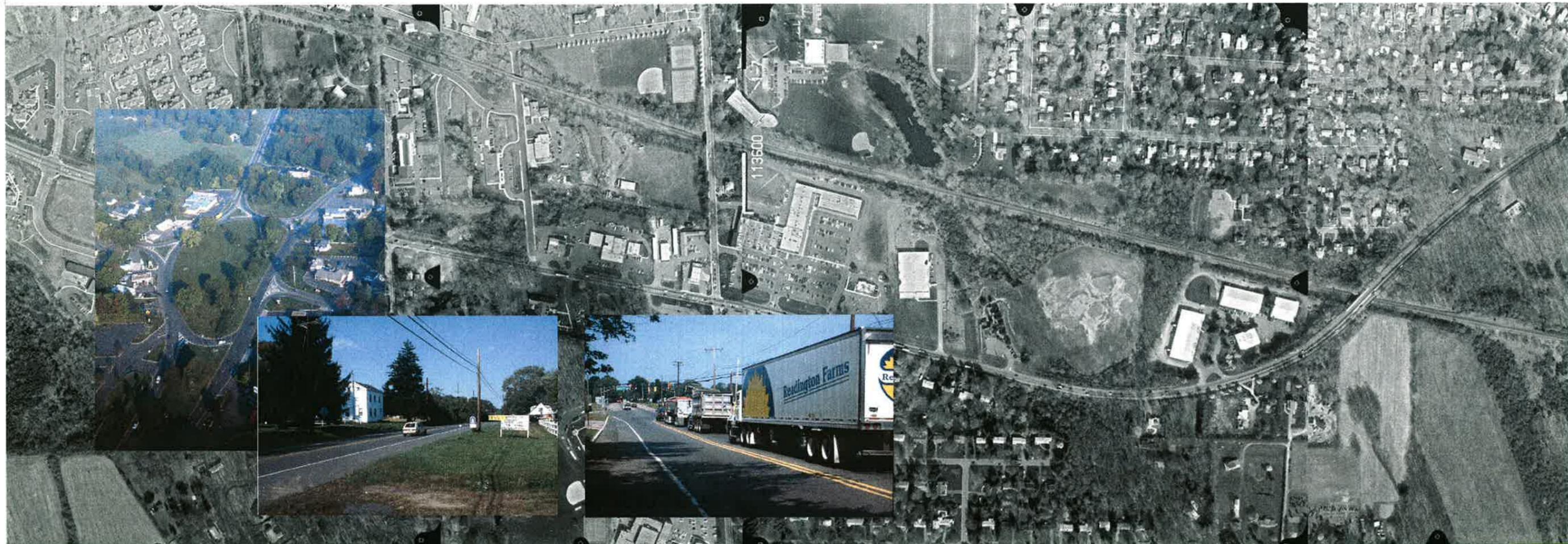


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Rt. 31 Design Study

**Dodson Associates would like to acknowledge the important assistance and participation of all those residents and interested community members who contributed their time and ideas to the three public meetings/workshops.**

**The Consultants also thank the following for their help:**

#### **Hopewell Township**

##### **Hopewell Township Planning Board:**

Michael Aucott, Chair and Env. Comm. Member; Jon Edwards, Mayor; Marylou Ferrara, Township Comm. Member; William M. Connolly, III; Joan Kiernan-O'Toole, Secretary; Michael P. Bolan, P.P., Planner/Banisch Associates, Inc.; Paul Pogorzelski, P.E., Engineer/Van Cleef Engineering

##### **Township Committee:**

Jon Edwards, Mayor; Marylou Ferrara; Bob Higgins, Deputy Mayor; Fran Bartlett; Vanessa Sandom; Christine Smeltzer, administrator

Edmund "Ted" Stiles, Chair, Environmental Commission & Open Space Advisory Committee

Horatio "Ray" Nichols, Environmental Commission

David Blackwell, Chairman, Historic Preservation Commission

Joseph Kowalski, Former Chairman, Mayor's Task Force for Traffic & Trucking

Bill James, Masterplan Advisory Committee on Rte 31

Ms. Joan Hall, Chair, Masterplan Advisory Committee on Rte 31

#### **Borough of Pennington**

##### **Planning Board:**

Winn Thompson, Chair; Robert Hough, p.c., Engineer; James Lytle, Council Member; Jeanne Donlon, Vice Chair; James Loper, Mayor; James Maul; Pam Cain; Maureen Hasset; Ernst Kovacs; William Meytrott; Katherine O'Neill; James Reilly; Tamara L. Lee, Planner

Karen Waldron, Borough Administrator

#### **Hopewell Valley Regional School District**

Norman Torkelson, Director of Facilities & Transportation

#### **Mercer County**

Donna Lewis, County Planning Director  
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#### **State of New Jersey**

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#### **Business People/Stakeholders**

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David Agins (overpasses/pedestrian bridges)

Glenn S. Gabai, Pennington Family Chiropractic

## **Route 31 Study Report**

### **Prepared For:**

Hopewell Township  
Borough of Pennington

December 2002

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The Rt. 31 Design Study was funded through a Smart Growth Planning Grant from the New Jersey Department of Community Affairs. It was jointly applied for by Hopewell Township and Pennington Borough. Hopewell Township provided additional funding support.

Building on previous work by the Master Plan Advisory Committee on Rt. 31 and by the Mayor's Truck and Traffic Task Force ( Hopewell Township) this study was intended to develop a shared community vision for the future character and "look and feel" of the Rt. 31 Corridor. A series of three public meeting/workshops were held and participated in by literally hundreds of area residents and stakeholders.

A General Improvements Plan for the Corridor is one product of the grant that has been included as Chapter 2 of this report. A second important product of this collaborative process between the Consultants and the Township, Boroughs, Mercer County and State Agencies such as NJDOT has been development of a set of detailed Design Options, Design Guidelines and specific short and long term Recommendations for dealing with growing congestion and safety problems along critical areas of the Corridor. These are included as Chapters 4 and 5 of this Report.

A major objective of the project was to identify ways of preserving the parts of Route 31's character that were identified as particularly valued by residents while also finding ways to keep it from dividing the Township and Pennington Borough with a highway strip dominated by vehicles.

**Recommendations by the Consultant Team Based on the Rt.31 Study Public Workshops and Written Comments**

- Preserve and enhance the existing character of Rt. 31's different segments by making this the character benchmark for all future improvements or development.
- The priority should be to keep traffic on Rt. 31 rather than displacing it onto local or County roads.
- Prevent incremental development of an unbroken corridor of strip development dominated by vehicles and so sprawling as to require their use. Instead create and maintain distinct, compact nodes of development (neighborhoods, the "Center") separated by protected intervals of open space, fields, woods and views that incorporate watershed drainages and existing or proposed trail linkages.
- Work to give the Rt. 31 south of Pennington Point the character of a Pedestrian friendly "Main Street" or Boulevard using buildings and trees close to the street to give a pleasing human scale and to calm through traffic. It should not be a high speed conduit for through traffic that cuts the community apart and requires screening and separation from the surrounding neighborhoods.
- Increase slow but steady traffic throughput as opposed to excessive speed to screaming stop conditions. In this context four lane slouctions with medians planted with trees could add extra capacity without increasing pedestrian/vehicle safety conflicts. Work to generally lower maximum speed to 35 m.p.h. with

transition zones off of I-95 and down to intersections, circles, roundabouts, turning lanes, etc..

- Prioritize improvement or elimination of the many extended areas of dangerous conflicts in turning movements; "taking your life in your hands to make a left hand turn" was one of the most common workshop comments.
- Preserve existing residential scale (and affordable) housing stock located directly on Rt. 31 from I-95 to Diverly Rd. and from the "Circle" north to the Railroad Overpass. Consolidate and eliminate curb cuts wherever possible in these stretches. Commit to adding no new curb cuts that are not consolidations in these areas.
- Work to create clear and attractive gateways to Pennington Borough and its Central Business District off of the Rt. 31 corridor at the West Delaware intersection - especially for those travelling Rt. 31 for the first time or unfamiliar with the area. Pennington does not want its "face" on the road to be an uncoordinated and undervalued area of strip malls (although it does want it to be its contact area for regional vehicular traffic and high volume uses) . The current area between the Conrail tracks and Rt. 31 to the west should be redeveloped over time to form a mixed-use center that is much more integrated into and part of the Main Street, Pennington core. Rather than providing competition to the Main Street businesses this area could accommodate a central parking structure that would add commercial vitality and increase walk-in trade throughout the entire core.

This kind of opportunistic and uncoordinated strip is also at odds with

encouraging a walkable and bikeable village area that incorporates both sides of Rt. 31 from Pennington Main Street in the east to the Schools and Libraries in the west. Enabling these alternative means of transit and a form of development that is compact enough to work with them will do its part in reducing congestion on the Rt. 31 corridor.

- It is imperative to create a safe crossing at the Rt. 31 and West Delaware intersection. This could be on grade with crosswalks whose materials extend the sidewalks across Rt. 31 and where adequate refuge islands are provided. If this is not possible then there was much interest in the Community in exploring either an aesthetically designed overpass or even an underpass if it could be well lit, safe and deal with drainage problems at this low point intersection. As the area between the Conrail tracks and Route 31 (and including the former landfill site) is redeveloped as a mixed use area - possibly incorporating a garage and a new Pennington Station for future commuter train use - there may be possibilities for combining an overpass with a second floor "gallery" or "sky walk" connecting the second floors of businesses along West Delaware from the Conrail tracks west over Rt. 31 to connect to the businesses and educational core of schools and library to the west. In this long term scenario the use of public elevators in the new garage or as part of new buildings closer to the Route 31 R.O.W. should be explored as an alternative to the long and divisive ramps necessary to reach an overpass deck height of 15 feet above the road while still meeting accessibility requirements.
- In all areas of Rt. 31 it is imperative to limit new curb cuts and to consolidate old ones. In Segment 4 from CR 518 to the Traprock RR overpass

this primarily involves limiting new residential curb cuts onto Rt.31 and encouraging coordinated rear access lanes connecting to existing side roads instead. From 84 Lumber south all the way to I-95 this means continuous linked parking lots between neighboring commercial/retail as well as separate frontage or reverse frontage roads should be created wherever possible. "Through access easements" should be required to link side and rear parking lots and service areas of different businesses and ownership parcels.

- Investigate a divided "boulevard" approach, possibly combined with roundabouts as an alternative to a concrete Jersey Barrier median and excessive traffic lights as has been done further to the north.
- The need for safe, clear and convenient Pedestrian Crossings was identified as of critical importance. From south to north these include:
  1. From the new Lehigh shopping Center across Rt. 31 to the west.
  2. From Blackwell ( CR 546) to Washington Crossing-Pennington Road across or around the "Circle".
  3. At the Ingleside Road/ Rt. 31 intersection.
  4. Most importantly as mentioned above, at the West Delaware and Rt. 31 intersection to allow safe pedestrian and bicycle crossings from the Pennington Borough core to the school and library core to the west of Rt. 31.
  5. At Pennington Point to link the Pennington Point -East and -West in a way that creates refuges for slow crossers and also creates an attractive northern gateway to Pennington Borough via N. Main (or, possibly, Knowles Rd.).
  6. From Titus Mill Road across Rt. 31 to the west. This is important to link the Stony Brook-Millstone

Watershed Association farm and open space area with potential new conservation land near the Traprock Quarry and beyond to the existing and proposed County Open Space network further to the west.

7. At the CR 518 and Rt. 31 intersection at the extreme northern edge of the corridor, including provision for a trail crossing coming in from the west of Rt. 31 and along the southern edge of the wetlands south of WaWa's and continuing east of Rt.31.

- The Borough and Township together with the large corporate employers in the area should make it a priority to link the proposed new 20 mile peripheral bike trail into the area between West Delaware Ave. and Broemel Place. Facilities for safe and convenient bicycle parking should be provided here. This will bring commercial vitality to the whole area and help emphasize a single, unified "Center" stretching from the schools west of Rt. 31 all the way to the aMain Street core in Pennington.
- Evaluate creating a low impact bicycle and walking trail link to the peripheral loop from a Stony Brook Crossing and through the area south of Lewis Brook to new or improved crossings of the Conrail tracks at either Broemel Pl., West Delaware or in between the two and connecting to the redeveloped former landfill site. It would be critical to do this in such a way as not to degrade the environmental potential of Lewis Brook.
- Control Signage with good and clear standards and bylaws supporting coordinated systems that give business owners an effective and attractive way to advertise closer to the traveled way without depending on large parking lots in front of the building as a form of advertising or on

large signs at the face of deeply set back buildings.

- Re-examine existing spatial standards, architectural standards, architectural and design guidelines for the corridor including signage. Integrate new standards following the detailed guidelines for different segments of the Rt. 31 Corridor included in Chapter 6 into appropriate elements of the Hopewell and Pennington Masterplans and Zoning Codes.
- Adopt standards and guidelines that discourage the predominance of new drive-through establishments in an area where everyone acknowledges existing traffic congestion and safety problems. Create incentives for more human oriented, streetscape type development and more appropriate development types, architectural scales and building/road relationships.
- Create incentives and expedited permitting for those site plans which encourage coordinated planning, linkage and through access easements between multiple property owners. Explore whether a community initiative should be encouraged by Pennington Borough and Hopewell Township to create what in some states is called a "specific plan" for the Segment 2 area north and south of West Delaware and west of the Conrail tracks. This involves the entire community of property-owners,, residents, businesspeople and municipal staff in developing an approved plan for an area involving multiple ownerships where if any one owner comes in with a proposal that meets the requirements of the plan then they are assured of incentives and an expedited and predictable approval process.
- Any new roadway design for Rt. 31

should try to preserve and incorporate existing mature street trees in the area to the greatest extent possible. This is particularly true of segment 1 from I-95 to the Conrail overpass where the existing R.O.W. might have to be widened, most probably along the west side of the roadway from I-95 to the Circle to allow new forms of residential development set further back from the road. Careful attention in these areas can work the existing tree rows into areas of proposed future verges or street tree belts, thereby preserving a very important element of this areas visual character.

Increasing development pressure in the area will inevitably lead to increasing pressure on the Rt. 31 corridor, its existing character and its potential to become a safer and more unified walking Center for bot Pennington Borough and Hopewell Township. However, in the context of the current NJDOT evaluation of potential designs and with creative and even-handed thinking from residents, stakeholders and corridor users the Consultants believe it is possible to deal with traffic congestion and safety issues while also making it more livable and attractive.



The Route 31 Design Study represents the latest effort by residents and business-people of the Hopewell Valley to shape the future character and form of this 7.5 mile corridor through Hopewell Township and Pennington Borough. The corridor stretches from the Rt. 31 and I-95 interchange in the south to the intersection of Rt. 31 and CR 518 (the Hopewell-Lambertville Turnpike) to the north.

The project comes at a time of unprecedented growth along the corridor, growth which has accelerated the need to deal with issues of increased traffic, dangerous turning movements, and hazardous conflicts between trucks, cars, and pedestrians. Intersections are becoming overloaded, with backups that can force local residents to wait through five cycles of a traffic light.

The traffic delays and hazards to life and limb have created great pressure to do something about the situation. The simplest solution is to widen the highway, upgrade intersections with turning lanes and additional signals, and install jug handles and concrete medians to control turning movements. Yet each of these improvements, while solving one problem, create another set of functional and visual issues. Following this trend, commercial centers such as that surrounding West Delaware Ave., will become increasingly dominated by chain stores fronted by parking lots.

The highway itself will grow to four lanes, divided by a concrete median, with center turning lanes and jug handles. While through-traffic will move better, Rt. 31 will increasingly become a barrier to movement across the town, and from the old center of Pennington Borough to the schools and library. Few pedestrians will care to walk between adjacent commercial uses, much less from one neighborhood to another.

These trends and issues were apparent as the township completed its recent



*An aerial view of a section of Rt. 31 North of Hopewell near Ringoes, including a jughandle and concrete median divider, demonstrates improvements that focus on vehicular convenience and throughput.*

Master Plan, which laid the ground work for more detailed study of the Rt. 31 Corridor. Following a joint application by Hopewell Township and Pennington Borough, the Rt. 31 Design Study was funded through a Smart Growth Planning Grant from the New Jersey Department of Community Affairs. Hopewell Township provided additional funding support.

The Consultant Team included Brock Cutting and Peter Flinker of Dodson Associates, Landscape Architects and Planners, and Bob White and Jake Owens of the Office of Robert A. White. Building on previous work by the Master Plan Advisory Committee on Rt. 31 and by the Mayor's Truck and Traffic Task Force (Hopewell Township), this study was intended to develop a shared community vision for the future use, function, and "look and feel" of the Rt. 31 Corridor.

An extensive public participation process involved local citizens and business owners in planning for the corridor. A series of three public workshops was held at the Hopewell

Township Municipal Center between the months of October of 2001 and March of 2002. A separate presentation and meeting was held with businesspeople from the Rt. 31 Corridor and from Pennington Borough and Hopewell Township in general. Each public meeting was attended by over 100 area residents and stakeholders, and over 200 people contributed their time and expertise to the project

As described in this report, the ideas and plans that resulted represent a broad-based consensus on the future use and character of the corridor. These include both general goals and specific physical objectives for the corridor, and many detailed ideas for how these goals can be achieved. While these overall goals are clear, however, there is still considerable work to do to evaluate the many options for specific improvements to the corridor, such as whether to replace conventional signalized intersections with roundabouts. This report thus includes many options and alternatives for each segment of the corridor, designed to support

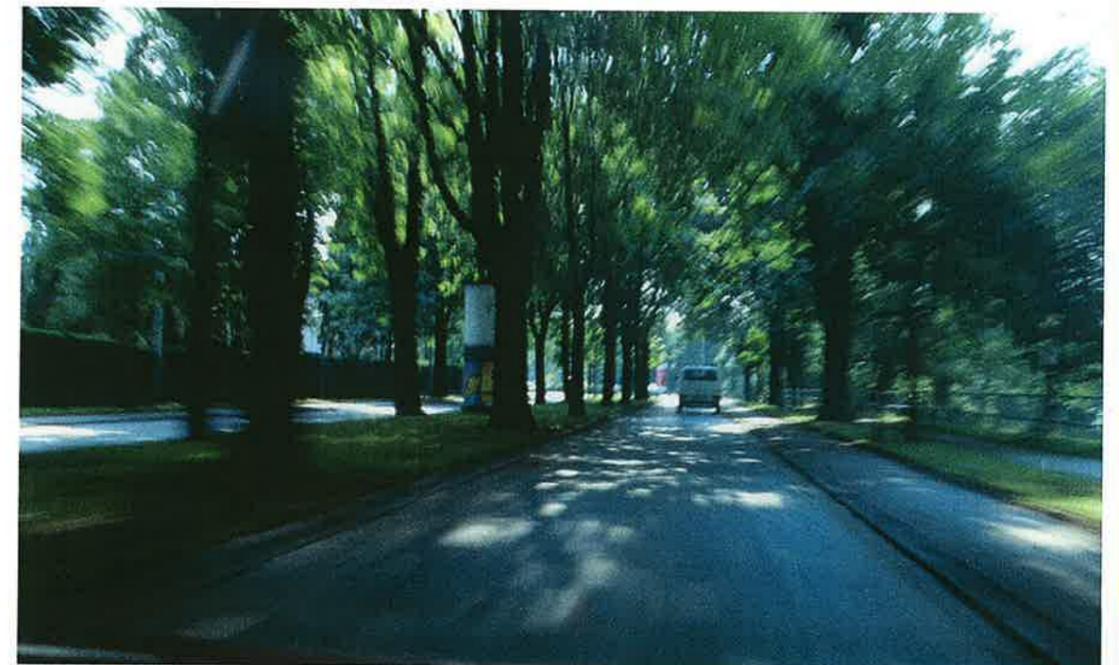
informed decisions about each segment.

The over arching ideas for the corridor are described in the General Improvements Plan which forms Chapter 2 of this report. A second important product of this collaborative process between the Consultants and the Township, Boroughs, Mercer County and State Agencies such as NJDOT has been development of a set of detailed Design Options, Design Guidelines and specific short and long term recommendations for dealing with growing congestion and safety problems along critical areas of the Corridor. These are included as Chapters 4 and 5 of this Report. Comments received in the public workshops are recorded in Appendix A.

The major objective of the project was to identify ways of preserving the parts of Route 31's character that were identified as particularly valued by residents while also finding ways to keep the Township and Pennington Borough from being divided

by a highway strip dominated by vehicles.

By the end of the public participation process a clear consensus emerged to ask NJDOT to seriously consider and evaluate the select number of transportation design options provided here for the actual highway, as well as the recommended improvements to the areas adjacent to it. Deciding what the community wants the future character and traffic design of Rt. 31 to be also involves deciding on whether Pennington Borough and Hopewell Township share a "village" center, and if so whether this area should be strongly and safely (as far as non-vehicular traffic) tied to the area between the Conrail tracks and Rt.31 near West Delaware and to the areas of shared civic core of schools and library beyond. In Hopewell Township the Planning Board recently went on record with a motion emphasizing that it felt Rt. 31 should evolve in a more compact and coordinated pedestrian-friendly manner as opposed to being viewed as a conduit to be optimized solely as a high speed throughway.



*A different approach was taken with this boulevard in Germany, where travel lanes are divided by a wide median with mature trees, and a separate sidewalk and bike path accommodate pedestrians and bicycles.*

Existing Conditions Along the Rt. 31 Corridor

Designation of Corridor Segments

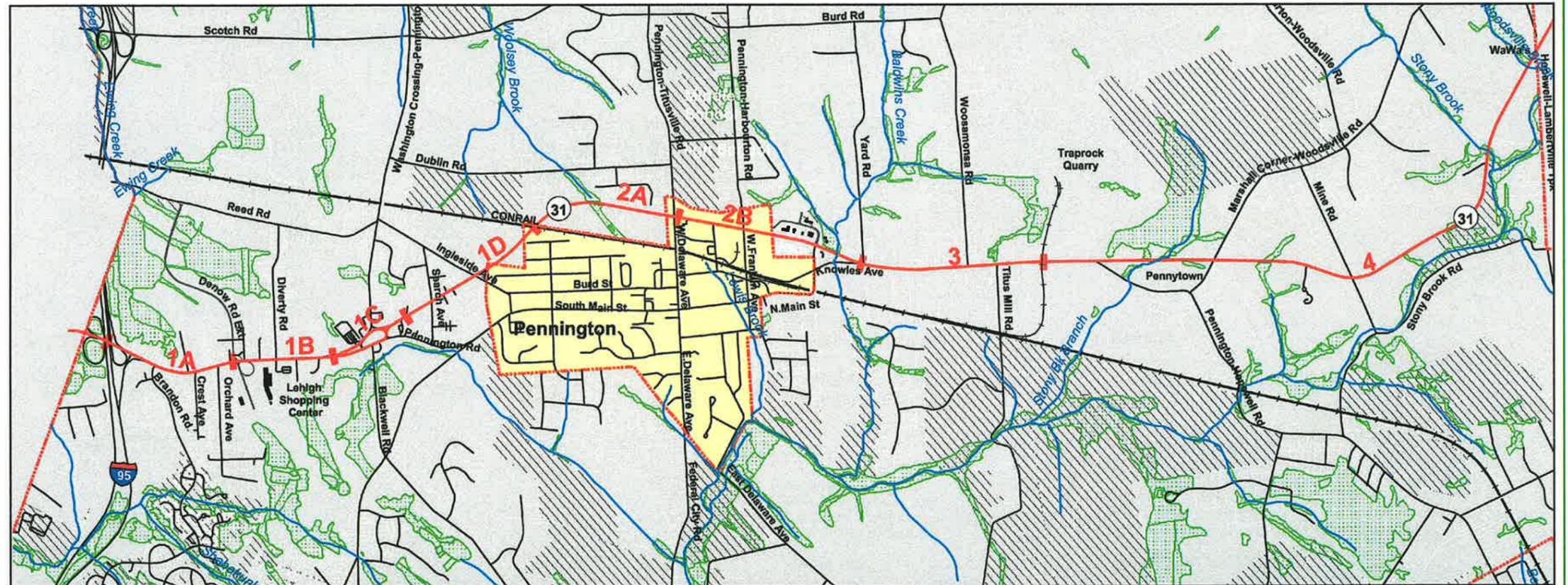
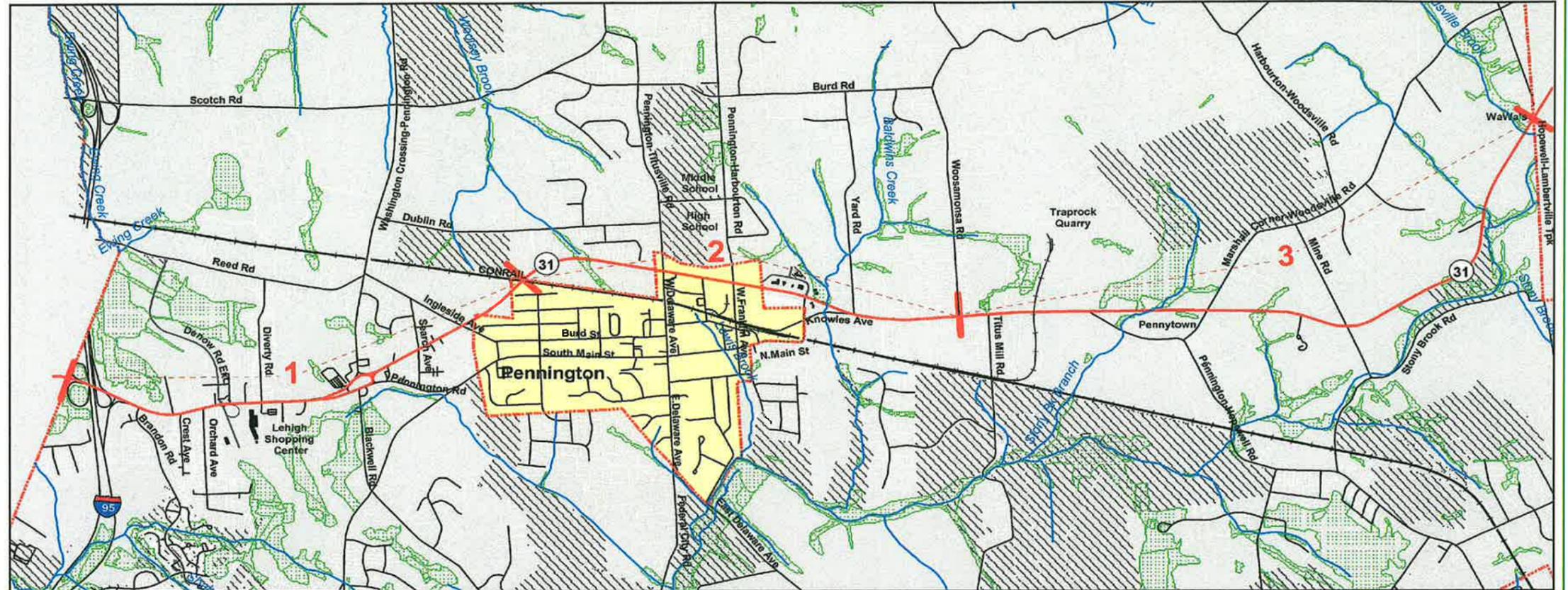
The Master Plan Advisory Committee established three segments of the Rt. 31 corridor to help organize the initial discussion of the project (map, top right). Segment 1 started at the I-95 interchange and extended north to the Conrail Overpass. Segment 2 went from the overpass to Woosamonsa Road. Segment 3 extended from Woosamonsa Road north to the Hopewell-Lambertville Turnpike.

In order to better organize more detailed planning for the corridor, a modified map of corridor segments was prepared (map, bottom right). This scheme reflects both the uses and visual character of each area along the corridor.

Segment 1 extends from I-95 to the Conrail Overpass, but has been divided into four sub-segments. Sub-segment 1A runs from I-95 to the Intersection of the proposed new Denow Rd and entrance to Lehigh Shopping Center. Sub-segment 1B extends from New Denow Road to the South end of the "circle." Sub-segment 1C includes the entire "circle" and its approaches, while Sub-segment 1D runs from the North end of the circle to the Conrail Overpass.

Segment 2 includes the area of Rt. 31 that is adjacent to or within the Borough of Pennington. Sub-segment 2A begins at the Conrail overpass and ends at W. Delaware Ave. Sub-segment 2B runs from there North to Yard Road.

Segment 3, a transitional area between the village and more rural areas to the North, extends from Yard Road to the railroad overpass from the traprock quarry. Segment 4 extends from the quarry railroad overpass to the Hopewell-Lambertville Turnpike (CR 518).



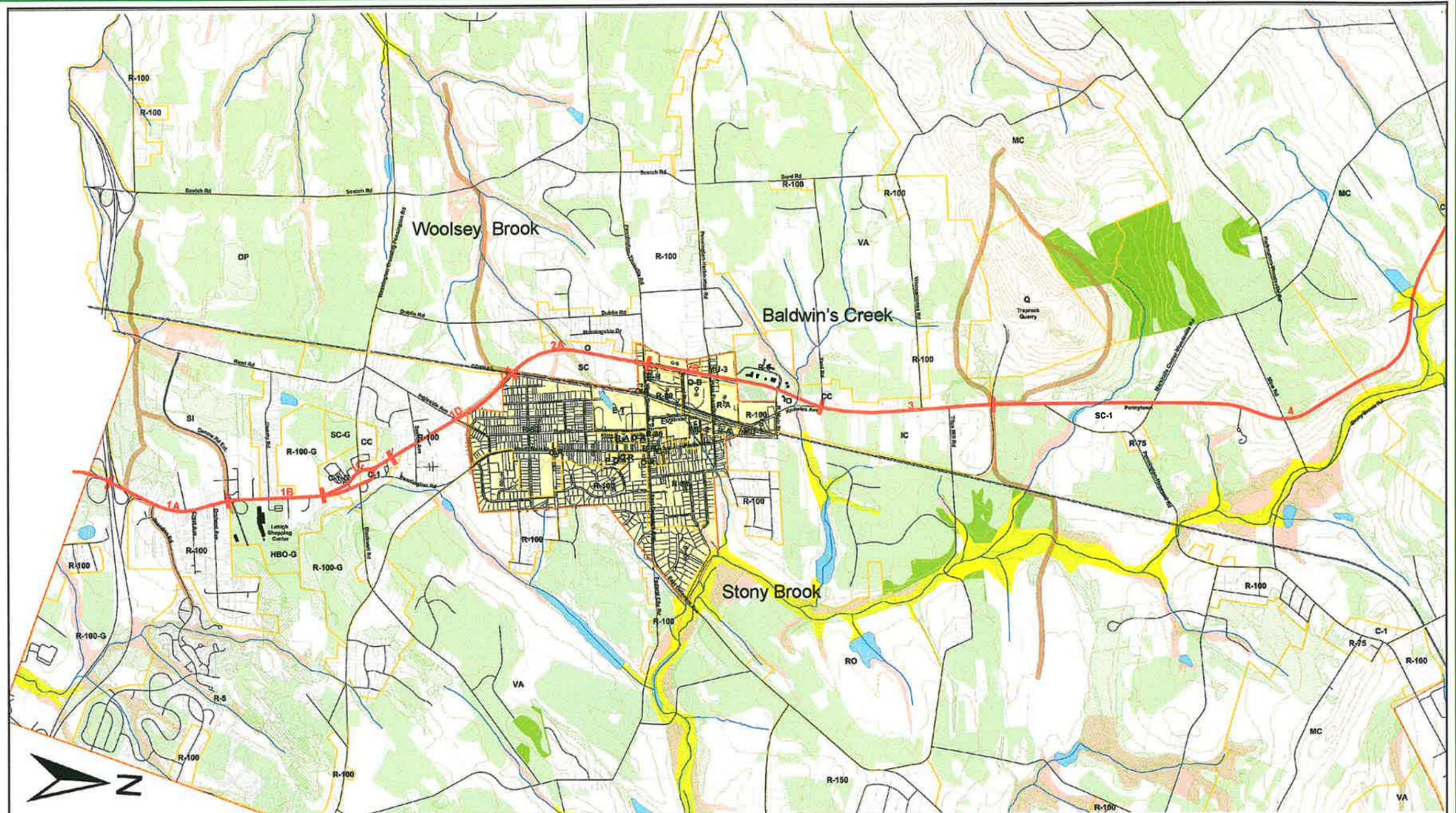
## Natural Resources in the Route 31 Corridor

Route 31 traverses a relatively flat agricultural landscape, until fairly recently dominated by farms. As shown by the green areas in the map at right, productive agricultural land still covers a large area -- though this map does not reflect some of the more recent residential and commercial development.

Other natural resources in the area include wetlands, streams and water bodies. Three principal stream/wetland systems drain the corridor. Woolsey Brook flows west from Pennington Borough, while Baldwin's Creek flows east, passing under Rt. 31 before merging with Stony Brook, which drains a large area east of Pennington. As indicated by green hatched areas on the map, most of the wetlands in the study area are along these streams or their tributaries. These wetlands are dominated by narrow, forested drainages that divide areas of agricultural land. With relatively flat topography and impervious soils, most of the area is slow to drain.

Areas where runoff is concentrated are prone to periodic flooding. Flood prone areas documented by USGS are indicated by the yellow areas on the map; additional undocumented flood prone areas are shown in pink. With the exception of a large area north of Pennington-Hopwell Road east of Penntown, most of these are relatively narrow ravines that follow the brooks.

Conceptual trail corridors proposed by Hopewell Open Space Committee are shown in brown. For the most part these are designed to follow the natural stream corridors and connect protected open space areas. For the purposes of corridor planning, the most significant of these are trails passing through the woods and wetlands along I-95, a trail running west from Pennington along Woolsey Brook, and trails connecting east and west from the old rail access to the traprock quarry.



## Route 31 Corridor Productive Agricultural Land Floodprone Areas and Wetlands

0 800 1,600 3,200 4,800 Feet

Sources:  
State of New Jersey  
County of Mercer  
Township of Hopewell  
Borough of Pennington

Prepared by:  
Dodson Associates, Ltd.  
Landscape Architects and Planners  
Ashfield, Massachusetts

January 2002

### Legend

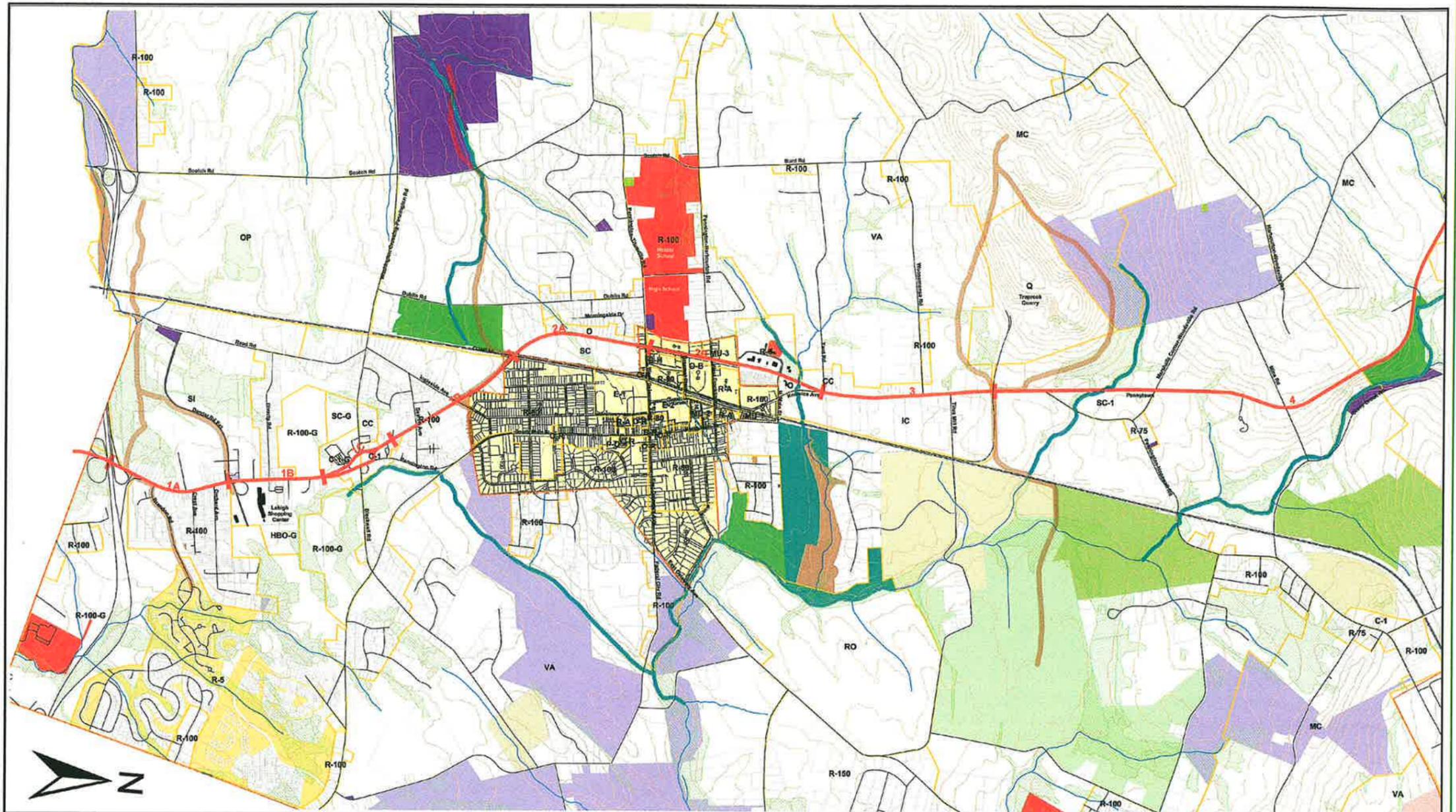
	Streams		Zoning Boundary
	Conrail		Parcels
	Route 31		<b>LABEL</b>
	Roads		USGS Documented Floodprone Area
	Segment Breaks		Undocumented Floodprone Area
	Proposed Trails		Water
	Contours (20 foot Interval)		Productive Agricultural Land
	Township Boundary		Preserved Farms
	1995 Wetlands		
	Borough of Pennington		

## Preserved Lands in the Route 31 Corridor

The outlying edges of the corridor are studded with a series of parcels that are already protected. The most significant effort in conservation has been along Stony Brook and its tributaries, where a patchwork of open space has been protected by Mercer County, the D&R Greenway, the Stony Brook Millstone Watershed, and the Township of Hopewell.

While a fair amount of land has been preserved in the area, little of it is directly visible from Rt. 31, except for one parcel at the north end of the corridor. Wetlands, indicated with green cross-hatching, follow the streams and intersect Rt 31 at several points. Protected by state and federal law, these streams and wetlands form the core of a potential open space network connecting larger areas of protected land -- but although protected from outright development, wetland areas are still prone to disturbance over the long term unless officially designated for conservation through acquisition or easement.

Included in this inventory of protected land are parcels containing Hopewell's public schools and library. Shown in red, the most significant of these are the Middle School and High School properties on the opposite side of Rt. 31 from Pennington Borough. As a major destination for residents, the schools and library present a particular challenge, especially in maintaining safe pedestrian access across Rt. 31 for school children and residents living east of the Rt. 31 corridor.



## Route 31 Corridor Preserved Lands and Wetlands

0 800 1,600 Feet

Prepared by:  
**Dodson Associates, Ltd.**  
 Landscape Architects and Planners  
 Ashfield, Massachusetts  
 January 2002

Sources:  
 State of New Jersey  
 County of Mercer  
 Township of Hopewell  
 Borough of Pennington

Disclaimer:  
 The "Mercer County Proposed Open Space" Information is derived from the "Mercer County OpenSpace & Recreation Plan" map showing stream valleys that are open space proposals. The area designated along streams are for conceptual purposes only.

Legend	
Streams	Blue line
Conrail	Black line
Route 31	Red line
Roads	Black line
Proposed Trails	Orange line
Contours (20 foot Interval)	Thin grey lines
Township Boundary	Thick black line
1995 Wetlands	Green cross-hatching
Zoning Boundary	Yellow outline
Parcels	Thin black outline
Borough of Pennington	Yellow area
Mercer County Proposed Open Space	Blue area
PRESERVED LAND	
Cemetery	Light green area
Conservation	Light blue area
County	Purple area
D&R Greenway	Dark green area
Golf Course	Light green area
HOA	Yellow area
Preserved Farmland	Yellow area
School	Red area
State and County	Blue area
State of New Jersey	Blue area
Stony Brook Millstone Watershed	Light green area
Township of Hopewell	Purple area

**Segment 1:  
I-95 to the Conrail Overpass**

Segment 1 begins at the I-95 interchange as a four-lane highway, and drops down to two lanes north of the circle. Like other areas of Rt. 31, the segment was once limited to residential uses and agriculture, but is fast evolving into a mixed commercial area with several large retail facilities. Numerous intersecting streets complicate traffic patterns, and the large traffic circle appears to be on the edge of functionality, at least in its current configuration. The principal challenges are maintaining steady traffic flow and safely accommodating turning movements, while not widening the road to the point where residential areas become unlivable.



At the interchange with I-95, Rt. 31 is a four-lane highway with a median and turning lanes.



An aerial view looking west shows the circle and surrounding mix of development. Expansion of commercial uses has complicated traffic flows since the circle was built, and sight lines and turning radii do not meet standards for the largest vehicles now passing through the area. Lack of deflection for vehicles entering at speed from the south creates a dangerous situation.



Toward the center of the segment, the highway is still four lanes, but the shoulders and verges are narrowed by the residential properties that line the roadway. The mature street trees at the right should be preserved in any new design



At the upper end of the segment, Route 31 is two lanes, lined by mixed residential and commercial uses. The roadway curves and rises to where it crosses the railroad tracks.



Traffic entering the circle must slow down, but flows fairly smoothly through the area. However, trucks have difficulty holding their lane through the turns.



## Route 31 Corridor Preserved Land with Wetlands

### Legend

- Streams
- Proposed Trails (see below)
- Contours (20 foot Interval)
- Township Boundary
- 1995 Wetlands
- Zoning Boundary
- Parcels

### PRESERVED LAND

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| Cemetery                          | Preserved Farmland              |
| Conservation                      | School                          |
| County                            | State and County                |
| D&R Greenway                      | State of New Jersey             |
| Golf Course                       | Story Brook Millstone Watershed |
| HOA                               | Township of Hopewell            |
| Mercer County Proposes Open Space |                                 |

The Proposed Trails are approximate locations only.  
Source: Dr. Ted Silies, Chair of the Hopewell Twp.  
Open Space Committee

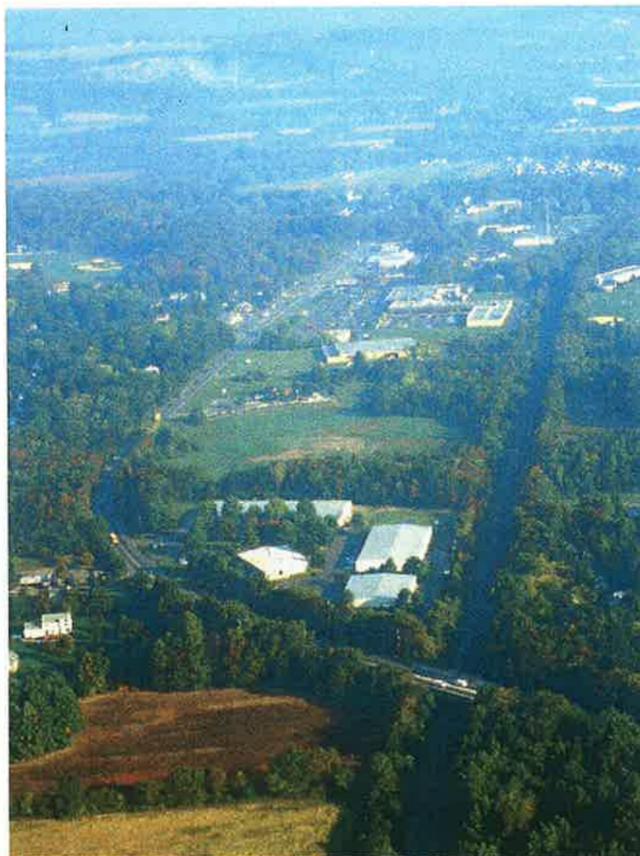
Other sources: The State of New Jersey, County of Mercer,  
Township of Hopewell and the Borough of Pennington.



**Segment 2:  
Conrail Overpass to Yard Road**

Segment 2 was originally constructed as a bypass to take Rt. 31 around Pennington Center. Like many bypasses, it became the place where large commercial uses and shopping centers were built, replacing smaller stores on small lots in the village center. These follow the common strip commercial model, with large paved parking lots separating the buildings from the roadside.

Traffic conflicts are common: through traffic driving north-south on 31 and east-west on West Delaware Ave. must contend with traffic turning into the shopping centers and other commercial users. There are additional conflicts between cars entering/ parking and pedestrians circulating among the stores and restaurants. Still another area of conflict is between vehicles and pedestrians trying to cross Rt. 31 between Pennington and the Middle and High Schools.



An aerial view looking north up the Rt. 31 Corridor from the railroad overpass shows the commercial properties at the south end of Segment 2.



Segment 2 is the commercial hub for much of Hopewell Township, as well as for the Borough of Pennington. As both a regional destination and pass-through for traffic, the area centered on West Delaware Ave. is a permanent bottleneck.



Older commercial businesses with just a few parking spaces are mixed in with more recent shopping centers with major access drives and hundreds of spaces.



The intersection of West Delaware Ave. is one of the most congested in the entire study area. Participants reported having to wait through up to five light cycles at peak hours.



Pennington Market and Pennington Center, foreground, are separated from Rt. 31 by a grass strip and parking lots.



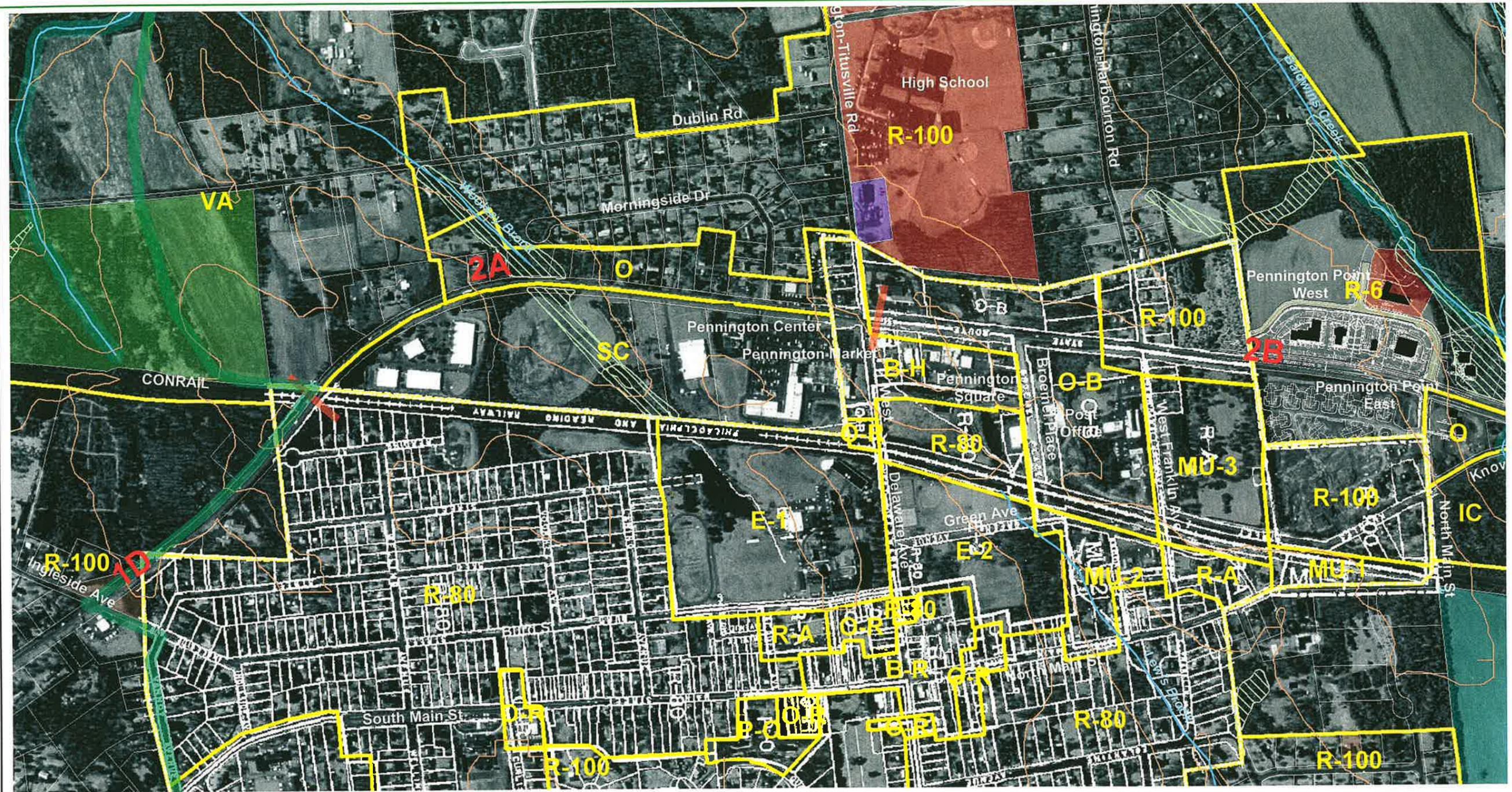
Pedestrians crossing Rt. 31 must contend with high-speed traffic, a long cross-walk, and drivers turning onto the highway from West Delaware Ave.



Commercial structures at Pennington Point West have a high level of architectural quality, but remain accessible only by vehicles.



At the north end of the segment, Pennington Point (upper right in image) and Pennington Point West (foreground) show the kind of high-density residential and commercial development that is gradually replacing the region's older mixed use centers with development that caters to the automobile.



## Route 31 Corridor Preserved Land with Wetlands



Prepared for Township of Hopewell and Borough of Pennington

Prepared by Dodson Associates, Ltd., Landscape Architects and Planners  
Ashfield, Massachusetts

February 2002



**Segment 3:  
Yard Road to Trap Rock Quarry**

Segment 3 is an area of transition from the commercial uses of segment 2 and the rural areas to the north in segment 4. It is also an area that is *in transition*, from open fields and woodlots to large-scale commercial and industrial uses, which are allowed by zoning east of Rt. 31. West of 31 uses remain predominantly residential, which gives the segment a somewhat chaotic appearance.

The one thing that mitigates this trend is that most of the new structures along the east side of the highway are set back behind lawns and maturing buffers of trees, with the largest structures well back on the lots, reducing the apparent scale of the buildings.



*On the corner of Titus Mill Road, the Rosedale Mills store is one of the primary commercial uses in the area, and a prominent landmark along Rt. 31.*



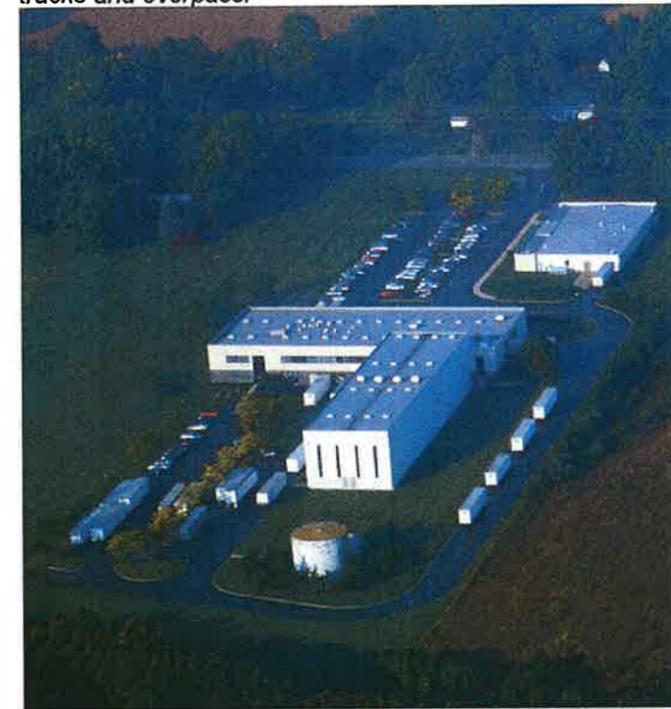
*An aerial view at the north end of Segment 3 shows the trap rock quarry set back behind agricultural fields that form the start of Segment 4. The quarry exit has poor sight lines since views to the north are obscured by the adjacent elevated railroad tracks and overpass.*



*Views across the remaining agricultural fields alternate with newer development.*



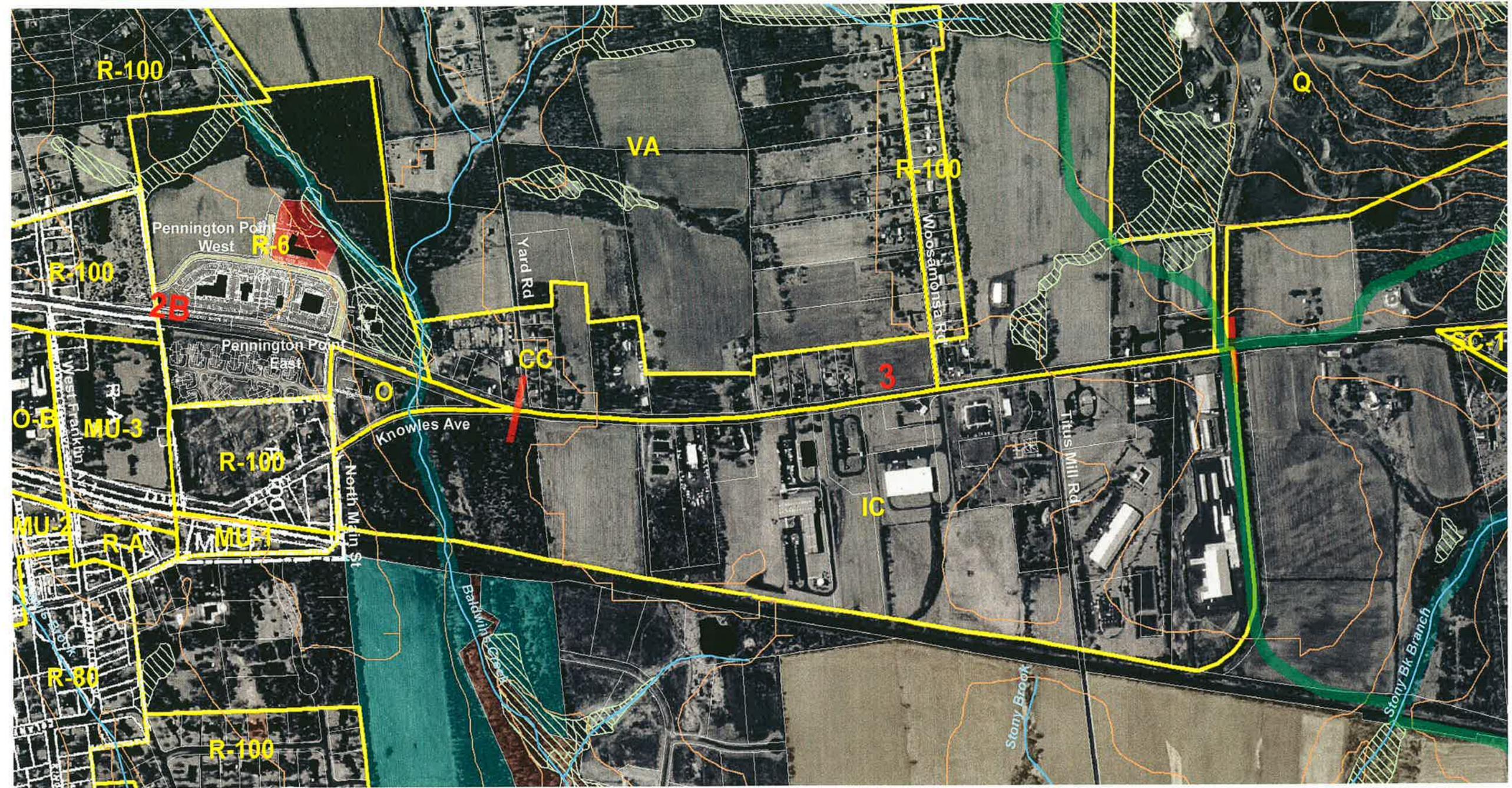
*An aerial view looking north shows the commercial and industrial development between Rt. 31 and the railroad.*



*An aerial view of one of the industrial uses shows the sort of self-contained development that is occurring in this area.*



*Looking north on Rt. 31, showing an older, probably historic, residential structure and trees on the west side of the highway. Fields and farm stand are located on the right.*



**Legend**

- Streams
- Proposed Trails (see below)
- Contours (20 foot Interval)
- Township Boundary
- 1995 Wetlands
- Zoning Boundary
- Parcels

The Proposed Trails are approximate locations only.  
Source: Dr. Ted Stiles, Chair of the Hopewell Twp. Open Space Committee

**PRESERVED LAND**

- Cemetery
- Conservation
- County
- D&R Greenway
- Golf Course
- HOA
- Mercer County Proposed Open Space
- Preserved Farmland
- School
- State and County
- State of New Jersey
- Stony Brook Millstone Watershed
- Township of Hopewell

Other sources: The State of New Jersey, County of Mercer, Township of Hopewell and the Borough of Pennington.

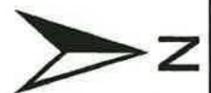
## Route 31 Corridor Preserved Land with Wetlands



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**Segment 4:  
Trap Rock RR Overpass to CR 518**

Segment 4 begins at the RR overpass from the traprock quarry and continues north to the intersection of the Hopewell - Lambertville Road. After crossing a branch of Stony Brook, there is a concentration of development at Pennytown, a hotel, restaurant and office complex. Beyond Pennytown, Rt. 31 becomes more rural in character, passing through an area of fields and wood lots, with several long gentle curves as the highway winds through more hilly topography. In several areas long vistas open up as the land falls away from the roadside to the east.

Toward the northern end of the segment, Rt. 31 is shaded by tall trees. Stony Brook is quite close to the highway at this point, and some of the land is permanently protected as open space. The edges of the highway are lined with guardrails hugged by mature trees at several points, and there is a pleasing contrast between the sheltered woodlands and open rural vistas opening up between them. At the end of the segment there is a traffic light at CR 518, with commercial development including a Wawa's convenience store. By and large, segment four retains the rural character that has disappeared from much of Rt. 31, with a delightful variation in views and spatial quality as one travels through dense patches of woodland, past small meadows, then through open farmland with distant vistas. While limited to two travel lanes, traffic flows freely since there are few intersections or even curb cuts to slow traffic.



*The south end of segment four is characterized by a mix of residential and business uses, within a landscape of small fields, woods and farmsteads.*



*North of Marshall's Corner - Woodsville Road, the roadside opens up on a mixture of fields and forests.*



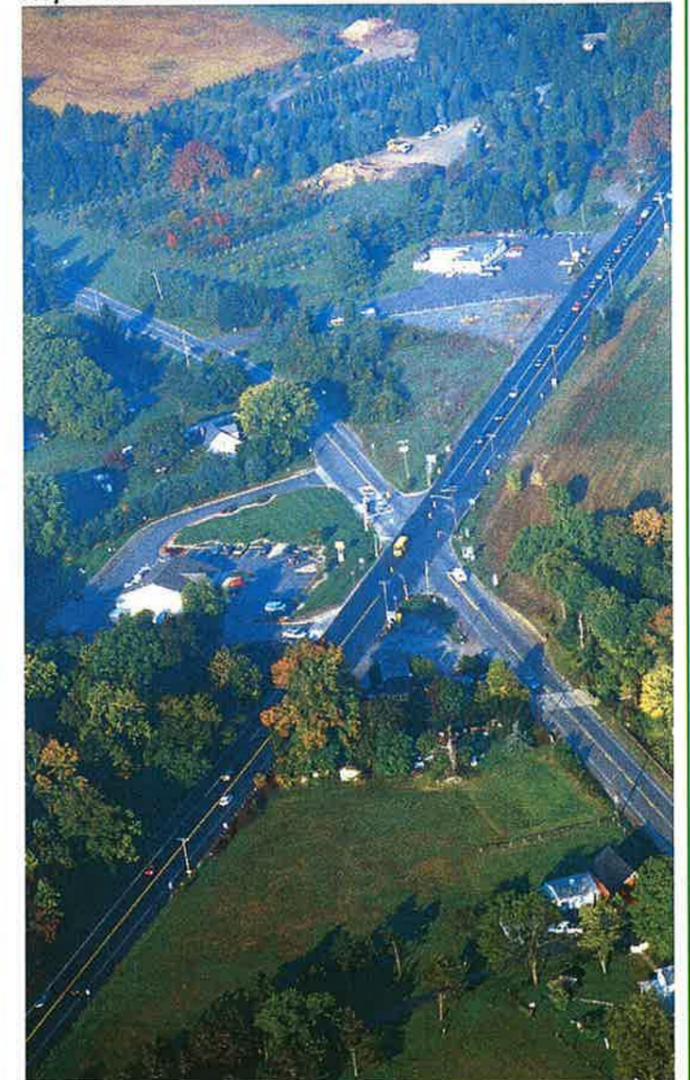
*The only significant restrictions in traffic flow are the lights at either end of Pennytown and at the intersection of the Hopewell - Lambertville Road.*



*The Inn at Pennytown anchors an area of mixed uses at the intersection of the Pennington-Hopewell Road.*



*In several areas, fields falling away from the roadside allow long views to distant hills to the east. On the opposite side, rising land hides recent residential development.*



*Aerial view of the intersection of Rt. 31 and the Hopewell - Lambertville Road. The Wawa's market occupies the corner at the left side of the picture.*



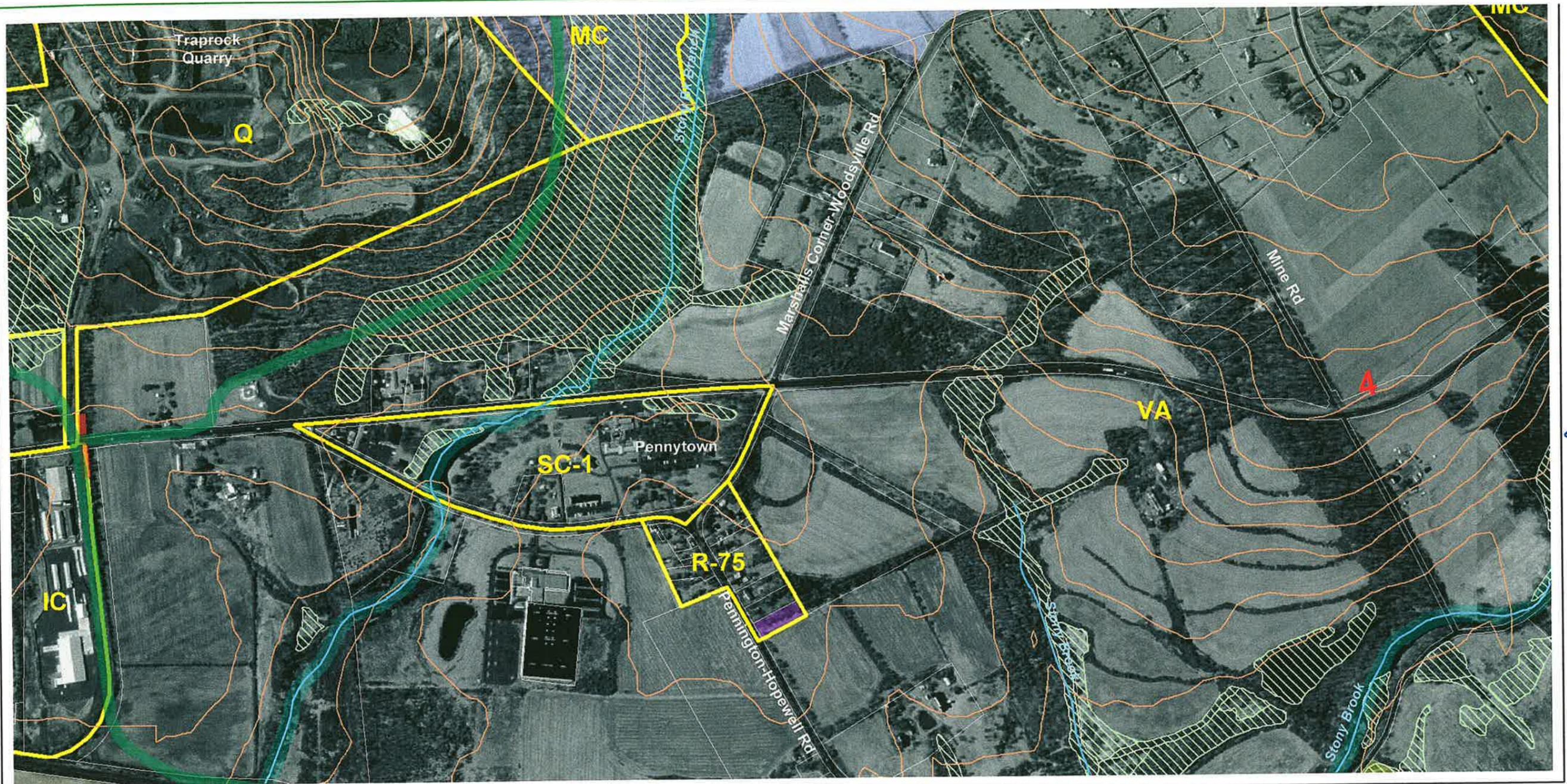
*A broken-down modular home trailer creates a temporary constriction of traffic flow.*



*For most of its length, the segment is lined with trees, in this case with a grass verge and meadows beyond.*



*As the highway passes near to Stony Brook, tall trees form a canopy, with dark filtered views through the woods.*



Scenic Vista  
←

**Legend**

- Streams
- Proposed Trails (see below)
- Contours (20 foot Interval)
- Township Boundary
- 1995 Wetlands
- Zoning Boundary
- Parcels

**PRESERVED LAND**

Cemetery	Preserved Farmland
Conservation	School
County	State and County
D&R Greenway	State of New Jersey
Golf Course	Stony Brook Millstone Watershed
HOA	Township of Hopewell
Mercer County Proposed Open Space	

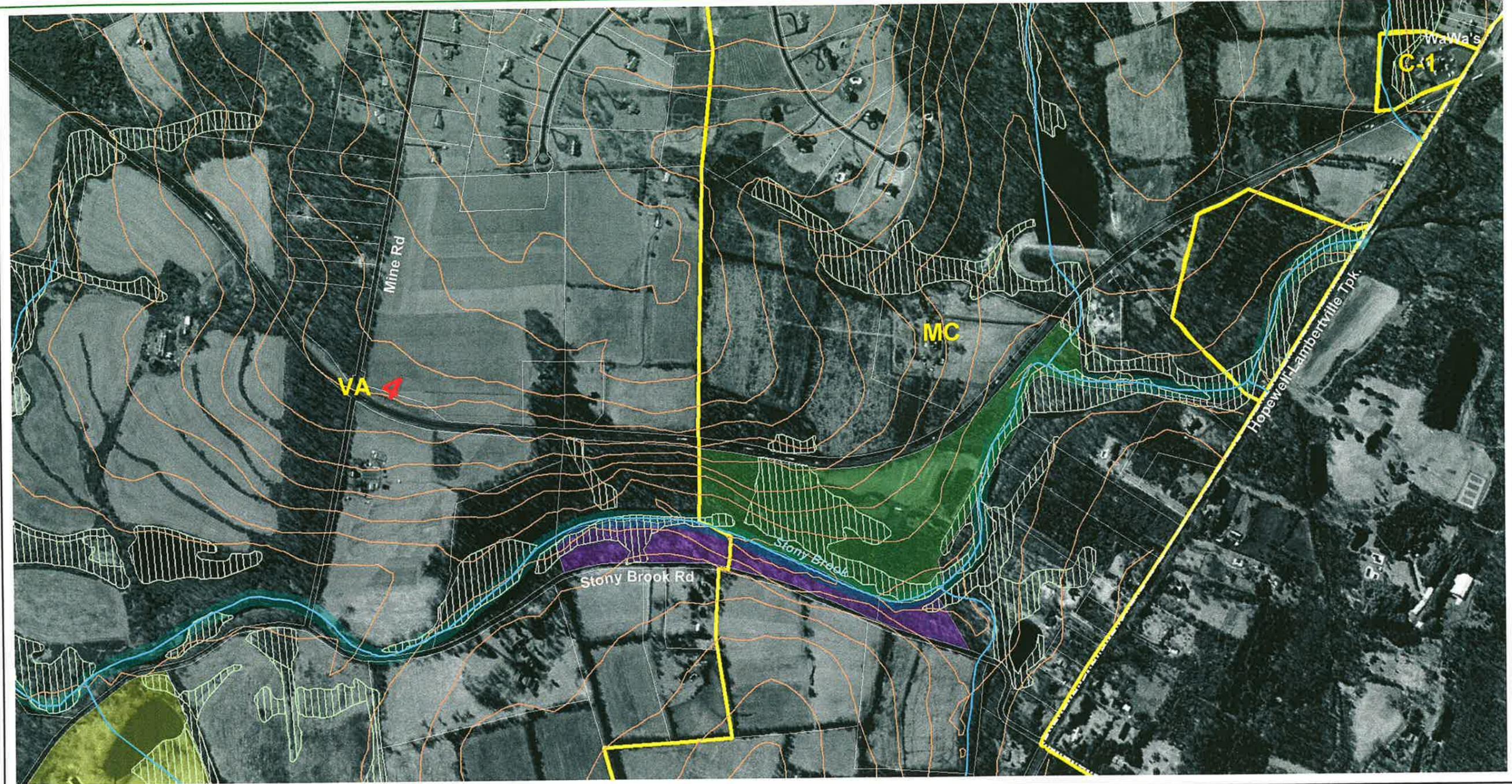
Other sources: The State of New Jersey, County of Mercer, Township of Hopewell and the Borough of Pennington.

The Proposed Trails are approximate locations only. Source: Dr. Ted Stiles, Chair of the Hopewell Twp. Open Space Committee

## Route 31 Corridor Preserved Land with Wetlands

0 300 600 1,200 1,800 Feet

Prepared for Township of Hopewell and Borough of Pennington  
 Prepared by Dodson Associates, Ltd., Landscape Architects and Planners  
 Ashfield, Massachusetts  
 February 2002



**Legend**

- Streams
- Proposed Trails (see below)
- Contours (20 foot Interval)
- Township Boundary
- 1995 Wetlands
- Zoning Boundary
- Parcels

**PRESERVED LAND**

Cemetery	Preserved Farmland
Conservation	School
County	State and County
D&R Greenway	State of New Jersey
Golf Course	Stony Brook Millstone Watershed
HOA	Township of Hopewell
Mercer County Proposed Open Space	

Other sources: The State of New Jersey, County of Mercer, Township of Hopewell and the Borough of Pennington.

The Proposed Trails are approximate locations only. Source: Dr. Ted Stiles, Chair of the Hopewell Twp. Open Space Committee

## Route 31 Corridor Preserved Land with Wetlands

0 300 600 1,200 Feet  
1 inch = 600 feet 1:7,200

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Ashfield, Massachusetts

February 2002

## Conceptual Plan for the Entire Rt. 31 Corridor



As part of the public participation process, Dodson Associates prepared this conceptual plan for the entire corridor. The purpose of the plan is not to make specific decisions about each parcel of land; rather, it is designed to illustrate the recommended solutions to problems identified through the process of planning and analysis. As described in more detail on the following pages, the concept plan demonstrates what the recommended approach to planning for the corridor could look like -- but it is not the final plan, by any means. Rather, it was prepared so that participants could better understand the issues of circulation, access, parking, location of buildings, landscaping, and street layout that must be considered as the corridor continues to grow and evolve. The way that evolution will actually play out will be determined by the incremental process of master planning and site design for each parcel or group of properties in the study area. That process will reflect the concept plan, but will of necessity be based on a much more detailed process of planning and analysis for each individual property.

The current pattern of vehicle-driven, hopscotch development along Rt. 31 threatens to fragment all the farmland, green space and distant views with an even sprawl of automobile driven development. Rt. 31 will become a strip mall-like corridor of uncoordinated uses that cannot easily and safely be accessed by foot or bicycle. Older residential neighborhoods will become increasingly difficult to safely access and devalued. Views from the corridor will be largely of parking lots and structures isolating those traveling the rt. 31 Corridor from the remarkably beautiful, open landscape beyond. Congestion and start and stop delays will push more and more traffic to find alternate routes on local or County roads.

In contrast, the Consultant Team's conceptual plan for the entire Rt. 31 Corridor is shown above. Development centers (shown here in brick or brown colors) and rural connecting corridors continue traditional patterns, open up views, and concentrate development in pedestrian-friendly centers. Open space that is currently protected (dark green) is extended (light green) to

protect adjacent watersheds and remaining key parcels of land in agricultural use.

The core of Segment 1 is redeveloped as what is sometimes called a Traditional Neighborhood Development (T.N.D.), a compact development of mixed-use and single-family houses modeled on a traditional 19th century village with a street network of narrow but deep lots and porches fronting on a tree-lined streetscape. The concept design for the proposed T.N.D. area shown at the left hand side of the plan above (1) is organized around a connected system of green open space for public use and is anchored on the west by a future Hopewell Train Station shared by the eventual 11,000 employees of the Merrill Lynch campus. A network of connecting streets will be sized for the uses fronting on them and will recreate the network of a traditional village.

In Segment 2 the area between the Conrail tracks and Rt. 31 would be incrementally redeveloped according to a coordinated plan anchored by the new Pennington Rail Station and Transit Center (2). The vision

for this area includes a unified streetscape, with new buildings built closer to Rt. 31, trees and landscaping along the verges, and medians to control traffic. The concept retains the character of a "Main Street" while maintaining a steady and safe flow through traffic on Rt. 31.

As with Segments 1 and 2, the concept for Segment 3 is for development of a compact, pedestrian-friendly core that would provide a focus of activity and interest (3). Existing uses would be tied together with a new interior street that would connect across the rear of the lots, reducing the impact of local traffic on Rt. 31.

In Segment 4, the guiding concept is to protect the existing rural character and views along the roadside. Any further development would be concentrated around existing commercial centers at Pennytown and the corner of CR 518. Further widening of Rt. 31 is unnecessary and should be discouraged.

Throughout the study area, intervening green areas shown on the plan would be made priority areas for permanent open space protection through acquisition of agricultural protection restrictions, view shed or open space easements, limited development or acquisition of fee simple ownership. Low impact and environmentally responsible trail systems including connections to the evolving 20 mile, peripheral bike trail would be worked through these green areas and connect to the proposed development centers or nodes.

Detailed descriptions of the concept or "vision" recommended by the Consultants for each identified Segment and Sub-segment of the Rt. 31 Corridor are elaborated on the following pages. Detailed recommended goals and implementation actions for each Segment and Sub-segment are included. Detailed Transportation design options for NJDOT to evaluate and Design Guidelines springing from the vision for Segments 1 through 3 are included in Chapters 3,4 and 5 of the Report.

## Problems and Recommended Solutions for Segment 1: I-95 to the Conrail Overpass:

### Sub-segment 1A: I-95 to the New Denow Rd./Lehigh Shopping Center Intersection:

#### Problems Identified:

1. Excessive speed; no transition zone from high speed of I-95.
2. Need to preserve existing affordable housing stock, but to consolidate or eliminate curb cuts.
3. Area of conflicts in turning movements (esp... left hand) = dangerous.
4. Four lanes and no shoulders invites dangerous speed and has no room for bikes or those turning into drives.
5. Posted at 45 m.p.h..
6. Lehigh Shopping Center/Denow Rd. crossing of Rt. 31 identified as "a mess in the making" – will increase congestion.
7. Some residences look like owners can't maintain them.

#### Recommended Solutions:

1. Evaluate conversion to 3 lane section with full shoulders for bikes. Middle lane dedicated to left hand turn queuing with interspersing islands (grass or perennials) to keep drivers from travelling the length of the middle lane and also to provide a pedestrian crossing "refuge".
2. Provide incentives/means for owners to fix up residences and maintain at home business scale and use. Explore creating access to these properties directly on Rt. 31 by means of a rear alley or road – if feasible, remove or consolidate existing residential curb cuts directly on this section of Rt. 31 (see section @ right, p.20).
3. Maintain residential scale through design guidelines.
4. Explore moving buildings back on one side or replacing with higher density housing of good architectural scale and interest w. parking to side or behind. Doing this would allow creation of a "boulevard cross-section that would form a natural transition and traffic calming as one comes into "town" (the Circle" and the southern gateway to Pennington Center) ( see pages 19 and 48).
5. Evaluate full traffic impacts of adding the Lehigh Shopping Center and Denow Rd. extension to the already high Vehicle Daily Trips (VDT) in this portion of Rt. 31.



### Sub-segment 1B: New Denow Road/Lehigh Intersection past Diverty Road to the "Circle" and CR 546 (including area of possible new development in the SW quadrant of the "Circle"):

#### Problems Identified:

1. Need to integrate proposed NJDOT Truck Inspection Station (safely and gracefully!)
2. Issues of conflicting and dangerous turning movements similar to sub-segment A above.
3. Excessively frequent curb cuts.
4. Need to integrate and take advantage of any possible new traditional neighborhood design (T.N.D.) parcels to the southwest of the circle in order to avoid adding any new curb cuts directly on Rt. 31 and to retire existing ones where possible.

#### Recommended Solutions:

1. Possible 3 lane or Boulevard w. periodic turning lane approaches versus widening of R.O.W. to allow 4 lane plus landscaped median w. turn lane intervals.
2. NJDOT should be asked to evaluate safety of allowing left hand turning movements and at which side streets.

### Sub-segment 1C: The "Circle" and existing approaches:

#### Problems Identified:

1. No deflection of traffic entering from south. Vehicles enter too fast.
2. Multiple approach roads that enter at speed.
3. Unclear and confusing circulation pattern around circle
4. Desire to preserve existing mature trees in "Circle".
5. No place to safely reverse direction to enter businesses southeast of the existing "Circle"

#### Recommended Solutions:

1. Evaluate re-configuring "Circle" as slower roundabout – smaller in diameter and provides more opportunities to enter traffic flow.
2. Traffic calming with splitter islands, etc. at approach roads will also provide refuges for safer pedestrian and bicycle crossings.
3. Work at retaining existing trees and augment with a disease-resistant mix of new tree plantings.
4. Create back service road south off Blackwell Road

### Sub-segment 1D: The "Circle" to the Conrail Overpass:

#### Problems Identified:

1. Similar area of older, small-scale residences with multiple, closely spaced curb cuts (drives).
2. This creates congestion and dangerous conflicts in turning movements.
3. This road is a two-lane section which serves somewhat to limit speed as compared to sub-segments A and B south of the "Circle".

#### Recommended Solutions:

1. Preserve existing housing stock in this area.
2. Eliminate new curb cuts.
3. Create safe pedestrian crossing at the Ingleside Avenue/Rt. 31 intersection.
4. Create "back lanes" to provide consolidated access and parking and retire existing, frequent and dangerous curb cuts (see section, page 20).
5. Prioritize preservation of the last central fields and open space as a "green heart" for this neighborhood and connect to lanes and trails (see green areas on plan on next page).

## Conceptual Plan for Segment 1:

In Segment 1 an area to either side of the existing compact lots on Diverty Rd. (1) is shown as being redeveloped as what is called a Traditional Neighborhood Development (T.N.D.). This is really just another way of describing a compact development of mixed-use and single-family houses modeled on a traditional 19th century village with a street network of narrow but deep lots and porches fronting on a tree-lined streetscape. This area stretches from just above I-95 and the proposed Denow Road extension (2) to the Conrail tracks adjacent to the Merrill Lynch complex (3) on the west to the Washington Crossing - Pennington Rd. and the "Circle" (4) on the north.

The concept design for the proposed T.N.D. area shown at the left hand side of the plan above is organized around a connected system of green open space for public use (5) and is anchored on the west by a future Hopewell Train Station (6) and on the east by a re-configured, safer "Circle" (7) as detailed in later chapters. The train station could integrate a transit center for buses and commuter bicycle storage as well as being shared by the eventual 11,000 employees of the Merrill Lynch campus. A network of connecting streets will be sized for the uses fronting on them (8). Some of these will serve to provide back access to residential lots or commercial lots with existing, dangerous curb cuts and turning movements onto and off of Rt. 31 (9).

The existing supermarket would be reoriented to front on interior streets and eliminate the existing dangerous curb cuts right at the southern end of the existing "Circle" (10). Networks of green space protect the watersheds and provide pedestrian circulation routes linking the new and existing neighborhoods (5).

Roundabouts (11) could calm traffic to a slow but steady pace and eliminate traffic signals. A roundabout at the intersection of Denow Rd. and Rt. 31 (12) could replace the space intensive jug handle currently planned for this site as long as the State Police truck inspection facility could be incorporated. This would free up space for an additional building fronting on Rt. 31 that would also serve to screen the Lehigh Shopping Center parking lot. Compact cores of mixed-use buildings (13) incorporating retail/commercial or office on the first floors with office or residential flats on the second and third floors provides the development's two anchors, one at the new train station and one at the new circle and its southern approaches. The existing CC Zone north of Washington Crossing- Pennington Rd. (14) is incorporated into the new T.N.D. area.



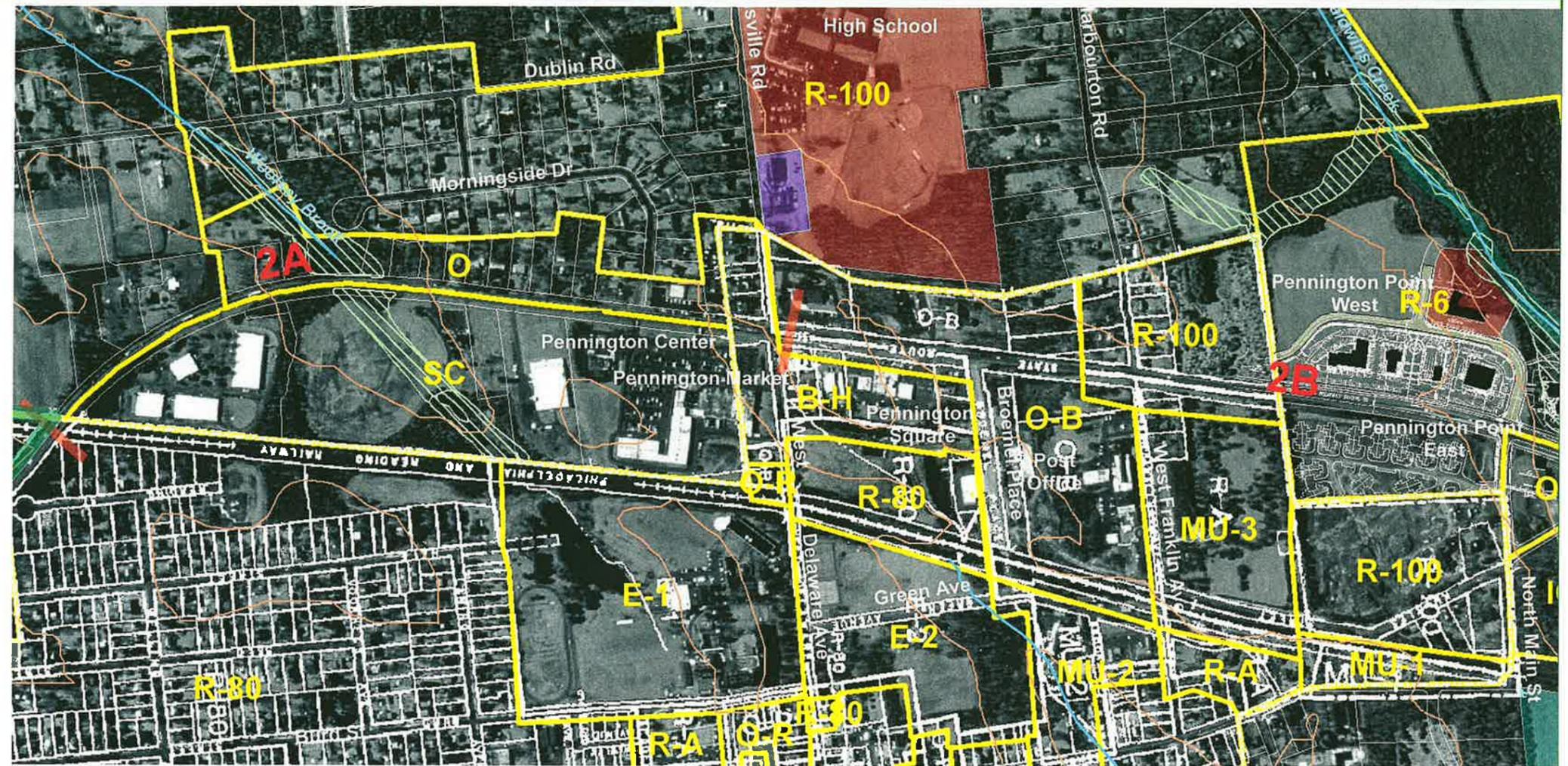
**Sub-segment 2A: The Conrail Overpass to the West Delaware and Pennington-Titusville Rd. Intersection**

Problems Identified:

1. Area has under-utilized 100' R.O.W. and a jumble of utility poles, wires and signs
2. Rt. 31 divides the School and Library area to the west from the compact "walking village" of Pennington Borough to the east. Crossing Rt. 31 involves a long exposed passage and is difficult and dangerous for pedestrians and bicyclists. A safer crossing is needed for all and especially for students.
3. The area north and south of West Delaware and between the Conrail tracks and Rt. 31 seems undervalued and isolated given its proximity to the Pennington Main Street.
4. Moving vehicles and parked cars dominate views. Impervious paving is very prevalent.
5. Delays of as many as five cycles of the lights can be expected at peak hours - encouraging vehicles to take alternate local streets or County Roads.

Recommended Solutions:

1. Evaluate conversion to 3 lane section with full shoulders for bikes. Middle lane dedicated to left hand turn queuing with interspersing islands (grass or perennials) to keep drivers from travelling the length of the middle lane and also to provide a pedestrian crossing "refuge".
2. Reroute utility poles along east side of Segment 2 to run along Conrail right-of-way.
3. Widen the existing connections to the Borough core at West Delaware and Broemel so that they can accommodate cyclists and pedestrians as well as vehicles. Investigate reclamation/redevelopment of the former landfill site in such a way as possibly to create major new public spaces unifying the east side of Segment 2 with the Main Street area.
4. Explore locating a parking structure as part of a redeveloped Pennington Market area. This would utilize about a quarter of the footprint of the existing surface parking and would allow more space for shops, trees, sidewalks, bike trails and public open space.



**Sub-segment 2B: The West Delaware and Pennington-Titusville Rd. Intersection to Pennington Point/ N. Main St./ Knowles Rd.:**

Problems Identified:

1. Need for a new Pennington Borough Train Station
2. Bicycles must compete for space with vehicles while waiting for signals and while riding across Rt. 31 on West Delaware.
3. Safer and shorter crossings are needed to allow residents in the Pennington Point East area to safely and conveniently visit businesses and offices in the Pennington Point West area without getting in a car.
4. This area seems undervalued and haphazardly developed.

Recommended Solutions:

1. Reroute utility poles along east side of Segment 2 to run along Conrail right-of-way.
2. Add advanced stop lines for bicycles as suggested in Tamara Lee's sketch plan for the redevelopment of the West Delaware sidewalk.
3. Add parking structures that can intercept vehicles while providing parking for the Pennington Borough Main St.. area while also serving the new transit center.
4. Strengthen pedestrian and bike routes between this area and Pennington Main Street/ Stony Brook by widening the narrow RR crossing bottlenecks at Broemel Pl. and W. Delaware.

## Conceptual Plan for Segment 2:

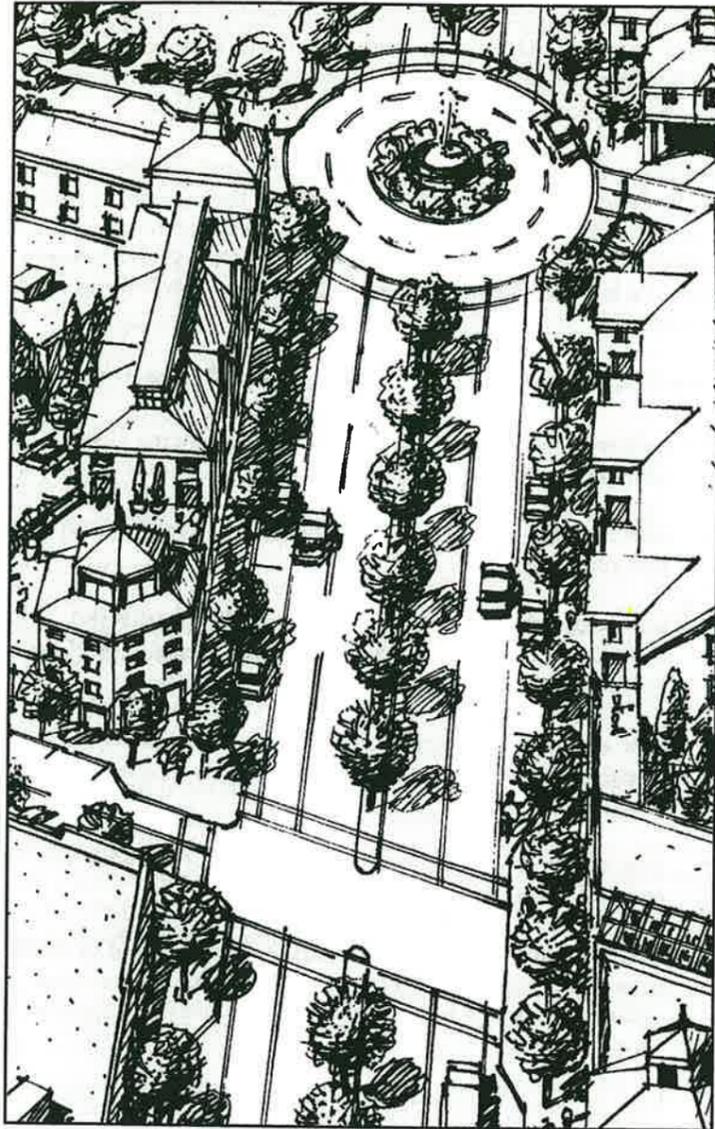
Description of Segment 2 (West Delaware) redevelopment area:

In Segment 2 the area between the Conrail tracks and Rt. 31 and the western side of the Rt. 31 Corridor would be incrementally redeveloped according to a coordinated plan that might even be sponsored by and integrated as a preferred outcome into local Master plan Elements and Zoning Codes. This area would be anchored by the new Pennington Rail Station and Transit Center. The vision for this area as developed in the public meetings and as already adopted on record by the Hopewell Planning Board would be an area that has more streetscape amenities with new buildings built closer to a Rt. 31 with teed verges and medians. The concept is to retain some of the character of a "Main Street" while maintaining a steady and safe flow of vehicles so that through traffic stays on Rt. 31. This new redeveloped area would be a natural extension of the current Pennington Borough core but could serve as the location for one or two parking structures tightly connected to adjacent mixed-use buildings with human-scaled facades and massing. This would add vitality and walk-in traffic to the Pennington core while adding much-needed off-street parking and integrated public and civic space. Finally, protected crossings of Rt. 31 would be provided as evaluated to be safe by NJDOT, computer modeling and perhaps a roundabout specialist. If none of the design options shown in chapter 3 and 4 seem acceptable to the community then there was considerable interest expressed at the public meetings in either an overpass- perhaps with elevator access worked into the facade of new buildings, located close to the street to shield parking behind and give Rt. 31 more of an enclosed, pedestrian-friendly scale. Alternatively, an underpass would be an option, although more difficult in the Consultant's opinion, if drainage problems ( W. Delaware and Rt. 31 intersection is a low spot from all directions) could be dealt with and a wide, well-lit underpass with clear views of the far side could be created.



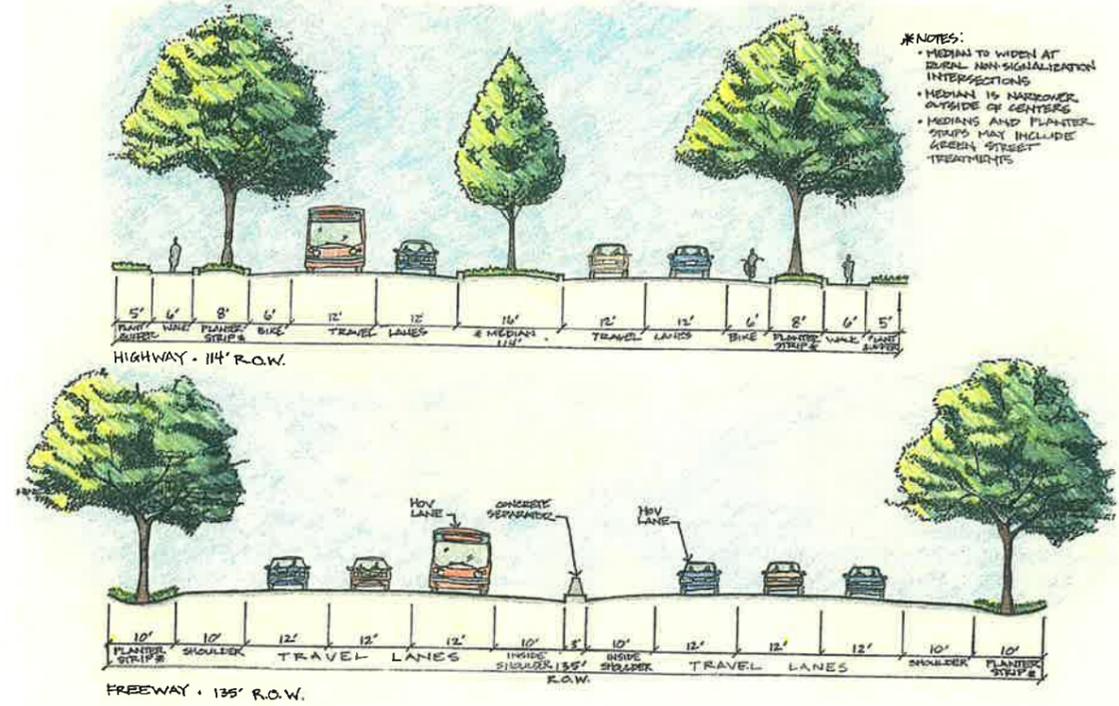
This concept diagram shows the double-loaded back road system as dashed lines these back routes would provide an alternative to having to get on and off Rt. 31 repeatedly and would be designed for a calm, slow speed that would also allow their use as service roads for existing and new mixed-use buildings (1). The New Pennington Borough Train Station and Transit Center (2). The Lewis Brook corridor offers

a possible low impact trail connection to Stony Brook and to the 20 mile peripheral bike path beyond and could help connect any redevelopment of the MU-2 parcel east of the Conrail tracks at the intersection of Green Ave. and Broemel Pl..

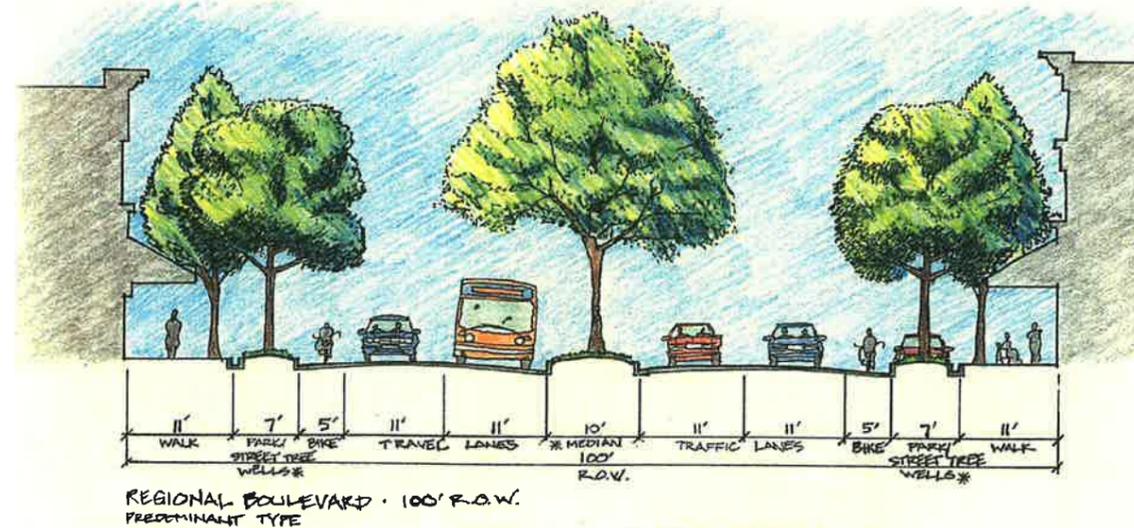


The regional transportation system seeks to promote community livability.

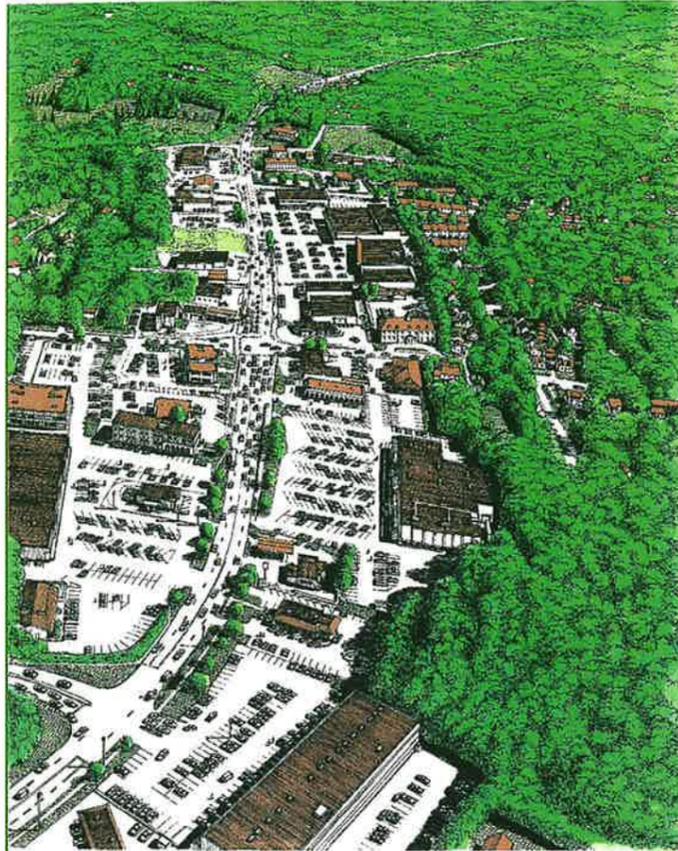
Buildings and street trees line this four lane road.



Examples of high speed thruway cross sections where vehicles dominate the pedestrians and the streetscape is negligible.

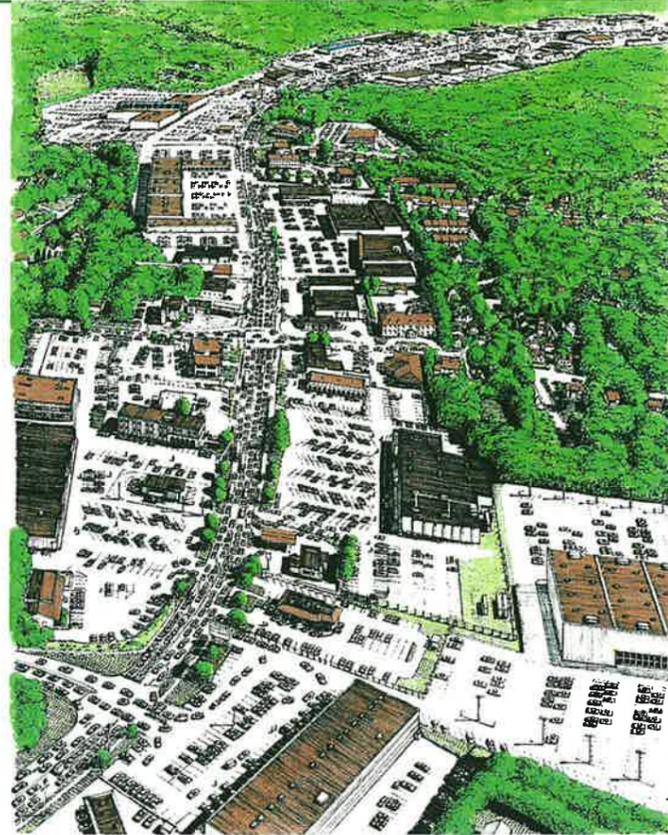


Without the on-street parking this cross section is closest to what the workshop participants and the Hopewell Planning Board have gone on record as preferring along Segment 2 of Route 31. The facades and street tree plantings show the enclosure and human scale that new buildings close to the street and tree planting in the median can create.



**Existing Conditions**

Suburban commercial strip containing super markets, office buildings, gas stations and neon signs and billboards. Traffic congestion is severe as a result of the many individual access roads creating chaotic driving conditions.



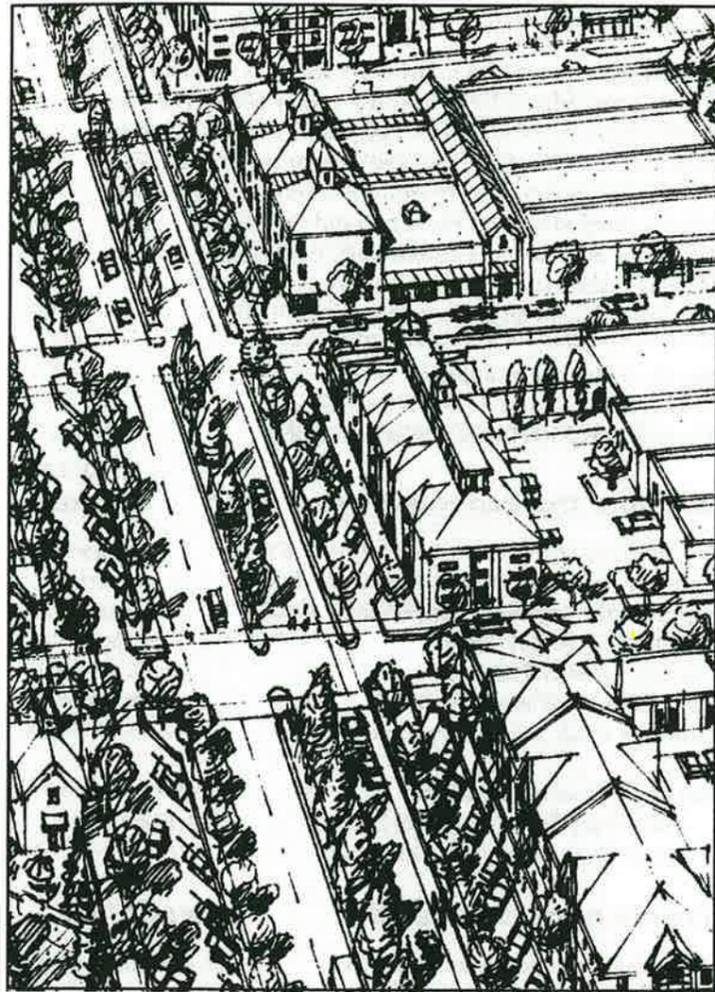
**Conventional Trends**

Typical development along these corridors provides for additional shopping centers that start to invade nearby residential neighborhoods. In the meantime, some stores go out of business in the foreground.

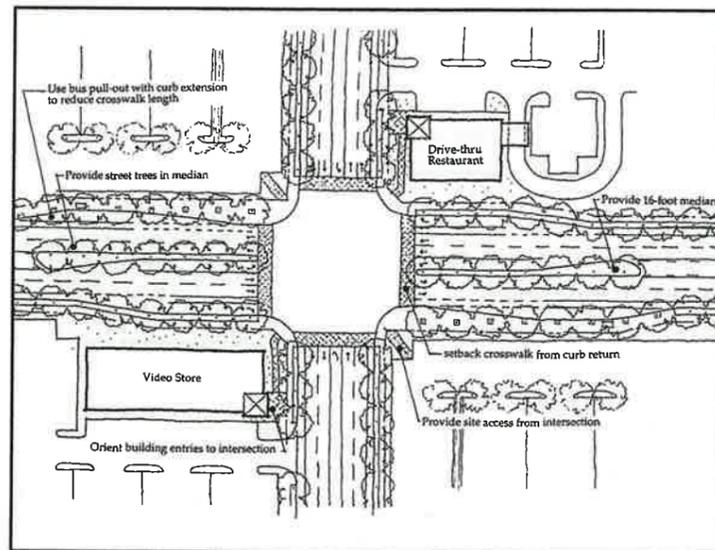


**Recommended Approach**

To accommodate the same amount of development shown in the previous panel, increased development densities are allowed in the distinct centers along the highway, shown in the foreground and the distance, separated by expanses of rural or low density development. Many of the existing commercial buildings are kept and renovated to fit into the new commercial center. Access roads to businesses along the highway are organized at key intersections, helping to reduce traffic congestion.

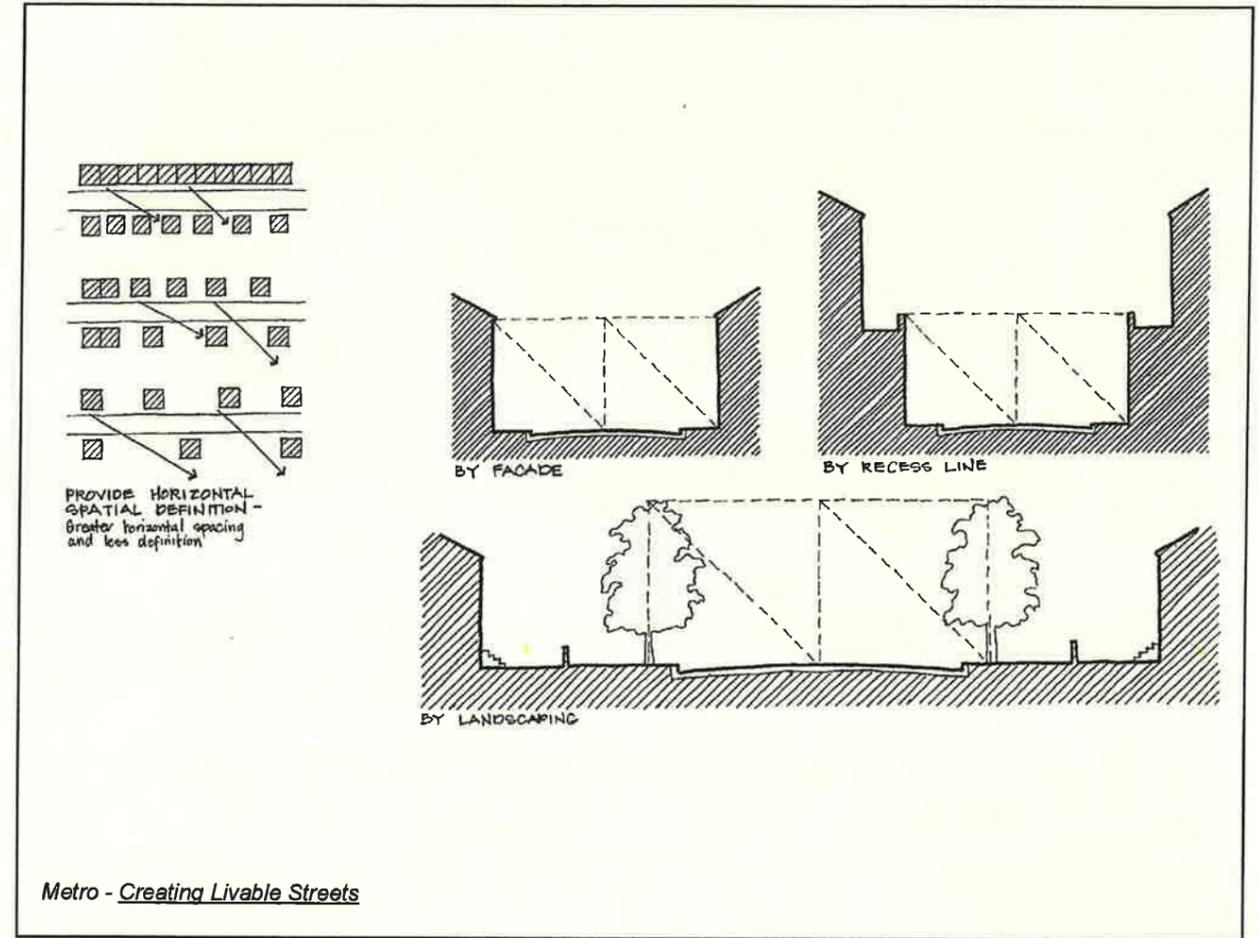


The design of regional streets can contribute to community livability.



Typical features of a "boulevard" intersection

Buildings close to the Rt. 31 Corridor in Segment 2 help define a streetscape and together with street trees and median tree plantings create enclosure. This enclosure breaks down a 4 to 6 lane wide space into a scale where pedestrians feel comfortable and there is human scale interest.

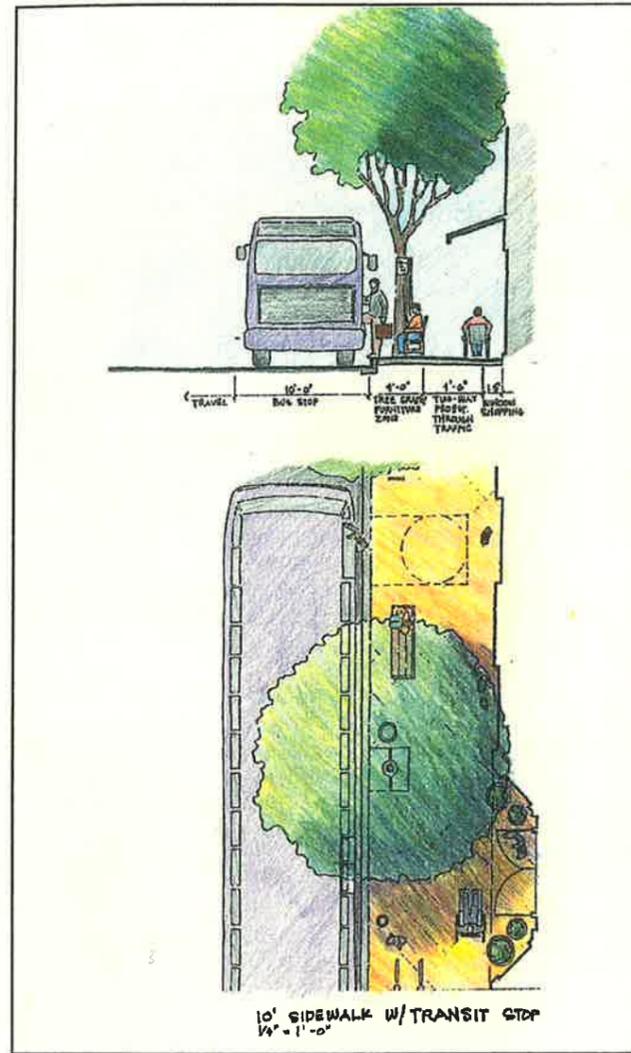


Metro - *Creating Livable Streets*

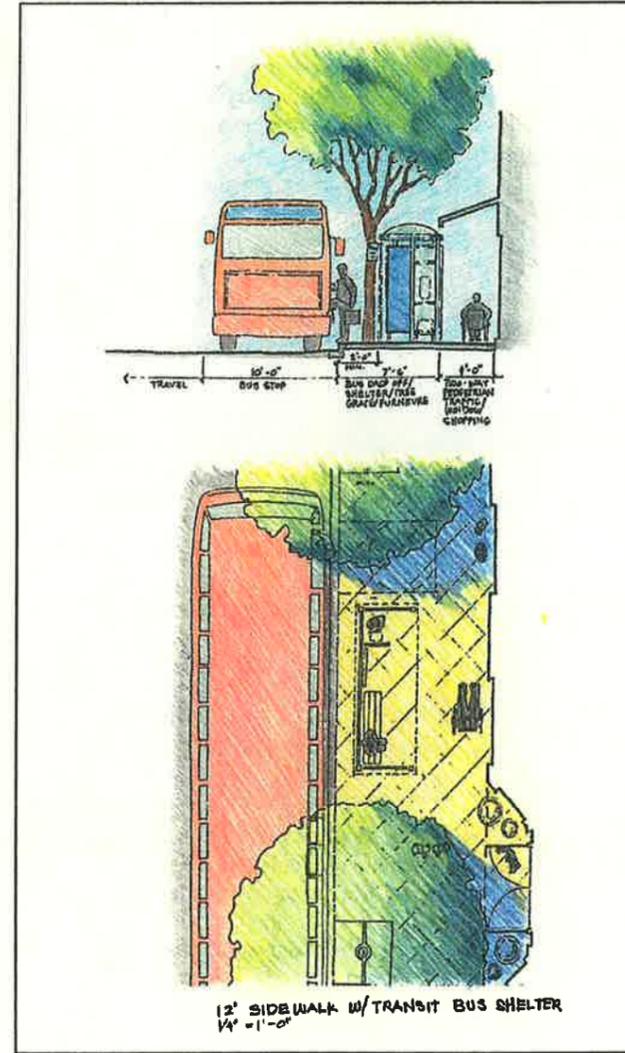
Provide horizontal spatial definition to streets with front of buildings oriented to the street. Provide vertical spatial definition with uniform building heights, street trees or building recesses.



New Mixed-use development close to an existing state highway provides visual interest, forms an enclosing edge to the road, calms traffic and has a low stone wall of local stone to anchor it to that specific locality.



Ten feet with transit stop is tight to have a bus shelter but sufficient for a bench.

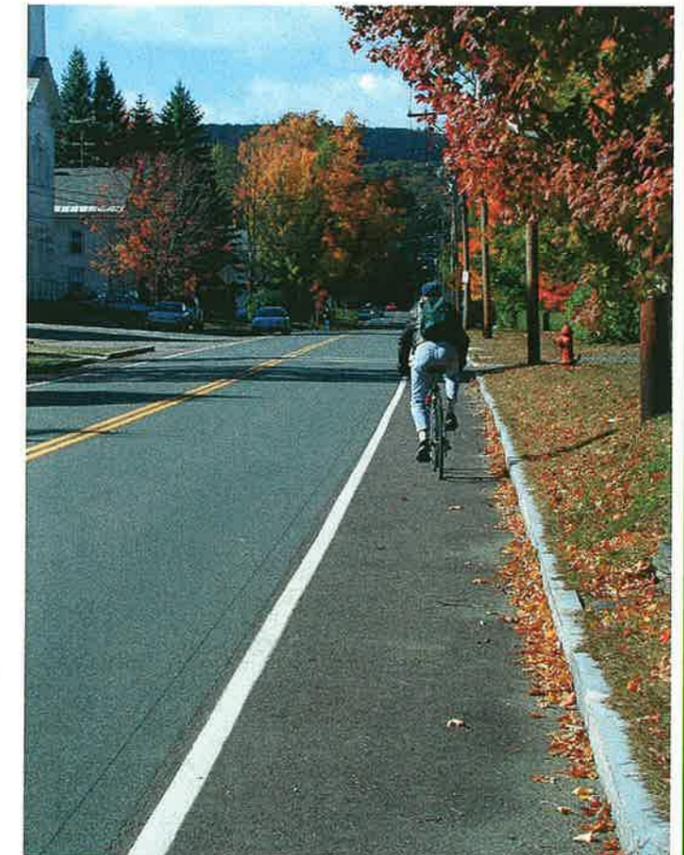


Twelve feet with transit stop is sufficient for a transit shelter.

Sidewalks along side streets or internal streets should consider transit stops and related amenities such as benches or shelters.



Crossings should carry the material of the sidewalk across Rt. 31 and side streets in order to heighten driver awareness. This also helps to visibly give priority to pedestrians and cyclists walking bikes.



Sections of the Rt. 31 corridor propose to have designated bike lanes as part of the travelway, delineated by the use of colored aggregate paving materials. This will differentiate the bike lane from the main roadway and make the travelway seem smaller.

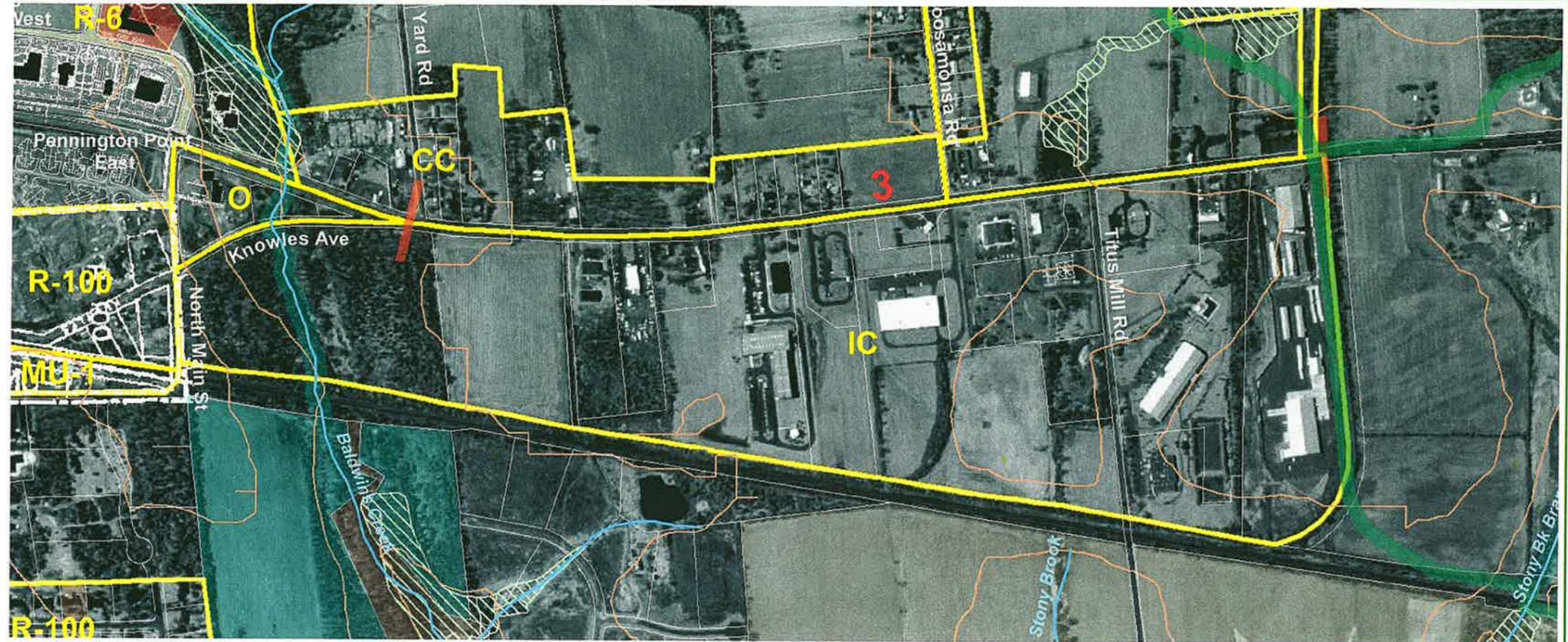
## Problems and Recommended Solutions for Segment 3: Yard Rd to 84 Lumber and Quarry Railroad Overpass:

### Problems Identified:

1. Turning movements (esp. left hand) out of Quarry are dangerous due to RR overpass embankment and limited sight lines.
2. Residential scale and open space on the west side of the road needs to be maintained and protected.
3. Frequent curb cuts and transitional industrial zone east of Route 31 needs reverse frontage access road to take pressure off Rt. 31.
4. Pedestrian crossings needed at Woosamonsa and at Titus Mill Rd..
5. Open Space Committee needs trail crossing of rt. 31 in this area.
6. The field and wooded area at the southeastern corner of Segment 3 (across from Yard Rd.) are very important green space and visual "relief" for those travelling the Rt. 31 Corridor.

### Recommended Solutions:

1. *Work with Traprock Quarry owners to examine moving the access driveway substantially to the south of its current location.*
2. *Limit parking lots to Rt. 31 side of new buildings. Parking should be back of 150' buffer and screened by dense planting.*
3. *Reverse frontage road or deeply set back frontage road to allow 100' to 150" deep tree and shrub buffer zone. Double-loading this road will add building sites in this area of Rt. 31, but will require effective screening of any service areas or parking for the businesses located between the reverse frontage road and Rt. 31 (as illustrated in conceptual elevation and plan on page 29).*
4. *Make arrangements with quarry to use RR overpass for trail connection over Route 31.*
5. *The field across from Yard Rd on the eastern side of Rt. 31 as well as the woodland area between it and Baldwin Creek should be made priority areas for preservation and protection.*



## Conceptual Plan for Segment 3:

Segment 3 was identified by the Consultants and public meeting participants as a transitional zone between the more compactly developed "center" and the more rural, undeveloped landscape of Segment 4. Between Rt. 31 and the Conrail tracks to the east there is an area of existing industrial, office and commercial uses. Most of these uses are set well back from the Rt. 31 Corridor and have some mature plantings of trees between them and the highway that provide some buffering.

The Segment 3 Concept envisions creating a new reverse frontage road as shown here that could form a new interior street, double-loaded on both sides with large new buildings with parking and service at the sides (or to the back for those buildings backing onto the railroad tracks to the east). The Zoning Code would be amended to prevent additional new curb cuts onto Rt. 31. Instead new building would connect to the interior street which will take pressure off of Rt. 31. This interior street should have street trees and sidewalks to allow workers to walk or bike if they desire to.

A trail connection could be made off of Titus Mill Rd. along the Conrail R.O.W. to the proposed new trail crossing over Rt. 31 on the existing traprock quarry railroad access. This trail would not use the Titus Mill underpass to cross under the Conrail tracks, but instead would go north to use an existing, wide, stone culvert that carries a branch of Stony Brook eastward under the Conrail tracks. The culvert could accommodate a raised trail section that would provide passage except during high water conditions.

All new buildings and parking would be required to be set back so as to continue the existing informal buffer strip. This buffer should extend from 100' to 150' from the Rt. 31 R.O.W. and should be heavily planted with evergreen trees and shrubs that will provide heavy screening when mature. The fields lining the west side of Rt. 31 as well as the compact resi-

dential lots along Woosamonsa Rd. should be preserved and form a distinctly different use and treatment from the reverse frontage road area across the highway. A new mixed use commercial node fronting directly onto Rt. 31 could be created as shown around the Woosamonsa and Rt. 31 intersection

and extending north on the east of Rt. 31 to include Rosedale Mills and the Titus Mill Rd/ Rt. 31 intersection.

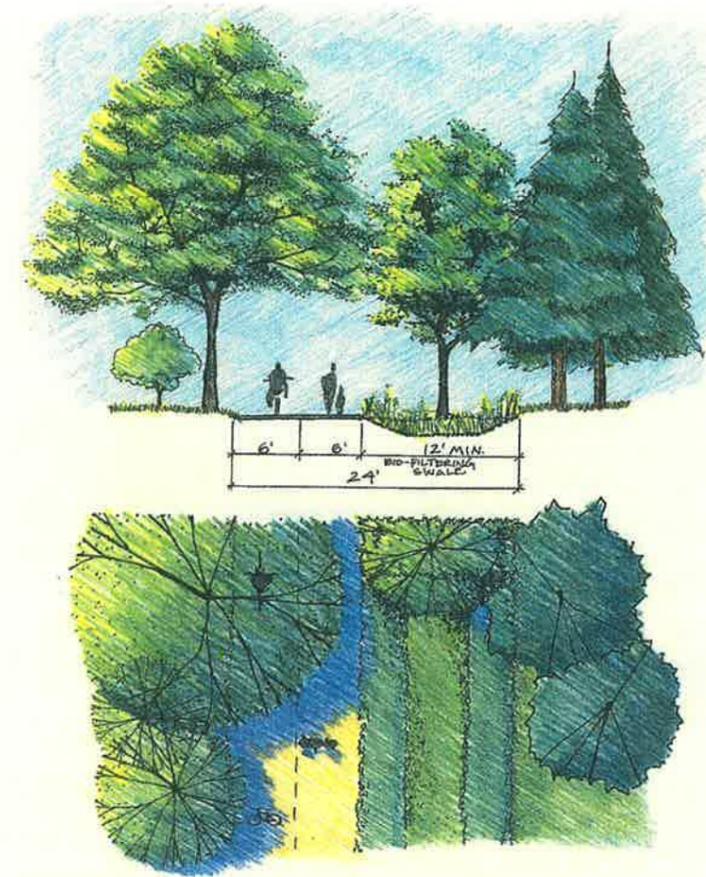
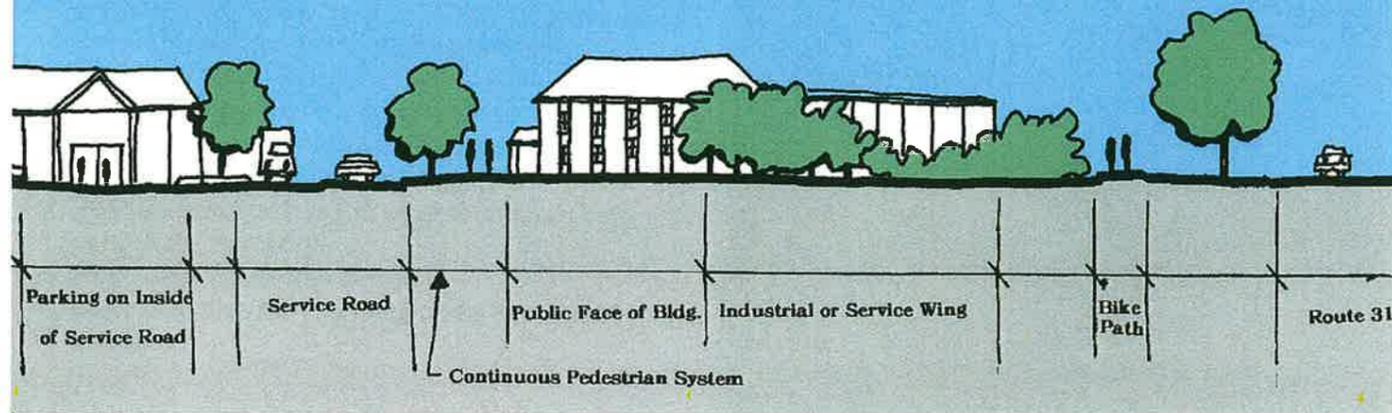
The Hopewell Planning Board should consider re-zoning the existing CC area between Woosamonsa Rd. and Baldwin Creek to VA while grandfathering all existing uses. Again a back access lane could be created linking these properties along their western edge. If the Creamy could be

accessed from a side entrance off Yard Rd. this might alleviate current safety problems on Rt. 31 at this point that were brought up at the public meetings.



Segment 3: Transitional Zone

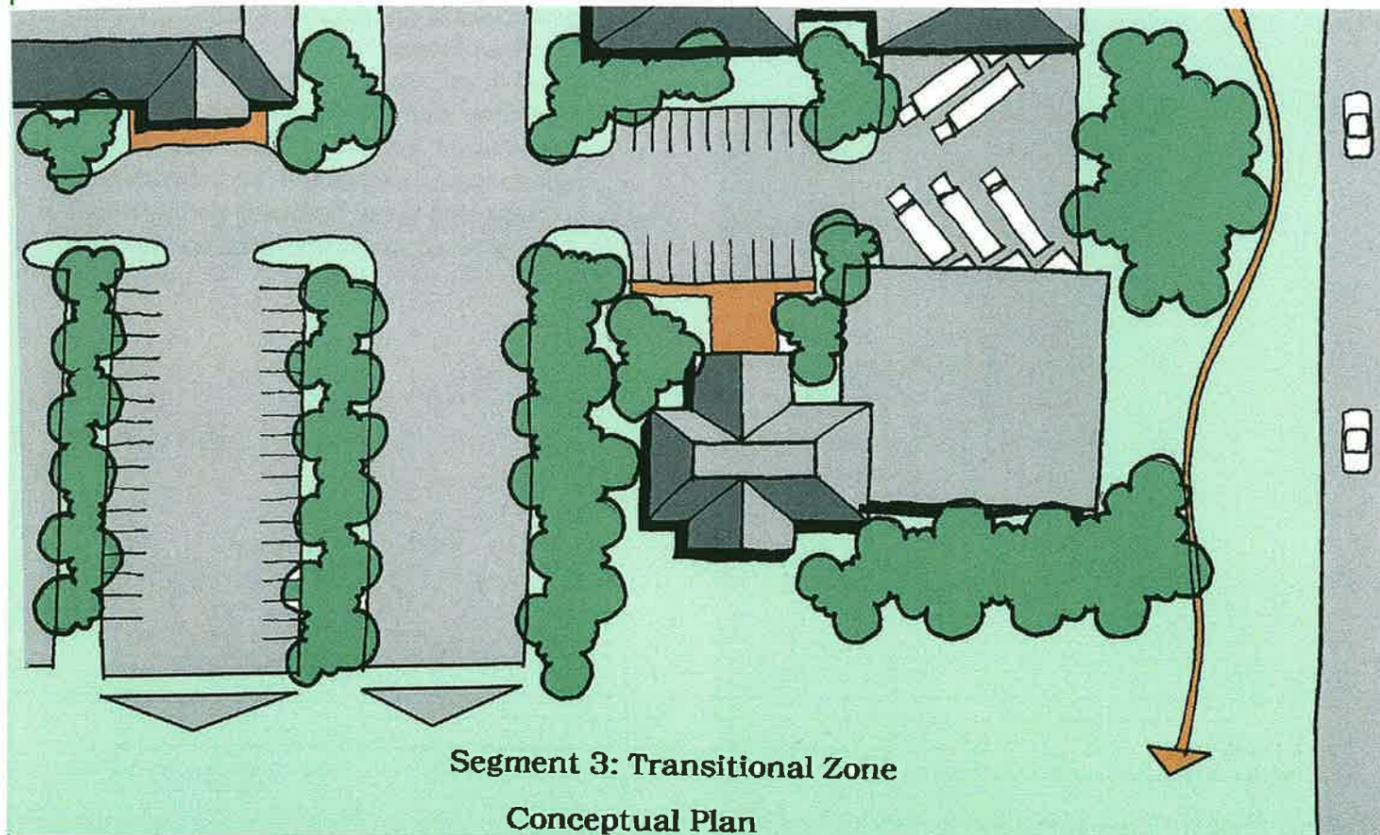
Conceptual Section



*Multi-purpose Path*

- Multi-purpose pedestrian/bike paths can be used where vehicular streets are undesirable or unnecessary.
- Swale is unnecessary for treatment of only path runoff if path is adjacent to vegetated areas.
- Right of way for multi-purpose paths allow opportunity to incorporate detention basins and biofiltering and/or conveyance swales for runoff collected elsewhere.

This cross section and combination of path and biofiltration swales and microdetention areas would be appropriately combined with existing or new buffers of trees and shrubs along the east side of Rt. 31 as it passes through Segment 3.



Segment 3: Transitional Zone

Conceptual Plan

# Problems and Recommended Solutions for Segment 4: Quarry Railroad Overpass to CR 518:

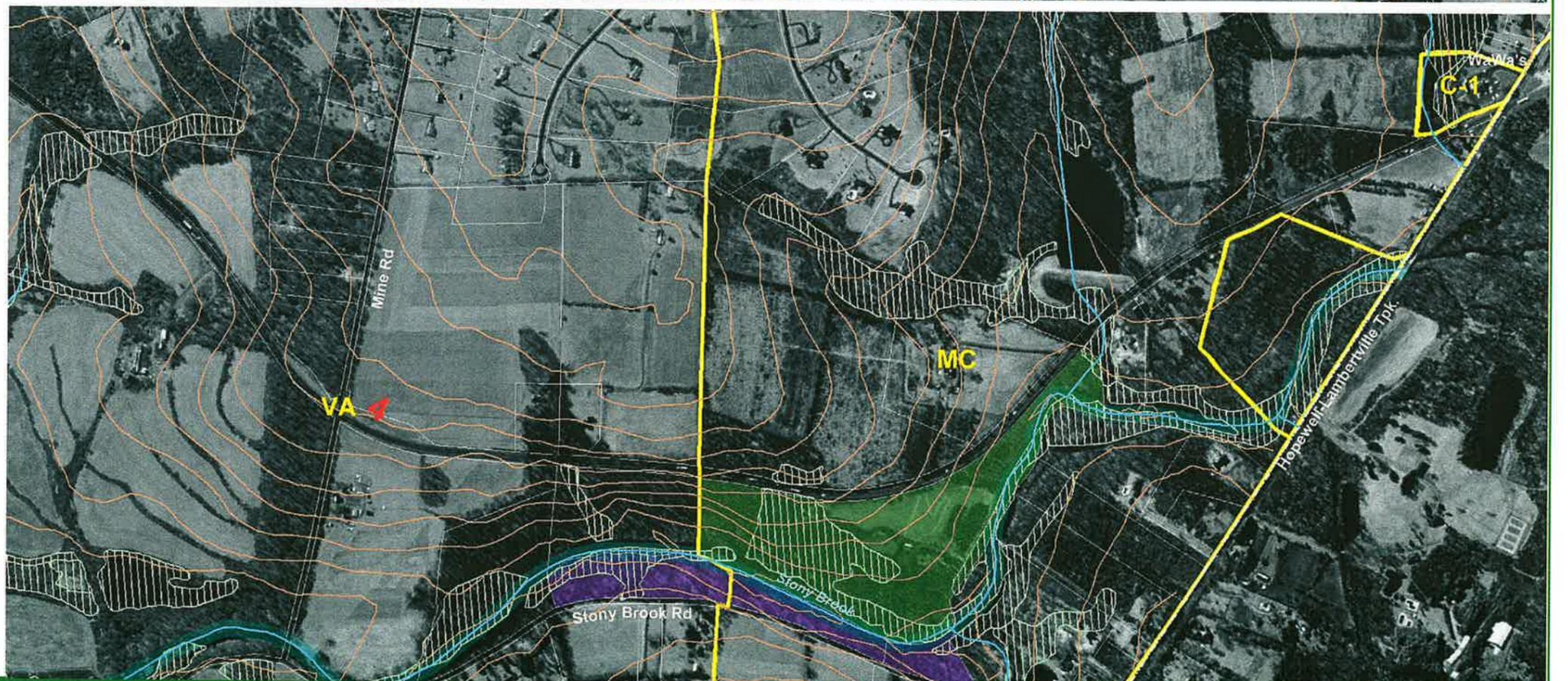
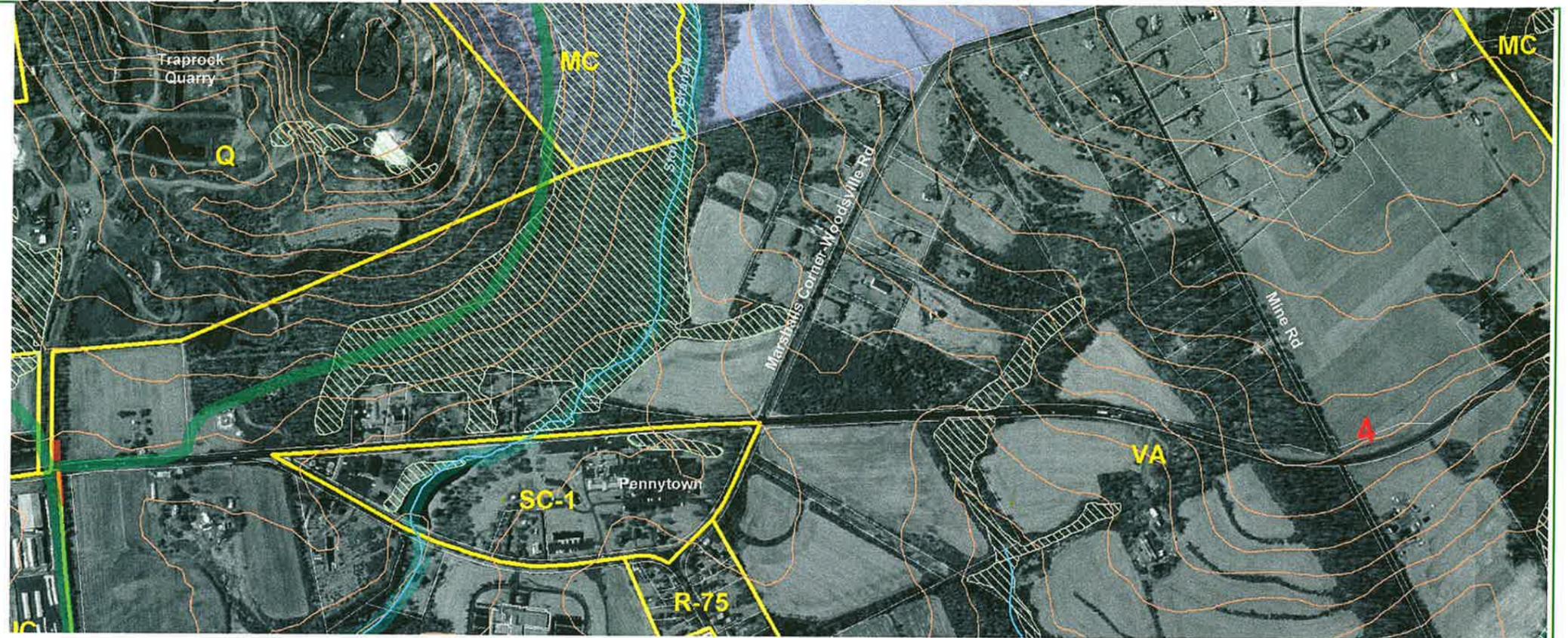
## Segment 4:

### Problems Identified:

1. Critical farms and cropland under intense development pressure.
2. Sections of rt. 31 north and south of Segment 4 either already are four-lane or may be going four-lane. This will put tremendous pressure on the Township
- 3. Residential curb cuts are currently few and far between but could increase, adding conflict points and slowing steady traffic throughput.
4. Rt 518 intersection is too wide and needs safe pedestrian crossings.
5. Need better guardrail design.
6. Need selective tree thinning close to road for views.

### Recommended Solutions:

1. Scenic Corridor Management Plan including view shed inventory. Prioritized acquisition of or permanent easements on key farms and open space parcels.
2. Strongly resist any widening since character is defined by the canopy of trees meeting overhead and current Vehicle Trips per Day in the area.
3. Avoid creation of new curb cuts onto Rt. 31.
4. Require 100' wooded setback for all new development be maintained and enhanced
5. Use oxidizing guardrail beam and wood supports on all guardrails to blend in.

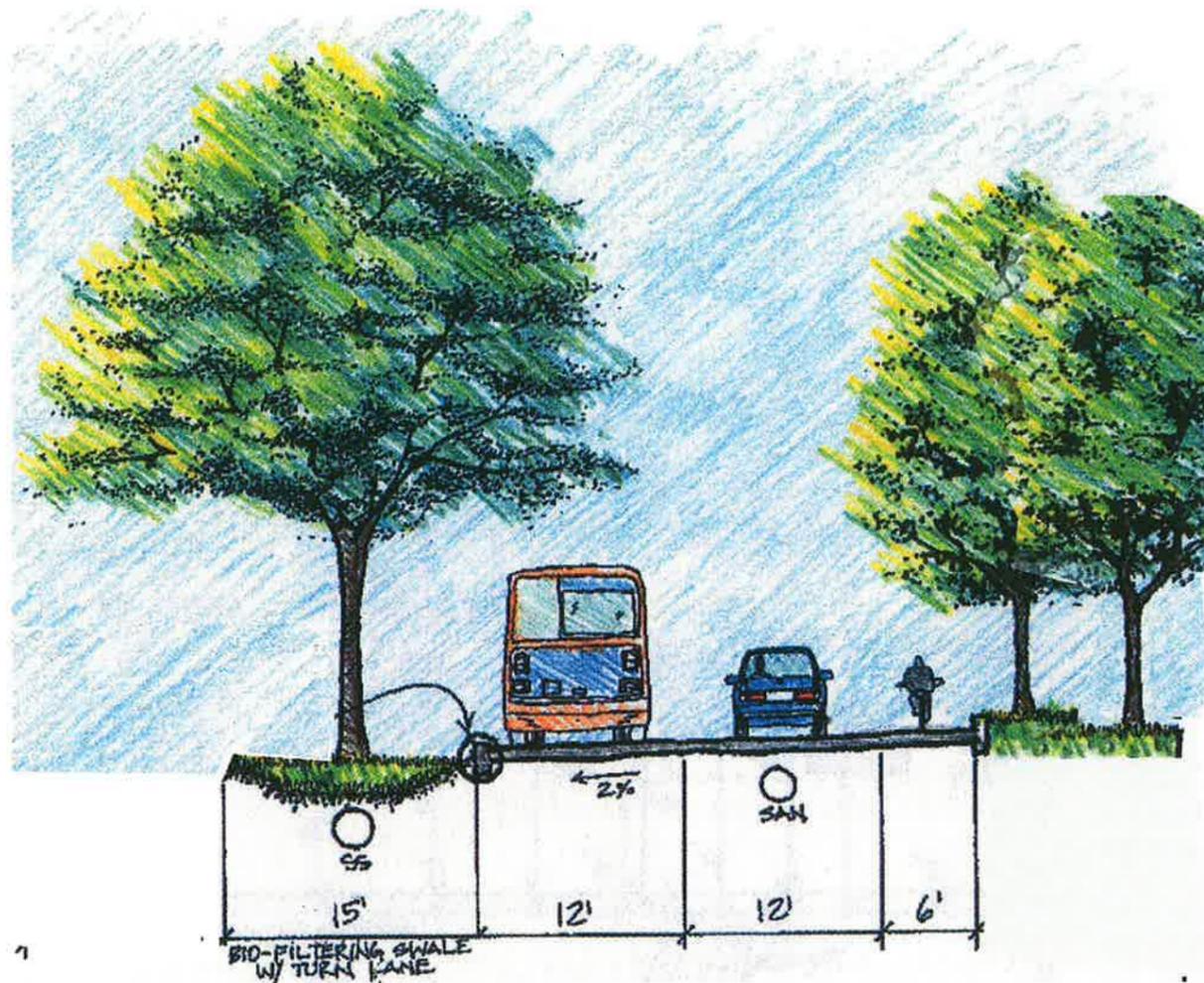


## Conceptual Plan for Segment 4:

Intervening green areas shown on the plan would be made priority areas for permanent open space protection through acquisition of agricultural protection restrictions, view shed or open space easements, limited development or acquisition of fee simple ownership. Low impact and environmentally responsible trail systems including connections to the evolving 20 mile, peripheral bike trail would be worked through these green areas and connect to the proposed development centers or nodes.

Additional commercial/retail/office development at the Marshall's Corner end of Pennytown would be carefully placed to preserve existing screens of mature trees as seen from the rt. 31 Corridor.





In Segment 4 pitching any resurfaced Rt. 31 to the west so that roadway run-off goes into a bio-filtration and infiltration swale will help protect the water quality of Stony Brook. This brook runs very close to parts of Segment 4.



*Weathering steel guardrail beam with wood supports allows guardrails to blend in.*



## INTRODUCTION

The transportation section of the “Improvement Plan and Guidelines for the New Jersey Route 31 Corridor” addresses the specific roadway design issues.

For many years, certain tensions have existed between the role of the road as a regional connector for inter- and intrastate transportation, and a perception on the part of the residents of Hopewell Township and Pennington Borough that the impacts of the regional road have been negative upon the communities.

While this guideline report is not intended to create a specifically engineered highway design, the intention of the study is to define ways in which these tensions might be resolved.

There are six distinct sections to this transportation section:

- An overview of existing traffic data organized into general section and three corridor sections;
- Transportation issues as defined through the project’s public participation process;
- Transportation goals and objectives adopted by the consultants based on the transportation issues defined above;
- Design concepts for several focal segments of the corridor;
- A “pros and cons” evaluation of the alternatives to assist in further deliberations; and
- Supplementary background on some of the design concepts.

## GENERAL OVERVIEW

Route 31 is a vital regional connection for local and regional through-traffic between Routes 518 to the north and I-95 to the south. The roadway is generally level with low, rolling hills, and two travel lanes along most of its length. Land use along this sec-

tion of the corridor ranges from relatively low-density, rural land in the north, to moderate density residential and commercial districts in the central and southern sections. There are increasing development demands on this land, and at least one major planned unit development is planned which will feed into the Route 31 corridor.

Route 31 has been classified as a principal arterial highway and as such, serves a wide range of transportation needs/demands that will be outlined in this report. Currently, the corridor is designated a truck route with trucks accounting for up to 12 percent of traffic. Posted speed limits range from 35-50 m.p.h..

Local and regional growth has outpaced Route 31’s capacity to serve traffic demands. Average daily traffic volumes along the Rt. 31 corridor for 2001 range from approximately 13,000 vehicles per day (vpd) at the north end of the study area to over 30,000 vpd at the I-95 interchange to the south. Traffic volumes steadily increase from north to south, approaching the I-95 interchange. It has also been increasingly used as a shortcut for traffic through the state especially for trucks, creating conflicts between through-traffic and local users. Traffic has increased in both directions and at all times of the day. Through-traffic contributes to increased, unsafe speeds and congestion. Left turns are almost impossible to make on Route 31. There are too many curb cuts requiring entering and turning traffic.

Safety for motorists, pedestrians and bicycles is increasingly an issue. The Hopewell Township Mayor’s Task Force on Traffic & Trucking is addressing traffic congestion and safety along Rt. 31 and other arterial roads.

The Hopewell Township Master Plan Advisory Committee on Route 31 sub-divided the stretch of Rt. 31 that runs through Hopewell Township and Pennington Borough into three sections as designated from

south to north:

**Section I** - I-95 interchange to the Railroad (Conrail) overpass.

**Section II** - Railroad overpass to Woosamonsa Road, including Pennington Borough.

**Section III** - Woosamonsa Road to Route 518.

For analysis purposes, the discussion of traffic issues related the Corridor in the following pages will be by the four segments identified in Chapter 2. These issues will include existing traffic conditions, congestion, safety and planned or proposed improvements.

## Overview Of Existing Traffic Data Organized Into Four Corridor Segments

### Segment I: I-95 Railroad Overpass

Segment I of the Rt. 31 corridor is increasingly congested with unique traffic safety issues. Route 31 is a two-lane roadway between the overpass and the Pennington Road intersection traffic circle. South of the traffic circle, Rt. 31 is a four-lane road with a 45 m.p.h. posted speed limit. Adjacent land uses include single family housing and some commercial developments. The daily traffic volumes range from 21,000 vpd to the north and increase to approximately 30,000 vpd near the I-95 interchange.

### Congestion

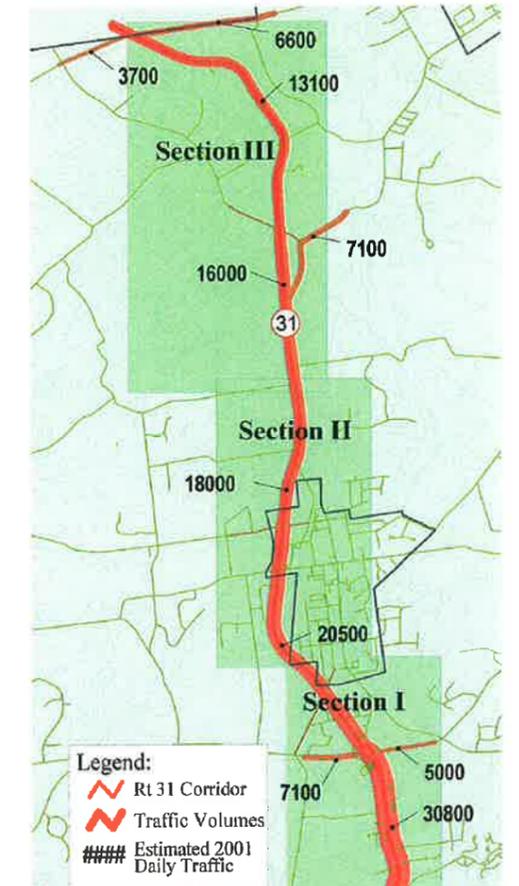
Given the four-lane road, high traffic volumes and the high-posted speed limits, this road appears to be relatively congested during an average hour of operation. Some residents have complained that left-turns onto or from the Rt. 31 traffic flow are very difficult, particularly during peak hours of traffic. The traffic circle at the Rt. 31/Pennington Rd intersection appears to operate relatively well, based on the com-

ments collected during public forums. Some residents felt that a traffic signal or any alternative traffic control at this intersection would increase back-ups and congestion at the intersection and along the roads.

### Safety

There are numerous complaints and observations about traffic safety along Segment I. The northern part of this section has limited curb cuts and does not appear to have above normal safety issues. The traffic circle does have some geometric and operational issues that would be problematic to traffic safety. There are numerous curb cuts at or near the intersection that makes operation confusing to the average driver. Also, people have observed newcomers unfamiliar with the traffic circle turn into the flow of traffic, causing a serious safety problem. Finally, high traffic speeds for approaching vehicles, with little or no geometric deflections to slow traffic, makes for additional unsafe conditions.

Relatively high speeds along the southern segment of this section (45 m.p.h.), with four lanes of traffic and residential and commercial curb cuts make for a potentially unsafe condition, particularly for left-turning vehicles.



Estimated 2001 daily traffic volumes according to the Master plan Advisory Committee’s three sections



vehicles. There are no bicycle and pedestrian facilities along Rt. 31 in this section. We are particularly concerned about the lack of bike/pedestrian facilities between the traffic circle and I-95.

### Previously considered improvements:

The two principal improvements that have been suggested for Segment 1 are geometric improvements at the traffic circle and along the four lane segment of Rt. 31. Geometric improvements to the traffic circle might include deflections to reduce traffic speeds as vehicles enter the circle and more defined access right-of-way for traffic movements. The four-lane segment may be reduced to three lanes (two directions of traffic and a center turn-lane). This improvement would provide a refuge for turning vehicles. An alternative to this scenario would be to create a four-lane boulevard. NJDOT has in the past contemplated increasing this segment of the corridor to a 4 lane divided highway, and/or replacing the rotary with a signalized intersection.

Local concerns for this segment of the corridor has centered on 1) safety for left turning vehicles onto side streets south of the rotary, 2) the lack of a turn around to reverse direction on NJ 31 from southbound to northbound for neighborhood residents, 3) future traffic growth that would cause a multi lane highway to be built (and a greater division of the community by the corridor), 4) safety issues at the rotary, 5) lack of bike/pedestrian facilities, and 6) the tendency for vehicles to divert to local streets due to congestion on NJ 31.

### Segment 2: Railroad Overpass to Yard Road Intersection

The overall land use character and traffic demands along Segment 2 are much different from Segment 1. Segment 2 includes many frontage properties that are either developed as commercial and moderate density residential use, or will potentially be developed in the near future. Route

31 is a two-lane roadway with turn lanes at the more significant intersections. The posted speed limit is between 35 and 45 m.p.h.. Average daily traffic volumes range from 16,000 vpd at the northern end and increases to approximately 20,000 vpd near the railroad overpass.

### Congestion

According to comments from residents, this segment of Rt. 31 is consistently congested, even in non-peak hours of the day. Roadway levels of service may be below average due to the high number of curb cuts along Rt. 31 and high traffic volumes. While a traffic impact study of the Pennington Shopping Center expansion shows the Rt. 31/W Delaware Avenue intersection to be at an average level-of-service during peak hours (i.e., less than 25 seconds of average vehicle delay), this contradicts extensive public comment at project workshops. According to comments up to 5 cycles of lights are required at peak hours to get through this area.

### Safety:

Based on observations along this section, the number of curb cuts accessing Rt. 31 and the congested traffic conditions make for potentially unsafe conditions in the more densely developed areas. Poor intersection safety may not be a concern. Pedestrian safety at the W. Delaware Ave/Rt. 31 intersection is a concern because of the desire line between Pennington Borough to the east of Rt. 31 and the schools to the west. There is a crosswalk at this intersection and recent efforts have been made to enforce restrictions against jaywalking across Rt. 31. There are no bicycle and pedestrian facilities along Rt. 31 in this section.

### Previously considered improvements:

Members of the Hopewell Township Master Plan Advisory Committee on Route 31 and local residents have discussed a number of potential improvements to the overall safety

along Rt. 31. There have been recommendations to limit the number of curb cuts or to construct minor roads parallel to Rt. 31 to control vehicle access and egress along the main corridor. Further efforts have also been requested by local residents to improve pedestrian facilities and connections in this area.

NJDOT has in the past contemplated increasing this segment of the corridor to a 4 lane divided highway and has participated in the improvements to the NJ 31 and North Main Street intersection improvements.

Local concern for this segment of the corridor has centered on congestion near Delaware Avenue and pedestrian safety at the Delaware /NJ 31 intersection.

### Segments 3 and 4 - Yard Rd. to Traprock Quarry and Quarry to Rt. 518

These northern segments of Rt. 31 are sparsely developed and have a rural character. There are two travel lanes with generous shoulders. These segments of Rt. 31 do not have a posted speed limit (the state speed limit is 50 m.p.h.). Average daily traffic volumes range from 13,000 vpd near the Rt. 518 intersection and increases to approximately 16,000 vpd at the southern end of Segment 1.

### Congestion

While we do not have information on any level-of-service analyses for Segments 3 and 4, we do have anecdotal evidence as to the intersection and roadway levels of service. (There are separate roadway and intersection level-of-service criteria). Due to the limited number of intersections, no steep slopes and the rural character of the area, the roadway level-of-service is likely to be good. Where there are intersections, average delays are likely to be high during peak hours, diminishing the intersection level-of-service. There appears to be some

congestion at the Rt. 518/Rt 31 intersection, with a possible below average level-of-service.

The unusually high number of trucks may have a significant impact on levels of service as they enter or exit the traffic flow (e.g.: at intersections or driveways) or as they climb and descend slopes. One segment of roadway that would appear to be congested due to trucks entering and exiting traffic would be the Marshall's Corner area, including the Trap Rock Quarry and other industrial developments along the corridor.

### Safety:

According to a report by the Hopewell Township Mayor's Task Force on Traffic & Trucking, the Rt. 518/Rt 31 intersection is of particular safety concern. The Task Force is currently working with the NJDOT to develop an acceptable and safe design alternative for this intersection. Pedestrian and bicycle facilities along the Rt. 31 corridor appear adequate for this section. Wide shoulders provide safe travel ways for cyclists and pedestrians.

Previously considered improvements: NJDOT has proposed a number of scenarios to improve the NJ 31 and NJ 518 intersection, but no design concept has been accepted by the community at this time.

## TRANSPORTATION GOALS & OBJECTIVES

- Accommodate current traffic volumes and responsible future growth, but do not create a roadway that divides the community and creates unsafe speeding, traffic volumes and truck movements.
- If possible, make improvements to the roadway that allows traffic to move more freely, reducing the tendency for travelers to seek local roads to bypass traffic. A litmus test for all design options should be keeping through traffic on Rt. 31 rather than forcing it to seek alternate routes on local or County roads.
- Design the road to be driven at a moderate rate of speed, enhancing safety for all.
- Make strategic improvements to intersections to make them safer for turning vehicles, pedestrians and bicyclists.
- Create safe points for crossing Rt. 31, especially at critical points such as the Intersection with West Delaware.
- Enhance the look and feel of the roadway with landscaping.
- Integrate corridor-length pedestrian/ bicycle access in the form of sidewalks, bike paths, and bike lanes & shoulders. Enhance access to commercial areas by foot and bicycle.
- Separate the bike/pedestrian corridors from vehicle travel lanes.
- Define points where dangerous commercial access driveways should be redesigned but do not excessively limit businesses' access to Rt. 31 custom-

- ers.
- Integrate roadway improvements with changes to land use so that the two are complementary.
- Provide examples of maximum community and economic development integration for Rt. 31.
- Provide examples of roadway choices that are positive, attractive roadways, so these alternatives can be advanced to NJ DOT in their process.
- Create alternative designs for the signalized intersections (signals create much of the corridor congestion).

## DESIGN RESPONSES TO GOALS & OBJECTIVES

### Accommodate current traffic volumes and responsible future growth, but do not create a roadway that divides the community and creates unsafe speeding, traffic volumes, and truck movements.

The design alternatives are set up to explore the implication of this objective. The three lane and four lane road configurations have inherent differences in vehicular capacity. The technical assessment of those differences will be assessed in the NJDOT study of Rt. 31 traffic volumes during the summer and fall of 2002, and the community should review that analysis closely. The design alternatives may be also be seen as possible phased approaches, where Alternative A, a three lane design south of the Pennington Circle, has features that could be readily implemented in the near future for minimal cost. The plan for the circle that modifies the existing rotary with alignment refinements to slow entering traffic speeds, even out traffic flow by removing dangerous curve transitions, and improving pedestrian crossings with splitter crossings and improved crosswalks is also a short term or a long term improvement. Major reconstruction of the circle is a long-term higher cost project with both highway-related changes as well as adjacent land use implications. The differences between the two schemes for the circle should also be analyzed closely by the community when NJDOT brings back the traffic study findings. The four lane boulevard scheme shown in Plan B requires more time to implement and has a considerably greater cost, but also will have increased capacity to offer for longer term improvements.

The ability for NJDOT to use federal and state funds for Rt. 31 improvements will also be contingent for improvements to have a reasonable cost effective life span. Most transportation projects must have a

20-25 year functional life. NJDOT will present future projections for the corridor. The community should validate those projections with realistic on-the-ground assessment of local and regional growth trends, looking at increases in regional traffic use of Rt. 31, with an eye to the specific generators of traffic on the corridor, specific development trends in the are post 9-11. Projections should not be based solely upon a straight % of traffic growth based upon a historic growth rate, although many DOT's still use that method.

Understanding traffic growth in the corridor will also enable the community to plan for alternative transportation needs.

### If possible, make improvements to the roadway that allow traffic to move more freely, reducing the tendency for travelers to seek local roads to by-pass traffic.

The local impacts of a nearby arterial highway are a major concern to both the Hopewell and Pennington communities. It is the opinion of the writers that delays at the signalized and non-signalized intersection on Rt. 31 that cause drivers to contemplate other local routes to avoid long cues at the lights at Delaware Ave, and North Main Street. There is a ripple effect of that decision though, that extends to more distant intersections such as the Pennington Circle to the south and perhaps as far north as Woosamonsa Road. Drivers make conscious decisions, based upon their anticipation that at certain times of day – the intersections are jammed to capacity. They select a path of local streets hoping to beat the congestion by going around it. The result is a pattern of regional traffic that uses local streets through both Hopewell and Pennington in roughly a parallel path to Rt. 31.

Both communities have attempted additional enforcement on local streets at

considerable expense. Anecdotal evidence was that speed traps in both Pennington and Hopewell are notorious. There are more negative aspects of this public perception, but the situation remains that the REGIONAL TRAFFIC SHOULD BE ON Rt. 31.

The key to improving congestion on Rt. 31 is improving capacity at the intersections. If signalized intersections are to be continued in use, future traffic growth and the need for greater capacity can only be achieved with additional through and turning lanes. This will pose significant challenges on the side streets because additional lanes on Rt. 31 for turning movements will also translate into more lanes at intersections on side streets as well. Wider roads and intersections can be more accident prone because of greater driver confusion and increases in car – to car and car to pedestrian/bicyclist conflict points. The more the road is perceived as a danger, the more divisive it is in the community.

One of the reasons that roundabouts were included in the proposals for the intersections is because they have a proven record of higher traffic - moving capacity than signalized intersections. In addition, the elimination of left turns (the primary delay movement on Rt. 31 and most roads) removes that congestion from the function of the intersection.

NJDOT analysis of the alternatives should include SIDRA analysis for the roundabout proposals. However, neither NJDOT nor their consultants have used SIDRA in roundabout design before. There are many subtleties of the SIDRA program and roundabout design aspects that are buried within the program that subtle fine-tuning of a conceptual design can identify and resolve. It is not a simple analysis process that leads to a yes – or no answer. Anecdotal analysis of the intersection in the NJ 31 corridor places them all as highly eligible candidates for roundabouts as replacements for traffic signals, and evidence presented to the contrary should be scruti-

nized by both Hopewell and Pennington.

Both communities should insist that the NJDOT retain the services of an impartial outside authority on high volume roundabout design and engineering to review the project and perform peer review of the SIDRA analysis.

### Design the road to be driven at a moderate rate of speed, enhancing safety for all.

Speed is a major safety aspect of the road south of the circle at all times and off-peak hours along the corridor in all locations. Prevailing speeds on the road range from 0 – 5 m.p.h. during congested periods to as high as 50-60 m.p.h. when the road is not congested. There are no barriers or limitations to speed along the whole road with the exception of the northbound curve exiting the circle, and the timing of signals which may be synchronized to specific traveled speeds. However, signals are generally not regarded as an appropriate nor effective manager of vehicle speeds. Their purpose is to manage traffic congestion when it becomes below acceptable levels.

All involved in the public process for this project believed that slowing traffic speeds would lead to a safer road, and the concept of a road that would be self-regulating from a speed perspective. Slow and steady should be a design intention so that through-movement can be readily accommodated, while not at unsafe speeds.

Traffic calming is a recent evolution of highway design practice and has a number of possible applications to arterial corridors such as Rt. 31. The two primary tasks for traffic calming on Rt. 31 are slowing traveled speeds to the posted speeds of 35 and 25 m.p.h., and creating a roadway environment that is “calm” for other users than strictly automobiles – namely pedestrians and bicyclists.

### A number of “Traffic Calming” features have been included in the alternative designs the NJ 31 corridor:

Defining 11’ wide travel lanes appropriate for moderate speeds instead of the highway width 12’ lanes.

Definition of 4’ paved bike shoulders to make a safe space for bicyclists to travel the corridor.

Modern roundabouts perform best at a traveled speed of 18 – 25 m.p.h. and have a speed-reducing effect.

Pedestrian crossing islands for intersections and mid-block crossings have a slowing effect.

The plan at bottom left, page 60 shows how traffic calming splitter islands could be integrated with non-signalized intersections to slow traffic speeds and create places for protected pedestrian crossings.

Creating linear parks and pathways along the corridor for pedestrian and bicycle use, and landscape enhancement of the corridor.

Retrofitting signalized intersections with pedestrian crossing refuges and other pedestrian safety and enhancement amenities.

Reducing the number of commercial curb cuts and better defining share and multiple-use driveways and access roads so that pedestrian access along Rt. 31 can be relatively uninterrupted and free of street/driveway crossing conflict points.

### Make strategic improvements to intersections to make them safer for turning vehicles, pedestrians, and bicyclists.

Intersections in the Rt. 31 corridor are places typically where vehicles, pedestrians, and bicyclists must interface. Currently vehicular needs and uses dominate the road and the intersection environment. The current intersections fail to create neither the impression nor the reality of a safe pedestrian/bike environment beyond a typical accommodation of simple signed

crosswalks. A major recent (March 1999) study by the Bike and Pedestrian Task Force of the Institute of Transportation Engineers (ITE) determined that in many cases for roads (like Rt. 31) with excess of 10,000 Average Daily traffic (ADT), the conventional designation of a crosswalk with sign offers no increased level of safety on two lane roads and actually increased the number of accidents on multi-lane roads and in some cases actually decreases safety. The report defines that more successful methods include: curb extensions, crossing refuge islands, and reductions of turning lanes at intersections, narrowed travel lanes, and speed reducing traffic calming measures including raised and/or contrasting pavement crosswalks. The report does not specifically mention the use of roundabouts but research on accidents between pedestrians and vehicles at varying speeds points to significantly increased likelihood of survival for a person struck by a vehicle with a traveled speed of 20-25 m.p.h. than 35-40 m.p.h..

The specific tools for intersection improvements for Rt. 31 include:

Reduction in the number and width of travel lanes.

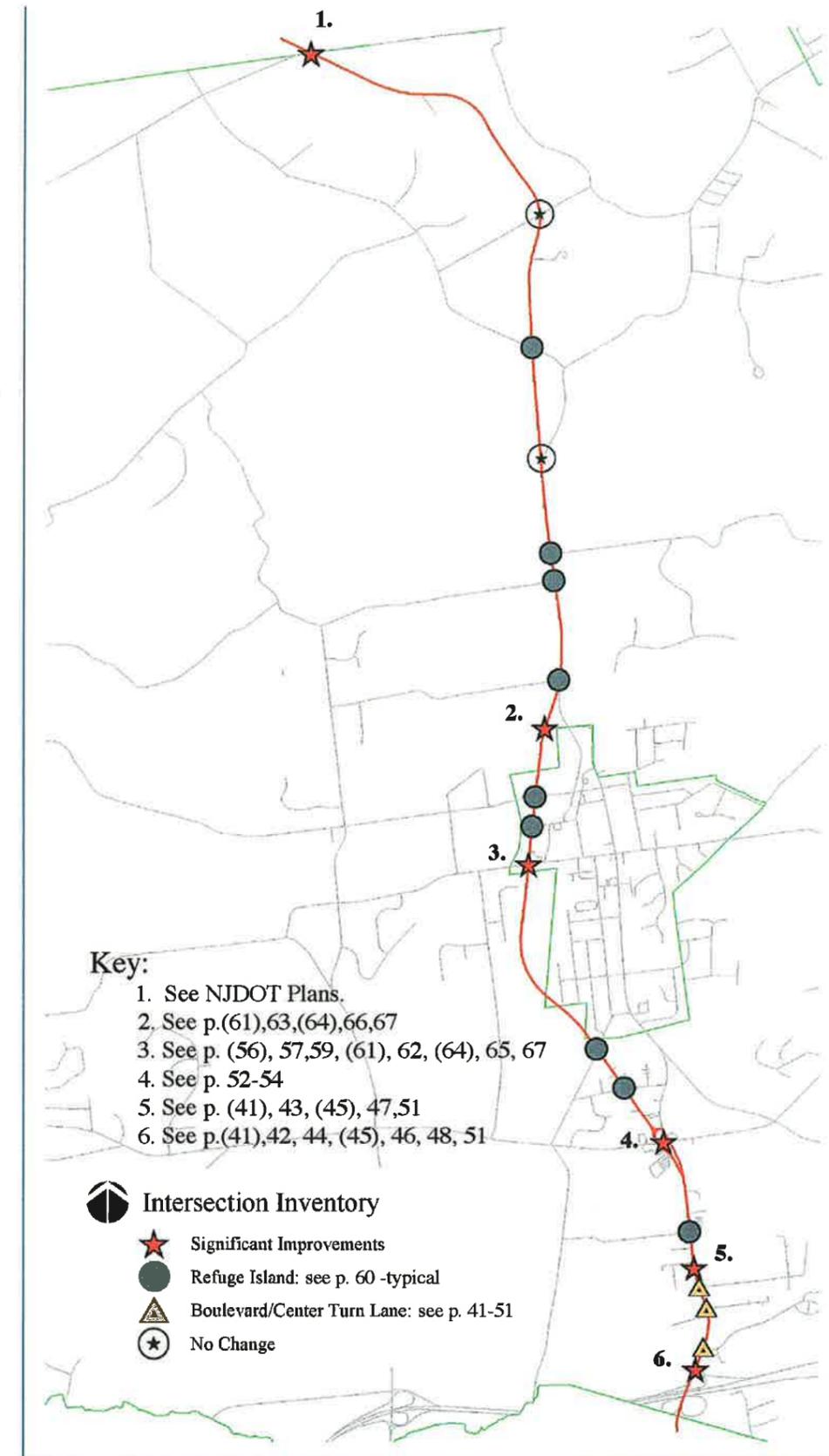
Definition of curb extensions at street crossings

Refuge islands so that pedestrians and bicyclists can have a protected staging area after dealing with traffic in one direction before they meet the other direction.

Enhanced crosswalks  
While not shown on the plans, Intelligent Transportation (IT) devices such as sensors and reflector lights for crosswalks are also proven to be successful and adaptable to corridors such as Rt. 31.

### Enhance the look and feel of the roadway with landscaping.

There is a significant Right of Way (ROW) for Rt. 31 along most of the corridor, ranging between 60’ to over 100’ in width, and this availability of land is a unique asset for the future improvement to the road.



Contrary to conventional highway improvements, the use of the ROW on Rt. 31 should not be just to achieve a wider faster road. The judicious use of the ROW for travel lanes, bike lanes, landscaped buffer areas, streets and sidewalks or shared use paths should be conceived as a balancing act where each mode of transportation receives a "democratic" share of the road surface and ROW area.

The road has very few sections where there is a public landscape form any intentional landscape development. To the contrary, the lack of agreement on the future of the road has contributed to a lack of interest and commitment to invest in the money, time, effort and time on either the part of the NJDOT or private landowners who see the future of their front dooryards as likely to change - for the worse.

The alternative plans for the corridor study areas define a series of landscape enhancement possibilities including: Continuous deciduous street trees to create a shady canopy over the roadside, and to buffer the visual, auditory, air quality affects of the high volume of cars. Large areas of landscaped parks and roadside greenspace.

Work with private property owners to create mutually beneficial landscape development for roadway frontages, and public and private landscaped areas.

The development guidelines define ways that landscaped areas along the corridor could be enhanced either through regulatory revisions in the permitting review process as well as cooperative public - private partnerships.

There is a general sense that past practices of requiring screening and berming the view of development along the corridor should be reconsidered. The notion that any development might be unsightly enough to warrant it's screening from view, points to a larger failure of the system to advocate for good aesthetic design and land use decisions. To the contrary, where these visual barriers have been defined, the road and the community seem even

out of balance and artificially cut off from each other. An alternative is the more distinguished boulevard concept advanced in the alternatives which emphasizes the creation of a treed lined corridor accessible to drivers, pedestrians and bicyclists alike. As future plans are developed by the NJDOT, in no way should the siting of noise barriers, "Jersey barriers", intensive fencing of the ROW, planted barriers, and other "highway like" features that separate the road from the community be accepted. Those belong along heavily traveled interstates, not through communities. If the design has developed that these features are deemed necessary the process has failed and it's time to back up and rethink the intentions of the Rt. 31 improvements. One way that the look and feel of the road can be enhanced is to make sure that the NJDOT's design standards are being compatibly use for Rt. 31. The technical standards such as design speed, level of service, desired sight distances will drive many related decisions decision that can make or break a well designed community-highway integration. The communities should advocate for a design speed as close to the posted speeds as possible, and should not allow a project to be designed for 50 or 55 m.p.h. design speeds.

### **Integrate corridor-length pedestrian/bicycle access in the form of sidewalks, bike paths, and bike lanes & shoulders. Enhance access to commercial areas by foot and bicycle.**

The alternative designs all include sidewalks and/or bikepaths/shared use paths for the entire length of the corridor. Because crossing points are relatively few currently, and the designation of crosswalks on the highly traveled corridor may be a challenge, it is assumed that pedestrians and bicyclists may have to travel some distance along one side of the road before

they reach a place where they can safely cross. Therefore sidewalks and shared use paths should be located along both sides of the road, and should be integrated with all NJDOT plans for the corridor.

The Alternative designs show sidewalks and shared use paths in a variety of configurations. These should be considered as the NJDOT design process continues.

Separate the bike/pedestrian corridors from vehicle travel lanes. Given the significant levels of traffic on Rt. 31, the design of sidewalks and /or shared use paths must incorporate a generous buffer of street trees and landscaping as a physical separation from the roadside and curb to the edge of where pedestrians and bicyclists travel. The alternative design cross sections clearly show these features as an integrated part of the whole streetscape design for the corridor. Under no circumstances should the communities accept designs for sidewalks that run along the edge of the curb next to the road or shoulder.

### **Define points where dangerous commercial access driveways should be redesigned in such a way as to not excessively limit businesses' access from Rt. 31 by their customers.**

Many successful businesses on Rt. 31 have shared driveways that serve multiple stores, even parcels.

### **Integrate roadway improvements with changes to land use so that the two are complementary.**

This corridor plan defines regulatory changes that can have a direct effect on both the function and appearance of the corridor. If the communities desire to keep the road as more of a scenic rural road then major regulatory changes to reduce the area designated as commercial and industrial development should be contem-

plated. The guidelines presume that more of a mixed-use corridor is desired in Sections One and Two with a better integration of land use and highway development.

## **Introduction**

The New Jersey Department of Transportation (NJDOT) will be completing a traffic study of the Route 31 corridor to update traffic data: traffic volumes, turning movements, accident data, and levels of service. A pedestrian and bike assessment of the corridor will also be done. With this data in hand, projections for future traffic growth in the corridor will be completed.

Both Hopewell Township and Pennington Borough should look very closely at growth projections for Route 31. There is considerable amount of permitted residential growth already in the pipeline and employment location trends post 9-11 have significantly changed population, commuting patterns and other regional demographics. Historical growth rates as often used by NJDOT may not reflect the true picture of future transportation changes of the New Jersey 31 corridor.

The township and borough should consider commissioning its own study of future transportation/ land use growth for the New Jersey 31 corridor, using NJDOT baseline data.

The NJDOT will be using the new data to access roadway improvement alternatives to Route 31. Based upon past improvements to the corridor on points north/south of Hopewell/Pennington, it is clear that turn mobility will be the priority for state/federally funded highway improvements. Given the road's regional significance and potential increases in traffic, it is highly likely that the NJDOT will propose changes to the road to increase capacity.

The community has resoundingly

rejected the theory that Route 31 should be widened at any cost and a divisible highway will not pass muster with either Pennington Borough or Hopewell Township councils. At present, there is no consensus about the road's future. That is appropriate given that the NJDOT is just beginning its study of corridor traffic.

The purpose of this report for corridor land use and transportation improvements guidelines is to guide that process, with a clear eye to improving the community-roadway integration of New Jersey 31.

The issues that have been identified have been assessed qualitatively so that basic issues of roadway scale, aesthetics, pedestrian safety and comfort, and access management for economic development are considered.

# NJ Route #31 Corridor

NORTH  
Rt.31 and N. Main St.

SOUTH  
(I-95)

## Qualitative Evaluation of Design Options

	Segment 2A/B	Segment 2A/B	Segments 2A/B	Segments 2A/B	Circle A	Circle B	Segments 1A/ B	Segments 1A/ B	Segments 1A/B	Segments 1A/ B
	two - three lane w/signalized intersections	two - three lane w/roundabout intersections	four - lane boulevard w/signalized intersections	four - lane boulevard w/roundabout intersections	Segnebt 1C Larger Modern O	Segment 1C Smaller Modern O	two - three lane w/signalized intersections	two - three lane w/roundabout intersections	fourlane boulevard w/signalized intersections	fourlane boulevard w/roundabout intersections
<b>Key to the evaluation uses a relative basis</b>										
	major improvement									
	minor improvement									
	no change									
	minor degradation									
	major degradation									
<b>NJDOT</b>	Quantitative response dependent on NJDOT scoping analysis of the corridor									
<b>R.O</b>	Quantitative response depends on roundabout expert analysis									
<b>Contributes to the visual and aesthetic character of the road</b>										
The existing natural and rural character of the road is preserved										
Changes to the road enhance negative aspects of the existing character of the road										
Integrates street trees and corridor length landscaping to improve visual charcater										
Improves frontages on commercial development										
The roadway appears to be a high volume state highway										
The roadway appears to be a busy urban/suburban street										
The appearance of the road is dominated by "highway" related appurtenences										
The road has a landscape and community identity and visual integrity										
<b>Accommodates existing and future traffic</b>										
Improves through - road capacity overall	NJDOT	NJDOT	NJDOT	NJDOT/RO	NJDOT	NJDOT/RO	NJDOT	NJDOT	NJDOT	NJDOT/RO
Improves intersection capacity and reduces points of congestion	NJDOT	NJDOT	NJDOT	NJDOT/RO	NJDOT	NJDOT/RO	NJDOT	NJDOT	NJDOT	NJDOT/RO
Configures intersections so that through traffic is taken away from local streets		NJDOT							NJDOT	
Roadway design moderates speeds to be "slow and steady"										
Roadway design enhances accessibility for emergency response vehicles										
Improves safety at identified or perceived high accident locations	NJDOT	NJDOT/RO	NJDOT	NJDOT/RO	NJDOT	NJDOT/RO	NJDOT	NJDOT/RO	NJDOT	NJDOT/RO
<b>Accommodates alternative transportation uses including transit, bike and pedestrians</b>										
bike lanes										
bike path/shared use path										
sidewalks										
landscaped buffer between bikes/peds and the roadway										
facilitates safe street crossings for bikes and pedestrians										
minimizes street crossing width for exposure to moving vehicles										

## Qualitative Evaluation of Design Options

The table above illustrates an initial evaluation of the corridor options designs based upon a relative scoring basis. The scoring basis defines relative improvements or degradation of a wide range of criteria as might be effected by the designs.

The following are the possible scores:

- major improvement
- minor improvement
- no change
- minor degradation
- major degradation

NJDOT means that a Quantitative response dependent on NJDOT analysis of the corridor

R.O means that a quantitative response depends on roundabout expert's analysis

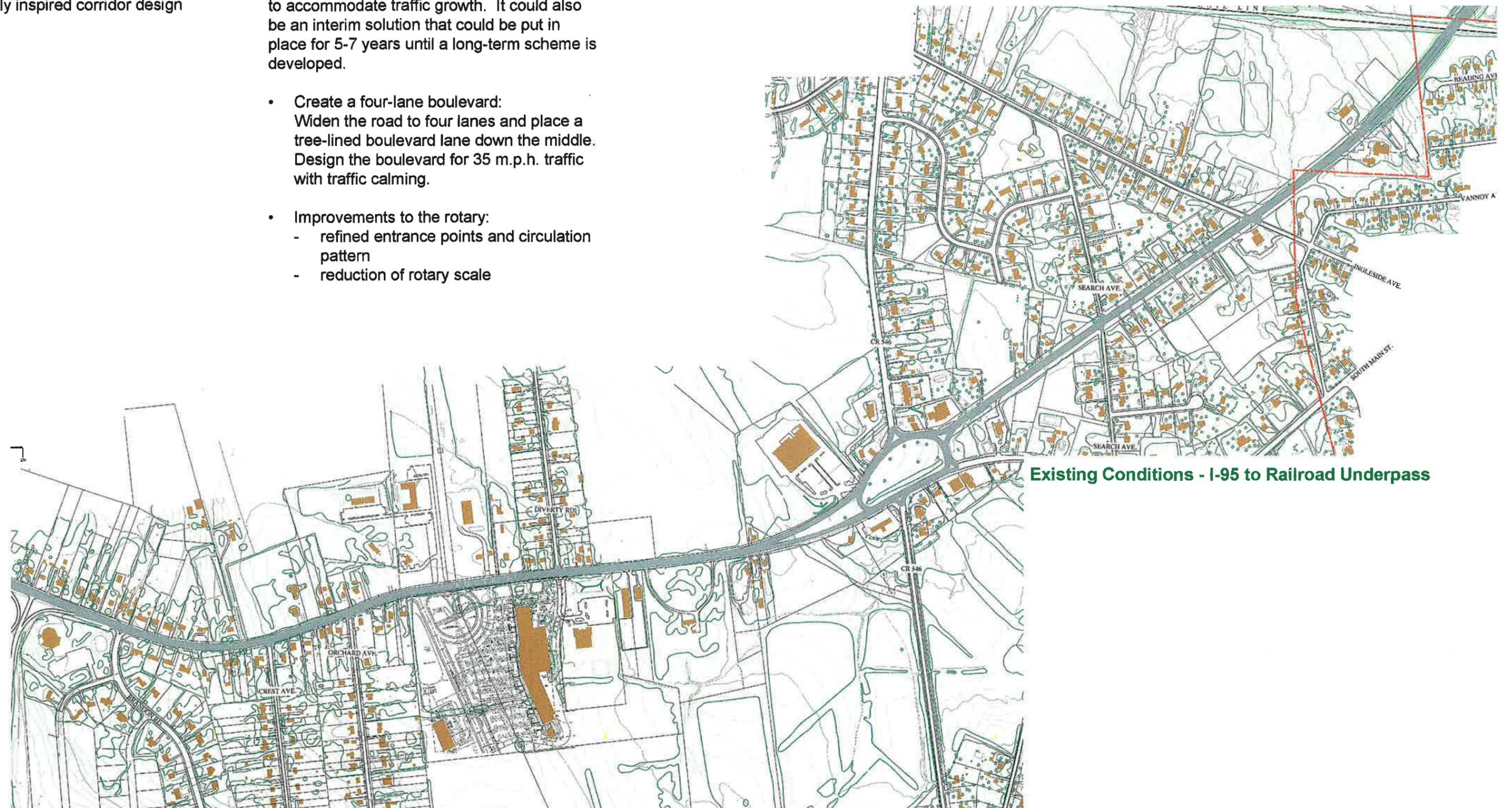
## Corridor Design Concepts

To work toward an overall corridor design, the project team has developed design concepts for several segments of NJ Rt. 31. Our purpose has been to integrate project goals and objectives to create opportunities for informed and aesthetically inspired corridor design concepts.

## Design Alternatives

### Southern Segment

- Create a three-lane road with center turning lane and bike lanes/shoulders to both sides of the road. This concept relies on the capacity of the road in this configuration to accommodate traffic growth. It could also be an interim solution that could be put in place for 5-7 years until a long-term scheme is developed.
- Create a four-lane boulevard: Widen the road to four lanes and place a tree-lined boulevard lane down the middle. Design the boulevard for 35 m.p.h. traffic with traffic calming.
- Improvements to the rotary:
  - refined entrance points and circulation pattern
  - reduction of rotary scale



Existing Conditions - I-95 to Railroad Underpass



PENNINGTON BOROUGH

Existing Conditions - Railroad Underpass to Woosamonsa Road



Existing Conditions - Woosamonsa Road to Woodville Road



Southern Section (Segment 1 on overall Corridor Plan):  
Alternative A:

Creates a three-lane road with center turning lane with center islands. The removal of the passing lanes will slow traffic, and the regular placement of the islands will protect the center lane from being used for passing, and will also protect cars seeking to turn left from oncoming collisions. The current road with four travel lanes functions such that the passing lanes double as the turning lanes, which causes the turning movements and speeding traffic to conflict. Cars attempting to turn left also are exposed to rear end collisions by passing vehicles.

This design uses the existing width of the road, and the removal of the fourth lane allows pavement width to be reallocated to create bike lanes and/or shoulders for biking along the roadside. Within the right of Way, new sidewalks are defined on both sides of the road.



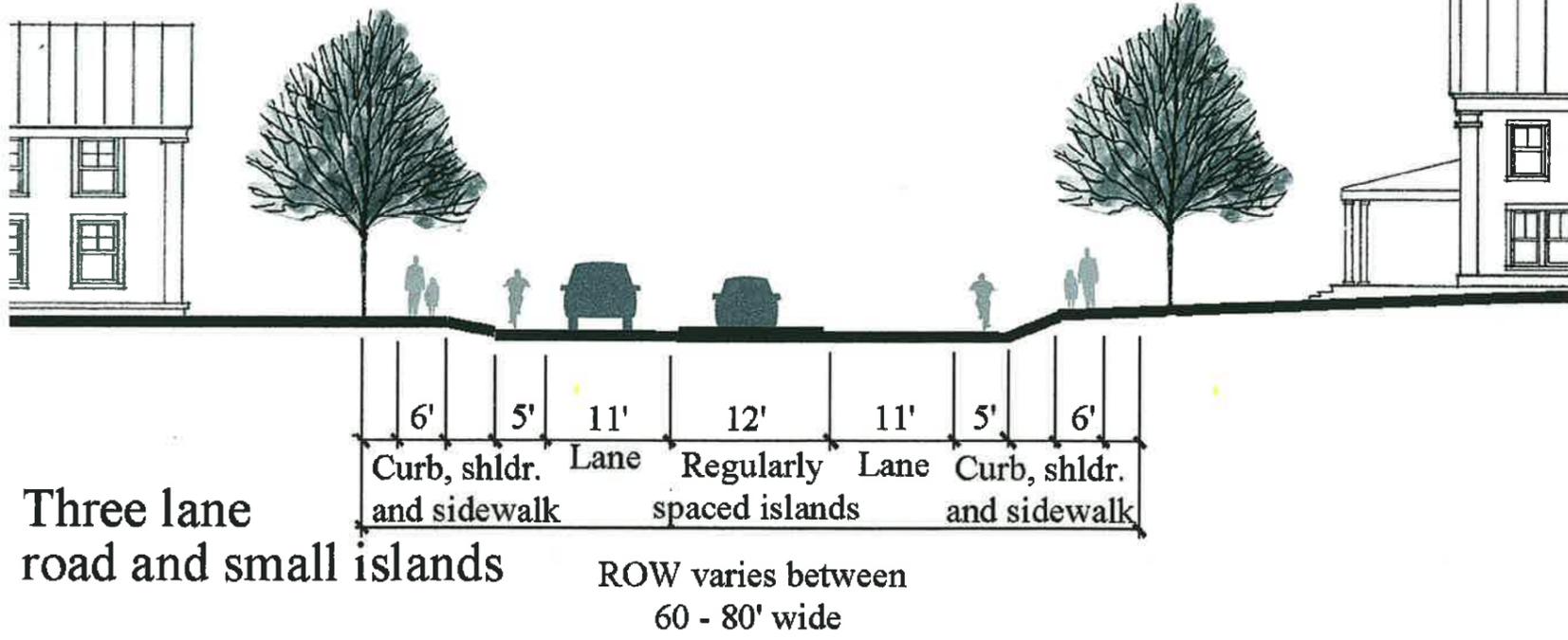
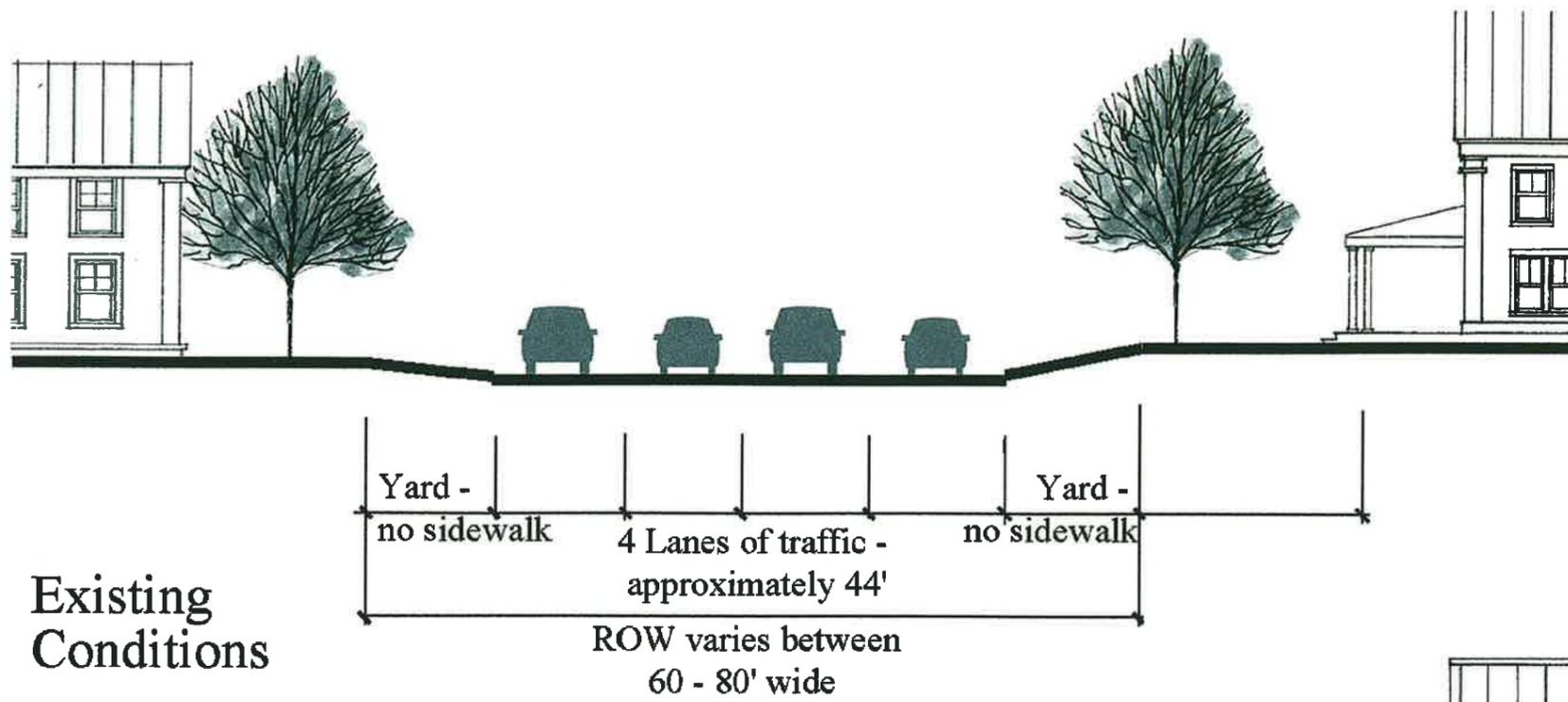
*Offset crosswalk uses center island as a protective refuge for pedestrians. A pedestrian in this plan only has to cross 1 lane of traffic at a time.*

*Turning lane islands are located at Brandon Rd. and regularly spaced intervals travelling northward at Crest and Orchard Avenues.*

Alternative A: Detailed View of Three -Lane Road I-95 to Crest Ave.



Alternative A: Detailed View of Three-Lane Street Crest Ave. to Diverty Road



Street Sections of the Three-Lane Road

These cross sections show the existing Right of Way and roadway width and how the three-lane configuration would reallocate pavement width for a slower road, with bike lanes/shoulders and sidewalks along both sides of the road. The exact configuration of lanes and their widths is subject to conformance with NJDOT Design Standards. The slower speeds that would likely result from this road should improve driver feeling of safety because the current conditions of high speeds and numerous turning movements into driveways and side streets conflict with the four-lane highway.



### Segment 1 - Alternative B

Creates a four-lane boulevard. This alternate design proposes to widen the road to allow for travel lanes and a center tree planting to make a boulevard island down the middle of the road. If the boulevard is designed for 35 m.p.h. traffic with traffic calming, the road should have higher traffic capacity but not at the expense of creating a very wide, fast highway.

This design requires widening the existing road to create the boulevard by some 20-40 feet. The widening also allows for space for a tree lined roadside and sidewalks along both sides. This design is presented to articulate a multi-lane highway while not creating the "Jersey Barrier" lined highway appearance of Rt. 31 further to the north towards Ringoes and Flemington.

This alternative represents a long-term solution that should be able to accommodate safely higher levels of regional and local traffic.



*Offset crosswalk uses center island as a protective refuge for pedestrians. A pedestrian in this plan only has to cross 1/2 lane of traffic at a time.*

*Protected left turn lane for Brandon Road, the exact length of the left turn cue to be determined by NJDOT.*

*Four - lane boulevard continues towards the Pennington Circle - see next section for the circle*

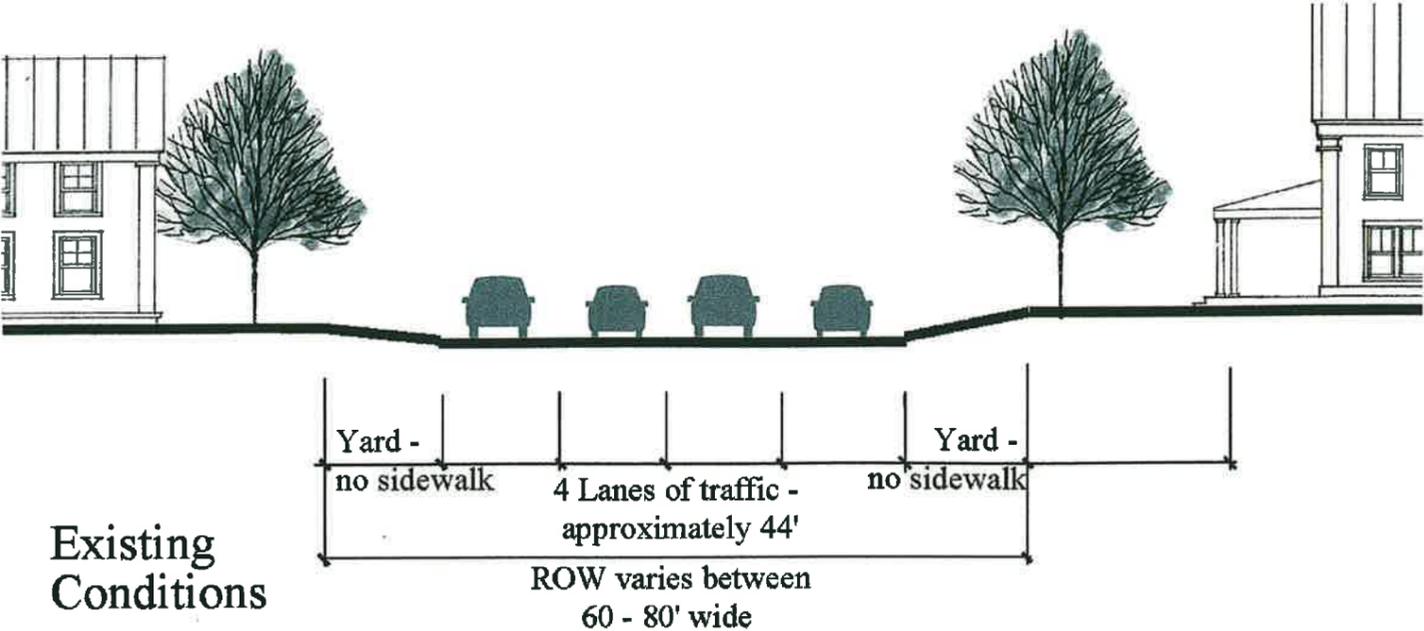
Alternative B: Detailed View of Four-Lane Boulevard - I-95 to Crest Ave.



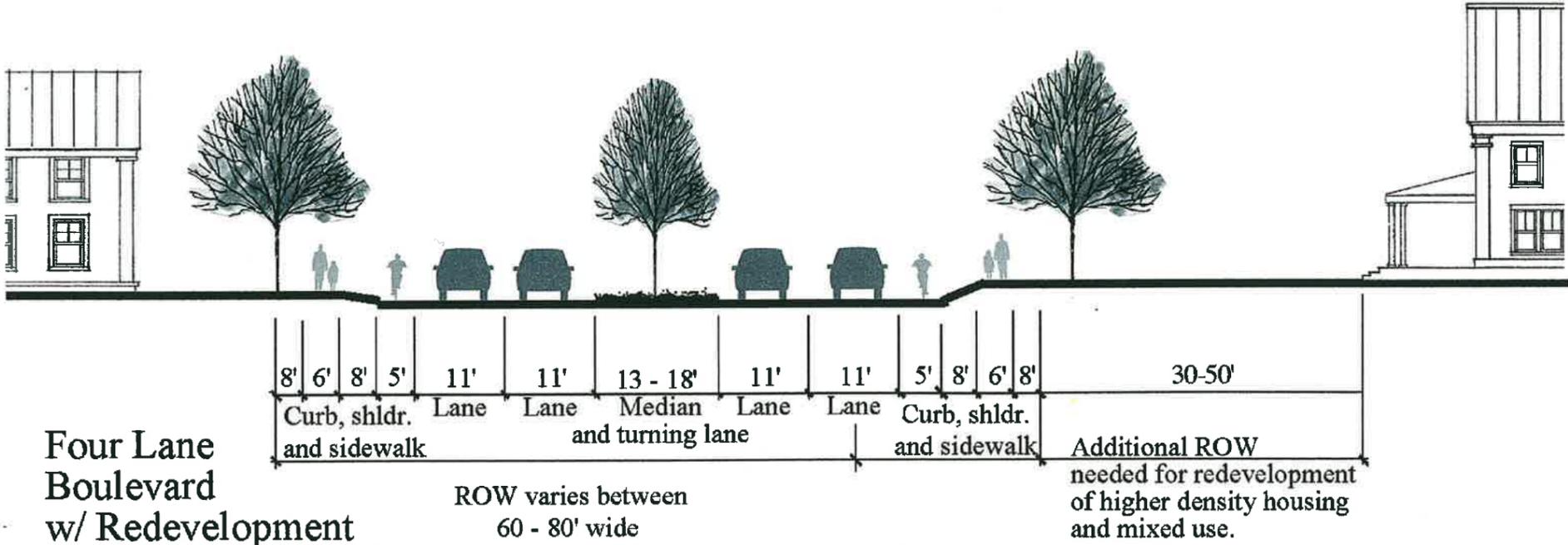
Alternative B: Detailed View of Four-Lane Boulevard - Crest Ave. to Diverty Road

Street Sections of the Four-Lane Boulevard

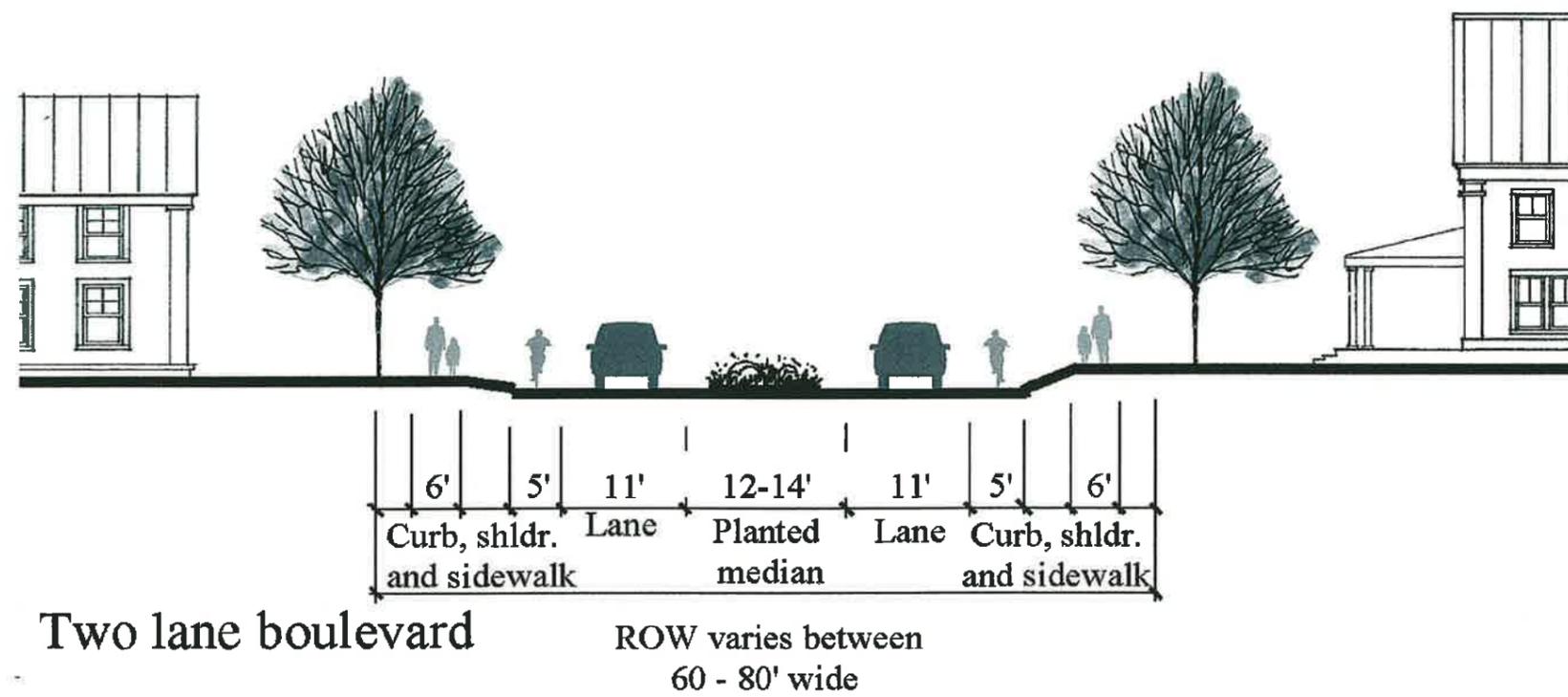
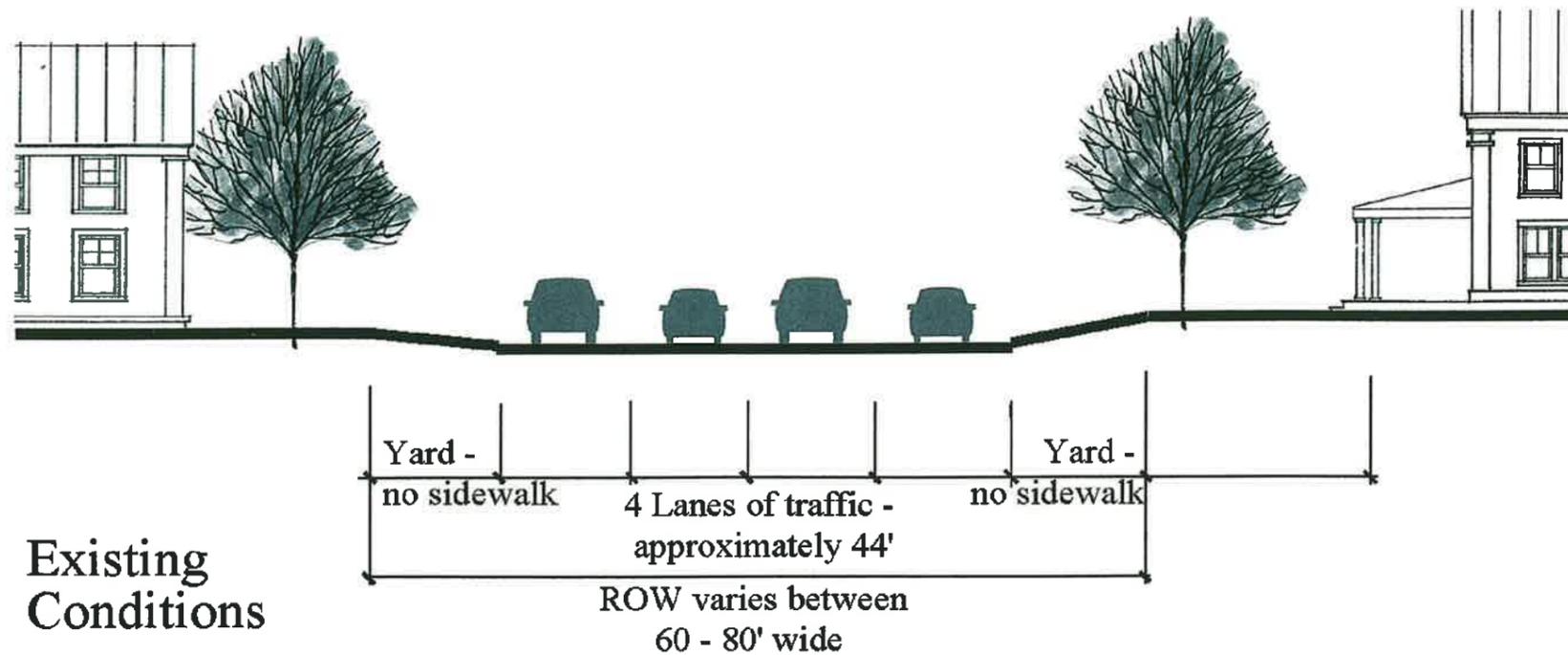
These cross sections show the existing Right of Way and roadway width and how the road would need to be changed to accommodate the Four-Lane boulevard. The boulevard would include bike lanes/shoulders and sidewalks along both sides of the road. The exact configuration of lanes and their widths is subject to conformance with NJDOT Design Standards. With turning lanes carved from the wide landscaped median for turns into side streets, the through flow of the four-lane road would be significantly enhanced from the current four-lane road that currently exists.



Existing Conditions



Four Lane Boulevard w/ Redevelopment



Street Sections of the Two-Lane Boulevard



#### Four-Lane Boulevard with Modern Roundabouts

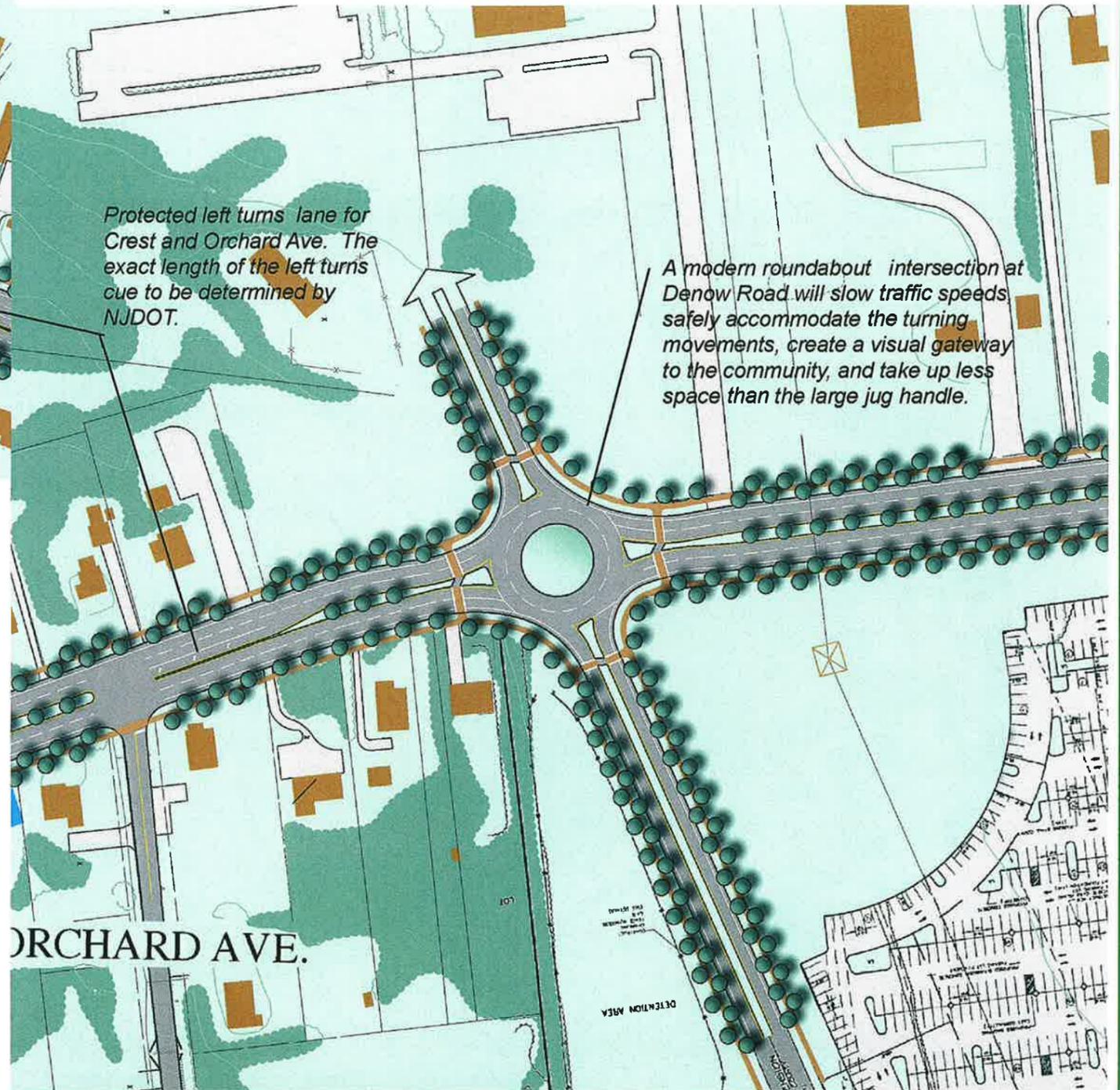
This design combines the boulevard design concept with the substitution of modern roundabouts at several of the intersections. Roundabouts allow for the reduction of turning lanes at the intersections and allow for slower but more efficient turning movements and intersection capacity. Modern roundabouts are also designed to be driven at 20-25 m.p.h., which would significantly reduce speeding problems on the multi-lane highway. The boulevard still allows space for a tree-lined roadside and sidewalks along both sides, with the added enhancement of the roundabout island which could be landscaped and made attractive as a community gateway.

This alternative represents a long-term solution that should be able to accommodate safely higher levels of regional and local traffic. NJDOT will assess this alternative in contrast to the signalized – jug handle intersection design previously shown. The community should consider the benefits in this plan of the likelihood of much slower speeds than a signalized design.



Modern roundabout at the I-95 interchange allows local traffic to be able to turn around to get into the Brandon Rd., Crest, and Orchard Ave. neighborhoods.

Offset crosswalk uses center island as a protective refuge for pedestrians. A pedestrian in this plan only has to cross 1 lane of traffic at a time.



Protected left turns lane for Crest and Orchard Ave. The exact length of the left turns cue to be determined by NJDOT.

A modern roundabout intersection at Denow Road will slow traffic speeds, safely accommodate the turning movements, create a visual gateway to the community, and take up less space than the large jug handle.

#### Detailed Views of Four-Lane Boulevard

Both roundabouts have been designed as tow lane roundabouts to accommodate the high traffic volumes along Rt. 31. Recently permitted residential development to the east of Rt. 31 will also generate higher side street traffic and turning movements. As the balance between through traffic and side streets equalizes, the roundabouts will function more and more efficiently, where traffic signals will have increased delays due to left turn cues onto side streets.

The roundabout at Denow road as opposed to the jug handle can accommodate crosswalks on all side of the intersection for bikes and pedestrians. Off set crosswalks have been used for increased pedestrian – vehicular visibility and eye contact.



Existing Conditions



Alternative A: Larger Traffic Oval



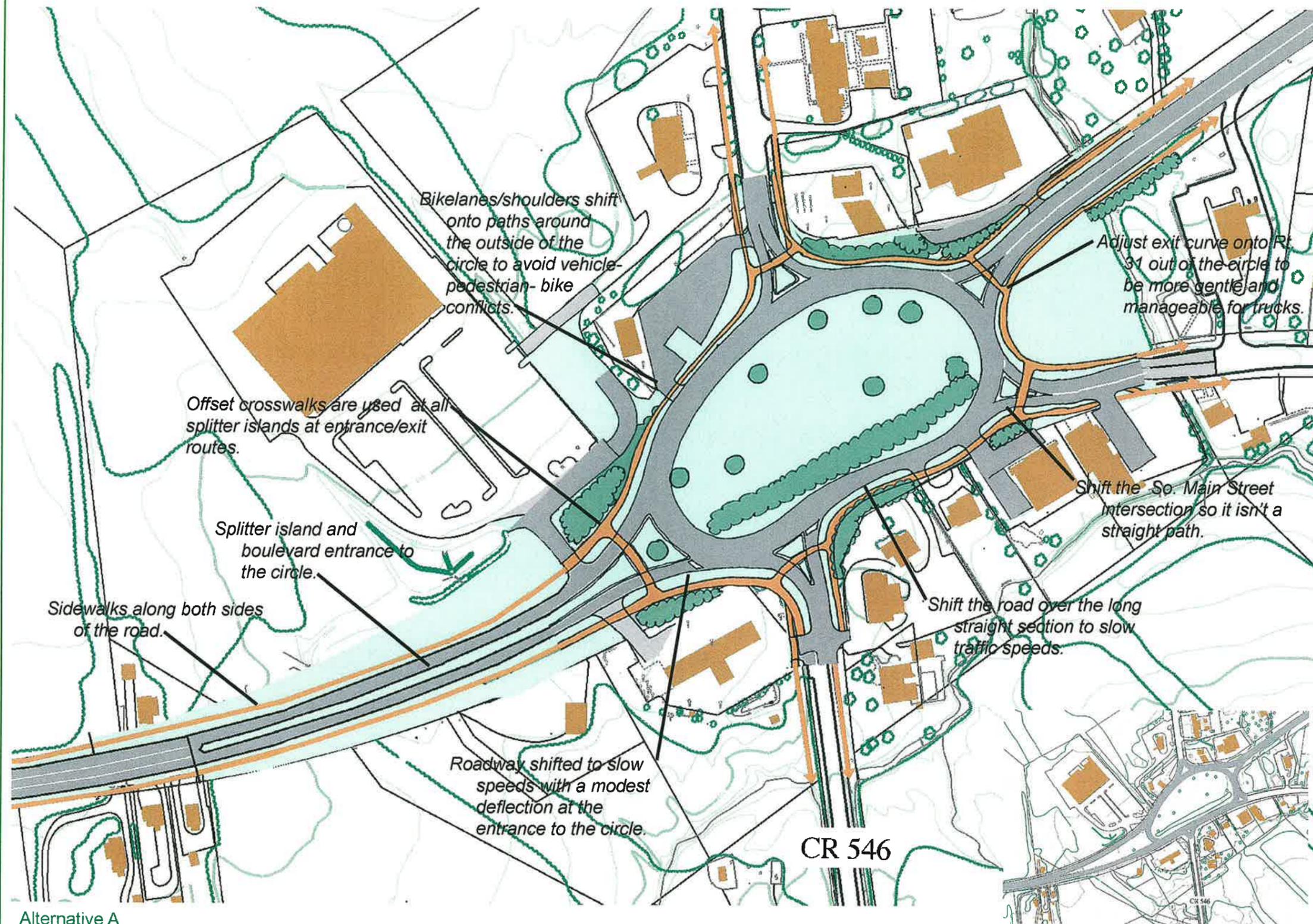
Alternative B: Smaller, Modern Roundabouts

### Design Options at Pennington Circle

- Higher speed traffic is slowed at entrance points with splitter islands.
- Smaller circle is slower yet maintains adequate capacity.
- Pedestrians and bikes are kept to the outside of the circle in safe paths off the highway.
- Reduced area of the circle allows for extensive landscaping for selective redevelopment of commercial properties.
- Location of frontage roads allows for safer commercial access.
- Relocation of Main Street into Pennington Borough may reduce through traffic on local streets.

The circle can be improved to be safer and maintain capacity by:

- Creating deflection at the entrance points to slow traffic speeds in the circle.
- Smoothing the radii of exiting turns such that sharp/dangerous speed transitions for through vehicles on Rt 31 are removed.
- Remove or relocate poorly located driveways.
- Define sidewalks/bike path around the circle for safe pedestrian and bike access.



Alternative A

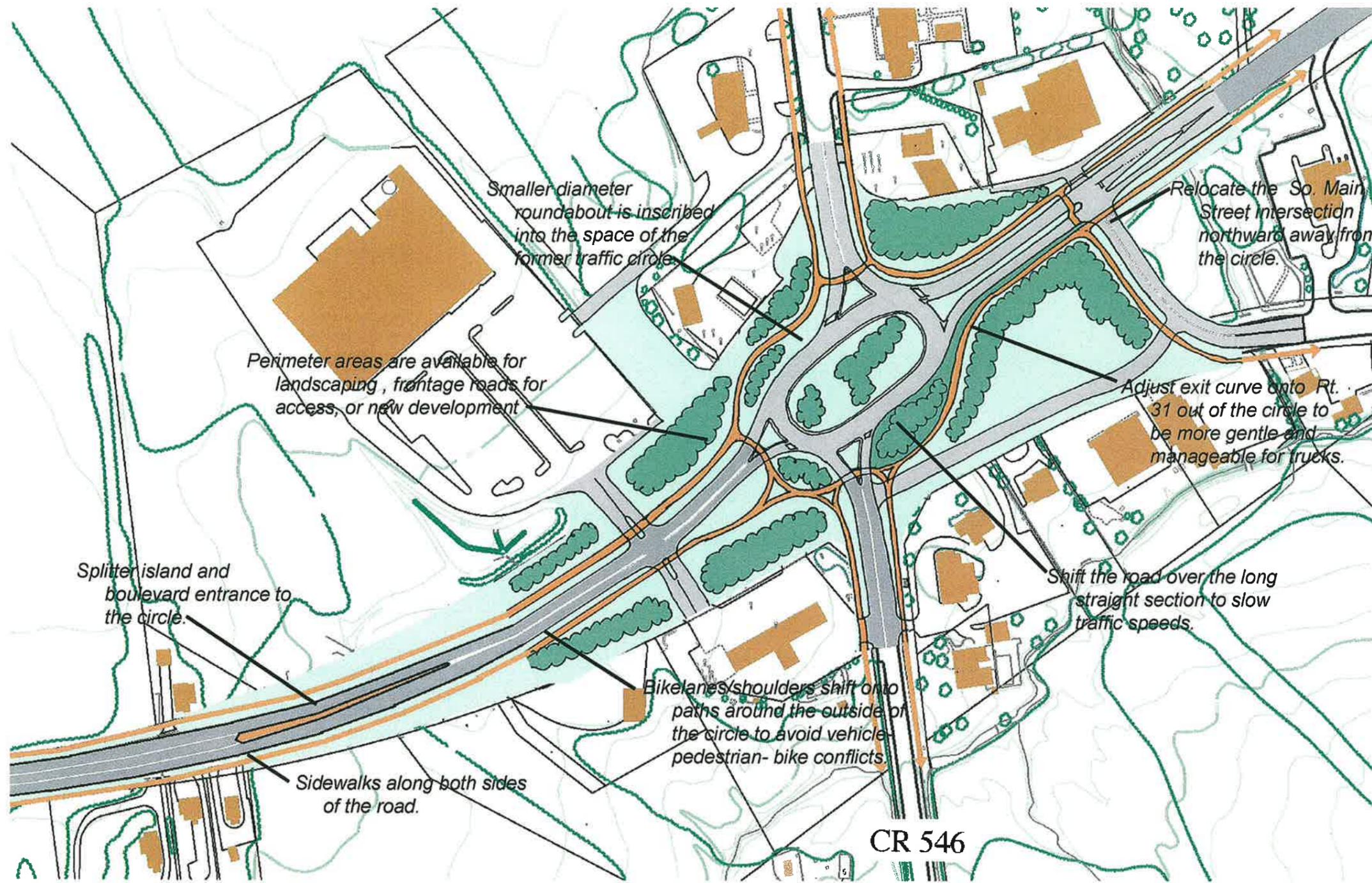
**Design Options at the Rotary:**

Public participation generally identified that the current traffic circle was a desirable visual part of the corridor but also confirmed that there were numerous safety and speeding problems at the circle.

The major issues are the rate of speed and high volumes of traffic that enter the circle from the south, from I-95, which then enter the circle and at the northern edge must negotiate with no warning a drastic S turn to proceed onto Rt. 31 northbound. Also at this location, the run onto south Main Street into Pennington Borough is almost the preferred route of roadway geometry because it is almost a straight path from the circle onto So. Main Street. This is undesirable form both a traffic circulation perspective as well as a concern on the part of the borough that regional traffic is diverted to So. Main street instead of remaining on Rt. 31.

The design alternatives for the circle address retaining the circular form, but with modifications for safety and clearer circulation:

**Alternative A:** defines a landscaped median entering the circle, and modifies the entrance and exit route of Rt. 31 to create traffic calming deflections to slow speeds similar to the splitter islands of a modern roundabout. Sidewalks are defined around the perimeter of the circle, and the alignment of the eastern leg of the circle is modified to create a slowing curve. The straight turn onto So. Main Street is deflected with an island, and the curve for Rt. 31 north is made more gradual and negotiable for both cars and trucks.



Alternative B

Alternative B: inscribes a smaller modern roundabout scaled circle inside the existing circle, so that the turning movements can be made more efficient and to remove the long straight legs of the current circle which contribute to higher traffic speeds. The outer section of road can be both removed and made into landscape space, or made into a frontage road to serve business' whose current curb cuts are dangerous in the larger circle. This re-configuration also shows the turn into south Main street closed completely, and relocated northward of the circle.

In both plans, sidewalks traverse the perimeter of the circle making for safer pedestrian and bicycle cross-town movement on CR 546 to Merrill Lynch and points west.

## Improvements to Rt. 31 between Delaware Avenue and North Main Street

Design options for this segment of the corridor have dealt with two basic scenarios: the preservation of a two lane road or the widening of the road to a four-lane boulevard. As with other corridor segments, the notion of an undivided four - lane road or a "jersey barrier" have been soundly rejected by the community.

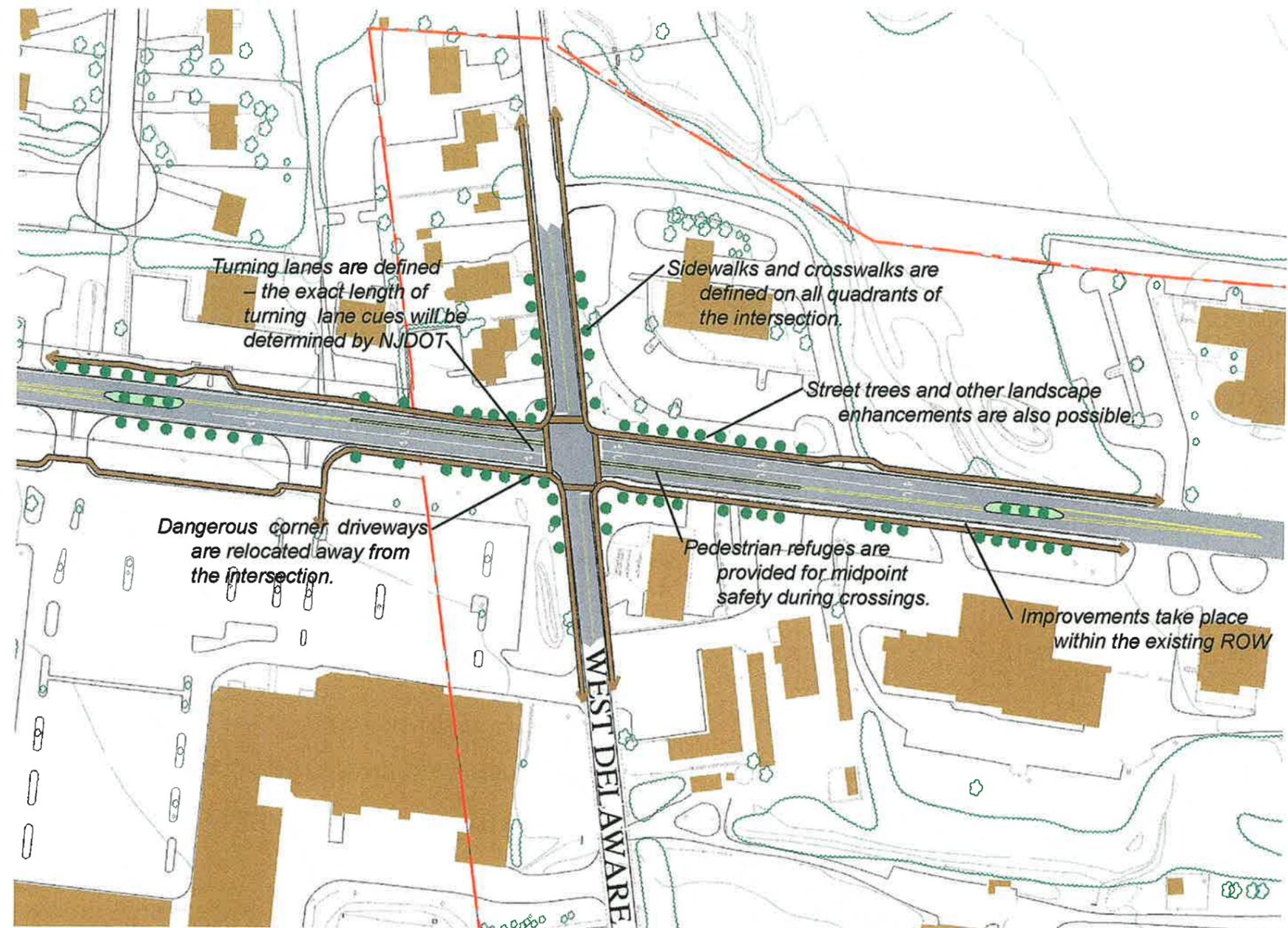
Given that this segment of the corridor has a wide ROW - as much as 100', there is adequate space for any number of boulevard design concepts that might be developed.

Using the full width of the ROW is an important issue, because in the past it was deemed that the uncertainty on the future use of the ROW was a deterrent to private landowners investing in improving the landscaping, parking and other aspects of their roadway frontage.

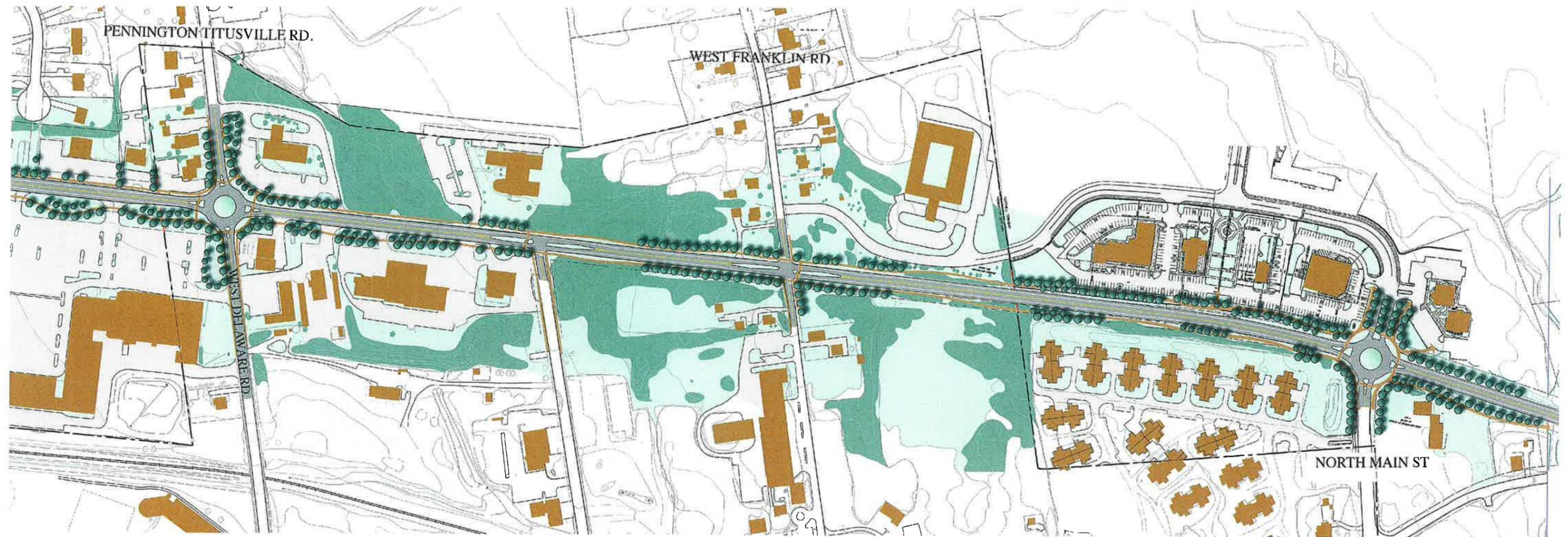
A major issue for this corridor segment is also the conflict around vehicular capacity and pedestrian safety at the Delaware Avenue intersection. With the high school and middle school located to the west of Rt 31, the community was very concerned about pedestrian safety and bicycle accessibility at this location. At the same time the traffic volumes at the intersection contribute to significant congestion in peak hours, and the long delays at the intersection were received to contribute to "rat racing" on local streets. Drivers seeking to avoid waiting at Delaware are looking to other streets to use to get around the intersection.

Clearly, what is needed, and in -fact demanded by the community is a design for Delaware that will accommodate adequate traffic capacity, and be safe for pedestrians and bicyclists. Both of the alternatives presented address those issues but in different ways:

- The first designs are based upon a two-lane roadway section and the use of enhanced striping and medians at the signal for pedestrian safety.
- A variation on the two-lane design is the use of either a signalized intersection or a modern roundabout .
- The second designs are based upon the four-lane boulevard with either a signalized intersection of a modern roundabout.

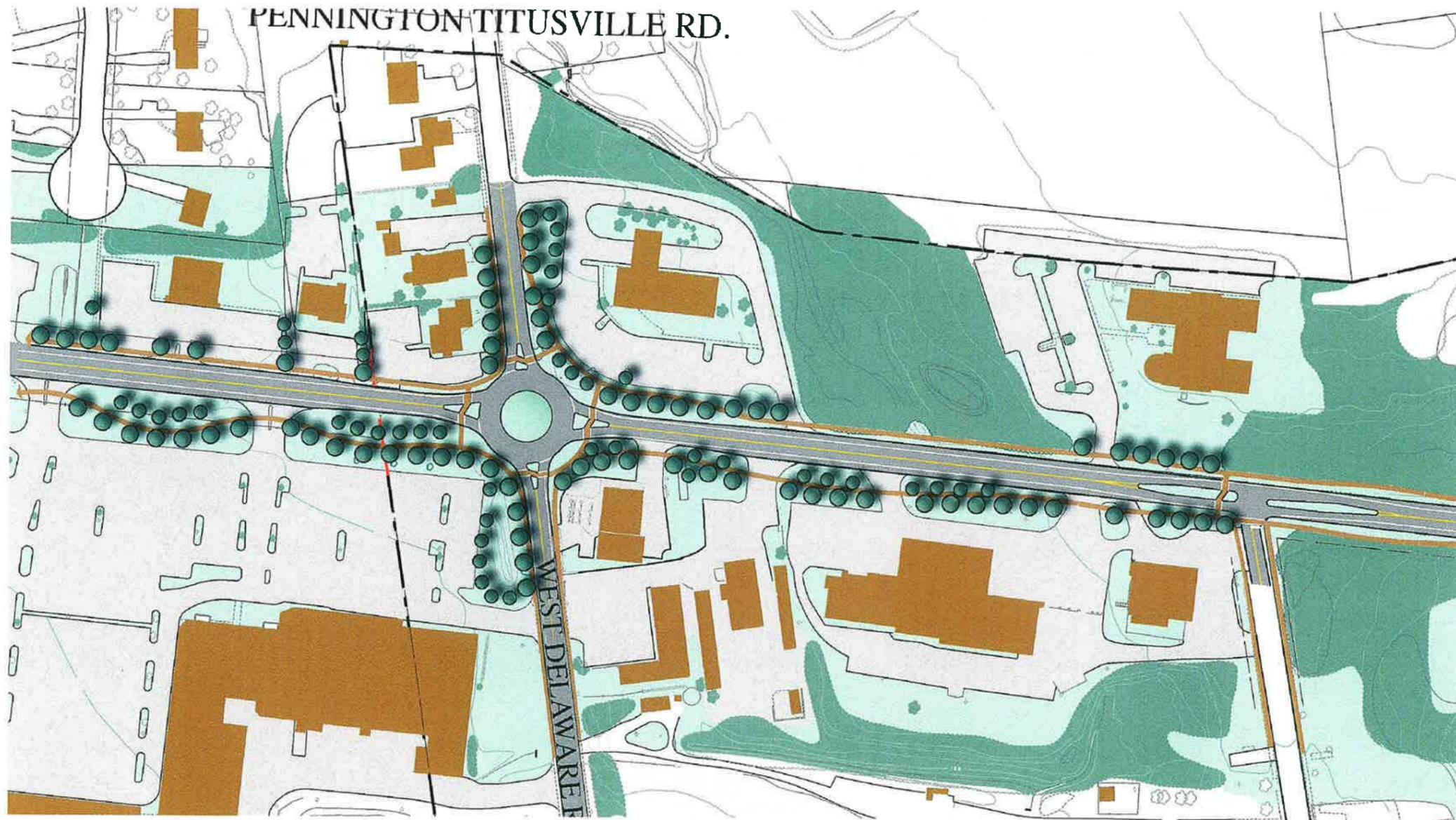


Signalized Design Option

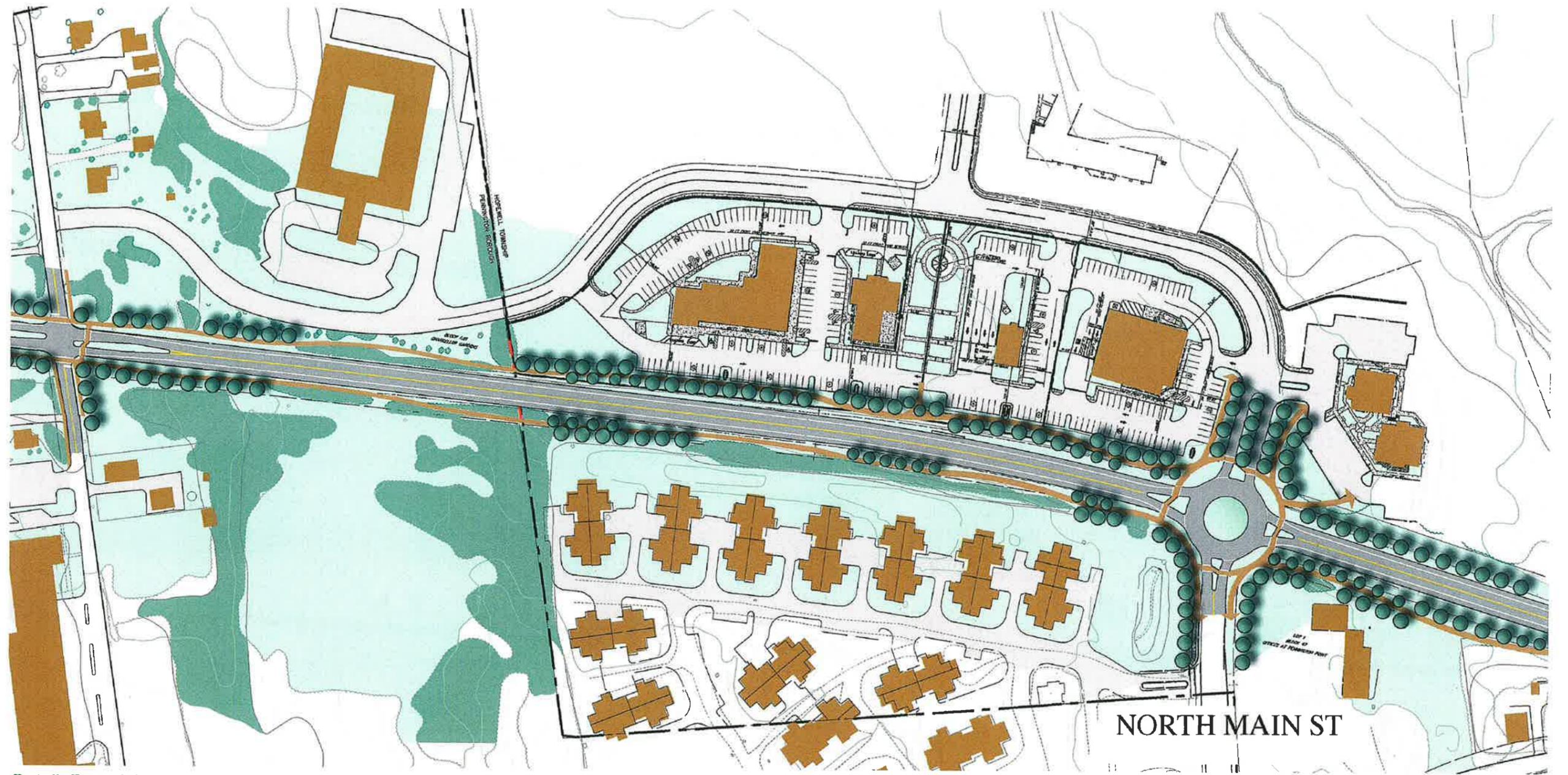


### Two- Lane Roundabout Design Option

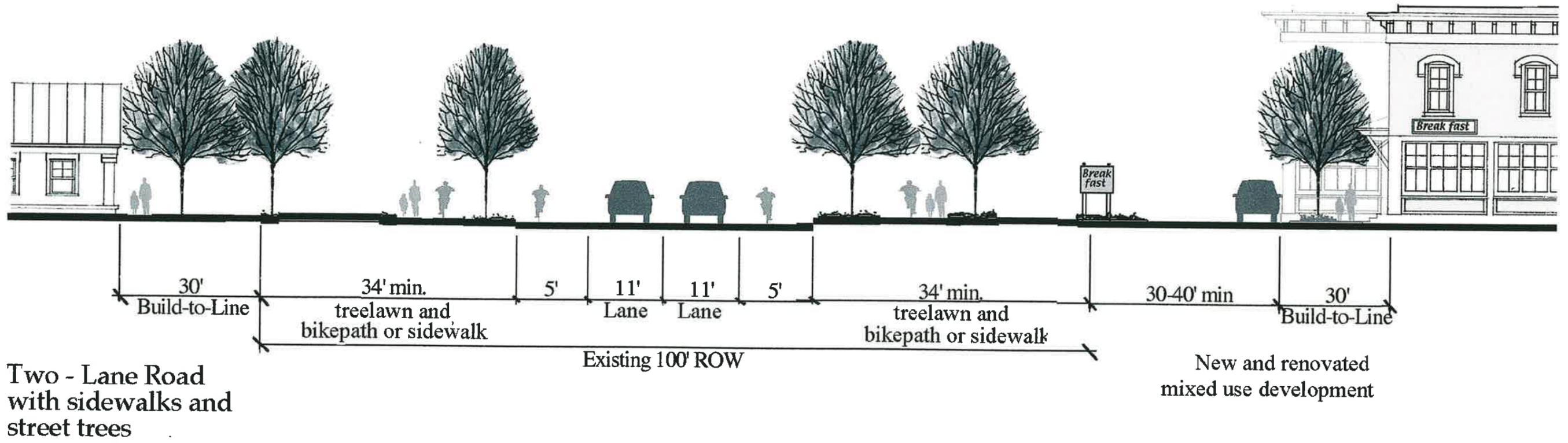
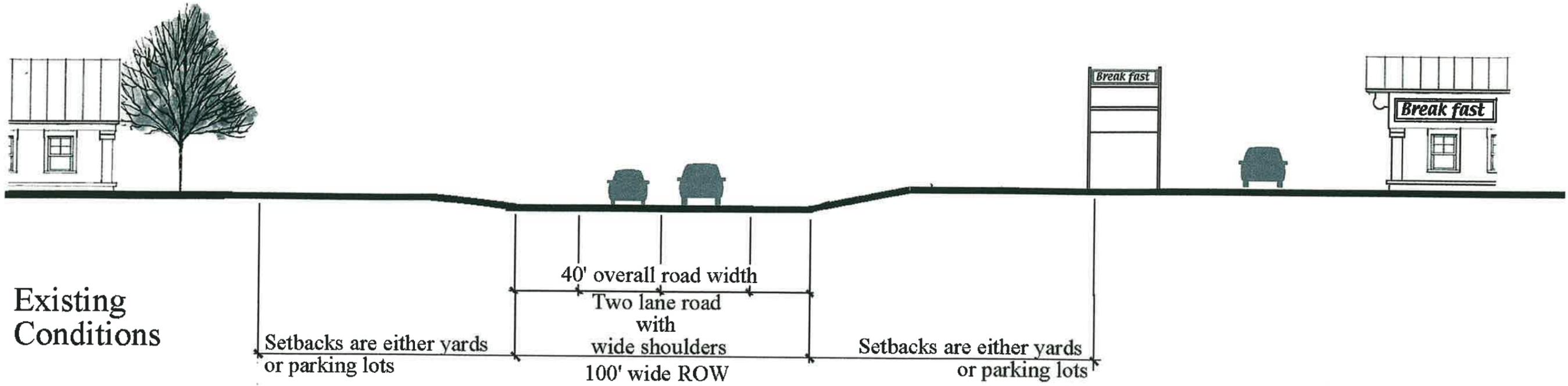
- NJDOT will include an analysis of the traffic capacity of the roundabout designs. The town should request that an expert roundabout designer be consulted on the project for peer review.
- When Rt 31 is a two - lane road, then the roundabout is a single lane design for both Delaware Ave. and North Main Street
- The roundabout at North Main Street can result in the removal of additional turning lanes making the road narrower and slower as one enters Pennington Borough.
- The roundabout at Delaware may benefit from slip lanes to draw off right turning traffic. The NJDOT study will determine those possibilities.
- The roundabout is designed to easily accommodate tractor trailers and is required to by both state and federal design standards.
- Sidewalks and crosswalks are defined on all quadrants of the intersection.
- Pedestrian refuges are provided for midpoint safety during crossings. Pedestrians are only required to negotiate traffic from one direction at a time, and if the roundabout is properly designed and speeds will be very slow at the intersection, making for excellent safety. People-safe crosswalks are shown that orient a pedestrian to have eye contact with oncoming drivers when crossing the road. Pedestrians have the right of way.
- Improvements take place within the existing ROW
- Dangerous corner driveways are relocated away from the intersection.
- Street trees and other landscape enhancements are also possible.
- Roundabouts have been proven to have significantly higher capacity than signalized intersections and have a much higher safety record in terms of accident severity and reduced pedestrian accidents and fatalities.



Detail: Two-Lane Roundabout at West Delaware Road



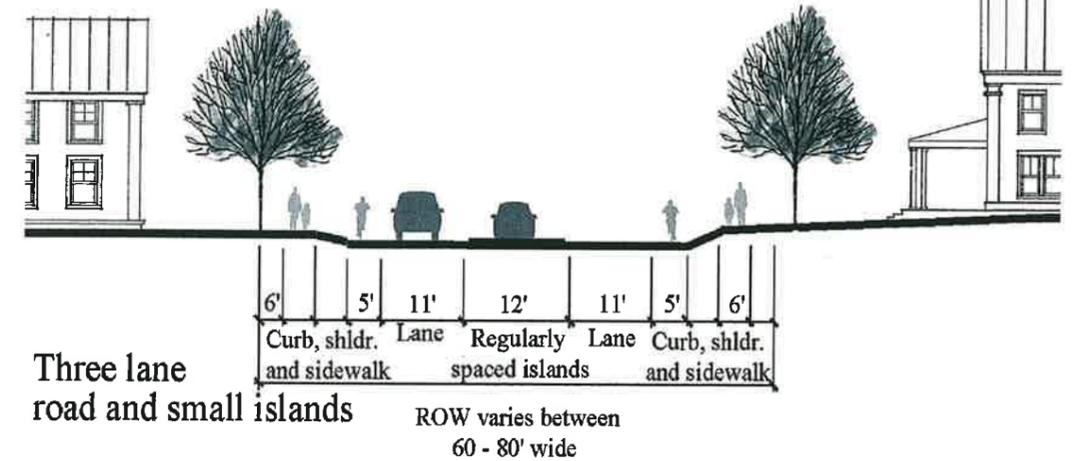
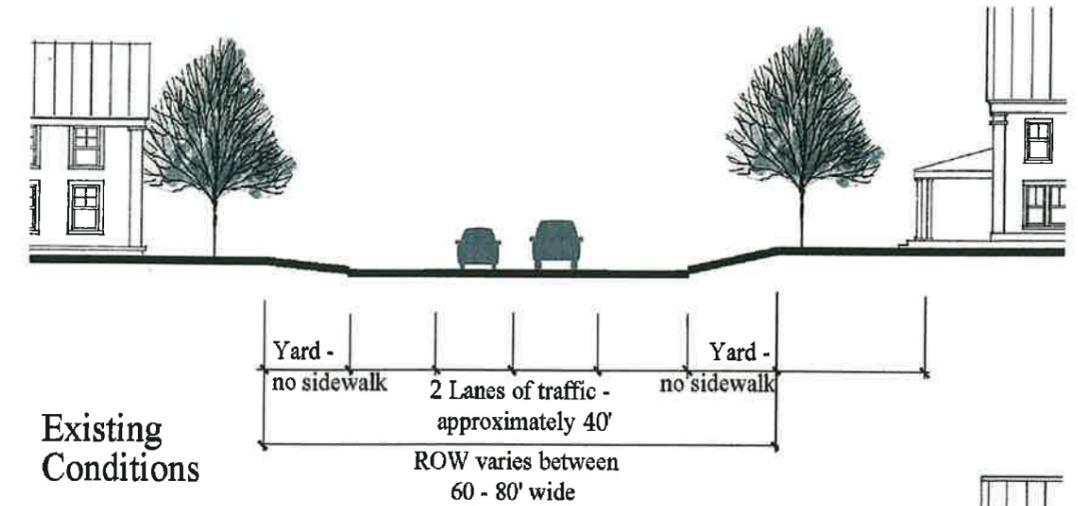
Detail: Roundabout at North Main Street



Street Sections: Two-Lane Road

### Street Sections: Three-lane Road

- The wide, under-utilized ROW has resulted in large areas of unused land along the highway – when commercial uses are located behind setbacks, it contributes to the feeling of a strip corridor.
- Preserving a two lane road allows for the road to be small with plenty of space for landscaping, bike paths and/or sidewalks, and enhancement of the corridor for non vehicular uses. The two-lane road though, has less capacity and may have greater congestion, and cause people to “rat race” on local streets.
- A design variation not shown in the plan options but similar to the segment south of the rotary is the use of a three lane road with a two-way-center turn lane protected with median islands to prevent use as a passing lane.



### Two-lane Road with Intermediate Intersections

- The community has defined that street crossings at local streets across Rt 31 are a major concern. For streets that do not warrant a left turn lane, this design concept creates a pedestrian crossing refuge and a left turn slip space for these locations.

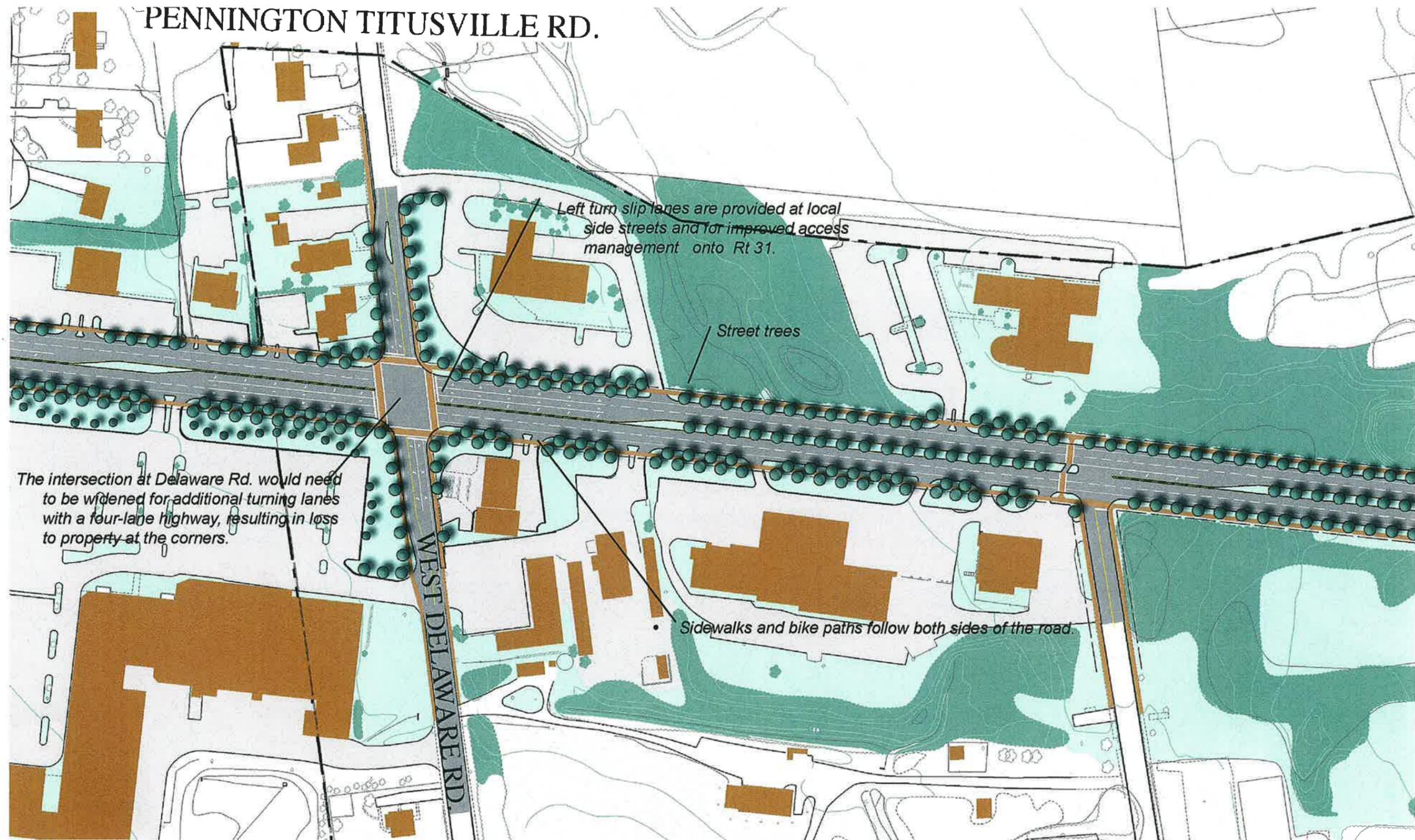




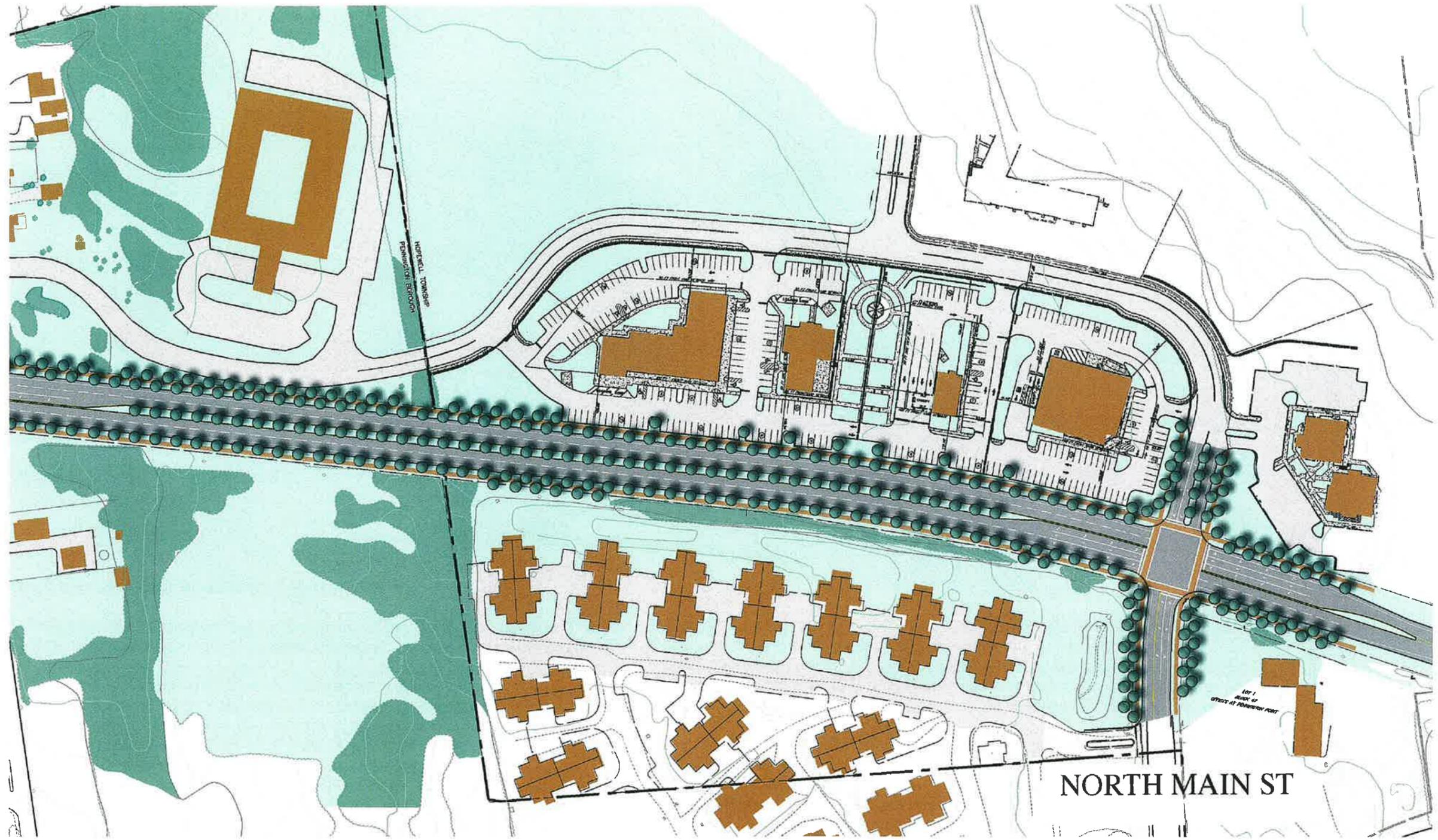
#### Four-lane Boulevard with Signalized Intersections

NJDOT has clearly stated a preference for a four-lane highway and if designed as a boulevard, this type of road could be both an attractive and highly effective regional roadway with higher traffic capacity, and be a local asset as a distinguished community roadway feature.

This plan shows a four-lane road with improvements to landscaping and pedestrian accessibility, and to the intersections at Delaware Ave. and North Main Street. A tree lined center island of considerable width is a prominent feature of the boulevard but it also includes street trees and sidewalks along both sides of Rt 31.



Detail: Four-lane Road with Signalized Design Option at West Delaware

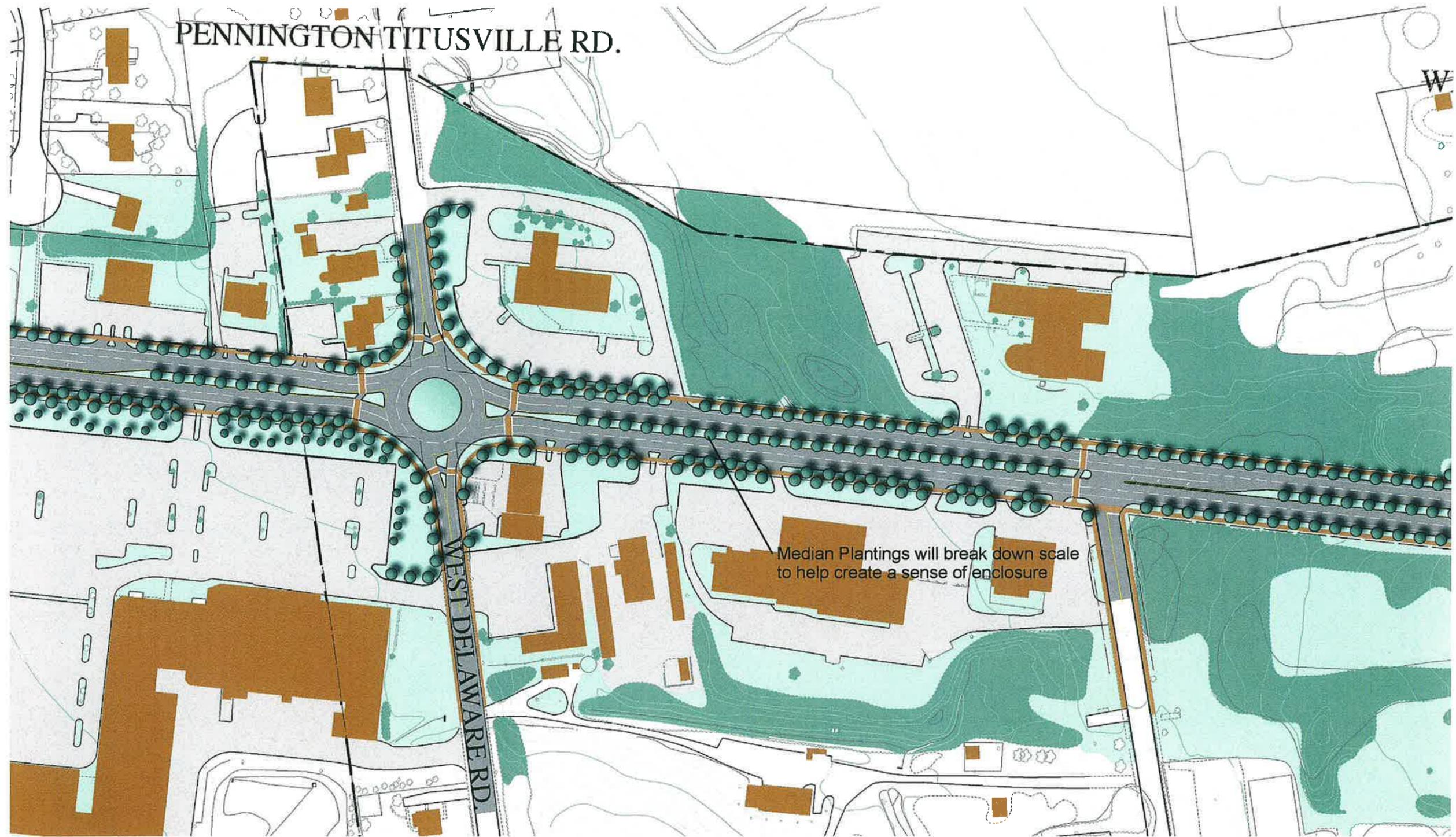


Detail: Four-lane Road with Signalized Intersection at North Main Street

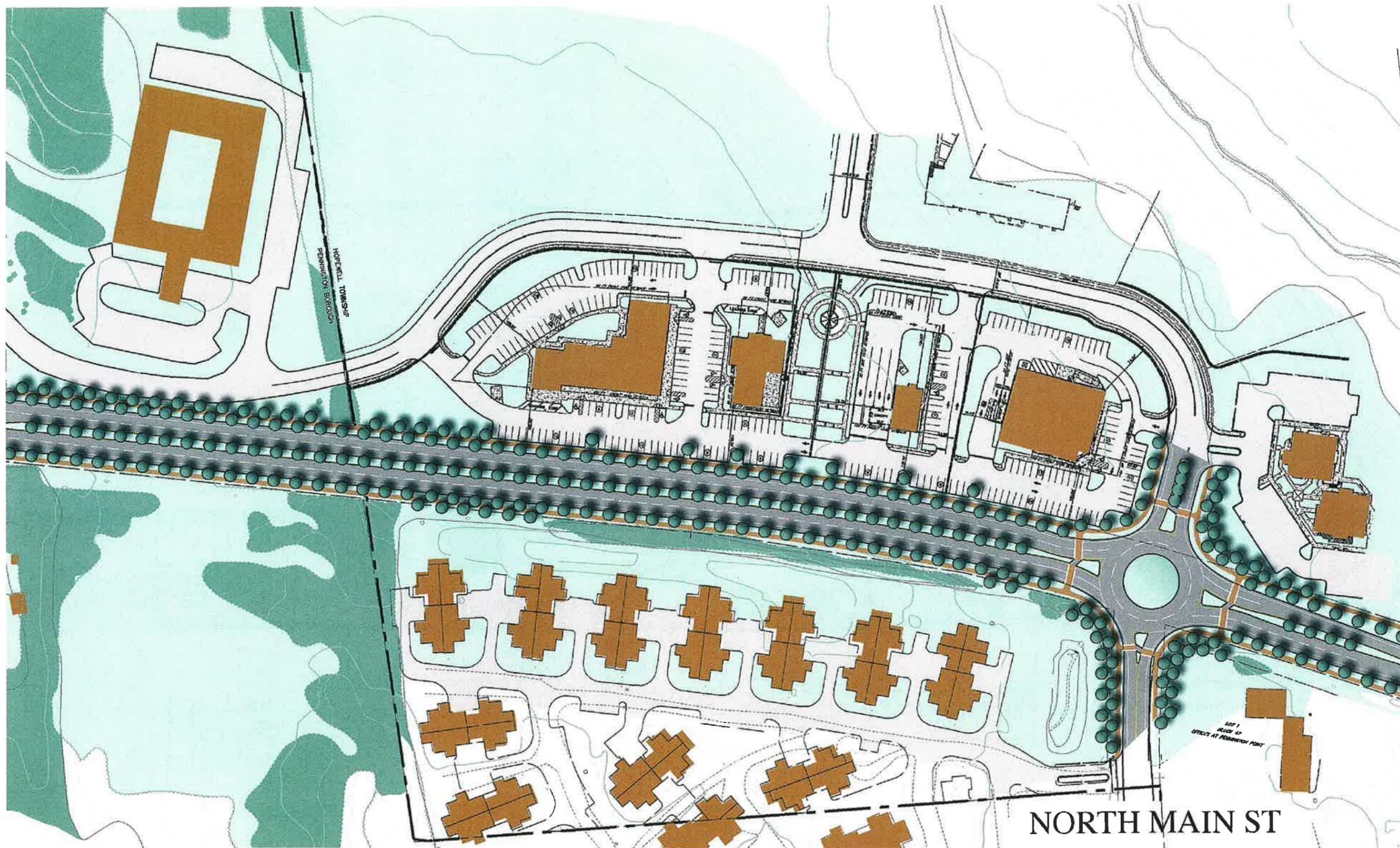


#### Four-lane Boulevard with Roundabout Design Option:

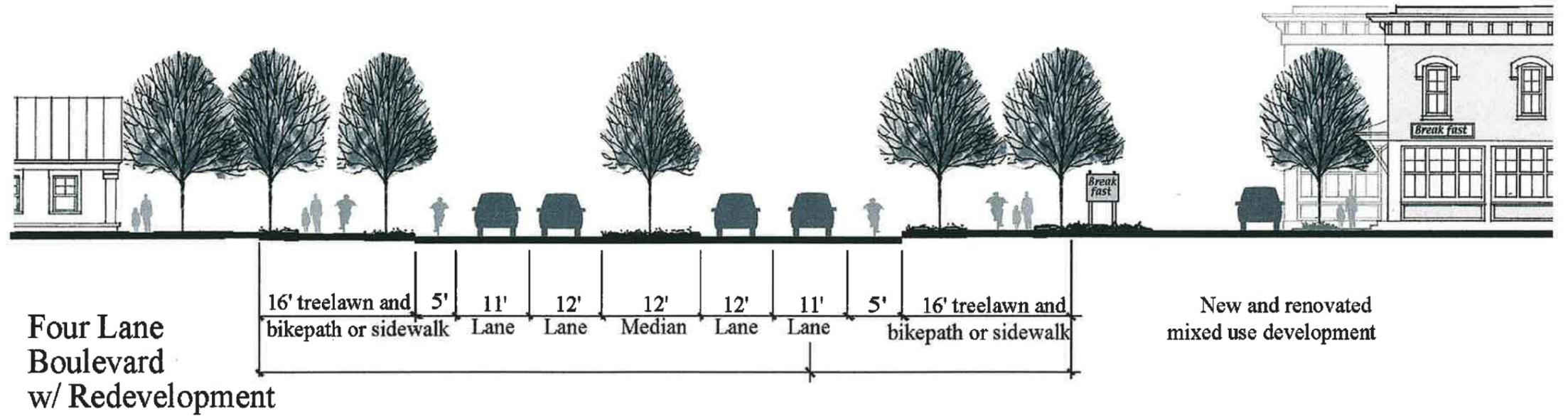
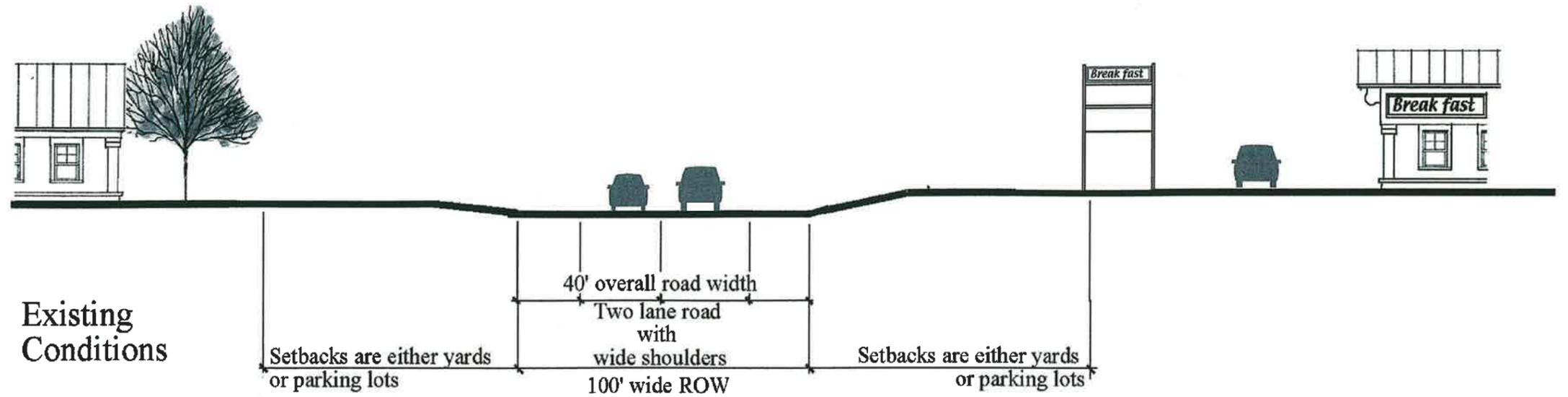
- NJDOT will include an analysis of the traffic capacity of the roundabout designs. The town should request that an expert roundabout designer be consulted on the project for peer review.
- When Rt 31 is a four-lane road, then the roundabout is a two-lane design for both Delaware Ave. and North Main Street. These make the roundabout more complicated but there are two lane roundabouts in the USA and abroad that safely accommodate traffic volumes of 30-40,000 vehicles per day in areas where there are also numerous pedestrians.
- The roundabouts at both Delaware Ave. North Main Street can result in less turning lanes than the signalized intersections. The roundabout at Delaware may benefit from slip lanes to draw off right turning traffic. The NJDOT study will determine those possibilities.
- The roundabout is designed to easily accommodate tractor trailers and is required to by both state and federal design standards. There should be adequate space for a tractor trailer to circulate in a two lane roundabout without taking the second lane.
- Sidewalks and crosswalks are defined on all quadrants of the intersection.
- Pedestrian refuges are provided for midpoint safety during crossings. Pedestrians are only required to negotiate traffic from one direction at a time, and if the roundabout is properly designed and speeds will be very slow at the intersection, making for excellent safety. People safe crosswalks are shown that orient a pedestrian to have eye contact with oncoming drivers when crossing the road. Pedestrians have the right of way.
- Improvements for the four-lane boulevard take place within the existing ROW but small amounts of additional Row mat be required for Delaware Ave.
- Dangerous corner driveways are relocated away from the intersection.
- Street trees and other landscape enhancements are also possible.
- Roundabouts have been proven to have significantly higher capacity than signalized intersections and have a much higher safety record in terms of accident severity and reduced pedestrian accidents and fatalities.



Detail: Four-lane Roundabout at West Delaware Road



Detail: Four-Lane Roundabout at North Main Street



Street Sections: Four-Lane Road

## What are the next steps?

While this study suggests a series of planning choices and options to consider the report also points out that a long process of exploration and work with the NJDOT lies ahead before there are clear answers that will guide a plan.

There may be other aspects of the corridor options that require other evaluation such as environmental impacts, Right of Way impacts, and project cost estimates and implications. These evaluations are beyond the scope of this current project.

The following are several important tasks that should be anticipated:

1. Broadly distribute the results of this study to residents of both the Township and Borough.
2. Conduct a community survey about additional information the community needs to be well informed.
3. Participate in the NJDOT analysis of the Route 31 corridor. The Township and Borough's active participation by informed city staff and officials will be essential to the continuity of the planning effort and attention to local issues for the corridor.
4. Appoint a citizen advisory committee to oversee the ongoing representation of the Township and Borough to the NJDOT study of Route 31.
5. Encourage committee member to become well educated in innovative transportation planning issues.
6. Sustain Township /Borough coordinated planning efforts.
7. Peer review of NJDOT : the Township and Borough may need to fund a technical review of the NJDOT report to

develop a second opinion on the viability of certain design options or lack thereof.

8. Solicit a presentation and consultation on roundabouts by national/international roundabout expert designers: Michael Wallwork from Florida, Georges Jacquemart from NYC, or Barry Crowne from England.

9. Model future transportation scenarios relative to local and regional growth to increase interest and financial commitment to funding/participation in public transportation. Using NJDOT data, a regional model of transportation impacts should be developed so that the changes in roadway use resulting from local permitting of large employers, commuting traffic, truck traffic, and housing development can be clearly established.

10. Define and adopt new Township policies and regulation for improved corridor land uses and incentives for integrated development/transportation improvements.

11. Encode compact growth center policies and regulation for the planned growth center southwest of the Pennington Circle.



## American Roundabouts:

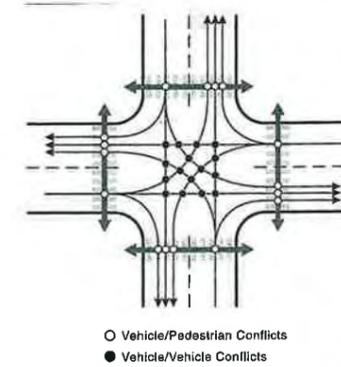
A well-designed modern roundabout is an excellent traffic control device that increases traffic efficiency while heightening safety for drivers and pedestrians. Largely misunderstood in the US, the benefits of a roundabout are many. Unlike a traffic circle or rotary, the modern roundabout has a small diameter, which promotes slower speed, and a one- or two-lane design that provides a similar, if not greater, capacity than a traffic signal. Traffic lights are absent, and traffic moves slowly but continuously through the circle in one direction. Notably, the left turn, problematic at any intersection, is eliminated. A modern roundabout can be easily integrated into the overall transportation system of a community or corridor to help solve problems of congestion and traffic delays. Though rare in the United States, they are used in England and Australia with great success. In Vermont, roundabouts are successfully in use in Brattleboro, Montpelier and Manchester.

## Safety

While the perception is that roundabouts are less safe than traditional intersections, the reality has proven quite the opposite. Roundabouts are excellent traffic calming mechanisms – everyone must slow down to negotiate the circle. This alone makes them safer than traditional intersections where traffic with the green light may be

traveling quite fast, with grave consequences when accidents do occur.

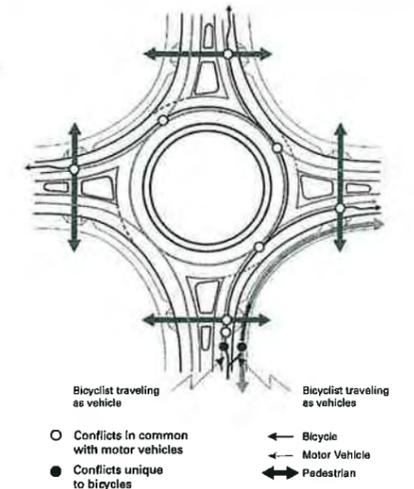
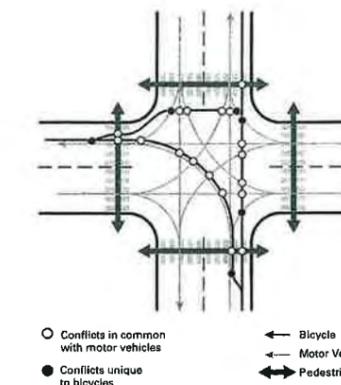
Roundabouts provide increased safety for pedestrians. With the elimination of the left turn, a pedestrian need only be aware of traffic approaching from one direction (unlike traditional intersections where traffic is coming from both directions). The distance from the intersection to a crossing can be increased for better visibility, and pedestrians need only cross 1-2 lanes (18-30 feet) unlike the 2-4, sometimes 5 (50-75 feet) lanes in a traditional intersection.



Bicyclists, too, because of slower speeds at roundabouts, are able to merge and move with traffic, or they may dismount and cross the intersection as a pedestrian.

## Efficiency

A modern roundabout balances safety and efficiency. Not only do roundabouts increase intersection capacity and reduce vehicle delay, they require fewer lanes to handle an equal amount of traffic as a traditional intersection.



Though some question the ability of large trucks and emergency vehicles to negotiate a roundabout, the use of truck aprons on the edge of the center island has solved this problem. An apron provides a mountable surface to accommodate the off-tracking of the rear wheels of a truck, should that occur. Aprons are off-colored to discourage cars from entering the apron, although most drivers never notice them at all.

Environmental and aesthetic advantages A landscaped center island of a roundabout provides a welcome break in the monotonous asphalt streetscape of most American roadways. Other advantages include the reduced need for electricity through elimination of traffic lights, and fewer lanes translates to less pavement and drainage, helping to protect water quality. By allowing vehicles to move continuously, fuel consumption is improved. The need for fewer paved vehicle lanes also provides room for bicycles and pedestrians within the existing public corridor.

## Achievements

Achievements of the first eight years of the Roundabout Revolution in the United States are presented by Georges Jacquesmart in NCHRP Synthesis 264, *Modern Roundabout Practice in the United States*. We recommend this richly illustrated, informative study to all U.S. roundabout designers and planners. It elaborates the following findings, among others:

- Total crashes decreased 37 percent and injury crashes decreased 51 percent at eleven American intersections converted to roundabouts.
- Respondents to a survey of all North American states and provinces and 26 municipalities were unanimously satisfied with their roundabouts.
- Construction costs varied widely, from \$10,000 to \$500,000 for roundabouts, and from \$2.8 million to \$6.4 million for roundabout interchanges.
- American designers use SIDRA, an Australian gap model, and RODEL and ARCADY, which contain British regression equations relating crash frequency and capacity to geometric parameters.
- Roundabouts can have significant benefits in terms of safety, capacity, and aesthetic improvements to urban

design.

- Roundabouts save money at interchanges and at the ends of bridges and tunnels, where the storage space required by traffic signals is expensive.

This use of roundabouts is called wide-node/narrow-road highway engineering. By building capacity where it is needed, at wide roundabout-type nodes, narrow link roads can join the nodes, for an overall cost saving. Narrow links are most needed where wide links would be expensive: through tunnels, and over and under bridges, especially the bridges contained within interchanges. Caltrans explains this concept under "Reduction of Queue Storage Requirements," the title of the third paragraph of Chapter III, "Appropriate Applications," of Design Information Bulletin 80:

Roundabouts can produce operational improvements in locations where the space available for queuing is limited. Roads are often widened to create storage for vehicles waiting at red lights, but the reduced delays and continuous flows at roundabouts allow the use of fewer lanes between intersections. Possible applications may be found at existing diamond interchanges, where high left turn volumes can cause signals to fail. By constructing a

pair of roundabouts at the ramp intersections, capacity improvements to the interchange can be accomplished without the costly requirement of widening the structure to carry additional lanes over or under the freeway.

## History of the Modern Roundabout

A modern roundabout has three major characteristics compared to its predecessors, traffic circles and rotaries. First, the roundabout gives vehicles in the circular travel way the right-of-way. This change on a national basis in England in 1963 marked the start of the modern roundabout era. Second, roundabouts are small, generally from 70 to 160 feet in diameter compared to 300 to 400 feet and more for traffic circles and rotaries. Third, roundabouts have a raised entry "splitter" island that slows down or constrains speed just before entry, duplicating in a way the curvature the driver will experience within the roundabout itself.

The modern roundabout, which dates from 1963 in England, finally arrived in the United States in 1990 in Summerlin a major Las Vegas residential subdivision. Leif Ourston was the main designer. When the first roundabout freeway interchange in the nation was built in 1995 (also designed by Leif Ourston)--at the I-70 interchange in Vail, Colorado--roundabouts then numbered about a dozen nationally. Avon, Colorado, the next I-70 interchange after Vail, in 1998 installed five roundabouts between the I-70 interchange and the Beaver Creek Mountain ski resort. Today, the number of modern roundabouts in the USA has jumped to around 700.

The roundabout community anticipates that roundabouts will be built in the United States annually by the hundreds in the coming years and by the thousands annually early in the next century, duplicating the trends first in Britain and Australia



**Design Guidelines for Residential, Commercial and Mixed-Use Development**

**Route 31 Corridor:  
Township of Hopewell and Borough of Pennington**

These design guidelines can be used as the foundation of a design review process for aesthetic and functional issues in development. Each contains a basic guideline, followed by a brief discussion section designed to help the reader understand the principles behind the standard. They are necessarily general in nature, and should be seen only as the starting point for an ongoing discussion of how to fit new development into the natural and cultural landscape. Detailed guidelines will be discussed separately in conjunction with illustrative plans and sections. The guidelines are arranged in five major categories:

**1. General Site Planning:** Concerns the overall pattern of development within a town and on individual sites. It includes the uses to be accommodated and how they are best arranged, as well as the relationship of roads, driveways, structures, yards, etc. Perhaps the most critical decisions in site development are made around these issues, for no amount of attractive architectural detailing or lush landscaping can make up for a bad master plan. This is also the place to discuss the fundamental issues of whether to design for vehicles or pedestrians.

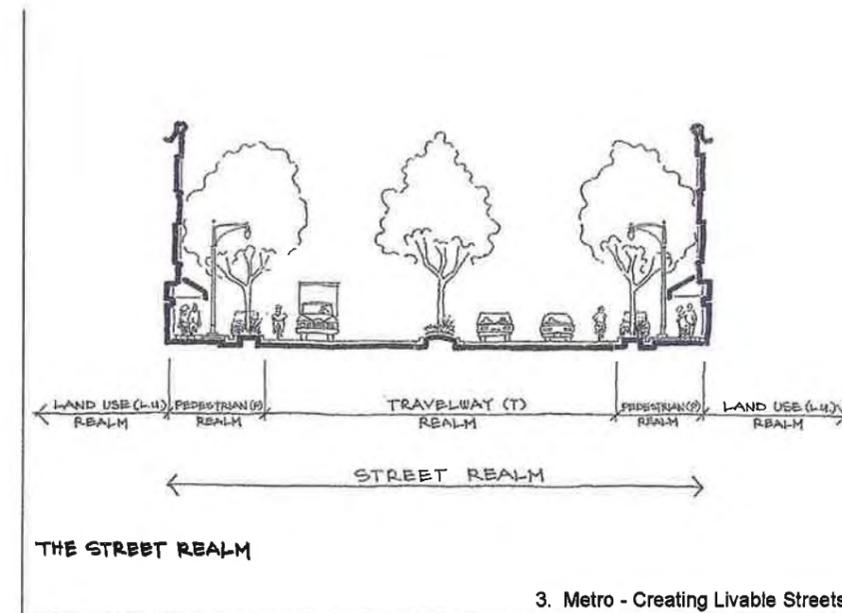
**2. Streetscapes and Landscaping:** The idea of the streetscape is based on the notion that the "public" street, that is everything that is enclosed by the structures lining both sides of a road, should be designed as a cohesive unit. This applies to functional issues, like sidewalks, location of benches, and drainage; as well as visual issues involved in creating a unified design. The goal of streetscape design is to create a cohesive whole that is a public space distinct from the private yards and buildings that surround it. A strong, coherent streetscape creates a unifying structure within which many individual variations can continue. This is a key step in creating memorable, livable communities. Likewise, a clear and consistent approach to landscaping can serve to pull the design of an area together -- whether through a strong street tree planting or repeated use of key decorative plantings.

**3. Architecture:** While the design of structures is rarely discussed in local regulations and ordinances, it is the most visible aspect of new development. While styles come and go, certain fundamentals of good design remain constant --

including the general scale and massing of buildings, the shape of the roof line, the size and location of doors and windows, and materials used to cover walls and roofs. As in other aspects of design, looking at local architectural traditions is instructive. Traditional architecture evolved in response to climate, availability of materials, and local cultural traditions -- all of which remain important, especially as we look for architecture that can be built and maintained to be more sustainable.

**4. Signage:** Particularly in commercial development, signage becomes a key aesthetic issue, for it is the one element that people not only notice, but actively look for and examine. Commercial strips are famous for competing signage. Design guidelines can help to level the playing field and provide more cohesive sign delineation while retaining a sense of local style and identity in signage.

**5. Access Management:** Managing the flow and patterns of vehicular access is of particular importance along the Route 31 corridor. Frontage roads and reverse frontage roads can be used to minimize and coordinate curb cuts. The use of shared driveways can also eliminate some level of traffic issues. Developing a hierarchy of streets and routes can also alleviate congestion and traffic pressure.



**I. General Site Planning**

**A. Land use and Development Pattern**

**General Guideline:**

Both what is built - the proposed land use- and how it is built - the development pattern - should be based on the existing visual character of the site and its physical capabilities. Mixed uses are encouraged in both rural and village settings. Design should start with valued models that already exist in the area such as the rural farmstead or estate; the crossroads hamlet, and the village or town main street. Each offers a wealth of ideas for development patterns that are more efficient to build and maintain, encourage walking, and foster a sense of community and neighborliness.

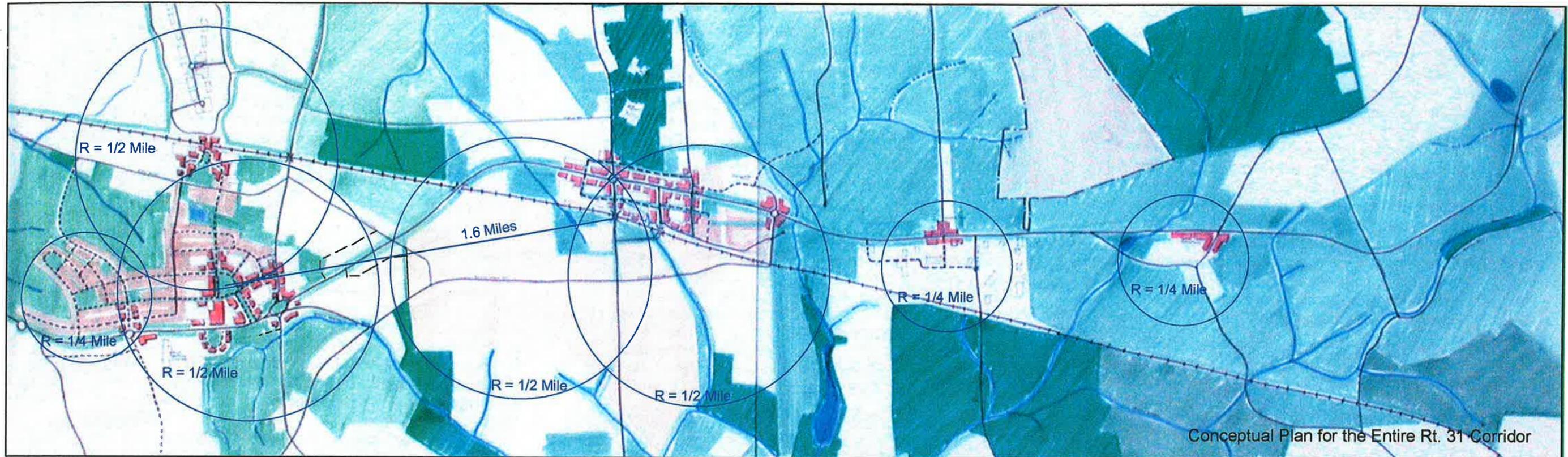
**Discussion:**

Zoning, developed over 100 years ago to control development in cities and to separate heavy industry from residential districts, succeeded too well. Today, most uses are needlessly forced into separate districts. Development within districts is often further dispersed by large lots and excessive setback requirements. This approach tends to erase existing site features, destroys the character of both rural areas and historic villages, and forces a dependence on the automobile. Far better is an approach that bases use, density and design on a careful analysis of the existing natural and cultural patterns in and around a given site or area. Creating or maintaining variety of uses and scale of those uses is extremely important in the round-the-clock vitality and economic success of all occupants of the centers.

**B. Mix of Uses**

**General Guidelines:**

Create economically viable and vibrant downtown or neighborhood cores with a mixture of retail, office, residential, light manufacturing or research and service uses. Create residential neighborhoods with a variety of housing types and some non-residential uses, primarily within a five minute walking radius from the downtown. Make available sites for civic uses, such as libraries, churches, branch post offices, meeting halls, theaters and schools. Concentrate major regional and traffic driven uses (such as drive-through establishments) in carefully designed groups (not strips) at the edge of neighborhoods and only with consolidated access points from the Rt. 31 Corridor. Ensure that these groups are of varied enough character, tenant mix, and architectural massing that no monolithic use or "big box" can dominate or create a scale that is inhospitable to pedestrian or other non-vehicular traffic.



**C. Relationship of Development to Surrounding Open Space and Natural Context**

**1. Distance Between Development Centers**

**General Guidelines:**

New development should be planned in relation to the town and neighborhood context, and either make a connection to an existing or planned neighborhood center off the site or include such a node within the development to serve the needs of the surrounding community. Distance between such centers should favor walkable access from all parts of the neighborhood. Typically, Neighborhood Centers are located so that the mixed-use core and highest density uses are located within a 5 minute walk of the neighborhood edge. Diagrammatically the neighborhood can be drawn as a center with neighborhood conveniences surrounded by a 1/4 mile radius circle describing the furthest dwelling units.

Larger Village Centers provide services for several neighborhoods and typically contain a transit stop or station at their heart. They can be circumscribed by a 1/2 mile radius circle measured from the core of the Village Center to its edge. In this situation it would take no longer than 10 minutes at an average pedestrian pace to get from the furthest dwelling in the new growth center to the mixed-use core.

**Discussion:**

The traditional development patterns were established by people who had to walk or ride a horse, which encouraged compact development centers separated by a distance that could be traversed in a morning's walk. This pattern will continue to be useful in developing neighborhoods that can function without dependence on the automobile. Most towns are enhancing neighborhood centers through their comprehensive plans, as these town-wide plans are updated, locations for new centers can be identified.

For reference the center of the possible new traditional neighborhood design (T.N.D) area in Hopewell (located halfway between the Circle on Rt. 31 and the proposed new rail station on the Conrail tracks opposite the Merrill Lynch Campus) and the intersection of West Delaware and Rt. 31 or West Delaware and Main Street in Pennington Borough is 1.6 miles.

**2. Growth Boundaries: Clear Town or Village Edges.**

**General Guidelines:**

Development at all scales, whether a small cluster of homes, a village or entire town, should have a clear edge or boundary. This edge or boundary and its value should be

clearly understood and protected by the entire community.

**Discussion:**

An important part of maintaining or creating a sense of identity for a neighborhood or town is establishing a strong edge between the built-up area and surrounding open space. This establishes contrasts that enhance visual interest, but more importantly creates a functional signal marking entry into the community.

**3. Preservation of Important Site Features**

**General Guidelines:**

Lay out roads, lot lines, house locations, and public open space using existing features of the site as the foundation of the development plan. Roads and driveways should follow existing paths or the lines of walls and hedgerows. Sensitive site features like old trees, wetlands and water bodies should be made the focus of public open space -- not merely preserved and forgotten.

**Discussion:**

Important site features like large trees, walls, streams and water bodies should be preserved, not only for public benefit, but for the long-term value they give to the development. While extra effort and expense may be required to rebuild an old wall or preserve an ancient tree,

these amenities often pay for themselves with higher lot values. Careful analysis of the site and a flexible approach to development alternatives can often reveal ways to build the allowed number of units on a property while still preserving its special features. Preserved site features can also serve as important design elements in the plan: for instance, homes on the edge of a preserved meadow share a common element that ties the design of the development together.

**4. Open Space Preservation**

**Guideline:**

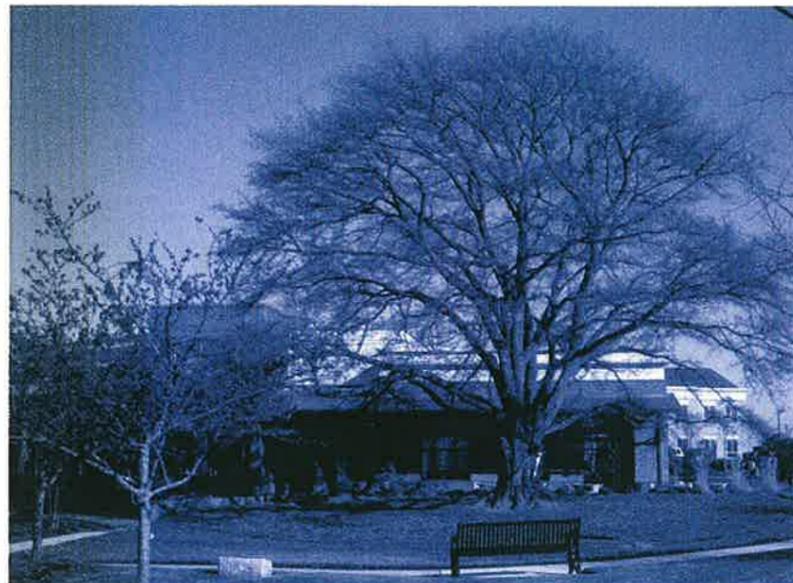
a. At least 60% of the entire project site shall be preserved as perpetual open space. This requirement shall be reduced to 40% if at least 80% of the open space land preserved is conveyed to Hopewell Township or Pennington Borough, a non-profit organization, or another entity that will make it available for public use. All preserved open space, regardless of its form of ownership, shall be protected by a permanent conservation easement running with the land. The number of acres of perpetual open space required by this paragraph may be reduced by the number of acres of perpetual conservation easements on developable farmland elsewhere in the Township or Borough which the applicant secures to prevent development of such farmland. The applicant may also reduce the acreage requirements by contributing to the open space preservation fund described in subsection b below. In no event shall the percentage of open space within a Town Center Development District or Neighborhood Development District be reduced to less than 25%.

b. An applicant may, as an alternative to securing conservation easements as described in subsection 3.b.above, deposit funds in lieu of acquiring conservation easements into a special fund established by the Township for the purchase of conservation easements on watershed land and farmland within the Township or Borough. The amount to be deposited in each case shall be established by the Township or Borough, upon a recommendation from the Planning Commission and Conservation Commission, based upon the average fair market value for the conservation easements to be purchased, plus 10% for administrative costs. The Township shall use these funds to acquire conservation easements of the kind described in subsection a. above and/or may contract with a qualified non-profit conservation organization with experience and expertise in acquiring conservation easements to obtain such conservation easements, to be held by such organization or by the Township or Borough. (8.)

**5. Impervious Surface Coverage**  
**Guideline:**

a. Except as provided in (b) below, a maximum of 30% of the entire new neighborhood or growth center may be covered with impervious surfaces, which include buildings, roads, compacted soil, and any other surface material that does not permit the infiltration of water. This limit shall be reduced to 20% if any impervious surfaces other than roads, utility infrastructure, or trails are located less than 500 feet from a perennial stream. For the purposes of calculating impervious surface coverage, sidewalks, alleys, and pedestrian and bicycle paths and trails shall not be counted.

b. The 30% limit on impervious surface coverage may be exceeded if the proponent of land uses that would exceed that limit arranges for the purchase of conservation easements on buildable acreage within the same watershed, such that the total impervious surface coverage of the combined acreage of the Town Center and the land protected by conservation easement remains within the 30% limit. As an alternative to purchasing conservation easements, the applicant may contribute to an approved open space preservation fund. (8.)



*Tree preservation can add significant value to new development*

*City of Raleigh Urban Design Guidelines*

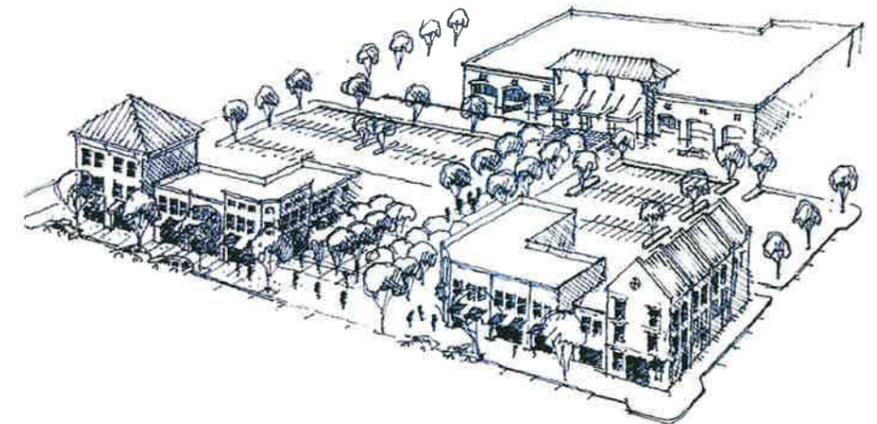
**6. Tree Removal and Protection**

**General Guidelines:**

Trees larger than 12" in diameter should be located on the site surveys before planning begins, and used as design features throughout the site planning process. Tree preservation and protection should be discussed at each stage of the design process, not only in terms of tree removal and mechanical damage, but also in terms of indirect impacts

**Discussion:**

Of any site features, large trees are the hardest to replace, and offer numerous direct and indirect benefits to marketing of new development and enhancement of quality of life. Planning development around existing trees is the first and most important step, but implementation of carefully designed tree-protection is no less critical, especially since construction usually occurs with little oversight from planning boards. This includes preventing direct mechanical damage, but also maintaining existing groundcover, preventing compaction of the root zone, and ensuring that existing water flows are not changed. Communities should encourage the preservation of existing trees through incentive programs such as tree credits. This program offers a developer a credit of 3 trees for the preservation of one 12"-25" caliper tree, for example.



*City of Raleigh Urban Design Guidelines*

**A Typical neighborhood Center:**

*The Pennington Market area might be redeveloped along these lines. Provision of structured parking would be an important part of such a new center although on street parking would not be appropriate on Rt.31.*

**D. Relationship of New Development to Nearby Existing Buildings and Cultural Context**

**General Guidelines:**

Existing patterns of development, including setback lines, density, landscape treatments, and architectural styles should be examined as part of the site analysis process. Proposed development need not follow existing patterns slavishly, but should be designed to have some conscious relationship to it.

**Discussion:**

Too often new development has been designed and built as if nothing exists beyond the border of the site. In fact, analysis of the surrounding context can provide numerous clues for designing successful projects. These include practical issues of methods and materials that will most likely work well for local soil and climatic conditions, as well as aesthetic patterns that can help inform design proposals.

**E. Layout of Streets and Blocks/ Street Connectivity**

**Guideline:**

Connect proposed streets into simple networks that allow multiple routes to a given destination. Locate new streets to connect existing streets and to fill in partial grid patterns within neighborhoods. Design road alignments to follow topography and curve only where it makes sense in the landscape. Consolidate major driveways of large development projects at ideal 1/8-1/4- mile intervals. Align driveways on opposite sides of the street.

**Discussion:**

The collector road system, common since the 50's -- beginning with the cul-de-sac and feeding into a larger series of collector streets - works well until the total amount of traffic exceeds the capacity of any single point in the larger arterial roads. Recent trends have favored a return to grid road systems that have many possible travel routes for local traffic and hence no single, choke point. Traffic is more dispersed, and as a result streets can be narrower. In rural neighborhoods, the grid can be looser, adapting to topography to achieve the same results. In the context of the Rt. 31 Corridor Study is important to bear in mind the distinction between planning for local traffic versus planning for through traffic.

**F. Parking Lot Placement and Location**

**Guideline:**

Commercial parking fields should never be allowed to take away from the pedestrian experience. Parking should occur behind or inside of commercial, retail or mixed-use buildings. Conceal parking in small lots connected with through easements. Plan for on street parking wherever sufficient right-of-way width would allow it on one or both sides of new streets. On street parking is not appropriate for Rt. 31.

Where possible provide back alleys for through access, commercial service, residential parking, access to garages and for garbage trucks and for play areas. Design alleys with a 10-14 foot wide paved area with a right-of-way of 20-24 feet in

order to accommodate utility easements. Detail alleys to ensure slow traffic and give pedestrians precedence.

**G. Building Size, Placement and Alignment**

**1. Orientation of Facades**

**Guideline:**

Structures in new communities should be placed with a consistent setback from the street and aligned to be either parallel or perpendicular to it. Isolated structures should be aligned with elements of the landscape to create a unified composition. Location and alignment of buildings should be included in the design process as streets and lot lines are planned. Buildings should be placed so that the largest possible yard areas remain for the use of residents or occupants.



*Commercial buildings can blend into a residential corridor provided the overall design is sensitive to the surrounding conditions*



*Break larger buildings down into separate volumes*  
*City of Raleigh Urban Design Guidelines*

**Discussion:**

A consistent approach to placement of buildings, and a formal relationship with the street helps to tie a new development together visually and functionally. Buildings aligned to form a continuous "wall" serve to enclose the public street space, enhancing the sense of place and community. Even isolated structures can have a formal relationship to the street or other elements of the landscape that helps to tie the building to the land. In both cases new structures serve to create a composition that is greater than the sum of its parts.

**2. Build-to lines, consistency of setback line**

**Guideline:**

Specify "build-to" lines rather than a wide setback zone to ensure a unified building line relative to the pedestrian streetscape. Allow departures by special permit from the build-to line where necessary to create variety, emphasize civic buildings or enable the creation of public space adjacent to the streetscape.

**Discussion:**

In the case of the Rt. 31 Corridor creating build-to lines along the corridor right-of-way will help ensure a strong facade line close to the traveled ways. This will develop a sense of enclosure and identity for those travelling on Rt. 31 while also screening consolidated parking from view. Strong consideration should be given to reducing front yard setbacks in the B-H and O-B Zones in Pennington Borough and the SC, SC-1, IC, CC, C-1 and HBO Zones in Hopewell Township from 100 feet to 30 to 40 foot build-to lines to encourage building closer to Rt. 31. This would create a stronger pedestrian streetscape, shield parking from view and discourage areas that are usable only for parking fields between Rt. 31 and redeveloped or new buildings.

**3. Floor area and Width of Buildings**

**Guideline:**

- a) Except as provided in subsection b) below, buildings with a footprint larger than 15,000 square feet shall be broken up into smaller volumes through additive massing and use of building proportions found in the Region's traditional architecture.
- b) Exception for Anchor Uses: The restrictions above shall not apply to uses which the Township or Borough determines are essential to the economic viability of the new Center, such as large-scale supermarkets, entertainment complexes, or retail stores which function as commercial anchors, provided that such uses are integrated into the fabric of the Town or

Neighborhood Center to the maximum extent practical. Wherever practical, such buildings shall be shielded from view from streets by storefront "liner" buildings that comply with subsection a) above.

**Discussion:**

Such buildings, which may be part of a larger "big box" structure behind them, provide traditional downtown facade treatments with separate functioning storefronts that maintain the traditional village center character. False storefronts, which do not have operable doors that lead into shops, shall not be considered adequate to fulfill the purposes of this subsection. Large stand-alone stores with parking in front may be permitted only if the Township or Borough determines that no other configuration is economically feasible and that such configuration will not detract from the traditional village character of the Town or Neighborhood Center. Buildings with street frontage shall be similar in size, massing and proportion to those in traditional villages in the Rt. 31 Region, with windows and doors at street level to encourage pedestrian traffic and commercial activity. (8.)

**4. Spacing between buildings**

**Guideline:**

Make spacing between buildings much tighter in developed centers or neighborhoods. Encourage periodic, carefully chosen views from Rt. 31 through the building and tree row "wall" along the highway to the public space beyond that forms the heart of the new or redeveloped Center. Avoid views through the peripheral building "wall" to large expanses of parking lot. Toward the edges of development centers where intensity of use decreases, spacing between buildings can be greater, although buildings should always be grouped together into nodes or homestead clusters to avoid isolating each building at the exact center of its lot.

**Discussion:**

Buildings aligned to form a continuous "wall" serve to enclose the public street space, enhancing the sense of place and community. Placing buildings towards the edges of lots and in such a way that they form coordinated groupings with buildings on other lots will preserve meaningful amounts of open space or natural scenery in between groupings. It will also make the provision of services more economical, strengthen creating a sense of place and community and allow unsightly views to be hidden from view from Rt. 31.

**H. Lot size, setbacks, and frontage**

**Guideline:**

Use a mix of lot sizes to encourage variety and take advantage

of unique site features. Use smaller lots near neighborhood centers to focus activity and community life within walkable areas. Setbacks and frontage should be flexible and written down only after a master plan for a neighborhood has been completed.

**Discussion:**

Dimensional requirements are more useful in preventing mistakes than in creating interesting, livable communities. While some minimums need to be observed, better results will be obtained by designing the best possible location and arrangement of structures first; and only afterward establishing lot lines. For example, setback and frontage requirements usually separate homes too much, diluting the sense of community and creating useless front and side yards. It is much better to treat the street as a single design problem, where setbacks, frontage width, and other dimensions reflect the scale of the street, the size of the businesses and homes, and the desired character of the neighborhood. Strive for variety of uses and tenants with no single, monolithic use making smaller, more flexible uses impractical or so dominated as to be made untenable.

**I. Design of Parks and Public Spaces**

**Guideline:**

Use shared public spaces as the backbone of the development plan. Link these spaces into a system that provides a clear structure to the community and fosters participation in shared activities. Provide sidewalks, benches, lighting, and landscaping that encourages pedestrian use of public streets. Locate public buildings and neighborhood commercial centers to reinforce the public character of adjoining spaces.

**Discussion:**

The "civic realm" is enjoying renewed attention in town planning circles, as planners realize that communities without a focus don't work as well or look as good as those with a clear public heart. Whether this is a traditional Main Street, a park or square, or just a protected natural area, public space creates a visual center for the life of the neighborhood. One benefit of plans that are organized around public space is that what happens on individual building lot is less important; the development looks "finished" sooner, and a greater variety of uses and architectural treatments can be accommodated without spoiling the unified effect of the whole.

**J. Public and Private Space**

**Guideline:**

Every space that is not part of a building should be clearly understood as either private, public, or transitional. While physical barriers are not always necessary, traditional elements like hedges, fences, walls, curbs and grade changes should be employed not only for decorative

purposes, but to enclose, separate, buffer and clearly articulate spaces.



*A public space that is enclosed by active buildings around its perimeter encourage its use and maintain its safety*

*City of Raleigh Urban Design Guidelines*



*The essential ingredients of a good public space include landscaping, furniture, and people*

**Discussion:**

Traditional towns and villages provided multiple clues as to the "ownership" of every space. The public streets and sidewalks are clearly public, while the private space in the rear of residential buildings is clearly private. Front yards and porches provide transitional elements that buffer private areas from the public. The result is a much more comfortable environment, with greater privacy even though individual lots can be quite small.

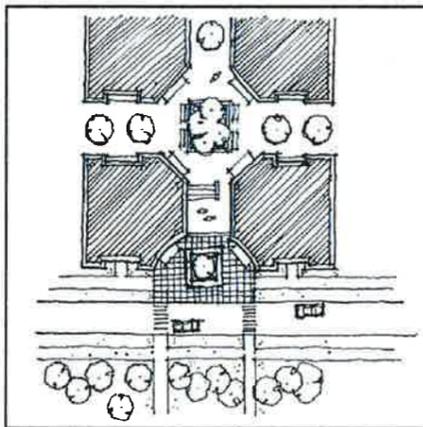
**K. Design and Management of Open Space**

**Guideline:**

Undeveloped open space should be located, designed, and Managed to enhance ecological functions, scenic values, and recreational opportunities. In cluster subdivisions, open space set-asides should be used to expand regional greenway



*Squares are bound by buildings and create public gathering places for special events and casual interaction*



*Internal public space must be designed properly to be safe and usable, providing wide pathways and elements such as fountains and seating*

*City of Raleigh Urban Design Guidelines*

corridors and to buffer sensitive environmental resources. Open space on the interior of the development should be designed for park and recreational use, as an alternative to large private house lots. In this way the open space will function as part of a Township or Borough-wide system of greenways or trails or as an important place-making "event" on a reverse frontage road or shared driveway.

**Discussion:**

Open space set aside in cluster subdivisions too often is forgotten, and adds little to the life of the community. This misses the great opportunity in clustering, which is to create from the protected open space a community asset, the value of which more than offsets the arguably lower value of smaller building lots. This requires a clear vision of what the open space is to be used for, and an ongoing management plan to maximize its potential value. Sometimes, the highest value is as an ecological preserve, to be seen but not used. More often, open space can serve multiple purposes for active and passive recreation, wildlife habitat, as well as views.

**L. Greenway and Trail Connections**

**Guideline:**

Every new development should have a direct connection to the town's larger greenway and trail network. Open space within the new development should be designed and managed to enhance this growing system of natural corridors. The creation of shared parking lots should be optimized and their uses include provision of trailhead parking and access to the greater greenway system.

**Discussion:**

Many towns have a large amount of land that is protected from development by public ownership, environmental laws, or private conservation. Town planners and private groups are working to link protected parcels into a greenway network, with public recreational trails through many areas. The existence of this growing network makes every new development a potential partner in the creation of the town's greenway plan. Options range from using the cluster provision to set aside 40-50% of a parcel as an extension of the town open space system to simply granting a narrow trail easement through the development. This approach benefits the town, to be sure, but also the developer, who is able to tell potential buyers that their property abuts a larger system of protected land.

**M. Gateways**

**Guideline:**

Establish visual gateways at the beginning and end of the "village" or "center" section of Rt. 31 or of other "main streets" in the new growth center. These serve as visual cues that the transitional zone between the rural roadway cross-section and the "core" roadway cross-section has ended and that the motorist should slow down. The gateway shall be designed to serve as an important landmark and place-making tool but shall be in harmony with its surroundings.

**Discussion:**

These gateways may consist either of strong architectural elements such as towers, vertically elaborated buildings or even overpasses or bridge crossings or of strong, architectural, mass plantings of trees and understory shrubs.

**N. Vistas**

**Guideline:**

Buildings shall have a well-defined front facade with entrances facing the street. They shall be aligned so that the dominant lines of their facades parallel the line of the street and create a sense of enclosure in the streetscape. In the downtown core, these facades shall generally form a continuous "street wall." Departures from this regular pattern may be permitted to terminate important vistas along streets or sidewalks or to act as focal points for public spaces. Vistas can also be framed by a combination of facades and strong street tree rows or by curving or diverging streets.

**Discussion:**

Vistas are part of what makes a specific "place" with a specific local identity. People naturally gravitate to such places and help support a viable mix of uses there.

**O. Focal Points**

**Guideline:**

New development should include existing or created focal points, which can include important natural features or buildings, prominent architectural features or landscape elements.

**Discussion:** Large civic, religious, or industrial buildings often served as focal points in traditional towns and villages. Striking topographic features, trees and water bodies can also serve as anchors that help to organize the visual experience and act as landmarks that provide orientation to residents and visitors.

## II. Streetscape and Landscaping.

### A. Design of Streetscapes

#### Guideline:

Every new street should be designed as a streetscape: an integrated system of buildings, pedestrian and vehicular circulation, landscape elements, and drainage structures. The focus should be on pedestrian comfort, livability for residents, and encouragement of community life. The design of the public realm should come first, commercial lots or private house lots are subordinate to a larger system organized around the public space along the street.

#### Discussion:

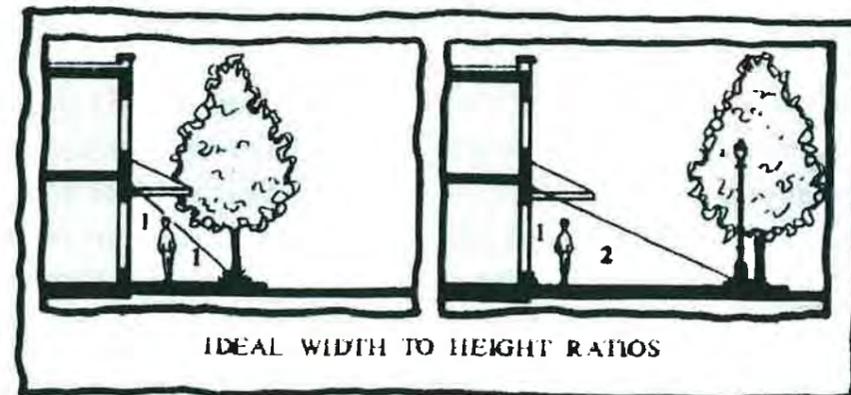
The idea of the streetscape has been traditionally employed in the design of commercial streets, but it is no less valuable in residential areas. It recognizes that the street is the most important element in most developments, serving to organize, for good or bad, most of the activity that happens on the public side of the houses. While most suburban residential development has only two kinds of space --the public street and the private house lot -- the streetscape concept deals with the transition area between them. Traditional streets have a rich layering of space within this transitional zone that makes them both more attractive and more useful to residents.

*\*\*On Rt. 31 the Township and Borough must answer the question of whether Rt. 31 itself is to be the streetscape or is that instead located on a frontage road, cross street (such as W. Delaware or Broemel) or on a through-access service road of some type). If the design speed on Rt. 31 is to be faster than 20 m.p.h. then Rt. 31 should not be the "Main Street" of the growth center for traffic safety reasons, but it could still have a pedestrian oriented series of facades and connected sidewalks.*

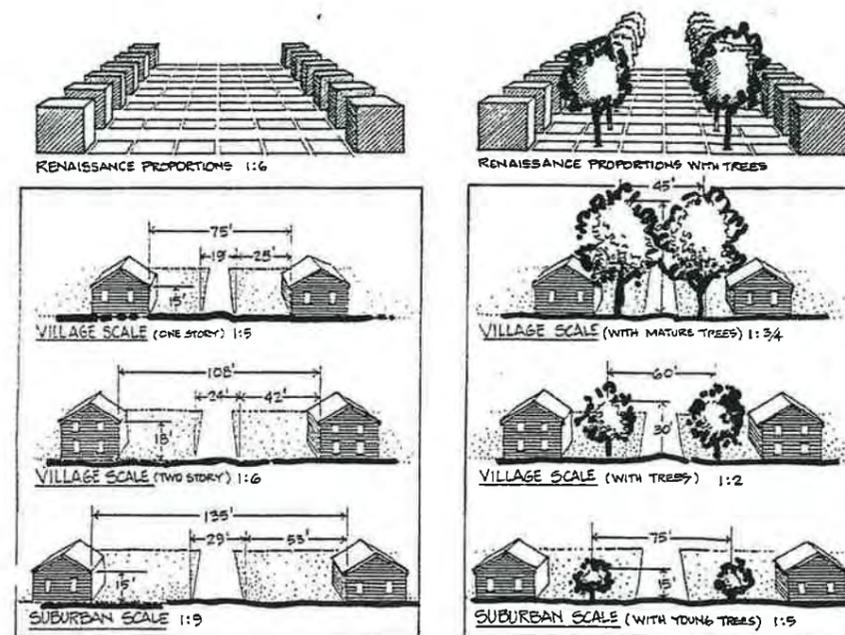
#### 1) Overall proportions of the cross section and amount of enclosure

##### Guideline:

"The proportion of the pedestrian realm is also important to create the positive experience of walking. This proportion is defined as the width of the sidewalk to the height of the edges, walls, and surfaces. The edges of the pedestrian realm can be defined by walls, building facades, overhangs or awnings, street furniture, street lighting, parked cars, and trees. Ideal proportions range from a width to height ratio of 1:1 to 2:1"



6. A. Nelessen - Visions for a New America



Less space in front of large buildings can be preferable. European villages the source for most New England settlement patterns -- often exhibit 1:5 \* or less which is experienced as pleasing space.<sup>5</sup>

\*1= building height  
5= space between buildings.

Whether residential or commercial contained space, intimacy and enclosure are cherished. The closer the ratio to 1:1 (full enclosure), the stronger the sense of village or human scale.<sup>5</sup>

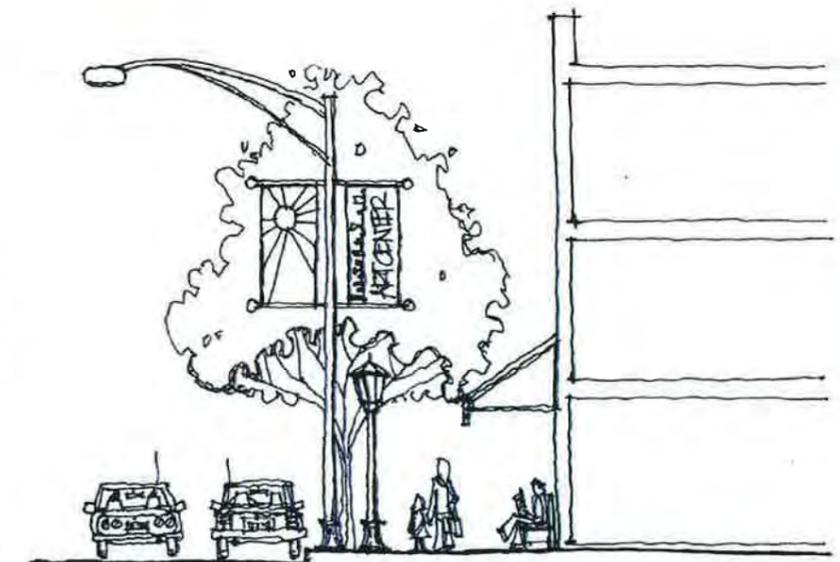
12. P. Craighead, ed. - The Hidden Design in Land Use Ordinances

### 2) Building Orientation and Setbacks

#### Guideline:

Building orientation should support the geometry of the street. Consequently, the relationships between buildings and the street shall be parallel or perpendicular rather than oblique or diagonal. Exceptions may be made as part of the site plan approval process to allow major civic or public buildings to deviate from strictly following the line of the street in order to showcase them and in order to provide adjacent public space. Major roof ridges shall be either parallel or perpendicular to the street.

### 3) Lighting



*A lighting program should consist of street lighting, pedestrian lighting at intersections and key nodes, and internal illumination from the storefronts*

#### Guideline

### 4) Sidewalk Width, Location and Materials

#### Guideline:

Provide sidewalks on at least one side of the street and preferably on both sides in mixed use areas. Sidewalks should be at least 5 feet wide to accommodate ADA requirements for wheelchairs with a passing space every 200'. Along mixed-use commercial streets they should be at least 8-16 feet wide. Use materials appropriate to the character of the neighborhood and with the best life cycle cost. Continuous connections with surrounding properties, trail links, and crosswalks should be provided. For blocks that are longer than 400', a mid-block through connection should be made. Where sidewalks run adjacent to curbed streets or ways use concrete or granite curbing (avoid bituminous curbing).

**Discussion:**

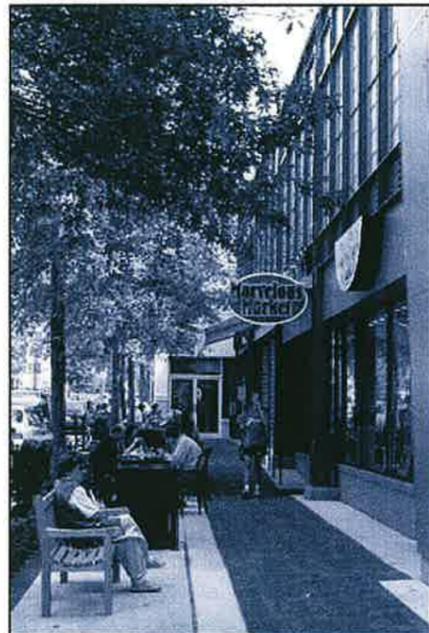
Sidewalks are often treated as an afterthought, or as something provided just to meet town requirements -- yet they are a key element in designing livable neighborhoods. In rural settings, it is often more appropriate to provide internal paths that go between houses to connect to town trails, rather than building sidewalks on the street that no one will use. Width, location and materials can vary widely; the most important need is for a continuous surface connecting the places that people want to go.

Designers often test this by imagining a typical user -- perhaps a parent pushing a stroller, or a grandmother with a toddler -- leaving their home, traversing proposed walks or paths to arrive at the corner store or neighborhood park. Pedestrian systems need to coordinate these activities as well as children's access to school and street crossings. Avoid

combining sidewalks and bikeways unless designed as a specific multi-use path separated from the street. (see B. 3) below).

**5) Street Furnishings/ Seating Guideline:**

New public spaces should provide as many seating opportunities as possible. Planter walls should be set at a maximum height of 2 1/2 feet to allow for their use as seating. Moveable chairs and sidewalk cafes are strongly encouraged.

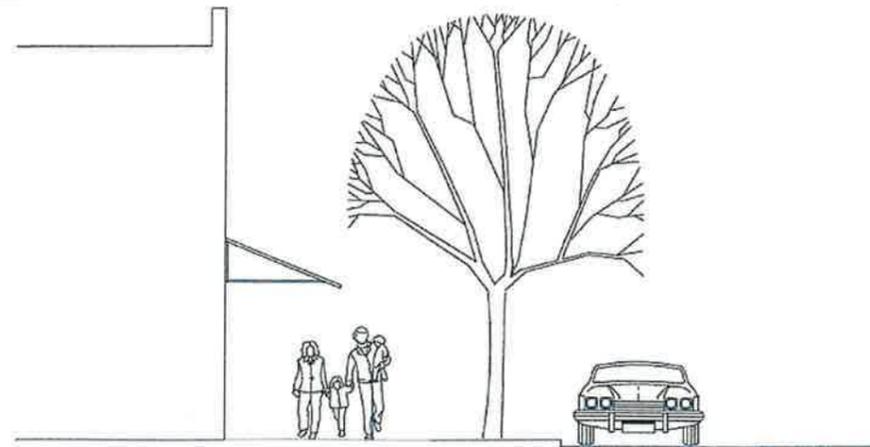


*A Pedestrian-Oriented Street is detailed with interesting storefronts, landscaping, furniture, wide sidewalks, and on-street parking*

**6) Transitions/ Continuity**

**Guideline:**

Streetscape elements shall be consciously used to 1) join disparate elements or areas in a single neighborhood or center into a more identifiable and navigable whole or 2) consciously reflect transitions between different areas or zones.



Building Zone	Sidewalk	Landscaping & Trees	On-Street Parking	Vehicular Travel Lanes
	Typical: 6-8 ft Commercial: 12-16 ft	Typical: 6-8 ft	8 ft Minimum	

**The Basic Elements of a Pedestrian-Oriented Street**

*City of Raleigh Urban Design Guidelines*

**B. Pedestrian and Bicycle Circulation**

**1) Sidewalk Connectivity**

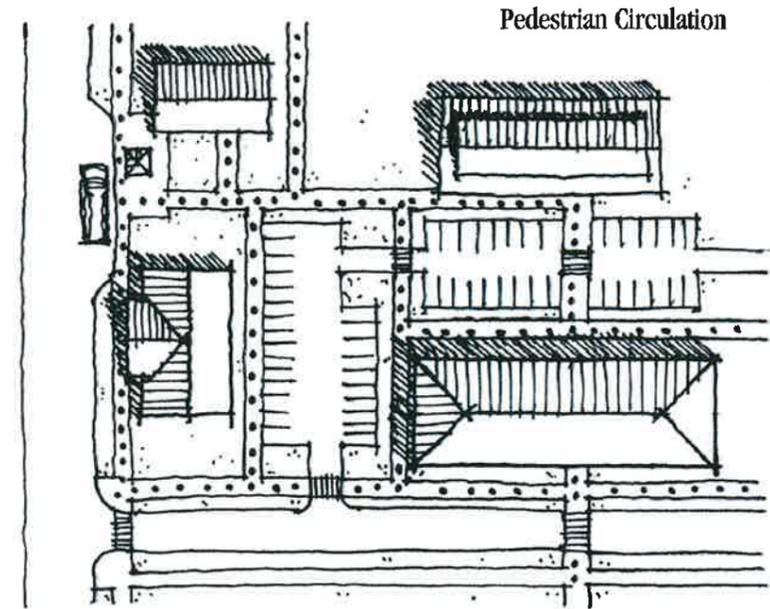
**Guideline:**

A clear, on-site system of pedestrian walkways shall be provided. On-site pedestrian walkways shall connect each primary entrance of a commercial building to the adjacent streetscape, parking blocks, structures or site amenities or public gathering spaces (see photograph, p. 26). The continuity of the sidewalk surface material shall be maintained across driveway entrances.

**2) Walking Paths and Trail Systems**

**Guideline:**

Non-motorized and pedestrian circulation, allowing safe, convenient, uncongested and well-defined circulation within, and reasonable access to the development shall be provided if required by the Township or Borough. If possible, connections to adjacent, regional non-motorized trails shall be provided. (8.)



*City of Raleigh Urban Design Guidelines*



*Bicycle racks should be conveniently located near building entrances and transit stops*

**3) Bike paths**

**Guideline:**

Two-way " multi-use trails" ( separate bike paths intended for use by both slower moving bicycles and pedestrians) shall be a minimum of 10 ft (3m) wide. Where possible, especially if bicycle or pedestrian traffic is expected to be high, bike paths should be 12 ft. (3.6 m) wide. Shoulders in the core areas of growth centers on Rt. 31 shall be a minimum of 5 ft. wide with shoulder width expanding to 6 ft. wide once posted design speeds reach 40 m.p.h. or higher.

These shoulders are intended for use by more serious and high speed bicyclists.

**Discussion:**

The AASHTO Guide defines a bicycle path or bike path as "a bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way." The AASHTO Guide also states that "sidewalks are generally not acceptable for bicycling". An exception is typically recognized for certain situations such as long, narrow bridges such as any possible pedestrian overpass over Rt. 31. "Sidewalks are generally inappropriate for use by adults because they put the adult bicyclist in conflict with motorists using driveways, and with pedestrians, utility poles and signposts. Also, the cyclist is generally not visible or noticed by the motorist so that the cyclist suddenly emerges at intersections, surprising the motorist and creating a hazardous condition." (Bicycle Master Plan, Oregon DOT, May, 1988.

**4) Accessibility**

**Guideline:**

Sidewalks on streets and ways shall be considered walkways under the ADA accessibility requirements - with the exception that if the slope of the natural topography or existing street exceeds one-in-20 (1:20 or 5%) a ramp is not required. All sidewalks shall be a minimum of 48" wide with 36" minimum of passage space clear of obstructions such as signposts, hydrants, etc.. The top of curbing running immediately adjacent to sidewalks shall not be counted in the 48" minimum width. Wherever possible the minimum width of new sidewalks shall be 60" wide (5 ft.).

**C. Landscaping**

**1) Landscape and Street Tree Plantings**

**Guideline:**

Trees and other landscape plantings should be used to reinforce the pattern of private and public spaces -- not just for decoration. Minimum three-inch caliper shade trees shall be provided along all streets and pedestrian ways at regular intervals averaging twenty-four (24) feet on both sides of the street and should form continuous canopies at maturity. Species should be mixed to prevent spread of blights and pests -- although massed plantings of the same variety should be allowed for design purposes. Housing developers should focus on creating a strong structure of plant material that can be filled in by

homeowners over time. Unusual cultivars should be avoided. The street trees in primarily residential areas shall be located in grassy planting strips at least eight feet wide running between the sidewalk and the edge of the street.

**Discussion:**

Over the long term, trees have a greater impact on the visual character of a community than almost any other element - especially if they are arranged to reinforce the pattern of buildings, roads, and sidewalks. Trees provide natural cooling, filter pollution, screen eyesores and provide privacy for residences. Trees also create comfortable outdoor space adjacent to retail and commercial buildings. Plantings of shrubs and groundcovers for screening and slope stabilization should favor native species over exotics. This is especially important in new developments adjacent to natural areas, where aggressive new species can be very invasive.



**2) Screens and Buffers**

**Guideline:**

Screens and buffers should be used to provide visual and physical separation between pedestrian and vehicular systems. Parking lots should be visually separated from building entry areas.

**Discussion:**

Plant materials provide the best screen and buffer but other materials such as earth forms and walls can be used as well. Trees and shrubs should be planted as close as possible to provide a unified element. Earth forms (such as berms) work best when combined with massed shrub or tree plantings

**3) Walls, Fences and Hedges**

**Guideline:**

Make plans for fences, walls, and hedges during the approval process and use these elements to create a finished edge to the street. Fences that pedestrians can look through or over (< 48") are desirable at the front property line. Taller screens should be kept behind a line projecting the front wall of the houses or commercial buildings. Traditional materials like wood, stone, and wrought iron are preferable to chain link. Solid plastic or vinyl fencing should be avoided although vinyl-coated chain link fence (especially in dark colors) is preferable to galvanized chain link. Dumpster screening enclosures shall be constructed from the same palette of materials that the building they service is constructed from.

**Discussion:**

Residential development usually leaves the provision of fences, hedges, benches, and other street furnishings to homeowners. Studies have shown, however, that these elements add significantly to the value of house lots. A comprehensive street furnishing plan, coordinated with plans for curbs, sidewalks, and street lighting, can give a new development a much more finished look.

Fences and hedges are important in separating the public street from private house lots, making front yards more usable and adding to the livability of the development. Their location and function is often more important than the materials chosen, but a consistent approach will help to create a unified appearance for the community.

**4) Design of Natural Areas**

**Guideline:**

In areas of a development site that won't be used for active recreation, use native species and ecological design principles to create self-sustaining plantings. This approach is especially valuable where a development site is adjacent to protected wetlands or wooded areas. Promote wildlife by planting food-producing plants. Protect vernal pools and intermittent streams.

**Discussion:** Open areas that are not directly associated with a specific commercial or retail space or are otherwise "leftover" space are often ignored or kept mowed as a lawn. Many other options are available that require less maintenance, are better for wildlife, function to filter and diminish stormwater run-off, and are more attractive. These include wildflower plantings

and meadows, managed succession, shrub masses and tree groves. Native plantings adapted to local soils and weather conditions will do better than introduced species. Transplanting native species from development areas and collection of seeds from nearby meadows and wetland areas are inexpensive planting options. Native plantings tend to require more maintenance at the beginning as exotic weeds move in, but once established they take care of themselves indefinitely.

### III. Architecture

#### A. Use and Siting of Structures

##### Guideline:

Allow a mix of uses, including small-scale commercial, office and workshops within buildings and individual developments. Provide for a range of housing prices with apartments within both residential and commercial structures. Use traditional siting principles to locate this more diverse collection of buildings within a larger pattern in which the public space is the unifying element. Siting should be coordinated with streetscape principles to promote a cohesive design.

##### Discussion:

Development can be much improved by introducing some social and visual variety by means of varied uses and housing opportunities - such as accessory units. The quiet residential character that most people are looking for need not be compromised if such uses are limited to 10-20% of the overall floor area. Traditional village development principles can help: using the mass of buildings to create private courtyards and entrances; using fences and hedges to control pedestrian access to private yards; providing a comprehensive network of sidewalks and paths so that people can get around without intruding on private spaces. The same principles apply to commercial and mixed-use development. A mix of small retail and commercial uses should be provided to complement and create a synergy with large retail or commercial uses.

#### B. Overall Building Form

##### 1) Height

##### Guideline:

Allow buildings of up to 40 feet in height at the ridgeline where the Rt. 31 R.O.W. plus the adjacent build-to lines or setbacks total 200 to 240 feet ( a 5:1 or 6:1 ratio of

height to width - see II A.1) above) or where special civic or gateway building elements are needed. Limit building height to 36 feet elsewhere (2.5 stories) to help maintain a human scale to the streetscape and, especially, to match the scale of existing surrounding neighborhoods where new development abuts them.

##### Discussion:

Height controls are a normal part of town center design regulations to ensure that buildings are built to a human scale and in proper portion to the public realm of the street. Conventional measures of the amount of development, such as minimum lot size or housing units per acre (i.e. density) are not very helpful. Three small apartments might have less impact than one very large house in terms of traffic, noise, water use, and stormwater runoff. Yet by the conventional measure of density, the three-unit apartment building is three times as dense as a single house on the same plot of land.

In order to achieve the goal of not increasing overall Township or Borough build-out, it is important to devise a workable way to measure and control the total amount of building that will occur in a town center. One approach is through restrictions on building height and impervious surface coverage. (8.)

#### 2) Scale

##### Guideline:

Use the human form as the basis for determining scale of new structures. Break large masses into smaller forms with traditional proportions and architectural detailing. Match building height to the existing architectural and neighborhood character where new development meets existing development. Step building height up from 2 1/2 stories at edges to 3 1/2 stories maximum at the core of new centers where the density of use should be highest.

##### Discussion:

Scale, massing and proportion refer to the overall size and shape of a building. Planners and designers have found that these factors are much more important in determining the character of a development and how it fits into its context than do surfacing material, colors, etc. Scale refers to the relative size of something, particularly in reference to the size of the human body. Massing is concerned with the way a building is configured, from a single block to a series of smaller units, and how these are placed relative to each other. Proportion deals with the relationship of length to width and height of a structure. Designers look at attractive historic structures or building complexes in these terms in order to figure out how to make new buildings fit in. Conversely, when new

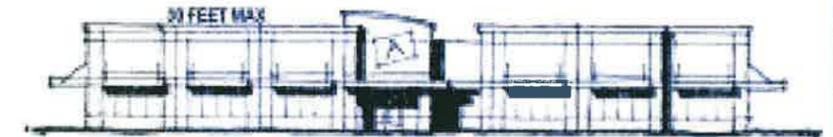


Locate buildings on the corner to create pedestrian interest and reduce the visual impact of parking

NO



YES



"No wall that faces a street or connecting pedestrian walkway shall have a blank, uninterrupted length exceeding 30 feet without including at least two of the following: change in plane, change in texture or masonry pattern, windows, trellises with vines, or an equivalent element that subdivides the wall into human scale proportions."

2. Clarion Associates and Hagman Architects  
- Commercial Design Guidelines for Overland Park, Kansas

buildings seem out of place, despite traditional material, it often is because of problems with their scale and massing.

#### 3) Massing and Proportions

##### Guideline:

Massing and proportions of new architecture shall be informed by and recall ( although not slavishly reproduce) those of existing architecture and historic settlement patterns in the Hopewell and Pennington area. Commercial development shall be designed and sized in a manner which is architecturally, aesthetically and operationally harmonious with the surrounding development.

Existing structures with historic or architectural significance, if any, shall be retained to the extent practical. Alterations to such structures shall be compatible with the architecture of the existing structure.

Trademarked architecture, which identifies a specific company by building design features, shall be prohibited, unless the applicant can demonstrate that the design is compatible with the historic architecture of the region.

#### 4) Articulation of Mass and Facade; Rhythm of Divisions

##### Guideline:

##### Discussion:

#### 5) Relationship to surrounding grade

##### Guideline:

Where possible build with a finished floor elevation and public landscape set 4-5 feet above the level of a busy highway.

##### Discussion:

Setting buildings and public landscape above the level of the adjacent highway will help form a more distinct place. When combined with hedges or massed plantings on the rise from the highway this will provide considerable screening and reduction of the adjacent high volume traffic impacts. The highest point of a site is actually one of the best places to put parking lots in a way that they can be de-emphasized and effectively screened.

### C. Roofs

#### 1) Roof lines: pitch, massing, silhouette

##### Guideline:

Roof types should be limited to a few simple types, dominated by the gable and the hip roof. Mansards and gambrel roof styles are generally out of place and should be used sparingly. Roof pitches should generally be fairly steep: between 8:12 and 12:12. In areas of prior Dutch settlement special attention should be paid to the tall narrow massing of this architecture and to its particular roof pitches. Dormers should be designed to be in scale with the rest of the building, generally limited to no more than 1/3 of the length of the eave line. Buildings or parts of buildings facing onto public spaces and streets, including canopies for accessory facilities, shall have

roof designs typical of the historic architecture of the region.

##### Discussion:

Roof lines are very important to defining visual character at the scale of the community. As with other architectural elements, analysis of traditional forms reveals a few common approaches that balance appearance with function in the most efficient way. Tall roofs have always been more common than flatter ones; they shed rain and snow better and open up more room in the attic. As with other design elements, simplicity and consistency are the watchwords. For example, roofs of different types were seldom combined on the same building.

#### 2) Materials

##### Guideline:

Use local materials of good quality and durability to the greatest extent possible. Use these materials in ways that resonate with their traditional use in the area, but are new interpretations appropriate for the new uses these buildings must accommodate. Avoid slavish repetition of traditional building materials as an end to itself.

### D. Facades, Fenestration and Building Entrances

##### Guideline:

Every building should have a clear front facade, a formal side facing the street. The principal entrance should be clearly visible, set apart by its location and detailing to mark it as the front door. Windows should be vertically proportioned, ranging from 1:2 to 3:5 proportion of width to height, and generally no more than three feet wide. Windows and doors should be arranged in a balanced, unified design -- though it need not be completely symmetrical. Glass should be limited to no more than 50% of the total area; the effect should be one where the windows have been cut out of a solid wall.

##### Discussion:

As the public face that the residential building presents to the street, the front facade plays a critical role in the overall appearance of the community. Generally the simple approach is the best design, with balanced windows and a well-marked entry. As the major repeating element on the walls of a building, windows should be arranged with a conscious rhythm in their spacing.

#### 1) Sense of Entry

##### Guideline:

All buildings should have a clear entry point that is architecturally emphasized and visible at least in part from the public sidewalk.

#### 2) Window size

##### Guideline:

Windows shall be vertically proportioned and balanced on facades above street level, with width to height ratios ranging from 1:2 to 3:5. Horizontal windows may be used just below roof eaves ("eyebrow" windows) and as first-floor display windows. On streets in the downtown core where the predominant first-floor use is commercial, at least 70% of the ground floor facade shall have transparent glazing, with detailing similar to that found in traditional downtowns in the Region.

#### 3) Rhythm of openings

##### Guideline:

For buildings with street frontage exceeding 100 feet, front entries shall occur at least every 50 feet. Any building with more than 60 feet of street frontage shall have at least two entries. No buildings shall have more than 25 horizontal feet of wall facing the street without a window or operating door opening.

### E. Surface Appearance

##### Guideline:

Use traditional forms and materials whenever possible. Use colors and surface treatments that help houses or commercial/retail buildings fit into their surroundings; dark colors in the woods and rural landscape help houses disappear; light colors unite houses or commercial/retail in a village setting.

##### Discussion:

Materials are important, not just for the people who live in the house but for the appearance of the entire neighborhood. Like the overall massing and proportions of a structure, materials can either give it a recognizable, human face, or a more "modern" appearance. Using materials that are native to the region can help new homes fit into the visual character of the town. These materials have a time-tested resistance to the local climate, as well. Use of local stone and wood products can also support the local economy and helps keep undeveloped open space in productive use.

The main street-facing facades as well as main entries should be

more highly elaborated in terms of the quality of materials and the specific architectural history and sense of place that local materials evoke.

### 1) Color

#### Guideline:

Color schemes shall tie building elements together, relate separate (free-standing) buildings within the same development to each other, and shall be used to enhance the architectural form of a building. All building projections, including, but not limited to, chimneys, flues, vents, and gutters shall match or complement in color the permanent color of the visible surface from which they project. Mechanical equipment (particularly roof-top equipment) shall be screened from view so color is less critical. Select building materials and color that are complementary to the surrounding area. Intense, bright, black or fluorescent colors shall be used sparingly and only as accents (that is not as the body color or trim color); such colors shall not be used as the predominant color on any wall or roof of any building. Permitted sign areas shall be excluded from this standard. (2.)

### 2) Cladding Material

#### Guideline:

Building materials shall be selected to be appropriate to the scale of the building proposed, to add visual interest and human scale to the surrounding pedestrian and street level, and to complement the architecture of the surrounding area. Building materials shall conform to existing materials but shall avoid attempting to create an "historic" look that is in fact, false. Pre-cast concrete, concrete masonry units or smooth-faced concrete block, applied thin brick veneers (less than 4" nominal thickness or materials made to look like masonry should not be used. Plywood or other wood panel sheathing materials should be avoided unless they are incorporated as a panel within a frame and are durable for exterior use.

**Re-siding:** Every effort shall be made to preserve existing architectural details when re-siding a house. Special care shall be taken to address the relationship of the new siding to the existing architecture, especially at the eave-line (rake) of the roof and at window and door casings and at cornerboards. "Jumping" or siding over the existing casings is not permitted.

#### Discussion:

Clapboard siding, brick and stone have been used very successfully in existing facades in the Rt. 31 corridor and the adjacent Pennington Borough "Downtown" and the continued use of these materials for building cladding is encouraged. Materials such as combinations of brick and clapboard siding are rarely appropriate. Consistent use of a dominant building material for the "skin" of a façade is

encouraged. Facades should relate to their surroundings through materials, proportions and colors to provide a sense of cohesiveness, without mimicry of inaccurate historical styles or slavish replication of neighboring buildings. Facades and roofs should be designed to be visually interesting, attractive and harmonious along areas that will be seen by the public. High quality materials should be used that convey substance and integrity, that are durable over time, and that afford opportunities for detailing to create interest at the human/streetscape scale and to break up large featureless expanses."

### 3) Trim Treatment

#### Guideline:

Use and detail trim treatment as an important finish element that emphasizes and frames the edges of wall planes, roofs, and window and door openings. Trim should be used to break up blank walls and to create visual interest and an overall hierarchy unifying the entire building and relating it to its neighbors. Particular care shall be given to never Vinyl siding, solid vinyl or other vinyl-clad products should not be used. If metal trim elements are used, they should be appropriate to the architectural context and convey a sense of quality and craftsmanship to assure an attractive appearance over time. Natural aluminum and glossy stainless finishes should not be used in conjunction with traditional structural or cladding materials.

### 4) Masonry

#### Guideline:

Use traditional masonry materials to add interest to a façade and convey permanence.

#### Discussion:

Use of traditional, local masonry materials and techniques has an established track record in terms of durability and will help new development to fit in with its surrounding context, both architectural and natural.

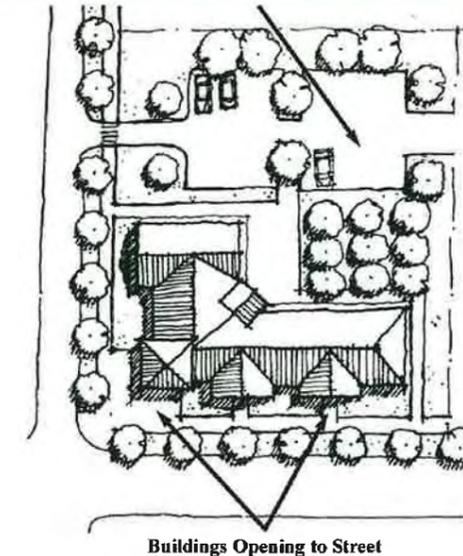
## F. Porches and Arcades

#### Guideline:

Porches and arcades can greatly enhance the appearance and functionality of a building. They can be little more than a cover over an entrance, but are more useful if given the proportions of a room: at least eight feet wide and 12 feet long. Materials and finishes should be compatible with the rest of the building, while durable enough to take the weather.

#### Discussion:

Porches provide a useful and relatively inexpensive extension of



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space. They provide protection from inclement weather and a transition between exterior and interior space. In the life of the community, the porch provides an essential transition area between the public space of the street and the privacy of the home's interior. Porches bring people outside and foster interaction between neighbors and passersby.

### 1) Railings

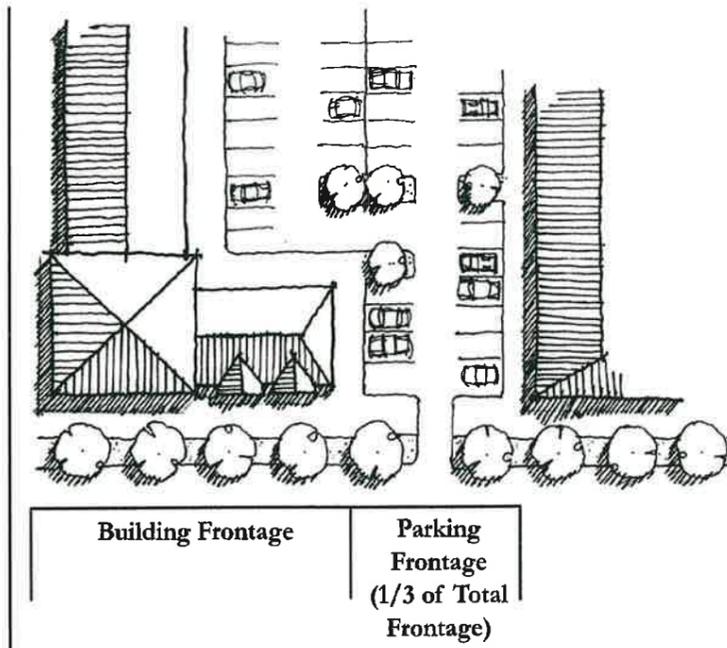
#### Guideline:

Railings are a visible feature of building elements such as porches, decks and ramps and as such should be detailed to add interest and quality to the streetscape that they abut. They should be designed to protect from falls and aid accessibility but also to allow views from the porch to the street or landscape beyond. Pressure-treated wood is acceptable for structural members but a higher grade of lumber, such as cedar, redwood or cypress (or metal where compatible with surrounding context) shall be used for all finish elements, including railings, posts, fascia and trim, stair risers and treads and other visible features.

## G. Decorative Elements: towers, cupolas, chimneys

#### Guideline:

Towers, cupolas and chimneys are architectural focal points of buildings that break up large masses with their height and serve as place-making elements or even landmarks. They should be carefully used to add height, variety and visual interest to building complexes. They also serve to anchor and emphasize major buildings in a complex. Use these architectural elements to steer pedestrians



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towards main entrances. These elements should always be used in a way that is consistent with their location in traditional area building types and not in a purely decorative way that does not look like it is "believable" in the surrounding architectural context.

#### **IV. Access Management and Parking**

##### **A. Reverse Frontage Roads**

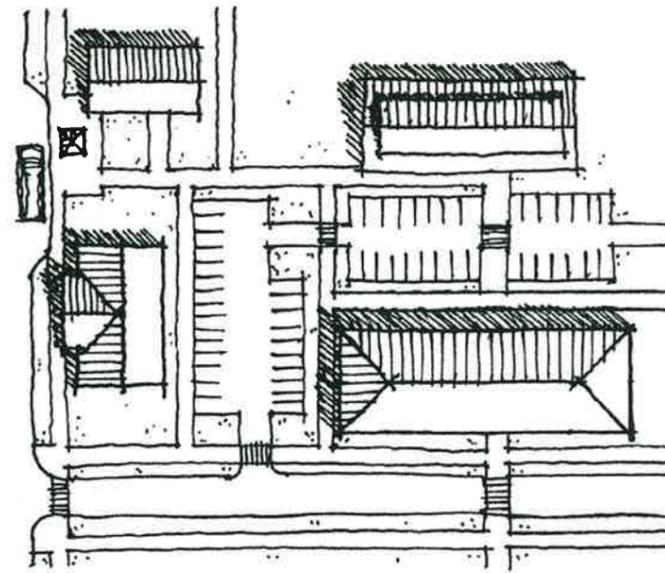
**Guideline:**

Whenever possible, internal access drives should be located to join together existing public streets and/or connect to adjacent private drives, so that the internal circulation functions as an integral part of the surrounding transportation network and provides alternate routes running parallel to Rt. 31 and linking multiple adjacent properties.

##### **B. Shared Driveways**

**Guideline:**

Minimize or eliminate curb cuts along a public street. Where possible, share vehicular access with adjacent properties and/or utilize alleys for access.



*Connect driveways for adjacent properties to improve circulation and eliminate the need for more curb cuts*

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#### **C. Parking**

##### **1) Rear Parking Lots**

**Guideline:**

Parking lots should be located behind buildings or in the interior of a block whenever possible. Parking lots should not occupy more than 1/3 of the frontage of the adjacent building or more than 64 feet, whichever is less.

##### **2) Planted Medians**

**Guideline:**

Parking aisles should be separated from one another by medians planted with shade trees as per provisions of the local Zoning Code.

**Discussion:**

Shade trees in parking lots not only break up the perceived size of the lot and provide cooler temperatures in summer, but have been shown to have a significant effect in reducing heat island effects of the asphalt. Studies in California have shown that shade trees in parking lots also have a significant effect on reducing hydrocarbon emissions from hot, parked cars.

##### **3) Smaller Parking Lot Sizes**

**Guideline:**

Large surface parking lots larger than 75,000 square feet of vehicular surface should be visually and functionally segmented into several smaller lots. Dead ended parking lots (with the travel aisle terminated in a back-up stub) should be avoided wherever possible and should never accommodate more than 24 cars, double-loaded. This would generally limit them to an aisle length of 120 feet or less.

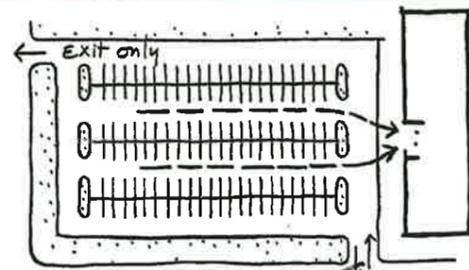
##### **4) Parking Lot Screening**

**Guideline:**

Parking lots along the street should be screened from the adjacent street and sidewalks by walls, fences, or landscaping to standards stated in the Zoning Code.

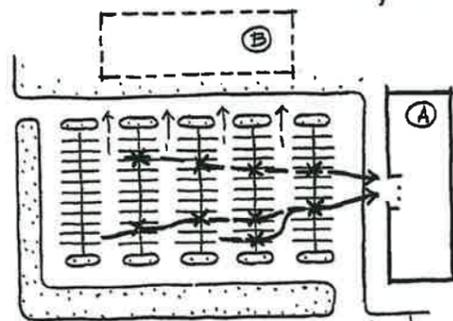


*When a parking lot is adjacent to a street, screen it using a wall and/or landscaping*



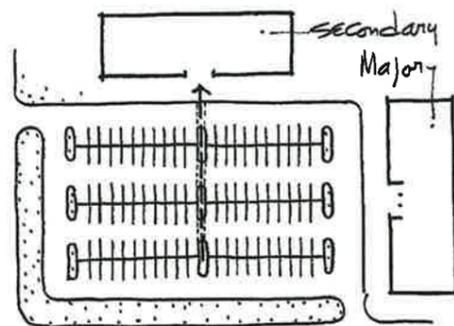
Entry - Exit  
Here pedestrian traffic moves in the aisles with relative safety.

- Align the parking aisles toward the major destination.



pedestrians moving from their cars to building A are induced to cross both the parking bays and aisle traffic. This layout favors pedestrian flow from cars to and from a building at position B.

- Avoid pedestrian movement through parked cars.



pedestrians can move in aisles from their cars to a well-marked crosswalk.

- Provide cross-compound walkways where needed.

#### Discussion:

In Segment 3 it will be particularly important to re-inforce the existing pattern of large buildings set fairly far back from the Rt. 31 R.O.W. behind a treed and landscaped buffer by adding a zoning standard to require no parking in front of any new buildings in a Rt. 31 buffer area within 150 feet of the edge of the Rt.31 R.O.W.. Tree and shrub plantings should be required to fill this 150' buffer zone with a heavy naturalistic screen for any new buildings. This will be especially important if a new interior industrial/commercial street and streetscape (similar to a reverse frontage road) is created as recommended for this area in Chapter 2.



## V. Signage

### A. Types and Styles

#### Guideline:

Consultants should design signs as an integral part of the building design. Letter size and location shall be appropriately scaled and proportioned to the overall building design. If a building has a sign band or an area that was designed specifically for sign placement, a sign should respect and conform to this architectural constraint. Storefronts designed to accommodate multiple tenants should incorporate a unified sign band detailing the upper limit of the retail storefront area. Signs for the various tenants should be part of a coordinated color and text style that is designed to blend harmoniously with the building and site. Each store shall be allowed one flush sign and one blade (projecting/hanging) sign per façade. Whether wall, sign band or projecting, all signs shall be carefully located not to obscure architectural details or to create visual confusion. No animated, flashing, audible signal or internally illuminated signage shall be permitted.

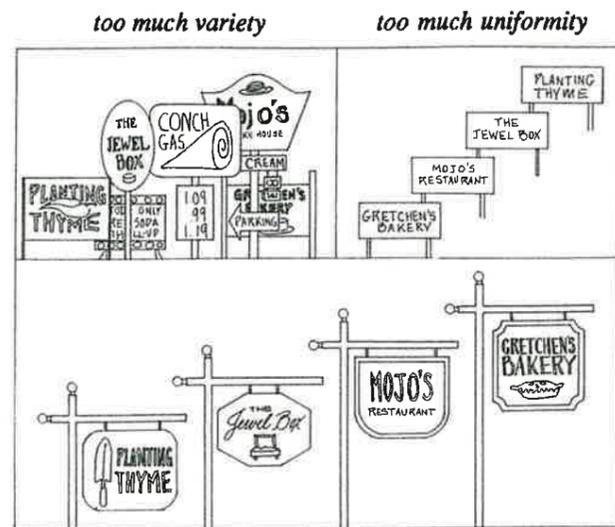
#### Discussion:

A wall sign is parallel to any exterior wall of a building. Because many of the commercial buildings in villages were originally constructed as residences, there are a limited number of places on the facades where wall signs can be located without obscuring important architectural details. However, older commercial buildings were often designed to make sign space an integral part of the façade. The lintel area, which extends horizontally across the top of the store front, was generally used as the sign area for the business. Where a building has been designed in this manner, the wall sign should be used as the primary identifier of the business. In the case of residentially designed commercial buildings, wall signs should be considered as a secondary or informational type sign. (Bucks County Village Planning Handbook)

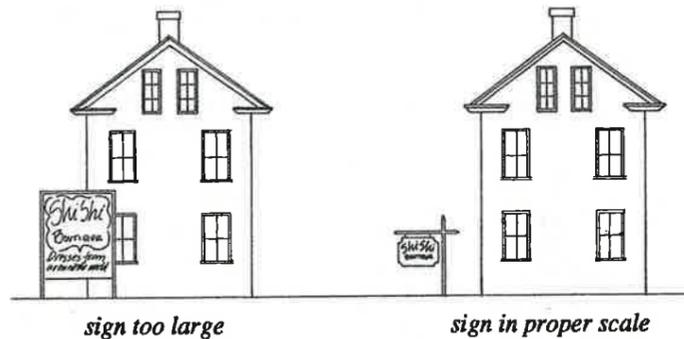
The colors, materials and illumination of a sign should be restrained and harmonious with the building and the site to which it relates. Text should be arranged on a sign in a balanced way. Individual items of information should be minimized in order to improve legibility. The over-arching goal shall be clarity and the lack of graphic confusion and clutter that makes the sign and its message difficult to read and quickly understand.

### B. Size, shape and location

Hopewell and Pennington should seek funds or help to prepare actual, coordinated designs for placement of signage for multiple tenants near the Rt. 31 Right of Way edge in such a way that it is low and aesthetically acceptable while at the same time giving sufficient advertising to uses served by interior frontage roads or



Though unified by common design elements, signs can still express the individual character of each business.



sign too large

sign in proper scale

RELATIONSHIP OF SIGN SIZE TO TRAFFIC SPEED						
Number of Lanes	Speed (MPH)	Reaction Time (Seconds)	Distance Traveled During Reaction Time (Feet)	Height from Ground (Feet)	Total Area of Sign (Square Feet)	
					Commercial	Rural, Residential Institutional
2	15	8	176	12	8	6
	30		352	16	25	18
	45		528	20	50	36
	60		704	24	100	70
4	15	10	220	14	8	6
	30		440	18	40	28
	45		660	22	90	64
	60		880	26	150	106

Source: Ewald, William R. and Mandelker, Daniel R., *Street Graphics*, The American Society of Landscape Architects Foundation, 1971

Bucks County Village Planning Handbook

connected service lanes. These signage "systems" should be easily modified, could be integrated into stone walls or fencing and should be designed to be placed to the Rt. 31 side of any vegetative screening of the uses behind.

### C. Materials

Lower and smaller signs located closer to the Rt. 31 right-of-way will have the same visibility for a motorist - especially if that motorist is moving at a slower but steadier pace - as a larger and taller sign located at or near the face of a building set far back from the edge of the travelled way. This relationship is detailed on the chart to the right at the bottom of the page. Therefore small and low signs could be attractively but effectively integrated into such roadside features as stone or brick walls. Materials, shapes and masses that are native to the region, such as native stone and native fence or wall styles should be integrated into sign supports wherever possible.

### D. Colors

No more than two or three colors should be used. Colors used for the sign should match either the background or the trim color of the structure which it serves. This will link the sign to the business. In addition, when more than one sign is used, the colors on the signs should be coordinated with each other to present a unified image.

(Bucks County Village Planning Handbook)

### E. Lettering

The information shown on signs should identify a business in a simple and straightforward manner. The message should be easy to read and direct. Lettering size should be related to the distance the sign is placed from the travelled way and should never be larger than necessary to communicate the information. Too much information on a sign or a group of signs is difficult, if not impossible, for a viewer to absorb - especially if the viewer is in a moving vehicle. Signs which identify a business should limit text to the name of the business and perhaps a secondary item such as a principal product or service.

### F. Illumination

Internally lit or flashing signs should be avoided. Illuminated, plastic awnings are prohibited.



**TRANSPORTATION ISSUES AS DEFINED THROUGH THE PROJECT'S PUBLIC PARTICIPATION PROCESS: The Corridor In Its Entirety**

For years, the towns of Hopewell and Pennington Borough have grappled with the effects that increased traffic has brought to the Route 31 corridor: backups in traffic caused by congestion, and safety concerns for motorists and pedestrians caused by increase use of the corridor by through truck traffic (often using the road as a short-cut through the state) and a growing community of local users. Local users of the corridor point out that drivers often travel off Route 31 in a series of short-cuts to avoid the congestion on the highway; this has the added negative effect of creating more traffic on small neighborhood roads not designed to handle it. In the past, the townships have sought to relieve pressure on Route 31 by attempting to limit its use through weight limits on trucks, strict speed enforcement, etc. While this may have mitigated some of the effects, the inevitability of growth both locally and regionally points to an increasingly problematic corridor unless measures are taken. The town is now considering whether to make the road fit the traffic (i.e., widening it, adding lanes, increasing speed limits) as one solution to the problem, or whether to seek solutions that will allow the community to maintain the rural nature of the road.

The Route 31 corridor's issues need to be understood in a regional context: as a major connector from I-95 to 287 (one of 3 major connector routes) and the inevitability of traffic increase due to regional growth. Long-range regional traffic patterns need to be better understood in order to define short-term and long-term objectives and their impacts. Growth has undeniably out-paced the road's capacity – how will the road handle regional growth over time? The following are comments from residents of Hopewell and Pennington Borough:

**Major issues:**

- Congestion – increased traffic in both directions at all times of the day
- Speeds and enforcement: traffic goes too fast
- Conflict between through-traffic (regional) and local traffic
- Tension between large, high-capacity roads and small roads which are not designed for through-traffic;
- Ingress/Egress to Route 31: left turns both off of and onto Rt. 31 are very difficult;
- Sight distances are poor in some areas, there are blind curves
- There are too many curb cuts.
- Need better access to employment centers to the East.

**Land Use / Economic**

- We need to get a handle on growth over time
- Economic development: positives and negatives
- Maintaining the rural nature of the road – how do we protect it?
- How does a change in one side road affect other side roads?
- How will we keep the town safe and quiet?
- The corridor is beautiful and has charm now.
- Zoning has limited commercial growth – new growth is likely to be redevelopment.

**Traffic**

- Trucks
  - How to segregate through truck traffic
  - Trucks start slow and slow other traffic movements
- Pedestrian/Bicycle:
  - Safety issues – need safe crossings (like new one planned at North Main
  - Sidewalks and bike paths needed to connect residential and commercial areas. If there were sidewalks, people would use them (not everyone has a car; kids could walk to the bus).

- There are other alternatives for bike traffic in this area

**General ideas for improvements along entire corridor:**

**Roadway safety and congestion reduction:**

- Control speeds – 35 mph
- Eliminate or reduce left turns to keep traffic moving
- Limit access-egress - not just new development but change existing ones; regulate turning movements onto Route 31.
- Create residential frontage roads to facilitate turns off/on Rt. 31 instead of frequent driveways.
- Create turning lanes for safe left turns.
- Consider something other than "jug handles" to accommodate left turns.
- Widen Route 31 so that traffic will not get squeezed onto side roads.
- Add traffic lights for side streets
- Don't add traffic lights – they make left turns difficult and "rat racing" on side streets too easy....
- Do not widen Route 31 except to add bike/pedestrian lane or maybe turning lanes. The road is wide and fast enough. If we keep the road congested people will find other roads to use.
- Eliminate 96 trucks for noise and safety issues.

**Pedestrian and bicycle improvements**

- Create sidewalks and bike paths to connect residential and commercial areas.
- Separate sidewalks and bike lanes from roadway
- Add/widen shoulders for pedestrians/bikes.
- Consider use of overpass for pedestrians.
- Use textured surface pavement

**Commercial development**

- New development should become part of town street grid – not just off Route
- Commercial development should not just be gas stations, convenience stores and big box stores. There should be more diverse commercial use; e.g., we need a family restaurant.
- Seek low-intensity commercial development

**Future land use / transportation**

- Consider future transit-rail line system and other long term transportation alternatives
- Examine the impact of land use decisions
- No more residential building on Route 31 – land is too valuable and the road is inhospitable to residential use.
- The opportunity is now – because we can't wait forever to make improvements.

**Aesthetics**

- Add trees and landscaping along the entire corridor.
- Create green buffers along the roadside in commercial and residential areas.
- Landscaped median strips with shrubbery.
- Use innovative road design for more attractive road.
- Clean up corridor (signage, dump area, overgrown weeds, facades, Ryder Truck corner, etc.)
- get rid of utility poles – put wires underground
- better, more uniform signage (good example is Waitsfield, VT)
- upgrade design standards
- Keep development clustered with open space between; mix commercial and residential use; 2-3 story buildings with parking behind.
- Keep rural community character (highway is divisive).
- Preserve land for open space, agriculture.

**TRANSPORTATION ISSUES AS DEFINED THROUGH THE PROJECT'S PUBLIC PARTICIPATION PROCESS: Individual Segments**

**Section I: I-95 Interchange to Railroad Overpass**

This section is increasingly congested with very unique traffic safety issues. There is a two-lane roadway between the overpass and the Pennington Rd intersection traffic circle, and a four-lane road south of the traffic oval. The posted speed limit is 45 mph. Adjacent land uses include single family housing and some commercial developments. The daily traffic volumes range from 21,000 vpd to the north and 30,000 vpd at the I-95 interchange. A better understanding of regional growth patterns is needed to understand how to respond to needs in this section. Regional truck traffic is pointed to as exacerbating the problems.

**ISSUES:**

**Congestion**

Congestion is perceived to be the top problem with Rt. 31 despite its four lanes, high traffic volumes and the high-posted speed limits, with regional truck traffic cited as the major cause.

- Left turns across to or from the Rt. 31-traffic flow are very difficult, particularly during peak hours of traffic. The traffic circle at the Rt. 31/Pennington Rd intersection appears to operate relatively well; a traffic signal or other traffic control here would increase back-ups and congestion.
- New development at Denow Road is a "mess in the making."
- It's difficult to get out of one's driveway!
- Potential new TND west of the oval (future development, mixed use center) will create more traffic problems.
- Traffic cut-throughs (short-cuts) at Reed Road-Trenton, Blackwell
- Congestion at shopping center

- Intersections are avoided, causing increased traffic on side roads that can't handle it e.g., new Merrill Lynch complex access might create more traffic through neighborhoods).
- R.O.W. is inadequate in some areas.
- "We don't want to become Route One."

### Safety

There are numerous complaints and observations about traffic safety along Section I, notably the geometric and operational issues associated with traffic. Pedestrian safety is perceived to be a top concern.

- There are no bicycle and pedestrian facilities along Rt. 31 in this section; safety especially as issue at the oval.
- numerous curb cuts at or near the intersection are confusing to the average driver (the northern part of this section has limited curb cuts and thus less associated safety issues). Some side roads intersect dangerously with highway.
- No shoulder.
- high traffic speeds (45 mph) with little or no geometric deflections to slow traffic makes for unsafe conditions;
- there is a need for speed transition between I-95 and Route 31

### Conflict of turning movements;

- It is difficult and dangerous to make left turns; people making left turns impede those traveling in left lane.
- Poor vision at places (especially south of the oval);
- people unfamiliar with the traffic circle occasionally turn into the flow of traffic, causing a serious safety problem; drivers are known to go the wrong way at the oval.
- Four lane segment of road is too narrow for safe travel and allows no margin for breakdowns.
- 18-wheelers hug the center line.

### Proposed improvements:

#### Geometric improvements at the traffic circle and along the four-lane segment of Rt. 31 have been

- Oval:
  - Maintain but re-configure oval – don't replace it with a traffic light intersection.
  - Improve pedestrian safety at oval: create pedestrian crossings (at oval, north or oval); consider pedestrian overpass. Perhaps use Pipeline ROWs as cross connections for greenways, pedestrians and bicyclists.
  - Deflections to reduce traffic speeds as vehicles enter the circle and more defined access right-of-way for traffic movements.
  - Better signs at oval – clarify right of way ("Keep Right") to keep people from driving in left lane and impeding left turns.
  - Create more choices for pedestrian crossings, especially at oval and north of the oval
- Reduce the speed limit along the roadway to 35 mph, and/or create speed transition from I-95 to Rt. 31.
- Reduce four-lane segment to three lanes (two directions of traffic and a center turn-lane, and regularly spaced center islands to prevent the lane from being used as a passing lane). This improvement would provide a safe refuge for turning vehicles. The actual roadway capacity of this alternative is in question, but the concept could fit within the existing right of way.). Plant trees in medians.
- Increase the road to a four-lane road with turning lanes - but don't do a four-lane road as can be seen further north on Rt. 31. The four-lane road with a Jersey barrier center median is unacceptable.
- Allow fewer access points onto Route 31;
- Re-design I-95 interchange to remove impromptu U-turn.
- Create a service access road to provide for many driveways to eliminate turning

movement conflicts.

- Consider traffic circles (roundabouts) to allow vehicles to turn around, reducing the need for left turns, and to slow traffic.
- Create a separation between the road and paths for pedestrians & bicycles.
- Add shoulders to move traffic further away from Rt. 31 houses.
- Create an alley between Crest Avenue and Orchard Avenue to provide residential access from behind instead of fronted onto NJ 31. .
- The problematic intersection at Ingle-side could be helped with a blinker.
- Preserve existing housing stock as it is a source of affordable housing.

### Section II: Railroad Overpass to Woosamonsa Rd.

This is a higher density area (both commercial and moderate density residential) with the likelihood of for more development in near future. The roadway is two-lanes with turn lanes at most significant intersections. Posted speeds range from 35-45 mph. Average daily traffic volumes range from 16,000 vpd (north end) to 20,000 vpd near the railroad overpass.

### Congestion

This section is consistently congested, even during non-peak hours of the day. There are back-ups in traffic – northbound in AM, southbound in PM (both ways north of Delaware Ave). Roadway levels of service may be below average due to the high number of curb cuts along Rt. 31 and high traffic volumes.

- The Rt. 31/W Delaware Avenue intersection is considered an average level-of-service during peak hours (less than 25 seconds of average vehicle delay).
- Two lanes configuration works well.
- There are conflicts in turning movements, e.g., poor turning access to Post

Office, Pennington-Harbour Road.

- Access problems – need to develop and retrofit access;
- Road isn't wide enough.
- Left turns are difficult to make (e.g., at Jann's and Sophia's exit). Commerce Bank-D.O.T. allows left turn but few people are doing it.
- Cut-throughs to and from BMS: King George, Main Street, Bard Street; Franklin to Scotch Rd to I-95; Pennington-Main St. avoids Rt. 31.
- Many accidents and sirens near Pennington/West Delaware Road.
- Traffic impacts Pennington Borough – diversion
- Route 31 traffic impacts side roads, e.g., West Delaware, West Franklin
- Delays at all hours at Delaware Ave. intersection; need to adjust traffic light for school hours, etc.
- Intersection at Pennington/Titusville Road:
  - roadway isn't wide enough
  - too many curb cuts – good local use, poorly designed
  - curb cut at gas station too close to the light
  - Lack of commercial services on west wide.
- Intersection at Knowles Road
  - curve in road here is problematic
  - road narrows
  - intensive traffic and uses near the road.
- Reading Road area:
  - noise problem
  - Rt. 31 access is a problem
- Woosamonsa Road - Conflict with left turns

### Safety:

This section contains unsafe conditions in more densely developed areas, especially for pedestrians:

- There are no bicycle and pedestrian facilities along Rt. 31 in this section; Improvement needed.

- Despite a crosswalk, pedestrian safety at the W. Delaware Ave/Rt. 31 intersection is a concern because it's where school children cross.
- Jaywalking is common here.
- Crosswalk problematic at Pennington/Titusville Rd. for school children.
- A large number of curb cuts accessing Rt. 31 create confusion.
- Sight distances are an issue – especially at Railroad bridge.

### Potential improvements

- Limit the number of curb cuts;
- Construct minor roads parallel to Rt. 31 to control vehicle access and egress along the main corridor; modify access to Rt. 31 properties so that convoluted movements aren't needed to "get around town."
- Improve pedestrian facilities and connections in this area; consider overpass for safe crossing. Pedestrian enhancements will help business.
- Create alternatives for the major signalized intersections (e.g., put Rt. 31 at Delaware section underground).
- Create service road between East Rt. 31 for businesses (from driving range to West Franklin or beyond). Create access roads for commercial properties.
- Elevate Rt. 31 from rotary to West Franklin St.
- Create big limited-access by-pass route to west side to I-95.
- Establish a Commuter Rail service-transit village with stops at Hopewell, Pennington.
- Delineate 11 foot travel lanes (rather than AAHTO standards of 12'), with shoulders for bikes/pedestrians and trees/shrubs in center median.
- Control weeds/vegetation for better sight.
- Delaware Avenue:
  - Create an all-way stop phase for the signal so that 4-way crosswalk is safe

with no turning movements.

Create pedestrian crossings at Main Street south of West Delaware;

- Change access on both sides (new road) at North Main St. and Titus Mill Rd.
- Pennington/Titusville Road
- Widen south- and northbound lane and provide wider left turn lanes
- Eliminate the left turn out of side of Pennington Market – make them exit on Delaware St.
- Need pedestrian overpass or underpass, or safe crosswalk with signal.
- Separate regional and local traffic.
- Reading Road:
- Improve look of the intersection.
- Tree Farm Road:
- Eliminate driveway by side of assisted living facility;
- Connect/extend to Peter Blichen's property;
- Eliminate left turn on Yard Road going north.
- Create connections in rear of lots
- Create plantings strips but keep parking visible.
- Tree Farm Rd. to Pennington – should be mixed uses, light industrial.
- Tree Farm Rd. to golf driving range: commercial corridor.

#### Land Use/Standards; Aesthetics

- New building facades should be designed to retain village and/or rural character.
- Building setback should be reduced; parking should be in the rear of buildings.
- Improve signage
- Improve architectural standards
- Improve lighting
- Attract desirable (local) business uses. Limit number of particular business

#### Other:

- Flooding issues on Lewis Brook – need to find space for detention
- Ascertain extent of existing DOT ROW from Penn Circle north to Tree Farm Road.

### Section III- Woosamonsa Rd to Rt. 518

This segment of Route 31 is sparsely developed. There are two travel lanes with generous shoulders. There is no posted speed limit (the state speed limit is 50 mph). Average daily traffic volumes range from 13,000 vehicles per day (vpd) in the north to 16,000 vpd at the southern end.

#### Congestion

- Traffic flow is generally good in this section because of limited intersections, no steep slopes and rural character;
- Some delays occur at intersections during peak hours, especially at the Route 518 intersection;
- Unusual level of truck traffic impacts entrance/exit to roadway, especially at Marshall's Corner area (the Trap Rock Quarry) and other industrial developments.
- Congestion at East Amwell TWP.

#### Safety

- Route 518 intersection of particular concern for safety issues;
- While there are generally acceptable pedestrian/bicycle facilities (shoulders are wide enough in this section), there is a problematic pedestrian crossing to SBMWA.
- Problem with kids and truck horns at Crème King.
- Mine Road - minor clearing needed to improve intersection safety

#### Potential Improvements

- Light at Titus Mill Road
- Re-configure Rt. 31/Rt. 518 intersection with a signal.
- Change access to East Properties to the RR side of the property.
- Preserve the two-lane rural character of the road – preserve as a Scenic Corridor? This is a model of how the entire

corridor should be.

- Create landscaped buffer as development and re-development occurs.
- Perhaps replace the guardrail with a more aesthetically attractive rail type, perhaps the rusted cor-ten w beam or stone walls.

1. American Association of State Highway and Transportation Officials (AASHTO), *Guide for the Development of Bicycle Facilities*; Washington, DC, 1991.
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