FINAL REPORT

Route 303
Sustainable Development Study
December, 2002

Prepared for:

Town of Orangetown

New York State Department of Transportation

Rockland County

New York Metropolitan Transportation Council

Prepared by:

Wilbur Smith Associates

In association with:
Allee, King, Rosen & Fleming
Eng-Wong Taub

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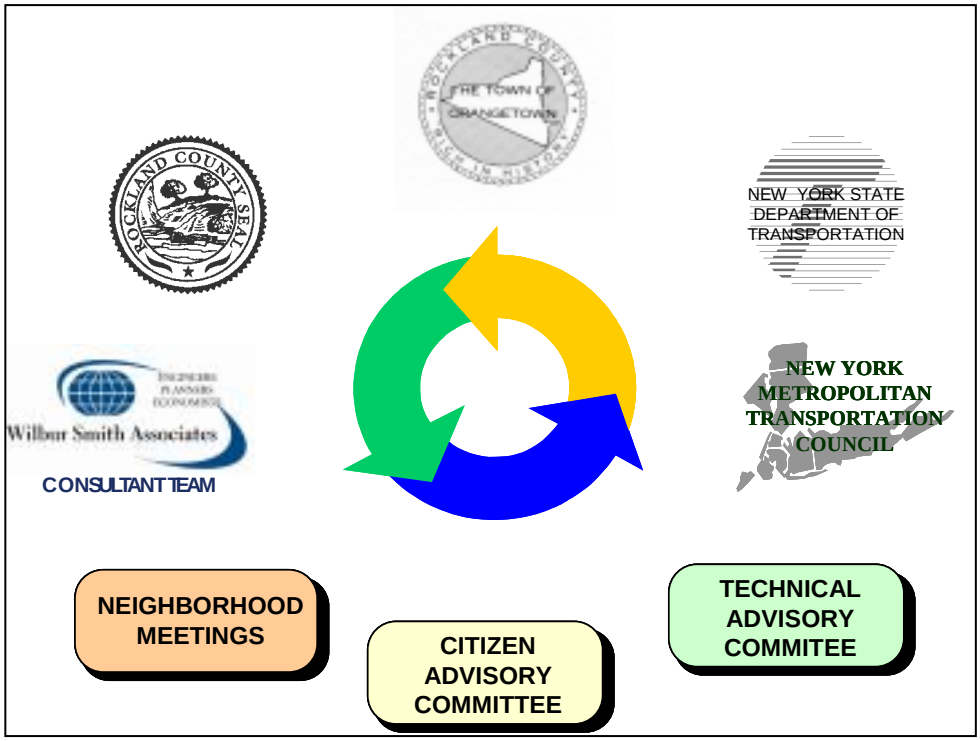

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Federal Disclaimer

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Route 303 Sustainable Development Study

Federal Disclaimer

ACKNOWLEDGMENTS

The Route 303 team would like to thank the members of the Citizen Advisory Committee (CAC) and the community participants who have dedicated their time developing the vision for the Route 303.

Thom Kleiner	Town of Orangetown Supervisor
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Gerry Bogacz	NYMTC
Business Owners	

The project team from Wilbur Smith Associates (WSA) included Harry Strate (Project Director), Josh Lecar, and Tim Boesch; the project team from Allee King Rosen & Fleming (AKRF) included Peter Liebowitz. Special thanks to the technical team from Eng-Wong Taub & Associates and Geomatrix Productions for the video production.

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1. INTRODUCTION

1.1 Study Background

The Route 303 Study Area is located in Rockland County in the Town of Orangetown, New York. Although this area is only approximately 25 miles from Manhattan, it has managed to maintain its suburban and natural character. Since the completion of the Tappan Zee Bridge in 1955, the Palisades Interstate Parkway in 1958 and the construction of the 87/287 connection most recently, Rockland County has experienced substantial increases in its population and employment. Over the years, Route 303 has become not only a major route for commuter travel and commercial traffic through its connections to the New York State Thruway, New York State (NYS) Route 59, and the Palisades Interstate Parkway, but also a focus of commercial and residential development in the town. The character of the area surrounding the Route 303 right-of-way – the communities of Tappan, Orangeburg, Blauvelt and Greenbush Road/Bradley Parkway – has not yet been overwhelmed by the adjacent commercial development at the Palisades Center and in New Jersey. The desire for a more comfortable and spacious environment continues to attract both residents and businesses to Rockland County, specifically to the Orangetown area.

Construction of the 1.2 million square-foot Palisades Center Mall in the mid-1990's has only added to the continuing pressure for office, industrial and "big box" retail development along the roadway. This pattern of development and redevelopment activity has focused public attention on the corridor's traffic safety and operational problems, diversion of traffic into residential areas, and the potential for diminished quality of life in the surrounding residential neighborhoods.

1.2 Study Area Characteristics

A project study area was defined as all land uses located within a half-mile on either side of the Route 303 right-of-way, and extending approximately five miles from the Clarkstown Town Line on the north to the New Jersey State Line on the south. Rockland County's 2001 Master Plan, *Rockland County: River to Ridge, a Plan for the 21st Century* classifies Route 303 as a "limited business corridor," as compared to "intensive business corridors," such as Route 59 in Nanuet and West Nyack. The plan recommends that, "while there is likely to be pressure for intensified commercial and retail uses along [limited business] corridors, the expansion of intensive business uses into [such corridors] should generally be discouraged." Furthermore, "where retail use is permitted in these corridors, it should be at a lower density (e.g. lower floor area coverage and development coverage) and should have greater green setbacks provided than in intensive business corridor areas."

> *DOT tried to make some necessary safety improvements, but they weren't done in a way that the community could buy into, because the community wasn't involved in the process.*
>
> Thom Kleiner
> Orangetown Town Supervisor

In response to the traffic safety and congestion problems identified along various portions of the Route 303 study area, in 1992, the New York State

Department of Transportation (NYSDOT) began to develop preliminary project plans for a street widening project that would address these deficiencies.

The plans were presented to the public in February 1993 at a public informational meeting. In June 1993, the Orangetown Town Board passed a resolution stating that, "The project is out of scale with the needs of the residents of Orangetown." The proposed road improvements by NYSDOT were dropped as a result of the public opposition to the project.

Route 303 Sustainable Development Study **-** In 1999, the New York Metropolitan Transportation Council (NYMTC, which serves as the federally designated Metropolitan Planning Organization for the New York region), in concert with the Town of Orangetown, the Rockland County Department of Planning, and NYSDOT initiated the Route 303 Sustainable Development Study as a joint effort. Each of the participating agencies shared a common desire to respond to NYMTC's identified regional goal:

> "*To expand awareness of the links between decision-making on the use of land and the provision of transportation services in order to enhance the efficiency and effectiveness of transportation investments."*

Supporting its regional goal, NYMTC has outlined a uniform set of objectives for all Sustainable Development studies conducted in the region:

- Develop transportation improvements and supporting land use patterns in key transportation corridors;
- Review current conditions;
- Identify community concerns and desires;
- Develop and stimulate future scenarios; and
- Foster agreements between municipalities.

Sustainable development means lots of things to lots of people. In the sense we're looking at it here is to basically agree on a course of development and solutions on the transportation side – and they're not just roadway solutions – they could be bicycle solutions, pedestrian solutions, etc. - it's a whole portfolio of transportation solutions – that sustain one another… You have development in the corridor, and you have a transportation system in the corridor, and neither one outstrips the other. So you don't have congestion and you don't have too much capacity… You're not imposing on the community; you're working with the community.

Gerry Bogacz,
NYMTC Director of Planning

With initial funding provided by Rockland County and ultimate reimbursement supported by NYMTC and NYSDOT, the county has served as the Project Manager and consultant contractor to retain a consultant team to initiate the Route 303 Sustainable Development Study. The consultant team was led by Wilbur Smith Associates (WSA) with support from Allee King Rosen & Fleming (AKRF) and Eng-Wong Taub (EWT). The project team interacted directly

with the government agencies constituting the Technical Committee (TC) and the general public through the Citizen's Advisory Committee (CAC).

Study Specific Goals and Objectives

Study goals and objectives were developed in concert with the Visioning Charrettes described later in this chapter. Objectives were developed in eight elements of the overall visioning plan. These included:

Neighborhood Centers – To protect the overall neighborhood character of the study area reinforcing positive attributes and enhancing and restoring those elements needing improvement;

Land Use / Residential – To preserve residential areas adjoining Route 303 and the commercial areas assuring effective linkage of land uses – commercial, residential, educational, and others to minimize demand for vehicle travel and enhance opportunities for pedestrian, bicycle, and transit use;

Commercial – To continue the commercial vitality of the area and to develop commercial activities within existing development patterns stressing small retail development within walkable communities in the southerly and middle parts of the corridor, and office/warehouse development to the north appropriately buffered from residential areas.

Pedestrian, Bicycle, and Transit Accommodation – To encourage transit oriented development supporting current transit proposals and at the same time allowing for accessibility, mobility, and connectivity through alternative transportation modes.

Public Spaces - Open Space, Historic, Recreational, and Natural – To encourage and support a system of public spaces that complement the built environment and that enhance the quality of life within the study area;

Traffic Safety – To reduce and eliminate hazards for motorists, residents, and visitors alike as they travel Route 303 through immediate action improvements and through long term land use and transportation strategies that protect pedestrians, bicyclists, motorists and others who travel the corridor.

Access Management - Closely related to traffic safety through access management, to reduce turning movement conflicts and curb cuts in new developments and existing land use abutting Route 303.

Coordination – To continue the coordination between citizens, businesses, towns, county, region, and state throughout the study process beginning with planning and continuing through environmental, design, and construction phases.

1.3 Summary of Study Issues

In order to "see" the corridor through the eyes of the residents and businesses within the corridor, the TC and the consultant team members conducted a walking tour of the corridor to provide the team members with an opportunity to interact casually with local residents and business owners and to visit specific problem areas within the study area.

> *The community is really talking about what it sees as its future in terms of both land use for the corridor and in terms of transportation solutions, and that's very different from a traditional corridor study, where transportation agencies would create a plan for the corridor and say, "here it is, tell us what you think of it."*
>
> Gerry Bogacz
> NYMTC Director of Planning

Numerous comments and concerns were identified during the initial rounds of Neighborhood and CAC meetings conducted from November 1999 to February 2000. In each of these meetings, participants were asked not only to review existing conditions and problems within the corridor, but also to help to form a vision of the future for what the Route 303 corridor could become.

Concerns over transportation-related issues, such as traffic safety, travel speed, truck traffic, and increasing volume of traffic along Route 303 were voiced frequently by study area residents. Throughout the course of the study, safety improvements for the corridor were given the highest priority by study area residents. A number of study participants also identified opportunities for open space preservation and landscape enhancement as key issues along the Route 303 study corridor.

> *What this study is designed to do is to incorporate land use changes and safety improvements… There are a lot of things we can do in the short term with regard to safety improvements, such as putting in left turn signals. But, if we were only to make safety improvements, then at the end of the day, we're still left with a "hodge-podge" of uses in the corridor. We need to re-zone parcels to permit more open space. We need a median up and down the road that will address the safety issues.*
>
> Thom Kleiner
> Orangetown Town Supervisor

Longer-term land use issues were also identified by CAC members throughout the study process, such as the need to limit and control large-scale commercial development and to provide buffering of existing residential areas adjacent to commercial zones. During the same time period as the Route 303 Sustainable Development Study, the Town of Orangetown also embarked on a revision and update of its Comprehensive Plan of Development. These two efforts were coordinated so that the strategies and goals developed during the Route 303 study process could be applied on a Town-wide basis, and also so that the recommendations of the Route 303 Study could be addressed through revisions to the Town's zoning ordinance.

For analysis of both transportation and land use alternatives, the corridor was initially divided into three neighborhood areas. While there are no formal boundaries to these areas, such as an

incorporated village, the identification of the individual areas was based on common land use, environmental, and transportation characteristics. The three neighborhood areas (which were shown in Figure 1.1) are:

- Tappan - extending from King's Highway South to the New Jersey State Line,
- Blauvelt/Orangeburg - extending from Glenshaw Street to the King's Highway South in Tappan, and
- Bradley Parkway - extending from Route 59 to Glenshaw Street (between Erie Street and Mountainview Road).

Each of these areas had a particular range of issues that were considered most significant by residents or business owners within the particular neighborhood. For example, residents in the Tappan area were most concerned with cut-through traffic on residential streets and the condition of retail properties in the neighborhood, while residents in the Bradley Parkway area were most concerned with truck traffic, traffic speed, and safety issues related to the change in roadway configuration from divided to undivided.
An additional outreach meeting oriented to the business community was conducted on a weekday morning in February 2000. Participants in the business meeting expressed their interest in County sponsored economic development and transit initiatives.

For the area surrounding the intersection of Orangeburg Road and Route 303, it may be possible in the future to revise the street pattern with a direct link provided between Orangeburg Road and Route 340. This will in turn allow a reassessment of land use in the area to create a "village-like" environment with opportunities for pedestrian and bicycle improvements and for retail redevelopment. Refer to Figure 4-10 in Section 4 for more information.

[In the Orangeburg Road area], *we have the ability of creating a neighborhood out of what used to be perceived as just a highway; we have the ability to take what was an injury to the environment and make it an asset.*

Dr. James Yarmus
Rockland County Planning Commissioner

Many participants at both the neighborhood and business meetings noted that Route 303 is the major access for the surrounding neighborhoods, not only for residences, but also for goods, services, distributors, and manufacturers. This access is fundamental to keeping businesses in the corridor.

I don't understand people saying they don't want truck traffic [on Route 303]*… Trucks bring the food in.*

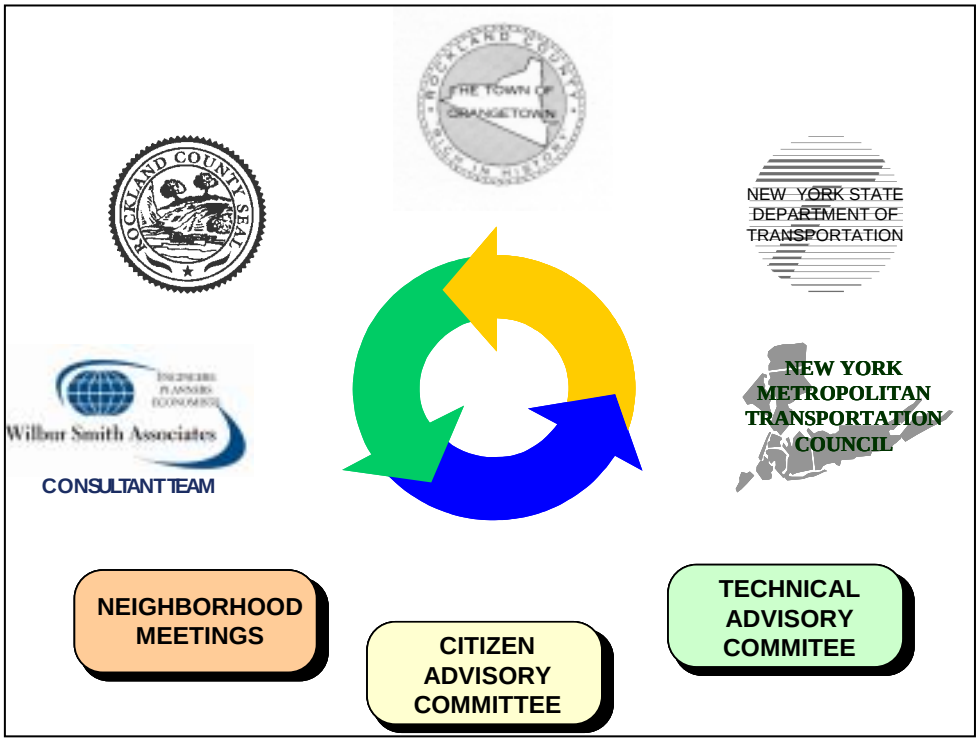
Corridor business owner

We're talking about a master plan. We're talking about changes that will be made over a 20 to 25 year period. If we don't address the long-term direction for the town, if we don't address where we're going, if we don't have a vision, then what we'll end up doing is making [only] *incremental changes and there won't be a direction.*

Harry Strate
Wilbur Smith Project Manager

2. STUDY APPROACH

An important element in the study approach was to integrate the technical study process of land use and transportation analysis with public outreach and consensus building and to involve public input in all phases of the study. This graphic illustrates the various stakeholders that made up the Technical Committee (TC) and the overall inter-relationship between them.

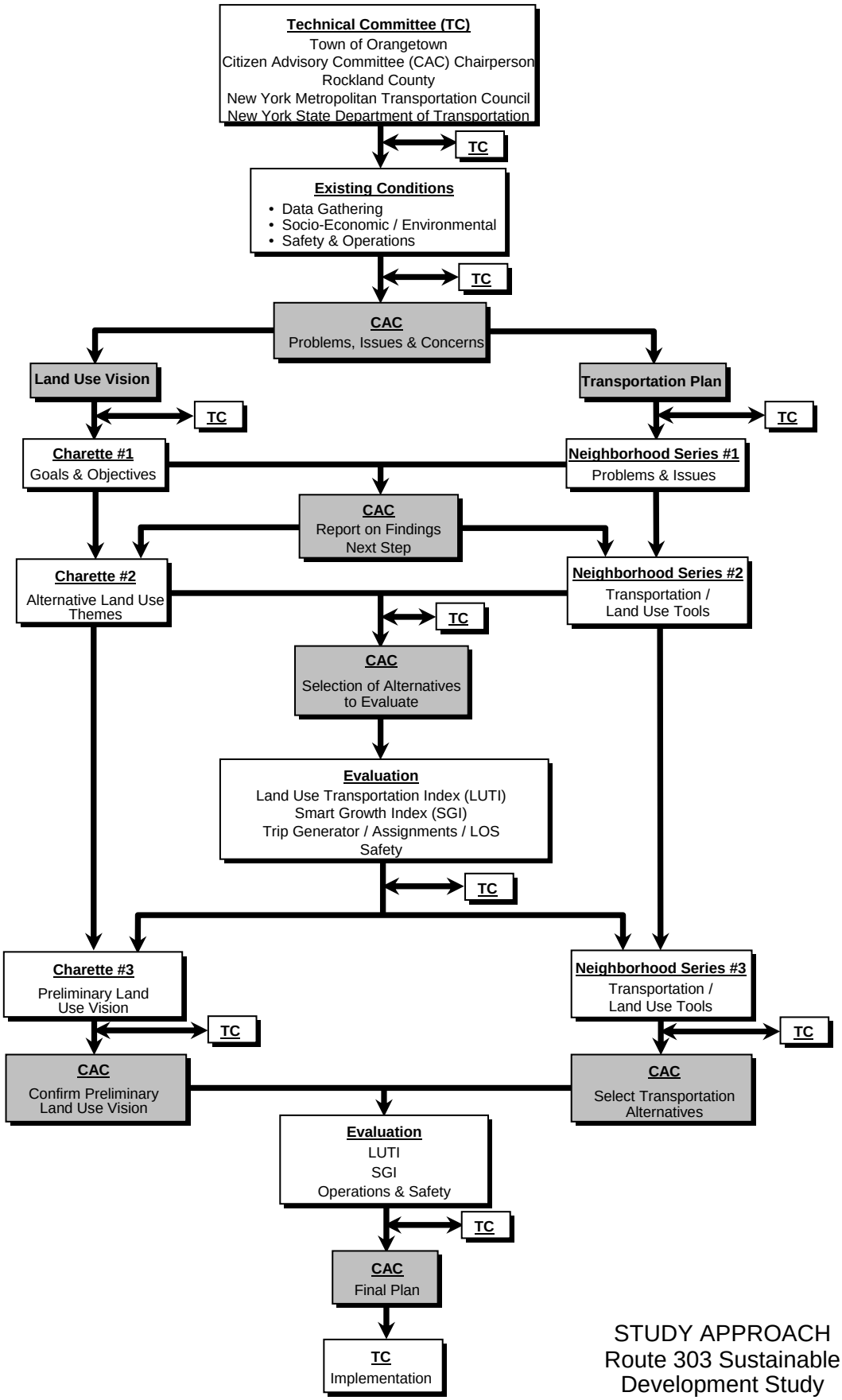


2.1 Community Outreach Process

At the beginning of the study effort, the TC was established consisting of representatives from the four main participating government agencies (Rockland County, Town of Orangetown, NYMTC and NYSDOT), as well as the chairperson of the CAC. The purpose of the TC was to coordinate the activities of the study's sponsoring agencies. The CAC, consisting initially of approximately 60 residents, business and property owners, and representatives of local educational institutions, was formed to provide broader interaction with the community.

A total of eleven TC meetings and nine CAC meetings were conducted during the two-year study process between October 1999 and September 2001. Figure 2.1 illustrates the study approach developed to integrate the technical and public aspects of the study, and also gives a sense of the interrelationship of the State, County and Town with the TC and CAC through each phase of the study process.

> *I feel energized by the fact that the community – the citizens – came to this group* [the CAC]. [They] *definitely caught on to the idea that we're looking to them to identify problem areas and to identify solutions for us to consider.*
>
> Ed Mark
> NYSDOT Project Manager



STUDY APPROACH
Route 303 Sustainable Development Study

WILBUR SMITH ASSOCIATES

FIGURE 2.1

Other outreach elements included the development of a project website – www.route303.net (which received over 12,000 total hits) and the production of three public information videos at key study stages. The study also received coverage from local and regional print and broadcast media. Community input regarding the desired future pattern of land use in the study area was solicited in a wide range of formats ranging from neighborhood meetings to charrettes (open public planning workshops) to comments received on the web site.

To better coordinate land use and transportation decisions, the study focused first on developing a land use vision through a series of outreach meetings with the CAC, as well as three Visioning Charrettes conducted in May 2000, October 2000, and April 2001.

The charrettes and CAC meetings were supplemented by five neighborhood meetings focused on specific transportation and land use issues within defined local areas.


Route 303 Sustainable Development Study

HELP PLAN THE FUTURE OF THE ROUTE 303 CORRIDOR!

Plan on Attending the:

FIRST VISIONING CHARRETTE

Saturday, May 6, 2000
9:00 AM – 2:30 PM
St. Thomas Aquinas College
125 Route 340, Sparkill, NY

Topics to be discussed will include:

1. Town Center/Gateways/Landscaping/Beautification
2. Land Use/Residential Development/Demographics
3. Retail and Commercial Development/Freight Movement
4. Transit/West Shore Railroad
5. Open Space, Historic, Recreational and Natural Resources/Bicycle and Pedestrian Linkages
6. Access Management/Transitional Areas
7. Coordination: Interstate / Inter-town Issues / Institutions (e.g. RPC) / Colleges
8. Traffic Calming/Traffic Safety Issues

NYMTC


The charrette format encouraged an informal and open dialogue between the TC members, the consultant team, and public participants.

As noted in the previous section, high-speed traffic, heavy truck volumes, high levels of accidents and traffic congestion were all identified as transportation issues associated with the level and type of existing commercial development along Route 303.

Land use concerns along the corridor included determining the appropriate levels of future retail and other commercial development (e.g. office and warehouse); protecting natural resources;

preservation of open space; avoiding over-development and impacts on existing residential areas; re-use of vacant commercial properties; and the future role of educational institutions.

2.2 Data Collection Program

The initial step in the study process was to gather as much information as possible within the study area. Information was collected regarding land use, population, employment, transportation, development patterns, and historical trends. Following the collection of this information, it was analyzed and presented to the CAC in the form of an *Existing Conditions Report* in February 2000.

Demographic Data **-** Initial reports from the U.S. Census indicate a 2.1 percent increase in Orangetown's population between 1990 and 2000, to a total town population of 47,711 in 2000. Of the Town's unincorporated areas (also referred to as CDPs – Census Defined Places), Blauvelt had the largest percent increase (7.6 percent) and the greatest absolute growth (370 people), while Orangeburg and Tappan experienced slight population loss (-1 percent) during this interval. Rockland County's population increased by eight percent between 1990 and 2000, gaining more than 20,000 people during the preceding decade. This increase was concentrated in the towns north and west of Orangetown, such as Haverstraw and Ramapo, where there remains a greater availability of land for residential development.

Traffic Data - Generally, peak periods for vehicle travel take place during the morning and evening periods during the weekday and midday on week ends. During these periods counts are taken to determine the peak hour and peak fifteen minute period that is the greatest. The peak hour and peak fifteen minute periods are used to calculate the Level of Service according to the methodology developed in the Highway Capacity Manual.

In order to determine the peak periods, hours, and fifteen minutes, the consultant team collected traffic and roadway data throughout the study corridor, during the morning, evening and Sunday peak periods. Automatic Traffic Recorder (ATR) counts were conducted at six locations along the corridor for a seven-day period in April 2000. A seventh location was set up on New York State Route 9W at the request of NYSDOT to provide calibration with the data obtained from previous counting programs.

Manual traffic counts were conducted to back up ATR data and to provide vehicle classification (number of vehicles by type) counts at the Route 303 intersections with Oak Tree Road, Campbell Street/Contempra Circle, and King's Highway South in the Tappan neighborhood. For each major signalized and unsignalized intersection, the evening peak hour turning movements were used to determine existing traffic flow patterns along the Route 303.

During the study period, there were highway construction projects that undoubtedly influenced traffic volumes on Route 303. Though attempts were made to take these temporary changes into account, actual traffic conditions will only be determined when new studies are conducted prior to implementing Route 303 improvements. The construction projects were as follows:

- During the initial portion of the study period, the Palisades Interstate Parkway (PIP) was undergoing major reconstruction, and the southbound Route 303 to northbound PIP ramp was closed. To replace traffic count data from these locations, NYSDOT provided 1999 counts for the PIP ramps. These counts, however, did not include Sunday traffic, so the Sunday volume for this movement was estimated based on historic traffic characteristics.

- At the time traffic data was being collected for this study, Route 9W in Piermont was closed for reconstruction.

The timing of exact peaks will vary depending on the location of the study area within the metropolitan area. Traffic in the Route 303 study area displays typical weekday peaking characteristics. A significant peak period occurs in the southbound direction during the morning, but after approximately 8:30 A.M. this volume levels off at about half of the peak volume until 6 P.M., after which traffic drops steadily to the midnight hour. In the northbound direction, the traffic rises more slowly in the morning, then experiences its peak period around 5:30 P.M. Overall, the greatest traffic volumes occur in the northern section of the corridor. Figure 2.2 illustrates the traffic volumes in the study corridor.

Within the peak periods, historically, since 1990, both southbound morning peak hour traffic and northbound evening peak hour traffic have been growing slowly (less than one percent annually) south of the PIP and between Spruce and Erie Streets. The remainder of the corridor has a peak hour traffic growth of a somewhat more robust two to three percent annually.

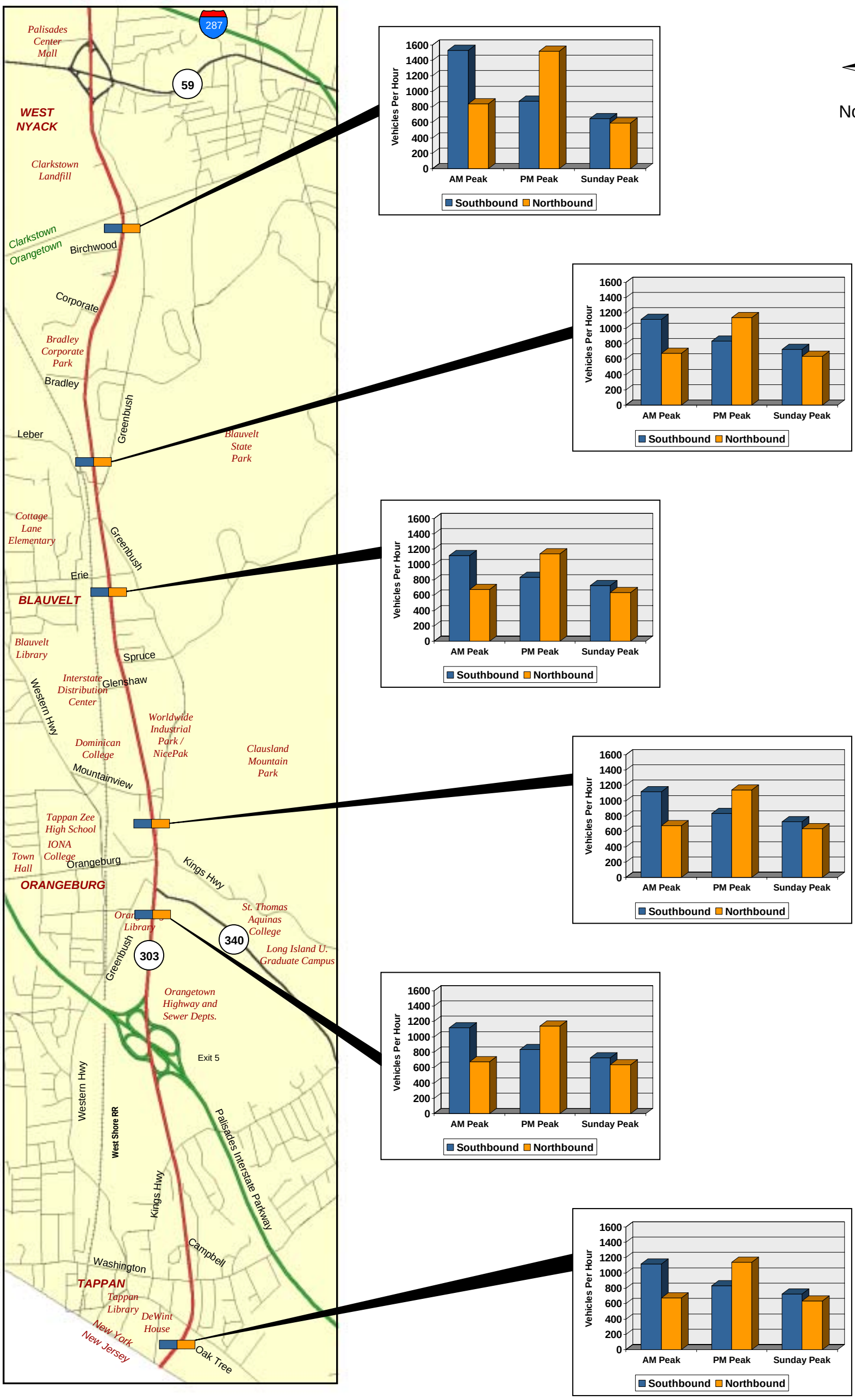
In the afternoon peak northbound direction, annual traffic growth is very low south of the PIP (less than 0.5 percent annually). From the PIP to Kings Highway North and from Leber Road to Spruce Street, peak traffic growth is higher, between one and two percent annual growth. From Kings Highway North to Glenshaw and from Bradley Parkway to the Barrier, traffic growth during the peak period is higher yet, at over 3 percent annually.

Off-peak directional traffic has shown greater annual growth than the peak hour growth, though off-peak volumes are 25 to 50 percent lower than peak hour volumes. Thus, overall increases in traffic during off-peak periods are comparable to peak hour volume increases.

The proportion of heavy vehicles (trucks and buses) ranges from about 16 percent during the northbound morning peak south of Erie Street to less than two percent during the northbound Sunday peak south of Oak Tree Road. The average percentage of heavy vehicles is less than seven percent over all time periods and locations. Less than half of the truck trips entering the corridor from New Jersey are through trips, while less than one in seven truck trips entering the corridor from Clarkstown are through trips.

Existing Transit Operations **-** While many Rockland residents use bus and train service to commute into New York City, a much smaller percentage utilize local bus services. At both the public meetings and charrettes, the limited amount of transit services was raised as a concern by the public.

According to 1990 Census figures (the most recent period for which detailed journey-to-work breakdown is available), 15 percent of Rockland resident work trips to New York City were



PEAK HOUR VOLUMES BY DIRECTION

ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

WILBUR SMITH ASSOCIATES

FIGURE 2.2

made by bus, with an additional eight percent made by train. However, only three percent of work trips that begin and end within the county were made by bus. As illustrated in Figure 2.3, three transit service providers operate within the Route 303 study area – Transport of Rockland (TOR), TRIPS (the countywide demand-responsive service), and Rockland Coach Corporation (Red & Tan). Unlike the adjacent Spring Valley and Clarkstown communities, Orangetown does not currently have a local jitney or shuttle bus service.

Transport of Rockland (TOR) provides fixed route service connecting Spring Valley, the Blue Hill Plaza office complex, Rockland Psychiatric Center, Dominican College and the Palisades Center Mall on its Route 92. This route is operated on Route 303 for the portion of its run between Dominican College and the Palisades Center Mall, which is the only part of the study area currently receiving scheduled local transit service. Route 92 operates Monday through Friday, with service provided at an hourly frequency in both directions between 5:45 a.m. and 6:45 p.m. The 1999 *Transit Development Program for Rockland County (TDP)* identifies the Route 92 segment between the Palisades Center Mall and Dominican College as having "very low ridership," but does not provide a specific number of daily users for this segment.

A 1998 data collection effort indicated that average daily boardings for the entire Route 92 between Spring Valley and Nyack are 333 passengers, while per hour on this route are 13.50 boardings per hour eastbound and 9.02 per hour westbound. The boarding per mile figure is 1.40, with a total of 465 revenue miles of service on this route per day. The fare recovery ratio is approximately 10 percent, which places this route below the 19 percent average ratio for the entire TOR system. By way of comparison, TOR's Route 59, serving the NYS Route 59 corridor from Nyack to Suffern is the most heavily utilized route in the system, with an average daily boarding of approximately 2,700 passengers and a fare recovery ratio of approximately 29 percent.

Red & Tan Route 20 provides service to the Port Authority Bus Terminal in Manhattan along Route 303 between West Nyack (Palisades Center Mall) and Washington Avenue. Service is provided seven days a week, with approximately one-hour service frequency on weekdays. Red & Tan Route 9A provides express service between New City and the George Washington Bridge Bus Station, with a stop at Washington Avenue and Route 303 in Tappan.

TRIPS, the county's demand-responsive service, is available throughout the study area to residents who qualify based on mobility limitations.

For the entire TOR system, Rockland County currently uses a flag system, where passengers wait at an intersection or along a road, and flag down the driver anywhere along the route, rather than limiting passengers to a bus shelter or stop. The two bus shelters provided within the Route 303 study area for the Red & Tan Route 20 are located to the east and west of Route 303 on Oak Tree Road.

Bicycle and Pedestrian Facilities - NYSDOT's 1998 *Bicycle and Pedestrian Policy* document notes, "A system of State bicycle routes has been designated on state highways as part of this comprehensive regional plan. Bicycle routes are shared travel lanes where bicyclists and motorists must respect each other's legal right to share the road." Adjacent to the Route 303

Source: Rockland County Transit Development Program

TRANSIT SERVICE WITHIN STUDY AREA

Route 303 Sustainable Development Study

WILBUR SMITH ASSOCIATES

FIGURE 2.3

study area, Route 9W forms a portion of the State's Bicycle Route 9 extending from the Canadian border south to New York City via the George Washington Bridge.

The Mid-Hudson South Region Bicycle/Pedestrian Plan calls for improvements running in five miles of trail along Route 303 between the New Jersey border and the NYS Thruway. That plan's recommendations are consistent with this study as well as Orangetown's Master Plan, and it is proposed to be included in the region's Transportation Improvement Plan (TIP). The trail, known locally as the J.B. Clark Rail-Trail, extends from Sparkill to Orangeburg. The J.B. Clarke trail is part of the recently-approved Palisades Trailway. Completion of a bridge crossing the Sparkill will allow the extension of the rail-trail to the Palisades Parkway area.

The Mid-Hudson South Region Bicycle/Pedestrian Master Plan calls for the following improvements in the Route 303 study area:

Short Term:

- Improve rail trail/roadway crossing

Long Term:

- Complete sidewalk network in and around all destinations
- Provide linkages, access and signing to state parks
- Provide sidewalks along Washington Street

An at-grade signalized crossing or a pedestrian bridge over Route 303 are under study for future implementation by NYSDOT, Rockland County or the Town of Orangetown in this section.

2.3 Assessment of Existing Corridor Conditions

Traffic Operations & Congestion - Six Level of Service (LOS) designations are used by traffic engineers to describe traffic flow conditions. These designations range from LOS A, which describes a condition of free flow, with adequate roadway capacity and no constraint on turning or lane change movements, to LOS F which is described as forced flow and is characterized by traffic volumes greater than the theoretical capacity of the roadway. In between these two extremes, the designations are: LOS B, which represents a stable traffic flow with minimal impact of traffic conditions on driver speed or lane movements; LOS C, which is normally utilized as the minimal traffic condition for design purposes, and describes a stable condition of traffic operation; LOS D, which reflects a condition of more restrictive movements for motorists and a noticeable level of traffic congestion; and LOS E, which is representative of capacity operation and involves delay to all motorists due to congestion.

According to roadway intersection and segment LOS calculations contained in the *Existing Conditions Report*, most of the intersections in the study area currently operate at satisfactory Levels of Service (LOS C or better) during the morning peak period. The exception to this is Kings Highway North in Orangeburg that operates at LOS E and the intersection of Orangeburg Road, which operates at LOS D during the morning peak. In the evening peak, several intersections operate at LOS D or below, including Oak Tree Road, King's Highway South, Route 340, Orangeburg Road, King's Highway North, Mountainview Road, Glenshaw Street, and Birchwood Drive.

Travel Speed **-** Travel speed surveys showed that the highest speeds typically occur in the section of the study area north of Bradley Parkway, since there are very few intersections and traffic lights. Another high-speed segment was the section of Route 303 between Route 340 and Kings Highway South, the area of the interchange with the Palisades Interstate Parkway, for the same reasons. Slower speeds usually occur in the vicinity of Orangeburg Road in both directions and south of Oak Tree Road in the northbound direction. Speed on many segments of the roadway is seen as a threat to safe pedestrian and motorist travel.

Traffic Safety **-** Traffic accidents are concentrated at those intersections where both volumes and turning movements are highest, for example, the Route 303 intersections with the Route 59 ramps, Bradley Parkway, Erie Street, Mountainview Road, Orangeburg Road, King's Highway, and Oak Tree Road. All of these locations have been previously identified by NYSDOT as High Accident Locations (HAL's). Specifically, the greatest number of accidents occurs at the intersections of Route 303 with Oak Tree Road (including commercial driveways south of Oak Tree), and at King's Highway North.

For more detailed information on accident rates, consult Table 2.2 and Figure 2.12 in Section 2.6.

Transit - Both existing bus service, and existing bus facilities, such as bus stops, turn-outs or shelters, are limited in the Route 303 study area. Based on responses from CAC members, the current limited transit service creates a perception that scheduled transit is not effective in the suburban environment of the Route 303 study area. However, many other areas of Rockland County with similar land use patterns are provided with more comprehensive, successful transit service. The *Transit Development Plan* (TDP) report notes, "The County should focus transit demand studies in the residential and commercial areas of the lower County adjacent to the PIP (Sparkill, Piermont, Palisades and Tappan)." These areas overlap with a major portion of the Route 303 study area. The TDP also recommends that all county bus routes begin to use established bus stops in place of the existing "flag" system.

Bicycle & Pedestrian Travel **–** The Route 303 study area offers few opportunities for safe, comfortable pedestrian and bicycle travel, either on the roadway or parallel to it. Generally, the design of both Route 303 and the surrounding pattern of development have also made travel by non-auto modes, such as transit, bicycle or pedestrian travel unattractive, by increasing the distances between origin points and destinations. As noted previously, the Mid-Hudson South Regional Bicycle/Pedestrian Master Plan seeks to improve this situation.

2.4 Development of Preliminary Land Use and Transportation Topics

Because of the collaborative approach for the study, it was important to develop and present analytical results in a manner readily accepted by both non-technical and technical audiences. As discussed in Section 1, the Route 303 Sustainable Development Study incorporated a series of three visioning charrettes and meetings with the CAC as the mechanism for developing the Land Use Vision Plan.

Prior to the first charrette, the TC, consultant team, and CAC members agreed on a set of issue and opportunity topics for further discussion. These were then organized into eight land use and transportation topic areas presented as break-out sessions that represented the range of possibilities that could be achieved within the existing land use and community context of the study area. A summary of these topic areas and the discussions that took place among participants follows.

Neighborhood Areas and Gateway Issues – This topic area identified opportunities to create or enhance the neighborhood character of areas such as the intersections of Route 303 at Oak Tree Road, Orangeburg Road and Bradley Parkway. The goal was to identify potential gateway landscape treatments, land use policies, and supportive transportation policies. These strategies included gateway signage, distinctive street signs, historic lighting, and sidewalks. Study area residents attending this charrette break-out session were generally supportive of these strategies, but were concerned about the timing and funding mechanism for improvements of this type.

Residential Land Use and Demographic Issues – Since determining the future land use along the corridor was considered the key to balancing development demand with transportation capacity and environmental capacity, this topic focused around the residential aspects of the community. Long-time study area residents identified a trend along Route 303 over the last 15 to 20 years for a transition toward more intensive, auto-oriented commercial land uses. Preserving open space and making landscape improvements to Route 303 were suggested as strategies to mitigate the impact of truck traffic. However, based on other input at this session, it seems that many residents favored a mixed pattern of residential, office and light industrial uses in order to have a more balanced tax base.

There was also significant concern that further development of strip malls and large retail uses will create a negative impact to the corridor. The majority of attendees felt that additional commercial uses, such as office development, would be appropriate if it could be screened or buffered from adjacent residential areas. Other attendees felt there were enough businesses already. Another concern was that high traffic levels on Route 303 discourage residents from patronizing local businesses.

Several attendees suggested that additional pedestrian travel opportunities should be provided in Tappan and other areas, especially along side streets intersecting Route 303. Safety for pedestrians (especially children) and bicyclists should be considered as an issue in road improvements. Sidewalks and shoulders are also needed along Route 303 for pedestrians and bicyclists. Many attendees also offered suggestions for protecting residential quality of life, including:

- Town, County or State acquisition of open space;
- Limitation on zoning variances;
- A moratorium on additional development;
- Preparation of a Comprehensive Plan update; and
- Development of senior-oriented housing.

Retail and Commercial Development Issues – This topic concentrated on the retail and commercial aspects of the study area as well as freight movement in the corridor. Discussion centered on maintaining a balance of future commercial development with community character. Several participants expressed concern over the effect of these limits on economic growth and the Town of Orangetown's future tax base.

Transit/West Shore Railroad – At both the public meetings and charrettes, the limited amount of transit services was raised as a concern by the public. This topic included discussion of both the types of transit service that are already in place in Orangetown and future possibilities of new transit service. Examples of new service opportunities included shuttles between colleges, institutions, major residential developments, and major shopping locations. Also, the potential positive and negative impacts of resumption of commuter rail service in the West Shore Line railroad corridor were discussed.

Open Space, Historic, Recreational and Natural Resources Issues - This topic included discussion of existing parks and open space, open space acquisition, and development of walking trails and pedestrian connections. Many participants brought up the rail trail as an underutilized transportation and recreational resource. The trail was cited as a means for students at Dominican and St. Thomas Aquinas colleges to get to Route 303.

The Sparkill was cited as the predominant natural resource within the Route 303 corridor. There was a strong sense that the land alongside the creek should be preserved as open space, and that additional planted areas, in either public or private ownership, could be used to provide a visual and vegetative buffer for the stream. Several attendees pointed out that there was significant flooding during Hurricane Floyd, and that the stream and any associated wetlands should be preserved to minimize further flooding in the future.

Access Management – This topic addressed controlling the number and frequency of access points along a particular stretch of roadway to adjoining land uses through techniques such as driveway consolidation, cross-lot connections, and service roads.

Traffic Calming/Traffic Safety Issues – Roadway design issues within this discussion topic included:

- Narrowing of Roadways (by reducing the width of shoulders);
- Center Line Medians / Pedestrian Refuges;
- Center Medians which provide major street left turns but not minor street left turns;
- Roundabouts;
- Provision and Improvement of Sidewalks;
- Center Turning Lanes (in areas of high accident potential);
- Curbs on Both Sides of the Road;
- Landscaping along the Curb, Sidewalk and Median; and
- Street Print Design for Crosswalks.

Coordination: Interstate / Inter-town Issues, Institutions and Colleges – This topic addressed how relationships between educational institutions themselves and with the general public can

continue and evolve for the betterment of the community. The presence of St. Thomas Aquinas College (STAC), Dominican College, Long Island University Graduate Center, Iona College's Rockland County program, and other educational institutions was noted as an impetus for the development of an "Educational Corridor" for the Orangeburg area, with future office-oriented development drawing on the knowledge base and research activities of these institutions.

2.5 Selection of Land Use Themes for Analysis

Responding to the input from the first charrette and from subsequent public meetings, the TC and the CAC selected four land use development themes for further evaluation by the study consultant team. These themes – "continuation of current trend," "open space emphasis," "neighborhood area (village center) emphasis," and "business emphasis" – served as the basis for development of a Land Use Vision incorporating the preferred elements of each of the four themes. Each of the themes was a topic for discussion at the second charrette held in October 2000. The study team developed a summary matrix, as shown in Table 2-1 to illustrate the relationships between the land use topics and broader land use themes, and to assist in the discussion and refinement of these themes towards a consensus land use vision.

2.5.1 Description of Land Use Themes

Continuation of Current Trends Theme – The Current Trend Theme was developed and analyzed for comparative purposes as a base case. This scenario projected existing development patterns for retail, office and residential development, over the 20-year study time period, with no major changes in zoning and land use regulations or transportation infrastructure.

Open Space Emphasis Theme **-** This theme incorporated open space preservation efforts through state grants, development restrictions and other techniques. Participants at the Second Charrette highlighted the potential to work with developers to preserve buffer areas surrounding their properties, to incorporate set-asides within development tracts, to interconnect open areas, and to seek opportunities for greater public use of these open areas.

Neighborhood Area Emphasis Theme **-** This theme envisioned clustering of retail and residential land use and development in the vicinity of three defined neighborhood areas:

- Tappan (south of Oak Tree Road);
- Orangeburg Road; and
- Erie Street.

These neighborhood areas were intended to promote nodes of pedestrian activity, and to enhance pedestrian safety. These objectives would be achieved by slowing traffic speed, giving the commercial areas more of a village atmosphere coordinated with existing and future retail development and redevelopment, by buffering residential development from commercial concentrations. Enhancement of roadway and transportation features such as sidewalks, crosswalks, bicycle paths and street lighting would encourage diversity in neighborhood-oriented businesses and services.

I would envision some small village centers [that are] *easily accessible by foot, where people can travel down 303, pull into an area, park, and spend some time in an area, without having to worry about getting back in their cars and going to the next big parking lot.*

Peter Solari
CAC Co-Chairperson, Participant at the Second Charrette

Participants at the second charrette identified the most desirable types of development within this theme as including both a pattern for neighborhood development as well as support for existing neighborhood-serving retail ('mom and pop" stores), such as coffee shops, clothing shops, restaurants, book stores, art galleries, bakeries, personal services (barber/beauty salon), small groceries, etc.

Future development under this theme could also include limited residential development, and the development of new government and cultural facilities. Within this theme, there could be both new development consistent in character with the neighborhood characteristics, and also re-use and reconfiguration of existing properties.

If businesses were located close together, maybe someone would take a 10-minute walk on their lunch break.

Participant at Second Charrette

Business Emphasis Theme **-** This theme incorporated continued non-residential development of large properties with frontage and access from Route 303. Participants at the Second Charrette identified the most desirable types of development within this theme as office space, research and development, and "flex" space suitable for both office and technology-based users. Large scale retail development would be limited, with commercial and office uses emphasized. Based on existing market conditions and zoning, some warehouse and distribution use would also be anticipated within the business emphasis theme.

The purpose of this [study] *is to make the kind of transportation corridor, and the kind of zoning, and the kind of planning that will attract the kind of businesses that is essential to maintaining a good quality of life in this town…* [However] *there has to be some limitation of what can be built where and how much of it can be built.*

Participant at Second Charrette

Table 2-1
Summary Matrix for Study Themes: Page 1 of 2

Theme Elements	Neighborhood Centers	Land Use / Residential	Retail and Commercial / Freight Movement	Transit / West Shore Rail	Open Space, Historic, Rec., Natural, Ped., Bicycle	Access Management	Coordination	Traffic Calming / Safety
Current Trends	No defined town centers. Further strip and "big box" commercial development will limit opportunities to re-shape existing commercial concentrations.	Residential use consistent with existing zoning: single-family, detached homes. Tree-lined streets, mature neighborhoods, with aging population. Fewer young families and seniors due to absence of other housing types. Most residentially-zoned areas are built out.	Growth of "big box" retail and other auto-oriented uses. Strip development throughout all segments of the corridor.	Under current trends, West Shore train service would draw primarily park-and-ride commuters to Manhattan. Development of station areas would be limited – most likely convenience stores, gas stations or dry cleaners serving commuters.	Existing rail-trail will be rehabilitated under current plans. Acquisition of open space may be limited due to conflicting town priorities.	Existing zoning and site standards do not significantly restrict new driveways and curb cuts. Additional curb cuts, problems with cut-through side-street traffic, large front-of-building parking lots, and congestion will continue.	The Route 303 Study represents extensive and unusual coordination between citizens, businesses, towns, county, region, and state. However, existing conditions would not provide for future coordination beyond the period of the study.	Currently, there is no particular traffic calming and safety plan beyond what the town, county, and state have provided at this point.
Open Space Emphasis	May limit growth outside village centers, but not intended to re-shape existing developed areas.	Extremely limited opportunities for new residential development.	Limited opportunities for new retail development. Restricted to existing as-of-right development types. Does not restrict or encourage change of use for existing buildings.	This development pattern would limit opportunities to intensify development around train stations.	Intensify open space preservation efforts through state grants and development restrictions.	Plan would not specifically address access management, curbs, pull-offs, and/or medians. However, they may still be beneficial in this plan.	Maximum open space would require coordination with all parties involved in the current study, but most especially the town, and county.	Traffic safety and calming would remain an important topic regardless of how much open space is designated since problems with safety and speed exist already.

Source: Wilbur Smith Associates

Table 2-1
Summary Matrix for Study Themes: Page 2 of 2

Theme Elements	Neighborhood Centers	Land Use / Residential	Retail and Commercial / Freight Movement	Transit / West Shore Rail	Open Space, Historic, Rec., Natural, Ped., Bicycle	Access Management	Coordination	Traffic Calming / Safety
Neighbor-hood Areas Emphasis	Strongly encourages development and redevelopment in defined town center areas through zoning changes, overlay zones, and potential use of urban renewal plan or special services district/ Business Improvement District (BID)	Greater variety of housing options, with small-lot, mixed-use and attached residential development in neighborhood center areas. Opportunities to locate senior housing near stores and services.	Small-scale retail concentrated in defined neighborhood centers. Potential for renewal and redevelopment of key parcels. Defined design and building size guidelines to enhance neighborhood character and encourage contextual development. More opportunities to walk to shopping.	Train service would enhance village centers and draw residents to new development in these areas. Potential for greater walk-on ridership with development clustered near train stations.	Open space acquisition could be focused on village center areas, creating pocket parks, ornamental landscaping (i.e. clocks, banners, etc.) and other focal points.	Access management can be implemented over time to assist in reducing turning movement conflicts and curb cuts, especially in new developments. Parking can be relocated behind buildings to promote walkable street frontage.	Village center development would require coordination with town, residents, and businesses at a high level, and the county, state, and region at a medium level. Institutions, which may participate in the village center development, would need to be onboard.	Traffic calming would play a major role in town center development helping to slow traffic through these key areas, especially on side streets.
Business Emphasis	Will result in big box retail and further strip development unless specific changes are made to local zoning and planning policies.	Potential for greater development of multi-family housing, both senior housing and non-age restricted. Depends on market and zoning to determine what is permitted. May result in development of senior housing based on strong market demand. However, less likely to be located in village centers without incentives.	Big box retail development and small or mid-size office space are current trends in the commercial market. These uses can generate substantial traffic growth, both at specific intersections and all along the corridor. Many existing parcels can be considered “soft sites” poised for development under appropriate market conditions.	Increased development at or near train stations might encourage reverse commutation to jobs in Orangetown. Office development might be encouraged by greater accessibility to and from Manhattan.	Open space purchase may be facilitated if additional development yields tax revenue for purchase by the town. Private open spaces, such as office campus style development, may occur, depending on market demand.	Curbs, pull-offs, and/or medians may become necessary under this plan to keep traffic flowing. Further development will require additional parking and access, which could become a problem if too many curb cuts are added, causing many areas to become like Route 303 between New Jersey and Oak Tree Road.	Accelerated Development will of course require coordination between the town, residents, and businesses, but may also involve county, regional, and state grants and funding to promote development.	Traffic calming and safety would likely be even more important in an accelerated development scenario since the land-use will likely result in increased traffic.

Source: Wilbur Smith Associates

2.6 Modeling and Evaluation

Because of the complexity of the land use and transportation challenges involved in the Route 303 study area, no single performance measurement was judged suitable for modeling the effectiveness of transportation – land use themes, so four different analytical tools were applied by the consultant team:

- US EPA's Smart Growth Index (SGI);
- WSA's Land Use Transportation Index (LUTI);
- Trip Generation, Assignment, and Level of Service (LOS) Analysis; and
- Safety Analysis.

Each of these approaches has its relative strengths and weaknesses in terms of providing the TC members and the general public with an objective basis for making comparisons between the different land use development themes. The attributes and results of each of these models are profiled below.

Smart Growth Index (SGI) **-** SGI is a sketch-planning tool developed for the U.S. Environmental Protection Agency (USEPA). It is designed for sketching alternative urban development scenarios and comparing their relative differences in environmental and "Smart Growth" measures. While SGI was applied to the Route 303 corridor to test existing (year 2000) and future (year 2020) scenario conditions, several of the indicators gave counterintuitive results. Given some of the discrepancies in the results of the SGI model, the Route 303 Sustainable Development Study team was able to provide the developers with further information on improving the SGI model. However, the results for the Study are included here for informational purposes.

SGI modeling is based on land-use and demographic layers, such as:

- Land Use
  - Population density
  - Use Mix
  - Balance of Jobs and Residential Development
  - Land Use Diversity

- Housing
  - Residential Density
  - Balance of Single-Family and Multi-Family Housing
  - Housing Proximity to Transit
  - Water Consumption

- Travel
  - Sidewalk Completeness
  - Pedestrian Route Directness
  - Street Network Density/Connectivity
  - Vehicle Miles of Travel

  - Vehicle Trips
  - Auto Travel Costs
- Residential Energy Consumption

- Environment
  - Open Space
  - Park Space Availability
  - Pollution and Emissions

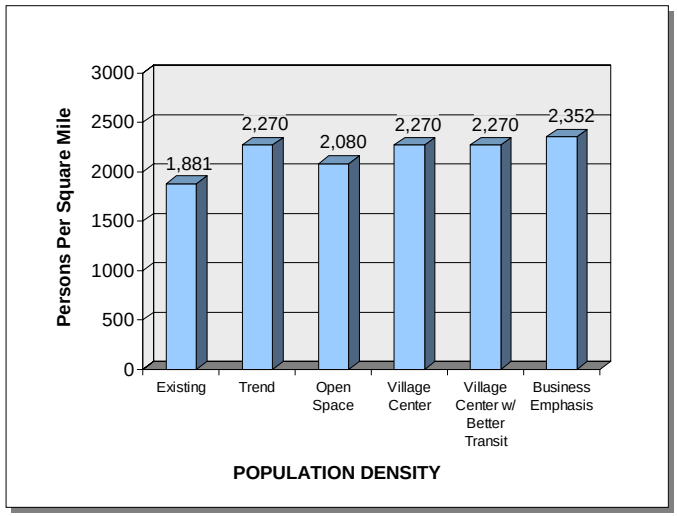
The results of the application of the SGI model for each of the five primary indexes, as well as employment, are given in the tables of Figure 2.4 and Figure 2.5. Rankings by scenario are found in Figures 2.6 and 2.7. For many of the analysis parameters, the results given by the SGI model do not vary that significantly between one theme and another making interpretation of these results difficult. Not surprisingly, the Open Space theme was calculated to produce the least impact on the environment and to produce the lowest levels of travel-related impacts.

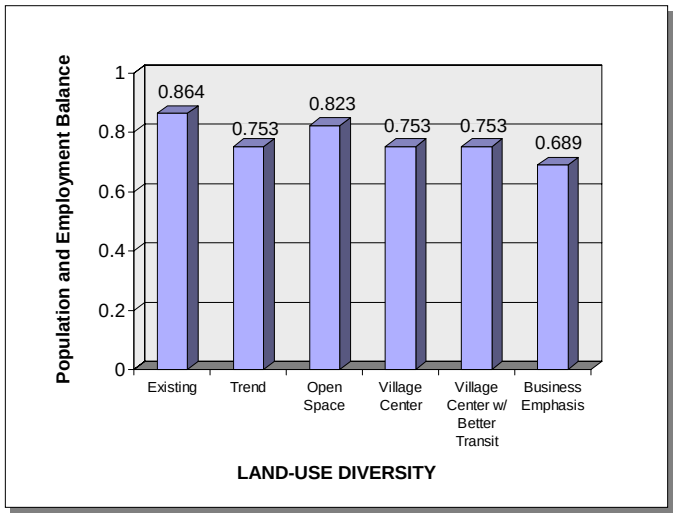
However, several of the indicators give counterintuitive results. Possibly because future development within the study area represents only a small proportion of incremental growth relative to the larger share of existing development, the Continuation of Current Trends is identified by the model as having the highest (most positive) result for housing, but the Existing Conditions baseline is identified as the lowest for housing.

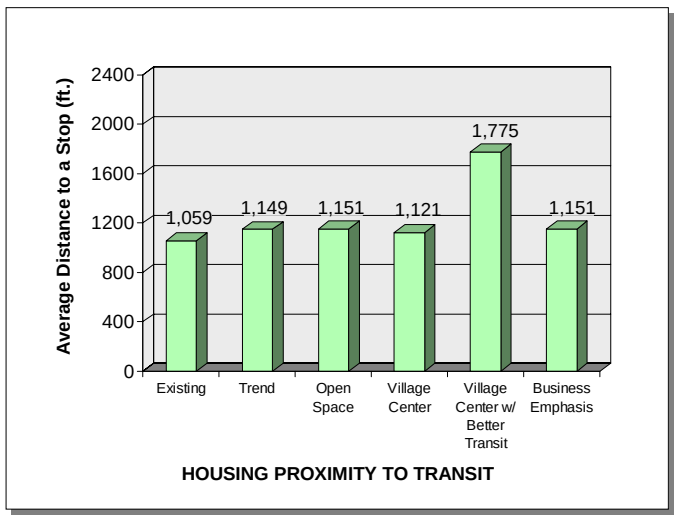
The residential energy and environment ranking are highest for the Neighborhood Center and Open Space scenarios, which included an assumption of better transit service within the study area. Housing and Employment proximity to transit are higher in the Neighborhood Center scenario. The indicator does not include a parameter that accounts for the number of residences and employers that are within walking distance of a transit stop. As a result, the Neighborhood Center scenario does have transit that is accessible to more residences and employers; however, the average distance from each to the transit stops is greater.

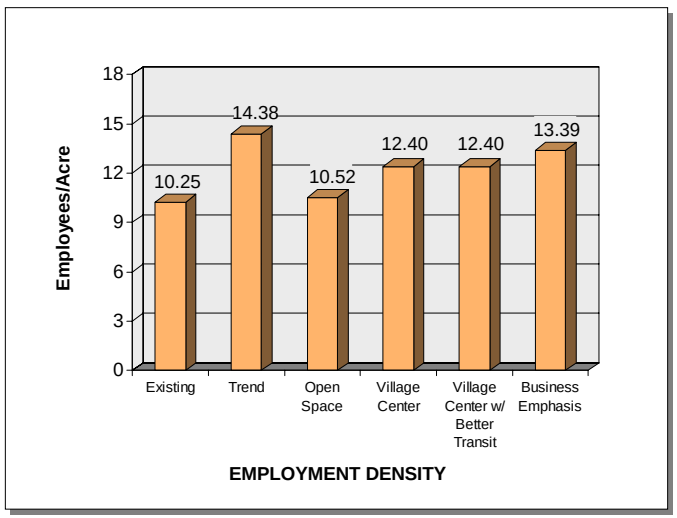
Land Use - Transportation Index (LUTI) - The LUTI model was developed by Wilbur Smith Associates as a comparative tool to analyze the potential transportation efficiency of land use patterns. As far back as the 1950's and 1960's, research in the fields of regional travel demand modeling and transportation planning have established that land use decisions and the resulting residential and commercial development patterns are the most direct contributors to localized traffic generation, choice of travel mode and overall traffic volume. Therefore, the intensity of land use within an area and the way in which traffic access and circulation is arranged have a strong correlation with a wide range of travel characteristics, such as:

- Trip purposes (home-work, home-school, home-shopping, recreational, etc.);
- Mix of vehicle types (the proportion of cars, buses and trucks in overall traffic volumes);
- Availability and utilization of non-vehicular travel modes (walking and bicycling); and
- Corridor/roadway-specific levels of traffic, transit, and transportation demand.









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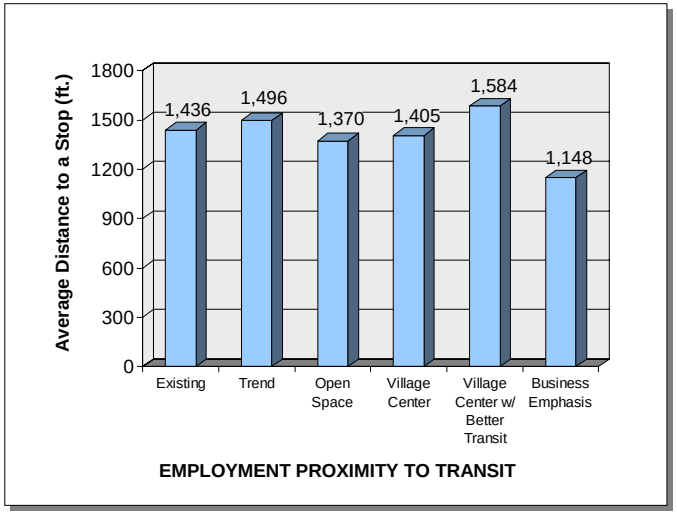
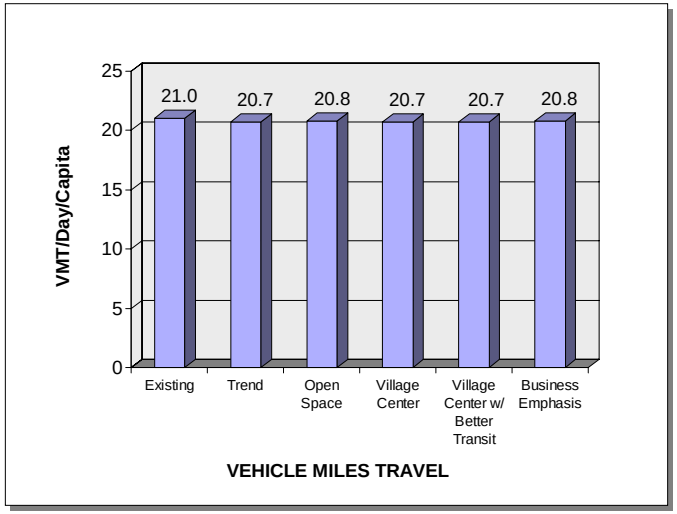
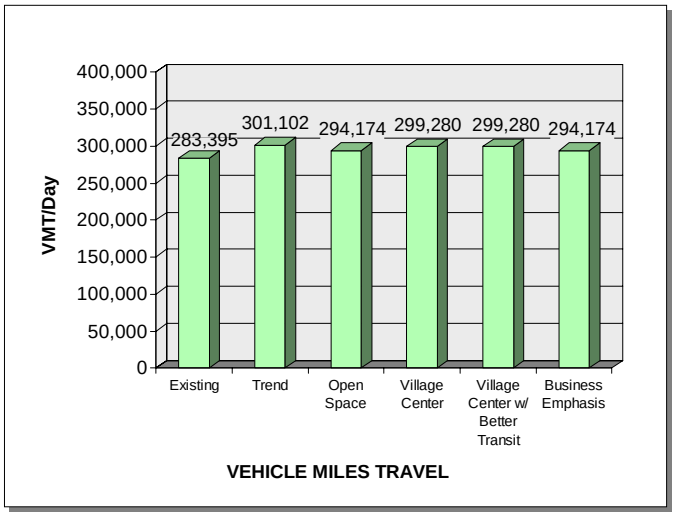
SMART GROWTH INDEX (SGI) RESULTS

ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

Figure 2.4







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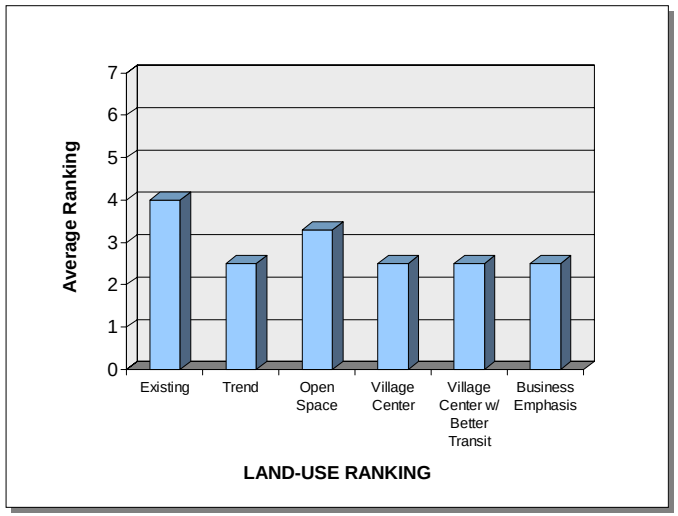
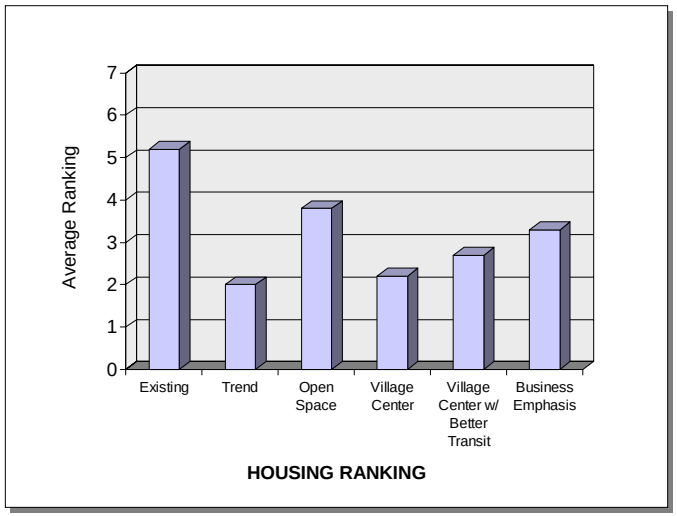
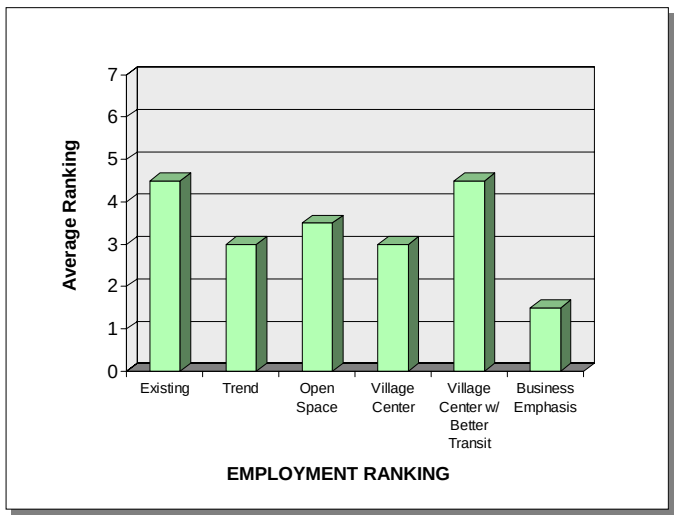
SMART GROWTH INDEX RESULTS (CONT.)

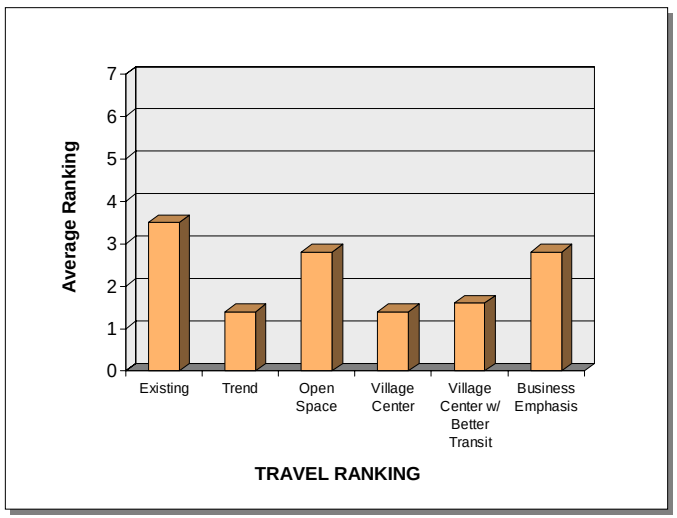
ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

Figure 2.5









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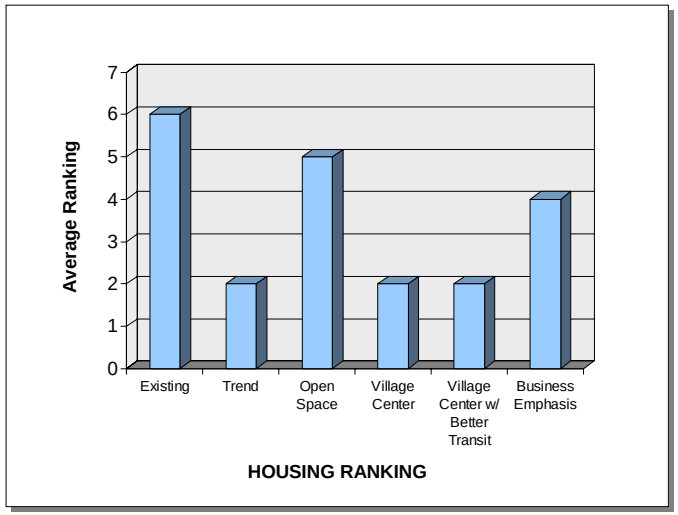
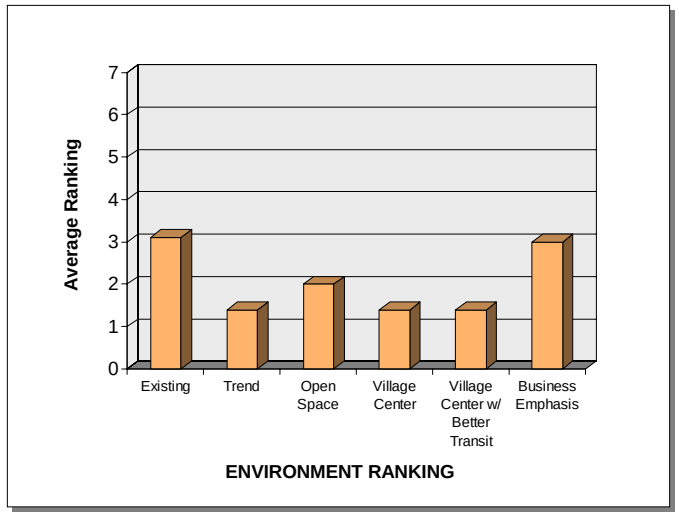
SGI AVERAGE RANKINGS BY SCENARIO

ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

Figure 2.6





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SGI AVERAGE RANKINGS BY SCENARIO (CONT.)

ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

Figure 2.7

For example, in areas where an existing land use pattern is at a low overall density, there are fewer opportunities for "linked trips" – trips that include more than one trip purpose at the same time, such as a stop at the dry cleaners on the way to work, or the grocery store on the way home. The pattern, which encourages *more* vehicular use, is *less* efficient in its requirement for more auto travel to accomplish the same cumulative trip purposes. Conversely, a land use pattern where more trip purposes can be accomplished within the same continuous trip, or by walking, bicycling or the use of transit, encourages *less* vehicular use, and is therefore *more* efficient in its use of natural resources and fossil fuel. Similarly, a more concentrated land use pattern complements alternative modes to the single-occupant automobile, such as pedestrian, bicycle, and transit travel, and ridesharing.

LUTI measured this relationship by estimating the potential level of vehicle use necessary to satisfy the demand for transportation services for people and goods. The LUTI can only measure the potential to reduce vehicular use because facilities, services, and programs must be provided to realize the trip reduction potential. For example, sidewalks and multi-use pathways are known to encourage more walks trips as improved transit service encourages transit usage.

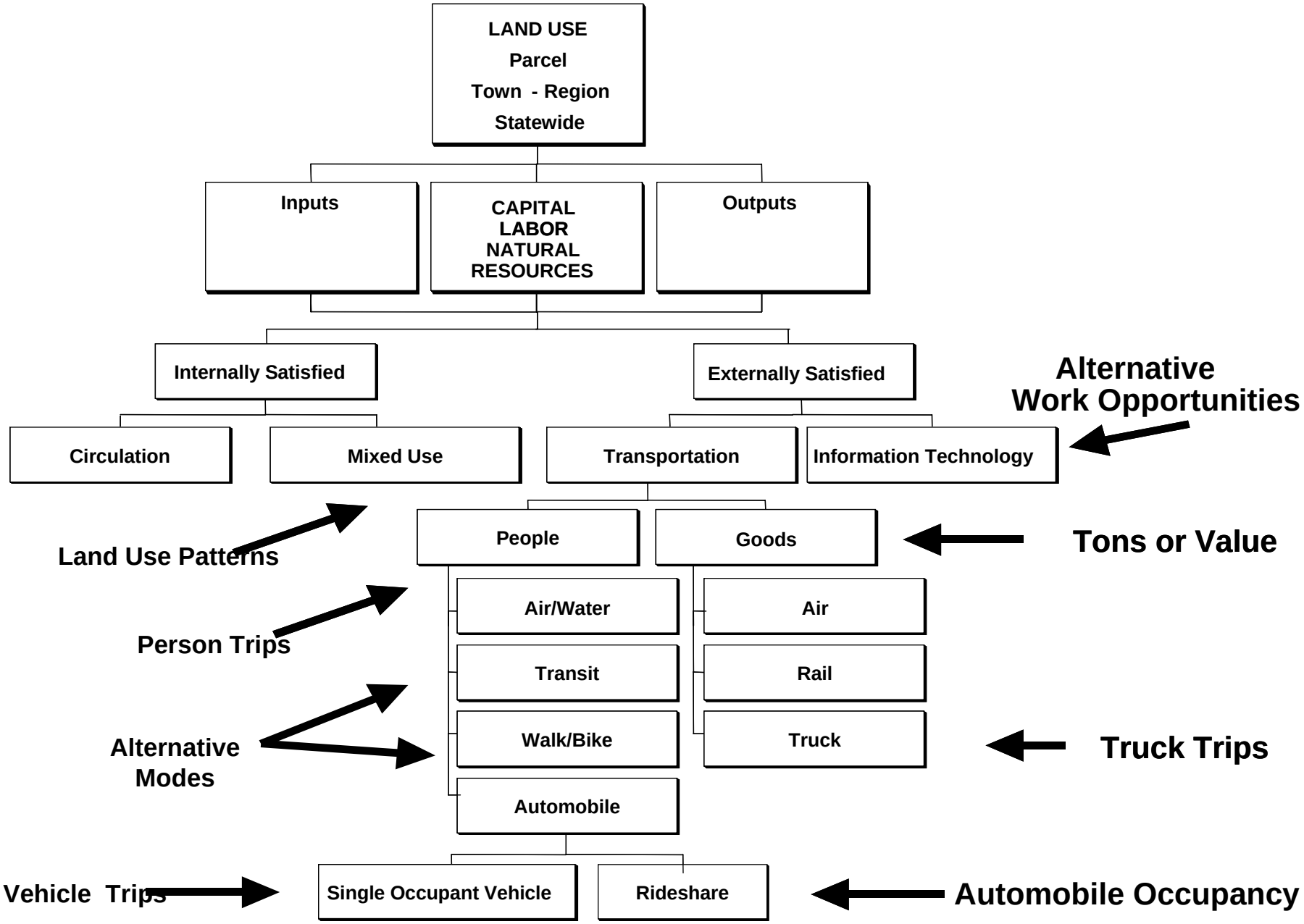
The basic performance measurement utilized in this model is given by the following equation:

$$\textbf{Transportation Land Use Index} = \frac{\textbf{Average Person Trips X Average Trip Length X (1-Average walk-bike-transit share)}}{\textbf{Average Vehicle Occupancy X Average Vehicle Operating Speed}}$$

Average Person Trip Frequency = Total Person Trips/Population
Average Trip Length = Vehicles Miles of Travel/Total Vehicle Trips
Average Walk-Bike-Transit Share = Number of Walk-Bike-Transit Trips/Total Person Trips
Average Vehicle Occupancy = Person Trips in Vehicles/Vehicle Trips
Average Vehicle Operating Speed = Vehicle Miles of Travel/Vehicle Hours of Travel

Reducing this equation to its simplest form reveals that the Land Use Transportation Index is equivalent to Vehicles Hours per Person, per Square Foot, or other unit of comparison. This expression is consistent with the overall philosophy of the equation described above that the most efficient land use form is the one that potentially would rely least upon vehicles to satisfy transportation demand. Figure 2.8 illustrates the modal relationships that form the basis of the equation indicated above. The results of the LUTI model are summarized in Figures 2.9 and 2.10.

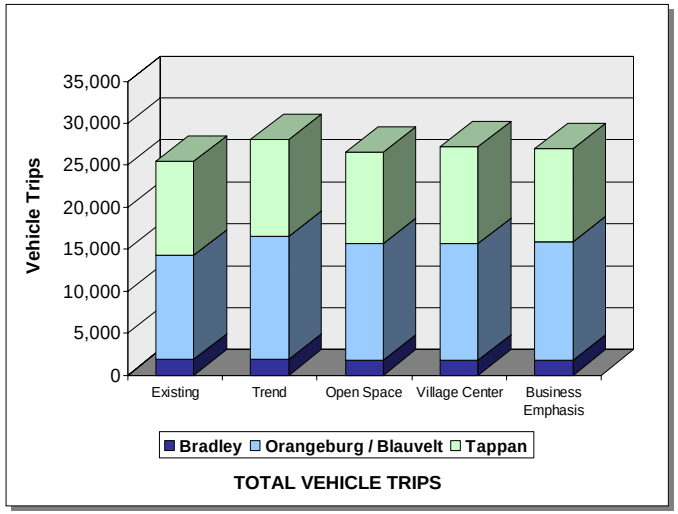
LUTI Conclusions. The LUTI was able to demonstrate that land use and development patterns will create a natural bias for specific types and levels of transportation demand. As noted above, a pattern that encourages *more* vehicular use is *less* efficient. Conversely, a pattern that encourages *less* vehicular use is *more* efficient. Similarly, a land use pattern that complements the development of alternative modes (pedestrian, bicycle, transit, and ridesharing) is more efficient because it will reduce the number of vehicle trips.

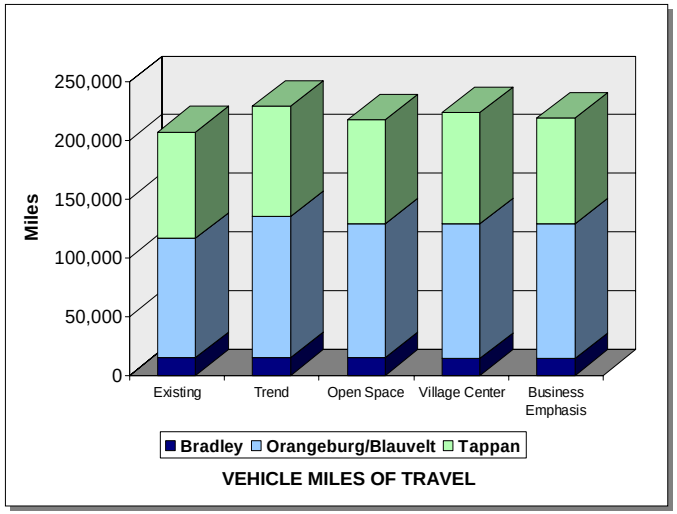


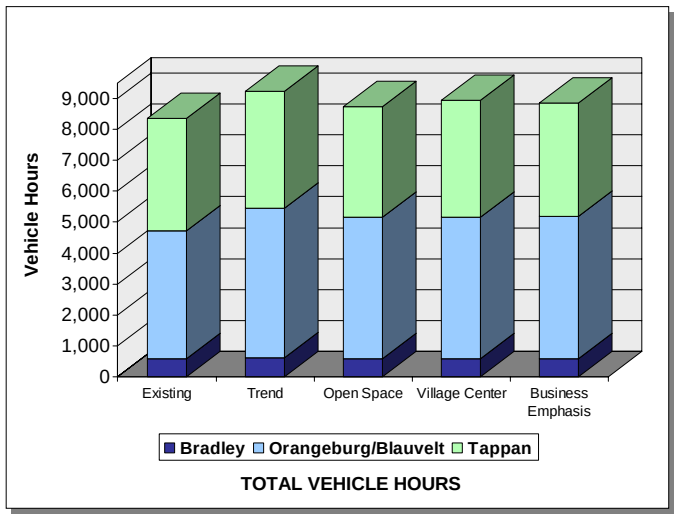
MODELING LAND USE RELATED TRANSPORTATION DEMAND

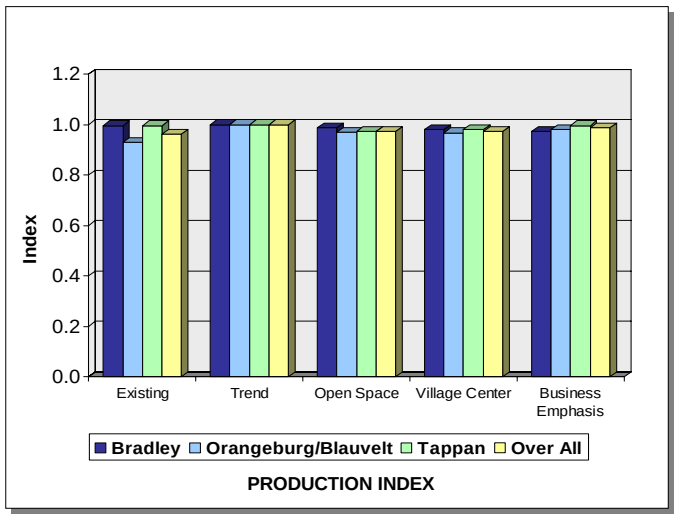
WILBUR SMITH ASSOCIATES

FIGURE 2.8









TRANSPORTATION INDEX
PRODUCTION ANALYSIS RESULTS
ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

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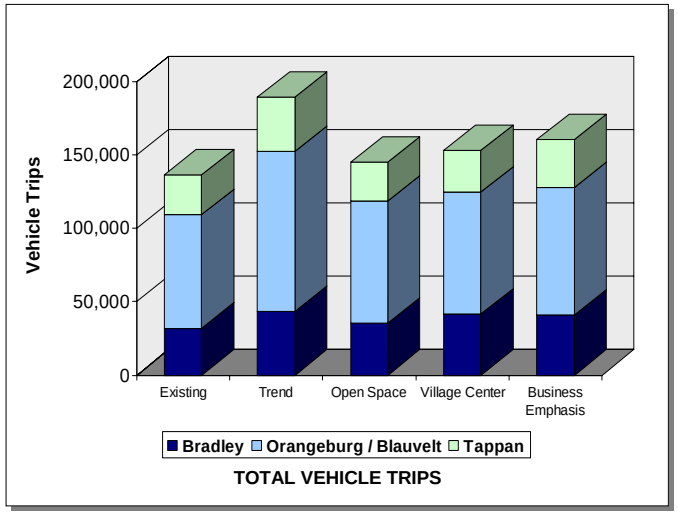
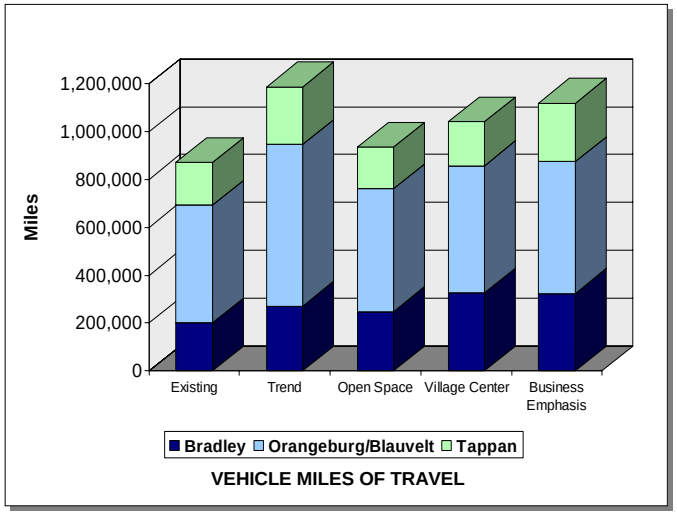
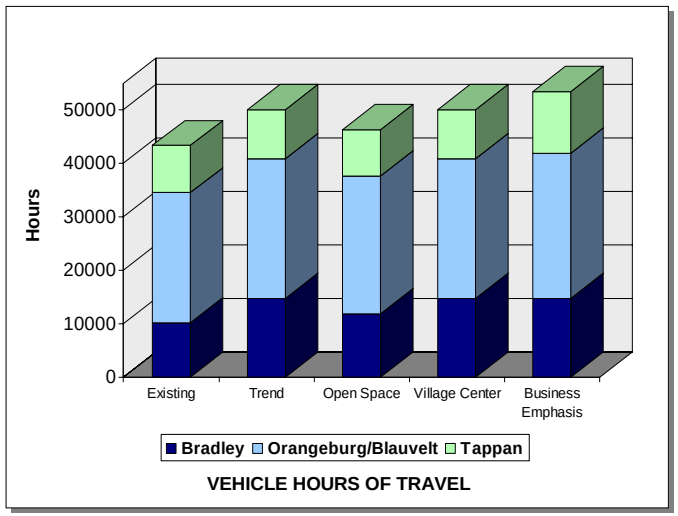
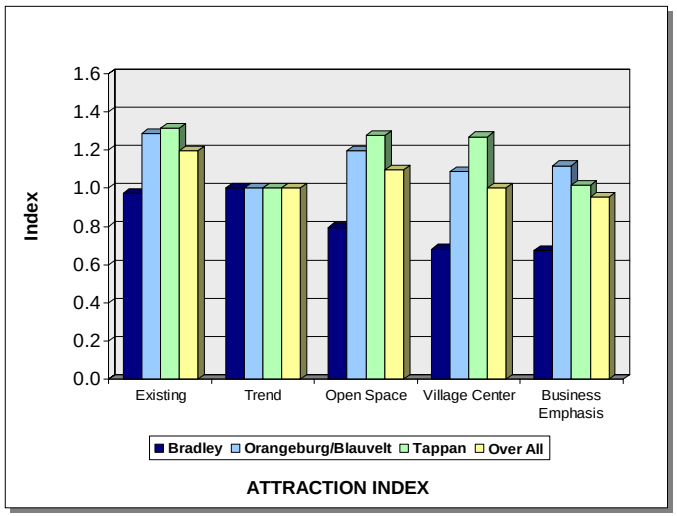
Figure 2.9









TRANSPORTATION INDEX
ATTRACTION ANALYSIS RESULTS
ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

Wilbur Smith Associates
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Figure 2.10

Compared to the existing condition, the Trend Scenario yielded a potential 10.3% increase in vehicle trips produced and a potential increase of 38.6% in trips attracted. The effect would be a significant increase in congestion and delay. For the Production Analysis, the Open Space Theme and the Village Center Theme results in the lowest Vehicle Hours per Capita for Orangeburg and Tappan areas. For the Bradley Park area, the Business Emphasis Theme results in the fewest trips and lowest index (Figure 2.9).

For the Attraction Analysis, the Open Space theme had the lowest number of vehicle trips due to the lowest level of future development, but displayed the least efficient index. The Business Emphasis Theme for the Bradley Park area had the greatest number of trips as well as the best index. This can be generally attributed to the lowest level of retail development. The performance of the Open Space and Village Center Themes are nearly equal for Tappan. The Village Center Theme is the most efficient for Orangeburg/ Blauvelt (Figure 2.10).

Trip Generation, Assignment and Level of Service Analysis **-** When evaluating land use – transportation relationships, perhaps the most commonly used measure is traffic impact expressed in terms of vehicle trip generation and Level of Service (LOS). The overwhelming use of the private automobile for personal transportation and trucks for goods movement generally points to increased traffic when land use change is proposed.

However, this approach has two major drawbacks. First, this approach focuses exclusively on automobile and truck traffic ignoring potential for pedestrian, bicycle, transit and rail performance. Second, because analysis gravitates to the peak hour where "journey to work" trips are prevalent other trip types may not be appropriately considered. Because "journey-to-work" trips only constitute one out of five trips taken, other trip types that make-up four out of five trips taken may not be adequately considered.

Safety Index **-** Improvement of roadway safety has been consistently stressed as the most important objective of Route 303 Study by citizens and public officials alike. The safety benefits of proposed improvements were evaluated by projecting future accidents under the no-build (current trends) condition and estimating the reductions in accidents based on documented accident reduction experience by the New York State Department of Transportation (NYSDOT). The safety analysis is based on the number of reported accidents that occurred on Route 303 in the three-year period from April 1, 1996 to March 31, 1999 based provided by NYSDOT.

First, future year (2020) accidents were predicted by applying existing accident rates expressed in terms of accidents per million vehicle miles (mvm) to future year traffic volumes predicted for the land use vision scenario. Accident rates change with increases in traffic volume. To understand this relationship, a factor was applied to the existing accident rate to determine the effect of increases in traffic volume.

Then, using the future year no-build number of accidents, accident reduction factors were applied for the improvements to Route 303. The accident reduction factors were based on reported experience obtained from NYSDOT Traffic Engineering and Safety Division's Accident Reduction Factors for State Highways. These reduction factors reflect before and after accident experience at locations improved by categorical safety funded projects. While actual accident experience will vary from location to location, this data base points to experience

gained at a large number of projects and can be used to estimate the safety benefits for the respective improvements.

Over the three years that constitute the analysis period, 529 accidents were reported with an annual rate of 4.67 accidents per million vehicle miles. Based on the forecast increase in traffic volumes and the influence of increased traffic on existing accident rates, the future no-build accident rate is expected to increase to 4.96 accidents per million vehicle miles, an increase of six percent. Applying this rate to expected volumes, the three-year total of accidents would increase from 529 to 755, an increase of 42 percent over 1996-1999 levels.

As shown in Table 2-2, and illustrated in Figures 2.11 and 2.12, the construction of a median with left-turn refuges has been shown to result in a 44 percent reduction in the number of accidents along a segment. The addition of left turn lanes and a turn signal have been shown to result in a 16 percent reduction in accidents at an intersection. The addition of a traffic signal has been shown to result in a 20 percent reduction in accidents at an intersection. Along the segments of Route 303, the 44 percent reduction factor was applied where a median is to be constructed. The 16 percent reduction factor was applied along the center-left-turn lane segment and at the intersections where left turn lanes were added. The 20 percent reduction factor was applied at King's Highway North, where a new signal is recommended.

Using the accident reduction experience of NYSDOT, the future year, no-build accidents would be reduced from 755 to 562 over the three-year period of the analysis, a decrease of 25.5% from the unimproved condition. The accident rate would decrease from 4.96 to 3.69 accidents per million vehicle miles (mvm) for the future year. This would be a net reduction from the existing accident rate, 4.67 accidents per mvm.

These evaluations helped to shape the preliminary Land Use Vision that was developed through discussion with CAC members and the general public at the third charrette on April 21, 2001. The individual elements of this Vision are summarized in the following section.

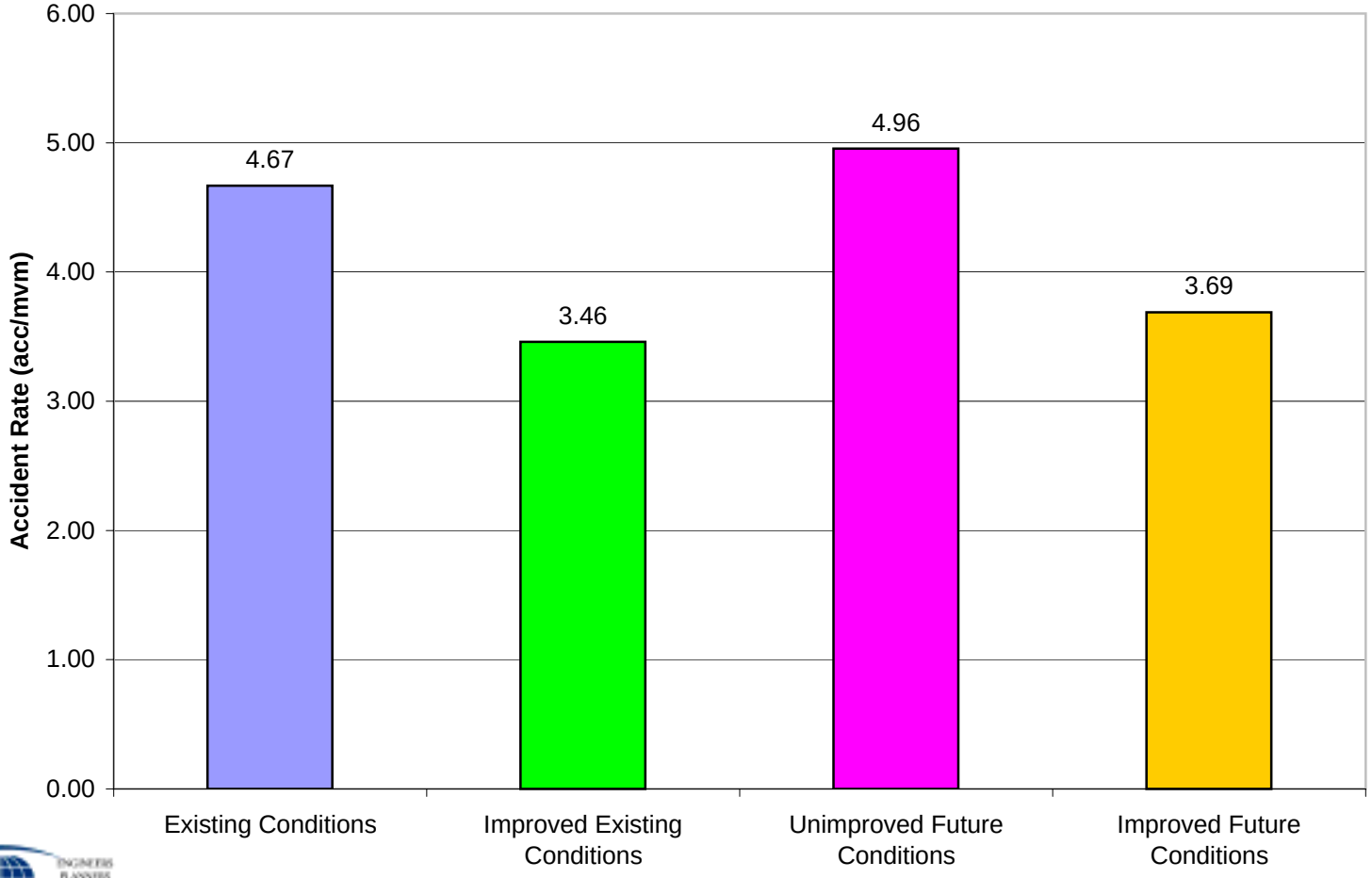
Table 2-2
Safety Index

Ref. Marker	Intersecting Street	EXISTING (YEAR 2000)		FUTURE (YEAR 2020)					
		Existing Accidents	Existing Volume	Future Volume	Volume Factor	NCHRP Factor	Base Future Accidents	Reduct. Factor	Imp Future Accidents
1000	NJ Line	16	1811	2257	1.25	1.05	21	0.16	18
1001		10	1811	2257	1.25	1.05	13	0.16	11
1002	Oak Tree	57	1811	2257	1.25	1.05	75	0.16	63
1003		8	1760	2245	1.28	1.05	11	0.44	6
1004	Washington	0	1760	2245	1.28	1.05	0	0.44	0
1005	Campbell	5	1760	2245	1.28	1.05	7	0.44	4
1006		12	1773	2284	1.29	1.05	16	0.44	9
1007		0	1773	2284	1.29	1.05	0	0.44	0
1008		0	1773	2284	1.29	1.05	0	0.44	0
1009	King's Hwy S	32	1773	2284	1.29	1.05	43	0.16	36
1010		3	2086	2680	1.28	1.05	4	0.44	2
1011		6	2086	2680	1.28	1.05	8	0.44	4
1012	PIP Ramp	9	2086	2680	1.28	1.05	12	0.44	7
1013	PIP Ramp	12	2086	2680	1.28	1.05	16	0.44	9
1014	PIP Bridge	12	1580	2244	1.42	1.05	18	0.44	10
1015	PIP Ramp	5	1580	2244	1.42	1.05	7	0.44	4
1016	PIP Ramp	7	1580	2244	1.42	1.05	10	0.44	6
1017		4	1580	2244	1.42	1.05	6	0.44	3
1018		0	1580	2244	1.42	1.05	0	0.44	0
1019		9	1580	2244	1.42	1.05	13	0.44	7
1020	Route 340	3	2124	3042	1.43	1.05	5	0.16	4
1021	Route 340	39	2124	3042	1.43	1.05	59	0.16	50
1022	Orangeburg	61	2123	3023	1.42	1.05	91	0.16	76
1023	King's Hwy N	9	2123	3023	1.42	1.05	13	0.2	10
1024	Mountainview	49	2073	2997	1.45	1.05	74	0.16	62
1025		5	1949	2772	1.42	1.05	7	0.44	4
1026		2	1949	2772	1.42	1.05	3	0.44	2
1027		6	1949	2772	1.42	1.05	9	0.44	5
1028		0	1949	2772	1.42	1.05	0	0.44	0
1029	Glenshaw	6	1990	2786	1.40	1.05	9	0.44	5
1030	Spruce	22	1990	2786	1.40	1.05	32	0.44	18
1031		3	1949	2731	1.40	1.05	4	0.44	2
1032		3	1949	2731	1.40	1.05	4	0.44	2
1033	Erie	22	1949	2731	1.40	1.05	32	0.16	27
1034	Erie	19	2235	3001	1.34	1.05	27	0.16	23
1035		8	2235	3001	1.34	1.05	11	0.44	6
1036	Greenbush	5	2235	3001	1.34	1.05	7	0.44	4
1037	Greenbush	2	2206	2965	1.34	1.05	3	0.44	2
1038		0	2206	2965	1.34	1.05	0	0.44	0
1039		10	2206	2965	1.34	1.05	14	0.44	8
1040		3	2206	2965	1.34	1.05	4	0.44	2
1041		0	2206	2965	1.34	1.05	0	0.44	0
1042	Bradley	30	2063	3015	1.46	1.05	46	0.16	39
1043		0	2063	3015	1.46	1.05	0	0.44	0
1044	Corporate	3	2570	3106	1.21	1.05	4	0.44	2
1045	Corporate	4	2570	3106	1.21	1.05	5	0.44	3
1046		2	2570	3106	1.21	1.05	3	0.44	2
1047	Birchwood	6	2228	3186	1.43	1.05	9	0.44	5
1048		0	2228	3186	1.43	1.05	0	0.44	0
1049		0	2228	3186	1.43	1.05	0	0.44	0
TOTALS		**529**					**755**		**562**

Source: Wilbur Smith Associates based on NYSDOT Accident Data, April 1, 1996-March 31, 2001

Comparison of Accident Rates

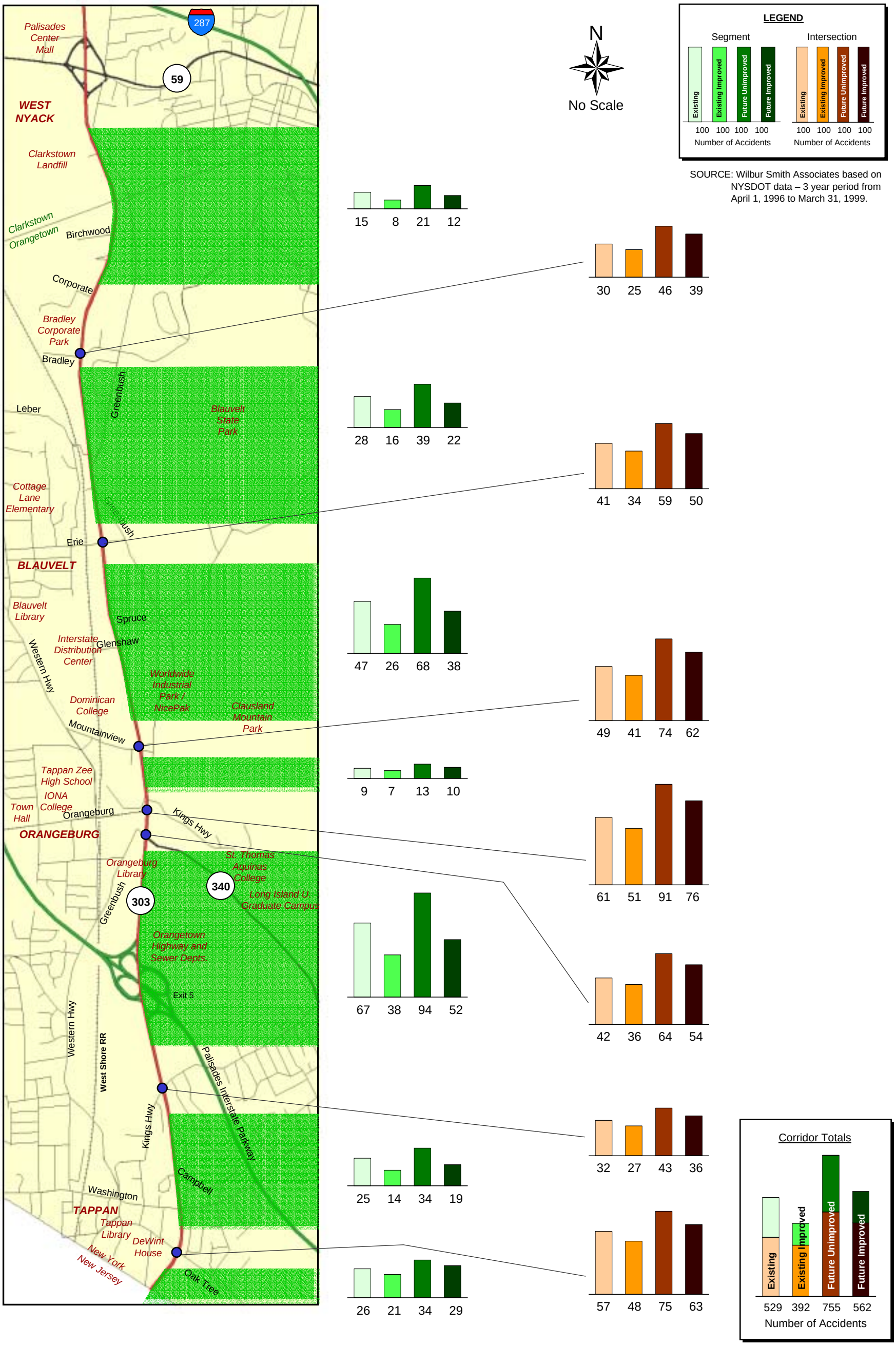
Route 303 Sustainable Development Study



Wilbur Smith Associates

Source: Wilbur Smith Associates based on NYSDOT data
3 year period from April 1, 1996 to March 31, 1999

Figure 2.11



SOURCE: Wilbur Smith Associates based on NYSDOT data – 3 year period from April 1, 1996 to March 31, 1999.

ACCIDENT REDUCTIONS FROM HIGHWAY IMPROVEMENTS:

Existing (Year 2000) and Future (Year 2020)

ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

WILBUR SMITH ASSOCIATES

Figure 2.12

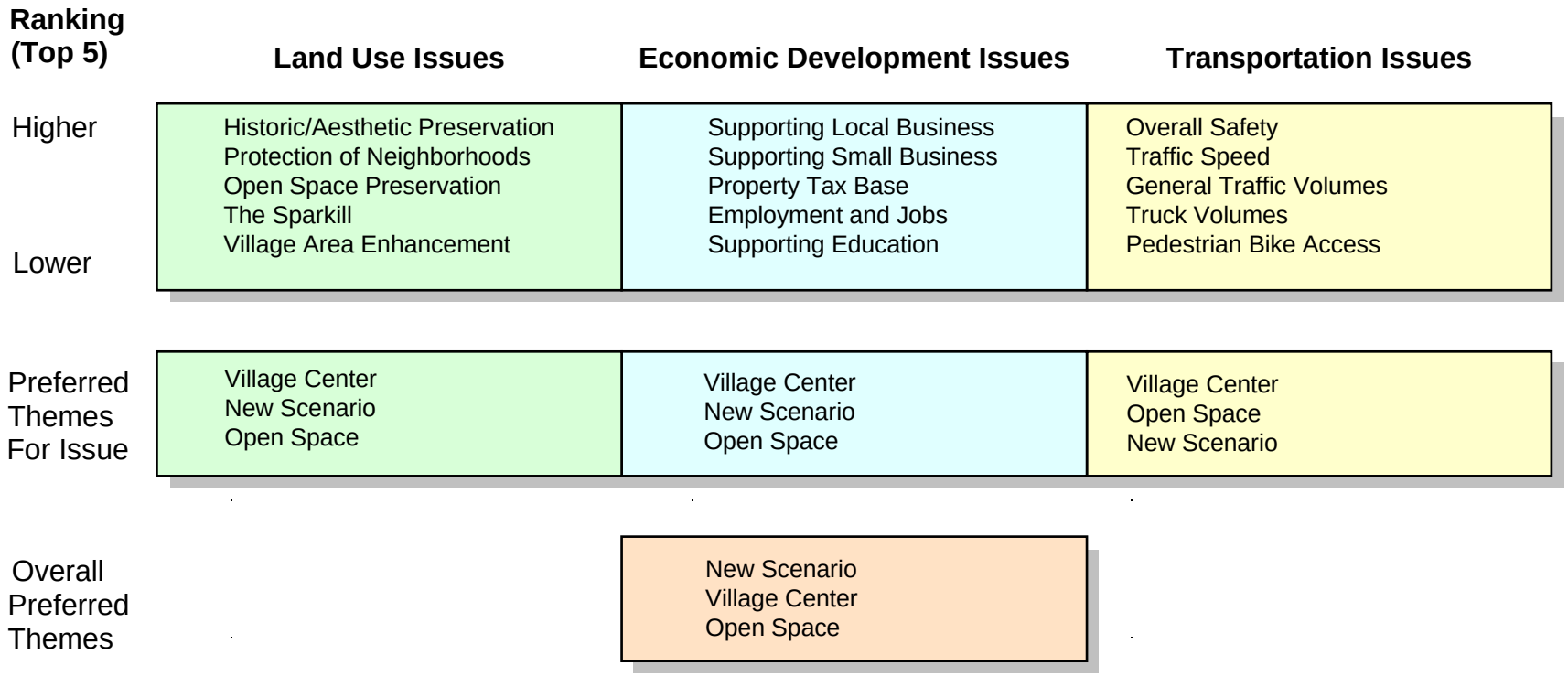
2.7 Development of Conceptual Recommendations

The continuing and committed involvement of a diverse group of over 150 residents, business and property owners and the local public officials through the neighborhood meetings was particularly significant in formulating and refining the transportation element. The Route 303 Transportation Conceptual Recommendations (Section 4) are intended to enhance roadway safety throughout the corridor with a goal of managing travel speeds and respecting the neighborhoods and properties that adjoin the Route 303 roadway.

In various segments of Route 303 – New Jersey State Line to Oak Tree Road, Oak Tree Road to King's Highway South, King's Highway South to Route 340, Route 340 to Mountainview Road, Mountainview Road to Erie Street, and Erie Street to Bradley Parkway – the Transportation Plan portion of the study has identified preliminary concepts for safety and operational improvements ranging from traffic signal installation and re-timing, turning lanes, median treatments and realignment of intersections. In addition, the other opportunities identified include bicycle and pedestrian and transit improvements and access management.

These recommendations will allow the Route 303 corridor to continue to function effectively in the future, and to accommodate orderly growth consistent with the Town of Orangetown's development objectives as defined in its Comprehensive Plan and its zoning resolution. The recommendations were evaluated by the Citizens Advisory Committee in a series of meetings conducted in June and August, 2001. A ranking of issues based upon CAC members' responses to a survey is provided in Figures 2.13, 2.14 and 2.15.

As Figures 2.13, 2.14 and 2.15 show, while there are differences among the priorities of each neighborhood, there are similarities as well. Generally, all neighborhoods raised similar transportation concerns: safety, traffic speeds, traffic volumes and truck volumes. More variation is found in each neighborhood's land use and economic development priorities. The Tappan neighborhood, for instance, placed emphasis on the need for historic preservation, for preserving businesses, and for the concept of a village center. Orangeburg emphasized the village center concept along with redevelopment of the Sparkill. The Bradley neighborhood highlighted the need for open space preservation and maintaining the property tax base.



TAPPAN NEIGHBORHOOD SURVEY
Ranking of Issues & Themes

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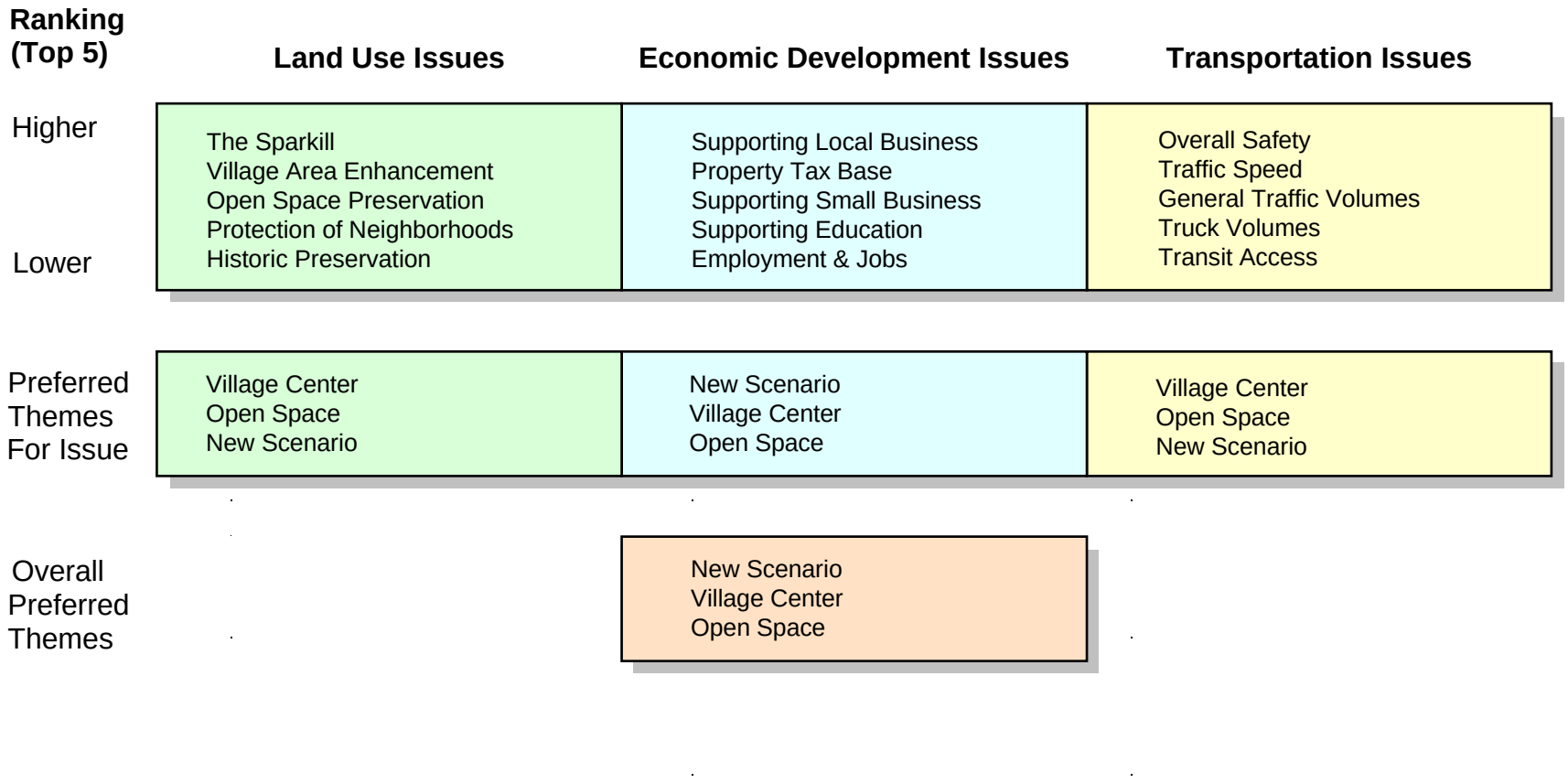
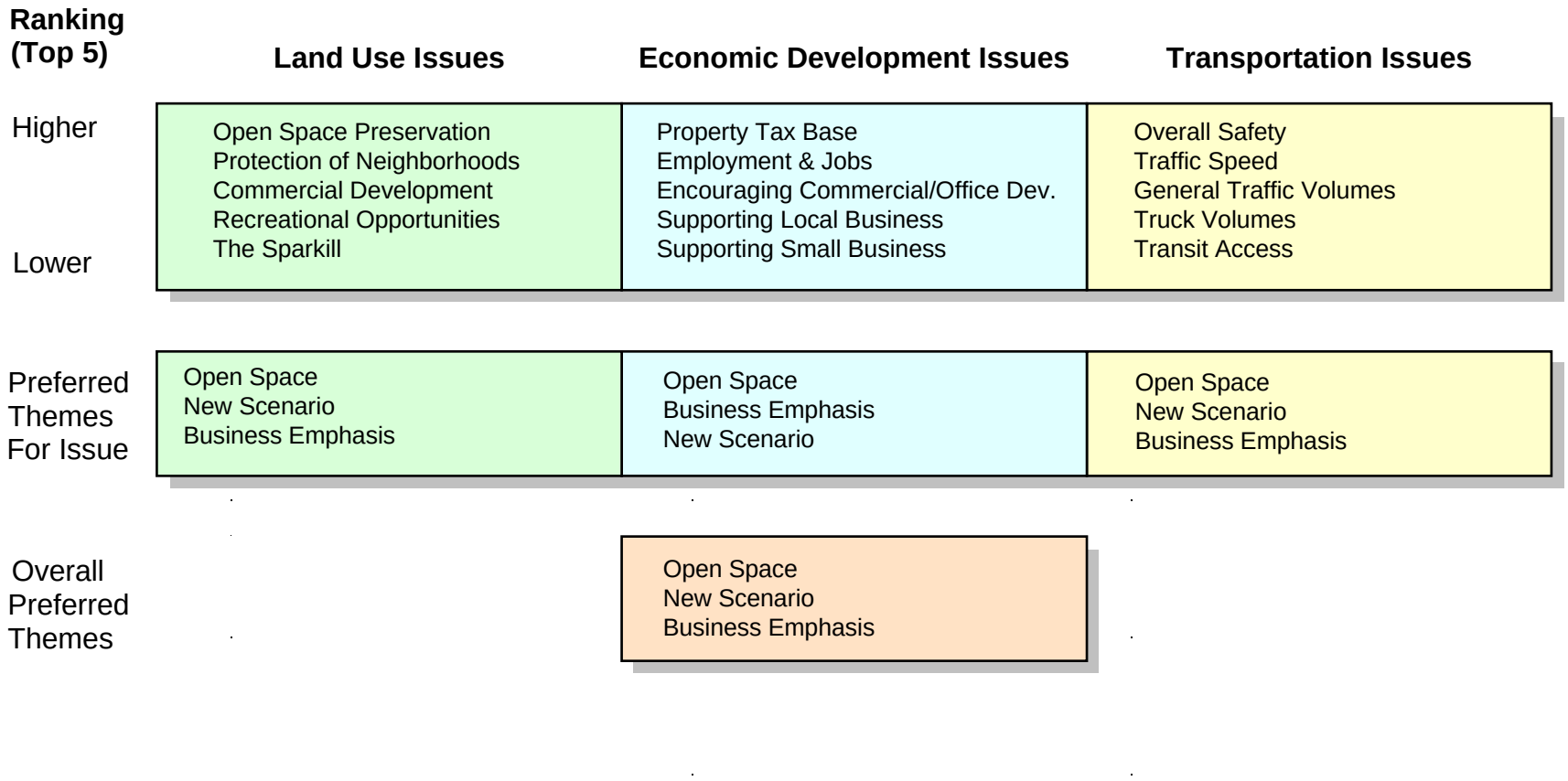
Figure 2.13



ORANGEBURG NEIGHBORHOOD SURVEY
Ranking of Issues & Themes

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Figure 2.14



BRADLEY PARKWAY NEIGHBORHOOD SURVEY
Ranking of Issues & Themes

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Figure 2.15

3. CORRIDOR CONCEPT PLANNING

3.1 Land Use

3.1.1 Alternatives Analysis

To provide specific values for quantitative analysis of the individual themes, the study team identified differing levels of future development by land use type for each of the four themes (Table 3-1). For the Open Space Emphasis, Neighborhood Areas Emphasis, and Business Emphasis themes, these estimated levels of future development were mathematically derived through consultation with the staff from project communities while also incorporating professional judgment. Estimates of square footages and numbers of housing units were made through an iterative process in consultation with both the Town of Orangetown and the TC, but did not involve any specific modeling effort.

The Continuation of Existing Trends theme utilized the same estimates of development as the Neighborhood Areas theme for the Tappan and Orangeburg areas, and the same estimate as the Business Emphasis theme for the Bradley Parkway area. In essence, this resulted in an identical future development estimate as the Neighborhood Areas theme.

These projections of future land use were presented to the TC, the CAC and Orangetown's professional land use review staff for their assessment.

3.1.2 Land Use Recommendations

Following the third charrette, land use recommendations were made. Elements of the different land use themes were used to derive the ultimate land use recommendations, or "Land Use Vision." A preliminary version of the Land Use Vision was presented for review by the CAC at two meetings in May 2001 and a revised version was presented for further review and public comment at two additional CAC meetings in August 2001. This Land Use Vision, illustrated in Figure 3.1, emphasizes the strong and interconnected relation between land use and transportation. Table 3.2 provides a numerical breakdown of the Land Use Vision that was ultimately evaluated in this study.

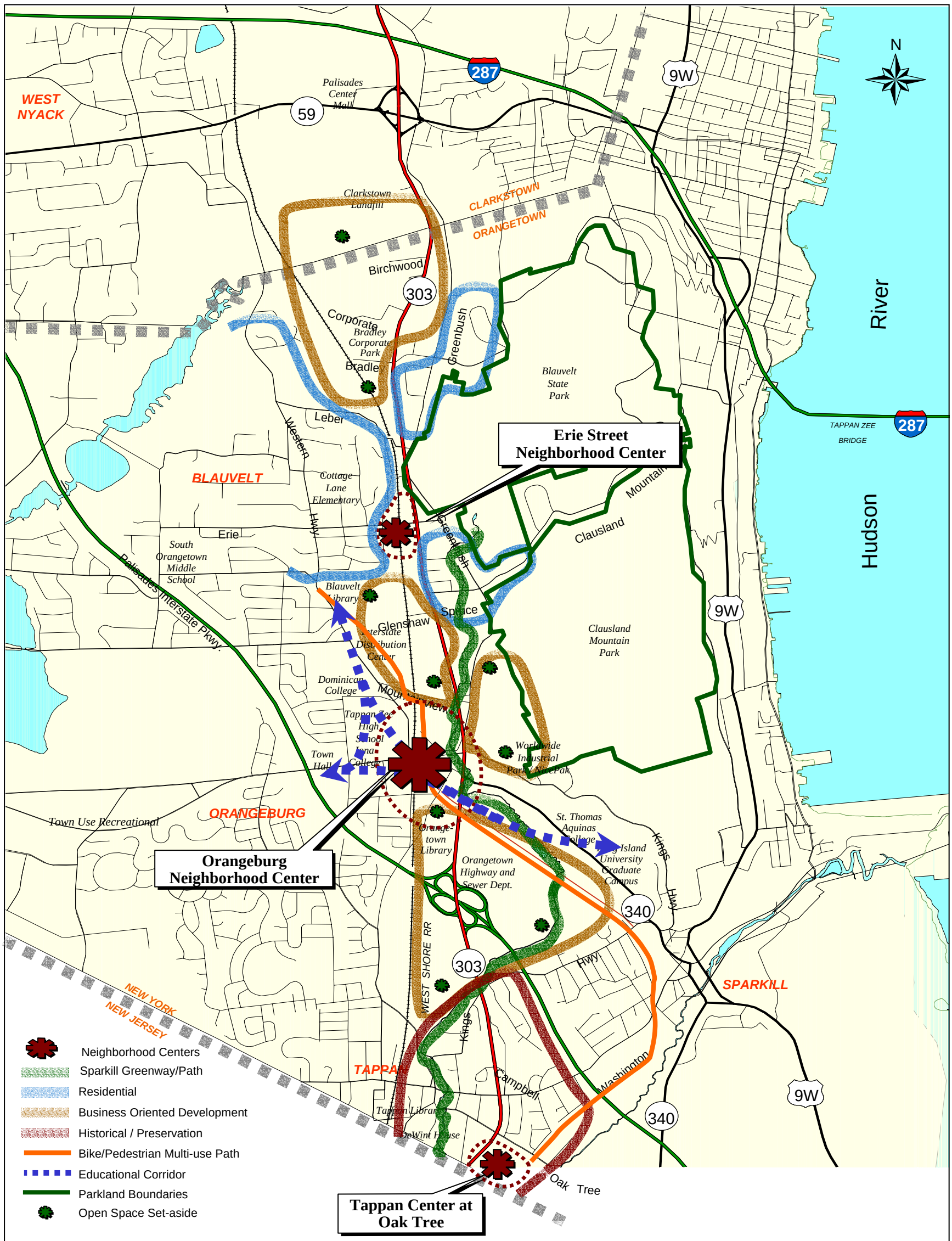
The key goals outlined in the Land Use Vision were to create zoning and land use policies that:

- Protect and buffer existing residential areas;
- Encourage open space preservation and environmental stewardship;
- Preserve existing neighborhood commercial use and enhance commercial development opportunities (except retail);
- Limit the location, size and siting of new retail development; and
- Foster the creation of focused nodes of neighborhood-oriented development.

Table 3-1
New Development and Redevelopment Potential
by Land Use Theme
(thousand square feet and housing units)

Land Use	Current Trends Emphasis			Open Space Emphasis			Neighborhood Areas Emphasis			Business Emphasis		
Neighborhood/ Subarea	Office/ Industrial	Retail	Residential	Office/ Industrial	Retail	Residential	Office/ Industrial	Retail	Residential	Office/ Industrial	Retail	Residential
	Sq. Feet (1000s)		Housing Units	Sq. Feet (1000s)		Housing Units	Sq. Feet (1000s)		Housing Units	Sq. Feet (1000s)		Housing Units
Bradley Parkway	1,600	0	0	800	0	0	1,600	0	0	1,600	0	0
Erie St./ Mountainview	125	30	0	50	30	0	125	30	0	150	80	0
Orangeburg	0	50	0	0	0	0	0	50	0	80	25	0
Rockland Psychiatric Center	0	50	400	0	50	400	0	50	400	0	50	400
Palisades Interchange	0	0	0	0	0	0	0	0	0	500	120	0
Tappan	0	50	150	0	0	0	0	50	150	0	25	0
Total	1,725	180	550	850	80	400	1,725	180	550	2,330	250	400

Source: Wilbur Smith Associates



WILBUR SMITH ASSOCIATES

LAND USE VISION PLAN

FIGURE 3-1

Table 3-2
Land Use Vision
New Development and Redevelopment Potential

Neighborhood/Intersection	Square Feet		Number of Housing units
Land Use	Office/Industrial	Retail	Residential
Bradley Parkway	800,000	0	0
Erie St./Mountainview	50,000	30,000	0
Orangeburg	0	50,000	0
Rockland Psychiatric Center	0	50,000	400
Palisades Interchange	0	0	0
Tappan	0	50,000	150
Total	850,000	180,000	550

Source: Wilbur Smith Associates

The following elements were included within this Vision:

Neighborhood Areas – Drawing from the Neighborhood Areas Theme, the Land Use Vision incorporates the concept of clustering retail and residential land use and development in the vicinity of three defined areas highlighted in Figure 3.1 by brown stars:

- Tappan neighborhood area (south of Oak Tree Road);
- Orangetown neighborhood area (between King's Highway and Route 340); and
- Erie Street neighborhood area.

The neighborhood areas would have differing levels and patterns of future development potential based on further evaluation and study by the Town of Orangetown. Participants in the third charrette favored only a modest amount of new commercial development within the neighborhood areas, and this is consistent with the amount of growth that is forecasted under the Land Use Vision, as shown in Table 3-1. A land use issue that has not been resolved through the Route 303 study process is the future of the Rockland Psychiatric Center. At the present time, the Town of Orangetown has not yet formally reviewed a development application for this site.

The Sparkill Greenway/Path (Mid-Hudson South Region Bicycle/Pedestrian Master Plan) – Future development of the Sparkill stream bank as a location for pedestrian and bicycle paths, passive recreational use (i.e. park benches, plantings, and landscaping) is highlighted in green in Figure 3.1. The development of a continuous pedestrian system consisting of sidewalks and crosswalks, and connection with the J.B. Clark (Orangetown) Rail-Trail in the Orangeburg neighborhood area were some of the features identified for a pedestrian/bicycle network by the CAC and members of the Orangetown Open Space Committee.

Buffering of Existing Residential Areas - A review of the Town's existing zoning indicated some opportunities to further protect residential use of properties adjacent to Route 303 in the Bradley Parkway and Erie Street areas, which have been highlighted in blue in Figure 3.1. Careful consideration needs to be given by the Town's Zoning Board of Appeals as it reviews future land use applications in these areas.

Business Oriented Development – Many CAC members and other participants in the third charrette favored business-oriented development of non-retail commercial facilities, such as office and research campuses as a source of future tax base for the Town of Orangetown. Areas considered appropriate for this type of development have been highlighted in tan in Figure 3.1. They include:

- Bradley Corporate Park – continuing development of office, warehousing/distribution and industrial property, as well as "flex" research and development facilities (which could encompass a combination of these uses);
- Udelco Property – potential for office use; and
- Palisades Parkway Interchange area – office campus or other self-contained institutional use.

In areas with new office and light industrial use, provision could be made for public access and use of buffer zones and natural areas.

Historic Preservation – Many of the CAC members noted the importance of maintaining and enhancing the historic characteristics of the Tappan area. This element of the Conceptual Land Use Vision has been highlighted in Figure 3.1 with a brown line around the areas identified as having historical value and interest. This area represents a larger area than the current federally recognized historic district.

Bike/Pedestrian Multi-Use Path – While the J.B. Clark Rail-Trail (highlighted in Figure 3-1 with an orange line) is already in public ownership, only the portion east of Route 303 is currently open for use due to storm damage associated with Tropical Storm Floyd. The Land Use Vision has identified and incorporated the need to develop a better pedestrian and bicycle access route across Route 303 in the Orangeburg neighborhood area, and overall to enhance signage and supporting facilities (bike racks, brochures, landscaping, etc.) for the trail. Improvements would be consistent with what is called for in the Mid-Hudson South Region Bicycle/Pedestrian Master Plan).

Educational Corridor – The Educational Corridor is an interesting idea that arose from the Second Public Involvement Charette. CAC members were receptive to further investigation and development of an Educational Corridor connecting the campuses of STAC, Dominican College and Iona with adjacent commercial and residential areas. These shared-use recreational and cultural facilities for these institutions and the Town would set the tone for future development in the Orangeburg Village Center area. This opportunity has been highlighted by a dashed blue line in Figure 3.1.

Open Space Set Asides - Participants at both the second and third charrettes highlighted the potential to work with developers to preserve buffer areas surrounding their properties, to provide a system of interconnected public space set-asides, and to seek opportunities for greater public use of these open areas. For example, the Clarkstown Landfill offers long-term potential for use of open space, following capping of the landfill. Similarly, key undeveloped properties at the Bradley Corporate Park complex and the adjacent area, such as the "dinosaur tracks property" located on the east side of Route 303 near the Bradley Parkway intersection, could be acquired for public open space use.

Other examples of land use parcels identified in this regard are listed below:

- Triangular parcel located at the intersection of Greenbush Road with Route 303, just north of the King's Highway (north) intersection;
- Camp Shanks Museum property; and
- Undeveloped properties in the vicinity of the Palisades Parkway interchange.

3.2 Transportation

3.2.1 Alternatives Analysis

The Route 303 study area presents a range of different transportation and land use needs that cannot be met with a single type of transportation facility or service. The Land Use and Transportation Visions were both developed through the planning Charrettes and concurrent neighborhood meetings, where discussion focused on transportation problems, issues, and solutions. After a comprehensive, in-depth discussion of problems facing neighborhoods, a full range of multimodal alternatives was considered for their applicability within the context of Route 303.

Alternatives considered included roadway "downsizing," traffic calming, roundabouts, access management, improvements for pedestrians and bicyclists, bus transit, rail transit stations, neighborhood connectivity, transportation system management, and transportation demand management strategies. Reflecting back on the design for Route 303 originally proposed by NYSDOT in 1993, many community members were concerned about the impacts that would be caused by additional highway capacity in the corridor. As a result, for the current review of Route 303, a "context sensitive" approach to planning and conceptual design was adopted as a cornerstone of all alternatives under consideration. Once the Land Use Vision had been identified, the study team, TC and the CAC defined an appropriately responsive set of transportation improvements to address the corridor's transportation safety deficiencies, as well as to support the Land Use Vision.

Preliminary roadway improvement alternatives were developed for five roadway segments and seven major intersections in the study area. Roadway configuration diagrams, showing travel lanes, turn lanes, and, in two locations, roundabouts were first presented to the public at a CAC meeting held on April 13, 2001. Following this preliminary presentation, more-detailed segment and intersection diagrams were developed (utilizing photo simulation) which were presented to the public at two Neighborhood Committee meetings held on May 23 and May 24, 2001.

These preliminary alternatives were then tested using the four different transportation analytical tools described in Section 2.6; the Land Use – Transportation Index model, the Smart Growth Index (SGI) model, and conventional Highway Capacity Software (HCS) Level of Service (LOS) analysis. The preliminary transportation improvement alternatives were refined, modified and enhanced using the technical analysis results run by the consultant team and feedback of the CAC and the general public regarding design preferences.

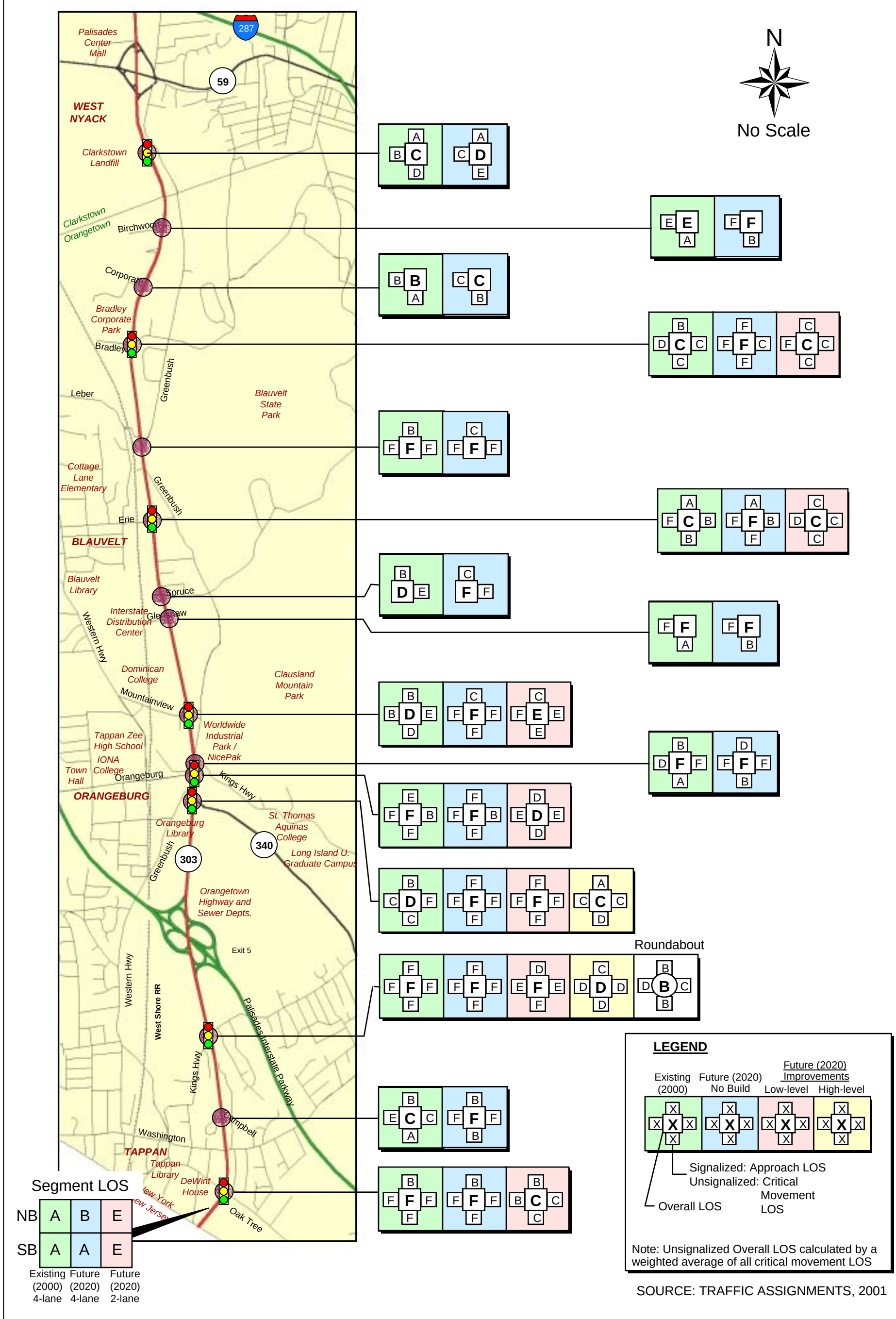
Level of service (LOS) analyses were conducted at all intersections in the study area under existing (year 2000) conditions and the four land use themes (Trend, Open Space, Neighborhood Area, and Business Emphasis). It is important to note that for future (year 2020) conditions only, the level of service during the weekday evening peak hour period was analyzed, as it is the critical time period for the Route 303 corridor. In addition, the level of service analysis reflects existing geometry and signal timings for future year conditions. Under all four scenarios, LOS was calculated to be at a failing level – LOS F – for all of the signalized intersections within the study area (Table 3-3), as well as for many of the unsignalized intersections (Table 3-4).

Signalized Intersections - Table 3-3 presents the results of the level of service analysis for the signalized intersection locations in the study area. Figure 3.2 illustrates the results in a graphical manner. As noted above, under all four future scenarios, all of the signalized intersections would operate at a failing level, LOS F, within the study area. With the exception of the intersections of Oak Tree Road, Kings Highway South and Orangeburg Road, which currently operate at LOS F, this would be a degradation from year 2000 conditions.

Table 3-3
Level of Service (P.M. Peak) –
Existing (2000) and Future (2020) Conditions (Signalized Intersections)

Route 303 Intersection	**2000 Existing**	**2020 Future Scenarios**			
		Trend	**Open Space**	**Neighborhood Area**	**Business Emphasis**
Oak Tree Road	F	F	F	F	F
King's Highway South	F	F	F	F	F
Route 340	D	F	F	F	F
Orangeburg Road	F	F	F	F	F
Mountainview Road	D	F	F	F	F
Erie Street	C	F	F	F	F
Bradley Parkway	C	F	F	F	F
Clarkstown Landfill	A	F	F	F	F

Source: Wilbur Smith Associates



SOURCE: TRAFFIC ASSIGNMENTS, 2001

FINAL SCENARIO (PM PEAK HOUR) INTERSECTION LEVELS OF SERVICE

ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY

WILBUR SMITH ASSOCIATES

Figure 3.2

Unsignalized Intersections **-** Table 3-4 presents the results of the level of service analysis for the unsignalized intersection locations in the study area. Figure 3.2 illustrates the results in a graphical manner. As the table shows, under future scenarios, all of the unsignalized intersections within the study area would operate at a failing level, LOS F, with the exception of the Route 303 intersection with Campbell Street (Open Space scenario only) and with Corporate Drive (LOS C under all scenarios). All intersections would experience some degradation in LOS under all scenarios. Three intersections (King's Highway North, Glenshaw Road, and Leber Road/Greenbush) currently operate at LOS F and would continue to do so.

It is important to note that the overall LOS calculated is based on a weighted average methodology using the traffic volumes and delays of critical movements.

Table 3-4
Level of Service (P.M. Peak)
Existing (2000) and Future (2020) Conditions (Unsignalized Intersections)

Route 303 Intersection	**2000 Existing**	**2020 Future Year Test Scenarios**			
		Trend	**Open Space**	**Neighborhood Area**	**Business Emphasis**
Campbell Street	C	F	D	F	F
King's Highway North	F	F	F	F	F
Glenshaw Road	F	F	F	F	F
Spruce Street	D	F	F	F	F
Leber Road/Greenbush	F	F	F	F	F
Corporate Drive	B	C	C	C	C
Birchwood Drive	E	F	F	F	F

Note: Overall LOS calculated by a weighted average of all critical movement LOS.

Source: Wilbur Smith Associates

3.2.2 Early Action Projects

Throughout the course of the study, Rockland County, NYSDOT, NYMTC, the Town of Orangetown and the study's Consultant Team worked to identify Early Action Projects that could be implemented quickly to address the study area's most immediate traffic safety needs in a way that would be consistent with the ultimate improvement program desired by the community.

The Early Action Projects that we're talking about came out of the study process which was started last year. [They] *came out of the neighborhood meeting process. We met with the community on a number of nights. We were able to garner ideas from the community and listen to the community's concerns.* [Then] *we could begin to plot out some Early Action Projects that we can implement as a State* [agency], *coordinating with the County and the local authorities.*

Ed Mark
NYSDOT Project Manager

Key elements of the Transportation Early Action Program included:

- Installation of new route signage at the Route 303/Route 59 interchange;
- Installation of "Signal Ahead" signage on Route 303 northbound and southbound, south of the median barrier at Bradley Parkway;
- Traffic signal installation with a left turn phase at Mountainview Road;
- Installation of a stop sign at Orangeburg Road at Route 303;
- Enhancement of sidewalks and crosswalks at the intersection of Route 340 with Route 303;
- Sidewalk and crosswalk improvements at King's Highway South and Route 303;
- Potential reduction in the Route 303 speed limit from 40 to 35 m.p.h. with stepped-up enforcement between Campbell Avenue and the PIP (pending a detailed speed study by NYSDOT);
- Replacement of a yield sign with a stop sign at Campbell Avenue;
- Street name sign installation and enhancement at Campbell Avenue and other locations along Route 303; and
- Sidewalk construction and repaving with brick pavers on Oak Tree Road at Route 303.

3.2.3 Transportation Recommendations

The functions of arterial roadways differ according to the roadside environment through which they pass. For example, village centers call for roadway design features that highlight their special character, enhance land use objectives, provide pedestrian safety, and foster economic vitality. Open-space-oriented areas call for scenic enhancements to the roadway such as landscaping, pedestrian and bicycle trails, and signage enhancements. Business-oriented areas should accommodate truck traffic with appropriate turn lanes, signal improvements, and access management strategies. These strategies will enable the roadway to respond to the peak travel demand, freight movement, and service and delivery vehicles.

The final transportation plan developed for the Route 303 study area should combine all of these elements and concerns in a context-sensitive way so that safety standards are met, while accomplishing both land use and transportation goals for community preservation and enhancement and natural resource protection.

The transportation improvements recommended are grouped under the following two general categories: *Low Level* Improvements and *High Level Improvements*. The definitions of these categories are as follows:

- *Low Level Improvements*, if implemented, would provide adequate turn lanes at intersections to improve spot levels of service. These Low Level Improvements could be implemented in a shorter and sooner time frame than High Level Improvements, and could include such things as some added turn lanes, minor refinement or addition of turn signals, improved striping of the roadway, improvements to pedestrian/bicycle paths, enhanced landscaping, and in some cases, limited widening along Route 303.

- *High Level Improvements*, if implemented, would consist of measures that would maintain a four-lane cross-section with turning lanes along Route 303, including a planted median. High Level improvements would focus on major intersecting streets along Route 303, including improvements to pedestrian/bicycle paths, enhanced landscaping, and in some cases, may require some limited widening along Route 303. Other High Level Improvements could include a major re-routing of Orangeburg Road to directly connect with Route 340, and possible changes to street patterns to support expanded design concepts for neighborhood areas. In general, these alternatives would cover locations that continue to operate at poor levels of service even with the Low Level Improvements.

It should be noted that both levels of improvement are not necessarily "either/or" choices to be made, but rather represent successive phases of continuing incremental transportation improvements for the Route 303 study area.

Key issues considered in the roadway concept development process include:

- Roadway width and lane width;
- Number of through and turning lanes;
- Design speed and speed management techniques (traffic calming);
- Curb/shoulder width and configuration;
- Sidewalk/crosswalk locations;
- Signalization;
- Median treatment; and
- Driveway spacing and width standards (access management).

Recommendations for the Route 303 corridor include:

Median Treatments - In the case of raised or flush medians, left turn pockets are created at signalized or unsignalized intersections or major driveways. Because it is impractical to provide median openings at each and every driveway along the roadway, medians may restrict some driveways and minor side streets to right-in/right-out turns only, thereby eliminating left turns. In this way medians serve as access management techniques that enhance roadway safety by limiting left turning conflicts. The advantage of raised medians is their ability to channel traffic, control left turns, provide greater protection for pedestrians, and serve as a traffic calming measure through plantings and streetscaping.

Continuous Two-Way Left Turn Lanes - Continuous two-way left turn lanes provide locations for left turning vehicles in either direction to wait for gaps in oncoming traffic without interfering with following traffic. A continuous left turn lane is often combined with access management techniques to limit locations where left turns are permitted. They are often located in commercial areas where it is difficult to limit the number of curb cuts through consolidation or elimination.

Driveway Access Management – Driveway Access Management refers to the control of access to properties adjacent to the roadway through use of consolidated driveways, service roads,

medians, regulation of curb cuts, and alternative side street access. It is not uncommon for driveways to be poorly defined (parking areas paved to the pavement edge the entire length of a property), too numerous or too closely spaced, thereby allowing turns to and from the property at random locations. The number and location of curb cuts (entrances and exits to a property) should be limited, clearly defined, and spaced to assure safety for motorists, pedestrians and bicyclists accessing the property and traveling on the roadway.

Design for Speed Control (Traffic Calming) – Both the perception and reality of high speed driving on Route 303 has received public attention and concern. Managing automobile and truck speed becomes the goal of nearly every transportation corridor study. Excessive speed, just like "stop and go" traffic, can result in higher than average rates of traffic accidents. Therefore, even for an arterial roadway such as Route 303, a menu of traffic calming techniques can be used to deter speeding and increase driver awareness while maintaining the operational capacity and functionality of the roadway for through travel and commercial vehicle use. In this type of setting, techniques such as speed bumps or chicanes would <u>not</u> be applicable, but roadway strategies such as textured crosswalks and neckdowns at key intersections may be the best response to speed issues along Route 303.

4. NEIGHBORHOOD CONCEPT PLANS

4.1 Neighborhood Integrated Land Use & Transportation Plans

Through the Route 303 study process it was determined that the individual neighborhood areas – Tappan, Orangeburg, and Bradley Parkway/Greenbush – would each require specialized land use planning and roadway design features that respond to their specific development character and enhance land use objectives, pedestrian safety, and economic vitality. The three neighborhood areas are illustrated in Figure 4.1.

Through the public outreach elements of the study, including neighborhood and CAC meetings, and the charrettes, a number of land use and transportation topics were defined for further evaluation. They are as follows:

Building and Parking Location - One of the main characteristics of traditional town centers, such as Pearl River, Nyack or Suffern, is the street-facing retail that has little or no setback from sidewalks. Within the three neighborhood areas, the existing pattern of development does not conform to this pattern.

Changes to the pattern of land use in a developed area can be accomplished through a number of strategies – short-term, intermediate and long-term. Examples of strategies include: incremental redevelopment through private market activity, with the potential modification of zoning setback requirements and the creation of targeted urban renewal areas involving public acquisition and re-assembly of properties.

Main Street in Suffern illustrates the traditional relationship between street-facing retail buildings, on-street parking and pedestrian amenities, such as sidewalks, street trees and crosswalks, within a village environment.

Signage - Signage for a defined neighborhood area can go well beyond traffic control and regular street signs. It can include gateway and wayfinding signage to inform drivers and pedestrians that they have arrived at a neighborhood or village center. Information and guide signs can be provided to certain key destinations, such as historic sites, cultural centers, colleges, local shops, and transit stops. Directory information can be given at the pedestrian level, which includes maps showing destinations within the neighborhood area. An identity for the center can be translated into a symbol, which is incorporated on local street signs, banners or other displays in the area.

Pedestrian and Side Street Connectivity – Neighborhood areas should have walkways and paths that connect all destinations within the center. For instance, where off-site or rear lot parking is used, a gap in the street-facing buildings is often beautified and used as a pedestrian walkway to access the street frontage from the parking lot without having to cross through a building.

Neighborhood Areas

Route 303 Sustainable Development Study

WILBUR SMITH ASSOCIATES

FIGURE 4.1

Pedestrian Amenities - The physical appearance of a neighborhood area or village center also plays a vital role in its acceptance and success. Granite curbs or brick sidewalk pavers along roadways can be provided, and crosswalks and sidewalks can be made from textured pavement or paver bricks. Historic or other architecturally-appealing lighting fixtures can also be incorporated into a neighborhood area roadway improvement plan, along with other pedestrian-oriented amenities, such as benches, waste baskets, and planters.

Bicycle and Pedestrian Concept Development

Bicycle and pedestrian facilities provide a mode of transportation critical to neighborhood and community cohesiveness, but also have a calming influence on vehicular traffic. Either separate facilities or designated shared bike lanes have the advantage of safer travel for bicyclists. Two of the most critical aspects of pedestrian accommodation are the provision of sidewalks and delineated crosswalks. Beyond these most basic features, typical enhanced pedestrian treatments for neighborhood areas include:

- Signalized Crossings – A traffic signal, either at an intersection or intermediate point allows pedestrians to cross while roadway traffic is stopped;
- Curb bump-outs – The sidewalk is extended into the roadway shoulder at the crossing location so that the effective width of roadway that pedestrians must cross is reduced;
- Pedestrian median refuges – Refuges are places on a median in the roadway for pedestrians to wait until it is safe to proceed. They allow crossing of the roadway in two separate stages.
- Markings – Pedestrian crossings may be marked with pavement marking materials or highlighted with separate pavement treatments, such as a brick or cobblestone pattern, to distinguish them from the roadway.

Many of these features have been included, where they seemed to have a logical application, in the concept plans for the individual neighborhood areas in the following three sections (Sections 4.2 through 4.4).

Transit Concept Development

The concept of a shuttle transit service along Route 303 was introduced earlier in Section 2.4, in the discussion about the West Shore Railroad. In suburban locations with active transit service, for example along Route 59, bus bays or roadside pullouts would allow buses to stop outside the regular roadway travel lanes. Bus pullouts are useful at locations with a high passenger volume, but are not always possible to implement due to the limited width of the right-of-way or sidewalk. Current and projected transit use along Route 303 may not warrant the implementation of this level of transit treatment. Even where a pullout is not implemented, both pedestrian and transit-oriented urban design treatments, such as sidewalks, bus stops, benches, and newspaper vending areas, can be very vital in creating a sense of identity for a neighborhood area. It is the county's overall policy to encourage non-motorized transportation and transit use, and these small-scale improvements, undertaken in the context of a larger transportation improvement program, can help to move forward toward this goal.

Neighborhood Area Concept Plans

The issues described in the preceding section were applied to three neighborhood area concept plans for the Tappan, Orangeburg, and Bradley Parkway/Greenbush neighborhoods that follow in Sections 4.2 through 4.4. Conceptual illustrations of intersection-level improvements are found in Appendix A and are referenced in the sections that follow.

4.2 Tappan Neighborhood Concept Plan

The Tappan Neighborhood was defined early in the study process as the area within a half-mile of the Route 303 right-of-way, extending from King's Highway South to the New Jersey State Line. This area is predominantly residential, with a narrow strip of neighborhood-oriented retail stores located at the south end of the study area, south of the Route 303 intersection with Oak Tree Road.

Since most of the commercial development in this area dates from the 1950's, some type of redevelopment activity may be anticipated for the future. Participants at the charrettes and the neighborhood meetings were asked to identify the specific types of retail activity that they wanted to see in the future of this study area segment. Common suggestions included a desire for the upgrading of existing stores and for more neighborhood-oriented businesses, such as a deli or grocery store, an ice cream store, and other small-scale businesses. In addition, the conflict between adjacent residential areas and the commercial development along the corridor was noted as a significant land use and transportation issue. As can be seen in the photo above, the area also lacks sidewalks and the existing land use pattern does not encourage pedestrian or bicycle travel. The consultant team identified an additional issue for the area relating to several large parcels of undeveloped land located in the rear of the Stateline Shopping Center.

4.2.1 Existing Land Use and Transportation Conditions

The Tappan Neighborhood Area is the most residential portion of the Route 303 corridor. This neighborhood area contains two multi-family condominium developments, Contempra Circle and the Tappan Grammar School Condominiums. Several mid-sized (25,000 - 50,000 square-

foot) strip shopping centers, including Stateline Plaza, are located on Route 303 between Oak Tree Road and the New Jersey State Line. In general, these shopping centers are older (constructed in the 1950's) and somewhat less active commercially than those located further north in the other neighborhood areas of the Route 303 study area.

The proximity of this area to the Tappan Historic District along Oak Tree Road and the presence of the DeWint House on Livingston Street were also noted by CAC and Neighborhood Committee members as important features that define the historic character of this area. Neighborhood residents have also expressed serious concerns about the heavy traffic volume on Livingston Street and its impact on their personal safety and quality of life.

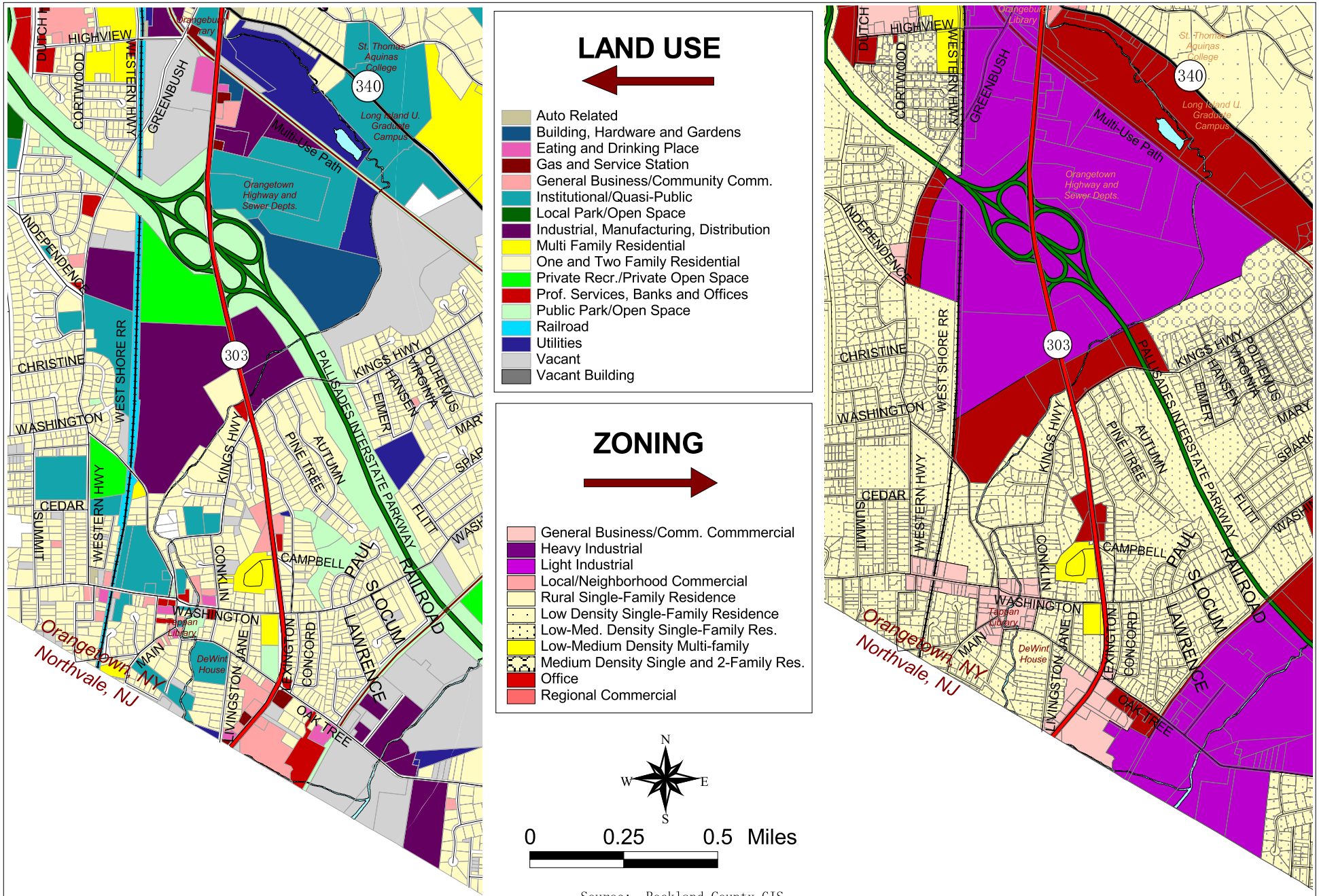
Figure 4.2 illustrates the existing land use and zoning patterns in the Tappan Neighborhood Area. As noted above, the Tappan Neighborhood is largely a residential area with a narrow (100 – 400 foot) strip of commercial uses abutting Route 303. Many of the parallel streets to Route 303, such as Livingston Street and Lexington Avenue, experience problems with cut-through traffic and significantly higher traffic volumes and speeds than would be expected for local streets of their width and classification.

In the Tappan neighborhood, Route 303 is a 4-lane, undivided arterial highway with travel lanes between ten and twelve feet wide. At the southern end of the corridor – at the New Jersey State Line – a transition is made between the 4-lane cross-section in New York State and a 2-lane cross-section in New Jersey.

In this portion of the study area, only very limited roadway sections provide sidewalks and paved shoulders. In most areas, such as the segment south of Oak Tree Road, partial curbing or an irregular shoulder is provided. In many portions of the Tappan Neighborhood, roadway shoulders along Route 303 are poorly defined, and can be as little as two feet wide. Few corridor intersections provide pedestrian signals, crosswalks or ramps, making the corridor an uninviting and potentially unsafe location for pedestrian and bicycle travel. The speed limit on Route 303 is 35 miles per hour from the Campbell Street/Contempra Circle intersection south to the New Jersey State line and 40 miles per hour north of Campbell Street.

Signalized intersections with Route 303 are located at two locations in the Tappan neighborhood – at Oak Tree Road and King's Highway South. Neither of these intersections has a left-turn lane, and King's Highway South is the only intersection within the Tappan neighborhood that has a protected left turn signal phase (where oncoming traffic movements are stopped to provide a safer and easier left turn). The remaining intersections and driveways are unsignalized, with minor street traffic controlled by "stop" signs. Route 303 has an overpass at Washington Street, and no access between the two roads is provided.

The interchange between the Palisades Interstate Parkway (PIP) and Route 303 is a full cloverleaf interchange. Due to the short ramp lengths and tight curves on the cloverleaf, for traffic entering the PIP from Route 303, deceleration must occur in the travel lanes of Route 303. This problem has been noted for traffic on northbound Route 303 accessing the PIP northbound and for southbound traffic on Route 303 accessing the PIP southbound. All other movements provide some acceleration and deceleration lanes in addition to the regular travel lanes, with the



Source: Rockland County GIS

Tappan Neighborhood Land Use and Zoning

Route 303 Sustainable Development Study

WILBUR SMITH ASSOCIATES

FIGURE 4.2

exception of the southbound PIP to southbound Route 303, which has a "stop" sign at the end of its ramp. "Yield" signs control all other PIP exiting ramps.

4.2.2 Neighborhood Issues

In the Tappan neighborhood, Route 303 through-traffic frequently conflicts with traffic bound for local destinations such as retail business, offices and schools. The neighborhood boundary and specific neighborhood concerns voiced at CAC and Neighborhood meetings are illustrated in Figure 4.3. These concerns included:

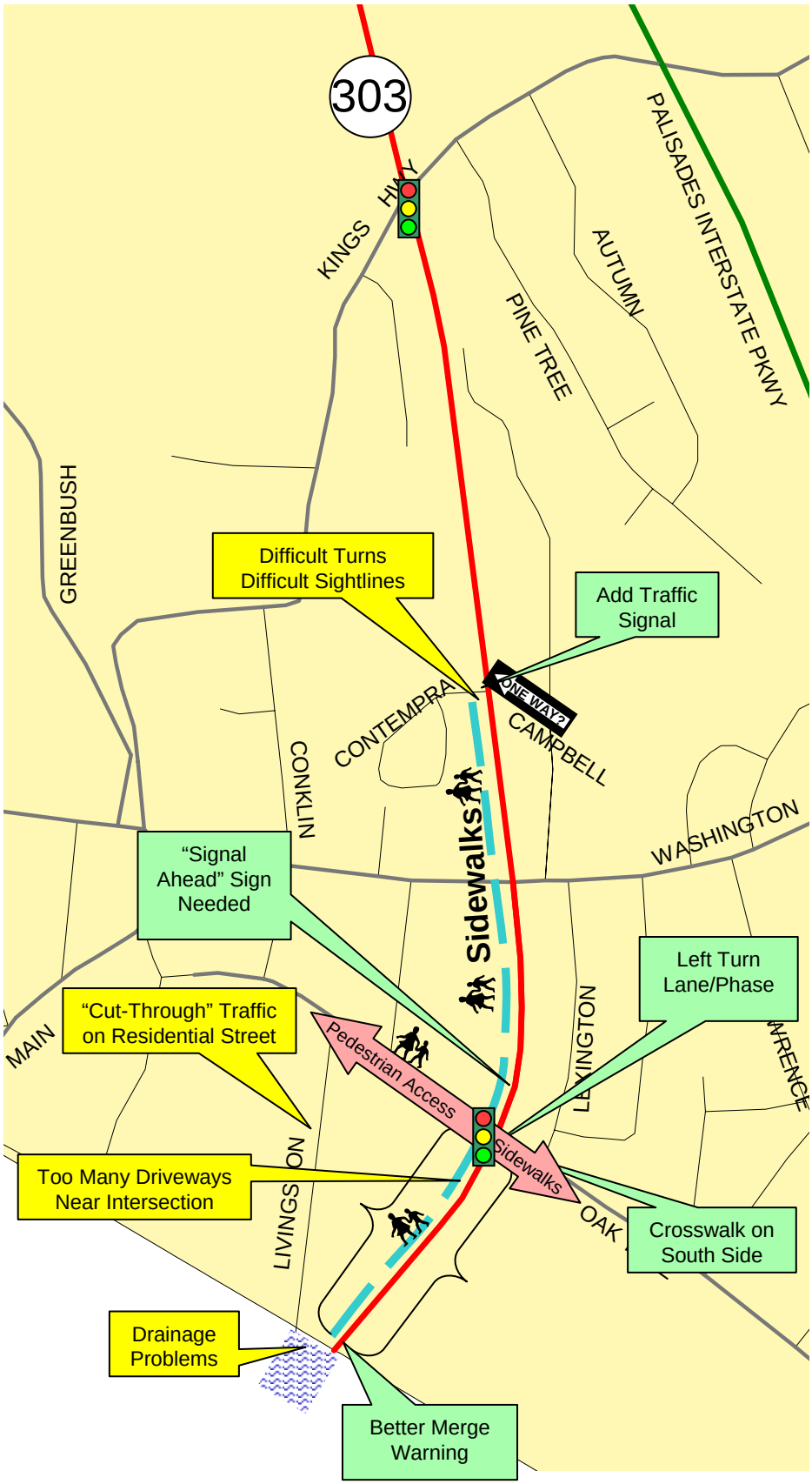
- Traffic safety problems, congestion and delay experienced in making left turns to and from Route 303 from intersecting streets, such as King's Highway South; Campbell Street; Contempra Circle; and Oak Tree Road;
- Future types of commercial development potential for properties adjacent to the PIP;
- Traffic safety concern due to the large number of driveways and access points in the commercial area south of Oak Tree Road;
- Vacancy in commercial properties south of Oak Tree Road; and
- Street sign visibility and type.

4.2.3 Alternatives Analysis

In the section south of Oak Tree Road, many CAC members and neighborhood residents expressed a desire to see average travel speed reduced and to have a narrower cross section for the roadway, while still providing access for local businesses. In the section of Route 303 north of Oak Tree Road to the PIP interchange, residents of the surrounding area expressed strong concerns that the roadway not be widened due to the limited existing right-of-way width and the proximity of the roadway to homes and businesses. The alternatives that follow reflect these concerns.

New Jersey State Line to Oak Tree Road – For the southernmost corridor segment, from the New Jersey State Line to Oak Tree Road, the selected alternative is a two-lane alignment in place of the existing four-lane cross-section. As shown in Figure 4.4, the two travel lanes would be 12 feet wide, with eight-foot shoulders on either side of the roadway, and, initially, a 12-foot wide Center Left Turn Lane (CLTL) with a planted grass strip separating the paved roadway area from sidewalks and providing additional taper/throat area for curb cuts.

Improved crosswalks and sidewalks would be installed where these features are currently absent or deteriorated. Initially, a continuous CLTL would be planned for intermediate implementation. For the longer term, a raised median with left-turn openings and a left-turn lane at Oak Tree Road would be proposed. The raised median alternative will be considered only if aggressive access management could be implemented reducing the number of curb cuts and providing appropriate driveway spacing. As shown in Figure A-1 in Appendix A, at the intersection of Oak Tree Road and Route 303, a widening would be needed to the south to accommodate a turning lane. It appears that this can be accomplished without impacting any existing structures.



CAC IDENTIFIED ISSUES FOR TAPPAN NEIGHBOR-HOOD

General Issues

Safety
Speed
Increase Police
Maintain Character
Protect Property
Minimize Widening
Control Truck Growth
Open Space Preservation
Lanes Too Narrow
For Trucks
Larger Street Signs
Beautify Road / Businesses

N
W E
S

0 0.04 0.08 0.12 Miles

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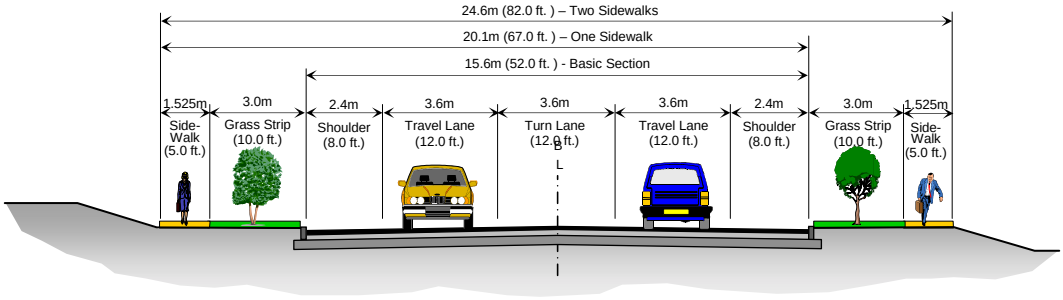
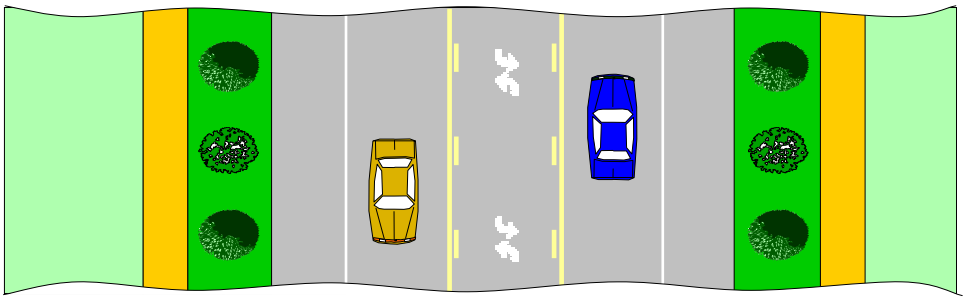
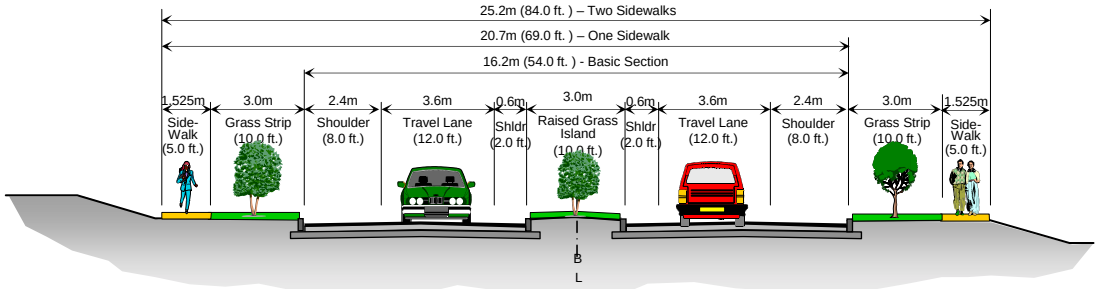
FIGURE 4.3



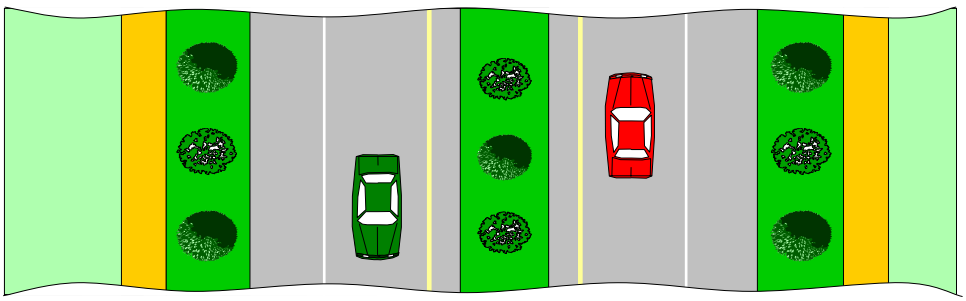
2 LANE UNDIVIDED WITH CLTL



State Line to Oak Tree Road



2 LANE WITH RAISED MEDIAN



State Line to Oak Tree Road

STATE LINE TO OAK TREE ROAD CONCEPTUAL CROSS SECTION ALTERNATIVE

Route 303 Sustainable Development Study

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FIGURE 4.4

This low-level aerial photograph of the intersection of Oak Tree Road with Route 303 at the southern end of the Route 303 study area illustrates the diversity of land uses, as well as the difficult transportation choices faced within the defined study area. Existing commercial development requires low-level old strip development with multiple curb cuts, while adjacent residences are faced with the traffic congestion, truck traffic, high traffic speeds, and a high rate of traffic accidents.

Oak Tree Road Intersection Alternatives **–** Two Neighborhood Area concepts, Basic Improvements and Enhanced, were considered. The Basic Improvements package consists of the addition of turning lanes, sidewalks and crosswalks, as noted above. The Enhanced concept incorporates a more limited rearrangement of commercial space in relationship to roadway access (with new access points developed away from Route 303), rather than a significantly higher level of development. However, considerable additional site planning would be needed before the Town takes action regarding these options. Where multiple commercial driveways serve the same business property, some driveways can be closed or modified as part of an overall access management plan for the corridor to reduce the number of potential traffic conflicts.

Figure 4.5 illustrates the potential to add landscaping and to undertake a limited amount of access management and driveway consolidation in order to enhance the appearance of the commercial district and to buffer the commercial area from adjacent residences. The participants of the third charrette also favored additional development of non-retail commercial uses that could take place outside of the defined neighborhood areas. Strip retail development would be discouraged through modification of zoning.

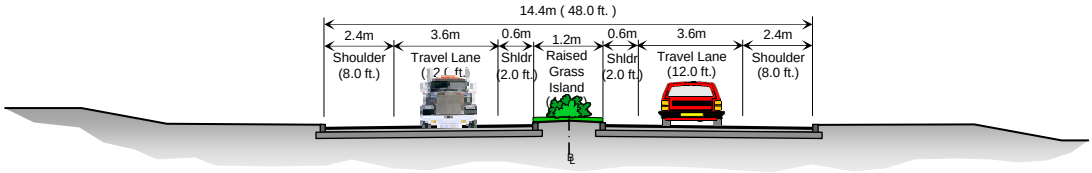
Oak Tree Road to King's Highway South - The preferred roadway cross section for this segment, as shown in Figure 4.6, is a two-lane configuration with a minimum four-foot wide raised median and shoulders adjacent to the travel lanes. Left turn lanes and median breaks would be incorporated into the design for segments with a raised median. While additional sidewalks should be incorporated into this segment, the CAC could not arrive at a consensus

ENHANCEMENT CONCEPT
TAPPAN NEIGHBORHOOD CENTER

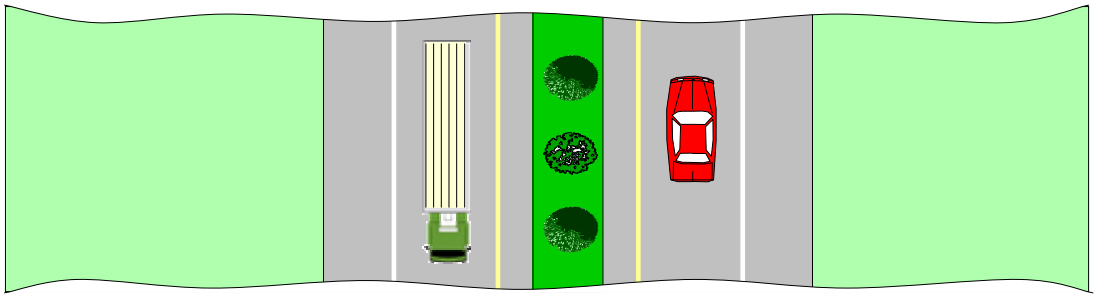
Route 303 Sustainable Development Study

Wilbur Smith Associates

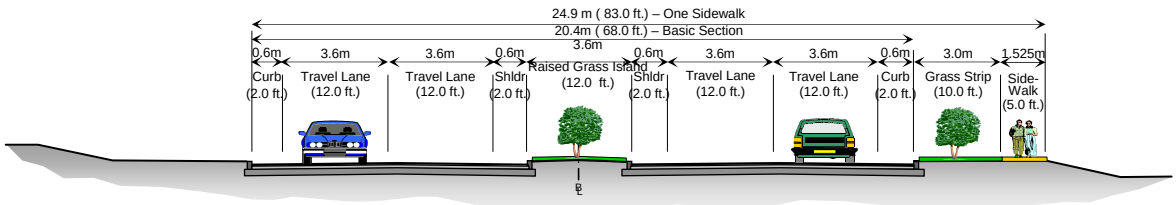
Figure 4.5



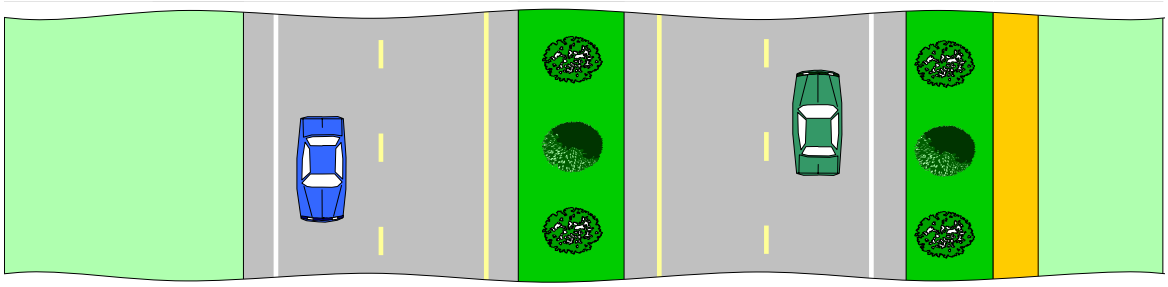
2 LANE DIVIDED



Oak Tree Road to
Kings Highway South



4 LANE DIVIDED



Kings Highway South to Orangeburg Road

OAK TREE ROAD TO ORANGEBURG ROAD
CONCEPTUAL CROSS SECTION ALTERNATIVE

Route 303 Sustainable Development Study

regarding the termini or side of the road on which sidewalks should be located. Restrictive bridge widths might suggest that sidewalks would be limited to only one side of the roadway or alternatively pedestrians routed off of Route 303 between Campbell Avenue and Oak Tree Road.

King's Highway South Intersection - Roundabout - As illustrated in Figure A-2 in Appendix A, a modern roundabout concept in place of the existing signalized intersection at Route 303 and King's Highway South was the selected alternative for this intersection. The roundabout as conceptualized would have a diameter of 162 feet – adequate to accommodate semi-trailer trucks. The roundabout's angle of deflection forces vehicles to slow down, but not to stop to maneuver around the roundabout. With the radius illustrated in the design, traffic would move through at between 15 and 20 m.p.h., and the roundabout could accommodate anticipated truck traffic. During CAC meetings, concern was expressed about the suitability of roundabout application in this corridor. Prior to design and implementation, further consideration needs to be given to the operations and safety of a roundabout at Route 303 and King's Highway South.

4.3 Orangeburg/Blauvelt Neighborhood Concept Plan

4.3.1 Existing Land Use and Transportation Conditions

The Orangeburg/ Blauvelt area includes several smaller concentrations of commercial uses, such as neighborhood-oriented stores, restaurants and local services (banks, professional offices, personal services, etc.) at King's Highway North, Erie Street and Mountainview Road. As is the case in Tappan, many of the commercial buildings date from the 1950's and 1960's and may become candidates for redevelopment within the next ten to twenty years.

A number of homes are located within walking distance of the corridor, particularly along Greenbush Road and on the side streets intersecting Route 303 and Western Highway.

In the vicinity of the Orangetown Town Hall, the Prel Plaza shopping center, the C-Town shopping center, and the 131-unit Prel Gardens condominium form a nucleus for pedestrian-oriented development.

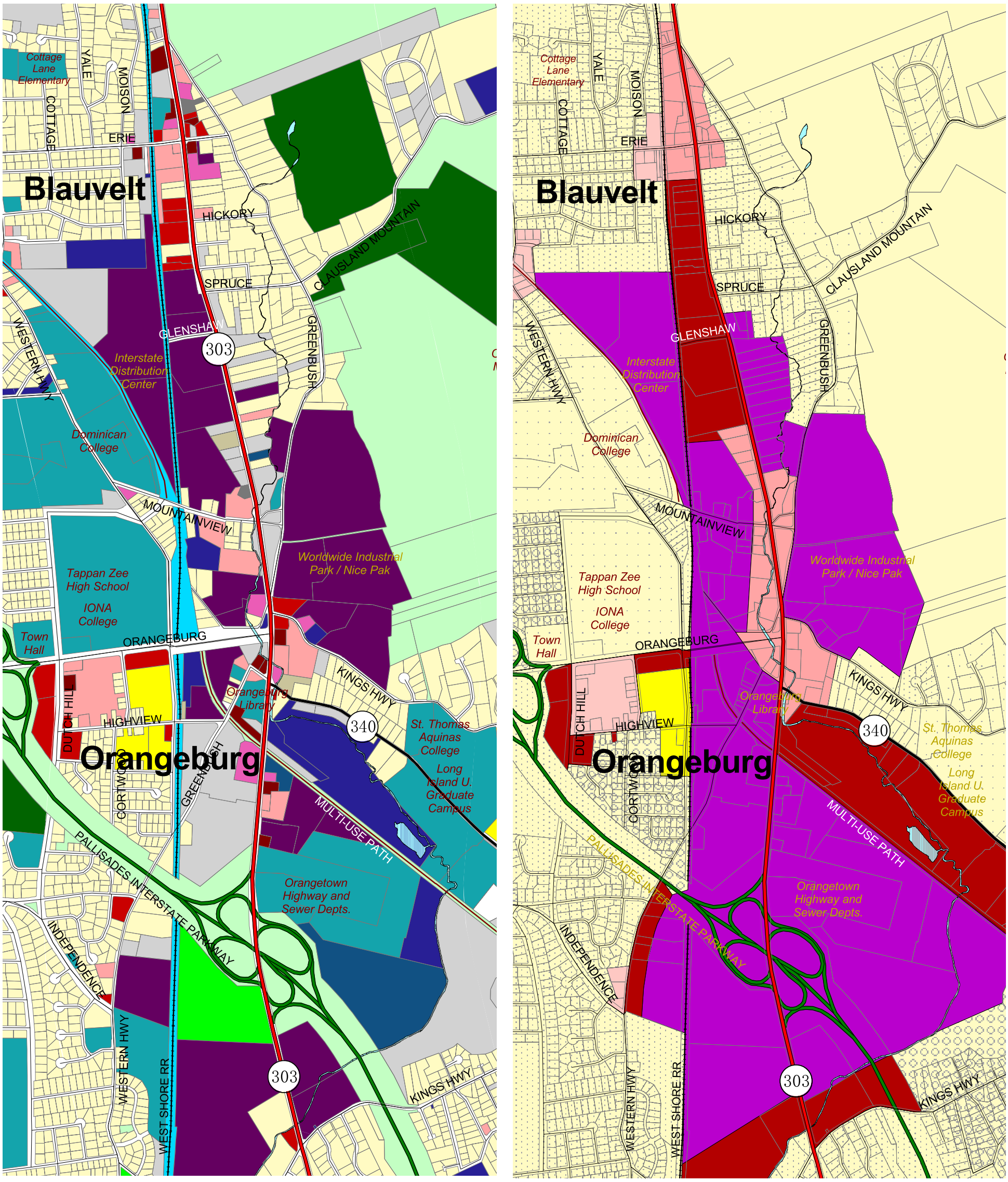
This map of the intersection of Route 303 and Erie Street in the Blauvelt section of the corridor illustrates the relationship between the roadway system, commercial buildings and their associated parking lots.

Figure 4.7 illustrates the current land use and zoning characteristics for the Orangeburg neighborhood area.

Two educational and institutional concentrations are located to the west and one to the east of this segment of Route 303. One of these is the area centered on the Orangetown Town Hall area at the intersection of Orangeburg Road and Dutch Hill Road. This area contains the Tappan Zee High School building on the north side of Orangeburg Road, the Rockland County campus of Iona College, and a portion of the Dominican College campus on the east side of Dutch Hill Road.

The Rockland Psychiatric Center property is located just outside the primary study area to the west between Orangeburg Road in the south and Convent Road in the north. The St. Thomas Aquinas College (STAC) campus on the east side of Route 303 along Route 340 constitutes the second educational concentration.

The views of the Clausland Mountain Park from Route 303 and Orangeburg Road, the natural streambed of the Sparkill and the J.B. Clark (Orangetown) Rail Trail were noted throughout the course of the public outreach process as important natural and recreational assets for this area. The J.B. Clark Rail Trail will be improved as part of the Palisades Trailway Project. An at-grade signalized crossing or a bridge over Route 303 are also under study in this section.



Orangeburg / Blauvelt Neighborhood Land Use and Zoning

WILBUR SMITH ASSOCIATES

Route 303 Sustainable Development Study

FIGURE 4.7

This aerial overview of the Orangeburg Road intersection with Route 303 illustrates several open space opportunities, including the Sparkill streambed and the Camp Shanks Museum and Orangetown library.

In the southern portion of the Orangeburg neighborhood area, Daimler-Chrysler Corporation has a large campus-type office and distribution center located south of the Palisades Parkway interchange. Other corporate and industrial facilities are also located in the area between Route 340 and King's Highway South. Additional vacant and publicly-owned properties within this portion of the study area include the former Orangeburg Pipe site on the west side of Route 303, the U.S. Army Reserve property located south of Route 340, and the Orangetown Department of Public Works property in the vicinity of the Palisades Parkway interchange with Route 303. There is also a significant amount of New York State-owned land including the Palisades Parkway right-of-way and buffer areas. Through the public outreach process, it was determined that a Town of Orangetown property in the vicinity of the PIP interchange may provide opportunities for future development of a variety of land uses, as well as open space preservation and enhancement.

4.3.2 Neighborhood Issues

In the Orangeburg neighborhood, Route 303 through-traffic frequently conflicts with traffic bound for local destinations such as retail business, government offices, schools, and others. The following specific concerns were voiced in neighborhood meetings, and are summarized in Figure 4.8:

- Traffic safety problems, congestion and delay experienced in making left turns to and from Route 303 from major intersecting streets, such as:
  - Erie Street,

- Mountainview Road,
- King's Highway North,
- Orangeburg Road, and
- Route 340;

- Traffic tie-ups on Route 303 and Erie Street related to the railroad grade crossing;

- Safety problems associated with traffic pulling into and out of driveways and side streets;

- Pedestrian and bicycle safety issues at the future Erie rail-trail crossing of Route 303 in the vicinity of Route 340; and

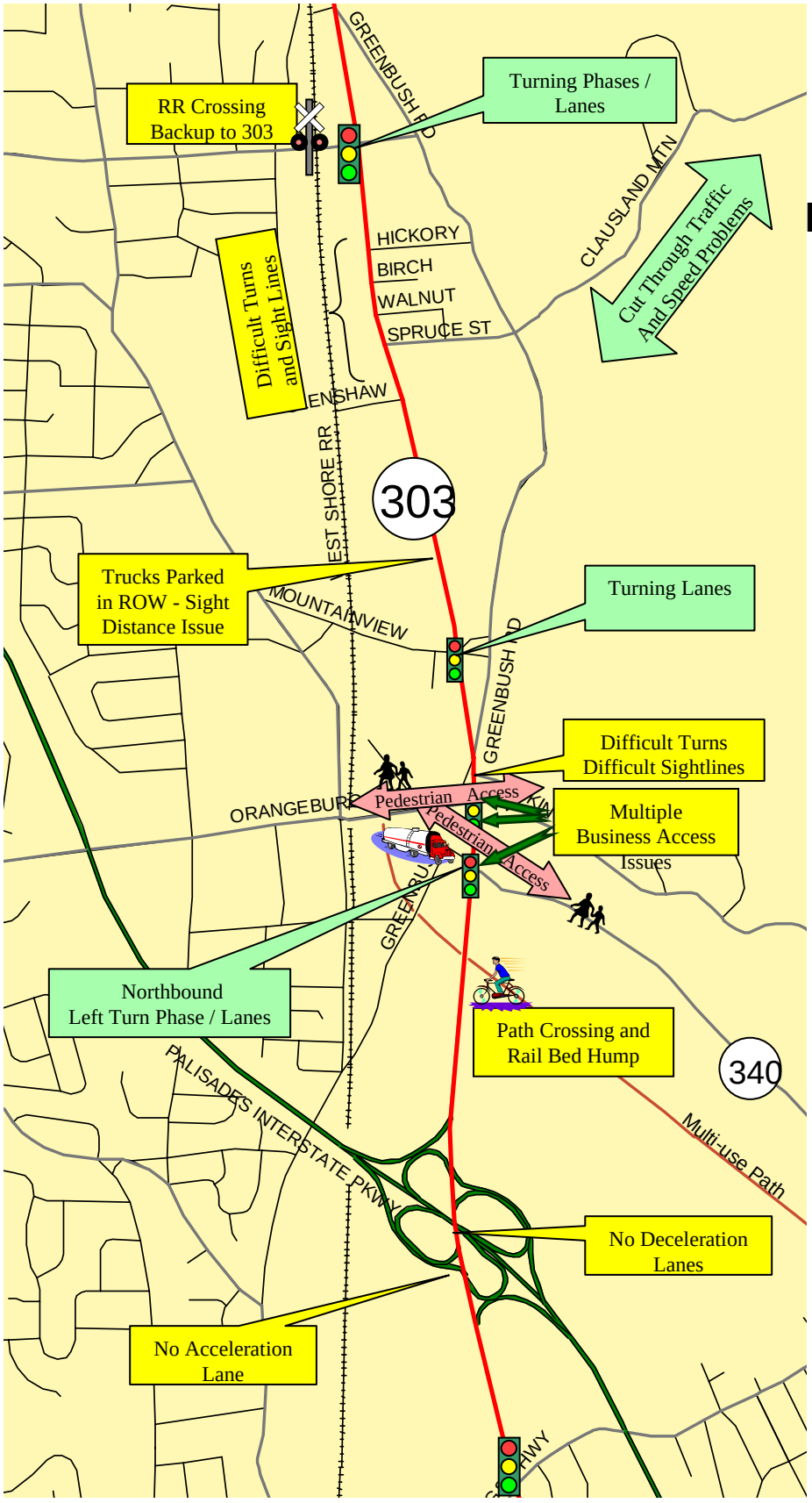
- Street sign visibility and type.

4.3.3 Alternatives Analysis

In response to CAC and resident concerns regarding the lack of community character for the area immediately surrounding the Route 303 intersection with Route 340 and with Orangeburg Road, several alternative street patterns were evaluated to create opportunities for open space enhancement, as well as the potential for neighborhood oriented retail development.

King's Highway South to Orangeburg Road - As was shown in Figure 4.6, the preferred alternative for this segment incorporates a four-lane cross section, with curbs and a raised median, in place of the existing four-lane undivided configuration. The raised median has been kept to a width of fourteen feet in order to reduce the amount of right-of-way required, but accommodates plantings and a suitable gateway treatment for entry into Tappan and Orangeburg Neighborhoods. Additional sidewalks, crosswalks and curb section would be implemented in this segment in keeping with its more intensive existing level of development and the future implementation of a Village Center concept for this area.

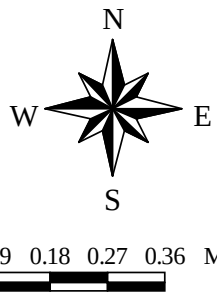
Route 340 and Orangeburg Road Intersection Alternatives - As shown in Figures A-3 and A-4 in Appendix A, the preferred alternatives for these two intersections were a phased implementation of Basic Improvements (additional turn lanes) and an Expanded concept (shown



CAC IDENTIFIED ISSUES: ORANGEBURG BLAUVELT AREA

General Issues

- Safety
- Speed
- Multiple Left Turns / Left Turn Lane
- Access Management
- Increase Police
- Maintain Character
- Beautification
- Protect Property
- Cluster Development
- Minimize Widening
- Control Truck Growth
- Open Space Preservation
- Lanes Too Narrow For Trucks
- Raised Pavement Markers
- Larger Street Signs
- Sidewalks
- Lighting



Route 303 Sustainable Development Study

WILBUR SMITH ASSOCIATES

FIGURE 4.8

in Figure 4.9) to re-align the Orangeburg Road area so that Orangeburg Road intersects with Route 340 at a four-way intersection, in place of the two closely spaced "T" intersections that currently exist. Further study of these concepts is recommended to assess development and site planning opportunities.

The Enhanced Orangeburg Village concept (Figure 4.10) would allow the creation of a park area within the center of the Town, incorporating the Sparkill as an important element in its design.

Orangeburg Neighborhood Area Roadway Re-alignment Concepts – Two concepts are proposed for the Orangeburg Neighborhood Area. While both concepts consist of bringing Orangeburg Road opposite Route 340 to form a four-way signalized intersection – the first includes a supplementary Connector Road and the second does not.

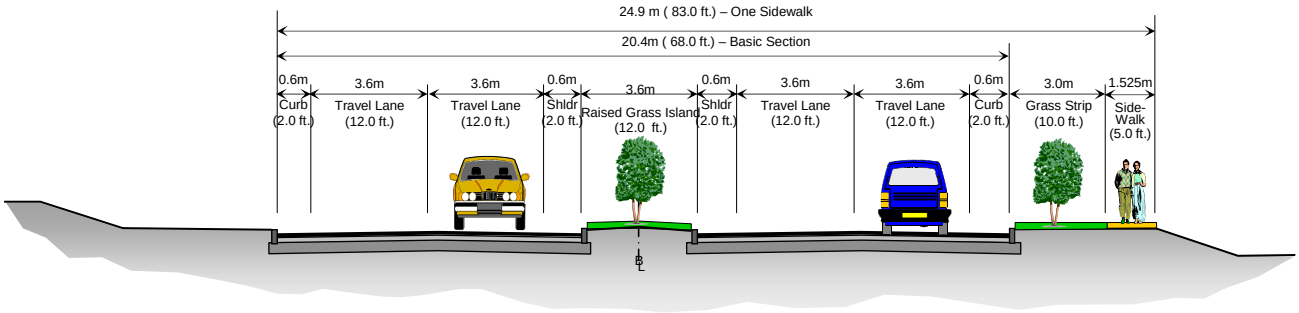
Concept 1 – Re-alignment with a Connector Road - As shown in Figure 4.11, a realignment alternative was considered to bring Orangeburg Road opposite Route 340. In order to prohibit left turn movements from Orangeburg Road to Route 303 at the newly constructed Route 303 and Route 340/Orangeburg Road intersection, a Connector Road was evaluated between Orangeburg Road and Route 303. The Connector Road will intersect Route 303 opposite King's Highway North to form a four-way signalized intersection.

The intersection of Route 303 and Orangeburg Road/Route 340 will consist of a five-lane section along Route 303 with an exclusive left turn lane in the northbound and southbound directions. In the eastbound direction, Orangeburg Road will consist of a through and a right turn lane. In the westbound direction, Route 340 will consist of an exclusive left turn lane, a through lane, and an exclusive right turn lane.

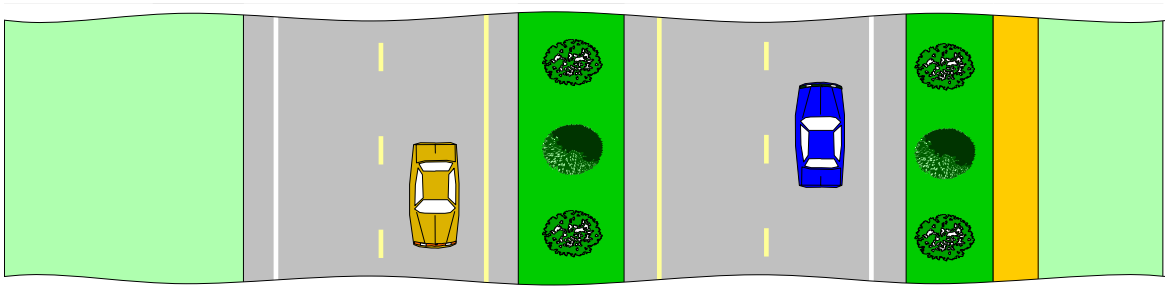
The intersection of Route 303 and King's Highway North/Connector Road will consist of a five-lane section along Route 303 with exclusive left turn lanes in the northbound and southbound directions. In the eastbound direction, the Connector Road has two left turn lanes, and a through lane shared with a right turn movement. In the westbound direction, King's Highway North has a shared left and through movement and an exclusive right turn movement at the intersection.

The intersection of Orangeburg Road and the proposed Connector Road in the eastbound direction along Orangeburg Road consists of an exclusive left turn lane and a through lane and in the westbound direction consists of a through lane and an exclusive right turn lane. In the southbound direction, the Connector Road consists of an exclusive left and right turn lane at the intersection. Old Orangeburg Road could be realigned and grade separated from Orangeburg Road.

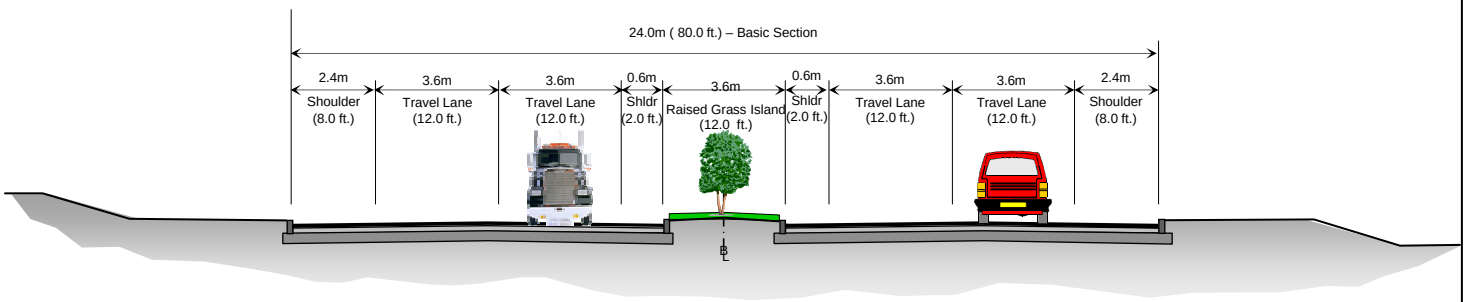
The intersections of Route 303 with Orangeburg Road and Route 340 currently operate at LOS F and D respectively; with the proposed realignment of Orangeburg Road, the intersection is projected to operate at an LOS C in 2020. The intersection of Route 303 with King's Highway North currently (2000) operates at LOS F and is projected to operate at LOS D in 2020. The intersection of Orangeburg Road and Connector Road, which would be constructed under this alternative, would operate at LOS B in the future.



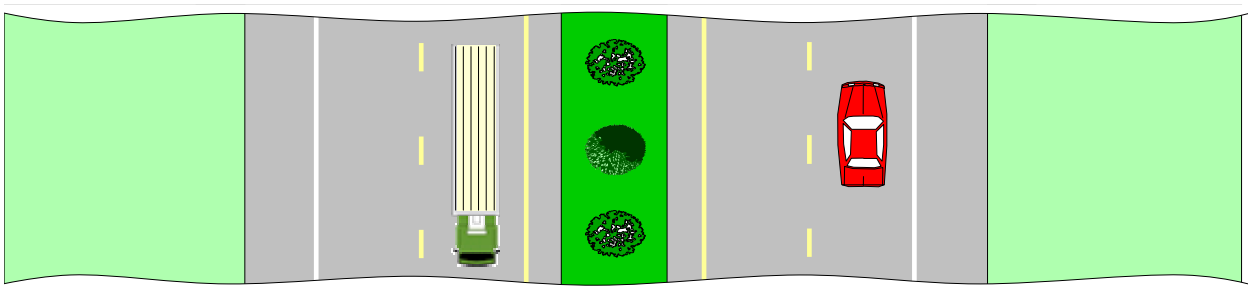
4 LANE DIVIDED



Orangeburg Road to Erie Street



4 LANE DIVIDED



Erie Street to Clarkstown Town Line

ORANGEBURG ROAD TO ERIE STREET & ERIE STREET TO CLARKSTOWN TOWN LINE CONCEPTUAL CROSS SECTION ALTERNATIVE

ENHANCEMENT CONCEPT
ORANGEBURG VILLAGE CENTER

Route 303 Sustainable Development Study

Wilbur Smith Associates

Figure 4.10

ENHANCEMENT CONCEPT ROUTE 303 AND ROUTE 340 / ORANGEBURG RD.

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE 4.11

Concept 2 – Re-alignment without a Connector Road - The second concept does not include the construction of the Connector Road between Orangeburg Road and King's Highway North. Therefore, under this concept, the intersection of Route 303 with Orangeburg Road and Route 340 requires additional lanes on all approaches due to the magnitude of traffic volumes being served at this intersection.

The lane arrangement in the eastbound direction along Orangeburg Road will consist of dual left turn lanes, a through lane, and an exclusive right turn lane. In the westbound direction along Route 340, an exclusive left turn lane, a through lane, and an exclusive right turn lane are required with this intersection configuration.

In the northbound direction along Route 303, an exclusive left turn lane, two through lanes, and a shared through and right turn lane are required, while, in the southbound direction, an exclusive left turn lane, two through lanes, and an exclusive right turn lane are required at this intersection.

The alternative incorporating the connector road would include the following benefits:

- A smaller intersection at Route 303/340 and Orangeburg Road;
- Improved access on Greenbush Road for local business;
- Reduced Cross Section on Orangeburg Road from Four to Two through lanes;
- Improved circulation in the Village Center; and
- Enhanced treatment for the Sparkill

Mountainview Road Intersection Improvements - As shown in Figure A-5 in Appendix A, a package of basic improvements including northbound and southbound left turn lanes for Route 303 has been selected for this intersection. In addition, this would be the northern terminus for the Sparkill Greenway and therefore should provide for pedestrian and bicycle circulation.

Orangeburg Road to Erie Street - A similar cross section is suggested for this segment – four 12-foot travel lanes with a fourteen-foot raised, planted median, curbs, and the development of additional sidewalks and crosswalks (see Figure 4.10).

Erie Street Intersection Alternatives - As shown in Figure A-6 in Appendix A, the preferred alternative for the Erie Street neighborhood area located at the intersection of Erie Street and Route 303 includes a left turn lane from Route 303 northbound to Erie Street westbound, as well as additional queue storage for the railroad grade crossing at Erie Street. The Erie Street Expanded option proposed for this intersection offers the opportunity to better screen the adjacent residences from Route 303 traffic and development, and can also offer additional access points off of Route 303 to reduce the number of turning movements that must be made on Route 303.

4.4 Bradley Parkway/Greenbush Road Neighborhood Concept Plan

4.4.1 Existing Land Use & Transportation Conditions

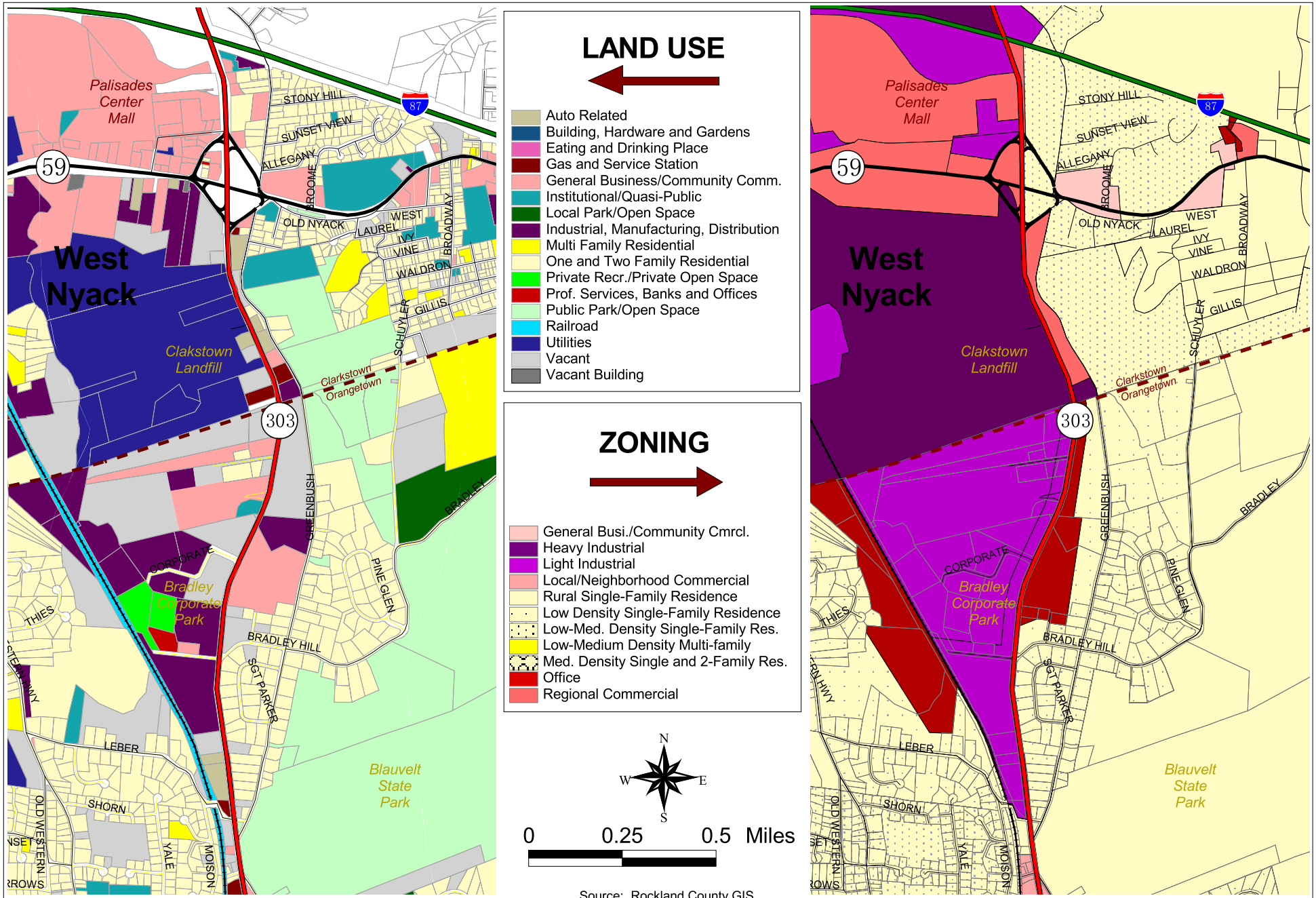
Along Route 303, this area is predominantly commercial, with several large corporate office buildings and industrial facilities, as well as the Bradley Corporate Park and the Xerox Corporation property. These facilities account for approximately two million square feet of commercial space, and constitute the majority of non-retail commercial space within the corridor. Tenants of Bradley Corporate Park are primarily firms involved in distribution, marketing, research and development. The current land use and zoning for the Bradley Parkway neighborhood are illustrated in Figure 4.12.

A significant number of homes are located just off Route 303 along Greenbush Road and several side streets to the east of Route 303, as well as to the west of Route 303 along Leber Road and in the vicinity of Cottage Lane Elementary School south to Erie Street. Concerns have been expressed regarding the potential for additional commercial development that may cause traffic and environmental impacts on adjacent residential areas in these two areas. In addition, apparent violations of existing zoning landscape buffer requirements and use of buffer areas and roadway shoulders for commercial activity have been noted by CAC members and members of the Planning Board.

This composite aerial map of the Bradley Parkway intersection with Route 303 demonstrates the differing land use characteristics of the area, with both corporate/industrial uses near the top of the illustration, and residential uses near the bottom.

4.4.2 Neighborhood Issues

Bradley Parkway residents and business owners face the double challenge of residing and working within an area of mixed land use next to the busiest segment of Route 303. Concerns reflected this difficult position. Neighborhood issues for the Bradley Parkway area are summarized in Figure 4.13. Some of the specific concerns included:



Bradley Parkway Neighborhood Land Use and Zoning

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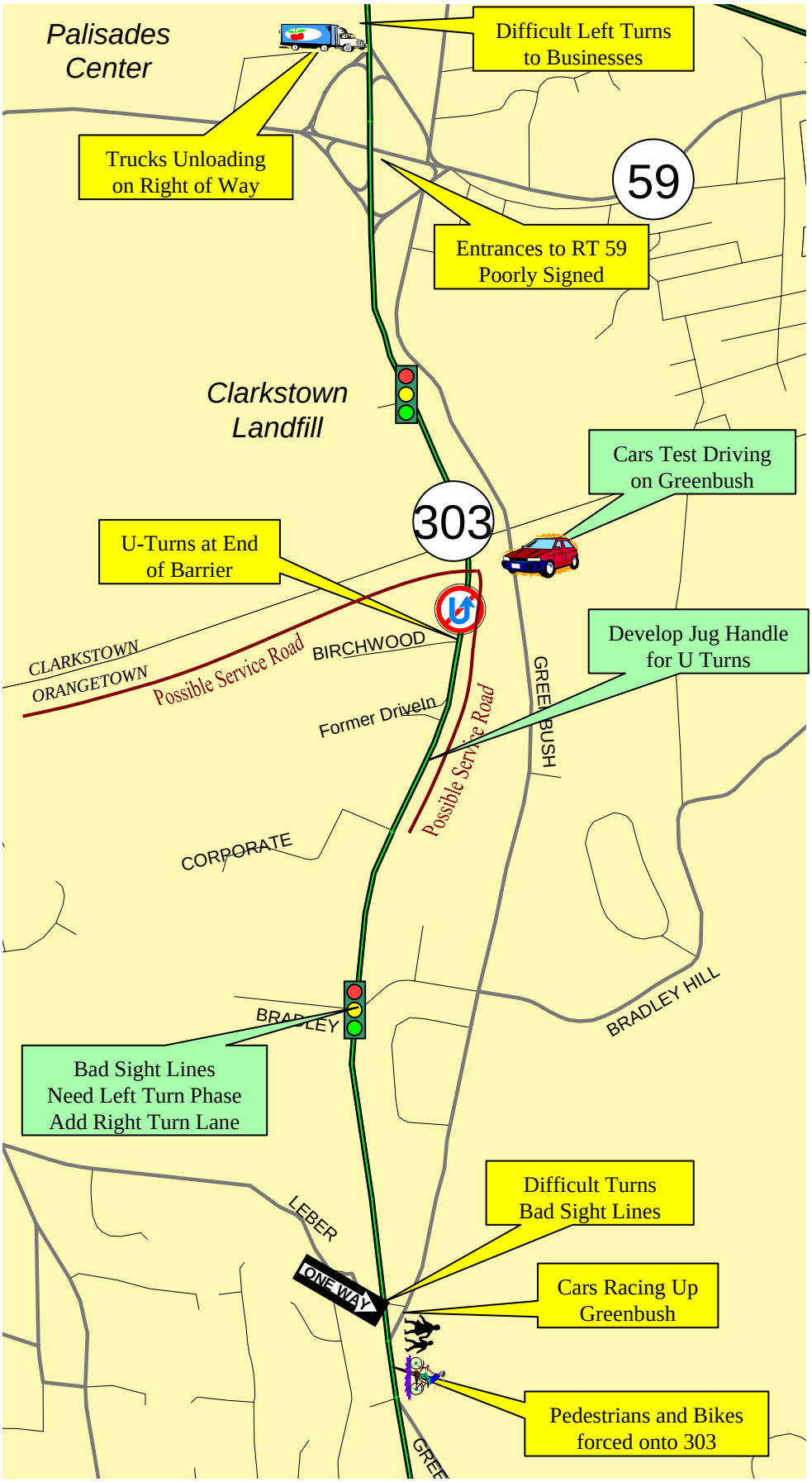
Route 303 Sustainable Development Study

FIGURE 4.12



CURRENT ISSUES: BRADLEY PARKWAY AREA

General Issues:

Safety
Speed – Lower Limit
Increase Police
Add a U-Turn Jug Handle
Control Truck Growth
Open Space Preservation
Development Already Saturated
Ban Through Trucks
Lanes Too Narrow For Trucks
Roadway Lighting
Aesthetic Improvements
Add Sidewalks
Median in Road
Add Noise Barriers Near Residences

N
W E
S

0 0.08 0.16 0.24 0.32 Miles

Route 303 Sustainable Development Study

WILBUR SMITH ASSOCIATES

FIGURE 4.13

- High volume of truck traffic;
- High travel speeds;
- Traffic safety issues associated with the transition from a divided to an undivided highway cross section;
- Unauthorized and illegal truck activities, such as unloading of car-carrier trucks and parking of trucks at the side of the road, within the Route 303 right-of-way;
- Possible ambiguity of existing zoning relating to permitted locations for additional commercial development and buffering requirements; and
- Noise, lighting and impact of both existing and potential future commercial development along Route 303 on the quality of life in adjacent residential areas along Greenbush Road, Leber Road and other side streets.

4.4.3 Alternatives Analysis

While both a Center Left Turn Lane (CLTL) and a raised median cross-section with left turn lanes were evaluated for this segment, the raised median with u-turns was selected as the preferred alternative for the Bradley Parkway neighborhood, as shown in the area pictured in Figure 4.10. Driveway frequency and prohibition of left turns are the biggest factors in the decision whether or not to implement a CLTL in lieu of a raised median. For smaller driveways intersecting Route 303, a "right in – right out" pattern of operation is recommended. In order to accomplish this, left-turn and u-turn areas should be provided at key intersections and major driveways. Sight distance and roadway geometry are also important factors to be considered.

Bradley Parkway Intersection - As shown in Figure A-7 in Appendix A, the preferred alternative for the intersection of Bradley Parkway and Bradley Hill Road with Route 303 provides left turn lanes from Route 303 southbound and northbound, from Bradley Parkway to northbound Route 303, and from Bradley Hill Road to southbound Route 303.

5. IMPLEMENTATION STEPS

Section 4 identified recommended actions to be undertaken in the Route 303 corridor. Implementation of these actions will require planning, environmental and design processes before improvements can be constructed. Following initial planning, the process typically involves parallel environmental and design tasks. It is recommended that there be a continuing role for the CAC throughout the project development process.

The following sections describe the Route 303 Sustainable Development Study Implementation Program, December, 2002. The implementation program is summarized in Table 5-1. Section 5.1 highlights corridor-wide land use issues. Section 5.2 describes corridor-wide transportation issues. Section 5.3 identifies specific plans for each neighborhood area.

5.1 Corridor-Wide Land Use Implementation

5.1.1 Corridor-Wide Land Use: Completed and In-Progress Actions

Route 303 Overlay Zone **-** Creation of the Route 303 Overlay Zone was identified as an early-action recommendation for the Town of Orangetown since it clearly established a directive to guide development in the corridor as a free-standing legislative action that did not involve substantive amendments to town-wide zoning.

The Town of Orangetown determined that an overlay zone would best implement some of the Route 303 Sustainable Development Study's recommendations and meet environmental, aesthetic and character issues of the corridor. As the name implies, overlay zoning districts are mapped districts that are placed on top, or over, existing base zoning districts established by the Town of Orangetown. In this manner, the base zoning that defines where commercial, residential, and retail uses are allowed remains the same as with current zoning. However, the overlay regulations provide an opportunity to augment or supercede the underlying zoning regulations.

The Overlay Zone was also designed to encourage land use decision-making in accordance with public interest, protection of property rights and the public good and applicable laws of the State of New York. Furthermore, it aims to provide for the economic, social, and aesthetic advantages of orderly development through harmonious groupings of compatible and complementary land uses and the application of appropriate development standards.

The overlay zoning district provides for supplemental land development regulations that supercede the relevant provisions of the underlying zoning. The Route 303 Corridor Overlay District ("The District") is a zoning district enumerated in §2.1 of the Orangetown Zoning Code (Establishment of districts). Since overlay zoning is a "mapped" district, the zoning amendment text includes provisions that are similar to all zoning initiatives. The amendment defines the boundaries of the land area included in the district, provides background and history leading to legislative action, summarizes the legislative intent of the zoning district, provides applicability criteria, and spells out the specific regulatory provisions of the zoning district.

THE ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY IMPLEMENTATION PROGRAM, December, 2002

	CORRIDOR WIDE IMPROVEMENTS	COMPLETED	IN-PROGRESS	SHORT-TERM	MID-TERM	LONG-TERM	NOTES
	LAND USE			**2003-2005**	**2005-2010**	**Post 2010**	
1	Overlay Zone	Created and Enacted		Analyze Impacts			
2	Bike Trail, Rail Trail, Pedestrian Path		Develop Plan	Implement Plan	Implement Plan	Implement Plan	Collaborate with County, NYSDOT, and NYMTC
3	Hamlet Center Guidelines			Develop Plan	Implement Plan	Implement Plan	
4	Townwide Open Space Plan	Plan Development	Implement Plan	Implement Plan	Implement Plan	Implement Plan	Integrate into Comprehensive Plan
5	Parcels in More Than One Zoning District		Identify Parcels	Implement Plan	Implement Plan	Implement Plan	Additional Parcels have been identified
6	Business Improvement District (BID)			Develop Plan	Implement Plan	Implement Plan	Town Wide Comprehensive Plan, Explore Funding Options
7	Rockland Psychiatric Center		Under Study	Develop Plan	Implement Plan	Implement Plan	Study of Traffic Impacts
8	Sparkill Creek Management Plan			Develop Plan	Implement Plan	Implement Plan	C.E.A. Designation, Watershed Mgmt Plan, RCDA Collaboration
9	Ridgeline Protection Regulation			Develop Plan	Implement Plan	Implement Plan	
	TRANSPORTATION						
10	Access Management Projects -Shared Driveways; Driveway Signage; Medians; Etc.,		Applied for Funding	Develop Plan	Implement Plan	Implement Plan	Quality Community Grant Program
11	Transit and Transportation Demand Mangement (TDM) Strategies			Develop Plan	Implement Plan	Implement Plan	
12	Traffic Calming Techniques for Residential Areas		Analysis	Implement Plan	Implement Plan	Implement Plan	
13	Passenger Service on the West Shore/Northern Branch Train Line including Passenger Stations			Evaluate Impacts	Mitigate Impacts	Mitigate Impacts	
14	Truck Parking Restrictions		Develop Plan	Implement Plan	Implement Plan	Implement Plan	

THE ROUTE 303 SUSTAINABLE DEVELOPMENT STUDY IMPLEMENTATION PROGRAM, December, 2002

	NEIGHBORHOOD AREA IMPROVEMENTS	COMPLETED	IN-PROGRESS	SHORT-TERM	MID-TERM	LONG-TERM	NOTES
	TAPPAN - Kings Highway to NJ State Line			**2003-2005**	**2005-2010**	**Post 2010**	
15	Interim Improvements: NJ State Line to Cambell Ave. Oak Tree Rd Intersection (Left Hand Turn Lanes on Route 303 NB, SB and Traffic Signal Improvements, 2 to 1 lane Cambell to NJ State Line,Center Turn lane Oak Tree Rd. to NJ State Line)		Plan/Design	Construction			
16	Oak Tree Rd. at Route 303 Intersection Improvement Project: Turn Lanes, Median, Bike/Ped. Access, Transit, Landscaping/Beautification			Plan Development	Implement/Construction		
17	Kings Highway South at Route 303 Intersection Improvement Project: Roundabout or Turn Lanes, Median, Bike/Ped. Access, Transit, Landscaping/Beautification			Plan Development	Implement/Construction		
18	Signing Upgrade on Route 303: Warning, Historic Street Designation and Regulatory	Completed					
19	Speed Reduction on Route 303: Reduced Speed Limit 40-35 mph Cambell to Oak Tree Rd.	Completed					
20	Interim Landscape Project: Oak Tree Rd. to NJ State Line	Completed					
21	Corridor Landscape Project		Develop Plan	Implement Plan			
22	Brick paved sidewalk along Oak Tree Road	Completed					
23	Palisades Parkway Scenic Byway Corridor Mangement Plan		Completed	Implement Plan	Implement Plan		
24	Palisades Trailway - NJ State Line to Anthony Wayne Recreational Area		Plan Development	Implement Plan	Implement Plan		
	BLAUVELT/ORANGEBURG - Glenshaw St. to Kings Highway South						
25a	Orangeburg Transportation/Community Development Project: Reconstruction of Orangeburg Bridge and Approaches to Realign with Route 340 at Route 303. In coordination with a Multi-intersection Improvement Project on 303			Plan Development	Implement/Construction		
25b	Intersection Improvement Project 303 at 340, Orangeburg Rd., Kings Highway North, Mountainview Ave.: Turn Lanes, Median, Bike/Ped. Access, Transit, Landscaping			Plan Development	Implement/Construction		
26	Erie Street at Route 303 Intersection Improvement Project: Turn Lanes, Median, Bike/Ped. Access, Transit, Landscaping; Greater capacity for queueing at CSX Crossing			Plan Development	Implement/Construction		
27	Corridor Landscape Project		Develop Plan	Implement Plan			
28	Signing Upgrade on Route 303: Warning, Historic Street Designation and Regulatory	Completed					
29	Closure of Highview Avenue at CSX grade crossing			Study Impacts	Implement Plan	Implement Plan	
30	JB Clarke Rail Trail Crossing Alternative Study			Develop Plan	Implement Plan	Implement Plan	Bike/Ped. Activated Signal;Bike/Ped. Bridge at Grade Crossing;
31	Left Turn Signal at Route 303 and Mountainview Road	Installed					
32	Palisades Parkway Scenic Byway Corridor Mangement Plan		Completed	Implement Plan	Implement Plan		
33	Palisades Trailway - NJ State Line to Anthony Wayne Recreational Area		Plan Development	Implement Plan	Implement Plan		
34	Linking educational corridors			Develop Plan	Implement Plan	Implement Plan	
	BRADLEY PARKWAY - Route 59 to Glenshaw Street						
35	Bradley Parkway at Route 303 Intersection Improvement Project: Turn Lanes, Median, Bike/Ped. Access, Transit, Landscaping			Plan Development	Implement/Construction		
36	Corridor Landscape Project		Develop Plan	Implement Plan			
37	Signing Upgrade on Route 303: Warning, Historic Street Designation and Regulatory		Develop Plan	Implement Plan			

In summary, the overlay district text is intended to achieve three key goals:

- Provides a directive for Town decision-makers that new development in the corridor be carefully evaluated for consistency with the recommendations of the Route 303 Study;
- Establishes an expectation that the community desires responsible and high quality development projects; and
- Creates zoning regulations to manage development and limit suburban sprawl in the corridor.

The Route 303 Overlay Zone includes several regulatory elements, as follows:

- Limitations on building size (65,000 square feet) applicable to wholesale and retail warehouses and other retail uses (e.g. "big box" stores), as well as movie theaters or cinemas;
- Prohibition of new commercial automotive uses, as well as outside storage of bulk fuels or liquids and other materials;
- Design standards requiring (where applicable) screening, vegetated buffers, rear-yard parking, and connections between abutting parking lots;
- Prohibition of detention ponds, signage, lighting fixtures or fences within the Route 303 right-of-way or within the vegetated buffer;
- Special permit requirements for curb cuts;
- Requirements of traffic impact study and access management plan for projects that would increase traffic by more than 10 percent; and
- Drainage system requirements.

The most notable aspect behind the zoning text amendment is the strong intent to limit the size and extent of large-scale retail development in the Route 303 corridor. Consistent with the Land Use Vision, the rationale for these restrictions is to:

- Preserve the non-retail, mixed use character of the corridor;
- Reinforce existing zoning;
- Keep land available for non-retail commercial development;
- Keep land available for potential transit-oriented development should the West Shore Line be activated for passenger use; and
- Ensure that the Transportation Concept Plan improvements are consistent with a non-retail corridor, minimizing the need for future additional capacity.

Parcels in More Than One Zoning District - The Town of Orangetown will identify parcels that fall into more than one zoning district in the short term (2003-2005). Decisions will be made as to how these parcels should be zoned or re-zoned in total.

Bike Trail, Rail Trail, and Pedestrian Path - Another current effort is the development of the bike trail, rail trail, and pedestrian path under the Mid-Hudson South Region Bicyle/Pedestrian Master Plan. Implementation of that plan's recommendations is expected to continue into the short term (2003-2005) and beyond, and will require collaboration between the Town, Rockland County, NYSDOT, and NYMTC.

Town-wide Open Space Plan - Another near-term activity is the completion and adoption of a Town-wide Open Space Plan to be integrated into the Town's Comprehensive Plan. As of June, 2002, the Open Space Plan has been developed, and implementation is currently underway.

Rockland Psychiatric Center - A major land use issue that has not been resolved through the Route 303 study process is the future of the Rockland Psychiatric Center. Use of this parcel is currently under study by the Town of Orangetown, with planning for the use of the site in the short term (2003-2005), and implementation of the plan further in the future. The town has not yet formally reviewed a development application for this site. The Town intends to purchase the site, primarily for passive and active recreation uses including a pool complex and playing fields. The Town will consider private commercial development proposals for the balance of the site including a bio-tech park, senior housing, assisted-living housing for seniors, a bakery complex and private recreation uses. The Town will solicit proposals from developers through an RFP process for these uses.

Palisades Interstate Parkway Scenic Byway Corridor Management Plan – This plan has already been officially approved and implementation is underway.

5.1.2 Land Use: Short Term (2003 – 2005) Actions and Beyond

Other land use recommendations that are planned to begin in the Short-Term period (2003 – 2005) include specific amendments to underlying zoning in the corridor, capital investment in land acquisition, and more detailed studies of specific land use and environmental issues. Implementation of most of these items is expected to continue into the mid-term (2005-2010) and long-term (2010-on). The Town of Orangetown's ongoing Comprehensive Plan update has been identified as the appropriate mechanism to provide further analysis and definition for these initiatives.

Business Improvement District - The establishment of a Business Improvement District (BID) is a recommended strategy to facilitate physical and economic revitalization of the study area. A BID is an organization, management and financing tool created under state and local law. Following the approval of its creation by the majority of property owners within a defined business district, the BID structure allows the municipality (Town of Orangetown) to collect a small fee from each local business along with its regular property tax payment. These fees are then used to provide specialized services, such as area clean-up, graffiti removal, physical improvements, holiday lighting and special events, area marketing and business promotion within the BID area. The services are designed to complement rather than replace municipal government services. Typically, a BID manager is hired to coordinate and manage the provision of these services.

The primary advantages for a BID structure for the Route 303 commercial areas are that it could provide:

- Legal authority to promote the corridor's revitalization;
- Provide a mechanism for professional management of services that would enhance business in the district, such as clean-up and maintenance; and

- Provide a dependable source of funding for these activities outside the needs and limitations of the budget of the Town of Orangetown.

Hamlet Center Guidelines – Hamlet Center Guidelines are planned for short-term development (2003-2005) to be implemented in the mid-term (2005-2010) and beyond.

Sparkill Greenway and Management Plan– A short-term (2003-2005) objective for the Town of Orangetown is to develop a Management Plan for the Sparkill and creation of a Sparkill Greenway. As an initial step, streambed preservation guidelines and regulations should be incorporated within the Route 303 Overlay Zoning District recommended for the study area.

Opportunities may be available to enhance the stream banks, on a segment-by-segment basis, so that over time a continuous segment of preserved public open space, or deed-restricted privately held land (i.e. within a property buffer area) will be available for the development of a pathway. Funding for this project has not yet been identified, but existing Federal transportation programs such as the Enhancement Program are an option that the Town should consider utilizing.

The concept of the Sparkill Greenway was incorporated in the final Transportation Plan and Land Use Vision. The model Sparkill Overlay text contained within the Land Use Plan will serve to protect the area from the effects of adjacent development using buffer zones and development restrictions. It is also recommended that a Sparkill Management Plan be developed in the short-term (2003-2005) to guide private and public development in this sensitive natural area. Buffer zones in the overlay will consist of a vegetated buffer strip of 75 feet on either side of the centerline of the Sparkill to be maintained on all new development of properties within this buffer area. This zone offers a suitable location for the development of off-street pedestrian and bicycle connections, and other landscape enhancements that will reduce the impacts of high traffic volumes in the corridor.

Ridgeline Protection Regulation – Another initiative planned for the short-term (2003-2005) is development of a Ridgeline Protection Regulation. The Rockland Riverfront communities council, which includes Orangetown, is reviewing model legislation which the Town may consider adopting.

5.2 Corridor-Wide Transportation Implementation

The following transportation improvements are recommended for the entire corridor. Specific intersection-level (neighborhood) improvements are described in Section 5.3.

5.2.1 Corridor-Wide Transportation Implementation: Completed and In-Progress Actions

Access Management Techniques – The Town of Orangetown applied for and received a grant from NYSDOT to conduct an access management study that will begin in the Winter of 2002, with development of the plan in the Short-Term period (2003-2005), and implementation to follow. The study will implement recommendations of the Route 303 Sustainable Development Study regarding the development of a corridor-wide access management plan. This plan will

contain strategies such as those listed below to provide guidelines for future access when a highway improvement is proposed or a land use change is contemplated.

With a high volume of both through and local traffic, Route 303 experiences heavy turning movements into and out of site driveways that conflict with through traffic movements. For the drivers on Route 303, these movements cause added travel delay, while for the traffic entering and exiting site driveways, the time required to safely maneuver to and from the roadway can be frustratingly long, potentially causing drivers to make unsafe entrances and exits. In some segments of Route 303, particularly south of the Palisades Parkway, the narrowness of roadway shoulders cause additional delays due to vehicles backed up behind a turning car or truck. These factors result in increased accidents, as motorists attempt to improperly cross opposing traffic or pass vehicles on the right-side.

Access management strategies seek to eliminate, reduce, space or regulate the number of curb cuts/ driveways that occur along a roadway especially an arterial such as Route 303. Managing the number of driveways where conflicting vehicle turning movements can occur provides safer and more efficient traffic operation. In many cases, only minor modification to existing parking or internal circulation patterns may be needed to allow closure of unnecessary curb cuts.

Curb cuts can be controlled by:

- Eliminating unnecessary or redundant curb cuts unnecessary for adequate access to property adjoining Route 303 with the goal of a single access point per property;
- Sharing driveways/curb cuts between adjacent property and providing for cross property easement to facilitate circulation;
- Substituting access from side streets, frontage roads or service roads;
- Better definition of driveway openings, and, where appropriate, reducing the driveway width, especially where the entire frontage is open to traffic;
- Channelizing and signing of existing driveways to properly define and identify locations for entrance and exit, and for one-way movement within the site.

Adjustments to existing driveways and approval of new curb cuts on State roads, such as Route 303, are regulated both by local zoning and subdivision regulations and by NYSDOT through its access permit procedures. Typically, access changes to existing developments are only made as part of highway improvement projects. Access changes may also be in conjunction with land use/zoning changes for development or redevelopment sites.

Traffic Calming Techniques for Residential Areas – Analysis of traffic calming measures at a corridor-wide level is currently underway, with implementation of such measures planned to begin in the short-term (2003-2005) and continuing into the future.

Truck Parking Restrictions –Evaluation of truck parking restrictions along the Route 303 corridor will take place in the short term (2003-2005) and continue into the future.

5.2.2 Corridor-Wide Transportation Implementation: Short Term (2003 – 2005) Actions and Beyond

Transit and Transportation Demand Management (TDM) Strategies – While determining the exact route and service characteristics for a Route 303 transit shuttle is not within the scope of the Route 303 Sustainable Development Study, it seems clear that a transit service within the study area could provide an improved level of mobility for residents of the area, in particular for seniors, students, and no-vehicle/one-vehicle households. Furthermore, Transportation Demand Management (TDM) strategies are important tools for reducing travel demand altogether, and can include such initiatives as ridesharing support, telecommuting, vanpools, parking incentives, etc.

The Rockland County Department of Transportation has received funding to purchase alternative fuel (CNG) shuttle transit vehicles. This type of transit vehicle fleet would be appropriate to provide shuttle services between Route 303 corridor destinations to supplement the modest level of existing scheduled transit service provided by the Transport of Rockland (TOR) and Red & Tan systems. As part of the preferred transportation alternatives for the Route 303 corridor, a shuttle route could be developed linking the Tappan area with the educational institutions in Orangeburg (Dominican College, St. Thomas Aquinas College, Tappan Zee High School, etc.) to form a component of an "Educational Corridor" plan for the study area.

Therefore, a County-funded study of transit and TDM measures would be warranted to determine what services could be implemented within the context of existing transit and TDM operations, and what sources of funding may be available for a demonstration programs. Planning for transit and TDM is expected to take place in the short term (2003-2005) with implementation of the plan taking place in the Mid-Term (2005-2010) and beyond.

Passenger Service on West Shore/Northern Branch Train Line – This effort, which includes NJ Transit, Bergen County, CSX, NYSDOT, Rockland County, and the towns and villages along the West Shore Line, will consist of impact assessment for the eventual re-use of the West Shore Railroad (CSX River Line) railroad corridor for passenger service, including evaluation of the land use impacts that this would create for the neighborhood areas. Passenger stations (number, placement) are important part of this effort. (2005-2010)

Roadside Pedestrian Facilities (Sidewalks/Crosswalks) – Most participants in the Route 303 study process supported improvement of existing sidewalks and construction of new sidewalk and crosswalk facilities, particularly within the three defined neighborhood centers and adjacent areas, such as the segment between Campbell Avenue and Oak Tree Road and between Mountainview Road and Erie Street. The construction and potential future use of sidewalks in a wider range of locations along Route 303 has been the subject of considerable discussion by the CAC and the Neighborhood Committees.

Current NYSDOT policy is to include sidewalk development in all of its urban and suburban arterial design efforts, unless there is a compelling reason why this is not feasible. NYSDOT considers the Route 303 corridor to be an appropriate location for sidewalks to enhance pedestrian safety and accessibility throughout its length.

Improvements to roadside pedestrian facilities should be made consistent with the recommendations of the Mid-Hudson South Region Bicycle/Pedestrian Master Plan. The plan calls for the following long-term improvements in the Route 303 study area:

- Complete sidewalk network in and around all destinations
- Provide linkages, access and signing to state parks
- Provide sidewalks along Washington Street

Improvements to pedestrian facilities at specific intersections are described in Section 5.3 below.

5.3 Neighborhood Area Improvements

Utilizing the Safety Index, the consultant team projected that the construction of a grass or planted median with left turn refuge would result in a significant reduction in the number of accidents along all corridor segments where this configuration could be implemented. The addition of left turn lanes, traffic signals and turn signals, where appropriate, would also result in additional reduction in accidents. Therefore, these features are highly recommended to be developed for further detailed design analysis.

Level of Service analysis results for the individual corridor intersections are presented in the sections that follow for each neighborhood:

5.3.1 Tappan Neighborhood Area Improvements

Overall, for the Tappan Neighborhood, the Route 303 Sustainable Development Implementation Program calls for a number of interim improvements, which have recently been constructed, including:

- Improvements at Oak Tree Road (left turn lanes on Route 303 northbound and southbound and associated traffic signal improvements
- A center turn lane from Oak Tree Road to the New Jersey state line
- Improved transition from 2 lanes to one lane in each direction between Campbell Avenue and the state line.

Table 5-2 presents the results of the level of service analysis for the signalized intersection locations in the Tappan Neighborhood. Figure 3.2 illustrated the results in a graphical manner.

Table 5-2
Level of Service (P.M. Peak)
Land Use Vision Plan Signalized Intersections, Tappan Neighborhood

Route 303 Intersection with:	2000 Existing	2020 No Build	2020 – Land Use Vision		
			Low-Level	High-Level	Roundabout
Oak Tree Road	F	F	C	-	-
King's Highway South	F	F	F	D	B

Source: Wilbur Smith Associates

Route 303 and Oak Tree Road – The existing roadway geometry at Route 303 and Oak Tree Road is not adequate to handle the traffic volumes at this intersection as indicated in Table 5-2. Under the 2020 No- Build condition, this intersection was projected to operate at LOS F with high delay levels and congestion. With a low-level of improvement consisting of an exclusive left turn lanes in the northbound and southbound directions along Route 303, an eastbound exclusive right turn lane along Oak Tree Road, and exclusive left and right turn lanes in the westbound direction along Oak Tree Road, this intersection was projected to operate at LOS C in 2020.

Other improvements that would be incorporated would be median improvements, bicycle/pedestrian access improvements, transit, and landscaping and beautification. Planning for improvements at Route 303/Oak Tree Road will take place in the short-term (2003-2005) with implementation and construction mid-term (2005-2010).

Route 303 and King's Highway South – Under the 2020 No-Build condition, this intersection was projected to operate at LOS F with high levels of delay and congestion. As indicated in Table 5-2, this intersection would operate at LOS F even with low-level roadway improvements consisting of exclusive left turn lanes along Route 303 in the northbound and southbound directions. This is due to the heavy traffic volumes experienced at this intersection along Route 303 and King's Highway South approaches under future year conditions.

The high-level improvement recommended for this intersection includes all of the low-level improvements and in addition requires widening Route 303 to provide an additional through lane in the northbound and southbound directions. With this improvement, the intersection is projected to operate at LOS D in 2020.

A roundabout option was also looked at this intersection based on input from the public and advisory committee meetings. The roundabout could be designed to provide two travel lanes in the northbound and southbound directions along Route 303 and a single lane in the eastbound and westbound direction along King's Highway South. With the roundabout option, this intersection was projected to operate at an overall LOS B.

Another alternative at this location is the re-alignment of King's Highway South from the west to fix the angle at which the King's Highway South currently intersects Route 303. If this improvement is pursued, the split-phased operation of the signal in the eastbound and the

westbound direction (due to the skewed alignment) can be eliminated. The lane arrangement in the northbound and southbound directions will consist of an exclusive left turn lanes, two through lanes, and an exclusive right turn lane along Route 303. In the eastbound and the westbound directions, an exclusive left turn lane is required along King's Highway South.

Sidewalk and crosswalk improvements at King's Highway South and Route 303 will be implemented. Other improvements that are still to be incorporated include median improvements, bicycle/pedestrian access improvements, transit, and landscaping and beautification. Planning for improvements at Route 303/King's Highway South will take place in the short-term (2003-2005) with implementation and construction mid-term (2005-2010).

Unsignalized Intersection in Tappan Neighborhood: Campbell Street

Increasing traffic volumes on Route 303 will account for the increased delay for vehicles entering from unsignalized side streets, in this case, Campbell Street, which is projected to operate at LOS F in 2020. Intersection-related improvements, such as those identified above to address traffic safety and delay, will generally not be applied to unsignalized intersections, due to the need to maintain through movement along the Route 303 mainline. Table 5-3 presents the results of the level of service analysis for Campbell Street. Figure 3.2 illustrated the results in a graphical manner. It is important to note that the overall LOS calculated is based on a weighted average methodology using the traffic volumes and delays of critical movements at an intersection.

Table 5-3
Level of Service (P.M. Peak)
Preliminary Land Use Vision, Tappan Neighborhood Unsignalized Intersection

Route 303 Intersection	**Existing (2000)**	**Future (2020)**
Campbell Street	C	F

Source: Wilbur Smith Associates

In a future year, as conditions warrant, all unsignalized intersections with a failing Level of Service should be signalized, with their operations coordinated with the currently signalized intersections. Timing of these actions is dependent on the growth of side-street and mainline traffic and should be done on a case-by-case basis.

Specifically at Campbell Street, the Route 303 Sustainable Development Study Implementation Program includes replacement of a yield sign with a stop sign at Campbell Street, and street name sign installation and enhancement at Campbell Street. This is to be implemented in the short-term (2003-2005).

Other Improvements in the Tappan Neighborhood

The following list includes other initiatives for the Route 303 Sustainable Development Study Implementation Program that are located within the Tappan Neighborhood and the dates of their implementation:

- Renovation of Main Street and part of Washington Street addressing drainage problems, redoing sidewalks, changing the light at Main and Washington Street, and street landscaping—to be implemented in short-term (2003-2005).

- Signing Upgrade on Route 303: In the Tappan Neighborhood, this includes sign improvements at Campbell Street (as noted above). Other improvements include Warning signs, Historic Street designation signs, Regulatory signs—Already completed.

- Speed Reduction on Route 303: Reduced speed limit from 40 to 35 mph between Campbell Avenue and Oak Tree Road – Already completed.

- Speed Reduction on Route 303: Reduced speed limit from 40 to 35 mph between Campbell Avenue and the PIP (pending a detailed speed study by NYSDOT)—Study and implementation in the short-term (2003-2005).

- Interim Landscaping Project between Oak Tree Road and New Jersey State Line—Already completed.

- Neighborhood-wide Corridor Landscape Project—Plans are being developed currently, will be implemented in short-term (2003-2005).

- Brick-paved sidewalk along Oak Tree Road—Already completed.

- Palisades Parkway Scenic Byway Corridor Management Plan—Plan in progress, will be implemented in the short-term (2003-2005).

- Palisades Trailway, New Jersey State Line to Anthony Wayne Recreational Area—Plans are being developed, implementation in short-term (2003-2005) and mid-term (2005-2010).

5.3.2 Blauvelt/Orangeburg Neighborhood Area Improvements

Table 5-4 presents the results of the level of service analysis for the signalized intersection locations in the Blauvelt/Orangeburg Neighborhood. Figure 3.2 illustrated the results in a graphical manner.

Table 5-4
Level of Service (P.M. Peak)
Land Use Vision Plan Signalized Intersections, Blauvelt/Orangeburg Neighborhood

Route 303 Intersection with:	2000 Existing	2020 No Build	2020 – Land Use Vision		
			Low-Level	High-Level	Roundabout
Route 340	D	F	F	C	-
Orangeburg Road	F	F	D	-	-
Mountainview Road	D	F	E	-	C
Erie Street	C	F	C	-	B

Source: Wilbur Smith Associates

Route 303 and Route 340 – Under the 2020 No-Build condition, this intersection was projected to operate at LOS F and will require mitigation to improve operating conditions. As indicated in Table 5-4, this intersection was projected to operate at LOS F with the low-level roadway improvements consisting of exclusive left turn lanes along Route 303 in the northbound and southbound directions, along with an exclusive left turn lane in the eastbound direction and an exclusive right turn lane in the westbound direction on Route 340. This is due to the heavy traffic volumes experienced at this intersection along Route 303 and Route 340 approaches under future year conditions.

The high-level improvement at this intersection includes all of the low-level improvements and in addition requires widening Route 303 to provide an additional left turn lane in the southbound direction and an exclusive right turn lane in the northbound direction. With this improvement, the intersection was projected to operate at LOS C in 2020.

Enhancement of sidewalks and crosswalks at the intersection of Route 340 with Route 303 is planned for the short term (2003-2005).

The Route 303 Sustainable Development Study Implementation Program calls for reconstruction of the Orangeburg Bridge and its approaches to realign with Route 340 at Route 303, in coordination with a multi-intersection improvement on Route 303. Improvements will include turn lanes, median improvements, bicycle/pedestrian access improvements, transit, circulation between colleges, and landscaping. This reconstruction is slated (2005-2010).

Route 303 and Orangeburg Road – Under the 2020 No-Build condition, this intersection operates at LOS F and will require mitigation to improve operating conditions. This intersection will require a low-level of improvement to improve the level of service to LOS D in 2020. The low-level improvement consists of providing an exclusive left turn lane in the northbound direction and an exclusive right turn lane in the southbound direction along Route 303. In addition, it requires providing an additional left turn lane in the eastbound direction along Orangeburg Road.

Installation of a stop sign at Orangeburg Road at Route 303 has already taken place.

The Route 303 Sustainable Development Study Implementation Program calls for reconstruction of Orangeburg Road at Route 303, in coordination with a multi-intersection improvement on Route 303. Improvements will include turn lanes, median improvements, bicycle/pedestrian access improvements, transit, and landscaping. This reconstruction is slated for plan development in the short-term (2003-2005) and implementation/construction in the mid-term (2005-2010).

Route 303 and Mountainview Road – Under the 2020 No-Build condition, this intersection operates at LOS F and will require roadway improvements to reduce delay and congestion at this intersection. This intersection will require a low-level of improvement to bring the level of service to LOS E in 2020. The low-level improvement consists of providing exclusive left turn lanes in the northbound and southbound directions along Route 303 and exclusive left turn lanes in the eastbound and westbound directions along Mountainview Road.

A roundabout configuration was also tested at the intersection of Route 303 with Mountainview Road. This location does not offer sufficient right-of-way available to make a roundabout feasible.

The signals at Mountainview Road have already been upgraded to offer an exclusive left-turn movement.

The Route 303 Sustainable Development Study Implementation Program calls for a multi-intersection improvement on Route 303, including Mountainview Road. Improvements will include turn lanes, median improvements, bicycle/pedestrian access improvements, transit, and landscaping. This reconstruction is slated for plan development in the short-term (2003-2005) and implementation/construction in the mid-term (2005-2010).

Route 303 and Erie Street – Under the 2020 No-Build condition, this intersection operates at LOS F and will require mitigation to improve operating conditions at this location. This intersection will require a low-level of improvement to bring the level of service to LOS C. The low-level improvement consists of providing exclusive left turn lanes in the northbound and southbound directions along Route 303 and an exclusive left turn lane in the eastbound direction along Erie Street.

A roundabout configuration was also tested at the intersection of Route 303 with Erie Street. This location does not offer sufficient right-of-way available to make a roundabout feasible.

The Route 303 Sustainable Development Study Implementation Program calls for a multi-intersection improvement on Route 303, including Erie Street. Improvements will include turn lanes, median improvements, bicycle/pedestrian access improvements, transit, and landscaping, as well as improving the railroad crossing at Erie (see below). This reconstruction is slated for plan development in the short-term (2003-2005) and implementation/construction in the mid-term (2005-2010).

Erie Street Railroad Crossing - A critical issue at the Route 303 and Erie Street intersection is its operation relative to the railroad crossing of the CSX River Line (West Shore) located on Erie Street just to the west of Route 303. A queue analysis was conducted along Erie Street to

determine if there is sufficient storage space along Erie Street between Route 303 and the railroad crossing for the vehicles to queue when the gates are closed for the train. It is important to note that Erie Street has a four-lane cross-section between the grade crossing and Route 303, but that in the existing condition this roadway space is not fully utilized.

The results indicated that assuming a four-minute stoppage time due to a train crossing Erie Street, a vehicle queue of approximately 350 feet per lane is created along Erie Street in the westbound direction. The available storage space between Route 303 and the railroad crossing is 440 feet. Therefore, there is sufficient storage space between the railroad crossing and Route 303 for vehicles queued at the railroad crossing.

The Route 303 Sustainable Development Study Implementation Program calls for improvements at the CSX crossing on Erie Street to provide greater capacity for queuing. This reconstruction is slated for plan development in the short-term (2003-2005) and implementation/construction in the mid-term (2005-2010).

Unsignalized Intersections: Blauvelt/Orangeburg Neighborhood

Increasing traffic volumes on Route 303 will account for the increased delay for vehicles entering from unsignalized side streets , specifically King's Highway North, Glenshaw Road, and Spruce Street in 2020. All three unsignalized intersections with Route 303 within this neighborhood are projected to operate at LOS F in 2020. Intersection-related improvements, such as those identified above to address traffic safety and delay, will generally not be applied to unsignalized intersections, due to the need to maintain through movement along the Route 303 mainline. Table 5-5 presents the results of the level of service analysis for the un-signalized intersection locations in the study area. Figure 3.2 illustrated the results in a graphical manner. It is important to note that the overall LOS calculated is based on a weighted average methodology using the traffic volumes and delays of critical movements at an intersection.

Table 5-5
Level of Service (P.M. Peak), Preliminary Land Use Vision,
Blauvelt/Orangeburg Neighborhood Unsignalized Intersections

Route 303 Intersection	**Existing (2000)**	**Future (2020)**
King's Highway North	F	F
Glenshaw Road	F	F
Spruce Street	D	F

Source: Wilbur Smith Associates

In a short-term timeframe (2003-2005), there is a likelihood of the Route 303 and King's Highway North intersection being signalized and coordinated with the Route 303 and Orangeburg Road intersection. In a future year, as conditions warrant, all unsignalized intersections with a failing Level of Service should be signalized, with their operations coordinated with the currently signalized intersections. Timing of these actions is dependent on the growth of side-street and mainline traffic and should be done on a case-by-case basis.

Other Improvements in the Blauvelt/Orangeburg Neighborhood

The following list includes other initiatives for the Route 303 Sustainable Development Study Implementation Program that are located within the Blauvelt/Orangeburg Neighborhood and the dates of their implementation:

- Signing Upgrade on Route 303: Warning signs, Historic Street designation signs, Regulatory signs—Already completed.

- Neighborhood-wide Corridor Landscape Project—Plans are being developed currently, will be implemented in short-term (2003-2005).

- Study of Closure of Highview Avenue at CSX Crossing—Impacts to be studied in the short term (2003-2005), with implementation in the mid-term (2005-2010) and beyond.

- J.B. Clarke Rail Trail Crossing Alternative Study—This effort will consider the issue of providing either a bicycle/pedestrian activated signal, or a full bridge to grade-separate the crossing, consistent with the Mid-Hudson South Region Bicycle/Pedestrian Master Plan. The study and design will take place in the short-term (2003-2005) with implementation in the mid-term (2005-2010) and beyond.

- Palisades Parkway Scenic Byway Corridor Management Plan—Plan in progress, will be implemented in the short-term (2003-2005).

- Palisades Trailway, New Jersey State Line to Anthony Wayne Recreational Area—Plans are being developed, implementation in short-term (2003-2005) and mid-term (2005-2010).

- Studying Educational Corridor Linkages—This study will take place in the short-term (2003-2005) with implementation in the mid-term (2005-2010) and beyond.

5.3.3 Bradley Parkway Neighborhood Area Improvements

Table 5-6 presents the results of the level of service analysis for the signalized intersection locations in the Bradley Parkway Neighborhood. Figure 3.2 illustrated the results in a graphical manner.

Table 5-6
Level of Service (P.M. Peak)
Land Use Vision Plan Signalized Intersections, Bradley Parkway Neighborhood

Route 303 Intersection with:	2000 Existing	2020 No Build	2020 – Land Use Vision		
			Low-Level	High-Level	Roundabout
Bradley Parkway	C	F	C	-	-
Clarkstown Landfill	C	D	-	-	-

Source: Wilbur Smith Associates

Route 303 and Bradley Parkway – Under the 2020 No-Build condition, this intersection operates at LOS F and will require roadway improvements. This intersection will require a low-level of improvement to bring the level of service to LOS C in the future year under the preliminary land use vision plan. The low-level improvement consists of providing exclusive left turn lanes in the northbound and southbound directions along Route 303 and exclusive left turn lanes in the eastbound and westbound directions along Bradley Parkway.

The Route 303 Sustainable Development Study Implementation Program calls for improvements at this intersection, including lanes, median improvements, bicycle/pedestrian access improvements, transit, and landscaping. This reconstruction is slated for plan development in the short-term (2003-2005) and implementation/construction in the mid-term (2005-2010) and beyond.

Route 303 and Clarkstown Landfill – This intersection will operate at LOS D under the 2020 No-Build condition and will require no roadway improvements. The Route 303 Sustainable Development Study Implementation Plan does not call for any specific improvements at this location.

Unsignalized Intersections: Bradley Parkway Neighborhood

Increasing traffic volumes on Route 303 will account for the increased delay for vehicles entering from unsignalized side streets in the Bradley Parkway Neighborhood in 2020. Two of the three unsignalized intersections with Route 303 within the study area are projected to operate at LOS F in 2020. Intersection-related improvements, such as those identified above to address traffic safety and delay, will generally not be applied to unsignalized intersections, due to the need to maintain through movement along the Route 303 mainline. Table 5-7 presents the results of the level of service analysis for the un-signalized intersection locations in the study area. Figure 3.2 illustrated the results in a graphical manner. It is important to note that the overall LOS calculated is based on a weighted average methodology using the traffic volumes and delays of critical movements at an intersection.

Table 5-7
Level of Service (P.M. Peak)
Preliminary Land Use Vision (Unsignalized Intersections)

Route 303 Intersection	**Existing (2000)**	**Future (2020)**
Leber Road/Greenbush	F	F
Corporate Drive	B	C
Birchwood Drive	E	F

Source: Wilbur Smith Associates

In a future year, as conditions warrant, all unsignalized intersections with a failing Level of Service should be signalized, with their operations coordinated with the currently signalized intersections. Timing of these actions is dependent on the growth of side-street and mainline traffic and should be done on a case-by-case basis.

Other Improvements in the Bradley Parkway Neighborhood

The following list includes other initiatives for the Route 303 Sustainable Development Study Implementation Program that are located within the Bradley Parkway Neighborhood and the dates of their implementation:

- Signing Upgrade on Route 303: Warning signs, Historic Street designation signs, Regulatory signs. In the Bradley Parkway neighborhood, this includes Installation of new route signage at the Route 303/Route 59 interchange and installation of "Signal Ahead" signage on Route 303 northbound and southbound, south of the median barrier at Bradley Parkway —Already completed.

- Neighborhood-wide Corridor Landscape Project—Plans are being developed currently, will be implemented in short-term (2003-2005).

6. CONCLUSION

The Route 303 Sustainable Development Study integrated planning for land use with planning for transportation improvements to develop a shared vision of the Route 303 study area among stakeholders including corridor residents, businesspeople, the Town of Orangetown, Rockland County, the New York Metropolitan Transportation Council, and the New York State Department of Transportation. By getting the public actively involved and engaged in project-level alternatives analysis and decision-making, the project team was able to develop a consensus among the stakeholders. The ultimate objective of the study was to chart a path for future improvements that balanced the need for safety, accessibility, mobility, and sustainable development and land use goals.

The approach to community outreach integrated government agencies' input through a Technical Committee with the public input garnered through a Citizens Advisory Committee, Neighborhood meetings, and a series of visioning charrettes. Data was collected to assess existing conditions and preliminary land use and transportation issues were outlined. Four land-use "study themes" were used for modeling alternative future development scenarios and the performance of transportation infrastructure.

Overall recommendations for the Route 303 corridor included median treatments - continuous two-way left-turn lanes and raised, planted medians, intersection signal improvements, pedestrian/bicycle accommodation, driveway access management, transit service, and "traffic calming" measures. Individual neighborhood concept plans were generated for each of three neighborhoods - Tappan, Orangeburg, and Bradley Parkway/Greenbush - that tailored recommendations to each.

The study recommendation included early action improvements, short-term strategies and long-term actions for implementing land use and transportation improvements.

- Early action improvements focused on signage, signal improvements, pavement striping, pedestrian crossings and others that would contribute to the overall goal of sustainability and could be implemented quickly.

- Short-term land use improvements center on the Route 303 Overlay District, to ensure that future development in the corridor appropriately reflects the community's desires and is compatible with the existing development in the corridor.

- Short-term transportation improvements could include "low-level" intersection improvements proposed for signalized intersections of Route 303 and Oak Tree Road, Orangeburg Road, Mountainview Road, Erie Street and Bradley Parkway as well as corridor signal coordination. These along with pedestrian and transit improvements could be implemented more quickly, deliver residents and travelers more immediate benefit, and ultimately be effectively coordinated with long-term transportation improvements. In addition, access management is being studied in order to develop regulations for redevelopment of properties abutting the corridor.

- Long-term land use improvements involve the implementation of village/hamlet center concepts in Tappan, at Orangeburg Road, and at Erie Street; creation and restoration of the Sparkill Greenway; implementation of commuter rail service and station focused transit oriented development; establishment of Business Improvement District(s), and formalization of the "Educational Corridor" concept.

- Long term transportation improvements would include installation of median treatments along Route 303, construction of sidewalks and pathways, realignment of Orangeburg Road, and construction of "high-level" intersection improvements at intersections with Route 340, and Kings Highway South. Unsignalized intersections are proposed for signalization as warranted in the future by virtue of growth in traffic.

7.0 RELATED RESOURCES

1. **Route 303 Public Outreach Technical Appendix**
   Completed December 14, 2001
   Orangetown Town Hall - 845-359-5100

2. **Route 303 Community Visioning Report**
   Completed December 14, 2001
   Orangetown Town Hall – 845-359-5100

3. **Route 303 Existing Conditions Report**
   Completed October 2000
   Orangetown Town Hall
   845-359-5100

4. **Route 303 Master Plan**
   Completed November 2002
   www.co.rockland.ny.us
   www.orangetown.com

5. **Orangetown Comprehensive Plan**
   Draft to be adopted December 2002
   www.orangetown.com
   845-359-5100

6. **Route 303 Overlay Zone**
   www.orangetown.com
   845-359-5100

7. **Route 303 Overlay Zone Economic Study**
   Completed January 17, 2002
   Orangetown Town Hall – 845-359-5100

8. **Route 303 Access Management Plan Quality Communities**
   (scoping underway – Winter '02-'03)
   Town of Orangetown, NYSDOT, & Rockland County

9. **Rockland County: River to Ridge**
   A Plan for the 21st Century
   Completed 2001
   www.co.rockland.ny.us

10. **Railroad Crossing Safety and Train Whistle Study**
    Completed phase I
    Rockland County Planning Department
    845-364-3434

11. **County of Rockland Open Space Guidelines**
    (Open Space Acquisition Program)
    Completed October 1999
    www.co.rockland.ny.us

12. **Mid-Hudson South Region Bicycle-Pedestrian Master Plan**
    Completed June 2001
    www.co.rockland.ny.us
    Rockland County Planning Department
    845-364-3434

13. **Palisades Trailway Corridor Study**
    NJ State Line to The Anthony Wayne Recreation Area
    Completed March 2002
    NYSDOT Region 8 Office 845-431-5723
    Palisades Interstate Park Commission
    845-786-2701

14. **Palisades Scenic Byway Corridor Management Plan**
    Completed June 2002
    NYSDOT Region 8 Office 845-431-5723
    Palisades Interstate Park Commission
    845-786-2701

15. **West Shore MIS**
    Completed June 2001
    DEIS will proceed concurrently w/West Shore Region DEIS
    New Jersey Transit 201-491-7813
    www.accesstotheregionscore.com

APPENDIX A

CONCEPTUAL IMPROVEMENT ALTERNATIVES

CONCEPTUAL IMPROVEMENT ALTERNATIVE
ROUTE 303 AND OAK TREE RD.

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-1

CONCEPTUAL IMPROVEMENT ALTERNATIVE
ROUNDABOUT
KING'S HIGHWAY AND ROUTE 303

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-2

CONCEPTUAL IMPROVEMENT ALTERNATIVE
ROUTE 303 AND ROUTE 340

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-3

CONCEPTUAL IMPROVEMENT ALTERNATIVE
ORANGEBURG RD. AND ROUTE 303

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-4

CONCEPTUAL IMPROVEMENT ALTERNATIVE
ROUTE 303 AND MOUNTAINVIEW RD.

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-5

CONCEPTUAL IMPROVEMENT ALTERNATIVE
ROUTE 303 AND ERIE STREET

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-6

CONCEPTUAL IMPROVEMENT ALTERNATIVE
BRADLEY PKWY. AND ROUTE 303

Route 303 Sustainable Development Study

Wilbur Smith Associates

FIGURE A-7