transportation and encourage additional riders. Transit operational improvement alternatives have the potential of slightly reducing vehicle trips and VMT as long as the alternatives are highly utilized; otherwise, these improvements will not fully meet the need for increased east-west mobility. Improvements to existing transit service involve adding transit capacity by increasing the number of vehicles operated, constructing new facilities and providing better and more comprehensive coordination among various transit systems. Several transit routes serve the project study area and vicinity, principally on Routes 1 and 27 destined for New York City (Port Authority Bus Terminal and Wall Street). There appears to be a potential for additional local transit service on US Route 1 and NJ Route 27 to/from Princeton/South Brunswick to New Brunswick/Edison, based on the employment growth in the corridor. Included in this concept is the potential for a bus rapid transit (BRT) system for the US Route 1 corridor.

Recognition of the potential opportunity to implement a BRT led to the initiation in 2004 of the Central New Jersey Route 1 BRT Alternatives Analysis, managed by New Jersey Transit and advanced in collaboration with NJDOT, the Delaware Valley Regional Planning Commission and the New Jersey Transportation Planning Authority. The study is an outgrowth of the work of the Central New Jersey Transportation Forum and the Greater Mercer Transportation Management Association. A report of the study issued in February 2006 estimates that a BRT system would increase the percentage of work trips using transit from a range of 2% to 4% to a range of 5% to 9% in the core study area of Plainsboro, West Windsor, Princeton Township and Princeton Borough.

The report estimates that the BRT system would cost \$600 million to \$700 million to implement. The BRT study is continuing.

Previous analyses have suggested that a BRT system, together with smart growth land use development, implementation of travel demand reduction strategies, and highway improvements could reduce the anticipated growth in roadway congestion. This is the same conclusion reached in the Route 92 EIS and indicates, as stated in the EIS, that BRT could be a complement to the proposed Route 92 project but would not likely be a substitute for it.

### **Bicycle and Pedestrian Facilities**

Because of the considerable average travel distances in the project study area, bicycle and pedestrian facilities do not have the potential to achieve significant reductions in vehicle trips. However, as a complementary strategy, these facilities can increase the potential for non-motorized trips. The NJDOT 1997 "Route One Corridor Bicycle & Pedestrian Case Study" proposed several bicycle and pedestrian projects, principally to serve the needs of bicyclists and pedestrians, as opposed to reducing congestion. The projects proposed in the case study focus on improving the ability to cross US Route 1 at Route 522 and Ridge Road and on connecting local community areas. Since the projects are concerned with cross traffic from west of US Route 1 to east of US Route 1, they may conflict with proposals to remove signals on US Route 1. Nevertheless, bicycle and pedestrian facility improvements should be considered in any project design.

### **Transportation Management Association Involvement**

Demand management is a key strategy to relieve roadway congestion. One element of any plan to address congestion in the study area would involve greater collaboration among government, the local business community, and Keep Middlesex Moving, Inc. (KMM), the Transportation Management Association (TMA) for Middlesex County. In creating complementary strategies, KMM helps to identify potential trip reduction strategies and opportunities in the study area. KMM serves as an alliance of government and businesses to provide commuter-related resources to people in Middlesex and Monmouth counties. KMM has advised and assisted employers in creating and implementing alternative commuting opportunities in areas such as Transportation Demand Measures (including carpooling/vanpooling, telecommuting, compressed work weeks), transit facilities (park & ride lots/facilities) and public transit operations (bus routes and services), non-motorized travel modes (bicycling/walking) and emergency traffic alerts.

### **Cumulative Effect of TDM Strategies**

In the project study area, the potential cumulative reduction in vehicle miles traveled after aggressive implementation of the above-described TDM strategies is estimated to be in the 5-10% range. This estimate is based on studies of the effectiveness of TDM measures in reducing traffic volumes (for example, a transportation planning study of the I-405 corridor in the Seattle, Washington metropolitan area by the Washington State Department of Transportation included major TDM components in the study. The

TDM package was estimated to reduce trips from 2% to 5% within the corridor). These strategies, while not sufficient by themselves to eliminate the need for the proposed project, as evidenced by existing and projected congestion levels, are nonetheless important components of a coordinated transportation system.

It should also be noted that the traffic projections incorporate the fact that many TDM measures including telecommuting are in use now and will continue.

### **TDM Conclusions and Recommendations**

The implementation of each TDM measure discussed above would likely provide some relief from traffic congestion in the study area, but overall would not substantially address the project need. TDM measures are most effective in reducing traffic congestion in locations that exhibit high densities of residential development and located near employment “centers”. Experience with TDM measures in suburban NJ indicates that the implementation of each of the previously described strategies would not significantly mitigate the existing congestion problems. However, *such strategies would be effective as complementary strategies*, and the combined effect of these measures can offset the potential for additional highway-capacity-induced SOV trips.

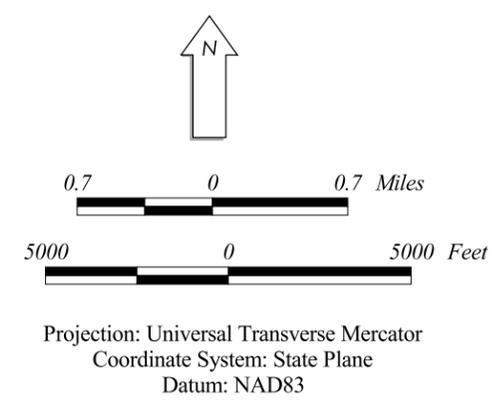
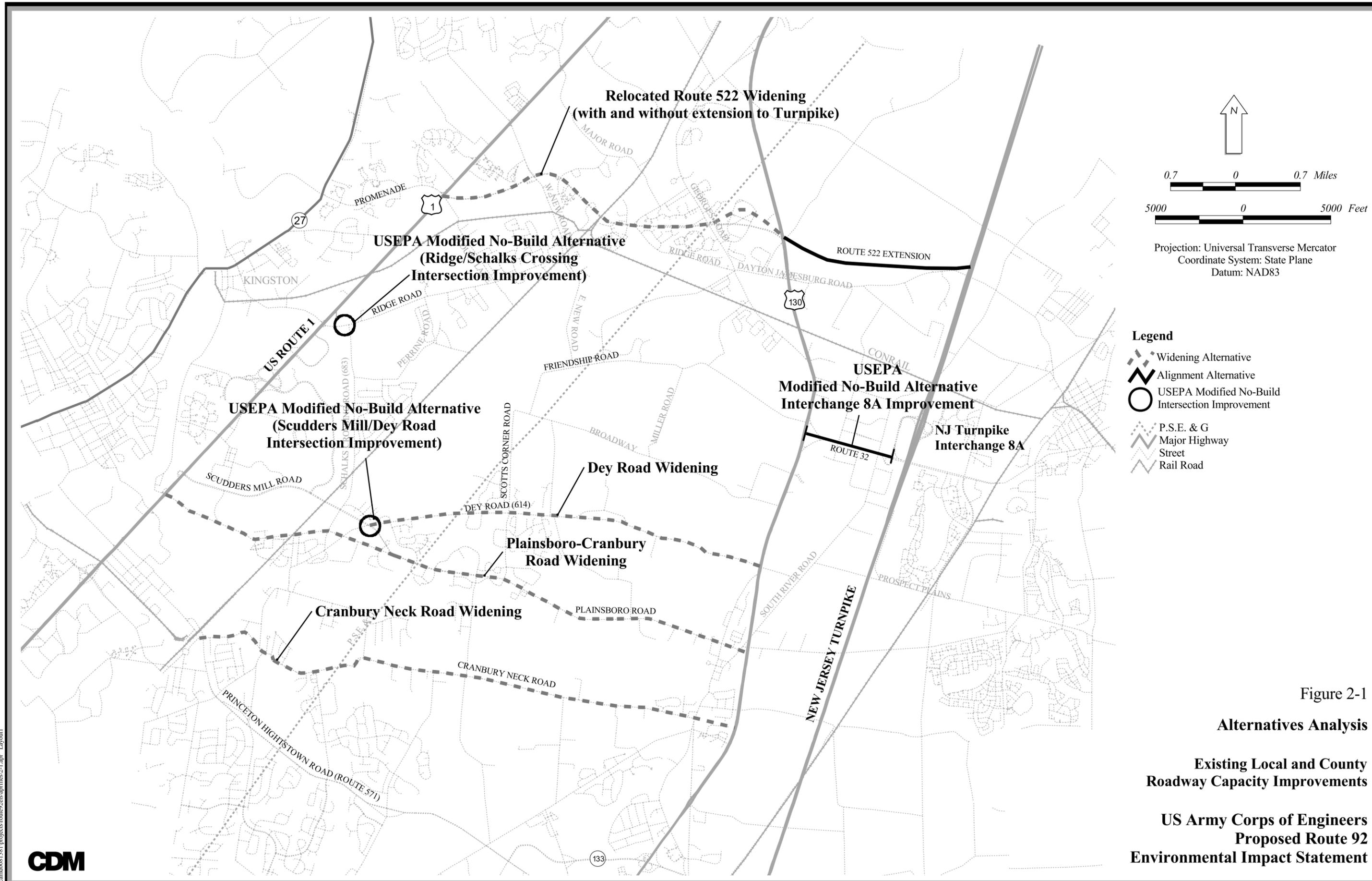
The TDM findings and recommendations are summarized as follows:

- TDM strategies such as rideshare matching services exist in the study area and are beneficial. Enhancement of these services through increased collaboration with and support of KMM would provide some congestion relief and is recommended.
- HOV lanes could theoretically reduce congestion if fully implemented. But the dispersed travel patterns in the study area and safety concerns on US Route 1 argue against recommending HOV lanes on that roadway.
- Public transit improvements in terms of increased local bus service to/from Princeton/South Brunswick and New Brunswick/Edison (e.g., bus rapid transit) is a potential strategy that is recommended for further analysis.
- Bicycle and pedestrian facility improvements would not reduce regional congestion, but are beneficial at the local level and should be considered.

## **2.4 Existing Local and Secondary (County) Roadway Capacity Improvements**

This group of alternatives, shown in Figure 2-1, involves the addition of new lanes to existing roads or improvements to existing intersections. As noted above, these alternatives are known as Transportation System Management measures.

Improvements to the following roads were not considered as alternatives because these roads do not provide convenient east-west connections among US Route 1, US Route 130, and the New Jersey Turnpike: CR-610/Deans Lane, Major Road, New Road,



- Legend**
- Widening Alternative
  - Alignment Alternative
  - USEPA Modified No-Build Intersection Improvement
  - P.S.E. & G
  - Major Highway
  - Street
  - Rail Road

Figure 2-1  
**Alternatives Analysis**  
**Existing Local and County**  
**Roadway Capacity Improvements**  
**US Army Corps of Engineers**  
**Proposed Route 92**  
**Environmental Impact Statement**

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CR-535, Dutch Neck Road, and Hankins Road. Improvement of CR-571 is not considered as an alternative because as part of the Penns Neck EIS process, it was decided not to widen CR-571 in West Windsor. Without widening in West Windsor, improving CR-571 could not be a viable alternative.

### **2.4.1 USEPA Suggested Modified No-Build Alternative**

In September 1998, USEPA-Region 2 identified an alternative to Route 92 that USEPA asserted would alleviate local traffic problems without impacting wetland areas. The USEPA alternative included specific improvements to existing roadways in the area of South Brunswick and Plainsboro:

- Improvements to Route 32 and its intersections with, and between US Route 130 and the New Jersey Turnpike (also proposed by NJTA as part of the proposed Route 92 project). This would improve the performance of four intersections that are currently failing (i.e., have level of service F, indicating congestion and significant queuing).
- Addition of a right-hand turning lane from southwest-bound Dey Road to northwest-bound Scudders Mill Road
- Optimization of signal timing at the intersection of Ridge Road and Schalks Crossing Road during peak evening hours.

Two of the three suggested improvements are currently in place. A right-hand turning lane from southwest-bound Dey Road to northwest-bound Scudders Mill Road currently exists, and has been assumed as a background condition in the updated traffic modeling conducted for this EIS. Traffic modeling also indicates that signal timing during peak evening hours at the intersection of Ridge Road and Schalks Crossing Road is currently optimized. Although two of these improvements have been implemented, there is still congestion along local east-west routes in the project area, and congestion is projected to worsen (see Section 1). The USEPA Suggested Modified No-Build Alternative also identifies improvements at and around Interchange 8A. The ability of these improvements to meet project purpose and need have been evaluated.

Updated regional traffic modeling was performed for this EIS (using traffic models previously accepted by NJDOT and the Metropolitan Planning Organizations – NJTPA and DVRPC). The traffic modeling indicates that this USEPA alternative would not fulfill the purpose of and need for proposed Route 92 (as listed above and discussed in Section 1). NJTA proposed Route 92 would *decrease* westbound non-local peak hour trips using local east-west roads by 18 percent in the morning and would *decrease* eastbound non-local trips using local roads by 28 percent in the evening. (See sections 3.7 and 4.2.7 for additional detail.) Comparatively, under the USEPA Suggested Modified No-Build Alternative morning non-local trips would *increase* by four percent, and there would be no reduction in the number of evening non-local trips using local roads. Because this alternative would not reduce regional through traffic on the local east-west road system, local driving would be more difficult as a result of congestion.

Walking and bicycling would be less safe. Congestion, caused by regional traffic attempting to use local roads to reach destinations more quickly, tends to decrease the attractiveness of community centers and decrease the identification of local residents with their community. This alternative would have the additional disadvantages of the No Action alternative discussed in Section 2.2.

This alternative would have minimal environmental and socioeconomic impact and would not promote sprawl development. However, these advantages are outweighed by the inability of this alternative to fulfill the purpose of the proposed project--to address the region's need for improved mobility. For these reasons the USEPA Suggested Modified No-Build Alternative is not considered for further analysis.

### **2.4.2 Route 522 Widening and Extension**

Route 522 is a four-lane east-west roadway in northern South Brunswick Township. It is the northernmost roadway evaluated as an alternative to Route 92 in this EIS. Traffic modeling analysis of the existing roadway network indicates that under the No Build alternative, the traffic generated by growth in the project region will result in several critical links of Route 522 exceeding capacity by year 2028. For this reason, it was determined that the Route 522 Alternative would need to include construction of additional lanes to fulfill a role as the primary east-west travel route. Thus, the Route 522 Widening alternative assumes a widening of Route 522 from four lanes to six lanes.

The existing 120-foot right-of-way of Route 522 is approximately 4.2 miles long and accommodates four travel lanes, a 16-foot median and two 12-foot shoulders. The effects of extending Route 522 approximately 2.3 miles farther east to connect to the New Jersey Turnpike near Interchange 8A have also been evaluated. The design that includes the extension provides regional travel functionality that is closer to the purpose of proposed Route 92, and more closely meets the need for expanded east-west travel capacity.

Widening Route 522, with or without an extension to the New Jersey Turnpike, would cause significant adverse environmental, social, and traffic-related impacts.

Construction of this alternative would result in property acquisition and displacement of six single-family residences, 52 multi-family residences, one commercial facility, and four public facilities. In addition to these direct property acquisitions, this alternative would bring the edge of pavement closer to a substantial number of remaining residences, resulting in increased adverse noise impacts, air quality impacts, and aesthetic impacts to those residences. Much of the land use along Route 522 is residential, and pedestrian crossing of Route 522 is typical of residential neighborhoods.

A new development built along Route 522 is the Summerfield Subdivision, a 641-unit residential development on both sides of Route 522 between US Route 130 and Georges Road. Summerfield includes approximately 230 single-family lots, 411 multifamily units,

two baseball fields, two basketball courts, several playgrounds, a 523,517 square foot commercial strip, and 15 acres of detention basins. Summerfield has four access drives onto Route 522 within a 0.6-mile distance.

Widening Route 522 from four to six lanes would have adverse impacts to many Summerfield residents, particularly those located adjacent to the proposed road. Increased noise levels and deteriorated air quality would adversely affect these residences. In addition, pedestrian safety, especially for the children who reside within Summerfield, is an important consideration. Summerfield includes recreational facilities on both sides of Route 522. It is anticipated that Route 522 will be crossed on foot extensively by children and adults moving between recreational facilities. Different types of facilities are located on each side of the road (e.g., only one side has a soccer field). Even with the use of crosswalks, there are significant safety concerns with pedestrians crossing four lanes of traffic. These concerns would be intensified with widening to 6 lanes.

NJDOT's Route 522 Final Environmental Impact Statement (FEIS, 1986) identified a total of 374 existing residences that were predicted to experience noise impacts with the construction of a four-lane Route 522. Since the publication of the Route 522 FEIS, there has been increased residential development in this area, particularly in the Summerfield subdivision. Widening Route 522 from four to six lanes is anticipated to increase noise impacts on at least the 374 residences identified in the Route 522 FEIS, plus another 100 or more residences in Summerfield, bringing the total number of residences impacted by increased noise levels to approximately 475.

In addition to requiring residential property acquisitions, widening Route 522 to six lanes would create travel lanes that would be closer to the many remaining residences than is currently the case. The edge of the widened pavement would be approximately 20 feet from an exterior wall of approximately 12 townhomes in the southwest quadrant of the intersection of New Road and Route 522. This would result in increased air quality, noise, aesthetic and safety impacts to these residences.

This alternative would also require filling of wetlands and cause displacement of parkland. Widening Route 522 without an extension to the New Jersey Turnpike would require filling of 2 acres of forested wetlands. The extension of Route 522 to the New Jersey Turnpike would require filling an additional 3 acres of forested wetlands within Pigeon Swamp State Park, and would also impact 2 acres of state open waters. In addition to being a state park, Pigeon Swamp State Park is a USEPA Priority Wetland and is included in the National Register of Natural Landmarks. Pigeon Swamp State Park overlies an aquifer utilized as a drinking water supply for nearby residential, commercial and industrial users.

In addition to social and environmental impacts, this alternative is not consistent with the intended purpose of Route 522 as expressed by NJDOT in the Route 522 FEIS. The

Route 522 FEIS states that Route 522 is designed to function as a local service road for existing and projected industrial and local transportation needs.

Traffic modeling indicates that widening Route 522 without an extension to the New Jersey Turnpike would not effectively divert local east-west traffic from other local routes because there is little advantage in using a different *local* roadway that did not improve access to the New Jersey Turnpike. The remaining local street network would not be improved, nor would substantial traffic be diverted from US Route 1 to the New Jersey Turnpike and Route 522. (See Appendix A, URS-Greiner Traffic Study, February 14, 1997 NJ Freshwater Wetlands Individual Permit application document.) Widening Route 522 without an extension to the Turnpike would encourage additional through traffic on this local road, reducing the amenity of adjoining neighborhoods and making walking and bicycling less feasible and less safe.

In contrast, extending a widened Route 522 to a terminus at the New Jersey Turnpike would carry a projected 61,900 vehicles per day (based on traffic modeling conducted for this EIS). An at-grade roadway that intersects with local roads, Route 522 was not planned and located to accommodate the impacts of such a high number of vehicles.

Extension of Route 522 would also encourage linear development instead of compact, clustered community design, because new roadways and driveways could be intersected anywhere along its length. Route 522 is essentially a county-level service road, collecting traffic from municipal roads and conveying it to state highways. Because of its “connectivity” function, an expanded Route 522 would improve access to undeveloped lands along its corridor, both directly and via intersecting local roads, thereby creating significant potential to contribute to sprawl.

Finally, the proposed route for the extension of Route 522 to the New Jersey Turnpike would require a new Turnpike interchange within a few miles of existing Interchange 8A, which would be costly, inefficient, and difficult to design with respect to traffic safety.

In summary, the alternative of widening Route 522 would result in significant residential, community, and environmental impacts. To achieve the east-west connectivity required to manage congestion in the project area, Route 522 would need to be connected to the New Jersey Turnpike, but, if a Turnpike connection were provided the roadway would carry traffic flows far in excess of its design, classification, and location. In addition, implementing a connection to the New Jersey Turnpike would increase the environmental impact of the project. The widening and extension of Route 522 would not effectively address the mobility requirements of this region, because it would use the local road network (including Route 522 itself) to carry regional through traffic. Route 522 would also increase potential for sprawl development because construction of curb cuts and intersecting roads are acceptable activities for this type of road, and because of its location in a relatively less developed area of South

Brunswick. For the reasons presented above, the Route 522 widening and extension alternatives are not considered for further analysis.

### **2.4.3 Dey Road Widening**

This alternative would widen a 4.7-mile section of Dey Road, a local east-west road, from two lanes to four lanes. The widening would extend from Scudders Mill Road in central Plainsboro Township to US Route 130 at the southeastern corner of South Brunswick Township, on the border of Cranbury Township. This widening project would terminate at Route 130, and would connect indirectly to the New Jersey Turnpike using Route 130 and Route 32.

Approximately 7.5 acres of forested wetlands would need to be filled to widen Dey Road. In addition, widening Dey Road would require acquisition or displacement of approximately 18 single-family residences and one commercial structure.

The updated traffic modeling conducted for this EIS indicates that widening Dey Road would increase its traffic volume to approximately 37,400 vehicles per day by year 2028, an increase of 9,000 vehicles over the No Action scenario. The increased traffic volume carried by the widened Dey Road would be approximately 10 percent less than the estimated 41,000 vehicles per day that would be carried by proposed Route 92, but would occur on a local, as opposed to limited-access, road. Furthermore, widening Dey Road increases morning westbound non-local peak hour trips using local roads by 3 percent, and would not have any effect on eastbound evening non-local trips using local roads.

Widening Dey Road would impact less wetland acreage than proposed Route 92, but it would displace a larger number of residences and would increase impacts on remaining residences, specifically for air quality, noise, and aesthetic concerns. Although this alternative would not open new areas to development, it would improve access to undeveloped land along Dey Road, and would therefore facilitate sprawl development to a moderate degree. In addition, widening Dey Road would not be effective in meeting the project purpose of improving regional mobility, because as an at-grade road with many curb cuts and connecting roads, it could not separate local traffic from regional through traffic, which is necessary to optimize regional travel. Under this alternative, the increased level of local and regional through traffic sharing the same road would make local driving more difficult, discourage walking and bicycling, and reduce the quality of life in affected communities. It would not provide an efficient connection to the New Jersey Turnpike, because it would require that traffic travel on local roads, through a number of local intersections, to reach Interchange 8A. Consequently, it would not be effective in addressing the region's traffic congestion and associated vehicular air pollution. For the reasons presented above this alternative is not considered for further analysis.

## 2.4.4 Plainsboro-Cranbury Road Widening

Plainsboro-Cranbury Road is a local 2-lane east-west road located south of Scudders Mill Road and Dey Road. To the west, its terminus is at Scudders Mill Road. To the east, Plainsboro-Cranbury Road ends at US Route 130 just north of the historic center of Cranbury Township. Under this alternative the entire 6.6-mile length of Plainsboro-Cranbury Road would be widened from two lanes to four lanes.

Approximately 0.6 acres of wetlands would be impacted by widening bridges in the course of widening Plainsboro-Cranbury Road. Crossings of Cranbury Brook and Walker Gordon Pond would require roadway construction within these water features and their associated floodplains. In addition, widening Plainsboro-Cranbury Road would require acquisition or displacement of approximately 35 single-family residences, six multi-family residences, five commercial structures and two public facilities. Some of the properties that would be affected are in the Cranbury Village National Historic District in Cranbury Township. Although this alternative would not open new areas to development, it would improve access to undeveloped land along Plainsboro-Cranbury Road, and would therefore facilitate sprawl development to a moderate degree.

Widening Plainsboro-Cranbury Road would draw traffic from other unimproved local east-west roads, including Route 571, Dey Road, and Cranbury Neck Road. The traffic volume on Plainsboro-Cranbury Road by year 2028 would increase to approximately 46,000 vehicles per day. The traffic volume carried by a widened Plainsboro-Cranbury Road would be greater than the estimated 41,000 vehicles per day forecast for proposed Route 92. Widening Plainsboro-Cranbury Road is expected to increase morning westbound non-local peak hour trips using local roads by 12 percent, and is not expected to have any effect on eastbound evening non-local trips using local roads.

Widening Plainsboro-Cranbury Road from two to four lanes would require fill in less wetland acreage than proposed Route 92. However, there are significant residential and commercial dislocation impacts, adverse impacts to the historic setting of Cranbury Village, and increased air quality, noise, and aesthetic impacts that would be experienced by residences adjacent to the widened road. Because of the number and nature of the existing land uses along Plainsboro-Cranbury Road, and the presence of a National Historic District in Cranbury near the widening, this alternative exhibits a number of serious obstacles to implementation.

This alternative would not be effective in meeting the project purpose of improving regional mobility (see Section 1), because widening Plainsboro-Cranbury Road would not separate regional traffic from local traffic, which is necessary to optimize regional travel. The increasing volume of local and regional through traffic would create congestion, make local travel more difficult, discourage walking and bicycling, and reduce the quality of life in adjacent communities and neighborhoods. This alternative would result in substantial adverse residential, community, social, historic and environmental impacts. It does not provide an efficient connection to the New Jersey

Turnpike because it would increase the burden on local intersections to reach New Jersey Turnpike Interchange 8A. For these reasons the widening of Plainsboro-Cranbury Road is not considered for further analysis.

### **2.4.5 Cranbury Neck Road Widening**

Cranbury Neck Road is a local two-lane east-west road located south of Plainsboro-Cranbury Road. To the west, it runs across the southern tip of Plainsboro Township and terminates at Route 571 in West Windsor Township. To the east, it terminates at Main Street at the southern end of Cranbury Village, in the center of Cranbury Township. Under this alternative, the entire 5.8-mile length of Cranbury Neck Road would be widened from two lanes to four. In addition, this alternative would extend east to US Route 130 by widening approximately 0.15 miles of Main Street and approximately 1 mile of Cranbury Station Road from two to four lanes. The widened roadway would therefore total approximately 7 miles. This alternative does not include either a direct connection to US Route 1, nor a direct connection to New Jersey Turnpike Interchange 8A.

Widening Cranbury Neck Road would draw vehicles from Route 571 in East Windsor and West Windsor townships, and Dey Road. Traffic modeling conducted for this EIS indicates that traffic volumes would increase to 46,500 vehicles per day on a widened Cranbury Neck Road. The increased level of local and regional through traffic would increase congestion on this mostly rural road, make local travel more difficult, discourage walking and bicycling, and reduce the quality of life in adjacent communities and neighborhoods.

For this alternative, approximately 4.3 acres of wetlands associated with the Millstone River would be impacted (filled or shaded). This alternative would also require widening two bridges crossing the Millstone River and a tributary to the Millstone River. Approximately 63 single-family residences and two commercial structures would be displaced. The most significant number of displacements would occur in Cranbury Village, a National Historic District near the center of Cranbury Township. Widening Cranbury Neck Road from two to four lanes would impact a smaller total area of wetlands than proposed Route 92. However, there are numerous residential and commercial displacements, adverse impacts to the historic setting of Cranbury Village, and increased air quality, noise and aesthetic impacts to the many residences remaining adjacent to the proposed improvements. Because of the extensive existing residential and commercial land uses along Cranbury Neck Road, and the presence of a National Historic District in Cranbury along the widening, this alternative presents a number of major obstacles to implementation. Although this alternative would not open new areas to development, it would improve access to undeveloped land along Cranbury Neck Road, and would therefore facilitate sprawl development to a moderate degree.

This alternative would not fulfill the project purpose of proposed Route 92 – improving regional mobility--because of the lack of an effective connection to US Route 1, its

inability to separate local and through traffic, and the absence of an efficient connection with New Jersey Turnpike Interchanges 8 or 8A. For the reasons presented above, the widening of Cranbury Neck Road is not considered for further analysis.

### **2.4.6 Composite Local Roadway Improvements Program**

The traffic modeling that was conducted for this EIS has shown that widening any single existing local road would not provide adequate east-west capacity to relieve the increasing burden on the east-west road network nor would it effectively link US Route 1 with the New Jersey Turnpike. Most widenings or improvements of local roads would result in traffic volumes that exceed capacity during rush hour, and thus the duration of the rush "hour" and the delay associated with rush hour travel would increase. Finally, individual local road widenings would also retain existing signalized and unsignalized traffic intersections, worsening existing local traffic congestion in many locations.

By letter, dated January 27, 1997, the NJ Dept. of Environmental Protection (NJDEP) previously suggested that a combination of several local alternatives might meet the goals and objectives of the NJTA proposed Route 92 project (January 27, 1997 letter from NJDEP to NJTA; and March 10, 1997 follow-up meeting). NJDEP indicated that even though a single alternative might not meet the goals and objectives for proposed Route 92, a combination of improvements to existing roads might meet the project purpose and need with fewer impacts than proposed Route 92. This EIS has considered a composite set of roadways improvements, and has assessed the cumulative environmental, social and traffic impacts that would result from implementation of the improvements listed below. The composite alternative was created to determine if widening existing roadways might have the potential to avoid impacts that are associated with a new alignment. The composite alternative consists of the following improvements:

- Widen Route 522 from four lanes to six lanes with an extension to the New Jersey Turnpike
- Widen Dey Road from two lanes to four lanes (described in section 2.4.3 above)
- Widen Plainsboro-Cranbury Road from two lanes to four lanes (described in section 2.4.4 above)
- Widen Cranbury Neck Road from two lanes to four lanes (described in section 2.4.5 above)
- Implement road and circulation improvements at Interchange 8A, consistent with the USEPA Suggested Modified No-Build Alternative

These widening and road improvement projects, if implemented together, would generally provide similar east-west travel capacity to that of proposed Route 92. Each roadway widening involves improvements to existing local roads whose capacity is reduced by existing road intersections and direct residential and business access to each of the roads. For the composite alternative, the sum of additional lanes (four additional

lanes in each direction) would need to be greater than the number of additional lanes for proposed Route 92 to provide similar capacity, because proposed Route 92 would be a limited access road that can provide higher per-lane capacity.

The travel time benefits achieved by all of these improvements would be less than the benefits of proposed Route 92, because traffic would be required to travel on arterial streets, through existing unsignalized and signalized intersections, as well as new signalized and/or stop-sign-controlled intersections.

Together, the composite set of widenings would require property acquisition displacing approximately 180 residences, 10 businesses, and at least six public facilities. In addition to these displacement impacts, local roadway improvements would bring travel lanes closer to the remaining residences, businesses, and facilities, potentially aggravating air and noise conditions for these receptors. From an aesthetic perspective, many of the existing roadways have a rural and/or historic character that is appealing to residents. Major roadway widenings and intersection improvements would degrade the existing visual appeal. Wetland impacts for the composite set of widenings would total about 20 acres. By generally expanding the capacity of the local road network, this alternative would generally increase access to undeveloped land, and would therefore facilitate sprawl to a significant degree.

The composite alternative, compared with proposed Route 92, would exhibit greater wetland impact and adverse socioeconomic impacts (especially residential and business dislocations), given the high level of disruption to the communities through which the road widenings would occur. This alternative would have a substantially greater potential to promote sprawl development. In addition, there would be potential disturbance to historic Cranbury Village under two of the program elements.

The composite alternative does not effectively address the project purpose. The composite improvements program would not optimize the efficiency of regional through travel by separating regional and local traffic. In fact, the composite improvements would attract increased traffic throughout the local roadway network, including truck traffic. The increased level of local and regional through traffic would increase congestion throughout the study area, make local travel more difficult, discourage walking and bicycling, and reduce the quality of life in adjacent communities and neighborhoods.

Individually, each of the widening projects was not considered for further analysis because it would result in high levels of disruption and impact to existing neighborhoods along the widenings; it would not divert non-local traffic from local roads; and it would be ineffective in addressing regional traffic congestion. When considered together, the composite set of alternatives would not reduce their individual impacts nor improve their relative ineffectiveness; in fact, this alternative worsens local traffic congestion and increases the adverse environmental impact associated with any single alternative.

The traffic modeling performed on this alternative indicates that traffic on each of the widened corridors would be about 30 percent greater than the traffic volumes on those corridors if proposed Route 92 were built (see Section 4.2.7).

In summary, this alternative is not considered for further analysis because there are major socioeconomic and environmental impacts caused by the component parts of this alternative, and there are no regional or local traffic benefits to be derived from the composite improvements program.

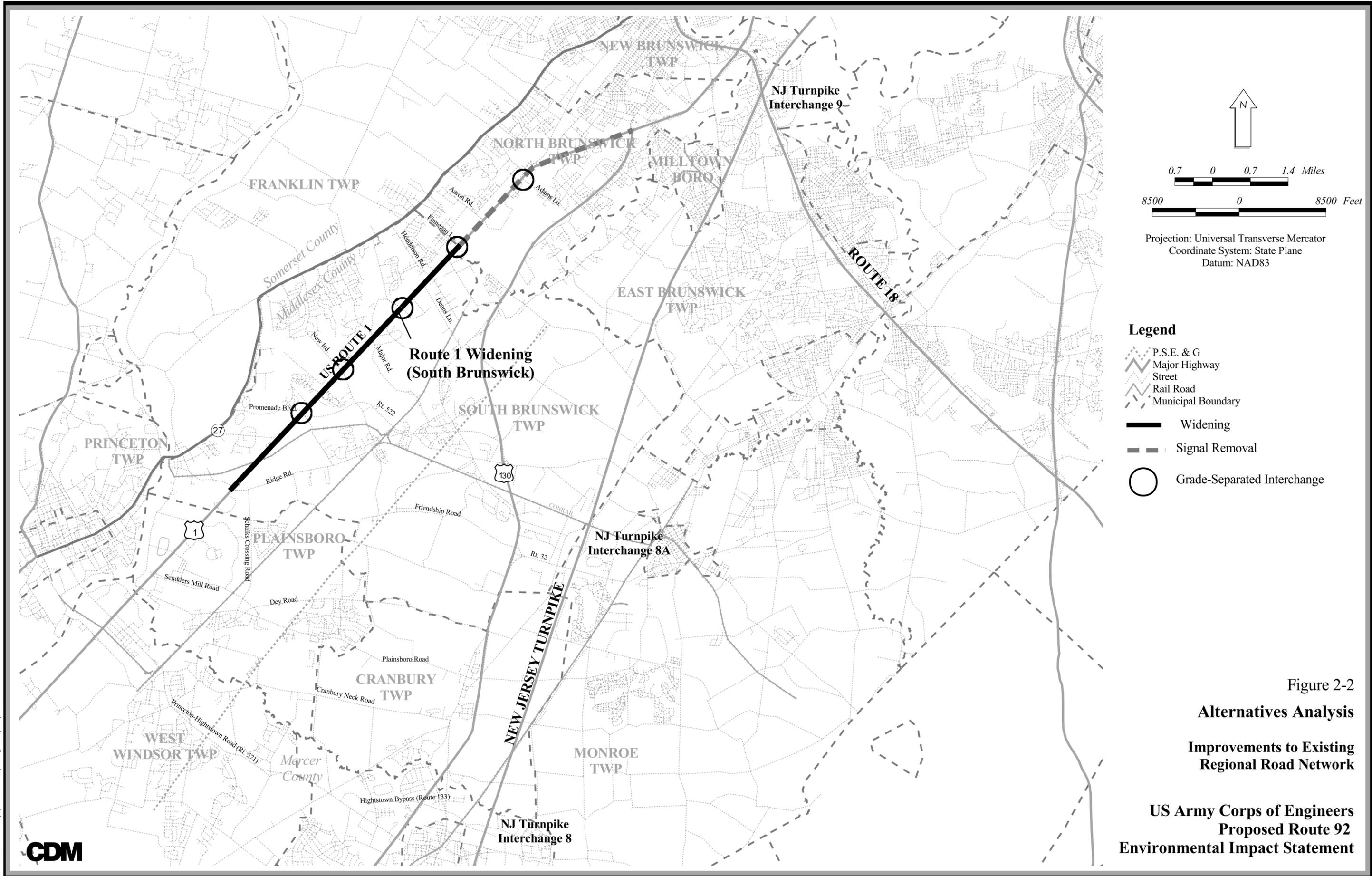
## **2.5 Existing Regional Highway System Improvements**

One element of the alternatives analysis involved a review of whether potential improvement to the existing regional *highway* network might meet the project purpose and need. In this regard, a widening of US Route 1 from four to six lanes was assessed, with respect to the ability of a widened US Route 1 to improve regional mobility and reduce congestion, and with respect to its environmental impacts. The results of this assessment are discussed below, in Section 2.5.1. Traffic modeling performed for this EIS indicated that the US Route 1 widening alternative was significantly less effective than proposed Route 92 in meeting the project purpose. For this reason additional improvements to US Route 1 were identified to assess whether comprehensive improvements to the US Route 1 corridor might equal the traffic improvement benefits resulting from construction of proposed Route 92 corridor. The expanded set of improvements that were identified to increase capacity on US Route 1 involved removal of six intersections and restrictions on turning movements at other existing intersections. The results of this analysis are presented in Section 2.5.2.

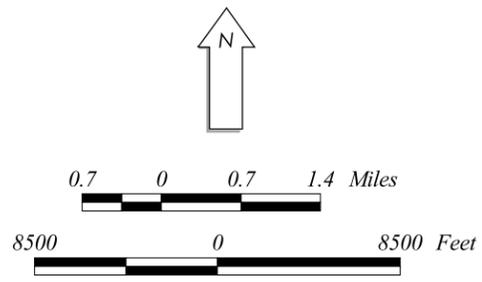
### **2.5.1 US Route 1 Widening to Six Lanes**

This alternative involves widening US Route 1 in South Brunswick Township from four lanes to six lanes. The widening would begin near Finnegan's Lane to the north and continue to Independence Way to the south. The section of US Route 1 to the north and south of this stretch has previously been widened to six lanes. By implementing this alternative, US Route 1 would be uniformly six lanes wide between Princeton and New Brunswick. This alternative is illustrated in Figure 2-2.

One of the principal factors leading to the increasing east-west movement of traffic (and resulting congestion) on the local road system between US Route 1 and the New Jersey Turnpike in southwestern Middlesex County is the congestion on US Route 1 between Princeton and New Brunswick. Strong population and employment growth in this region has led to increasing traffic congestion on US Route 1, as commuters and commercial truck freight travel on the area roadways. Significant volumes of local and non-local traffic traveling from the US Route 1 corridor to the New Jersey Turnpike are encountering extensive travel delays on US Route 1. Currently, the only highway route between US Route 1 in the southwestern Middlesex County area and the New Jersey Turnpike is via US Route 1 to NJ Route 18 to New Jersey Turnpike Interchange 9.



- Legend**
- P.S.E. & G
  - Major Highway
  - Street
  - Rail Road
  - Municipal Boundary
  - Widening
  - Signal Removal
  - Grade-Separated Interchange



Projection: Universal Transverse Mercator  
 Coordinate System: State Plane  
 Datum: NAD83

Figure 2-2  
**Alternatives Analysis**  
**Improvements to Existing**  
**Regional Road Network**

**US Army Corps of Engineers**  
**Proposed Route 92**  
**Environmental Impact Statement**



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NJDOT has implemented an extensive program of improvements to US Route 1, but the strong growth in this region continues to create extensive congestion.

One potential alternative to creating improved linkage between US Route 1 and the New Jersey Turnpike in southwestern Middlesex County is construction of additional capacity improvements in the US Route 1 corridor. For this EIS both the effectiveness of highway widening, and the impacts of such a widening are evaluated.

A review of existing zoning, land use mapping, land cover mapping, 1995 aerial photography and wetland mapping was conducted. This information was updated via visual inspection and site reconnaissance activities.

***Vegetation and Habitat.*** Widening US Route 1 would result in the loss of vegetation and associated possible wildlife habitat along the new roadway right-of-way. Approximately two acres of land bordering US Route 1 would be taken for roadway construction. Because the vegetated area potentially affected consists of relatively narrow strips of land immediately bordering both sides of highly traveled US Route 1, no wildlife or threatened or endangered species are likely to be present, nor displaced.

***Land Use and Zoning.*** The major land uses that abut US Route 1 directly are office parks, retail, services, mobile home parks, and single-family residences. Local zoning (principally commercial and office) and the current land use are for the most part consistent. The non-conforming uses include single-family homes sporadically located along the roadway. Some of the single-family residences are now abandoned, others have been converted to commercial use, and about 25 still remain as residential properties.

US Route 1 is a long-established, major at-grade highway with linear development along most of its length. Community centers and neighborhoods do not cross US Route 1. Widening US Route 1 would not fundamentally alter the character of the highway, nor the character of the adjoining land uses and residential neighborhoods, where they are present. Because widening US Route 1 would not open new areas to development, and because land along US Route 1 is substantially developed or in the process of being developed, widening US Route 1 would have little potential to promote sprawl.

***Direct Land Use Impacts.*** Direct land use impacts refer to residential or non-residential properties that would be taken by right-of-way acquisition. The proposed widening of US Route 1 would potentially impact approximately seven existing businesses whose properties are developed to the edge of the existing roadway. Three of these businesses may not be able to function on a smaller lot. The three businesses that may not be able to function on a smaller lot caused by US Route 1 widening are a gasoline station (now closed), a foreign car repair shop, and an auto dealership (recently opened as Brunswick Kia).

Of the approximately 25 single homes along this length of US Route 1, approximately three occupied homes would likely be displaced, as they are located at or close to the current roadway edge.

Widening US Route 1 to six lanes would also require the relocation of existing utility lines that are located at the roadway edge, including poled electrical and phone lines. Also, catch basins and stormwater lines exist along the curbed section of roadway. Widening the roadway would require that these utility structures be relocated, in some cases requiring easements and construction on adjacent private property.

**Indirect Land Use Impacts (Noise).** As noted, approximately 25 single family homes are located along the seven to eight mile length of US Route 1 considered in this analysis for widening. There are also several hotel/motels and three mobile home parks along this corridor. Noise associated with the construction of an additional lane on either side of US Route 1 would be audible to these residences. Bringing the road and the traffic closer to these residents would increase the traffic related noise on a daily basis. Widening the roadway would also allow for increased volumes of vehicles to be carried by this roadway, another source of increased noise.

### **Summary**

Widening US Route 1 from four lanes to six lanes from Finnegan's Lane in South Brunswick Township south to Independence Way would result in potential impact to approximately 4 acres of wetlands. Also, approximately 7 businesses would be impacted, as a portion of their properties would need to be acquired to extend the roadway easement. Three businesses would need to be acquired in their entirety. Of the approximately 25 occupied single-family homes along this corridor, 3 of these homes would likely need to be acquired.

Widening US Route 1 would help alleviate current congestion along this stretch of road. Because the road capacity would increase, traffic modeling shows that more traffic would be carried on this section of road, thereby increasing current traffic-related noise for existing homes and for travelers who stay at the hotels along US Route 1.

Widening US Route 1 is partially responsive to the project purpose because it would provide improved linkage between US Route 1 in the Princeton area and the New Jersey Turnpike at Interchange 9. However, this alternative would not fully meet the project purpose because it would not improve regional east-west mobility. Improved east-west mobility is the most critical component of the improved regional mobility that is the purpose of the project.

For this reason, widening US Route 1 without signal removal was not considered for further analysis. Instead, additional capacity improvements to US Route 1 were identified – specifically, signal removal and replacement with interchanges, and restrictions on turning movements at the remaining signalized intersections. This expanded set of improvements to US Route 1 is evaluated in Section 2.5.2, below.

## 2.5.2 US Route 1 Widening to Six Lanes with Signal Removal

While improving the capacity of US Route 1 through widening would improve the linkage of US Route 1 and the New Jersey Turnpike at Interchange 9, the traffic improvements resulting from a “widening only” project would not be effective in improving regional mobility. For this reason, the widening alternative was expanded further to include removal of six signalized intersections, replacement of the removed intersections with grade-separated interchanges, and restriction of turning movements at remaining signalized intersections. These additional improvements were applied to increase the capacity of US Route 1 as much as possible. In addition to widening US Route 1, as discussed in Section 2.5.1 above, this EIS evaluates further capacity improvements to US Route 1, as identified in Table 2-1.

### Traffic and Transportation Effects

The changes in year 2028 peak-hour traffic flows that would result from US Route 1 Widening and Signal Removal were estimated using the detailed network model developed for this project. This model demonstrates that US Route 1 Widening and Signal Removal would partially meet the objectives of this project as stated in Section 1, Project Purpose and Need.

US Route 1 Widening and Signal Removal would be expected to reduce the amount of *through traffic* on the local and secondary east-west roads crossing the screenline (defined and mapped in Section 1) by 10 percent, as compared with the No Action Alternative. This alternative would also be expected to result in modest changes in peak-hour *truck volumes* on the local and secondary east-west roads in the traffic study area, and along NJ Route 27 in Kingston. Peak-hour truck volumes on the local and secondary east-west roads would be expected to drop by 8 percent, as compared with the No Action scenario.

Traffic modeling conducted for this EIS indicates that this alternative would be expected to result in minor reductions in peak-hour traffic volumes on *local and secondary east-west roads* in the Traffic Study Area, including in the sensitive areas listed in Section 1 (Plainsboro Center, South Brunswick Center, and Princeton Junction Center).

While the US Route 1 Widening and Signal Removal would substantially increase the traffic-carrying capacity of US Route 1, this capacity increase would not significantly relieve congestion. Rather, the capacity increase would likely attract a large number of local trips to US Route 1 that otherwise use alternate routes to avoid existing congestion on US Route 1. However, unlike a limited-access highway, a widened US Route 1 with additional capacity would not result in separation of regional and local trips. The extensive commercial and office land uses along widened US Route 1 do not allow the increased road capacity to be reserved for regional and through trips, and local traffic would consume much of the capacity being provided in support of regional commutation and trucking. As a result, US Route 1 would be expected to remain heavily congested in the peak hour in the peak direction. (See Section 4.3.6 for further detail and data on the traffic improvement effects of this alternative.)

**Table 2-1  
Signal Removal, Interchange Construction Proposals, and Restrictions on Turning  
Movements at Remaining Signalized Intersections along US Route 1**

<b>Roadway Intersecting with US Route 1</b>	<b>Milepost</b>	<b>Action</b>	<b>Interchange Spacing</b>
College Rd	13.70	Interchange remains	
Independence Rd	14.12	Signal remains	
Ridge (CR 522)	14.57	Signal remains	
Raymond	15.85	Remove signal, right-in/right-out	
Promenade/Stouts (CR 522)	16.47	Remove signal, new interchange	1.47
Wynwood/Whispering Woods	16.96	Remove signal, right-in/right-out	
New Road	17.54	Remove signal, new interchange	1.07
Major/Sand Hills	18.34	Remove signal, overpass @ Major to Sand Hills	
Beekman/Northumberland	19.07	Remove signal, new interchange	1.53
Deans (CR 610)	19.74	Remove signal, right-in/right-out	
Henderson (CR 610)	19.94	Remove signal, right-in/right-out	
Blackhorse	20.42	Remove signal, right-in/right-out	
Finnegans (CR 682)	20.73	Remove signal, new interchange	1.66
Aaron	21.38	Remove signal, right-in/right-out	
Commerce	21.94	Remove signal, right-in/right-out	
Cozzens/Adams (CR 608)	22.44	Remove signal, new interchange	1.71
NJ 91 Connector	22.90	Interchange remains	0.46
NJ 26 Connector	23.05	Interchange remains	0.15
North Oak Rd	23.77	Remove signal, right-in/right-out	
Shopping Center	24.15	Remove signal, right-in/right-out	
Georges Rd	24.64	Interchange remains	1.59
Milltown Rd	25.12	Interchange remains	0.48
Ryders Lane	26.42	Interchange remains	1.30
NJ Route 18	27.19	Interchange remains	0.77

Peak hour travel times between representative origins and destinations in the project study area are projected to decrease by an average of 5 to 6 percent as a result of this alternative. Peak direction travel times between US Route 1 in Plainsboro and New Jersey Turnpike Interchange 8A would be expected to improve by 10 to 15 percent.

Projected 2028 peak hour traffic conditions at 15 key intersections within the traffic study area were evaluated for the No Action and US Route 1 Widening and Signal Removal scenarios (see Section 4.2.7). During the morning peak hour, 7 of the 12 intersections are projected to have shorter average delays, while 4 are projected to have longer average delays. In the evening peak hour, 6 of the intersections are projected to have delay reductions of at least 20 percent.

### **Environmental Effects**

The improvements proposed to increase the capacity of US Route 1 would result principally in impacts to the built environment. The US Route 1 corridor is substantially developed, as noted in the discussion above of the US Route 1 Widening alternative, and there are limited impacts to wetlands, waterways, and natural resources that would result from implementation of this alternative. These impacts are described in Section 4.3.2. Because widening US Route 1 with signal removal would not open new areas to development, and because land along US Route 1 is substantially developed or in the process of being developed, this alternative would have little potential to promote sprawl.

However, because of the extensive development around the signalized intersections along US Route 1, there are potential business dislocations that are likely to result from this alternative. While the widening of US Route 1 would occur principally within the existing right-of-way, electrical and storm drainage utilities along the highway and around the intersections would require relocation, a potentially costly endeavor. More importantly, the removal of signalized intersections and replacement with interchanges would require the acquisition of new rights-of-way that would dislocate many existing businesses.

As described below, the additional land requirements for construction of six new interchanges greatly expands the land requirements of the US Route 1 Widening alternative, and increases the cost of the widening alternative to include acquisition of commercially valuable lands and the construction cost for such intersection improvements. Previous public discussion on US Route 1 improvements in general, and regarding replacement of intersections with interchanges, by municipalities along the US Route 1 corridor, specifically North Brunswick, indicates that upgrading signalized intersections to grade separated interchanges is not desirable, due to the land use impacts and restrictions on local turning movements at remaining intersections. US Route 1 is a long-established major highway exhibiting linear (principally commercial) development. Widening with signal removal would reinforce its character as a regional business-oriented highway.

***Proposed Cozzens Lane-Adams Lane Interchange.*** It is likely that a new ramp from westbound Adams Lane to northbound US Route 1 would have to be routed through the eastern end of the vehicle storage area at an existing auto dealership. The ramp would probably be located in an area currently occupied by a towing and service center, and the ramp could also impact a gas station on US Route 1 north of the existing intersection.

***Finnegans Lane Interchange.*** A new grade separated interchange at Finnegans Lane would likely include a ramp connecting eastbound Finnegans Lane to southbound US Route 1, and the new ramp would likely displace a gas station in the southwest quadrant of the existing intersection. The same ramp could (pending more detailed design) also displace one or two single-family residences on the south side of Finnegans

Lane. Constructing interchange ramps connecting northbound US Route 1 with Finnegans Lane could displace one of the catenary towers along the power line easement extending southeast from the existing intersection. A new ramp from southbound US Route 1 to westbound Finnegans Lane would likely pass close to a religious facility and the eastern end of a townhouse development, but would not directly interfere with use of either of these facilities.

***Beekman Road-Northumberland Way Interchange.*** Constructing a new grade-separated interchange at Beekman Road and Northumberland Way would not interfere with any developed land use, but could (pending more detailed design) remove approximately 6 acres of open land from agricultural use.

***New Road Interchange.*** Constructing ramps connecting northbound US Route 1 with New Road may displace a new furniture store on the east side of US Route 1 north of the existing intersection. A ramp connecting northwest-bound New Road with northbound US Route 1 may also displace two single-family homes on the northeast side of New Road. Constructing ramps connecting southbound US Route 1 with New Road may displace a gas station in the southwest quadrant of the existing intersection. These ramps may also displace a single-family home on the west side of US Route 1 southwest of the Exxon Station.

***Route 522 Interchange.*** It is anticipated that the ramps required for a new US Route 1-Route 522 interchange would be concentrated in the undeveloped southwest and southeast quadrants of the existing intersection. This would have minimal impact on existing developed land uses, but would remove up to 8 acres of land from agricultural use. A surface-level ramp from southbound US Route 1 to eastbound Route 522 was completed in the southwest quadrant in 2006.

### **Summary**

The socioeconomic impacts of this alternative are anticipated to be high due to land acquisition, business dislocation, impacts to business operations, and utility relocation impacts and costs. The implementation of signal removal and replacement with grade-separated interchanges has been previously considered by NJDOT. Meetings with NJDOT indicate that proposals to replace additional intersections with interchanges (as outlined in this section) have not been included in NJDOT's capital plans and funding proposals, because past evaluations have indicated limited effectiveness and high cost. Before being considered for inclusion in NJDOT's capital plan, the funding availability, cost effectiveness of the improvements, and the permit and implementation potential would need to be evaluated in detail by NJDOT.

However, because the US Route 1 Widening with Signal Removal alternative has the potential to meet, to some degree, the project purpose – improvement of regional mobility--in part by providing improved linkage with the New Jersey Turnpike at Interchange 9, the benefits and impacts of this alternative are evaluated in more detail in Section 4, Impacts of the Proposed Project and Alternatives.

## 2.6 New Roadway Facilities

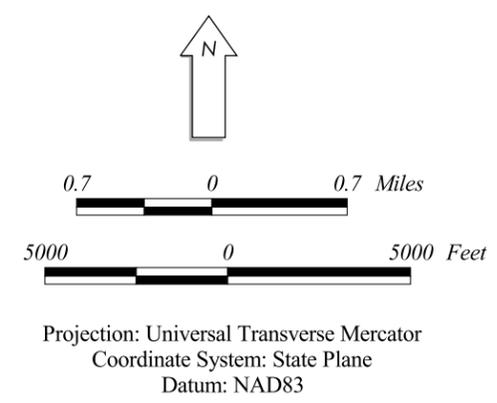
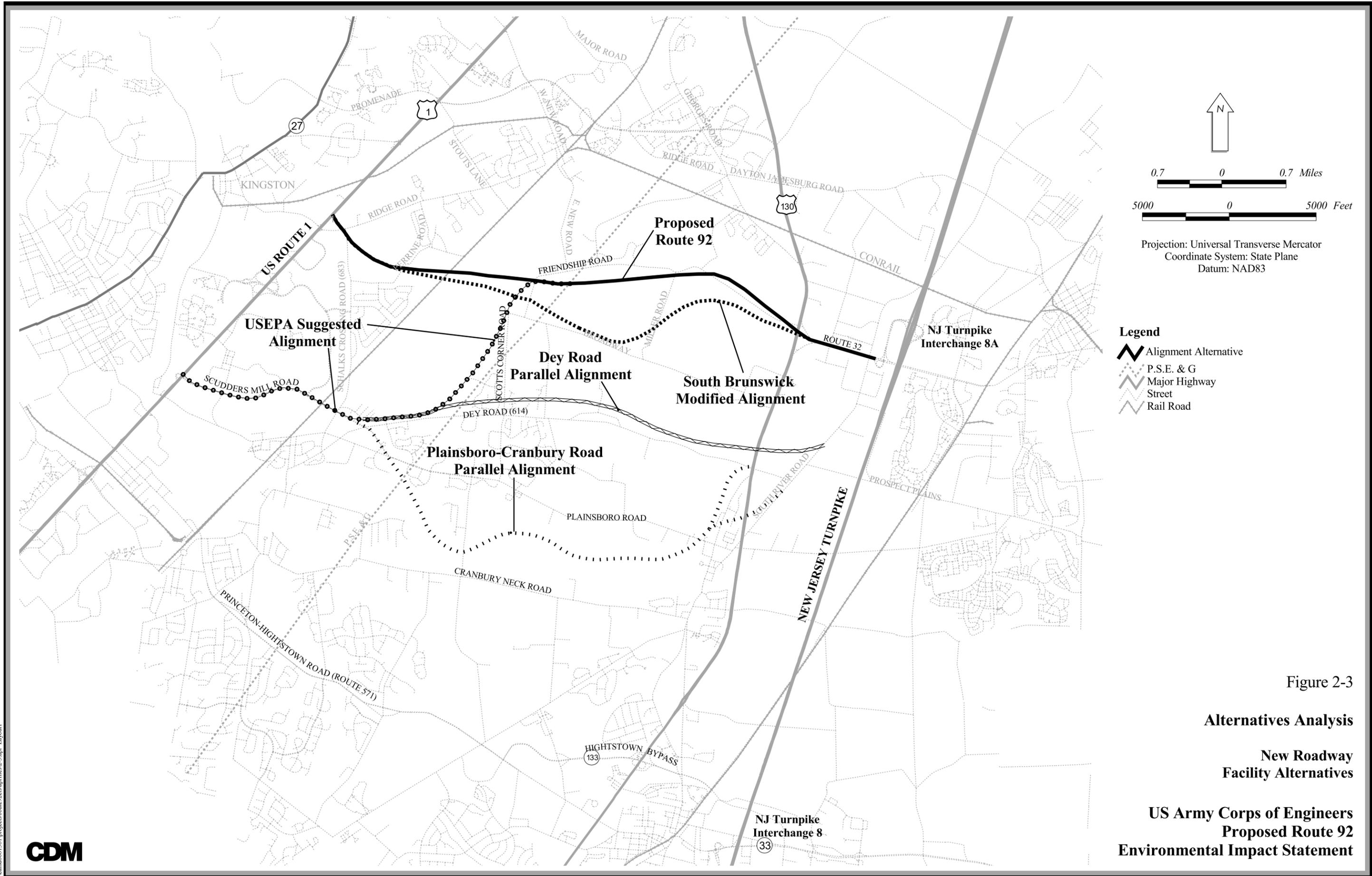
This group of alternatives involves the construction of new roadway alignments to carry local and regional auto and truck traffic. The new roadway facilities are generally aligned in an east-west direction, in response to the need to provide improved linkage between US Route 1 and the New Jersey Turnpike (see Section 1). This group of alternatives is illustrated in Figure 2-3.

### 2.6.1 Proposed Route 92

Over the past 20 years, planning, discussion, and conceptual design of an east-west connector highway resulted in the identification of a wide range of potential routes and western terminating points for such an east-west highway. The current design for Route 92 as proposed by NJTA has been revised and improved over the years to reduce the potential environmental and socioeconomic impacts of the project. Proposed Route 92, as evolved to the current design, is NJTA's preferred alternative. USACE, the preparer of this EIS, is neither an opponent nor a proponent of the NJTA proposal, and the full range of decision options regarding the permit application is available to the USACE district engineer.

The current design for proposed Route 92 involves construction of a 6.7 mile, four-lane limited-access toll highway, serving as an east-west transportation link connecting US Route 1 in South Brunswick Township to the New Jersey Turnpike at Interchange 8A. The proposed western terminus would be a grade-separated interchange at US Route 1 just north of Ridge Road. From that interchange, the alignment would travel southeast, crossing Ridge Road, then swing east and cross the Amtrak rail line. On the east side of the Amtrak line the alignment would continue eastward, running just south of the east-west portion of Friendship Road. After crossing Miller Road, the alignment would cross Friendship Road, turn southeast along the north side of Friendship Road, then recross Friendship Road just before reaching US Route 130. On the east side of US Route 130, the alignment would proceed along existing Route 32 to the New Jersey Turnpike at Interchange 8A. The 0.9-mile section of proposed Route 92 between US Route 130 and Interchange 8A of the New Jersey Turnpike would be constructed at grade and would consist principally of widening existing Route 32.

Proposed Route 92 would consist of two 12-foot-wide lanes in each direction with 12-foot-wide right shoulders. The travel lanes would be divided by a median of varying widths. A 36-foot-wide median (two 5-foot-wide left shoulders separated by a 26-foot-wide grassed area) is proposed between US Route 1 and US Route 130, except through the Devil's Brook wetland system where, for a length of approximately 3,750 feet, a 13-foot median (two 5-foot-wide left shoulders separated by a 3-foot-wide concrete median barrier) is proposed (to minimize wetland impacts). A concrete median barrier is also proposed for the segment between US Route 130 and Interchange 8A of the New Jersey Turnpike.



- Legend**
- Alignment Alternative
  - P.S.E. & G
  - Major Highway
  - Street
  - Rail Road

Figure 2-3  
**Alternatives Analysis**  
**New Roadway Facility Alternatives**  
**US Army Corps of Engineers**  
**Proposed Route 92**  
**Environmental Impact Statement**

\\camd0081381\projects\route92\246\mapfiles\2-3.apr Layout1



Proposed Route 92 includes improvements to existing local roadways at the proposed interchanges of Route 92 with: US Route 1, Perrine Road, US Route 130, and New Jersey Turnpike Interchange 8A. Additionally, the project would require the construction of bridges over US Route 1, Ridge Road, Amtrak Northeast Corridor, Devil's Brook and associated floodway, Friendship Road (twice), Miller Road, US Route 130, Cranbury-South River Road, relocated Route 32 westbound and New Jersey Turnpike Interchange 8A ramps. A bridge would also be constructed to carry relocated Perrine Road over proposed Route 92. A proposed toll plaza facility would be constructed west of US Route 130. Approximately 147 acres of impervious surfaces would be added by this project.

### **History of the Western Terminus of Proposed Route 92**

The *Middlesex County Short Range and Post 1990 Transportation Plan and Program* (October 1985) included the construction of an east-west connector road from New Jersey Turnpike Interchange 8A to US Route 206 in Montgomery Township. The DEIS prepared by NJDOT in 1986 evaluated two alignments, one of which came to be called the NJDOT Preferred Alignment. A revised design, originally evaluated in the 1994 NJTA DEIS, was developed specifically to minimize potential impacts to wetlands in the proposed project corridor. As evaluated in the 1994 DEIS, proposed Route 92 did not extend to US Route 206, but did include a connection from US Route 1 to NJ Route 27 in Franklin Township, a distance of approximately one mile. The DEIS revealed that the project corridor between US Route 1 and NJ Route 27 presented significant environmental constraints (including wetlands and forested open space). As a result, the US Route 1 to NJ Route 27 segment was eliminated from the scope of the overall project. NJTA planning for proposed Route 92 progressed with the termination of the roadway at US Route 1, which is the final design of the proposed project.

### **Traffic Network Effects**

The traffic and transportation impacts of proposed Route 92 are discussed in detail in Section 4. A detailed traffic analysis demonstrates the following effects of the implementation of proposed Route 92:

- Given the increasing levels of congestion currently experienced on US Route 1 and local east-west roads linking US Route 1 and the New Jersey Turnpike, a regional highway such as proposed Route 92 would help maintain mobility in the region.
- By 2028, the limited access east-west highway would divert 18 percent of the westbound morning auto traffic from local roads, and 28 percent of the eastbound evening auto traffic from local roads.
- By 2028, the limited access east-west highway would divert 48 percent of the westbound morning truck traffic from local roads, and 69 percent of the eastbound evening truck traffic from local roads.

- Traffic using local east-west connector roads, such as Dey Road, Plainsboro Road, and Route 522, would be reduced in volume in the future by approximately 20 percent if proposed Route 92 were implemented. Without proposed Route 92, traffic on these local east-west routes will reach saturation capacity by 2015.
- Proposed Route 92 would draw regional through-traffic away from local roads. This would make local driving more amenable and efficient and facilitate walking and bicycle riding. Removal of through traffic from neighborhood centers would increase the centers' attractiveness and would tend to strengthen the identification of residents with their communities while allowing more efficient development designs.
- Because it would provide a direct east-west connection between US Route 1 and the New Jersey Turnpike, proposed Route 92 would improve traffic flow on US Route 1 by diverting long-distance regional traffic onto the New Jersey Turnpike, which can absorb the increased traffic because of Turnpike capacity expansions implemented over the past 15 years. Although proposed Route 92 would be a toll facility, the reduction in travel time for commercial drivers, commuters, and other drivers is expected to outweigh the toll disincentive. The traffic modeling conducted for this EIS, which predicts a high level of use for proposed Route 92, factors in the effects of the toll that will be collected.

### **Air Quality**

The air quality impact analysis indicates that air quality would improve with or without proposed Route 92, primarily in response to more stringent federal emissions standards. With Route 92, regional vehicular emissions of carbon monoxide (CO), nitrogen oxides (NOx) and volatile organic compounds (VOCs) would be reduced by 35 to 88 percent compared to existing conditions. CO and VOC reductions would be slightly smaller without Route 92. With Route 92, CO ambient concentrations at the worst congested intersections in the study area would also be further reduced. See Section 4 for additional details on the air quality effects of this alternative.

### **Wetland and Land Use Effects**

Proposed Route 92 would require fill in approximately 11.58 acres of wetlands and 0.45 acres of open water subject to federal jurisdiction. An additional 2.9 acres of wetlands would be temporarily impacted during construction and restored upon completion of construction (Section 4 provides additional detail regarding the wetland impacts of proposed Route 92). Proposed Route 92 also requires seven crossings of watercourses, and would pass through the northern end of the Plainsboro Preserve. The Plainsboro Preserve is a public open space preservation area in Plainsboro Township, with a right-of-way reserved by the Township in anticipation of Proposed Route 92.

NJTA proposed Route 92 would not impact Agricultural Development Areas (ADAs) or Farmland Preservation Areas. ADA's and Farmland Preservation Areas are locations delineated under the NJ Farmland Preservation Program as priority agricultural

preservation areas. This alternative would directly impact approximately 210 acres of land used for agricultural purposes (that are not within delineated ADA's or Preservation Areas) and would complicate access to an additional 78 acres of active agricultural land.

Although proposed Route 92 would cross undeveloped lands, no direct access would be available to those adjacent lands either via frontage or via connecting local roads (except at interchanges at the eastern and western terminuses) because proposed Route 92 is designed as a limited access highway. For this reason, proposed Route 92 would not create opportunities for linear development along its route, and direct access to nearly undeveloped lands would only be possible in the interchange areas. No interchanges are proposed along the road segment between Perrine Road and US Route 130, where the majority of the undeveloped land is present, and thus proposed Route 92 could not connect to local or cross streets that might provide access to new land for development. Induced development impacts could potentially occur at the interchanges of proposed Route 92 with US Route 1, Perrine Road, US Route 130 and New Jersey Turnpike Interchange 8A. However, these interchange areas have either already been extensively developed, or are zoned for development, because of the proximity of these lands to US Route 1 and the extensive office development that currently exists in this area (between US Route 1 and the Northeast Corridor railway). While the four interchanges may accelerate existing development trends for nearby parcels, proposed Route 92 is not expected to change the final amount of development anticipated in these areas because these areas are already planned for development. Development in these locations remains under the jurisdiction of the municipal development review process, and occurs under the guidance of municipal Master Plans.

### **Socioeconomic Effects**

Acquisition of the right-of-way for proposed Route 92 and associated interchanges would displace four residences and one business.

### **Summary**

Traffic modeling conducted for this EIS indicates that the project purpose of improving regional mobility is achieved by proposed Route 92. This alternative is also effective in reducing traffic congestion in the region and in removing truck traffic from local roads. This alternative would have greater wetland impacts than many of the alternatives, and impacts to greater areas of parkland and farmland, but would have lower impact on residences, businesses and public facilities than most alternatives. Importantly, because this alternative provides only limited access (principally at its terminal points at and near the New Jersey Turnpike Interchange 8A and at US Route 1) it does not provide new access to undeveloped lands (consistent with New Jersey's attempts to contain sprawl). Consistent with the purpose of an east-west connector highway in this region, proposed Route 92 allows for separation of local from non-local traffic.

Because proposed Route 92 achieves project purpose and because it avoids many of the adverse impacts associated with local road capacity improvements, the impacts of NJTA

proposed Route 92 are evaluated in more detail in Section 4, Impacts of the Proposed Project and Alternatives.

### **2.6.1.1 Sub-alternative Designs to Proposed Route 92**

Three sub-alternative designs to the proposed project have been identified. These sub-alternatives involve partial and/or phased implementation of the proposed four-lane Route 92.

The three sub-alternatives are:

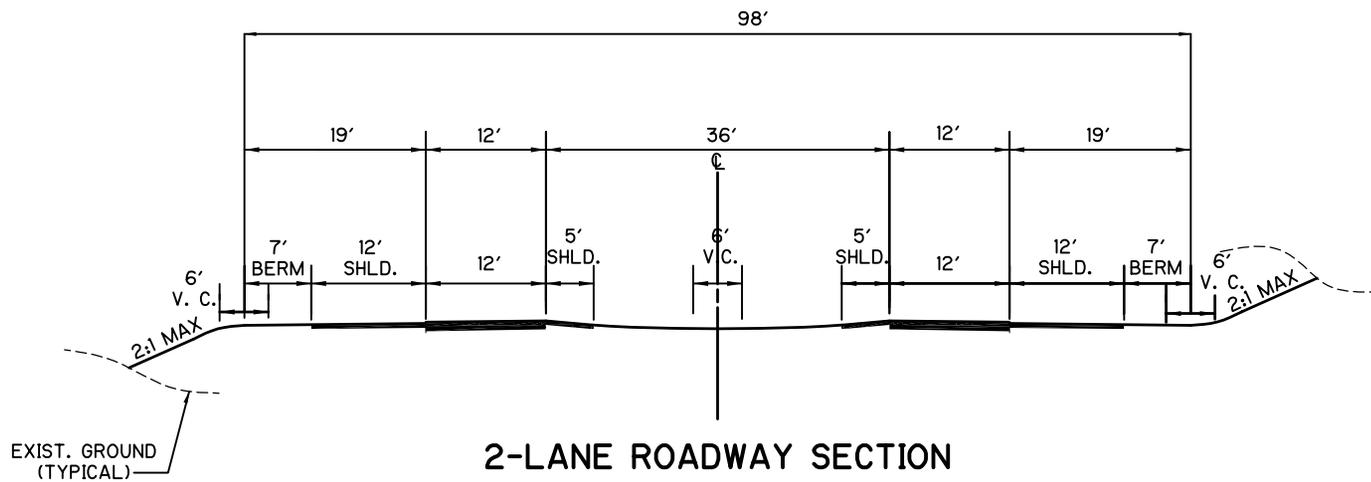
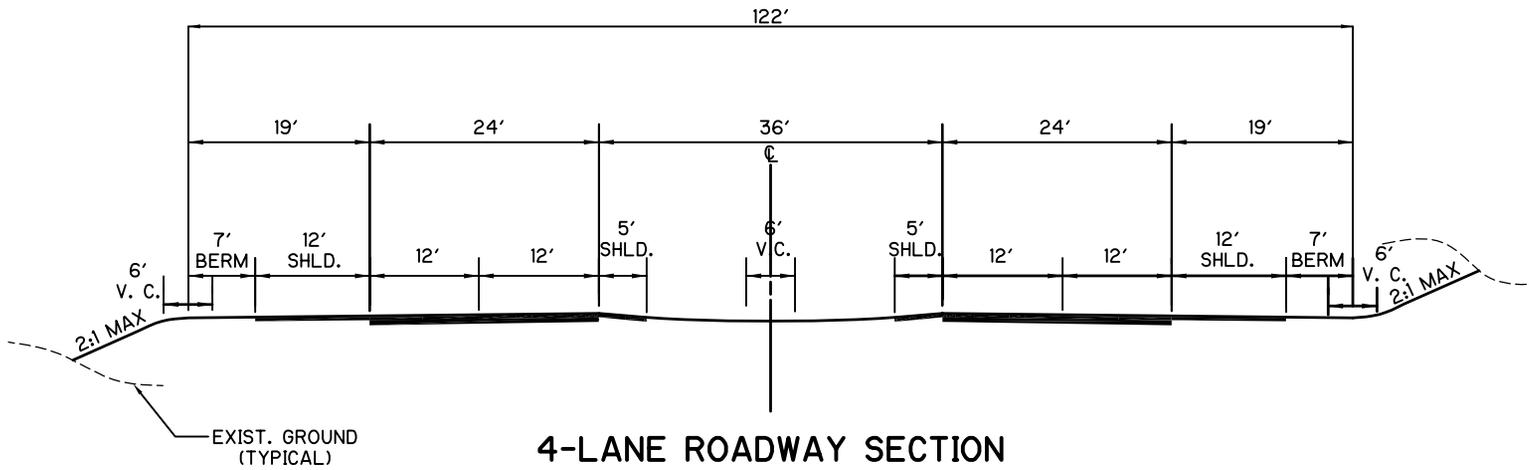
- A two-lane design for proposed Route 92 (one lane in each direction)
- Phased construction of proposed four-lane Route 92 (two-lane highway initially; demand-based expansion to four lanes at a later date)
- A four-lane or two-lane proposed Route 92, without the Perrine Road interchange

Each of the above sub-alternatives has been evaluated for transportation and environmental impacts (specifically, in terms of how their impacts may be different from the proposed four-lane Route 92 alternative). The sub-alternatives were developed to determine the degree to which they might facilitate the goals of the New Jersey State Smart Growth Program.

#### **Two-Lane Route 92**

A two-lane Route 92 alternative was evaluated to determine whether decreasing the roadway width would substantially decrease environmental and socioeconomic impacts (such as wetland fill and growth-inducing impacts) while still providing traffic flow improvements similar to proposed Route 92 in its four-lane configuration.

The two-lane Route 92 alternative would follow the same route and have the same interchanges as proposed Route 92. It would consist of one 12-foot-wide lane in each direction with 12-foot-wide right shoulders. For the purposes of this analysis, it is assumed that the median would vary in width in the same manner as for proposed Route 92: a 36-foot-wide median (two 5-foot-wide left shoulders separated by a 26-foot-wide grassed area) between US Route 1 and US Route 130 except for the Devil's Brook wetland system (a length of approximately 3,750 feet), which would have a 13-foot-wide median to minimize wetland impacts. A concrete median barrier (13-foot-wide median) is assumed for the segment between US Route 130 and Interchange 8A of the New Jersey Turnpike. It is also assumed that the right-of-way for a two-lane Route 92 would be reduced from 300 feet to 275 feet, corresponding to the 24-foot decrease in roadway width. A typical two-lane roadway section, juxtaposed with a typical four-lane roadway section, is shown in Figure 2-4.



SOURCE:  
 LOUIS BERGER & ASSOCIATES  
 SCALE: 1"=20'-0"

**CDM**

FIGURE 2-4  
 ALTERNATIVES ANALYSIS  
 ALTERNATIVE TYPICAL ROUTE 92 SECTIONS  
 NEW JERSEY TURNPIKE AUTHORITY  
 ROUTE 92  
 ENVIRONMENTAL IMPACT STATEMENT

It is also assumed that a two-lane Route 92 would include improvements to existing local roadways at the interchanges of proposed Route 92 with US Route 1, Perrine Road, US Route 130, and New Jersey Turnpike Interchange 8A, similar to the four-lane proposed Route 92. As in the four-lane design, the two-lane project would require the construction of bridges over US Route 1, Ridge Road, Amtrak Northeast Corridor, Devil's Brook and associated floodway, Friendship Road (twice), Miller Road, US Route 130, Cranbury-South River Road, relocated Route 32 westbound and New Jersey Turnpike Interchange 8A ramps. A bridge would also be constructed to carry relocated Perrine Road over proposed Route 92. A proposed toll plaza facility would be constructed west of US Route 130.

### ***Traffic Network Effects***

A two-lane design would have less traffic-carrying capacity than that provided by a four-lane Route 92. For this reason, this sub-alternative is less effective in achieving the goal of removing non-local traffic from the local east-west roads in the study area. This is demonstrated by analyzing the sub-alternatives using the detailed "Central Jersey" traffic model developed for this project. The results are summarized in tables 2-2, 2-3 and 2-4.

As shown in Table 2-3, a two-lane Route 92 would be less effective in removing non-local traffic from local east-west roads, as compared with proposed Route 92. Relative to the No-Build condition, morning non-local westbound autos would be reduced by 5 percent, as opposed to 18 percent for proposed Route 92. Morning non-local westbound trucks would be reduced by 19 percent, as opposed to 46 percent for proposed Route 92. By 2028, a two-lane Route 92 could remove only 60% of the non-local traffic from local roads that a four-lane Route 92 would. Because a two-lane Route 92 would not remove as much traffic from the local road network it would be less effective in maintaining the quality of the neighborhoods in the project area, and in facilitating a variety of local transportation options (such as walking and bicycling). Furthermore, traffic modeling shows that a two-lane Route 92 would have reached 90% of peak-hour capacity in 2001, and would reach its peak-hour capacity in 2008. This suggests that a two-lane Route 92 would reach its peak-hour capacity within a year or two of its earliest completion. Consequently, a two-lane Route 92 could not provide the same improvement in regional mobility that a four-lane Route 92 could provide.

### ***Air Quality***

An air quality screening-level regional emissions modeling analysis was conducted to assess the air quality impacts of the three sub-alternatives compared to proposed Route 92. The emissions modeling analysis was conducted using the USEPA MOBILE 6.2 model to estimate nitrogen oxide (NO<sub>x</sub>), carbon monoxide (CO) and volatile organic compound (VOC) emission factors in grams per vehicle mile traveled (g/VMT) for each sub-alternative. The MOBILE 6.2 input files representing the study area were obtained from the North Jersey Transportation Planning Authority (NJTPA). The transportation modeling provided regional VMT and travel speeds for the entire transportation study

area for each sub-alternative. The VMT data and the MOBILE 6.2 results were used to calculate NO<sub>x</sub>, CO and VOC emissions in tons per day.

**Table 2-2**  
**2028 Non-Local Peak Hour Traffic Crossing Screenline on Local East-West Roads**

Scenario	AUTOS				TRUCKS			
	AM		PM		AM		PM	
	E/B	W/B	E/B	W/B	E/B	W/B	E/B	W/B
No-Build	2,141	3,472	2,450	1,652	95	132	86	89
Proposed Route 92	2,072	2,842	1,760	1,437	74	72	26	51
Two-Lane Route 92	2,096	3,297	1,940	1,416	82	107	30	53
Proposed Rt. 92 w/o Perrine Rd Interchange	2,078	2,845	1,861	1,453	72	68	35	49

**Table 2-3**  
**Change in 2028 Non-Local Peak Hour Traffic Crossing Screenline on Local East-West Roads**  
**(Relative to No-Build)**

Scenario	AUTOS				TRUCKS			
	AM		PM		AM		PM	
	E/B	W/B	E/B	W/B	E/B	W/B	E/B	W/B
No-Build	0%	0%	0%	0%	0%	0%	0%	0%
Proposed Route 92	-3%	-18%	-28%	-13%	-22%	-46%	-69%	-43%
2-lane Route 92	-2%	-5%	-21%	-14%	-14%	-19%	-65%	-41%
Proposed Rt. 92 w/o Perrine Rd Interch.	-3%	-18%	-24%	-12%	-24%	-48%	-59%	-45%

**Table 2-4**  
**Change in 2028 Non-Local Peak Hour Traffic Crossing Screenline on Local East-West Roads**  
**(Relative to Proposed Route 92)**

Scenario	AUTOS				TRUCKS			
	AM		PM		AM		PM	
	E/B	W/B	E/B	W/B	E/B	W/B	E/B	W/B
Proposed Route 92	0%	0%	0%	0%	0%	0%	0%	0%
2-lane Route 92	1%	16%	10%	-1%	11%	49%	15%	4%
Proposed Rt. 92 w/o Perrine Rd Interch.	0%	0%	6%	1%	-2%	-5%	34%	-4%

The emissions loading data in Table 2-5 show a reduction of CO, VOC and NO<sub>x</sub> for all 2028 sub-alternatives compared to proposed Route 92. Each 2028 alternative produces similar NO<sub>x</sub> and VOC emission loadings. However, the four-lane proposed Route 92 produces the smallest loadings for CO when compared to the 2028 No-Build alternative, resulting in a 7.9% reduction in VOC emissions and nearly a 1.4% reduction in CO emissions compared to the No-Build alternative. The two-lane Route 92 alternative results in a 5.2% reduction in VOC emissions and less than a 1% reduction in CO emissions compared to the No-Build alternative.

**Table 2-5  
Total VOC, CO, and NO<sub>x</sub> Loadings**

Year	Scenario	VOC (tons/day)	CO (tons/day)	NO <sub>x</sub> (tons/day)
2001	Existing	1.17	22.39	1.81
2001	2-Lane Route 92	1.14	22.24	1.80
2028	No-Build	0.38	14.71	0.22
2028	2-Lane Route 92	0.36	14.57	0.22
2028	Route 92 w/o Perrine Road Interchange	0.35	14.54	0.22
2028	4-Lane Route 92	0.35	14.51	0.22

**Noise**

The transportation analysis predicts that the two-lane road would be operating at 90% capacity westbound in the morning peak hour if it had been open in 2001 and at 100% capacity by 2008. The two-lane design alternative at full capacity would generate lower noise levels than proposed Route 92 at each of the sensitive receptors because the edge of the roadway would be slightly further from the receptors and there would be an approximately 50-percent reduction in peak hour traffic volumes compared to the four-lane proposed highway. It is anticipated that the reduction in peak hour noise levels would be “perceptible” to “substantial” (5 to 10 dBA according to FHWA guidance) for those sensitive receptors identified within the corridor area. By 2028, the traffic volumes for the two-lane alternative would be approximately 25 percent lower than proposed Route 92; therefore, peak hour noise levels would still be lower than the four-lane alternative, but the difference in noise levels would be “perceptible” (about 5 dBA) and not “substantial” (about 10 dBA).

### ***Wetlands***

A two-lane Route 92 would reduce the required fill in wetlands by approximately 2 acres over proposed Route 92; approximately 9.5 acres of wetland subject to federal jurisdiction would be filled under this alternative. The amount of additional wetlands subject to temporary impact during construction and restored upon completion of construction would remain approximately 2.5 acres. A two-lane Route 92 would require seven crossings of watercourses, the same as the four-lane design.

### ***Vegetation and Habitat***

A narrower two-lane Route 92 would reduce the direct impact to vegetation and wildlife habitat by approximately 20 acres in a narrow band along the highway. This would include wetland, forested wetland and upland, grassland, and agricultural land. Like proposed Route 92, it would pass through the northern end of the Plainsboro Preserve, a public open space preservation area in Plainsboro Township.

### ***Water Resources***

Approximately 80 acres of impervious surfaces would be added by this project (roughly 20 acres less than the proposed four-lane Route 92). Therefore, runoff from a two-lane Route 92 would be somewhat less than from the proposed four-lane roadway. It is assumed that the stormwater retention facilities proposed for the four-lane Route 92 would also be built, at an appropriate scale, for a two-lane highway. Therefore, runoff quality and infiltration would remain approximately the same for either alternative.

### ***Farmland***

Assuming that the right-of-way of a two-lane Route 92 would be reduced from 300 feet to 275 feet, approximately 90 fewer acres of farmland would be taken compared to the proposed Route 92. However, a two-lane Route 92 would still pass through active farmland and would indirectly impact (by bisecting several fields) roughly the same acreage of farmland as the proposed Route 92.

### ***Visual***

The decrease in visual impacts from a two-lane Route 92 would be minimal, as the highway would have the same route and grade. Since some impacted residents would be slightly further away from the highway and the roadway itself would be narrower, the visual impact would be slightly reduced, as compared to proposed Route 92.

### ***Land Use***

A two-lane Route 92 would slightly decrease direct impacts to land use, including farmland, since the highway right-of-way would decrease by 25 feet. However, this acquisition would likely require the same property displacements as proposed Route 92. As with proposed Route 92, the two-lane alternative would cross currently undeveloped lands but no direct access would be available to these parcels because Route 92 is proposed as a limited access highway. As noted for the Proposed Route 92 alternative, induced development impacts could potentially occur at the interchanges with US

Route 1, Perrine Road, US Route 130 and New Jersey Turnpike Interchange 8A. However, these interchange areas have either already been extensively developed, or are now zoned for development. While the four interchanges may accelerate existing development trends for nearby parcels, a two-lane Route 92 is not expected to change the final amount of development anticipated in these areas. Development in these locations remains under the jurisdiction of the municipal development review process, and occur under the guidance of municipal Master Plans.

Because of its partial ability to relieve traffic on local roads, provide a separate route for regional and commercial traffic, and thereby improve regional mobility, this sub-alternative was determined to partially meet the project purpose and need. Issues include traffic safety, which is a concern when no passing opportunities are available and truck and commercial traffic will be significant. The environmental effects of this sub-alternative are very similar to the impacts of the four-lane proposed Route 92, but the ability to provide needed capacity is reduced by more than 50%, because only two lanes would be constructed, and because of the lack of passing opportunities. For these reasons, this sub-alternative is not analyzed further.

### **Phased Route 92**

Under this sub-alternative, phased construction of the proposed four-lane Route 92 would take place. Initially, Route 92 would be built as a two-lane highway, with expansion to four lanes completed at a later date when travel demand requires.

#### *Traffic Network Effects*

The traffic model estimates that a two-lane Route 92 would have already been operating at 90 percent of capacity westbound in the morning peak hour if it had been open in 2001 and would be at 100% capacity by 2008. This strongly suggests that a "phased" approach would be inefficient from a planning perspective, since the highway's ability to further divert non-local traffic from the local east-west roads would already be constrained at the time of its opening as a two-lane road. Hence, current travel behavior would lead to use of nearly the full capacity of a two-lane facility if it were implemented today. A two-lane design would not accommodate significant projected increases in travel demand that results from build-out of already-approved development projects in the region. The traffic model indicates that a phased approach requires that the additional two lanes be built almost immediately following construction of the initial two lanes.

#### *Environmental and Socioeconomic Effects*

A phased Route 92 would ultimately be built to the proposed design specifications. Therefore, the impacts of this sub-alternative would be the same as for proposed Route 92, but would occur in a phased manner, over time.

The phased Route 92 sub-alternative was determined to meet the project purpose and need and is therefore analyzed further in Section 4.

### **Proposed Route 92 without the Perrine Road Interchange**

A four-lane or two-lane Route 92 without the Perrine Road interchange would follow the same route and have the same interchanges in the other locations as the proposed Route 92 project. For the purposes of this analysis, it is assumed that other than the deletion of the Perrine Road interchange, the proposed relocated Perrine Road east and west of Schalks Crossing Road and the removal of Research Way would occur (see Figure 2-5).

Compared to the proposed four-lane Route 92 with the Perrine Road interchange, the deletion of the Perrine Road interchange alters the transportation and environmental impacts from a four-lane design as noted below.

#### *Traffic Network*

The removal of the Perrine Road interchange results in removing slightly less non-local traffic from east-west local roads, but the impact is relatively small. Removal also reduces local circulation and access options for the office development area between Schalks Crossing Road and US Route 1 (Forrestal Center and others). As a result, vehicle-miles of travel (VMT) are projected to increase (by more than 1,600 miles in the morning peak hour alone) as many people traveling to and from this development area would need to use more circuitous routes, adding traffic and congestion to Route 1 and other roadways. The largest increase in volume would be on US Route 1 between Route 92 and College Road, which would carry an additional 200-300 southbound vehicles in the morning peak hour, and a similar additional number of northbound vehicles in the evening peak hour.

The more severe traffic impacts, however, would occur on the lower-capacity local roads connecting US Route 1 with the office development area. Impacts would be most severe on Ridge Road between US Route 1 and Schalks Crossing Road, and on College Road east of Route 1. The traffic increases on these roads (eastbound in the morning peak and westbound in the evening peak) are projected to be about 20 percent of these roads' capacities, which are already expected to be exceeded even if the Perrine Road interchange is built.

Total projected morning peak hour VMT are 321 hours higher than for the proposed Route 92 (this is 12 minutes for each additional vehicle-mile, implying an average speed of 5 mph for the added VMT). Eliminating the Perrine Road interchange would mean not taking full advantage of the investment in Route 92 to achieve mobility improvements in the area.

#### *Air Quality*

Route 92 without Perrine Road interchange results in a 7.9% reduction in VOC emissions but only a 1.2% reduction in CO emissions compared to the No-Build alternative (see Table 2-5).

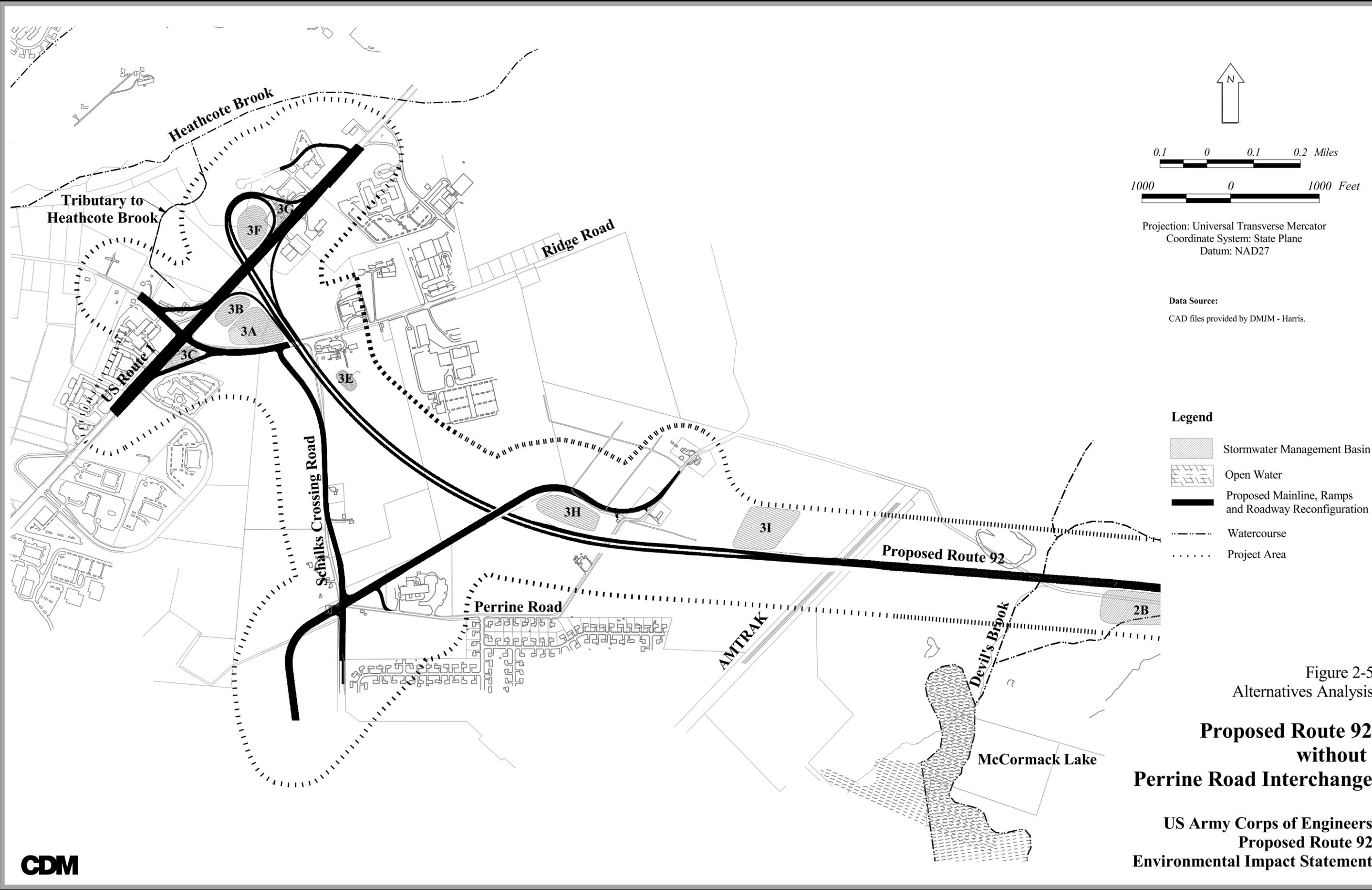


Figure 2-5  
Alternatives Analysis

**Proposed Route 92  
without  
Perrine Road Interchange**

**US Army Corps of Engineers  
Proposed Route 92  
Environmental Impact Statement**

### *Noise*

Deletion of the Perrine Road interchange is not expected to perceptibly change noise levels generated by proposed Route 92.

### *Wetlands*

No wetlands are present in the immediate area and thus no reduction in wetland impacts would result from eliminating the Perrine Road interchange.

### *Vegetation and Habitat*

Deletion of the Perrine Road interchange would eliminate the removal of approximately 5 acres of upland currently in agricultural use.

### *Water Resources*

Deletion of the Perrine Road interchange would eliminate approximately 1 acre of impervious surfacing, resulting in a slight reduction of stormwater runoff. The proposed stormwater retention facilities would lead to similar runoff water quality and recharge as for the four-lane highway.

### *Farmland*

Deletion of the Perrine Road interchange would avoid the loss of approximately 5 acres of currently active farmland.

### *Visual*

The primary visual effect of deleting the Perrine Road interchange is to eliminate the visual impact of the ramps on the residences fronting Perrine Road in the Princeton Collection development, on the residences along Perrine Road in the vicinity of the proposed interchange and on the facility formerly occupied by "Films for Humanities and Sciences" at 12 Perrine Road, immediately south of the proposed relocated Perrine Road.

### *Land Use*

Elimination of the Perrine Road interchange would avoid the permanent presence of the interchange and its impact on the Perrine Road homes near the interchange, but would not significantly alter development patterns in the area. The Northeast Corridor railroad tracks forms a north-south linear barrier to the east of the proposed Perrine Road interchange. The railroad tracks are crossed by local roads in only a very few locations; most local roads and development end at the rail barrier. Because proposed Route 92 would not provide new access to the local road system east of the Northeast Corridor railroad tracks, potential induced development from proposed Route 92 in the area to the east of the rail line would remain highly constrained. The area between US Route 1 and the Northeast Corridor railroad tracks, surrounding the proposed interchange, is already extensively developed, and is zoned by the local government for further development.

The proposed Route 92 without the Perrine Road Interchange sub-alternative was determined to almost fully meet the project purpose and need. However, because the induced development potentially caused by constructing the Perrine Road interchange is limited and attributable mostly to current zoning designations, this sub-alternative is not expected to exhibit any significantly lower growth-related environmental impacts than if the interchange were built. Because the traffic effects on US Route 1 and local roads that result if this interchange is not built are significant (without the improved access provided by this interchange), and because proposed Route 92 without this interchange would not be as effective in reducing congestion this sub-alternative is not analyzed further.

### **2.6.2 USEPA Suggested Alignment**

In 1997 USEPA Region 2 requested that NJTA evaluate an additional alternative alignment for proposed Route 92. This alternative has come to be called the USEPA Suggested Alignment. It would have a total length of approximately 9 miles. The eastern 4 miles would follow the same route as the eastern 4 miles already proposed by NJTA for Route 92. The two alignments diverge at a point near the intersection of Friendship Road and Turkey Island Road, on the Plainsboro-South Brunswick border. At this point the USEPA Suggested Alignment curves to the southwest, enters the 630-acre Plainsboro Preserve at its northeastern corner and crosses the preserve to the east of McCormack Lake. The alignment then passes through the middle of Plainsboro Community Park. Southwest of the park, the alignment curves to the west and parallels Dey Road until reaching Scudders Mill Road. The alignment then ties into Scudders Mill Road and continues west to US Route 1. The length of the USEPA Suggested Alignment from its point of divergence from the proposed Route 92 alignment to US Route 1 is approximately 5 miles.

The USEPA Suggested Alignment would be a four-lane limited access highway except for a 2.1-mile section on Scudders Mill Road at the western end of the alignment. The portion of Scudders Mill Road that is included in the USEPA Suggested Alignment would require widening from four to six lanes as well as improvements at major intersections. The bridges over Devil's Brook and the Amtrak rail line would require widening, as would the US Route 1 bridge over the Millstone River. Based on its conceptual design, the function and effect of the USEPA Suggested Alignment with respect to the regional road network would be similar to proposed Route 92. That is, it would draw through traffic away from local roads, making local driving less congested, facilitating walking and bicycling, and increasing the attractiveness of the area's neighborhood centers. Because of the greater negative impacts of this alternative (described below), the potential performance of the USEPA Suggested Alignment was not modeled.

The USEPA Suggested Alignment would be a limited access highway except where it coincides with a substantially developed segment of Scudders Mill Road. This alternative would therefore have little potential to promote sprawl development.

The USEPA Suggested Alignment would require the filling of approximately 13 acres of wetlands, and would require 10 stream crossings. The USEPA Suggested Alignment would not impact Agricultural Development Areas or Farmland Preservation Areas. However, this alternative would require acquisition of, or complicate access to, approximately 303 acres of land used for agricultural purposes. The USEPA Suggested Alignment would adversely impact 73 single-family residential units proposed or constructed as part of three subdivisions approved by the Plainsboro Township Planning Board, and 11 residences in other areas. The USEPA Suggested Alignment would also adversely impact a proposed church site and a tract proposed by Plainsboro Township for a Village Center.

A total of approximately 1.4 miles of the USEPA Suggested Alignment would be constructed on public parkland and private open space in Plainsboro Township. Southwest of the point where it diverges from proposed Route 92, the USEPA Suggested Alignment would pass through the eastern end of the Plainsboro Preserve approximately 600 feet east of McCormack Lake and approximately 400 feet east of the New Jersey Audubon Society Environmental Education Center at the preserve.. The USEPA Suggested Alignment would require acquisition of approximately 19.3 acres of the Preserve. The USEPA Suggested Alignment would cross the access road to the Preserve off Scotts Corner Road, requiring construction of a new route for public access to the Preserve.

The USEPA Suggested Alignment would pass through the center of Plainsboro Community Park, which contains several ball fields and other recreational facilities. The USEPA Suggested Alignment would require the acquisition of 8.3 acres of the park and would render an additional 10.1 acres inaccessible.

In addition to its impacts on public parkland and open space, the USEPA Suggested Alignment would require acquisition of approximately 20 acres of private land proposed for open space purposes as part of the residential subdivisions of Wicoff Estates and Windwood at Plainsboro. Total direct impacts of the USEPA Suggested Alignment to parkland and open space would be 48 acres.

The USEPA Suggested Alignment exhibits wetland and agricultural impacts comparable to those of proposed Route 92, but would exhibit greater impacts to parkland and open space. This alternative would also require extensive residential dislocation. The USEPA Suggested Alignment would not be as efficient in meeting project purpose as other alternatives because it requires a greater distance of highway construction for similar capacity improvements and because it relies on a 2.1-mile stretch of Scudders Mill Road. For these reasons this alternative was not analyzed further.

### 2.6.3 Dey Road Parallel Alignment

The design of the Dey Road Parallel Alignment would consist of three sections:

- A western section of approximately 2.1 miles connecting to US Route 1 via Scudders Mill Road in Plainsboro Township.
- A middle section consisting of approximately 5.4 miles of new roadway running parallel to, and an average of 2,000 feet north of, Dey Road.
- An eastern section of approximately 1.4 miles that would connect to New Jersey Turnpike Interchange 8A via Route 535 in Cranbury Township and a short stretch of Route 32 at the eastern edge of South Brunswick Township.

The western and middle sections would be aligned in an east-west direction, while the eastern section would be aligned in a northeast-southwest direction. The total length of this alignment would be approximately 8.9 miles.

This alternative would require fill in approximately 3.6 acres of wetlands and would require two stream crossings. The Dey Road Parallel Alignment would displace approximately 63 single-family residences and four commercial structures.

This alternative would cause the loss of approximately 78 acres of active agricultural land, including approximately 27 acres managed under the New Jersey Farmland Preservation Program. Under the Farmland Preservation Program public agencies cannot exercise the power of eminent domain to acquire land in a municipally approved Farmland Preservation Program, nor may nonfarm transportation facilities be built, unless the Governor declares that the action is necessary for the public health, safety and welfare and that there is no immediately apparent feasible alternative. (Agriculture Retention and Development Act, P.L. 1983, c.32, N.J.S.A. 4:1C-25) For this alignment, the only alternative to impacting the Farmland Preservation Areas would be to fill additional wetlands that are present north and south of Dey Road.

Because this alternative would not extend directly from US Route 1 to the New Jersey Turnpike, it would not separate regional through-traffic from local traffic. By requiring some use of local roads, the alternative would make local driving more congested and less efficient, and would discourage walking and bicycle riding. More through traffic in the community would decrease the quality of life and would tend to weaken the identification of residents with the local aspects of their community. The new roadway section could also open new areas to development because of the opportunity to build connecting roads, and driveways for commercial facilities. This would contribute significantly to sprawl.

The Dey Road Parallel Alignment, although displacing a smaller total area of wetlands than proposed Route 92, would cause relatively higher residential dislocation than other alternatives, as well as loss of farmland. Implementation of the proposed alignment

would require approval from the Governor because of the status of lands within the route under the Farmland Preservation Program. In addition, this alternative would not be effective in meeting the project purpose of improving regional mobility, because it does not connect directly to US Route 1, but relies instead on Scudders Mill Road, a local road where traffic flow is currently impeded by signalized intersections. Because the project does not meet project purpose, and because it exhibits significant adverse socioeconomic impacts, this alternative is not considered for further analysis.

#### **2.6.4 Plainsboro–Cranbury Road Parallel Alignments (PCPA)**

The Plainsboro-Cranbury Road Parallel Alignment (PCPA) would travel roughly east-west along Scudders Mill Road from US Route 1 to Dey Road in Plainsboro Township, a distance of approximately 2.2 miles. After crossing Dey Road the alignment would involve construction of a new roadway that would turn southeast and cross Cranbury Brook, then turn east and cross Davidson Road. The alignment would then cross Plainsboro-Cranbury Road approximately one mile east of Petty Road, and continue northeast toward US Route 130.

In response to a request from USEPA-Region 2, two alternative interchange designs were evaluated for the eastern terminus of the PCPA, in addition to the original design. The original design is designated PCPA-535 and the alternative interchange designs (described below) are designated PCPA-130/Dey Road and PCPA-130.

- The PCPA-535 design would cross US Route 130 and terminate at Route 535 at a new signalized intersection. The total length of the new roadway would be approximately 5.5 miles and the total length of the PCPA-535 alignment would be approximately 7.7 miles.
- The PCPA-130/Dey Road design would terminate at the existing US Route 130/Dey Road intersection, which is currently signalized. The total length of the new roadway would be approximately 5.4 miles and the total length of the alignment would be approximately 7.6 miles.
- The PCPA-130 design would also terminate at US Route 130, but at a new signalized intersection south of the US Route 130/Dey Road intersection. This alignment would be slightly shorter than the PCPA-130/Dey Road design.

The PCPA-535 design would impact a total of approximately 5.6 acres of wetlands, require four stream crossings, and adversely impact the associated floodplains. The PCPA-130/Dey Road design would impact approximately 10.1 acres of wetlands, require five stream crossings, and adversely impact the associated floodplains. The PCPA-130 design would impact approximately 5.2 acres of wetlands, require four stream crossings, and adversely impact the associated floodplains.

All three PCPA designs would require acquisition of 12 residences. In addition, each of the three designs would directly impact the Estates at Grovers Mill, a 149-lot residential

subdivision south of Plainsboro-Cranbury Road. All of the PCPA alignments would traverse the northeast corner of this development, impacting public open space and several home sites, as well as causing adverse air quality, noise and aesthetic impacts to the community.

The PCPA-535 design would impact approximately 156 acres of a Middlesex County Agricultural Development Area (ADA). The PCPA-130/Dey Road design would impact approximately 149 acres of the ADA, and the PCPA-130 design would impact approximately 156 acres of the ADA. The acres impacted by each design would include approximately 33 acres permanently protected by the Farmland Preservation Program within the ADA.

The PCPA-535 design would cross Main Street, Cranbury, near three homes listed on the National and State Registers of Historic Places. The three homes are listed on the Registers as individual resources as well as contributing resources to the Cranbury Village Historic District. The PCPA-130/Dey Road design was developed to avoid impacts to the three historic structures impacted by the PCPA-535 design. In the PCPA-130/Dey Road design, the PCPA connects to US Route 130 north of the historic structures, at the existing US Route 130/Dey Road intersection. Existing development east of US Route 130 prevents this alignment from extending across US Route 130 to Route 535.

Because this alternative would not extend directly from US Route 1 to the New Jersey Turnpike, it would not separate regional through-traffic from local traffic, nor would it remove through traffic from local roads. This would make local driving less amenable and efficient and would reduce the attractiveness of walking and bicycle riding as alternate forms of transportation. Concentration of through traffic in the community would decrease the quality of life and would tend to weaken the identification of residents with the local aspects of their community.

Because the proposed road improvements provide direct access to undeveloped land, the new roadway sections could contribute secondary impacts from induced development. Development and direct access is allowed and achievable along local roadways. Further, the local roadways being considered for improvement connect to a many other local roads that now cross and connect to the roadways being considered for improvement. For these reasons, improvement of the local road system has potential to induce extensive secondary sprawl development because it creates new access to undeveloped land.

The adverse environmental and socioeconomic impacts of these alternatives are only slightly less than those of proposed Route 92. However, none of the PCPA designs would be effective in meeting the project purpose because of their reliance on the signalized Scudders Mill Road. An alignment that includes a signalized local road can not separate regional traffic from local traffic, which is necessary to optimize regional travel while reducing local congestion. Most importantly, encumbrance of portions of

each alignment under the Farmland Preservation Program limits the implementability of each of the three PCPA designs. For the reasons presented above this alternative is not considered for further analysis.

### **2.6.5 South Brunswick Alignment - Modified**

The recently superseded South Brunswick Township *Master Plan and Master Plan Reexamination* (Zimmerman, 1988) presented an alternative alignment for proposed Route 92. This alignment is called the South Brunswick Alignment. Because the route of the original South Brunswick Alignment would have crossed extensive wetlands associated with Broadway Swamp, it was shifted 1,600 feet to the south. The modified alignment is called the South Brunswick Alignment – Modified (SBAM).

The western 1.2 miles of the SBAM, from US Route 1 to a point approximately 0.4 miles west of the Amtrak rail line – are identical to the alignment of Route 92. West of the Amtrak line, the SBAM diverges to the southeast and at approximately its midpoint is about one-half mile south of the proposed alignment of Route 92. The SBAM rejoins the proposed Route 92 alignment at US Route 130 and follows the Route 92 alignment along Route 32 to Interchange 8A of the New Jersey Turnpike. The total length of the SBAM (6.8 miles) is essentially the same as that of proposed Route 92.

The SBAM would have minimal direct impacts on residences, businesses, public facilities and historic sites, and would contribute only slightly to sprawl; however, this alternative would result in the loss of approximately 43 acres of wetlands, approximately three times the wetland impact of proposed Route 92. Because the SBAM is south of the proposed Route 92 alignment, it would cross the full width of the northern portion of the Plainsboro Preserve rather than just its northern end, and the length of the SBAM within the preserve would be approximately twice that of Route 92. The SBAM would pass several hundred feet closer to McCormack Lake than proposed Route 92. Because this alternative exhibits substantial wetland and parkland impacts, it is not considered for further analysis.

## **2.7 Comparison of Alternatives**

The environmental and community impacts exhibited by each of the alternatives studied in the preceding subsections were evaluated and compared. Those alternatives that were found to have comparatively greater environmental impacts, while meeting project purpose to a similar degree, were removed from further analysis. The remaining alternatives were compared, based on the degree to which they could meet the project purpose.

Because the proposed project is a non-water-dependent project, the evaluation and comparison of alternatives was subject to USEPA guidelines under Section 404(b)(1) of the Clean Water Act. The guidelines state that “no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does

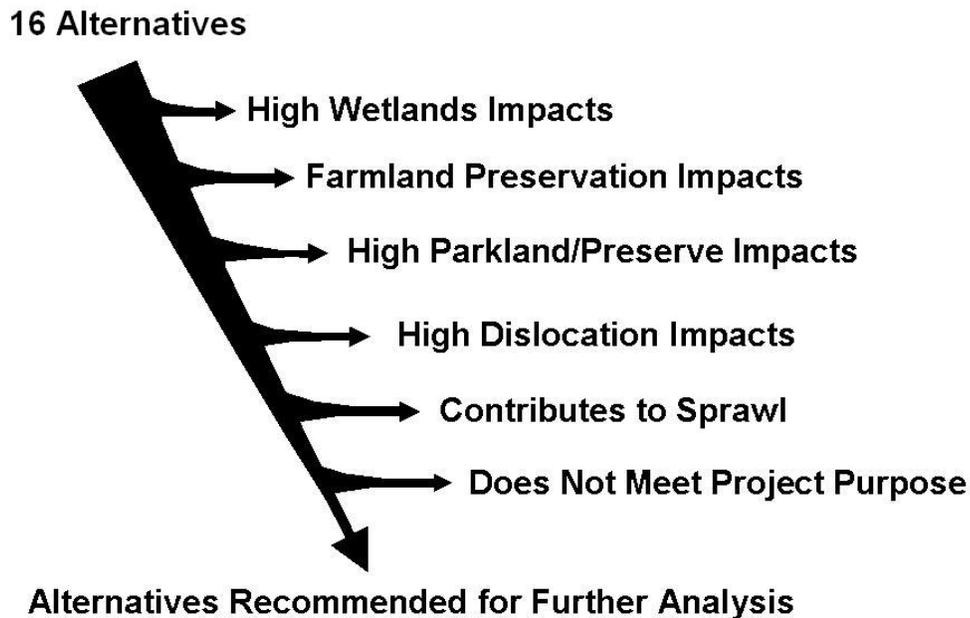
*not have other significant adverse environmental consequences”, and “an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”*  
(40 CFR 230.10)

In some cases, the non-wetlands impacts (e.g., impacts to parks/preserves and socioeconomic impacts) exhibited the potential to be relatively more significant than wetland impacts because they were extensive, and could not be mitigated effectively.

Table 2-6 presents a summary of the evaluation of the alternatives. Table 2-6 presents a hierarchy of the impacts of the alternatives, with the major impacts of each alternative highlighted in the table (e.g., comparatively high wetland impact, farmland preservation impact, parkland impact, direct impact to historic sites, residential/commercial/public dislocation, contribution to sprawl, and inability to meet project purpose).

The alternatives evaluation logic is illustrated in Figure 2-6 below.

Figure 2-6  
Alternatives Analysis



The results of the alternatives analysis, as summarized in Table 2-6, are presented below.

Compared to the other alternatives, the South Brunswick Alignment – Modified and Composite Local Roadway Improvements Program alternatives have greater impact to permanent wetlands and open water than almost all other alternatives. The Composite Improvements Program alternative also has substantial dislocation impacts, particularly

**Table 2-6  
Alternatives Evaluation Summary**

Alternative	Permanent Wetland/Open Water Impacts (acres)	Impact to Preserved Farmland (acres)	Parkland Impacts	Direct Impact to Historic Sites?	Residential Impacts	Commercial Impacts	Public Facilities Impacts	Facilitates Sprawl Development	Meets Project Purpose?
South Brunswick Alignment – Modified	43.0	0	Loss of 34 acres of Plainsboro Preserve	No	n/a	n/a	n/a	Slightly	No
Composite Local Roadway Improvements Program	20.0	0	0	Yes	180	10	6	Significantly	Partial
Dey Road Parallel Alignment	3.6	27	0	No	63	4	0	Significantly	No
Plainsboro – Cranbury Road Parallel Alignments	5.6	33	Public open space part of Estates at Grovers Mill Subdivision	Depends on alignment	12	4	0	Significantly	No
USEPA Suggested Alignment	13.0	0	Loss of 38 acres of Plainsboro Preserve	No	11	0	1	Slightly	Partial
Route 522 Widening (with/without extension to New Jersey Turnpike)	2.0 / 7.0	0	Pigeon Swamp State Park impact	No	58	1	4	Significantly	No
Plainsboro – Cranbury Road Widening	0.6	0	0	Yes	41	5	2	Moderately	No
Cranbury Neck Road Widening	4.3	0	0	Yes	63	2	0	Moderately	No
USEPA Suggested Modified No-Build Alternative	1.2	0	0	No	0	0	0	No	No
Dey Road Widening	7.5	0	0	No	18	1	0	Moderately	No
<b>NJTA Proposed Route 92 with Terminus at Route 1</b>	12.0	0	14 acres reserved for roadway in Plainsboro Preserve	No	4	1	0	Slightly, at Perrine Road interchange	Yes
Two-Lane Route 92	9.5	0	Same as above	No	4	1	0	Slightly, at Perrine Road interchange	Partial
Phased Route 92	12.0	0	Same as above	No	4	1	0	Slightly, at Perrine Road interchange	Yes
Route 92 without Perrine Road Interchange	12.0	0	Same as above	No	4	1	0	No	Yes
<b>US Route 1 Widening in South Brunswick</b>	4.0	0	0	No	3	3	0	Slightly	Partial
<b>US Route 1 Widening in SB with Signal Removal</b>	7.7	0	0	No	8	7	0	Slightly	Partial

Shaded cells identify the principal disadvantages of each alternative.

residential dislocations (180). Both alternatives have significant potential to contribute to sprawl. Neither alternative would be effective in meeting the project purpose of improving regional mobility, because neither alternative would separate through traffic from local traffic, which is necessary to optimize regional travel. Because protection of the nation's aquatic resources, including wetlands, is a USACE priority under the Clean Water Act, these alternatives were identified as the least desirable alternatives.

The Dey Road Parallel Alignment and Plainsboro-Cranbury Road Alignment alternatives, while exhibiting lesser wetland impacts than the alternatives discussed above, have substantial impacts on farmlands preserved by law and, in the case of the Dey Road Parallel Alignment, has substantial residential dislocation impacts (63). Both alternatives have significant potential to contribute to sprawl. Neither alternative would substantially meet the project purpose of improving regional mobility, because neither would separate local and through traffic. Under New Jersey's Farmland Preservation program use of legally preserved farmland for non-farm purposes is strongly discouraged, and the legal impediments greatly restrict use of such lands for non-farm purposes. While there are several categories of farmland protection and recognition, farmland preservation is the strongest. For this reason these alternatives were identified as substantially infeasible.

The USEPA Suggested Alignment alternative has greater wetland impacts than most of the alternatives, and substantial direct and indirect parkland impacts (loss of 48 acres of Plainsboro Preserve in a heavily used part of the preserve). This alternative has only slight potential to contribute to sprawl, but would result in comparatively great impacts to the natural environment. This alternative would not fully meet the project purpose of improving regional mobility, because it relies on a 2.1-mile section of Scudders Mill Road, and would therefore not separate local and through traffic.

The Route 522 Widening alternative (with or without extension to the New Jersey Turnpike) exhibits relatively fewer wetland impacts. However, it has substantial parkland impacts with the extension to the Turnpike (Pigeon Swamp State Park) and substantial residential and public facility dislocation impacts with or without the extension. Its impacts to the Pigeon Swamp wetland complex, which has been designated as a USEPA Priority Wetland and is included in the National Register of Natural Landmarks, are significant. This alternative has significant potential to contribute to sprawl. Without the extension to the NJ Turnpike, this alternative would not meet the project purpose of improving regional mobility. With the extension to the Turnpike, this alternative still would not substantially meet the project purpose, because it would not separate local and through traffic, which is necessary to optimize regional mobility.

The Plainsboro-Cranbury Road Widening and Cranbury Neck Road Widening alternatives have relatively less wetland impact than the other alternatives, but exhibit major residential dislocation impacts (41 and 63 dislocations, respectively). These alternatives would cause great adverse social impacts to the community. These

alternatives have moderate potential to contribute to sprawl, and they would not substantially meet the project purpose because they would not separate local and through traffic, which is necessary to optimize regional travel.

The USEPA Modified No-Build alternative has few physical and socioeconomic impacts and would not contribute to sprawl, but fails to meet basic project purpose. Two of the three improvements suggested under this alternative have been implemented, and were considered to be part of the existing road system when future traffic congestion was modeled. Even though the traffic modeling analysis includes these improvements as background conditions, the traffic modeling analysis still identifies significant need for road network improvements (as described in Section 1, Project Purpose and Need, and the transportation analysis in Section 4) above and beyond the already implemented intersection improvements. While a new interchange at US Route 130 and Route 32 has not been implemented, this road system improvement would yield little benefit in improving east-west travel congestion because it does not improve travel capacity to points west of Route 130. While a new interchange would provide slightly improved linkage between the New Jersey Turnpike and Route 130, this benefit would be provided at only one of four needed interchange locations to improve linkage between north-south highways.

The Dey Road Widening alternative exhibits moderate wetland impacts (7.5 acres) and moderate residential dislocation impacts (18), and would facilitate sprawl to a moderate degree. Most significantly, the Dey Road alternative would use local roads to carry regional traffic, and does not provide an efficient connection to the New Jersey Turnpike because it increases the burden on local intersections as traffic travels toward Interchange 8A. Because this alternative does not meet project purpose and exhibits moderate wetland and residential dislocation impacts, it was identified as less desirable than other alternatives.

The two-lane Route 92 sub-alternative reduces wetland impacts by 2 acres and slightly reduces other environmental impacts over the four-lane configuration. However, it would be significantly less effective at reducing congestion and improving regional mobility by separating through traffic from local traffic. Traffic modeling shows that a two-lane Route 92 would reach 100% of its capacity by 2008. A two-lane Route 92 was determined to insufficiently fulfill the purpose of the project, because it would not adequately address projected future traffic. Similarly, a phased two-lane to four-lane Route 92 would be inefficient from a planning perspective, and would ultimately not decrease environmental or socioeconomic impacts, because the second phase would need to begin construction almost immediately upon completion of the first two lanes. However, because the phased Route 92 sub-alternative would meet the project purpose, and would temporarily avoid some environmental effects, it was considered for further analysis.

The removal of the Perrine Road interchange from proposed Route 92 would reduce the loss of farmland by approximately 5 acres, but would not significantly reduce other

adverse impacts. It is also predicted to cause more congestion on Route 1 and local roads in the area because it would provide fewer access options for the office development area that currently exists between Schalks Crossing Road and US Route 1 (Forrestal Center and others). Because the removal of the Perrine Road interchange would have limited environmental and socioeconomic benefit and would decrease the traffic improvements that would result from proposed Route 92 (and thereby increase congestion and air pollution), this sub-alternative was eliminated from further consideration.

The US Route 1 Widening in South Brunswick (with or without signal removals) and NJTA Proposed Route 92 have minor to moderate wetland and dislocation impacts and minor park and socioeconomic impacts, while fully or partially meeting the project purpose. US Route 1 Widening with signal removal would have moderate commercial dislocation impacts. Proposed Route 92 would have an impact on the northern section of Plainsboro Preserve; however, when Plainsboro Township created the preserve it anticipated construction of proposed Route 92 through the preserve.

Based on the comparative assessment of the alternatives, three action alternatives have been identified that have low to moderate wetland impacts, do not cause substantial adverse physical and/or socioeconomic impacts, reduce potential sprawl effects, and substantially meet the project purpose of improving regional mobility. They are:

- Proposed Route 92 with Terminus at Route 1, both as-proposed and with phased implementation
- Route 1 Widening in South Brunswick with Signal Removal

In addition, the No action/No build alternative (under which no permit is issued, and no project would be implemented to address project purpose and need) is carried through for further analysis.

The alternatives evaluated in the preceding sections were screened based on their environmental, social, and smart growth impacts, and their ability to meet the project purpose of improving regional mobility.

## **2.8 Summary**

This alternatives analysis reviewed the environmental (including socioeconomic and land use) impacts of 16 action alternatives (as well as several sub-alternatives) and identified those with comparatively fewer adverse environmental impacts. The analysis then assessed the ability of each of the comparatively lower impact alternatives to meet project purpose and respond to the need for the project. The ability of TDM measures to meet the project purpose was also evaluated.

This alternatives section set forth a comparative evaluation of a number of potential alternatives that appeared to have the potential, prior to the screening analysis, to achieve the project purpose. Based on the screening analysis conducted in this section,

those alternatives that exhibit comparatively fewer environmental impacts and that best meet project purpose receive more detailed analysis in Section 4.

Based on the alternatives analysis, the majority of projects involving capacity increases on local roadways were eliminated from further consideration, because:

- (1) they indicated potential to induce local development in lesser developed areas;
- (2) the alternatives exhibited adverse impacts that were equal to or greater than the impacts of the projects recommended for further analysis;
- (3) they did not meet the project purpose of improving regional mobility, because they did not separate local traffic from regional through traffic, which is necessary to optimize regional travel.

A number of projects involving construction of new roadway alignments were eliminated from further consideration because:

- (1) they exhibited impacts that were equal to or greater than the impacts of the projects recommended for further analysis;
- (2) they provided new access to areas previously characterized by low accessibility, thus exhibiting significant potential to induce sprawl development in rural areas;
- (3) they did not meet the project purpose of improving regional mobility, because they did not separate local traffic from regional through traffic;.

Evaluation of TDM measures found that such measures keyed to the study area could complement any of the alternatives evaluated in this EIS and help offset possible increases in single-occupancy vehicle use that might result from any of the alternatives. Although TDM measures could not replace the need for roadway system improvements, primarily because of their limited effectiveness in suburban areas with dispersed residential origins and dispersed employment destinations, a coordinated package of TDM measures and roadway system improvements would be consistent with the goals and objectives of the NJTPA Regional Transportation Plan for the study area.

Based on the alternatives analysis, four alternatives are recommended for more detailed impact analysis. One alternative is the No action/No build scenario, in which no project would be implemented to address project purpose and need. The second and third alternatives involve construction of a new limited access east-west highway alignment, all at one time or in two phases. The fourth alternative involves construction of capacity improvements and removal of traffic flow impediments in an existing highway corridor.

The alternatives carried forward for additional analysis are:

- No Action/No Build Alternative
- NJTA Proposed Route 92 with Terminus at US Route 1, constructed at one time or in two phases
- US Route 1 Widening in South Brunswick

Please refer to Section 4 for more detailed analysis of the impacts of each of these alternatives.