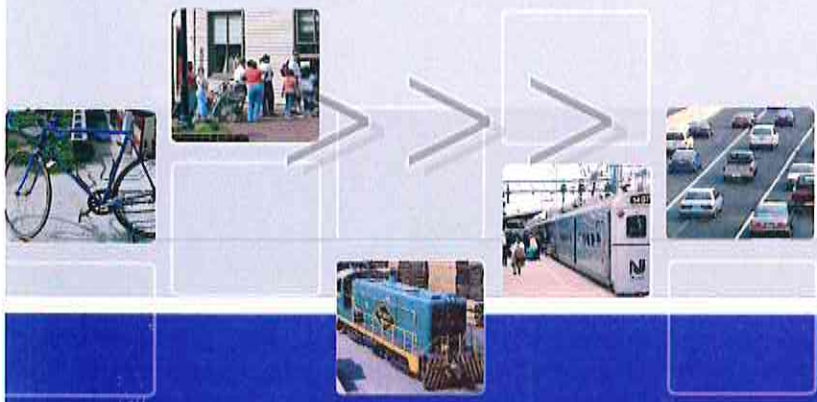




CENTRAL JERSEY TRANSPORTATION FORUM

**WORKING PAPER  
ON CIRCULATION  
ELEMENTS**

**JULY 26, 2005**



**Delaware Valley  
Regional Planning  
Commission**



**CJTF**  
CENTRAL JERSEY  
TRANSPORTATION FORUM



July 6, 2005

Dear Central Jersey Transportation Forum Members:

As agreed at our February meeting, a letter was mailed out requesting copies of circulation plans from each municipality and county in the Forum area. We had an amazing response, receiving plans from all municipalities. For this, we would like to extend our appreciation for your assistance and for taking the time to forward along a copy of your plan and supporting documents. In addition, we would like to thank the Forum's Transportation Management Associations for their assistance in preparing this report.

The Forum is using these plans in several ways, one of which is looking for sections, maps and graphics from the circulation plans that **best demonstrate a comprehensive approach to transportation planning**. We have compiled an overview matrix of all the circulation plans and a table indicating sections of local best practice examples. Copies of the cited sections, maps, and graphics are included. We hope that you find this material informative and that it will help you as you update your circulation plan and coordinate with surrounding municipalities.

Again, thank you for your help in this effort, and we plan to continue to use these documents to inform the Forum as it moves forward.

Sincerely,

John J. Coscia  
Executive Director, DVRPC  
Chair, CJTF

# Circulation Plan Review Matrix

	Date	Content		Auto	Transit	Bicycle	Pedestrian	Freight	Other
		Text	Maps						
<b>Mercer County</b>	1 / 2000								<ul style="list-style-type: none"> <li>▸ From Mercer County Growth Management Plan - Highways</li> <li>▸ Other materials submitted: Transportation Development District Plan &amp; Roadway Access Management Code</li> <li>▸ Noted in the submission is that many of the county documents are under revision</li> </ul>
Hightstown Borough	10 / 1998								<ul style="list-style-type: none"> <li>▸ Contains section on land use &amp; transportation</li> <li>▸ Propose new downtown circulation pattern</li> </ul>
Hopewell Borough	1 / 2005								<ul style="list-style-type: none"> <li>▸ Contains section on land use &amp; transportation</li> </ul>
Lawrence Township	6 / 1995								<ul style="list-style-type: none"> <li>▸ Will be updating plan in the near future</li> </ul>
Pennington Borough	2 / 2005								<ul style="list-style-type: none"> <li>▸ Most of the focus of the circulation element is on Rt. 31</li> </ul>
Princeton Borough	10 / 2003								<ul style="list-style-type: none"> <li>▸ Brief paragraph on 'Truck Routes' (Princeton Regional Planning Board)</li> <li>▸ Address Environmental impacts</li> </ul>
Princeton Township	10 / 2003								<ul style="list-style-type: none"> <li>▸ Brief paragraph on 'Truck Routes' (Princeton Regional Planning Board)</li> <li>▸ Address Environmental impacts</li> </ul>
Washington Township	12 / 2000								<ul style="list-style-type: none"> <li>▸ Washington Town Center has a separate plan, 'Street Regulating Plan'</li> <li>▸ Address Traffic Calming</li> <li>▸ Sets forth design standards for roadways</li> <li>▸ Set strategies for connecting neighborhoods &amp; form community</li> </ul>
West Windsor Township	8 / 2003								<ul style="list-style-type: none"> <li>▸ Have separate Bicycle Pedestrian Plan (10 / 2004)</li> <li>▸ Address TDM</li> </ul>
East Windsor Township	12 / 2003								<ul style="list-style-type: none"> <li>▸ 5/22/2005 announced new circulation plan study</li> </ul>
Hopewell Township	11 / 1998								<ul style="list-style-type: none"> <li>▸ Cite TDD as factor in development of circulation system</li> <li>▸ Address driveway access, residential zoning traffic impacts</li> <li>▸ Address traffic safety</li> <li>▸ Brief mention of TDM practices (e.g. carpooling)</li> </ul>



# Circulation Plan Review Matrix

	Date	Content		Auto	Transit	Bicycle	Pedestrian	Freight	Other
		Text	Maps						
<b>Middlesex County</b>	5 / 1999								<ul style="list-style-type: none"> <li>Address ferry, aviation, technology, land use &amp; safety &amp; security</li> <li>Address TDM</li> <li>Have separate Bicycle Pedestrian Plan (3 / 2002)</li> <li>Address rapid development in county &amp; recommend improving E-W access through 522, 610, 614 &amp; 92</li> </ul>
Plainsboro Township	5 / 2000								<ul style="list-style-type: none"> <li>Address TDM</li> <li>Contains TDM Plan for Princeton Forrestal Center</li> <li>Address Traffic Calming</li> <li>Recommend municipal &amp; regional planning</li> <li>Emphasis on the need for improving E-W access corridors (e.g. 92)</li> </ul>
South Brunswick Township	11 / 2001								<ul style="list-style-type: none"> <li>Parks &amp; Recreation Plan addresses pedestrian &amp; bicycle access (Bike lanes &amp; sidewalks guidelines in Circulation Element)</li> <li>Propose Transportation Improvement Districts</li> <li>Address access to regional rail facilities, park &amp; ride, E-W access corridors (e.g. 92)</li> <li>Address traffic calming</li> </ul>
Cranbury Township	12 / 1967								<ul style="list-style-type: none"> <li>Major focus on access management</li> </ul>
Jamesburg Borough	2002								<ul style="list-style-type: none"> <li>Address parking</li> <li>Address traffic calming</li> </ul>
Monroe Township	7 / 2003								<ul style="list-style-type: none"> <li>Address zoning impacts on transportation</li> </ul>
<b>Somerset County</b>	6 / 2003								<ul style="list-style-type: none"> <li>Address "new transportation initiatives": TDM &amp; role of TMA, CSD, TOD, Environmental Issues, TED, etc.</li> <li>Address County goals, principles &amp; implementation agenda relative to achieving circulation plan</li> </ul>
Montgomery Township	5 / 2003								<ul style="list-style-type: none"> <li>Modified Land Use Plan to minimize traffic generation</li> </ul>
Millstone Borough	1997								<ul style="list-style-type: none"> <li>Address traffic safety</li> </ul>
Franklin Township	1999								<ul style="list-style-type: none"> <li>Address TRO</li> <li>Address transportation management</li> <li>Address zoning impacts on transportation</li> </ul>
Hillsborough Township	1996								<ul style="list-style-type: none"> <li>Address roadway signage along 206</li> <li>Address driveway access</li> </ul>
Rocky Hill Borough	1996								<ul style="list-style-type: none"> <li>Have 2004 Master Plan Update, but does not amend any sections of circulation plan</li> <li>Address Bike &amp; Pedestrian system as a 'secondary circulation improvements'</li> </ul>
<b>Hunterdon County</b>									
East Amwell Township	12 / 1996								<ul style="list-style-type: none"> <li>Short reference to 'Public &amp; Other Transportation'</li> <li>Short reference to 'Impacts of Truck Traffic on Rt. 31'</li> </ul>

## Municipal Circulation Plan Elements – Best Practices

All municipal circulation plans require a great deal of time and work, and each represents good planning efforts. The examples cited below, however, represent sections, maps and graphics from circulation plans that **best demonstrate a comprehensive approach to transportation planning**. The materials cited in the table are attached. Some plans were shared electronically and some were paper copies, resulting in a variety of formats.

<b>MERCER COUNTY</b>	<b><i>Best Practices</i></b>
Hightstown Borough	<ul style="list-style-type: none"> <li>• Street Patterns</li> <li>• Balance Transportation Needs</li> <li>• Directing Transportation Needs</li> </ul>
Princeton Community (Borough & Township)	<ul style="list-style-type: none"> <li>• 1996 – 2001 Goals</li> <li>• 1989 – 1996 Changes in Transportation</li> <li>• 1996 – 2001 Strategies</li> <li>• Information Improvements</li> </ul>
Washington Township	From Township Master Plan: <ul style="list-style-type: none"> <li>• Goals and Objectives</li> <li>• Roadway Functional Classification</li> <li>• Design Standards</li> </ul> From Town Center Street Regulating Plan: <ul style="list-style-type: none"> <li>• Entire Document</li> </ul>
West Windsor Township	<ul style="list-style-type: none"> <li>• Mass Transit and Travel Demand Management</li> <li>• Circulation Plans of Surrounding Municipalities</li> <li>• Web layout and accessibility</li> </ul>

<b>MIDDLESEX COUNTY</b>	<b><i>Best Practices</i></b>
Plainsboro Township	<ul style="list-style-type: none"> <li>• Bus Service</li> <li>• Travel Demand Management</li> <li>• Pedestrian Circulation and Bikeway Plans</li> </ul>
South Brunswick Township	<ul style="list-style-type: none"> <li>• Historical Groundings</li> <li>• Current Conditions</li> <li>• Proposed Truck Routes (&amp; map)</li> </ul>
Jamesburg Borough	<ul style="list-style-type: none"> <li>• Pedestrian and Bicycle Access</li> </ul>

<b>SOMERSET COUNTY</b>	<b><i>Best Practices</i></b>
Montgomery Township	<ul style="list-style-type: none"> <li>• Web layout and accessibility</li> </ul>
Franklin Township	<ul style="list-style-type: none"> <li>• Trip Reduction Demand Strategies</li> </ul>
Hillsborough Township	<ul style="list-style-type: none"> <li>• Mass Transit</li> </ul>

<b>HUNTERDON COUNTY</b>	<b><i>Best Practices</i></b>
East Amwell Township	<ul style="list-style-type: none"> <li>• Hunterdon County Transportation Plan</li> <li>• New Jersey Traffic Congestion and Air Pollution Control Act</li> <li>• Appendix 2: Proposed Cross-Section of Roads</li> </ul>

### **Street Patterns**

The Borough's street pattern is essentially a grid, which makes it easy to follow and navigate through town. However, Mercer Street cuts diagonally cross the grid pattern and this creates some awkward, and sometime dangerous acute angled intersections. In particular, the intersections of South Street/Mercer and West Ward/Mercer are both dangerously askew. Similarly, South Main Street and Mercer Street intersect at "the Point," a difficult confluence that's sometimes safer to avoid than utilize.

### **Balance Transportation Needs**

If we assume that the By-Pass will, indeed reduce traffic through the Borough, then the municipality must build on this initiative and advance other improvements to the circulation system in town. Improvements should be designed to restore pedestrian priorities to the downtown, manage and control vehicular through traffic, and provide a balance of opportunities for all modes of transportation. All three of these objectives are interconnected. Improving resources for alternative modes of transportation will lead to less vehicular traffic and more opportunities for safe pedestrian access. There are a number of steps the Borough can take toward this end.

The Borough's small size relates directly to traffic levels. It is easier to develop congestion in a small town than a large one. Therefore, the Borough must recognize the importance of all forms of transportation, cars, trucks, bicyclists, carpools, buses. Obviously, trains are not an option in Hightstown anymore. If the Borough can improve conditions for alternative modes of transportation, it will help to encourage more people to leave their cars at home and thereby reduce traffic levels.

This is not to say that cars should be banned from downtown. Far from it. Most people will still arrive in Hightstown by car but their experience can be made a more positive one if unnecessary cars are not sharing the roadway. People who do arrive by car must find easy access to parking and well designed signs to help orient themselves. Parking should be close to stores, whether in front or in back, and should be attractive, inviting and safe.

## **1996 - 2001 GOALS**

In order to implement this policy the following circulation goals are presented.

**I. Goals to manage traffic to protect and enhance the historic districts, downtown and business districts as well as residential neighborhoods in the Princeton Community.**

**II. Goals that require coordination with the State, with Mercer, Middlesex, and Somerset Counties, and with surrounding local communities.**

### **A. Regional Traffic Coordination**

1. Provide leadership in promoting regional traffic coordination in State, County, and municipal road projects.

### **B. Regional Traffic Distribution Goal**

1. Promote a peripheral road system which will distribute traffic over several smaller two-lane roadways rather than creating larger four-lane roads.

### **C. Regional Land Use Goal**

1. Balance land use with the capacity of the circulation system to ensure that proposed land uses will not overload the circulation system.

### **D. Interstate/Interregional Traffic Goal**

1. Develop strategies to reduce interstate/interregional truck and automobile traffic in the area through the development of by-passes, especially ones with direct links to the turnpike.

### **E. Information Goal**

1. Develop traffic data on employment and commuting patterns to evaluate circulation impacts from existing and new development.

2. Develop information on traffic management plans and policies.



Washington Township has defined five broad Goals that are the foundation and framework for each of the Master Plan Elements. Each of the planning Goals is supported by a number of action-oriented Objectives. In turn, each Plan Element must refer to the goals and objectives and document how the Plan's recommendations will support the Master Plan Goals.

### **1. HERITAGE**

*Protect the rural character, the rural way of life, and the cultural heritage of the Township.*

The transportation system to a large extent provides the forum by which people are able to appreciate the rural character and cultural heritage of Washington Township. Inappropriate or insensitive roadway or other improvements can obliterate the features that help to establish that heritage, whether we are speaking about hedgerows and tree lines, viewsheds, historic buildings in the context of an historic street or a balanced center of development. On the other hand, if no improvements are provided to accommodate the growing demands placed on the transportation system by a growing population and employment base, the same destruction to the community's heritage can result.

### **2. COMMERCE**

*Encourage office and retail uses to locate in a pattern of compact nodes in the Township.*

Commercial development requires easy accessibility. In most instances that means vehicle accessibility, although access by walking should always be encouraged. Customers need to be able to reach businesses. Truckers need to be able to find manufacturing or warehousing sites. Visitors to commercial sites need to leave feeling that the experience of reaching the site was not so onerous that future trips will be avoided. The circulation system has to be sufficiently obvious that drivers do not find themselves lost or fearful of becoming lost.

### Arterial Highways:

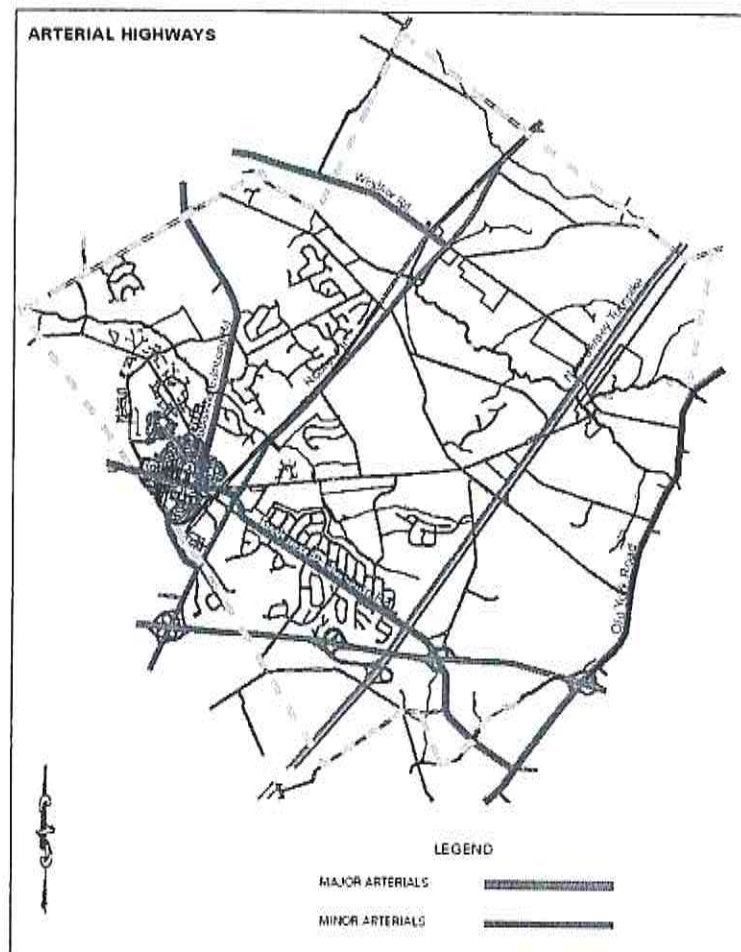
- Major arterials:

Major arterial highways serve corridors with high concentrations of vehicles moving between major centers of activity. In New Jersey, principal (or, major) arterial highways today frequently have average traffic volumes in excess of 25,000 vehicles per day. These volumes usually require multi-lane road construction. Major arterial highways, however, do not have to have high traffic volumes. Critical to the definition of a roadway as major arterial is the role it plays in connecting distant places together or in serving major travel demand corridors.

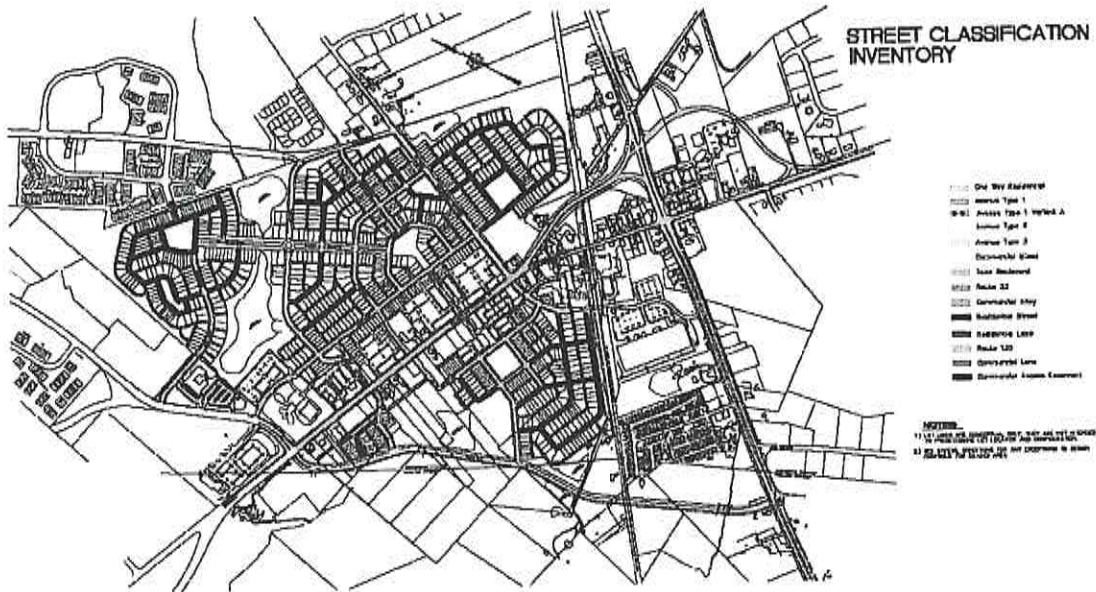
Major arterials frequently serve transportation corridors that were of importance since colonial times. By recognizing the inherent strategic function of a principal arterial highway it should be possible to protect that function as traffic volumes on a highway grow.



Route 33, which will be the "Main Street" of Town Center, is one of the most important Minor Arterial roadways in the Township.



*Washington Township  
(Town Center Street Regulating Plan)*



Washington Town Center Plan

STREET REGULATING PLAN

REVISADO 10/24/09

## Section 2

**2-2 (1)**

AVENUE TYPE 1

**STATION NAME •**  
**Traffic Flow**  
 Parking  
 Rampway  
 Passenger Walk  
 Cargo  
 Driver  
 Passenger Queue  
 Passenger Entrance  
 Average Daily Traffic  
 Weight Loading  
 Landscaping  
 Display Path

Two way  
 South side except in winter months at  
 Roadhouse  
 64 ft.  
 50 ft.  
 20 ft.  
 15 ft.  
 Double rampway  
 Stairs on both sides  
 Stairs on W. rampway across at 20 ft.  
 main rampway  
 4,300  
 60 ft. on main along back section with  
 between 40 ft. to 50 ft. on main along section  
 There is parking at 30 ft. intervals existing  
 lanes should be removed to the extent  
 possible  
 incorporated in pavement strip.

\* Except in Historic Buildings which deserve special consideration.

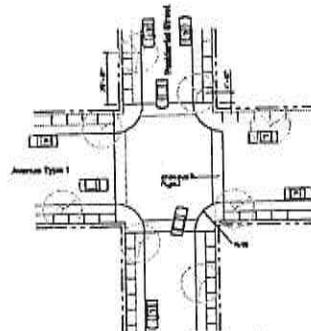
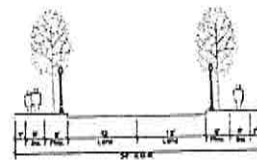


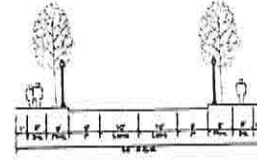
Figure Ground Plan of an Avenue Type I Intersection

AVENUE TYPE I - VARIANT A

<b>APPROACHES</b>	Two way
Traffic Flow	None
Right-of-Way	SA R/L
Forward Motion	SA R/L (1 L + 2)
Speed	25 MPH
Left Turn	SA R/L
Drivings	Control required
Passing	Suburban or both ways
Passing	Suburban mix; several series of design
Passing	SA R/L
Average Daily Traffic	< 3000
Street Lighting	SA R/L, no center going features with
Landscaping	freeway barriers 10 ft, no center 60 ft trees with commercial buildings
	tree in parkway at 20 ft intervals, reducing
	tree should be retained in the adjacent residential
Sample Path	area = 10 ft wide with traffic



Section of Avenue Type 1 - Variant A



Section of Avenius Type 1

**Street Regulating Plan**  
**REVISED 10/18/04**

## Section 2

2-12 (D)



***Mass Transit and Travel Demand Management***

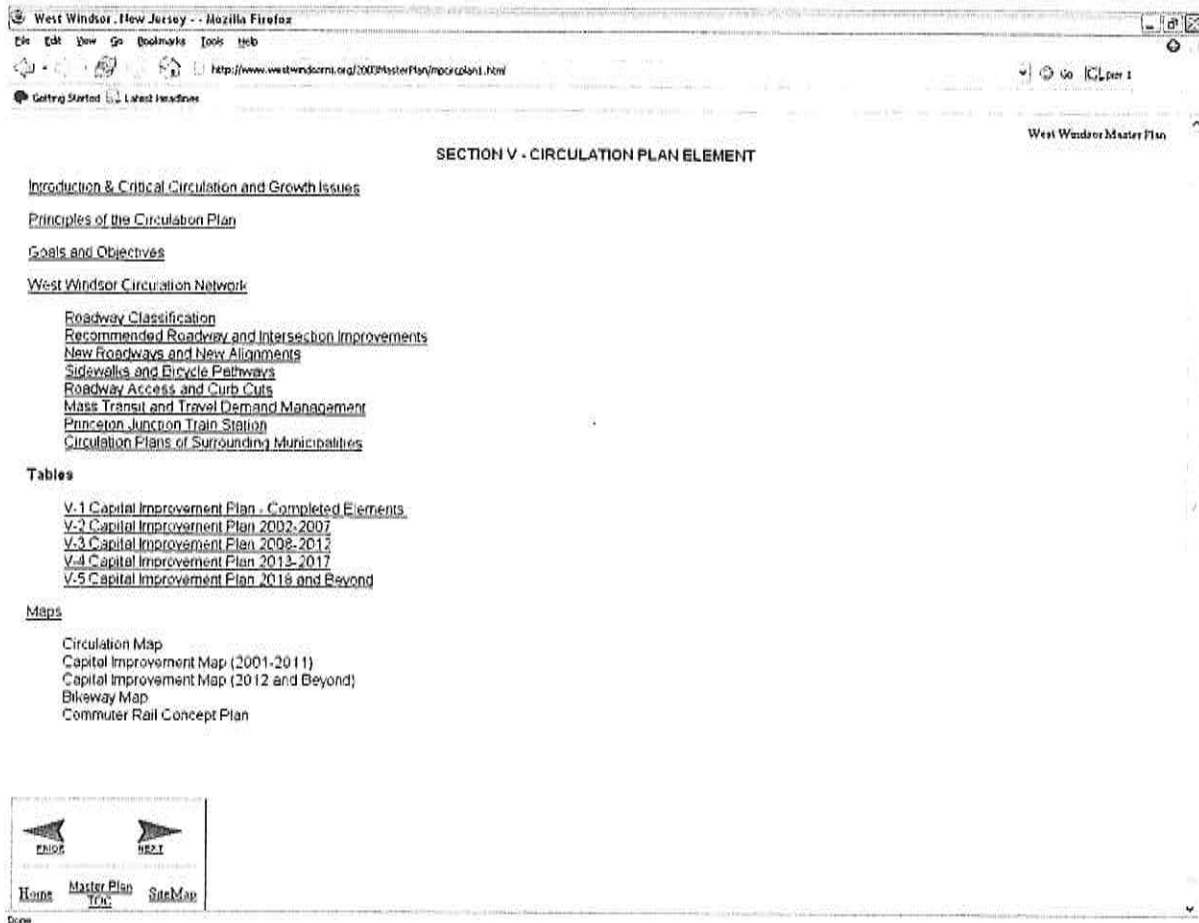
Use of mass transit and travel demand management are often closely related to one another. Travel demand management techniques include use of transit, ridesharing, telecommuting and other forms of reducing single occupancy vehicular travel. Use of mass transit is dependent on the cost of single occupancy vehicular travel, including cost of fuel and cost of travel time. When roadway congestion increases, use of mass transit becomes more attractive to commuters. Travel demand management is used to then decrease roadway congestion. Use of mass transit is also dependent on a convenient, cost effective transit system. The Central Jersey Transportation Forum is evaluating bus route enhancements for West Windsor. The Township also has the benefit of convenient rail service that saves travel time for residents and regional travelers commuting to Newark, New York and Philadelphia employment centers on the Northeast Corridor Amtrak and New Jersey Transit rail line. This train station has been one of the attractions for new residents of the Township. The largest deterrent to using the train to travel to these locations is the limitation on parking spaces at the station, which is discussed further in the next section.

The future development of large commercial properties such as Sarnoff and Wyeth, coupled with completion of already approved developments including Carnegie Center and the Palladium, will create a very large employment and retail complex in the Township. The travel activities that this complex (and others in adjoining communities) will generate may be large enough to justify a major public transit investment to link residential, office, and retail areas to each other and to the Princeton Junction train station. It has been suggested that the Dinky rail line could be expanded and extended in the form of a Bus Rapid Transit (BRT) or Light Rail Transit (LRT) facility. This plan illustrates a possible concept: to the north, the line could be extended through the Sarnoff property and further into Plainsboro. To the south, the line could branch to provide a loop through Carnegie Center and the Canal Pointe area, and/or it could be further extended to the south through Nassau Park, the Wyeth property, and terminating in the vicinity of Quakerbridge Mall.

Clearly such a facility would require a substantial commitment by NJ Transit, the State of New Jersey, and others to provide both capital and operating funds. It does appear, however, that the needed activity thresholds are met to insure that a reasonable ridership level will result and that mobility in the Township will be significantly improved by the project. The Township should initiate discussions with responsible transportation agencies to begin planning for a facility of this type.



Source: [www.westwindsornj.org/2003MasterPlan/mpcircplan1.html](http://www.westwindsornj.org/2003MasterPlan/mpcircplan1.html)



Map 4 shows the existing train link, American Limo, NJ Transit bus route, the proposed Section 18 route, and where NJ Transit bus stops now exist. It also identifies additional NJ Transit bus stops along its route. The NJ Transit bus route requires eastbound buses to make a right turn from Scudders Mill Road onto Schalks Crossing Road, make a stop at the Town Plaza Shopping Center, and then proceed through the village onto Plainsboro Road, with another stop in front of the Enterprise Business Park, and terminating at Princeton Meadows. The return trip from Princeton Meadows does not route the buses through the village, but instead requires them to travel Scudders Mill Road and stop at the intersection with Schalks Crossing Road before proceeding onto College road and Forrestal Village.

Establishing NJ Transit bus stops requires approval by the NJ DOT. Generally, the municipality and NJ Transit together identify the most appropriate location for bus stops. If the stop is intended for a county road, the county must also approve the proposed location. Once the proposed bus stop location is identified, the municipality and county (if the bus stop is along a county road) are required to pass a resolution officially designating the bus stop. The DOT reviews the proposed bus stop location and approves or denies it. If bus shelters are desired, NJ Transit must be contacted because they are responsible for funding and providing bus shelters on their routes.

A bus shelter design which is now being implemented by Bristol-Myers Squibb and the Town Plaza Shopping Center is shown on the following page. This shelter design will be typical of the one used throughout the township at other approved locations. The shelter is placed on a concrete pad and has a metal bench, tempered glass (sides and back only), a cantilever roof, and aluminum with green powder coat finish.

#### 7. Travel Demand Management

The various roadway improvements described for the township are intended to guide continued growth. With their implementation a future roadway system will be available which will be responsive to expected traffic demands yet balanced against other conditions or constraints in the area.

As evident by the need to consider constrained future traffic demands, the suggested improvements by themselves will not be fully sufficient. An alternative to fully satisfying future traffic forecasts is to manage traffic growth in such a way that the peak demands are controlled so that they match more closely the ability of the roadway network to accommodate them without creating intolerable motorist delays. Through various man-

agement strategies, the peak traffic demands generated by the area development can be monitored and adjusted to the most efficient levels.

A variety of demand management strategies could be applied to regulate traffic flows. A range of possible actions are being considered as part of the township's travel demand management program. Several strategies are presently underway in the township and at the Forrestal Center, in either a formal or informal sense, and others might have only minimal applicability. Morning and afternoon train link shuttle bus provides service between the Princeton Junction train station and Forrestal Center as described in #6 above. All stops in the Center are curbside, except Merrill Lynch, First Boston, and American Re-insurance, whose stops are at the front entrance. The shuttle makes designated stops along College Road and terminates its run at Scanticon.

Varying work hours, car pool/van pool programs, and expanded transit services may be the most effective and applicable actions in the future. Secondary actions such as coordination of site plans to compliment primary strategies, or municipal direction and participation in the implementation of demand reduction programs could also be important as enforcement measures.

The diversity and size of the uses within the township also lend themselves to some natural demand reduction strategies. This condition is recognized by reduced trip generation characteristics expected from large mixed use developments, and is exemplified by the overall Forrestal Center development program which places employment, residential, and retail uses in proximity to one another. Trips occurring between these types of uses do not add new traffic to the region's roadway system and can reduce overall traffic impacts. Mixed use activities are also beneficial for employees and residents in that they can have retail and other service uses located more conveniently to their homes or offices.

The specific types of actions, how and when they are implemented, and an estimate of their use or effectiveness are areas that need further study. While some actions can be applied successfully on a site by site or employer by employer basis, others may be more effective when applied over a wider area and encompassing multiple sites. An operating plan describing the applicable programs, the steps for their accomplishment and a budget forecast is a desirable prerequisite for any formal plan of transportation management strategies.

The implementation of demand reduction or management actions will likely require some form of sponsorship to provide coordination, monitoring and support. This could be through a formal Transportation Management Association (TMA), such as the Keep Middlesex Moving TMA, or a

# Township of PLAINSBORO

MIDDLESEX COUNTY, NEW JERSEY

2002

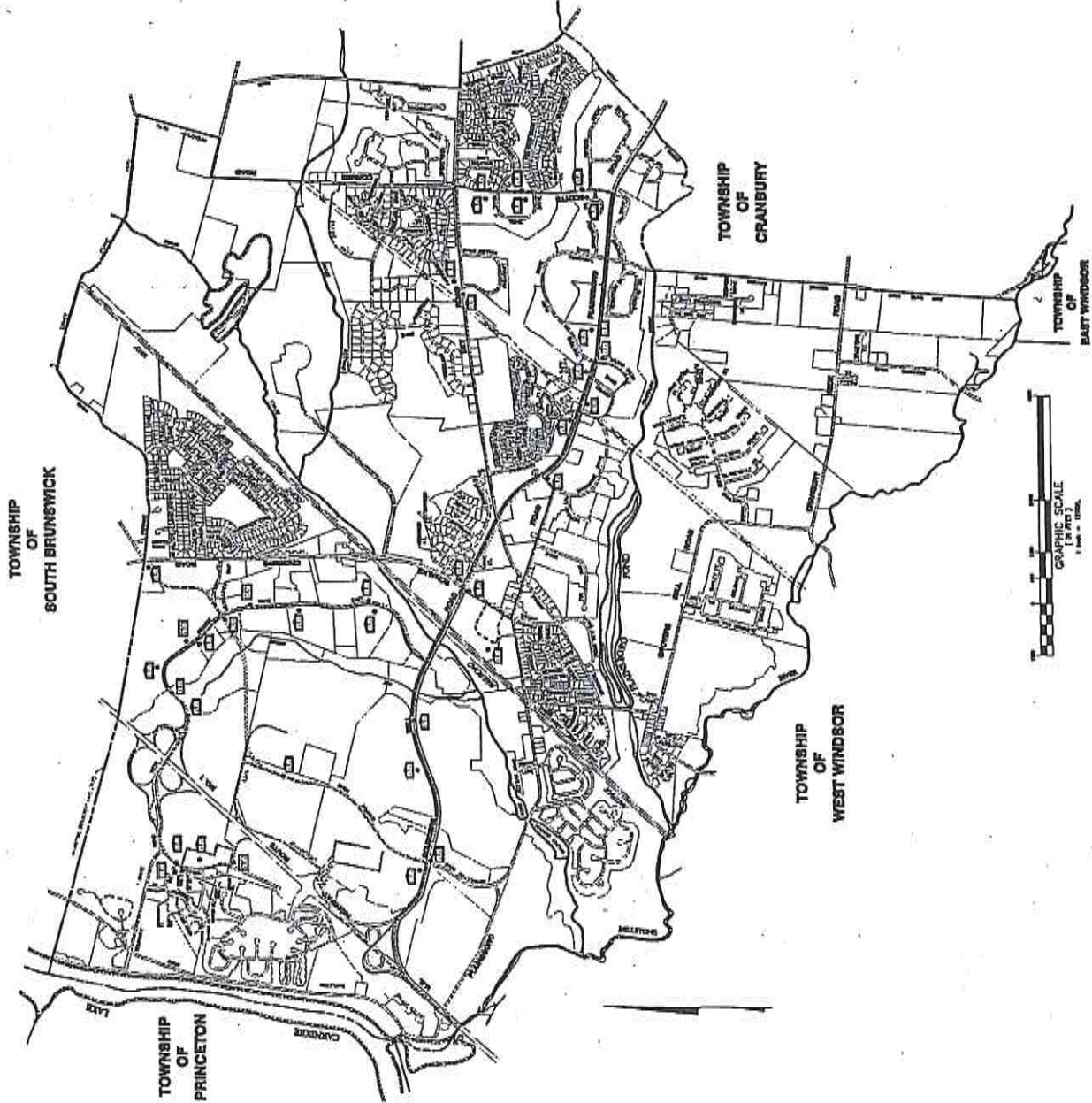
## BUS ROUTES, STOPS & SHELTERS

Plainsboro Township

MAP 4

### LEGEND:

- EXISTING N.J. TRANSIT BUS ROUTES
- PLANNED N.J. TRANSIT BUS ROUTES
- TRAIN LINK BUS ROUTE
- AMERICAN LIMO BUS ROUTE
- EXISTING BUS STOP
- EXISTING BUS STOP W/BENCHES
- EXISTING BUS STOP W/SHELTER
- PLANNED BUS STOP
- PLANNED BUS STOP W/BENCHES
- PLANNED BUS STOP W/SHELTER

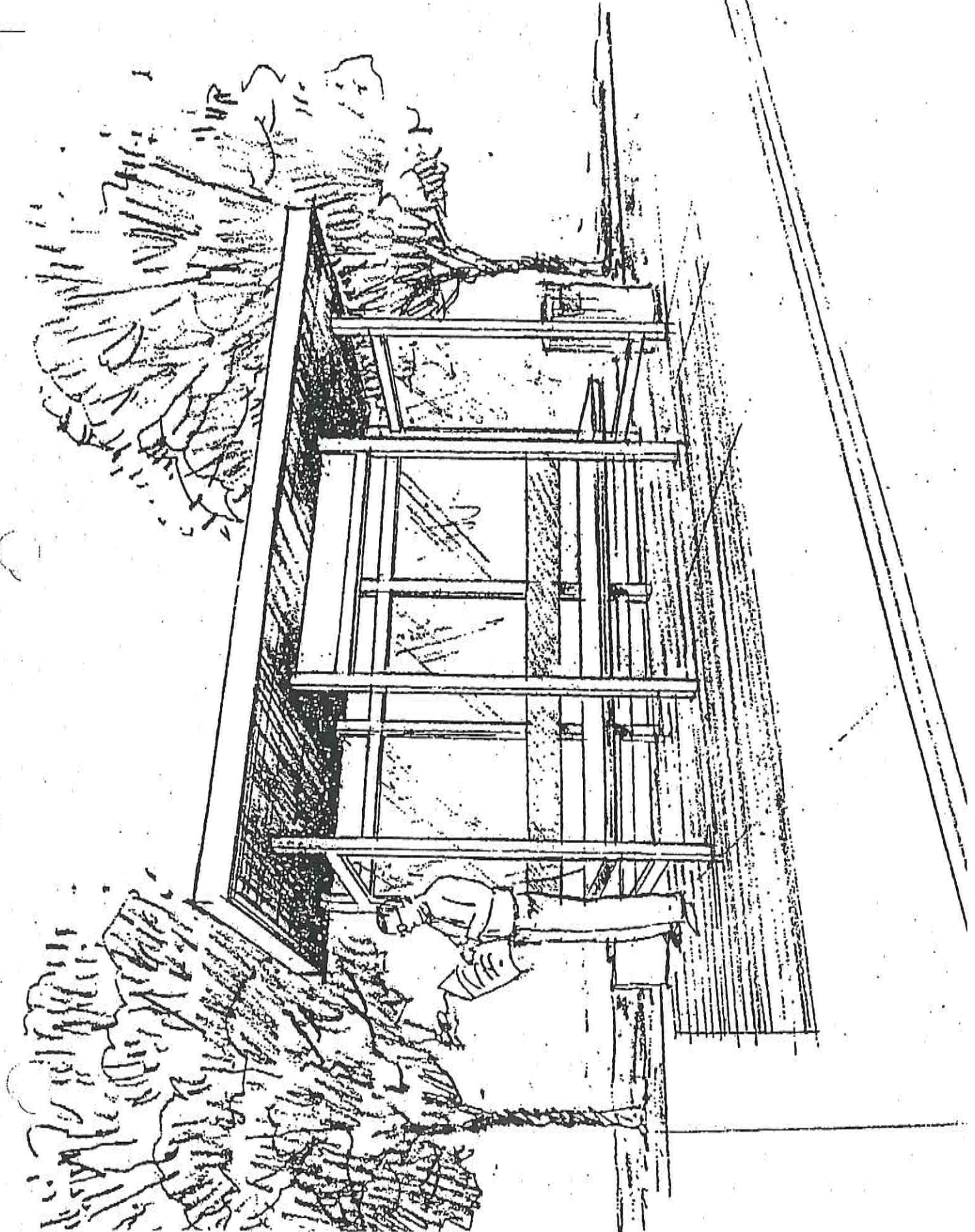


David J. Samuel, P.E.  
Township Engineer



CONSULTING AND MUNICIPAL ENGINEERS





## Plainsboro Township

As indicated by these definitions, the designation of a roadway as a bikeway represents a proactive policy designed to encourage bicycling. Three categories of bikeways exist:

### Bicycle Routes

Roadways designated for bicycle use through the installation of directional and informational signage.

### Bicycle Lanes

A lane designated for exclusive or preferential use by bicycles through the application of pavement striping or markings and signage.

### Bicycle Paths

A bicycle facility separated from motorized vehicular traffic. A bicycle path may be located within a highway right-of-way or on an independent right-of-way. A bicycle path is not a sidewalk but may be designed to permit shared use with pedestrians.

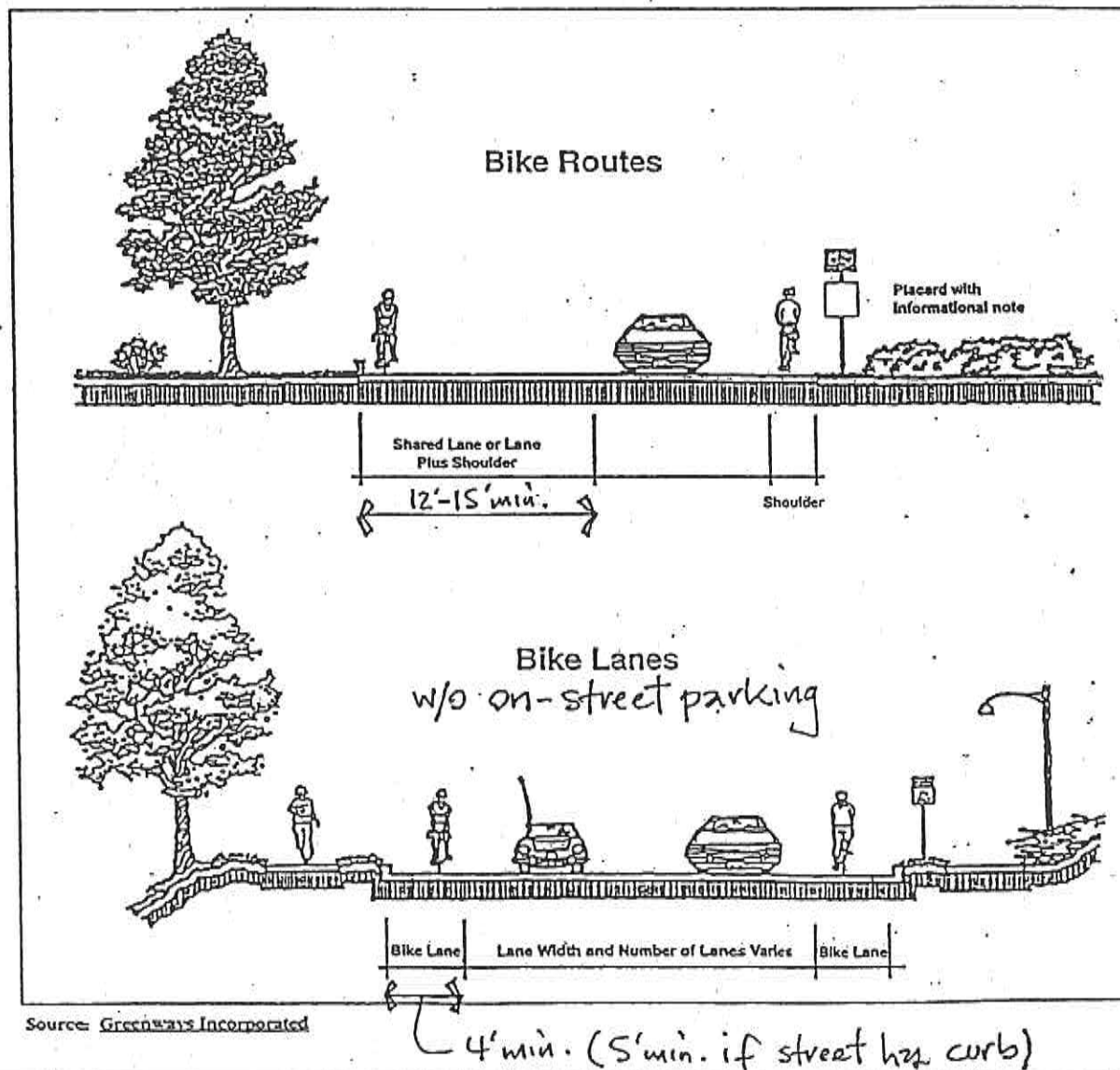




FIGURE 26. CLASS III FACILITIES, SUPPORTIVE POSTS, RACKS, AND RAILS

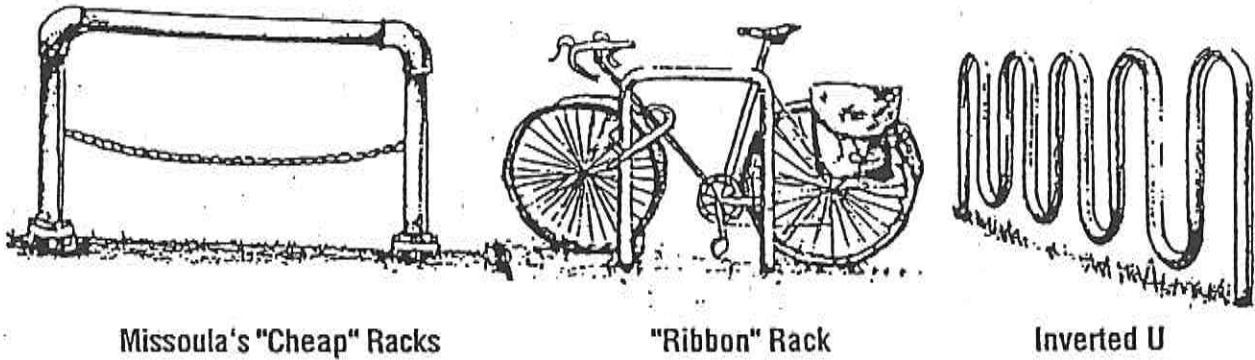


FIGURE 25. CLASS II FACILITIES, RACKS THAT LOCK WHEELS AND FRAME

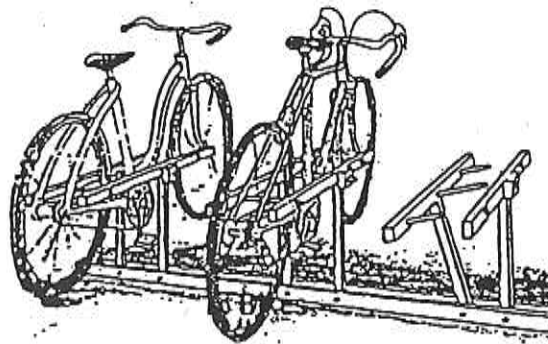
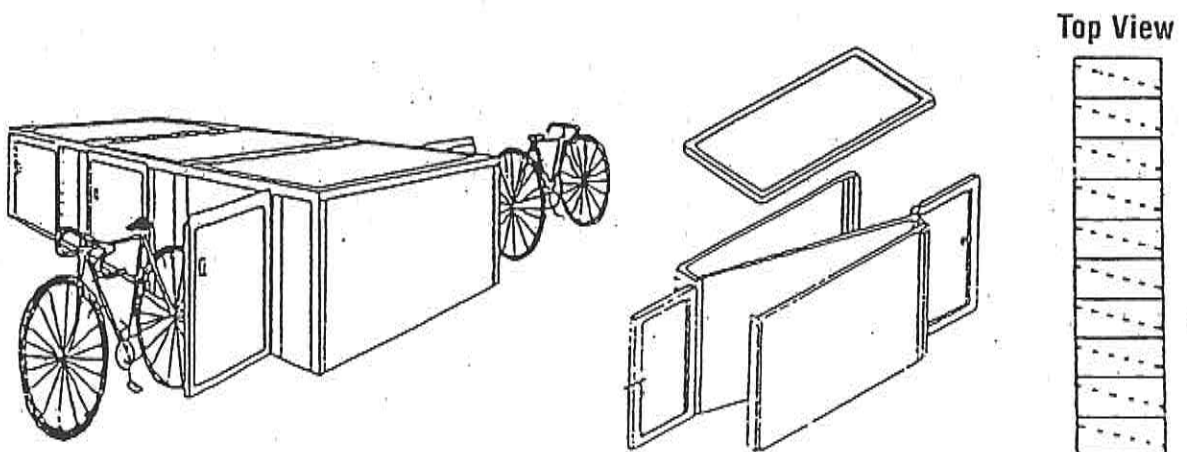


FIGURE 24. CLASS I FACILITIES, BICYCLE LOCKERS



Proposed roadway improvements primarily include the following:

- roadway widening
- roadway realignment
- resurfacing
- re-striping
- grading
- drainage improvements
- creation of new roads

Based on research documented in this report, additional options are recommended to improve traffic flow in South Brunswick. These include the proposed roadway construction shown on The Proposed Roadway and Intersection Improvements Plan P-2. Also identified are proposed intersection improvements which are also shown on The Proposed Roadway and Intersection Improvements Plan.

As a result of the review of the Municipal documents and the proposed and recommended transportation improvements, various transportation districts have been developed. These transportation districts can be seen on the Transportation Development District Plan P-1.

South Brunswick Township's existing ordinance for off-tract contributions has been reviewed and evaluated based on current rules, policies and procedures established by recent court rulings, state legislation and regulations. The new draft ordinance is provided as a separate document, and is intended to be the basis for off- tract contributions to the Township.

## **2. HISTORICAL GROUNDING**

Over the past twenty years the Township of South Brunswick has experienced significant population growth and land use changes. The population has more than doubled, and the infrastructure has increased dramatically as the result of over 8,000 acres of vacant and agricultural lands having been developed. South Brunswick has increasingly become a regional center, as well as a link to other centers. This growth and regional role dramatically burdens the municipal roadway network. South Brunswick's officials have helped guide managed growth and achieve a relatively balanced tax base while maintaining nearly half of the municipality as open space, agricultural lands and preserved natural resources. While recognizing land owner rights to use their property, the township has developed numerous plans and documents which



have provided guidance and direction for managed growth. These plans and documents include:

Township Master Plans and Supporting Documents

- The 1982 Township Master Plan
- The 1988 Master Plan and Master Plan Reexamination
- The 1994 and 2000 Master Plan Reexamination Reports

Township Circulation Plans and Middlesex County Transportation Plan

- The 1989 Township Circulation Master Plan
- The 1992 Township Circulation Technical Memorandum
- The 1999 Middlesex County Transportation Plan

Each of these plans was examined and their specific recommendations were evaluated and listed below. This analysis provides the historical grounding of the 2000 Circulation Master Plan and the continuity of efforts by the Township to provide a working circulation infrastructure to efficiently move people and goods.

1982 TOWNSHIP MASTER PLAN

Rural

- Two large rural areas were designated: one was located in the Fresh Ponds area and the other in the area lying west of Route 130 and south of the Villages of Monmouth Junction and Dayton.
- Extensive development in rural areas was discouraged.
- Limiting uses in rural areas to residential, agricultural, public and open space/conservation.
- Lot sizes should not average more than one dwelling unit per two acres.

36. U.S. Route 130/Broadway Road intersection improvements and median closure at Merich Road.
37. Subject to further study, a grade separated interchange at County Route 682 (Finnegans Lane)/US-1.
38. Intersection improvement at U.S. Route 130/Finnegans Lane/Davidson's Mill Road involving left-turn elimination through the installation of jug handles at Finnegans Lane/Davidsons Mill Road.

### **3. CURRENT CONDITIONS**

South Brunswick Township is one of the larger municipalities in Middlesex County in terms of population. The Township's 2000 population of 37,734 represents an increase of over 20,000 people since 1980. The Township is also the third largest municipality in terms of square miles (40.96 sq. mi.) in Middlesex County. South Brunswick's large land area and rapid rise in population have made critical the need for the Township to continually evaluate its roadway network, and to anticipate and identify solutions to traffic circulation concerns.

South Brunswick has numerous major roadways that provide access to destinations in the Township and throughout the county and state. Major roadways in South Brunswick include the New Jersey Turnpike, State Route 1, State Route 27, State Route 130 and County Route 522. These major roadways connect the Township regionally. The surrounding growing communities which create the greatest volume of traffic moving through South Brunswick Township include the Townships of Cranbury, East Brunswick, Franklin, Monroe, North Brunswick, Plainsboro and Princeton. The vast majority of motorists traveling through South Brunswick drive alone on work related trips. Currently, only three percent (3%) of workers in Middlesex County walk or bike to work according to U. S. Census data.

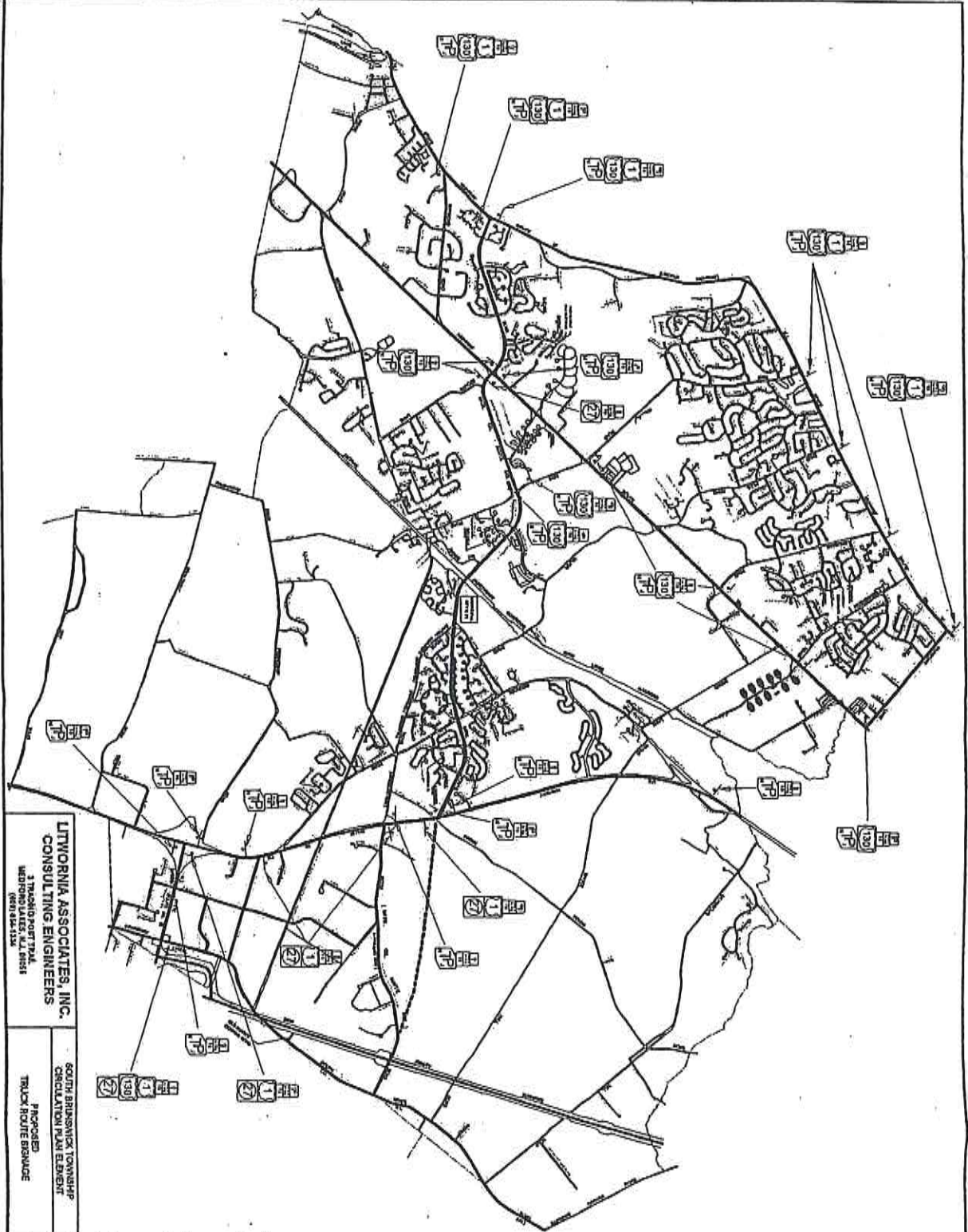
**A. Current Conditions\***

1. Traffic Study Area Characteristics
  - a. General Section
  - b. Travel Inventories
  - c. Traffic Generators
  - d. Summary
2. Social and Economic Characteristics
  - a. Table –Population Growth: South Brunswick and Adjacent Municipalities
  - b. Table – Population, Density and Growth: Comparison of Area Municipalities
  - c. Table – South Brunswick Housing Units 1970 – 2000
  - d. Table – Comparison of Median Household, Family and Per Capita Income: Area Municipalities 1990 Census
  - e. Table – Land Use Changes 1960 – 1994: South Brunswick
  - f. Table – Real Property Valuation: South Brunswick and Area Municipalities
  - g. Table – South Brunswick 2001 Circulation Master Plan: Summary of Projected Planned Development Yields Within the Township, Current 3/2000
3. Existing Study Documents and Plans
4. Environmental Features
  - a. Soils (w/table)
  - b. Freshwater Wetlands
  - c. Flood Hazard Area
5. Existing Levels of Service
  - a. Roadways (w/table for existing LOS of roadways)
  - b. Intersections (w/table for existing LOS of major intersections)

*\*Adapted from 'Current Conditions' section of South Brunswick Township Wide Circulation Element*



# South Brunswick Township



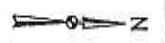
LITWORNIA ASSOCIATES, INC.  
CONSULTING ENGINEERS  
3 THORNTON ROAD  
NEW BRUNSWICK, N.J. 08901

SOUTH BRUNSWICK TOWNSHIP  
CIRCULATION PLAN ELEMENT  
PROPOSED  
TRUCK ROUTE SIGNALS

CLIENT:	SOUTH BRUNSWICK TOWNSHIP	DATE:	SEP. 2001
PROJECT NO.:	4400-03	CHECKED BY:	ALN
DESIGNED BY:	WILLIAM J. JACOB		

LEGEND  
 ——— TRUCK ROUTE  
 - - - - - FUTURE TRUCK ROUTE  
 REFERENCE:  
 STREET MAP PREPARED BY CIE ASSOCIATES

SCALE  
 0 200 400 600 Feet





2. Entry Corridors - dramatically increase driver awareness upon entering the Borough along a major street.
3. Secondary Corridors - reduce traffic speed and dramatically increase driver awareness of sharing the street with pedestrians and bicyclists, especially children and the elderly.
4. Intersections - reduce traffic speed and more safely channel vehicular movement.
5. Neighborhoods - enhance driver awareness upon entering a neighborhood, reduce traffic speed, reduce/divert cut-through traffic, and dramatically increase driver awareness of sharing the street with pedestrians and bicyclists, especially children and the elderly.

I. Pedestrian and Bicycle Access

Adequate bicycle and pedestrian circulation is vital to having a successful comprehensive transportation planning process that links people with places they want to go. Jamesburg has developed this plan component in recognition of the importance of enhancing this type of circulation in the Borough.

This plan was developed to provide Borough residents and workers with safe and convenient linkages between their homes and points of interest and activity, such as the Post Office, shopping areas, local parks, and schools. The implementation of a comprehensive pedestrian and bicycle circulation system will also help to alleviate some of the safety and traffic congestion problems on local roadways. Pedestrian and bicycle pathways can and should be used for commuting purposes, as well as for recreation, which, in turn, may increase the vehicular carrying capacity of local roadways. The Pathways Plan is shown on Map #6.

This plan is intended to guide the Combined Land Use Board in insuring that the areas designated for pedestrian paths and/or bikeways are reserved and used for that purpose. Once this plan is fully implemented, the system can be used by Borough residents to locate a preferred route of unmotorized travel to recreational areas, shopping, places of employment and worship, and other activity centers both within and outside the Borough.

The following types of pathways are identified and described below:

1. Bicycle Paths - The first type of pathway is a bicycle or bike path, which is part of the broader category of pathways known as Bikeways. Bike paths are designed to accommodate both pedestrians and bicyclists. Such pathways can be located

- ▶ Heavy usage of pathway by children and/or less experienced cyclists.
- ▶ Need or desire to make connections within the system where roads do not exist.
- ▶ Desire to provide bikeway access to natural/scenic areas.

As with bike paths, the design and engineering standards for designated bike routes, as much as possible, should be in accordance with the NJDOT bikeway standards. For example, designated bike lanes along roadways should have a minimum width of 5 feet where the roadway is curbed or 4 feet where no curbs exist. Important components of safe bicycle routes are bicycle friendly grates and utility covers flush with the pavement surface, a smooth pavement surface free from irregularities (i.e. rumble strips), and adequate signage. Proper signage is essential to alert motorists to the fact that certain roadways will be used by bicyclists and that special care should be taken when traveling these roadways.

The Manual on Uniform Traffic Control Device (MUTCD) should be used for signage design and placement.

All designated bike routes should be regularly inspected or monitored to insure that debris is being picked up and removed from roadway shoulders and bike lanes, and that any necessary maintenance is done in a timely manner. Such monitoring and maintenance is critical to providing a safe and attractive bikeway system.

The Middlesex County Bicycle-Pedestrian Plan adopted by the Middlesex County Planning Board on March 14, 1995 identified six (6) major bicycle touring circuits that are available utilizing the existing roads network of Middlesex County. One of the touring circuits is called "Helmetta-Jamesburg-Monroe" and utilizes Forsgate Drive, Half Acre Road, Lincoln Ave., Pergola Ave., and Perrineville Road in Jamesburg; Perrineville Road, Half Acre Road, Applegarth Road, Forsgate Drive, and Old Forge Road in Monroe Township; and primarily Main Street in Helmetta.

According to the Middlesex County Bicycle Suitability map - prepared by the County Planning Board - all major roadways in Jamesburg are suitable for bicycling, especially Docks Corner Road, Rhode Hall Road, Gatzmer Avenue, Half Acre Road, Forsgate Drive, Lincoln Avenue, East Railroad Avenue, Pergola Avenue, and Buckelew Avenue. These roadways should either have bike route signage and/or have striped shoulders. The draft Middlesex County Bicycle/Pedestrian plan proposes the construction of a Greenway Trail to run from Thompson Park along the Manalapan Brook to Helmetta and from Thompson Park into Monroe Township to Monmouth County. It is recommended that bikepath and sidewalk



Source: <http://twp.montgomery.nj.us/depts/landuse/trafficcirculation.asp>

Montgomery Township : Land Use - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

<http://twp.montgomery.nj.us/depts/landuse/trafficcirculation.asp>

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boards and commissions administration engineering finance health kid connection **planning / land** public safety public works recreation

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**List of Plates**

- [The Current Traffic Circulation Study Area](#)
- [Areas in Montgomery Township Along Route 518 Which Include Properties That Have Been the Subject of Informal Development Proposals](#)
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4. Bikeways should have a minimum four-inch base of gravel, crushed stone or slag on the subgrade and a two-inch FABC-2 surface course. Where bikeways intersect streets, curbing should be ramped for bicycle access.
5. Somerset County is encouraged to include bikepaths wherever possible as part of any County improvements.

## **TRIP REDUCTION DEMAND STRATEGIES**

### **Employee Trip Reduction Program**

To reduce traffic congestion in New Jersey and comply with the 1990 Federal Clean Air Act Amendments, in June 1992 the New Jersey State Legislature passed legislation entitled the "New Jersey Traffic Congestion and Air Pollution Control Act." This Act assigned responsibility for developing and administering the Employer Trip Reduction Program (ETRP) to the New Jersey Department of Transportation and required each employer of 100 or more employees at a single work location to develop and implement employee commute option (ECO) programs to reduce vehicle trips and vehicle miles traveled to the site by encouraging employees to use public transit, share rides in carpools and vanpools, or use other alternatives. In 1996, the State Legislature repealed the mandatory elements of the ETRP and essentially made the ETRP voluntary. Tax incentives for participation in the program have been added. Employers who employ 100 or more employees are eligible for the tax incentives if they participate in the ETRP. Large employers should be encouraged by the Township to participate in the ETRP.

### **Traffic Management Ordinance**

Traffic management ordinances use a community's regulatory authority to limit trip generation from new and/or existing development. Some of the advantages of traffic management ordinances include coverage of an entire political subdivision or area rather than an individual project; and the regulatory burden is spread more equitably between existing and future development. One or all of the following techniques may be used in a traffic management ordinance to achieve a reduction in trips:<sup>4</sup>

1. Encouraging large employers to establish either flexible or staggered work hours.
2. Requiring major new residential developers to construct park and ride facilities where appropriate.
3. Establishing additional shuttle bus services from major employment centers to transit facilities.
4. Encouraging large corporations to establish "third party" vanpool programs.

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<sup>4</sup> Vigna, Thomas A., "New Jersey's First Traffic Management Ordinance - the North Brunswick Experience," New Jersey Federation of Planning Officials, Summer, 1988.

Traffic Management Ordinances typically require large-scale new residential and nonresidential development to submit a Traffic Reduction Plan to the Planning Board as part of the site plan approval process. Existing businesses with large numbers of employees are also subject to Ordinance requirements. The Ordinance also provides for an enforcement mechanism. The implementation of such an ordinance is recommended to encourage the reduction of peak hour trips.

### **Zoning Mechanisms**

Although it is difficult to control the number of vehicles driving through the Township, there are several zoning mechanisms which could potentially aid the Township:

- Decrease residential densities throughout the Township.
- Encourage connectivity between residential developments to limit the number of "single-outlet" developments.
- Limit points of access on heavily-traveled roadways and encourage the use of interior service roads.
- In nonresidential areas where there are large tracts of vacant land, encourage the construction of uses that do not generate high levels of peak traffic, such as industrial, warehousing and indoor/outdoor recreational uses. Office uses typically generate high levels of peak hour traffic.
- Require Traffic Management Plans for large-scale developments.

### **SCENIC CORRIDORS**

In conjunction with the Scenic Corridor Overlay Zone as discussed in the Land Use Plan Element, design standards for scenic and rural roadways themselves should be clarified. Standards for drainage, road grade, access points, curving alignment and roadside vegetation and embankments should be created specifically for roadways that are intended to remain rural in character, and yet also safely convey traffic.

It is recommended that access points be limited along scenic corridors to promote the flow of traffic while also maintaining the scenic qualities of the roadside views. Signs should be limited to essential public health and safety signage, and, where appropriate, scenic corridor designations. Roadside features such as guide rails should utilize materials which reinforce the natural character of the area and are visually unobtrusive. Existing hedgerows and stonerows which reveal cultural development patterns should be protected wherever possible. Any efforts by the Township to retain the rural character of scenic roadways should be coordinated with Somerset County, as the County owns many of the scenic roadways.

The following roads, or road segments, are classified as scenic corridors:

- Canal Road
- Old Georgetown Road
- Copper Mine Road



turning movements, and vehicular speed are low. On the other hand, where these conditions are in the path of development, or where the conditions are worse, they must be corrected to design standards that will serve the long-range interests of the Township.

#### 4-3 SIGNS, CURB-CUTS, PARKING AND SIGNALS

Because of the importance of Route 206, signs along that highway were surveyed in 1978. There were 556 signs, not including window signs and street name signs. Almost half (49 percent) were no parking, speed limit, curve, and directional signs. The overall impression of all signs along Route 206 was that they become a blur with some blocking others, some in deteriorating condition, others in massed groups, and some impairing driver visibility.

The second largest number of signs were the 148 free standing signs representing 27 percent of all signs along the highway. (This is a conservative number since many free standing signs had more than one piece of information, yet the sign was counted as a single sign.) A single sign with a simple message identifying a store or shopping center would be sufficient to identify its location. It is believed that precise standards for their use and regulation should be provided.

There were also 117 attached signs representing 21 percent of the total number of signs. However, this too is misleading. The only signs included in this category were those attached to the structure giving the name of the operation, e.g., cleaners, bank, deli, etc. Most, if not all, of these businesses had hand painted signs in windows and doors which are often temporary, but because another quickly takes its place, the appearance is permanent.

Overall, the number, location, type and physical condition of signs along Route 206 require attention. Instead of providing aesthetic information, they become part of the maze adding to the unaesthetic, confusing data thrown at the driver. They are part of a blighting influence.



conceivable additional trains, altered bus routes, and new equipment may result in a long-term shift to the use of mass transit. Within the Township, additional bus service, Township parking lots for commuters who can van-pool or use the bus, a more convenient station on the Reading Railroad for Township residents, and similar efforts would serve to reduce the use of cars and ease the problems on Route 206 and other major roads. However, even with substantial development in recent years, the four major factors which would tend to create a strong nucleus for mass transit services are not yet available in Hillsborough:<sup>1</sup>

- 1) A minimum residential density of 7 units per acre for half-hourly bus service and higher densities for more frequent service. Rail rapid transit service has been considered beginning at around 30 units per acre.
- 2) A high concentration of population, e.g., 5,000-9,500 people/square mile for some local bus service, but more likely a minimum of about 10,000 people/square mile. For rail rapid transit, the number is about 50,000 people per square mile.
- 3) A strong, major destination point for the bulk of that population recognizing that most trips are between home and some non-residential activity such as work, shopping, school or personal business. The non-residential concentrations are generally a central business district type of an industrial/shopping center/office park/college or similar employment center. A center with at least 2.5 million square feet of non-residential floor space, about 5,000 jobs, in a square mile was used as a minimum for transit service.

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1. Transit-Supporting Land Use Characteristics as an Element of the Land Use Plan, Tri-State Regional Planning Commission, January 1977, pp. 23-26.

As shown on the "Surrounding Municipal Zones And Proposed State Plan" map prepared by Hintz Associates, Inc. for East Amwell Township, the "New Jersey State Development And Redevelopment Plan" designates three (3) planning areas within East Amwell Township: "4 Rural", "4B Rural/Environmentally Sensitive", and "5 Environmentally Sensitive".

The policy objectives relating to transportation in Planning Areas "4", "4B" and "5" are stated in the "New Jersey State Development And Redevelopment Plan" as follows:

■ Planning Area 4

"Maintain a transportation system that provides appropriate access of agricultural products to markets and accommodates the weight of modern agricultural equipment." (p. 113)

■ Planning Areas 4B and 5

"Maintain a transportation system that links Centers and supports recreational, natural and cultural resource-based activities." (p. 116)

The policies stated in the "New Jersey State Development And Redevelopment Plan" relating to transportation have been considered during the formulation of the "Traffic Circulation Plan Element" of the Township of East Amwell which appears in a later section of this document.

Hunterdon County Transportation Plan

The Hunterdon County Planning Board has adopted a "Hunterdon County Transportation Plan", dated May 13, 1993, which sets forth specific goals, objectives and implementation strategies to be considered by local governments when they formulate and adopt plans for improvements to the road network throughout Hunterdon County. The six (6) stated goals and objectives within the "Hunterdon County Transportation Plan" are as follows:

- 
- "Design and improve roadways in a manner that allows for the safe and efficient operation of vehicles while considering the impacts on the surrounding communities. It must be recognized, however, that demands of vehicles either in terms of maintenance of speed or freedom from congestion are not the sole criteria that determine the level of roadway improvements designed or implemented."
  - "Maintain the County's rural environment and historic character while accommodating appropriate levels of growth."

- "Accommodate regional impacts of major traffic generators on the existing infrastructure; reduce the dependency of the travelling public on the automobile, especially the single occupant automobile."
- "Integrate land use and transportation planning at all levels of government and in private sector development ventures."
- "Implement a process for determining transportation infrastructure needs within the County. This shall be a cooperative effort of the Department of Roads, Bridges and Engineering and the Hunterdon County Planning Board."
- "Identify appropriate and equitable funding sources to construct transportation improvements."

Overall, the "Hunterdon County Transportation Plan" emphasizes the relationship between transportation planning and land use planning and refers to the 1986 "Hunterdon County Growth Management Plan" and to the "Intermodal Surface Transportation Efficiency Act of 1991" (ISTEA). The discussion of the ISTEA within the "Hunterdon County Transportation Plan" includes the following statement:

"This most ambitious piece of transportation funding legislation ever enacted by Congress contains a mandate that future transportation policies no longer focus largely on the efficient movement of motor vehicles through the construction of roadways. Future efforts must be focussed instead on the efficient movement of people by a variety of modes. Fiscal, environmental, and political constraints have required that the policies of the past change. This new focus for our transportation planning efforts will require not only a rethinking of our land use planning policies, but it will also require behavioral changes in how we use our transportation system." (p. 21)

The strategies proposed within the "Hunterdon County Transportation Plan" for improvements to the roadways within the County reflect the stated relationship between land use planning and transportation planning and the recommendation is made that the design standards for roadways respect and complement the surrounding natural and built environment.

The Hunterdon County Planning Board has assigned a functional classification to all County roads, with recommended ultimate right-of-way widths. Regarding the roadways under the jurisdiction of Hunterdon County within East Amwell Township, the following recommendations have been made by the Hunterdon County Planning Board:

- None of the County roads within East Amwell Township have been classified by the Hunterdon County Planning Board as an "Arterial" road.



## **NEW JERSEY TRAFFIC CONGESTION AND AIR POLLUTION CONTROL ACT**

The Clean Air Act Amendments of 1990 were signed into law by the U.S. Congress on November 15, 1990. The purpose of the Clean Air Act is to focus upon the reduction of ozone and carbon monoxide levels within those geographic areas found by the U.S. Environmental Protection Agency not to have attained the National Ambient Air Quality Standards. The Clean Air Act places the responsibility with the states to achieve the necessary air quality standards and requires that each state prepare a State Implementation Plan.

The State of New Jersey passed the "New Jersey Traffic Congestion And Air Pollution Control Act" during June 1992. One component of the 1992 State Act is the "Mobile Source Component" which includes a "Transportation Control Measures" subcomponent.

The basic purpose of the Transportation Control Measures subcomponent is to define and adopt transportation planning measures which will reduce emissions from mobile sources such as the automobile. The Transportation Control Measures will affect both public agencies and private employers of one hundred (100) or more persons in severe non-attainment areas of New Jersey, which includes Hunterdon County.

Hunterdon County currently has been classified as a "severe-level 2" ozone non-attainment area, where the ozone level exceeds the federal standards by fifty-eight to one hundred thirty-three percent (58%-133%).

The "Transportation Control Measures" subcomponent of the "New Jersey Traffic Congestion And Air Pollution Control Act" provides a methodology to reduce both vehicular travel as well as emissions. Since the Transportation Control Measures relate to traffic circulation planning, they should be considered by East Amwell Township in the formulation of transportation policies and regulations.

The specific Transportation Control Measures which can be accomplished at this time at the municipal level include the following six (6) items:

1. Providing facilities for bicyclists and pedestrians and thereby encouraging alternative modes of transportation;
2. Providing zoning incentives and regulations to encourage fewer access points along major roadways and to promote interconnected driveways for non-residential uses where appropriate;
3. Reducing the need for travel through mixed use development and appropriate land use distribution consistent with transportation planning;

4. Improving signal system timing and coordination and making improvements to existing intersections to reduce delay and improve traffic speed, thereby reducing the amount of emissions caused by idling vehicles; and
5. Require employers to address a reduction in the vehicular traffic to and from the workplace.

In regards to the last control measure discussed hereinabove (item #5), the State of New Jersey will require that employers of one hundred (100) or more persons at one (1) worksite in severe non-attainment areas reduce the number of employee trips by increasing the average passenger occupancy per vehicle for commuting trips during peak travel hours by twenty-five percent (25%) over the area average for all such trips.

Therefore, it appears prudent from a transportation planning perspective for East Amwell Township to require an applicant for site plan approval to indicate the amount of traffic estimated to be generated by the proposed use and how a prospective employer will reduce the number of vehicular trips.

Some techniques which can be utilized to decrease vehicular trips to and from the workplace include the following six (6) items of consideration:

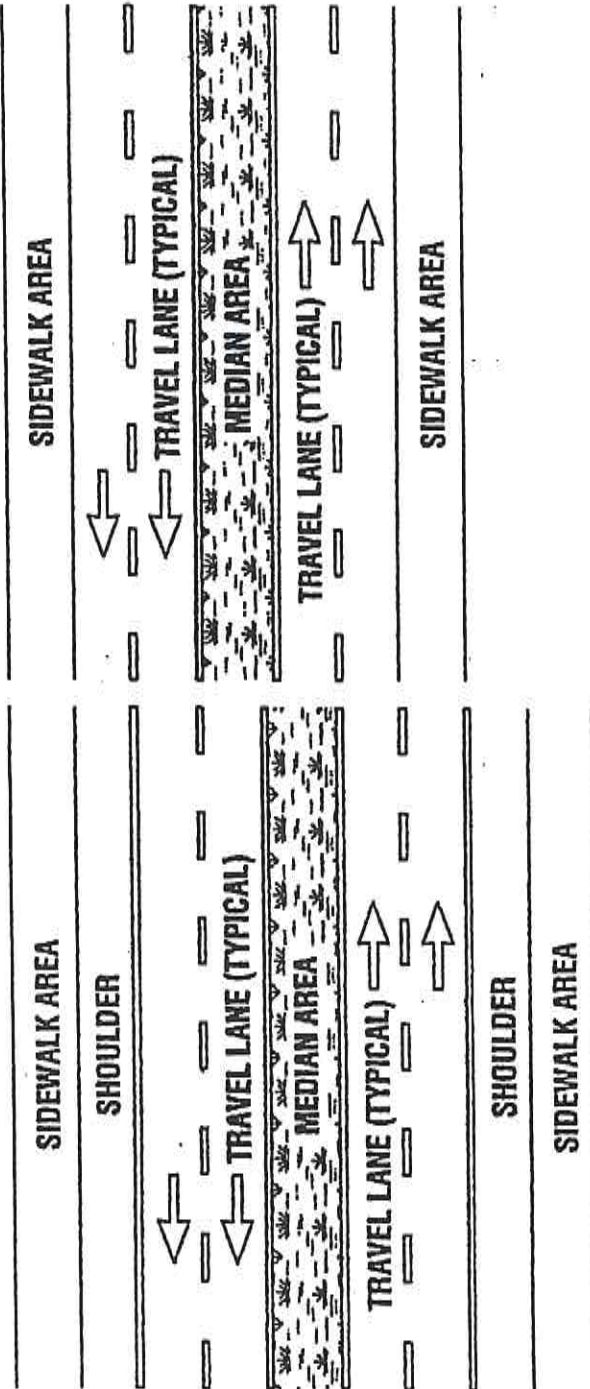
1. Car or van pooling;
2. The provision of cafeterias or other accessory uses on-site which are needed during the work day by employees;
3. Staggered work hours;
4. Preferential parking provided to multiple occupancy vehicles;
5. Employee incentives or bonuses for reducing their vehicular trips; and
6. Appropriate location and accessibility of use to users and/or employers.



**UNION TOWNSHIP**

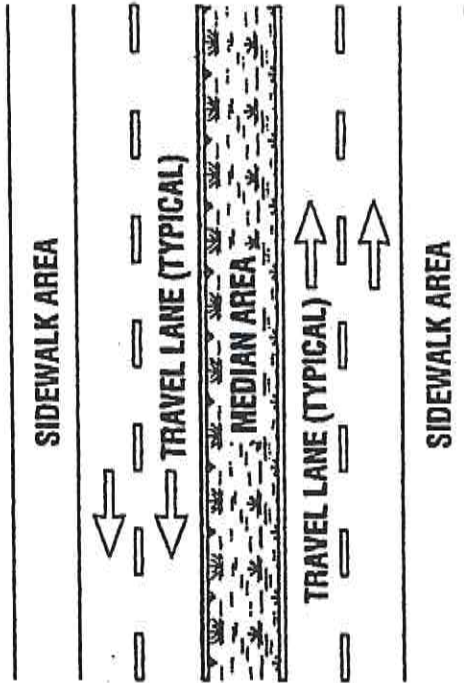
**4A**

**4 LANES, DIVIDED WITH SHOULDERS  
(ROW WIDTH 114')**



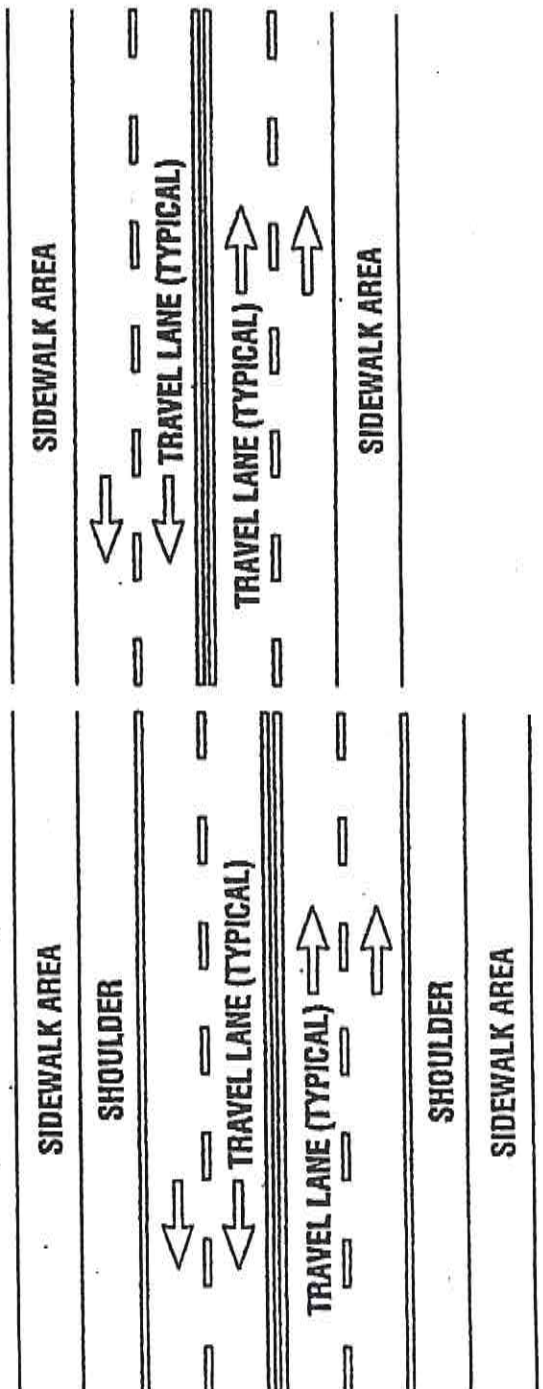
**4B**

**4 LANES, DIVIDED WITHOUT SHOULDERS  
(ROW WIDTH 90')**



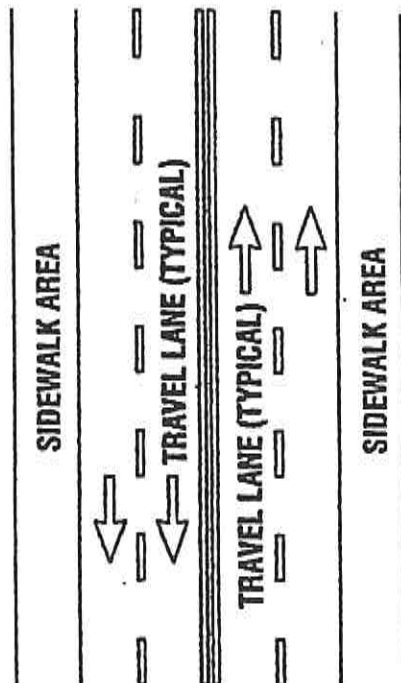
**4C**

**4 LANES, UNDIVIDED WITH SHOULDERS  
(ROW WIDTH 102')**



**4D**

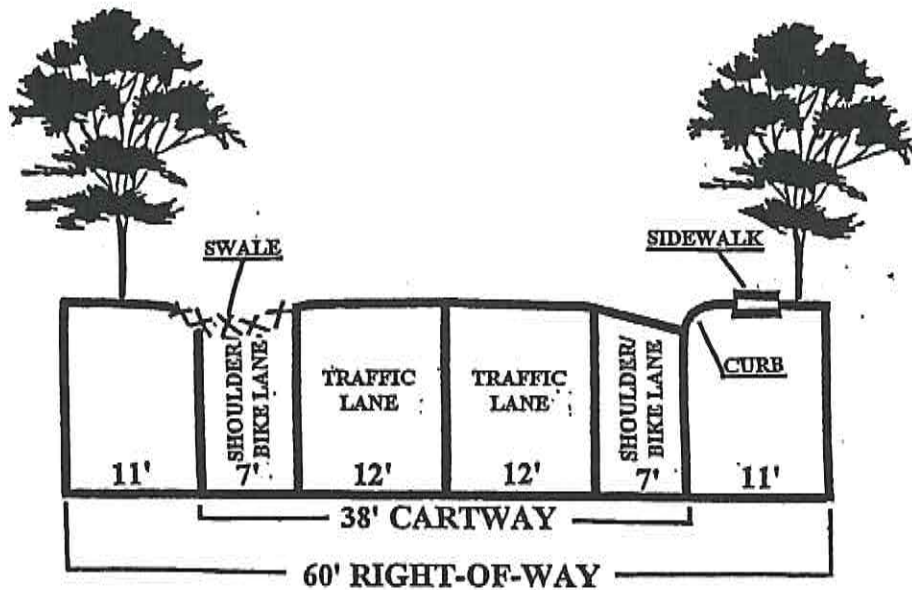
**4 LANES, UNDIVIDED WITHOUT SHOULDERS  
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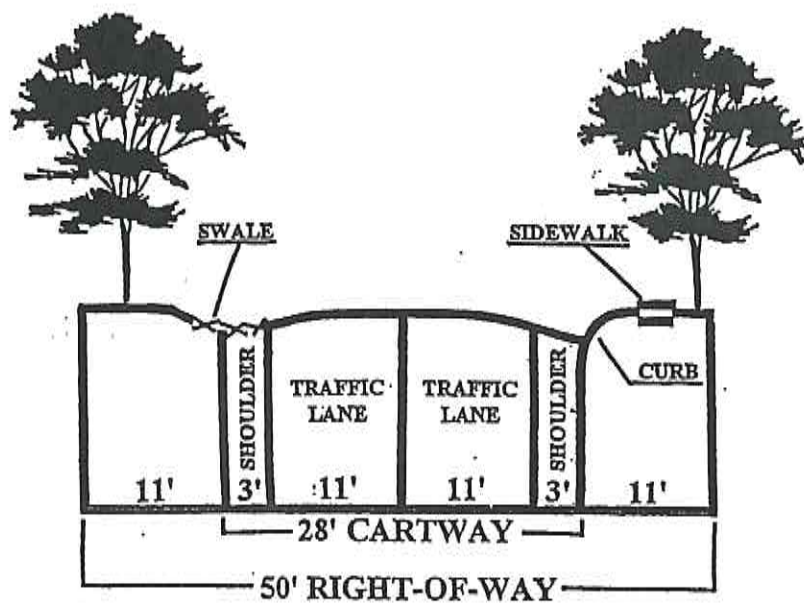


**PROPOSED CROSS-SECTIONS OF ROADS**  
**TOWNSHIP OF EAST AMWELL**  
October 1996

**MAJOR COLLECTOR**



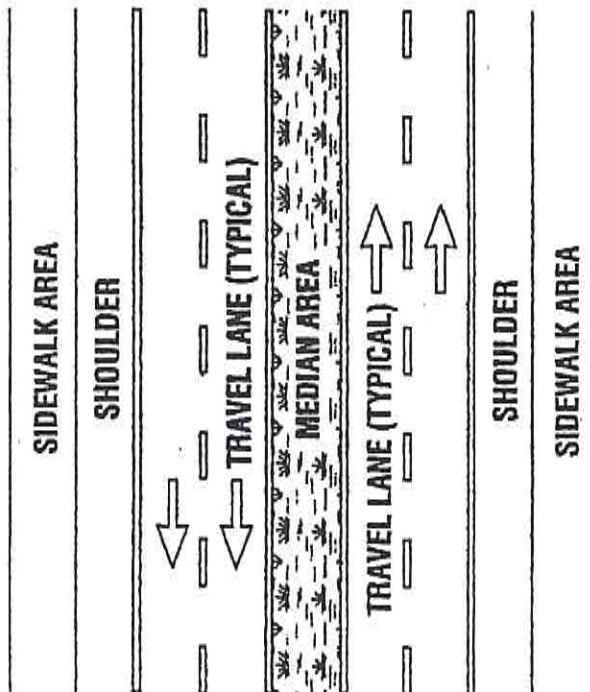
**RURAL COLLECTOR**



# DESIGNABLE STANDARD SOLUTIONS

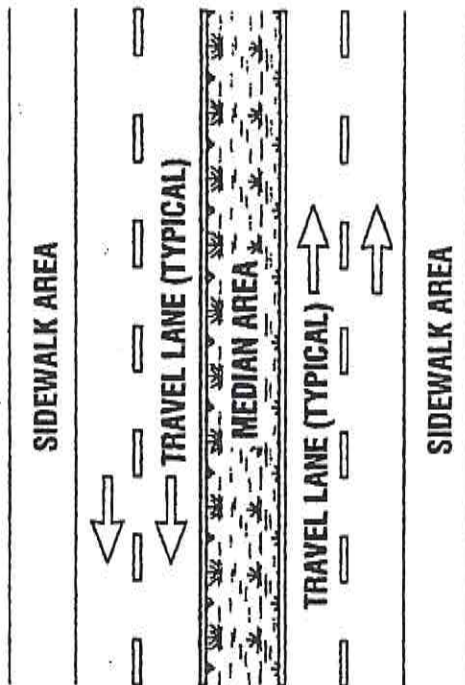
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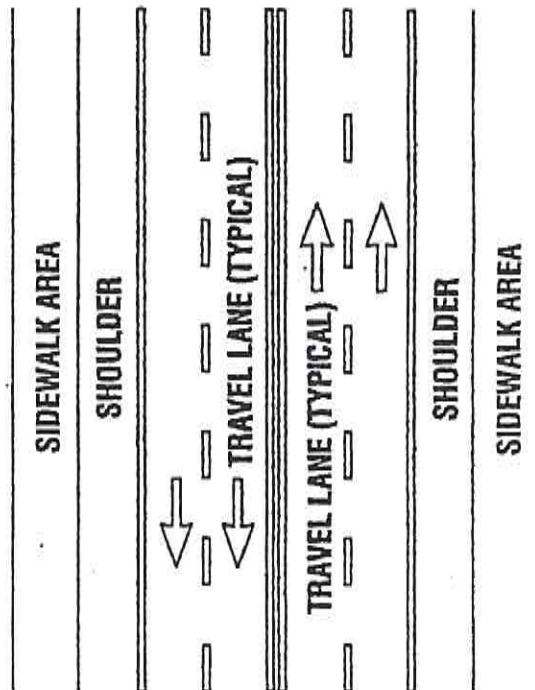
## 4B

4 LANES, DIVIDED WITHOUT SHOULDERS  
(ROW WIDTH 90')



## 4C

4 LANES, UNDIVIDED WITH SHOULDERS  
(ROW WIDTH 102')



## 4D

4 LANES, UNDIVIDED WITHOUT SHOULDERS  
(ROW WIDTH 78')

