

**Section V**

**CIRCULATION PLAN ELEMENT**

## SECTION V - CIRCULATION PLAN ELEMENT

### INTRODUCTION

West Windsor has continued to develop at a rapid pace since the latest revised Circulation Plan was prepared in 1991, and traffic volumes within the Township have increased accordingly. The Township developed a timed growth control program to regulate new development at a rate compatible with the capacity of the Township roadways. However, that program was eliminated due to court decisions. The Township is now faced with a situation in which the Township has more approvals for proposed development than can be sustained on the existing transportation network.

### CRITICAL CIRCULATION AND GROWTH ISSUES

In preparing this circulation plan, West Windsor is confronted by a number of critical development and transportation issues which will be difficult, if not impossible, to fully resolve. In any community there is inevitably a tension between the need to accommodate traffic growth and the ability and desirability of providing the necessary transportation facilities. In West Windsor this dilemma is compounded by the large amount of non-residential development which can occur on large, still-open tracts of land; and by market forces which have historically made the Route 1 corridor attractive to corporations seeking new facilities.

After two decades of defining and implementing transportation facilities through a variety of innovative planning initiatives and funding mechanisms, West Windsor has in place a high quality regional and local arterial system. Route 1 improvements which have been contemplated since the 1970's have been or are nearly completed, and other regionally-significant projects such as the Millstone Bypass are being planned. Local projects such as intersection improvements along Route 571 and completion of New Village Road and Edinburg Road have been accomplished. The remaining local projects such as improving Route 571 through Princeton Junction, the Alexander Road Railroad Bridge, and Edinburg improvements are mainly intended to resolve local circulation needs and not to add large amounts of system capacity.

But while the end of planned highway construction projects is in sight, non-residential development in the Township will continue. Large portions of Carnegie Center on both sides of Route 1 remain unbuilt. The Palladium office development just to the south replaces multi-family housing. And two of the largest properties along Route 1 – Sarnoff and Wyeth – are now undergoing early planning for future development. Development of these two tracts also was not included in prior circulation plans.

So while the future regional highway network will not change dramatically from what is now in place (with the exception of the Millstone Bypass), over the long term the amount of office/research space along Route 1 could more than double what is on the ground today. Without additional highway improvements, traffic congestion both on Route 1 and on the local streets of West Windsor will be severe.

This condition is not unforeseen. In the early 1980's two decades ago New Jersey Department of Transportation studied the Route 1 corridor and concluded several things: office space construction would be massive; major improvements would be needed to both Route 1 and the local roadway system; and even with all of that in place, traffic demands would overwhelm the available system capacity over the long term. The Route 1 improvements now in place and nearing completion emerged from that study, but it was recognized at the time that they would be insufficient for the long term needs of the corridor.

## SECTION V - CIRCULATION PLAN ELEMENT

Continuing assessments using West Windsor's traffic model have led to much the same conclusion: full build-out of all the properties along Route 1 will generate traffic demands that will greatly exceed the currently planned capacity of Route 1. Further, local streets will be heavily impacted both by the traffic that naturally would use them (not all traffic needs to or wants to use Route 1, after all), and also by diverted traffic seeking to avoid Route 1 congestion.

As a result, the Township's future planning efforts should seek to establish a balanced transportation system with three distinct prongs of activity:

- Adjustments to the Township's land development policies to encourage development which produces fewer commuters during peak hours. These policies could include outright reductions in FAR; transit friendly design; redefined uses (for example, research instead of office, resulting in a lower site population); or alternative uses (residential and retail typically generate fewer peak hour trips per acre than does conventional office).
- Implementation of Transit and Travel Demand Management (TDM) measures to reduce auto dependency. Historically, TDM and transit programs have had little effect in suburban environments such as West Windsor, and recent efforts by the State have been largely abandoned. However, because future congestion will be severe, there may be incentives which could be leveraged through renewed efforts to implement transit and TDM programs. Major transit initiatives such as bus service along the arterial road system and a bus rapid or light rail system could effectively build upon existing service.
- Roadway planning and construction will be needed, both to complete the projects already contained in the circulation plan, and to define, fund, and implement additional projects over the long term. It may not be possible to design these long-term projects at this time, but future corridors could be designated where future roadway construction is possible.

A key challenge encountered in developing this Circulation Plan is the competition between the need for new or widened roadways and the resulting impacts to the abutting Township residents and business owners. There has been much discussion as to whether the Township should provide needed transportation capacity despite the impacts to adjacent property owners, or whether it would be preferable to limit roadway widening projects and attempt to absorb the added congestion. The alternate to providing the needed transportation capacity on arterial roads will inevitably be a major increase in congestion on those roads and the diversion of traffic to local and collector roadways. This will directly, and negatively, impact the quality of life in local residential neighborhoods. In general, however, the community has elected through this master planning process to limit the amount of roadway widening in residential areas, and to focus on providing safe pedestrian and bicycle movement in heavy traffic locations.

This circulation plan provides a framework for meeting these challenges by outlining a series of transportation improvements and initiatives. In some cases general principles are articulated which are intended to guide more detailed studies of problem areas, whereas in other cases, specific recommendations are made.

### PRINCIPLES OF THE CIRCULATION PLAN

The Township has an established overall circulation strategy based on a hierarchal road network. The purpose is to provide a roadway system that consists of arterials and collectors to transport regional and inter-township/county traffic, and collectors and local roadways for internal traffic. The arterial roadways are intended to direct around, not through, residential areas of the Township.

## SECTION V - CIRCULATION PLAN ELEMENT

Unfortunately the arterial roads tend to be under the jurisdiction of the State or County, and improvements require the approval of many more entities than local improvements. As such, the Township has reduced control over the phasing of these projects as they are prioritized on a regional basis. For instance, the proposed Millstone Bypass, needed to improve congestion on Route 1 and alleviate traffic on Washington Road, is under State jurisdiction. The State has had significant opposition by Princeton Township and Borough. The project is now undergoing a full Environmental Impact Statement. This means these much needed traffic improvements in the Township, recently projected for construction by 2005, are now projected for completion by 2010.

The arterial peripheral road network is intended for regional traffic, but also serves Township traffic as well. With the abundance of residential development throughout the Township and large corporate office and retail development along the Route 1 corridor, the trend has shifted so that most traffic on Township roads, with the exception of Route 1, currently has an origin or destination within the Township. So the provision of needed capacity on arterial roads under County and State jurisdiction is paramount in preserving the quality of life for Township residents as well as providing acceptable service to through traffic

The Township also suffers from a shortage of viable principal arterial roadways running east-west to serve as regional alternates to Route 571. Route 92 was intended to provide an east-west connection to the north of the Township between the New Jersey Turnpike/ Route 130 and Route 1/Route 206. However, following substantial completion of design, the project is in serious jeopardy of being eliminated due to significant environmental impacts. This potentially eliminates the opportunity for traffic relief to Route 571 anticipated from the construction of this alternate east-west route. There also continues to be a need to examine options for developing a bypass around the center of Princeton.

The planning of effective regional traffic circulation also requires coordination with the neighboring municipalities, the County and the State. Compatibility with their circulation plans has been considered and accounted for so far as they are consistent with the planning needs of the Township.

This Circulation Plan redefines the prior circulation plans to account for the expedited development schedule and revalidates the need for transportation improvements compatible with the planning needs of the Township. Planned roadway and intersection improvements are identified based on projected traffic growth and demographic changes within and around the Township. Since opportunities for future development has decreased over the last two decades, future traffic growth is more predictable than it was previously.

### GOALS AND OBJECTIVES

The main purpose of this Circulation Plan is to adequately plan for the upgrade of the transportation network. However there are many supporting goals and objectives used to accomplish this initiative. Those goals and objectives include the following:

*A. Goal: Continue to pursue a coordinated road plan, which enables the safe and efficient movement of people and goods and minimizes the negative impact of regional traffic on local roads, particularly in residential areas.*

#### **Policies**

1. Establish a hierarchy of roads with appropriate geometric characteristics and capacity,

## SECTION V - CIRCULATION PLAN ELEMENT

thus avoiding channeling regional traffic onto local streets resulting in the degradation of residential areas and community centers.

Continue to support a system of arterial roadways for the purpose of carrying regional and inter-municipal traffic through West Windsor. Discourage regional traffic from using local and collector roadways.

2. Support completion and upgrading of regional roadways to aid in improving local circulation, particularly those related to Route 1.
3. Limit major new road construction to those linkages and improvements identified in the Circulation Plan as needed to insure an adequate distribution of local traffic.
4. Emphasize development of final major connections and local roadway improvement to aid in east-west traffic movement (e.g. Millstone Bypass, realignment of Meadow and Clarksville Road) and select key intersections as described in the Circulation Plan.
5. Plan for a transportation network compatible with those of neighboring Townships, the County, and the State. Coordinate with the Central Jersey Transportation Forum.

*B. Goal: Encourage alternate circulation modes and networks (e.g., pedestrian, bicycle, mass bus transit) to be devised to minimize local auto traffic trips, and to increase opportunities for recreational bicycling and walking.*

### **Policies**

1. Provide and interconnect pedestrian and bicycle pathways throughout the Township, with particular emphasis on interconnections between recreational uses and schools. Create bicycle-compatible roadways to improve accessibility to parks and recreation areas, and develop a network of multi-use trails.
2. Improve pedestrian accessibility in areas of the Township where pedestrian traffic is encouraged (i.e., train station, community recreation areas, shopping areas) and in areas where pedestrian use is anticipated.
3. Plan various modes of transportation so that they interface cohesively to encourage intermodal travel. In particular, encourage implementation of a transit-way system capable of supporting bus-rapid or light-rail transit to link major employment, retail, and residential areas with train stations, park-and-rides, and other elements of the regional transportation system.
4. Encourage alternate commuter rail parking and rail stops in the region to minimize future impacts on the Princeton Junction area.

*C. Goal: Create a pedestrian and bikeway system that makes walking and cycling a viable alternative to driving, and which improves bicyclist and pedestrian safety.*

### **Policies**

1. Provide accessible, convenient pedestrian and bicycle compatible links to major generators and destinations, including major shopping and commercial destinations, the

## SECTION V - CIRCULATION PLAN ELEMENT

Princeton Junction Train Station, employment centers, schools, community facilities.

2. Provide bicycle parking and storage at major bicycle destinations, including working with employers and retailers to provide facilities for commuters and patrons.

3. Identify locations and provide roadway illumination at those locations where pedestrian street crossings and movements occur. Appropriate levels and types of illumination should be determined. Pedestrian crosswalks, signage, bus stop locations and amenities, and other treatments should be reviewed to improve safety.

4. Provide the public with information on bicycle and pedestrian facilities, such as publishing maps or brochures of the existing and proposed bikeway and trail network. Institute bicycle and pedestrian safety programs for school children and educational efforts directed at adult cyclists and drivers.

5. Institute programs to track bicycle and pedestrian crashes and to develop solutions for problem areas; to increase the public's awareness of bicycle and pedestrian safety, and to implement roadway features such as signage and traffic calming to improve pedestrian and bicycle safety.

6. Seek to improve roadway lighting in the vicinity of pedestrian crosswalk locations and other areas of pedestrian activity to improve the safety of such locations.

7. Identify missing links in the sidewalk network, prioritize bicycle and pedestrian improvements and assure that bicycle and pedestrian facilities are considered as an integral part of all street maintenance and reconstruction work. Work with Mercer County and the State of New Jersey to incorporate bicycle and pedestrian facilities into roadway reconstruction, resurfacing, and improvement projects.

8. Continuously improve and maintain bicycle and pedestrian facilities by incorporating them into new open space as acquired and as feasible. Coordinate with neighboring communities, the County, and the Greater Mercer TMA to provide linkages to create a regional bicycle / trail network. Specifically, the Township should work with Plainsboro Township and the Board of Education to provide a high quality pedestrian and bicycle connection to the High School property in Plainsboro. Seek to implement stable funding mechanisms, such as funding bicycle facility, sidewalk, and crosswalk maintenance as a regular part of the street maintenance budget, and exploring the possibility of funding multi-use trails through the Township's open space tax.

*D. Goal: Develop an implementation plan for necessary transportation improvements, which outlines the schedule for improvements and funding mechanisms, utilizing the off-tract transportation improvement program.*

### **Policies**

1. Continue application of off-tract road improvements and pro-rata share obligations for roadway improvements generated by new development in accordance with the Township Circulation and Capital Improvement Plan.

2. Evaluate the impact that changes in the circulation plan and capital improvement program will have on the Township's roadway assessment program and, if needed, seek appropriate modifications to the inter-local services agreement with Mercer County, in

## SECTION V - CIRCULATION PLAN ELEMENT

conjunction with State and Federal agencies.

### WEST WINDSOR CIRCULATION NETWORK

This Circulation Plan provides a planned circulation network and a corresponding Capital Improvement Plan (CIP) developed to systematically achieve the transportation goals of the Township's roadway network. The intent is to utilize the existing roadways with planned improvements, to the fullest extent possible, then plan new roadways to complete the network. The steps used in developing the circulation network for this Circulation Plan are as follows: a)develop a hierarchal classification of roads to provide a logical network of local roads leading to collector roads and collectors roads leading to arterials; b)determine the standard characteristics of each roadway classification; c)determine the individual roadway improvements needed to comply with the classification standards; and d)evaluate the future network traffic volumes versus roadway capacity to identify the sequence of construction.

#### *Roadway Classification*

The township circulation plan is formulated using a roadway classification system based on a hierarchy of intended traffic-carrying capacity and roadway function. This system classifies roadways as arterials, collectors, or local streets. The classification given to each roadway relates to the function that roadway serves within the transportation system. The classification of roadways within the Township was guided by the American Association of State Highway and Transportation Officials (AASHTO) definitions of roadway classifications, adjusted for local conditions. In addition, the State mandated standards for residential roadways are published in the Residential Site Improvement Standards (RSIS). The Township is required to comply with the RSIS standards or file for a waiver in order to exceed these standards on a project specific basis. These standards dictate design standards for residential roadway infrastructure for roadway classifications from major collector and lower, which include minor collectors and local roads. Local roads can fall into many RSIS classifications (i.e. alleys, loop roads, cul-de-sacs).

In this fashion, a hierarchical system of roadways was established which, in descending order, accommodates lesser volumes of traffic. The highest traffic volumes are accommodated on the principal arterial (Route 1). The next level would be the arterial system, then the collector system (principal, major and minor), with the local street system carrying the lowest traffic volumes.

The arterial roads, which carry the highest volumes of traffic, are the most difficult to designate. Those that are already built with arterial design standards can simply be redesignated. But those that must be selected to complete the network are most difficult to designate.

The roadway classifications for arterials are not regulated by the RSIS. The differentiation between principal collector and arterial roads is related both to the type of traffic intended to travel on the road, as defined herein, and to the projected design traffic volumes. Roadway traffic for collector roads is defined per RSIS not to exceed an average daily traffic (ADT) of 7,500 vehicles. However, some arterials may have ADTs less than 7500 vehicles per day as well.

The roadway and right-of-way widths indicated below for roadway classifications are similar to the prior Circulation Plan, except for roads regulated by RSIS. The collector and local road standards shown are consistent with RSIS to the extent that they are not already built or designed, provide additional width for bicycle compatibility and provide additional width for purposes of intersection and driveway turning lanes. During the review of development applications the Planning Board should seek to achieve an optimal level of service through the design of such

## SECTION V - CIRCULATION PLAN ELEMENT

details as intersections, islands, shoulder and bike paths, and driveways. The current RSIS standards result in a narrower roadway and right-of-way, where turn lanes are not present, than previously planned by the Township, which would cause a discrepancy for drivers between those collectors that are already constructed to a wider section and those that are newly constructed to the RSIS standards. One additional change in this Circulation Plan caused by the RSIS classifications and standards is the reclassification of four lane major collectors to the principal collector classification. RSIS does not provide for a four-lane collector.

Another area of the RSIS that requires further waiver attention is that two lane residential road standards provided in RSIS do not allow for shoulders and curb, only one or the other. However, there are locations that curb is needed for drainage and safety, as well as traffic shoulders for safety and bicycles. The Township should pursue revision of the RSIS to permit use of both without a special waiver.

The road classifications used in West Windsor Township to advance a peripheral arterial road network and its supporting collector/local street system are described in the following subsections.

The Circulation Plan Map shown on the next page illustrates these three classifications.

### 1. Principal Arterial Roads

Principal arterial roads are the highest order road classification in the township. A principal arterial road provides limited vehicular property access and generally carries high volumes of inter-municipal and regional traffic.

Principal arterial roads have a typical right-of-way of 150 feet, although the New Jersey Department of Transportation (NJDOT) is seeking up to 170 feet in certain instances on future improvement plans for Route 1. Route 1, the only principal arterial road in West Windsor, now has six (6) travel lanes, with a median traffic divider. NJDOT plans for Route 1 call for elimination of all traffic signals in the Township to increase traffic capacity and reduce delays. Grade separated interchanges have been and will continue to be constructed at key intersections to replace signalized intersections as a means of crossing and accessing Route 1. Construction is also underway to construct a collector-distributor divided roadway configuration between Meadow Road and Carnegie Center Boulevard along northbound Route 1.

#### **Principal Arterial Roads:**

- Route 1

### 2. Secondary Arterial Roads

A secondary arterial road links the collector road network with other arterial roads. The secondary arterial roads are designed to carry high volumes of traffic from one community to another and direct vehicular traffic away from the residential core of the municipality onto a higher volume road network. Secondary arterial roads are designed for four travel lanes with a right-of-way (ROW) of 80 feet. Route 571 should have a 60 foot roadway width between Clarksville Road and Cranbury Road/Wallace Road to accommodate one through lane in each direction, a center turn lane, and shoulders for bicycles and turning movements. East of Clarksville Road, future development should be set back from Route 571 sufficiently to permit the eventual addition of one lane in each direction.

#### **Secondary Arterial Roads:**

- Quakerbridge/Province Line Roads
- Old Trenton Road
- Princeton-Hightstown Road (Route 571)



## SECTION V - CIRCULATION PLAN ELEMENT

- Millstone Bypass (Route 571, described in the New Roadways and New Alignments section)
- Clarksville Road (from Quakerbridge Road to Meadow Road)
- Meadow Road
- Alexander Road (from Route 1 to North Post Road)

### 3. Collector Roads

Collector roads are designed to carry moderate volumes of traffic from other collector roads and local roads to the arterial road network. Generally, collector roads carry traffic originating in one location within a municipal boundary, destined for another location within the municipality.

Minor and principal collector road classifications are used in West Windsor, with the latter being a newly added classification. Principal collectors are designed to support greater traffic volumes than minor collectors since they collect traffic from a series of residential neighborhoods or minor collectors and extend to an arterial roadway. The principal collector classification is also used for circulation roads in and around commercial developments that contain local residential traffic, such as Canal Pointe Boulevard and Nassau Park Boulevard.

RSIS requires for minor collectors up to a 36 foot road with parking lanes, with travel lanes from 10 to 12 feet and ROW of 50 to 60 feet. The roadway widths and ROW widths are dependent on the provision of shoulders and parking lanes. Typically in the Township, collector roads have previously had a right-of-way of 60-70 feet and consisted of two to four (2-4) travel lanes, as traffic capacity and acceptable levels of traffic service warrant. Principal collectors will have a 70-foot ROW with 50-foot roadway widths supporting either four lanes or two lanes plus shoulders, widened for turn lanes as needed.

#### **Principal Collector Roads (4 lanes wide):**

- Roszel Road
- Nassau Park Boulevard
- Canal Pointe Boulevard
- Carnegie Center Drive Connector to Meadow Road
- Carnegie Center Drive loop road
- Carnegie Center Boulevard
- Alexander Road (West of Route 1 to Princeton)

#### **Principal Collector Roads (2 lanes wide):**

- South Mill Road
- New Edinburg Road
- New Village Road
- Village Road West
- Edinburg Road
- Clarksville Road (Meadow Road to North Post Road)
- Clarksville Road (North Post Road to Route 571)
- North Post Road, Village Road to Clarksville Rd.
- Bear Brook Road
- Washington Road (west of Millstone Bypass to Princeton)

The principal collectors intended for a center median and/or center turn lane include, but are not limited to, New Village Road, Village Road, New Edinburg Road, Nassau Park Boulevard, Carnegie Center Boulevard and Bear Brook Road. Mountable curbed and landscaped median islands would be provided at roadway intersections, along with turn lanes in order to enhance pedestrian safety and traffic turning movements.

## SECTION V - CIRCULATION PLAN ELEMENT

### **Minor Collector Roads (2 lanes wide):**

- Millstone Bypass extension roads (to Harrison Street, Washington Road and Sarnoff)
- Southfield Road
- South Post Road
- Rabbit Hill Road
- Cranbury Road
- Millstone Road
- Clarksville Road (Route 571 to Cranbury Road)
- Village Road East
- Conover Road
- Robbinsville Road
- North Mill Road
- Bennington Drive
- Dorchester Drive
- Line Road
- Windsor Road
- Wallace Road
- North Post Road, Clarksville to Alexander Road
- Washington Road (Station Drive to Millstone Bypass)
- Lanwin Boulevard
- Meadowbrook Road
- Woodmere Way
- Cubberly Road
- Grovers Mill Road
- South Lane (between Village Road East and Windsor Road)
- Wheeler Way (Emmons Drive to Farber Road)
- Emmons Drive (Wheeler Way to Route 1)
- Penn Lyle Road
- Proposed Vaughn Drive Extension (described in then New Roadways and New Alignments section)

### **4. Local Roads**

Any road within the township not designated as a principal arterial, secondary arterial road, or collector road is considered a local road. Local roads are the lowest classification roads in the Township and are designed to carry low volumes of municipal traffic from residential subdivisions and planned developments to collector roads.

Ward Road has been designated a Local Road connecting North Post Road to Penn Lyle Road. No exact alignment has been delineated, but the primary objective is accommodation of the needs of emergency service vehicles and incorporation of bicycle/pedestrian friendly pathways. The alignment should minimize any adverse impacts to the environment and to any natural features. There should be no connection between Ward Road and the Birchwood neighborhood.

#### **Local Roads**

- Ward Road

### ***Recommended Roadway and Intersection Improvements***

Using the defined roadway classification network as the ideal guide, needed roadway improvements

## SECTION V - CIRCULATION PLAN ELEMENT

were identified to meet the design standards of those classifications. The township-wide transportation traffic forecast model used for calculating off-tract transportation improvement fees is the tool used to determine when the improvements are needed to develop the improvement sequencing. Traffic volumes were collected during the spring of 2000 to calibrate the model to a 2000-year base condition. Background traffic growth, as well as projected development of vacant parcels using planned zoning in the Master Plan was imposed on the 2000 base condition. Trip generation for the vacant parcels is estimated using the Institute of Transportation Engineers' Trip Generation Manual. Development was phased in between 2001 and 2020. No traffic generation is included for parcels currently under contract for open space acquisition. This tool is used to determine when each identified roadway improvement was needed within blocks of five years through 2017, and grouped thereafter to an estimated program completion in about the year 2035.

A map indicating the location of roadway improvements by time period is shown on Figures 2 for the years 2002-2012, and in Figure 3 for the years 2013 and beyond. The allocation and description of roadway improvements by time period is shown in Tables 1 through 5 for the periods of 1994-2001, 2002-2007, 2008-2012, 2013-2017, and for 2018 and beyond. The table showing improvements completed during the prior the six year period (1994 – 2001) is provided. This list is also included for accountability for the off-tract transportation improvement program, discussed later in the Circulation Plan. Some improvements in the timeframes beyond 2007 may be needed sooner, but cannot feasibly be constructed by 2007 given their current state of planning and design.

The program improvement groupings do not preclude subsequent prioritization of specific projects from different programs for inclusion within future capital spending plans, since the latter process traditionally involves numerous considerations in its preparation and adoption by Township Council. Also, the numbering of improvements within a time frame does not signify any prioritization intended for completion of individual improvements. However in some cases several individual improvements encompass a single project and the completion of one without another may be inappropriate.

It must be emphasized that the proposed circulation plan is not intended to reflect exact roadway alignments, but rather sets forth principles to achieve in the township's transportation system. During subsequent implementation of this Capital Improvement Plan, further detailed study will be necessary to identify exact roadway alignments and updated cost estimates for the various road improvements to be undertaken. Implementation of these improvements is dependent on both public and private actions. As development activity progresses in the future, application of the township's off-tract transportation improvement mechanisms will provide private pro-rata contribution to identified capital improvements. As the Township, County and State prepare their respective annual capital plans as well as long-range capital improvement plans, the precise timing and package of improvements to be undertaken will be identified. To the extent practicable, funding for the completion of improvements to the arterial road network should be given early consideration in future capital improvement programs by the respective governmental entities responsible for their implementation. Improvements are typically designed to accommodate the projected theoretic full development impact of the Township during the recommended time period for implementation. In this regard, improvements would generally be made once to a particular road link or intersection in order to minimize public expense and disruption to the neighborhood and to the immediate environment. Where excess capacity may be created on a particular road link earlier than necessary in the capital program, the roadway would be striped and maintained to accommodate only the traffic service levels for the near term. This allows preservation of the improvement's ultimate capacity for the theoretic full build situation when required. In a few cases, however, an interim improvement is provided in this plan due to constraints on making the final improvement earlier in the program or the need for the long-term improvement may be tentative, requiring subsequent review.

The majority of improvements programmed for the 2002 to 2007 timeframe are currently in the final

## SECTION V - CIRCULATION PLAN ELEMENT

design phase or under construction. Improvements programmed for the 2008-2012 timeframe should be in the scoping stage within the next three years to assure completion as needed. In particular, improvements on roadways under County or State jurisdiction should begin the planning or scoping as soon as possible, due to the Township's recent history of long planning and design phases. The Township should encourage the State and County accordingly.

Improvements to arterials typically require additional planning time allocated for their successful completion, as evidenced by the delay encountered on programmed arterial improvements. Unfortunately the sequencing of the planned capacity improvements to several of these roads has been delayed beyond when needed and previously anticipated. This includes the elimination of traffic signals on Route 1, completion of the Millstone Bypass, and widening of Route 571 between Clarksville Road and Cranbury Road. On the other hand, the Township has had much success in completing improvements planned for Township roads within or ahead of the planned timeframes.

Site visits were made to verify the current state of peak hour traffic conditions at intersections throughout the Township. The locations experiencing the worst congestion are those locations identified in the New Roadway and New Alignments section, in which environmental impact, controversy or design delays have been encountered.

### **Open Space Acquisition**

An analysis was performed to quantify the traffic benefits associated with the current open space acquisition plan. Open space acquisition will have the most impact on the needed improvements beyond 2017, since those programmed earlier generally address existing roadway deficiencies or are improvements needed to support approved development. It is estimated that the open space acquisition of the full-targeted 98 parcels can potentially eliminate the creation of approximately 2,200 evening peak hour vehicle trips throughout the Township. This will have a significant impact on the future transportation needs of the Township and will serve to minimize growth beyond the 2017-year window.

### **Zoning Impacts**

While identifying the roadway improvements needed to support future site development and traffic growth, it is apparent that zoning of vacant parcels is a significant deciding factor as to whether and when roads need to be expanded. Many two lane roads in the Township are at or approaching unacceptable peak hour conditions. In some cases, acceptable levels of traffic operations can be restored with intersection improvements.

The traffic impacts associated with reducing allowable floor area ratios (FAR's) for vacant commercial properties were evaluated. In a few cases reduction of the FAR requirements could reduce the immediate or short-term need for roadway widenings. However, to a larger extent the need for widenings will simply be deferred, and significant widenings will be needed in any event. Considering the potentials for regional roadway improvements, site redevelopment, and reuse of existing development, it is likely that further substantial improvements beyond those itemized in this plan will be needed, if a reasonable level of service is to be provided and impacts on local streets are to be minimized. As a result it is recommended that allowable FAR's for office and research developments be reduced, coupled with implementation of travel demand management (TDM) and public transit initiatives.

Of particular relevance is the rezoning of the few remaining vacant or underdeveloped parcels of significant size (the Wyeth and Sarnoff tracts). As plans for the Princeton University tract evolve, the intensity of that development should continue to be evaluated with respect to traffic impacts. Intense development of these parcels will result in significant degradation of the future level of

## SECTION V - CIRCULATION PLAN ELEMENT

service on the Township's roadway network. The Planning Board should examine the need for FAR reductions on properties in both the Route 1 and Route 571 corridors.

Also, a number of properties have General Development Plans (GDP's) in place which will come up for renewal in future years. The terms of those renewals should be carefully evaluated with respect to the projects' traffic impacts to obtain the best fit with the overall circulation system. Specific transportation improvements and/or travel reduction measures may be needed in conjunction with the GDP renewal.

### *New Roadways and New Alignments*

The arterial roadways include Route 1, Route 571 and the future Millstone Bypass, Quakerbridge Road, Hughes Drive, and Old Trenton Road. Currently there are "bottlenecks" along many of these roadways that require improvement in order to avoid the diversion of traffic onto lower hierarchy roads intended to serve mainly residential traffic. For example, there are bottlenecks on Route 1 at various signalized intersections; on Old Trenton Road at Edinburg Road and Robbinsville Road; and on Route 571 in Princeton Junction and at Route 1. Most of these needed improvements were previously programmed to occur prior to 2000. The added capacity of these road improvements is needed even to accommodate the existing traffic demand. Traffic congestion and diversion to residential roads will worsen until these improvements or alternate improvements are completed. The Millstone Bypass was expected to be expedited, but has since met with opposition from Princeton Township and Borough and recently was delayed further by the need for a full Environmental Impact Statement.

In an effort to further the township's circulation policy to direct large traffic volumes along an arterial road network, these new roadway realignments and/or new roadways continue to be needed to alleviate existing congestion. The current list of such improvement projects includes the Meadow Road realignment at the Clarksville Road intersection (including a widened bridge); Alexander Bridge Replacement; Vaughn Drive Extension from Alexander Road to the Millstone Bypass/Route 571; Millstone Bypass; and widening of Route 571 to provide turning lanes and shoulder through Princeton Junction.

These proposed improvements are indicated on the Circulation Map. It should be emphasized that these alignments are not fully engineered, and variations could occur prior to final designs being prepared.

### **Meadow Road Realignment**

The realignment of Meadow Road from Route 1 to Clarksville Road is necessary based on safety and environmental concerns along existing Meadow Road and future Meadow Road/Route 1 grade separated improvements.

Construction of the Route 1/Meadow Road interchange began in the summer of 2000 and includes improvements to Route 1, a northbound frontage road on Route 1 from Meadow Road to Carnegie Center, and a Carnegie Center connector to Meadow Road. The realignment of Meadow Road from Route 1 to Bear Brook Road involves eliminating the "S" curve and the minor realignment of the Meadow Road/Bear Brook Road intersection. These improvements are currently under design.

The realignment of Meadow Road from Bear Brook Road to Clarksville Road involves upgrading the existing roadway and continues to provide arterial links with Bear Brook and Clarksville Roads. Meadow Road is to be realigned to connect directly with the westerly section of Clarksville Road. The easterly section of Clarksville Road would intersect the Meadow

## SECTION V - CIRCULATION PLAN ELEMENT

Road/Clarksville Road West intersection as the stem of the T intersection. The intersection would also be shifted to the north slightly. This relocation would significantly increase the sight distance for stopped vehicles and would improve the vertical alignment of the intersection. This realignment and roadway improvement would create a safer roadway condition and provide improved circulation within the Township.

Sidewalks, pedestrian paths, and bike paths should be provided along Meadow Road to insure that pedestrians and bicyclists can safely travel along this busy street.

Clarksville Road from Meadow Road to Quakerbridge Road will also be widened to four lanes so that the Meadow Road to Clarksville Road link can better serve as a major link between Route 1, Carnegie Center and the train station and Quakerbridge Road in Lawrence Township. This improvement is shown in the 2008-2012 period, but the timing and scale of the improvement are dependent upon the development of the Wyeth property which abuts Clarksville Road.

### **Alexander Road Bridge**

The current Alexander Road bridge configuration with its adjacent intersection at North Post Road currently operates at unacceptable levels of service F, resulting in excessive traffic queues along Alexander Road, particularly in the evening peak hours.

The Planning Board prefers replacement of the bridge at its current location, maintaining the existing alignment, a T-intersection of Alexander Road with North Post Road and including the installation of a traffic signal at the intersection. Some improvement to the vertical intersection alignment and provision of turn lanes is possible.

This improvement is programmed for 2008-20 12, the earliest it can feasibly be built. But the Township, County and State must work diligently starting now to finalize a bridge alignment and meet this schedule.

The funding of the bridge replacement has been supported by the State. Legislation was passed to provide funding to the Counties to improve the “orphan” bridges throughout the State. However, there is not enough funding available to replace all bridges in a timely manner. The County has also acknowledged its intentions to prioritize this bridge replacement. The County has programmed the project scoping of the bridge replacement and is already working with the Delaware Valley Regional Planning Commission (DVRPC) on this project. The bridge cannot continue to support traffic in its current alignment without replacement, due to its limited service life and current state of structural deficiency. Not having a bridge crossing the railroad in this vicinity would impose significant fire and life safety limitations.

Transportation modeling of bridge alternatives indicates there is more traffic anticipated to cross this bridge during the peak periods than can be accommodated on North Post Road and Clarksville Road, or through Berrien City and the Route 571 intersections. Other traffic relief is needed. An extension of Vaughn Drive to Route 571/ could provide such additional relief.

### **Vaughn Drive Extension**

Vaughn Drive is presently a local roadway serving as access to the Princeton Junction train station. The thoroughfare from Alexander Road to Washington Road via Vaughn Drive starts at Alexander Road, continues via access aisles through the Princeton Junction train station, and then connects with Station Drive to Washington Road/Route 571. It is not a direct link and not a through roadway in its current condition. The realignment and extension of Vaughn Road as a Township owned through roadway would provide another connection between Alexander Road and Route 571 (future Millstone Bypass). Vaughn Drive should be constructed to a 36-foot cartway, with two lanes

## SECTION V - CIRCULATION PLAN ELEMENT

plus turn lanes. This improvement will accommodate some of the traffic volumes destined for Route 571 from Alexander Road that would otherwise travel via the Alexander Road Bridge.

Pedestrian and bicycle paths should be provided along the improved Vaughn Drive to facilitate non-motorized access to the train station.

### **Millstone Bypass**

The Millstone Bypass is a large-scale regional project which will support the removal of the traffic signals on Route 1 at Washington Road, Fisher Place, and Harrison Street. In order to provide local east-west circulation, the project would provide a bypass of the Penns Neck area of the Township, directing traffic on Route 571 traveling toward Princeton to travel on a new two lane roadway starting at the railroad bridge at the base of Washington Road, traveling to the north side of the Sarnoff site, crossing Route 1 just south of Harrison Street, and continuing south to Washington Road near the Township boundary. The project is supported by the Township, as it provides the opportunity for NJDOT to eliminate all Route 1 traffic signals between Route 95 and South Brunswick, reducing congestion on the Route 1 corridor. The project will also reduce traffic volumes on Washington Road between the Princeton Township line and the Northeast Corridor railroad tracks. Washington Road will have right turn access only to Route 1.

The alternative currently preferred by the Township includes a connector to Harrison Street and a connector to the Sarnoff buildings, both with traffic signals on the Bypass, and a grade separated interchange at Route 1 with the northbound Route 1 ramps signalized. Due to the project's overall proximity to the D&R canal, there are still environmental impacts of concern to many. The Township and Borough of Princeton are also vocally opposed to the project because of their concerns that the project will increase the traffic volumes entering Princeton via Harrison Street and Washington Road. The project has been the subject of a series of planning studies which have evaluated many alternatives, including a complete latest Environmental Assessment currently underway. That environmental process will probably add two years to the project planning and design phase. While the improvement is needed sooner, the improvement is programmed in the 2008-2012 timeframe to account for the current status of the project.

The Township continues to support a roadway width of two lanes with turning lanes within an 80-foot wide right of way.

Full development of the Sarnoff site requires expansion of the Bypass to accommodate site traffic. Thorough study of this will be needed as Sarnoff's development planning proceeds.

Projects of this size require careful planning. However the Millstone Bypass project is delaying the NJDOT's long planned objectives of removing the traffic signals on Route 1 at Harrison Street, Fisher Place and Washington Road. The Township has consistently supported NJDOT's plans for this project, which is entirely inside of the Township, not in Princeton. The Township must continue to do so until this project is completed.

### **Route 1**

Development of the remaining major non-residential tracts in West Windsor – Wyeth, Sarnoff, the remainder of Carnegie Center, and the Princeton University lands – will continue to stress even the improved Route 1 when coupled with ongoing regional growth.

Several actions will be needed in the long term to insure that Route 1 can continue to absorb and

## SECTION V - CIRCULATION PLAN ELEMENT

serve the high volume of regional traffic which desires to use it. Failure to provide the necessary improvements will inevitably result in traffic diverting to the local street system, impacting areas of the Township that are sensitive and should not be so impacted. Further projects along Route 1 could include the following:

- Route 1 Widening, south of Meadow Road – The traffic studies conducted to support design of the Route 1 / Meadow Road interchange clearly established that, even without the Wyeth and Sarnoff developments, widening of Route 1 will be needed south of Meadow Road. Presently this segment is six to eight lanes wide; traffic demands indicate the need for at least one additional lane in each direction. Clearly this scale of improvement would impact the abutting properties, particularly south of Quakerbridge Road, and it is anticipated that it will be a long, difficult process for the New Jersey Department of Transportation to progress this project. The Township should press the Department to initiate the needed studies early and should provide full support for the project.
- Route 1 / Nassau Park Boulevard – It has been decided to remove the existing traffic signal at this intersection. Additional construction of some additional ramp modifications within the Quakerbridge Road interchange and of additional lanes in the Quakerbridge Road / Province Line Road intersection will be needed to mitigate possible impacts. As development of the Wyeth tract proceeds, this intersection is an obvious location at which a grade separated interchange could be constructed, providing access to both Wyeth and to Nassau Park. Funding of such a major project will need to be determined.
- Route 1 / Carnegie Center Boulevard – This intersection is signalized at present, but once the Millstone Bypass is completed and traffic signals removed from Penns Neck and Nassau Park Boulevard, it would be the only signal between I-295 and South Brunswick. Therefore it is very important that this signal also be removed. In the past it has been suggested that a grade-separated interchange could be constructed here, but no funding source has been established and several Carnegie Center buildings block the interchange footprint. Therefore it may be preferable to simply remove the signal, make the movements into and out of Carnegie Center Boulevard right-in/right-out only, and absorb the diverted traffic at the Alexander Road and Meadow Road interchanges. Special detailed studies will be needed to establish the effects of such a closure, to investigate alternatives, and to define any needed mitigation measures.

Clearly projects relating to Route 1 are within the jurisdiction of the New Jersey Department of Transportation. The Township will need to develop and nurture a good working relationship with the Department, so that these critical projects can be planned, programmed, funded, and ultimately constructed.

### **Princeton Junction**

The Princeton Junction area includes several of the special roadway alignments discussed in this section including the Alexander Road Bridge, Vaughn Drive, and portions of the Millstone Bypass and its connectors. Other crucial roadways in this area are Wallace Road, Route 571, portions of Clarksville and North Post Roads, Alexander Road, and Bear Brook Road. Based on the traffic volumes and distributions generated by the model, several improvements to these roadways and corresponding intersections will be needed to provide mobility in the peripheral roadway system:

- Vaughn Drive Extension should be constructed connecting Alexander Road and Route 571/Millstone Bypass;
- The railroad bridge on Route 571 should be widened to four travel lanes;



## SECTION V - CIRCULATION PLAN ELEMENT

- The intersections of Route 571 with Wallace Road, Clarksville Road and Alexander Road should be improved to include turn lanes on all approaches and optimum signal timing, phasing and coordination; and
- Route 571 between Clarksville Road and Wallace Road/Cranbury Road needs to be widened to two travel lanes with a center turn lane and shoulders, to accommodate projected traffic volumes.
- Adequate pedestrian and bicycle safety amenities, including bike lanes, sidewalks, improved crosswalks, and pedestrian signals should be integrated into the improvement plan for Route 571 and nearby streets, including the vicinity of the Princeton Junction Train Station.

These improvements are closely related in shaping a traffic circulation network within Princeton Junction that is compatible with the land use initiatives in this area. In particular, there are recent efforts to establish a Princeton Junction village center. If this initiative is pursued, the Township must reassess the long-term transportation circulation network in this area.

It should be noted that the development of the Sarnoff property will impact traffic flow through Princeton Junction. Assessment of an early development proposal indicates that traffic generated by the Sarnoff development and traveling through Princeton Junction could be equivalent to one full lane in each direction. This impact would be in addition to future traffic demands which would exceed the capacity of the proposed three-lane improved roadway after 10 years or so. While evaluating alternative land use and transportation plans for Princeton Junction, a thorough analysis needs to be made of the Sarnoff development and other through-traffic factors.

The widening of Route 571 has been in the planning stage for over five years. The NJDOT performed a scoping study in which the need for a five-lane section, two through lanes in each direction and a center turn lane, was identified and conceptual plans developed. The NJDOT put the project on its capital funding program. The Township did not support a five-lane section due to impacts on the integrity of the Princeton Junction business district. A three-lane section was presented to the County for consideration. The County agreed to support this section if a traffic study could support the transportation benefits of such a section. A traffic study was recently prepared by the Township demonstrating an improvement to traffic operations that could be sustained for up to ten years. As a result the County petitioned the NJDOT to retain the project in its capital funding program and to progress the project as a three-lane section without returning to the scoping stage of project development. Preliminary concurrence is anticipated by NJDOT, but the project has not been programmed for subsequent development to date.

### **Alexander Road**

The “S” curve on Alexander Road as it approaches Princeton and the D&R Canal has long been a significant safety and capacity problem due to the curvature, steep grade, pavement condition, and lack of sidewalks to accommodate pedestrians. It is recommended that the Township aggressively pursue means of improving this location to improve the overall safety for both pedestrians and vehicles

### ***Sidewalks and Bicycle Pathways***

The Planning Board adopted a comprehensive sidewalk master plan, developed by the township’s Pedestrian and Bicycle Access Advisory Committee in December 1983. That master plan included an inventory of existing walkways and a priority listing of extensions to be completed. Many of the missing links have since been completed and the inventory updated.

## SECTION V - CIRCULATION PLAN ELEMENT

In 2004 the Township participated in a joint bicycle / pedestrian planning process funded by New Jersey Department of Transportation, and which provided recommendations for improvements to facilitate pedestrian and bicycle movement through the Township. Recommendations of that study are reflected in this Circulation Plan.

This Circulation Plan reaffirms the need for annual updates to the inventory and sidewalk extension program. A copy of the latest inventory and list of priority sidewalk extensions is included in Figure 6. All projects in the Township must conform to the Americans with Disabilities Act. Handicap ramps are to be provided at curb-sidewalk intersections. During roadway and site design projects, existing deficiencies will be identified and corrected.

### **Principles of Bicycle / Pedestrian Facility Design**

It is recommended that sidewalks be added along new site development frontages unless there are extreme reasons not to provide the sidewalk. The individual sidewalk links are very crucial in terms of completing the sidewalk network. In residential neighborhoods and pedestrian activity centers (train station, recreation areas, schools, future town or village center), sidewalk should be provided on both sides of roadways to the fullest extent possible, within the guidelines of the RSIS. Sidewalk should be provided along Wallace Road, Cranbury Road, throughout Berrien City, and across the Alexander Road Bridge due to the high pedestrian activity associated with the train station. Enhancements to the roadway lighting should be considered through this area since much of this pedestrian activity occurs during dark conditions. The Township engineer staff should also develop plans for additional sidewalk to provide access to Community Park, including along Route 571.

With continued development of the Route 1 corridor, it is recommended that this sidewalk plan be re-examined to insure that opportunities for creating appropriate linkages between housing, jobs, and supportive community facilities are implemented. As grade separated interchanges are designed for intersections along Route 1, pedestrian and bicycle accessways should be incorporated as part of those structures or in a separate location where such traffic demand would logically be expected to cross Route 1. On the west side of Route 1, pedestrian/bicycle pathways from residential development are being tied into the D&R Canal system. This concept should be extended to include future office developments as well as longer-term development of Princeton University lands. Similarly, on the east side of Route 1, pathways within Carnegie Center are being connected into similar systems from other developments, such as the Palladium office and hotel development.

The Township endorses the concept of providing multiple bicycle/pedestrian-friendly crossing opportunities along Route 1, such as at the existing Dinky rail line as well as other locations with significant potential for bicycle / pedestrian activity.

Similarly, a continuous sidewalk system should be provided along Meadow Road and Clarksville Road to Route 1, and along Alexander Road from Princeton Junction to Route 1.

An important element of the township's overall circulation system involves bikeways. Since the 1970's, bicycling for commuting, recreation and other travel purposes has become increasingly popular in the county and in West Windsor. Adequate bicycle circulation, which links people with major activity centers, is achievable in the Township. There are several circulation components that make up the township bicycle network plan: bicycle lanes, roadways with compatible shoulders, shared roadways, and multi-use trails. Multi-use bicycle pathways or trails also provide pathways for pedestrians. The bicycle circulation system should be achieved utilizing utility ROW and possibly parallel easements along the Greenbelt, consistent with the Township Open Space and Recreation Plan and Greenbelt Plan. Bicycle facilities should be designed in conformance with the NJDOT's Bicycle Compatible Roadway and Bikeways Planning and Design Guidelines.

This plan does not preclude bicyclists from using other bikeways to travel within the Township. In

## SECTION V - CIRCULATION PLAN ELEMENT

fact, as this plan is developed, additional bikeways should be incorporated. In addition, while this bikeway plan is intended to provide linkage with township activity centers, linkage with facilities or activity centers outside of municipal boundaries is encouraged by this plan.

### Design Considerations

Bicycle lanes are portions of roadways that have been designated by striping, signing and pavement markings for preferential use by bicyclists. These lanes may be located on low volume roadways; or roadways with moderate traffic volumes and speeds and having fifteen (15) foot wide vehicular travel lane widths in each direction; or roadways with somewhat higher traffic volumes and speeds and having paved shoulders. Bicycle compatible inlet grates need to be used for new roadway construction.

Bike lanes follow the direction of traffic. Ideally, bike lanes should have a minimum lane width of four (4) feet. However, additional width may be necessary depending on an individual roadway's truck and car traffic volume and speed limit.

The designation of a bike lane on an existing roadway with two travel lanes allows for the preservation of a wider shoulder area for bicycle travel. It also strengthens the ability of the township to seek from the NJDOT a reduced speed limit for the roadway.

Bicycle lanes are generally recommended for collector or arterial roadways that provide direct connections in the bikeway network. Bike lanes also provide links between major employment centers, schools, shopping centers, and higher density residential areas. Roads recommended for installation of bike lanes typically are found in the northern section of the Township where the population and commercial centers are at a higher density than the more rural, lower density areas in the southern part of the Township. Within the category of proposed bike lanes, it is useful to further categorize roadways into those needing minor or major improvements. Bike lanes designed with minor improvements can typically be created through spot widening or restriping of shoulders and travel lanes. Bike lanes that require more significant improvements typically are incorporated into larger roadway improvement or construction efforts. For example, the Township could coordinate with Mercer County to install bike lanes on County roads as part of planned capital improvements, such as milling or repaving.

The majority of the West Windsor bikeway circulation plan consists of bicycle lanes along roadways as depicted on Figure 4- Bikeway Circulation Map. The reason for this is that bike lanes do not require much public funding since the roadways on which the bicycle lanes will be located have sufficient roadway width to accommodate vehicular and bicycle traffic. Some signage and striping will be required at a minimal cost. General guidelines for signage and striping are provided in the Manual on Uniform Traffic Control Devices.

Roadways recommended for compatible shoulders are typically lower volume roads or streets where the posted speed limit is below 30 mph. All shoulder segments should be designed with appropriate width according to NJDOT guidelines. Segments of roadways that currently meet these standards for shoulder width should be maintained as such, or upgraded to bike lanes if located within more developed parts of the Township. Compatible shoulders should be installed when future roadway construction and/or drainage improvements are planned for particular roads.

With respect to shared roadways, a number of roadways have been suggested for the bike network even though they cannot easily accommodate bike lanes or compatible shoulders. Most of these streets are located in residential areas and have low enough volumes to accommodate shared use.

## SECTION V - CIRCULATION PLAN ELEMENT

These roadways provide important connections to generators such as the train station, schools, parks, and other community facilities. Consequently many of these roads are appropriate for bike route signage and could be designated as shared roadways. “Share the Road” signage could be installed on these roads.

Multi-Use Trails and bicycle pathways are portions of a bikeway that are physically separated from motorized vehicular traffic by an open space or barrier, usually within an independent right-of-way or along a property line. Bike pathways usually are located along railroad tracks, in parks, along river or stream banks, and similar areas. There are a number of existing multi-use trails or pedestrian paths throughout the Township. The majority of these facilities have been installed by developers. (The central pathway system within Carnegie Center serves as an example of such a pathway.)

Multi-Use Trails in greenbelt and environmentally sensitive areas must be designed in consultation with the Township Environmental Commission and other stakeholders, to insure that such facilities properly account for and relate to the surrounding physical environment.

While they provide an attractive pedestrian facility or a path for young or inexperienced bicyclists, Multi-Use Trails are often too narrow to safely accommodate a wide range of users. Studies also indicate a greater degree of risk in those locations where multi-use trails or side paths intersect roadways or driveways. In the future, multi-use paths should be limited to locations with relatively few driveway and roadway intersections, since motorists can be taken by surprise at those locations. Where they follow parallel roads, these paths should not be considered a substitute for on-road facilities, but rather should be used in conjunction with shoulders or bike lanes.

For a two-directional bicycle path, a paved width of 8-12 feet is necessary depending on expected bicycle traffic, anticipated pedestrian traffic, and pathway alignment. One direction pathways should have a minimum width of 5 feet and a minimum 2-3 foot wide-graded area on both sides of the pathway pavement.

### **Bicycle Facility Locations and Linkages**

Figure 4 of this Circulation Plan indicates the recommended locations where bicycle facilities should be developed.

In general a bike lane should be constructed within the roadway on two-lane roads, and an off-road bike path should be constructed along roads with more than two travel lanes. The design and layout of such facilities should be subject to the specific conditions of the street and abutting properties and development.

Mercer County Park has an extensive bike pathway system, which extends along the sides of Lake Mercer. This county system is beneficial to West Windsor bicyclists. The Township Bikeway Plan identifies a pathway to connect to this County system to make the existing County system more accessible to bicyclists. The proposed conceptual County bike system extension is shown on the Township Bikeway Circulation Map.

A pedestrian bikeway linkage is under development along Bear Brook Road from the train station to Meadow Road as part of the Estates at Princeton Junction project. This bikeway should be extended to Route 1 and Canal Pointe Boulevard along Meadow Road. Other such bikeways should be developed as large projects are constructed. The Bear Creek developments have a comprehensive pedestrian bikeway network as well. Special bicycle and pedestrian amenities have also been incorporated into the design of collector roads with median islands. Attention to pedestrian and bicycle mobility and accessibility must be paid in every roadway project and site plan approval in order to have a comprehensive plan.

## SECTION V - CIRCULATION PLAN ELEMENT

The Township bikeway plan is comprehensive and designed to provide bikeway linkage throughout the community. Because of the cost of providing such a comprehensive plan as well as the fact that additional or more appropriate bikeway routes are likely to be recommended by township bicyclists, a phasing schedule is established in order to implement the bikeway plan.

The phasing schedule targets a first phase basic bicycle network that provides designated bikeway routes where the greatest numbers of bicyclists are envisioned to travel. The basic network is designed to establish the framework for a comprehensive bikeway system. Access to schools, recreation centers, employment centers, the Princeton Junction train station, and the county park from established residential neighborhoods was considered vital to the basic bicycle system framework. Many of the bike lanes are existing or will be provided during the construction of planned roadway improvements. The bikeways, however, will require specific projects for their completion. It is recommended that the Township dedicate resources to study and design these pathways.

A project to use the PSE&G utility easement for a bikeway is moving forward. The Township is in the process of preparing plans and obtaining easements adjacent to the ROW, which will provide a direct linkage with the Mercer County Park.

The second phase bicycle network involves providing additional linkages from emerging residential and commercial areas to the basic system. No time frames are established for either implementation phase. However, it is anticipated that both phases can be implemented in a timely fashion and coordinated with the capital road improvement plans, as they are prepared.

### **Ancillary Bicycle Facilities**

To improve the quality of the proposed bikeway system, it is important to provide supplemental or accessory facilities. These facilities will make the bikeways more enjoyable, thus encouraging their greater use.

Bike parking facilities should be provided at various stopping points along the bikeway system for security and weather protection. For example, shopping centers, commuter parking at Princeton Junction, the municipal complex and employment centers should have adequate parking facilities that are conveniently located near building entrances or other highly visible areas which are self-policing. As noted by the American Association of State Highway and Transportation Officials, bicycle parking that is not properly designed will encourage bicyclists to use trees, railings, and other appurtenances for bicycle parking.

The Township should seek ways to encourage employers to provide bicycle-friendly accommodations for employees. These could include such things as bicycle lockers and racks, and shower and changing facilities.

This plan envisions adequate township capital budgeting to provide for continued connecting of missing minor links of sidewalk and bikeways or bike paths. Funding should also be pursued from the NJDOT. Dedicated funding for pedestrian and bicycle accessibility projects is allocated by the NJDOT and DVRPC, pursuant to the TEA-21 national transportation appropriations bill.

### ***Roadway Access and Curb Cuts***

This plan seeks to reinforce established local policy to continue sound highway access management procedures with respect to driveway spacing along Route 1 and the township's major arterial and collector road system. Its intention is to preserve the traffic carrying capacity of such roadways and

## SECTION V - CIRCULATION PLAN ELEMENT

to preclude multiple access points on all roadway classifications above local or minor collector streets. Depending upon a parcel's specific location, direct access to principal arterials, where other access alternatives are practically available, will be discouraged.

The NJ State Highway Access Management Code controls Route 1 access design. This Code defines the spacing of driveways, driveway widths and number, developer fair share contributions for State highway improvements and allowable traffic operation degradation permitted by developers. The Code heavily supports the use of reasonable alternative access, onto side streets for example, in lieu of driveways onto the heavily congested Route 1. The Code also supports the use of shared accesses and cross accesses to minimize the number of access points along the highway and encourage internal traffic movements rather than external movements to move between sites. Examples of this application within the Township include the shared and cross accesses between Princeton Marketfair, Carnegie Center West and other adjacent restaurant and hotel development, and the future shared access for Princeton Overlook and Carnegie Center West. The Township should continue to support shared and cross accesses for all site plan applications to which such a configuration is reasonable, particularly along arterial roadways. Like missing sidewalk links, individual cross accesses will lead to a comprehensive program, alleviating traffic congestion on these heavily traveled roads. Shared accesses have been of concern to property owners due to potential competition for parking spaces and the desire of commercial property owners to have recognition through its own driveway. Site planning in the Township has consistently supported the goal of reducing intensity of development parcels to preserve adequate parking facilities. In the interest of maintaining diminishing roadway capacity, standards to require shared and cross accesses for parcels fronting arterials and collector roadways should be developed. The County's future access management plan, discussed below, will potentially offer such standards for County roads. The Township should consider using the County and State access management plans to develop Township standards.

The County is in the process of developing a County Access Management Plan. They anticipate completing the plan by 2002. The County plan will be somewhat consistent with the State Code. The Township should take an active role in the development of this plan since it will restrict the Township's design authority during development approvals.

### ***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

## SECTION V - CIRCULATION PLAN ELEMENT

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.

The Township is also served by several New Jersey Transit bus routes (Routes 600, 603, 609 and 976). Additional route expansions are being evaluated by NJ Transit. The routes primarily service regional shopping areas, hospitals, large office complexes and major employers. These 600 series routes are regional routes, all with bus stops at Quakerbridge Mall in Lawrence Township. Route 600 travels from the City of Trenton to Plainsboro Township along the Route 1 corridor, servicing Princeton Marketfair, Carnegie Center, and the Princeton Junction train station in the Township. Route 603 runs from Lawrence Township to the City of Trenton to Hamilton Township, with stops at Nassau Park in the Township. Route 609 travels from Ewing Township to Lawrence Township via Trenton, with bus stops at Mercer County Community College and Mercer County Votechnical School in West Windsor. Route 976 is a Wheels route, specifically geared toward bringing people from high density housing to the train station to support an alternate means of public transportation.

Mass transit currently serves to bring people into the Township to shop and work and serves to bring residents to work in other cities. There is little transit service for the remainder of the residents traveling needs, except to Princeton on the Dinky service.

The Township should periodically evaluate the need for additional service to employment and retail areas to better serve its residents and workers. The Township should review site plans for the need for bus stops, particularly along the Route 1 and Route 571 corridors, and discuss requiring site plan applicants to coordinate with New Jersey Transit for such service.

### **Princeton Junction Train Station**

Parking and access to the Princeton Junction Commuter Station remains important to the overall circulation scheme for the Township. Currently, the New Jersey Transit and West Windsor Parking Authority parking lots operate at capacity during the weekdays. New Jersey Transit and the West Windsor Parking Authority provide daily and monthly permit parking.

The Princeton Junction Train Station services much of Mercer County's and part of Middlesex County's rail transit needs. In the 1990's the closest rail stations were in New Brunswick and Trenton, so many commuters traveled to Princeton Junction from Ewing, Hamilton Township, Lawrence Township, Princeton Township and Borough, Washington Township, Hightstown Borough, Cranbury Township, Plainsboro Township, South and North Brunswick Townships. In addition, Pennsylvania commuters may have chosen Princeton Junction Train Station over Trenton station.

A new station opened in neighboring Hamilton Township in 1999, and it is anticipated that a reduction in commuter traffic may be realized from areas such as Ewing, Hamilton and Lawrence Townships. As such, reducing parking at the Princeton Junction station for the construction of

## SECTION V - CIRCULATION PLAN ELEMENT

Vaughn Drive Extension may become more feasible. The peak travel times for people commuting to and from the station are prior to normal morning peak traffic hours and after evening peak traffic hours. Due to the roadway deficiencies around the station, such as at the Alexander Road and North Post Road intersection, the evening peak traffic failures last for several hours spanning both the rail traffic peaks and typical commuter peaks.

Bicycle and pedestrian access to the Princeton Junction Train Station is an important component of the Township's Circulation Plan in general, and of the Princeton Junction plan specifically. Improvements to bicycle and pedestrian facilities serving the Station should receive priority in the Township's consideration.

Regional demand for rail service will continue to grow as the area continues to develop. Clearly, the long-term solution to maintaining a workable commuter station and preserving the township peripheral road circulation scheme involves a regional solution. This long-term solution can only be realized by joining cooperative local, County and State efforts, and the construction of a new rail stop between Princeton Junction Station and New Brunswick and construction of park-and-ride facilities within the region, preferably outside the Township. West Windsor should support a future station in South Brunswick Township in order to achieve a more balanced mass transit accessibility program in the region.

### CIRCULATION PLANS OF SURROUNDING MUNICIPALITIES

Since traffic does not yield to municipal boundaries it is important that the township consider existing and proposed circulation plans of surrounding municipalities. For this reason, the circulation plans of the Princeton community, East Windsor Township, Washington Township, Lawrence Township, Plainsboro Township and Hamilton Township have been reviewed and are highlighted below:

#### *Princeton Community*

Princeton's Circulation Plan currently classifies Washington Road as a secondary arterial and Alexander Road as a major collector road. Alexander Road has the same classification in the Township while Washington Road is designated a major collector in West Windsor. However the use of these terms varies between municipalities. Princeton's typical roadway section for a secondary arterial is similar to West Windsor's major collector. The design traffic volumes also coincide. As such, West Windsor need not be concerned with the difference in classification.

#### *East Windsor Township*

The Hightstown Bypass was completed in 1999 in East Windsor Township to enhance their peripheral arterial roadway system. It will also serve to draw traffic away from development in the eastern corner of West Windsor. The intersection of Route 571 and Old Trenton Road was recently widened with turn lanes and provides much traffic capacity for exiting the Township to the Hightstown Bypass.

East Windsor roads that interface with West Windsor roadways are compatibly classified except for Dutch Neck Road. Dutch Neck Road is a major collector in East Windsor that intersects in West Windsor with Hickory Corner Road, a local street and South Lane, a minor collector. The character of development along Dutch Neck Road is comprised of continuous existing residences of higher density than West Windsor along the intersecting routes. Residents in this specific area of East



## SECTION V - CIRCULATION PLAN ELEMENT

Windsor will travel through West Windsor via South Lane and Village Roads to get to the regional malls on Route 1 at Quakerbridge Road and to Route 95 perhaps. This route will not typically be used as a regional through route because of the higher speed peripheral arterial road system that exists.

### *Washington Township*

The Washington Township Master Plan lists Hankins Road as a primary collector road with jurisdiction being transferred to Mercer County. Windsor Road is classified as a residential collector road and Robbinsville Road as a minor arterial road. Washington Township is also aggressively working to complete its town center. The town center plans include a new roadway connecting Route 33 to Route 130 from the Foxmoor shopping area to a midpoint between Route 526 and the Route 195 interchange. This could encourage regional traffic to use Robbinsville Road.

It should be noted that West Windsor Township classified Windsor and Robbinsville Roads as minor collector roads. These road classifications represent the township's intention to keep regional through traffic on arterial roadways that are intended to handle high volumes of regional traffic.

### *Lawrence Township*

Within Lawrence Township, construction of Grovers Mill Road was completed several years ago. Grovers Mill Road is a Clarksville Road extension behind the Quakerbridge Mall to Route 1 just north of the Route 295 interchange. This road provides a convenient parallel road system with Route 1 so drivers can avoid Route 1 during heavy morning congestion periods. However the roads in West Windsor that supplements this parallel system are secondary arterial roads, intended to serve access to local destinations including Carnegie Center and the train station.

Previously Lawrence Township envisioned a grade separated interchange where Grovers Mill Road intersects Route 1, with a connection to Province Line Road to the west of Route 1. It was West Windsor's position that the Route 1 intersection not be grade separated, but rather an at-grade intersection that allows only right-in/right-out turning movements and no cross-Route 1 movements. Mercer County and NJDOT supported this position. Lawrence Township has removed any further improvement to Route 1 at Grovers Mil Road and extension behind Mercer Mall from their Master Plan.

### *Plainsboro Township*

The Plainsboro Township circulation element designates Cranbury Road and Grovers Mill Road as rural roadways. Since these two roadways direct traffic into the historic Grovers Mill area, it is important to limit the amount of vehicular traffic moving through the area.

The West Windsor Circulation Plan designates these roadways as minor collectors and further notes that a two-lane system is most appropriate in this historically significant area.

### *Hamilton Township*

Of primary importance to West Windsor with regard to Hamilton Township is Hughes Drive.

## SECTION V - CIRCULATION PLAN ELEMENT

Hughes Drive links Quakerbridge Road and Old Trenton Road, and provides an important peripheral arterial road north-south connection. Without this link, regional traffic would be directed along New Village Road, which is designated as a principal collector road. The Hamilton Township plan classifies Hughes Drive as an arterial roadway.

### MEANS OF ROAD IMPROVEMENT FUNDING

A combination of public and private funding is required to implement an overall capital road improvement program. The various sources and mechanisms to attain such funding are described below.

#### *Capital Improvement Plan*

While previous sections of the circulation element addressed the planning rationale and concepts behind the circulation plan, costs for the various identified capital road improvements must also be addressed in order to allow for subsequent implementation of the plan. The Capital Improvement Plan (CIP) is a companion document to this circulation plan, which outlines the schedule and budget for implementing the improvements described herein.

The capital improvement program provides the basis for establishing private and public entities' (township, county, and state) financial obligations for the various improvements. The program also serves as the basis for the computing developers' pro rata contributions to the road improvements.

To achieve the anticipated private share of the identified capital road improvement costs, the Township should continue to update its established off-tract transportation road assessment program as the collection mechanism for the Capital Improvement Program. The off-tract road assessment program serves the entire township and is currently operational. The transportation model used for calculating the private off-tract assessment fee must be updated to reflect completed projects and actual or revised construction costs on an annual basis. The model also needs to be updated periodically to reflect changes to industry planning standards, such as trip generation rates.

Township improvements are to be supplied through subsequent adoption by the Township Council of a long range Capital Improvement Program and initiation of specific ten-year capital plans for road improvements. These funding programs should be derived from a prioritization of the projects identified within this Circulation Plan.

Bicycle and pedestrian facilities are considered to be an integral part of the roadway structure, and as such are an important part of the Capital Improvement Program. Costs of such facilities should be included in the Off Tract Road Assessment Program.

#### *Off-Tract Road Assessment Program*

An off-tract road assessment program, which superseded prior Township improvement district programs, provides for private participation of roadway improvements needed to support on-going site development. This program provides for the calculation and payment of fair share contributions by private developers for roadway improvements that are the financial responsibility of the Township and County. The primary tools used to facilitate this program are the Capital Improvement Program and the West Windsor travel demand model. This model is a series of computer programs that estimates the travel patterns of existing and expected development in West Windsor and translates that development into traffic volumes on the roadway network of West

## SECTION V - CIRCULATION PLAN ELEMENT

Windsor Township. These traffic volumes have been used to define areas of forecasted congestion and have helped shape the Township's capital improvement plan.

Another element of the travel demand model is a set of programs that allows the Township to determine the fair share infrastructure cost associated with a specific proposed development. In this manner, the Township can assess improvement fees commensurate with a development's impact, thereby maintaining adequate traffic circulation throughout the Township. The cumulative affect of this model is that the number of vehicle trips for a proposed development and all future development traveling through a specific improvement is calculated. The cost of the improvement is prorated to each of the future vehicles and assessed against the specific site development, consistent with the MLUL (NJ 40:55D-42), which establishes that the "proportionate or pro-rata amount of the cost of such facilities that shall be borne by each developer or owner within a related and common area shall be based on fair and reasonable standards." As part of this Circulation Plan update, the West Windsor travel demand model and the pro rata improvement cost assessment program were evaluated. The following is an assessment of these tools and a suggested course of action to upgrade the model's efficiency and to incorporate latest planning assumptions. Overall, the current model needs as a minimum to be updated to reflect the latest planning efforts incorporated in the Master Plan.

The existing Base Year network for the West Windsor Model is a 1996 Base Year. Several projects have been completed since the last update and have been added to the 1996 network, with interim validations completed in 1996 and 1997 by Garmen Associates to support the Timed Growth Control Staging Plan. While the ordinance implementing Timed Growth was struck down by the courts, the provision requiring an annual updated remains in effect. The estimation of future vehicle trips for vacant lots is directly associated with the zoning of such parcels. As such, the trip estimation program must be revised to coincide with any zoning changes approved by the Township.

The Township should continue to allow for and encourage developers to construct roadway improvements for a credit towards their pro-rata off-tract improvement fee. This may reduce administrative costs associated with designing and constructing road improvements and eliminate some risks inherent to roadway construction.

### ***County/State Improvements***

An interlocal service agreement was approved between the Township and the County which provides the necessary framework for financial resources to fund County road improvements in the Township. For a project to get a strong commitment from the County, it is suggested that the Township seek appropriate project priority on the County's Transportation Improvement Program (TIP) as well as to obtain annually, as necessary, project funding for those improvements in which a county obligation is required.

Discussions with the County and NJ DOT have reaffirmed the state's commitment to the Alexander Road bridge replacement and Route 571 (Princeton Junction) projects. Continuing discussions are needed to secure firm funding and schedule commitments for these projects.

Table V-1

**West Windsor Capital Improvement Plan  
Completed Elements, 1994-2001**

<b>Improvement Number</b>	<b>Location</b>	<b>Improvement Type</b>	<b>Improvement Description</b>
A-1	Route 1	Roadway	Roadway widening to 6 lanes
A-2	Route 1 / Alexander Rd	Intersection	Grade separated interchange
A-3	Alexander Rd / Carnegie Rd	Intersection	Traffic signal
A-4	Canal Pt. Blvd / Alexander Rd	Intersection	Widen and install traffic signal
A-5	Old Village Rd / Edinburg Rd	Intersection	Widen, curbs, sidewalk, traffic signal
A-6	New Village Rd	Roadway	Construct to 50 feet, curb, drainage, sidewalk
A-7	New Village Rd / Edinburg Rd	Intersection	Widen, curb, sidewalk, traffic signal
A-8	Route 571 / Southfield Rd	Intersection	Widen, curb, sidewalk, traffic signal
A-9	North Mill Rd Safety Improvement	Intersection	Safety improvement
A-10	Vaughn Dr / Alexander Rd	Intersection	Widen, curb, sidewalk, traffic signal
A-11	Quakerbridge Rd / Nassau Pk Blvd	Intersection	Turn lanes, curb, sidewalk, traffic signal
A-12	Village Rd (W of Penn Lyle Rd)	Roadway	Reconstruct to 30 feet, curb, sidewalk
A-13	Village Rd / Post Rd	Roadway	Widen, curb, sidewalk, traffic signal
A-14	Old Trenton Rd / Village Rd	Intersection	Widen, curb, sidewalk, traffic signal
A-15	Village Rd (E of Old Trenton Rd)	Roadway	Complete widening to 30 feet, curb, drainage, sidewalk
A-16	N. Post Rd (N of Clarksville Rd)	Roadway	Road bed improvements, curb, drainage, sidewalk
A-17	Southfield Rd (Rt 571 to Cranbury Rd)	Roadway	Widen, curb, drainage, sidewalk
A-18	Southfield Rd (Village Rd to culvert)	Roadway	Widen, curb, drainage, sidewalk
A-19	Edinburg Rd (New to Old Village Rds)	Roadway	Road bed improvements, curb, drainage, sidewalk
A-20	Old Village Rd	Roadway	Reconstruction, curb, drainage, sidewalk

Table V-2

**West Windsor Capital Improvement Plan  
2002-2007**

<b>Improvement Number</b>	<b>Location</b>	<b>Improvement Type</b>	<b>Improvement Description</b>
B-1	Rabbit Hill Rd / Rte 571	Intersection	Widen for turn lanes, curbs, sidewalk, traffic signal
B-2	South Mill Rd	Roadway	Road bed improvements, curb, drainage, sidewalk
B-3	Rabbit Hill Rd / Cranbury Neck Rd	Intersection	Widen for turn lanes, curb, sidewalk, traffic signal
B-4	Rabbit Hill Rd	Roadway	Drainage, sidewalk
B-5	Southfield Rd / Village Rd	Intersection	Install traffic signal
B-6	Southfield Rd (Rt 571 to culvert)	Roadway	Road bed improvements, curb, drainage, sidewalk
B-7	Carnegie Center Connector	Roadway	Construct to 50 feet, curb, drainage, sidewalk
B-8	New Meadow Rd / Carnegie Ctr Connector	Intersection	Construct new intersection with traffic signal
B-9	New Meadow Rd / Meadow Rd (to Clarksville)	Intersection	Realign, widen to 50 feet, curb, sidewalk
B-10	Meadow Rd / Bear Brook Rd	Intersection	Widen for turn lanes, sidewalk, traffic signal
B-11	Bear Brook Rd	Roadway	Widen to 40 feet, curb, drainage, sidewalk
B-12	Route 1 / Meadow Rd	Interchange	Grade separated interchange, 2 traffic signals
B-13	Village Rd (W of Post Rd)	Roadway	Complete of road bed improvements to Quakerbridge Road
B-14	Nassau Park Blvd / Route I	Intersection	Remove traffic signal, jughandle, and reconstruct for right-in / right-out; implement mitigation measures within Route 1 / Quakerbridge Rd interchange and at Quaker-bridge Rd / Nassau Park Blvd intersection
B-15	Alexander Rd / N. Post Rd (at the bridge)	Intersection	Widen for turn lanes, traffic signal
B-16	Clarksville Rd / Meadow Rd	Intersection	Realign, widen for turn lanes, curb, sidewalk, install traffic signal
B-17	Quakerbridge Rd / Village Rd	Intersection	Widen bridge for turn lanes, realign, improve traffic signal
B-18	Alexander Rd / Vaughn Dr	Intersection	Widen for turn lanes, improve traffic signal
B-19	Vaughn Dr Extension	Intersection	Construct to 36 feet, curb, drainage, sidewalk, associated
B-20	Penn Lyle Rd, Arnold to Clarksville Rd	Roadway	Sidewalk, driveways, curbs
B-21	Old Trenton Rd/Dorchester Dr	Intersection	Widen for turn lanes, install traffic signal

**Table V-3**  
**West Windsor Capital Improvement Plan**  
**2008-2012**

<b>Improvement Number</b>	<b>Location</b>	<b>Improvement Type</b>	<b>Improvement Description</b>
C-1	North Post Rd at curve	Roadway	Realign, curb, sidewalk
C-2	Alexander Rd / N Post Rd / Wallace Dr	Intersection and Roadway	Realign, widen for turn lanes, curb, sidewalk as needed to service new bridge over the railroad
C-3	Alexander Rd railroad bridge	Roadway	Replace at current location, realign, and widen for two lanes, turn lanes, shoulders, sidewalk, and bike path
C-4	Alexander Rd (E of Railroad)	Roadway	Traffic calming and pedestrian crossings
C-5	Alexander Rd (W of railroad)	Roadway	Widening, curb, drainage, sidewalk
C-6	Route 571 (W of Clarksville)	Roadway	Widening to 60 feet: two lanes, center left turn lane, center median, shoulders, curbs, drainage
C-7	Clarksville Rd / Quakerbridge Rd	Intersection	Widen for turn lanes, revise traffic signal
C-8	Clarksville Rd (North of N Post Rd)	Roadway	Curbs, drainage, sidewalk, pedestrian crossings
C-9	Clarksville Rd / Penn Lyle Rd	Intersection	Improve pedestrian crossings
C-10	Clarksville Rd / Route 571	Intersection	Widen for turn lanes, curbs, drainage, sidewalk
C-11	Route 571 (E of Clarksville Rd)	Roadway	Widening, curbs, drainage, sidewalk
C-12	Route 571 / South Mill Rd	Intersection	Widen for turn lanes, curbs, sidewalk, revise traffic signal timing
C-13	Village Rd / New Village Rd	Intersection	Widening for turn lanes, curb, sidewalk
C-14	Route 571 – Bridge over railroad	Roadway	Restripe to 4 lanes, revise median; coordinate with the Penns Neck Bypass
C-15	Alexander Rd / Route 571	Intersection	Widen for turn lanes, curbs, sidewalk, modify traffic signal
C-16	Cranbury Neck Rd / Route 571	Intersection	Widen for turn lanes, curbs, sidewalk, traffic signal timing revisions; coordinate with the Penns Neck Bypass

SECTION V - CIRCULATION PLAN ELEMENT

**Table V-3 (continued)**  
**West Windsor Capital Improvement Plan**  
**2008-2012**

<b>Improvement Number</b>	<b>Location</b>	<b>Improvement Type</b>	<b>Improvement Description</b>
C-17	Millstone Bypass (railroad bridge to Route 1)	Roadway	New roadway construction; coordinate with the Penns Bypass
C-18	Millstone Bypass / Route 1	Interchange	Grade separated interchange; coordinate with the Penns Neck Bypass
C-19	Millstone Bypass (Route 1 to Washington Rd)	Roadway	New roadway construction; coordinate with the Penns Neck Bypass
C-20	Washington Rd / Millstone Bypass	Intersection	Intersection construction, curb, sidewalk, traffic signal; coordinate with the Penns Neck Bypass
C-21	Harrison Rd Connector / Millstone Bypass	Intersection	Intersection construction, curb, sidewalk, traffic signal; coordinate with the Penns Neck Bypass
C-22	Route 1 / Carnegie Center Blvd	Interchange	Remove signal, construct grade separated interchange or right-in / right-out access, evaluate secondary impacts on Roszel Rd, Meadow Rd, Canal Pointe Blvd, and Alexander Rd
C-23	Old Trenton Rd / Edinbug Rd / Windsor Rd	Intersection	Widen for turn lanes, realign, improve traffic signal
C-24	Old "Trenton Rd / Robbinsville Rd	Intersection	Widen for turn lanes, signalize
C-25	Clarksville Rd (Quakerbridge to Meadow Rd)	Roadway	Widen to 50 feet for 4 lanes, curb, drainage, sidewalk. Timing to be coordinated with development of the Wyeth Property
C-26	Clarksville Rd (Meadow to North Post Rd)	Roadway	Improve with shoulders and turning lanes, curbs, drainage, sidewalk
C-27	Meadow Rd / Canal Pointe Blvd	Intersection	Widen for turn lanes, install traffic signal,
C-28	Carnegie Center Blvd / Canal Pointe Blvd	Intersection	Widen for turn lanes, install traffic signal,
C-29	Route 1 / Nassau Park Boulevard	Interchange	Grade separated interchange to serve Nassau Park and Wyeth sites. Timing to be coordinated with development of the Wveth property.

Table V-4

**West Windsor Capital Improvement Plan  
2013-2017**

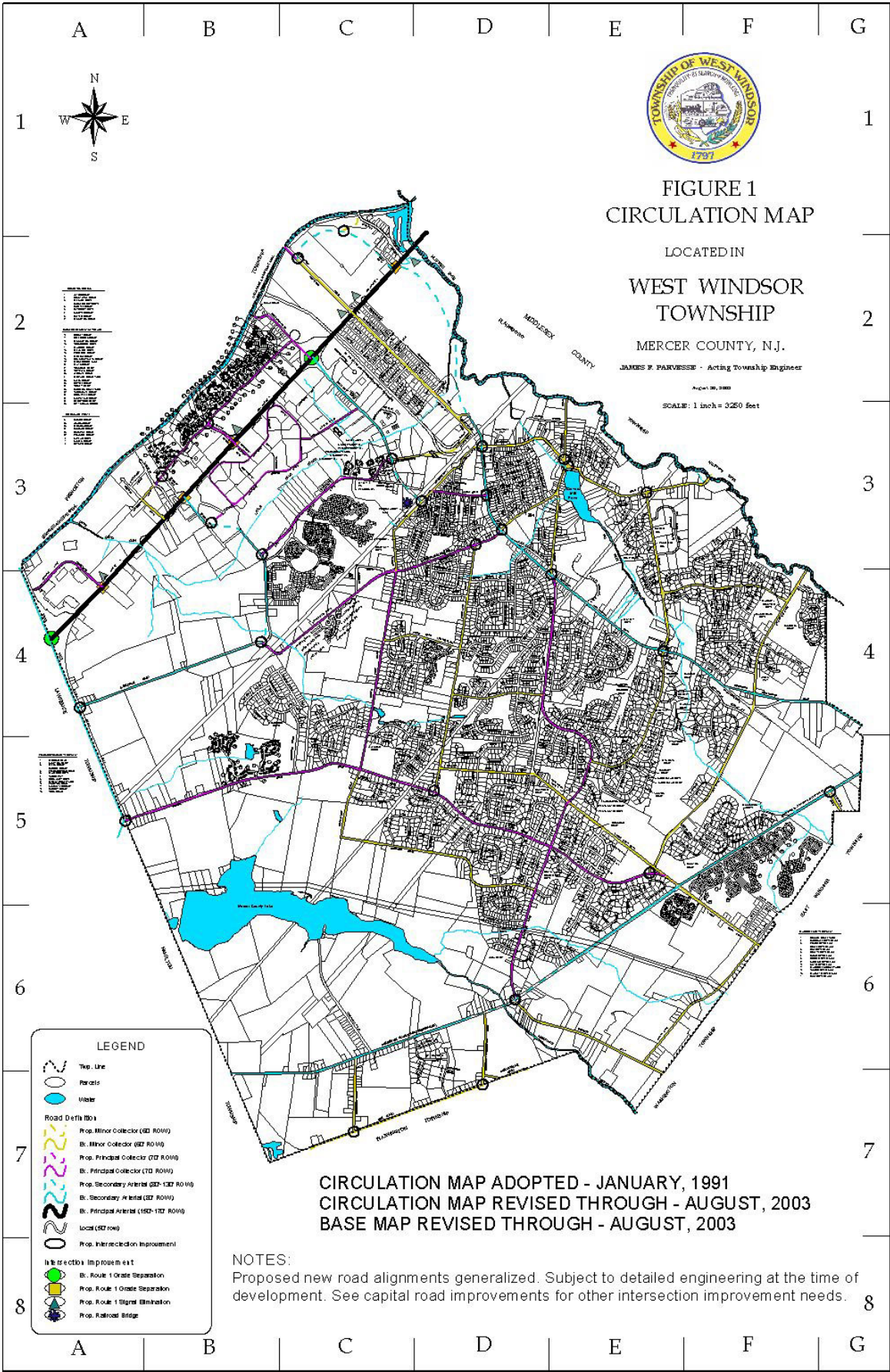
<b>Improvement Number</b>	<b>Location</b>	<b>Improvement Type</b>	<b>Improvement Description</b>
D-1	Old Trenton Rd	Roadway	Widen to 50 feet for 4 lanes, curb, drainage,
D-2	Old Trenton Rd (within Edinburg Village)	Roadway	Widen consistent with intersection improvement at Edinburg Rd, curb, drainage, sidewalk
D-3	Edinburg Road (N Village Rd to Old Trenton)	Roadway	Widening to 36 feet, curbs, drainage, sidewalk
D-4	Ward Road (N. Post to Penn Lyle Rd)	Roadway	New roadway, 30 feet wide, curbs, drainage, sidewalk



Table V-5

**West Windsor Capital Improvement Plan  
2018 and Beyond**

<b>Improvement Number</b>	<b>Location</b>	<b>Improvement Type</b>	<b>Improvement Description</b>
E-1	Clarksville Rd / Cranbury Neck Rd	Roadway	Widening for turn lanes, curbs, drainage, traffic signal
E-2	Cranbury Neck Rd (Rte 571 to Clarksville)	Roadway	Widening to 30 feet, curbs, drainage, sidewalk
E-3	Cranbury Neck Rd / Millstone Rd)	Intersection	Widening for turn lanes, curb, sidewalk, traffic signal
E-4	Cranbury Neck Rd (East of Clarksville Rd)	Roadway	Widening to 30 feet, drainage, sidewalk
E-5	N Post Rd (South of Clarksville Rd)	Roadway	Widening to 50 feet, curb, drainage, sidewalk, reconstruct Duck Pond Culvert
E-6	Penn Lyle Rd	Roadway	Widening to 36 feet, curb, drainage, sidewalk
E-7	Robbinsville Rd	Roadway	Road bed improvements curb drainage sidewalk
E-8	Windsor Rd	Roadway	Road bed improvements curb drainage, sidewalk
E-9	Line Rd	Roadway	Road bed improvements, curb, drainage sidewalk
E-10	Line Rd / Robbinsville Rd	Intersection	Widening for turn lanes, curb, sidewalk, traffic signal
E-11	Line Rd / Cubberley Rd	Intersection	Sidewalk, curb, traffic signal
E-12	Route 1 (Quakerbridge Rd to Meadow Road)	Roadway	Add lane in each direction
E-13	Route 571 (Clarksville Rd to Old Trenton Rd)	Roadway	Reserve right-of-way for 6 lanes, add turn lanes and shoulders



**FIGURE 1  
CIRCULATION MAP**

LOCATED IN  
**WEST WINDSOR  
TOWNSHIP**  
MERCER COUNTY, N.J.

JAMES P. PARVESSE - Acting Township Engineer

August 30, 2003  
SCALE: 1 inch = 3250 feet

**LEGEND**

	Thru Line
	Parcel
	Water
<b>Road Classification</b>	
	Prop. Major Collector (40 ROW)
	B. Major Collector (30 ROW)
	Prop. Principal Collector (70 ROW)
	B. Principal Collector (70 ROW)
	Prop. Secondary Arterial (100-120 ROW)
	B. Secondary Arterial (100-120 ROW)
	Prop. Arterial (150-170 ROW)
	B. Arterial (150-170 ROW)
	Local (50 ROW)
	Prop. Intersection Improvement
<b>Intersection Improvement</b>	
	B. Route 1 Grade Separation
	Prop. Route 1 Grade Separation
	Prop. Route 1 Signal Elimination
	Prop. Railroad Bridge

**CIRCULATION MAP ADOPTED - JANUARY, 1991  
CIRCULATION MAP REVISED THROUGH - AUGUST, 2003  
BASE MAP REVISED THROUGH - AUGUST, 2003**

**NOTES:**  
Proposed new road alignments generalized. Subject to detailed engineering at the time of development. See capital road improvements for other intersection improvement needs.

