SUATS
Long-Range Transportation Plan

Chapter 5 — Future Roadway Element

Introduction

The challenges facing the future of the transportation network in Sumter are the collective result of sustained growth, continued reliance on the automobile for even short trips, and competing agendas for scarce transportation funds. State forecasters expect Sumter's 2000 population to grow 25 percent by 2030. If this growth coupled with the recent surge of commuters in single-occupancy vehicles continues, the few projects with committed funding will do little to address deficiencies in the transportation network.

The Future Roadway Element considers these dynamics as it examines the future transportation network under a variety of conditions. A travel demand model was utilized to assess existing and future travel conditions. This Tranplan model tested the operation of the future highway network under various scenarios. Two scenarios for 2030 travel conditions developed using the model included the travel conditions given (1) the construction of existing and committed projects and (2) the construction of all recommended projects.

This chapter begins with an overview of the existing plus committed scenario, which considers the impact committed projects will have on future travel conditions. The recommendation section explores how financially constrained projects can improve future travel conditions. Recommendations in the form of a Vision Plan are proposed to address the remaining deficiencies. The chapter concludes with access management strategies, an overview of complete streets, and a series of recommended cross sections.

Existing + Committed Conditions

The initial step in identifying projects for the SUATS Long-Range Transportation Plan is to analyze how the existing transportation network combined with committed projects will perform in 2030 given current growth patterns. As discussed in Chapter 4, the only committed project in the Sumter area is the widening of Alice Drive. Funding for construction of this project's final phase is scheduled for FY 2012.

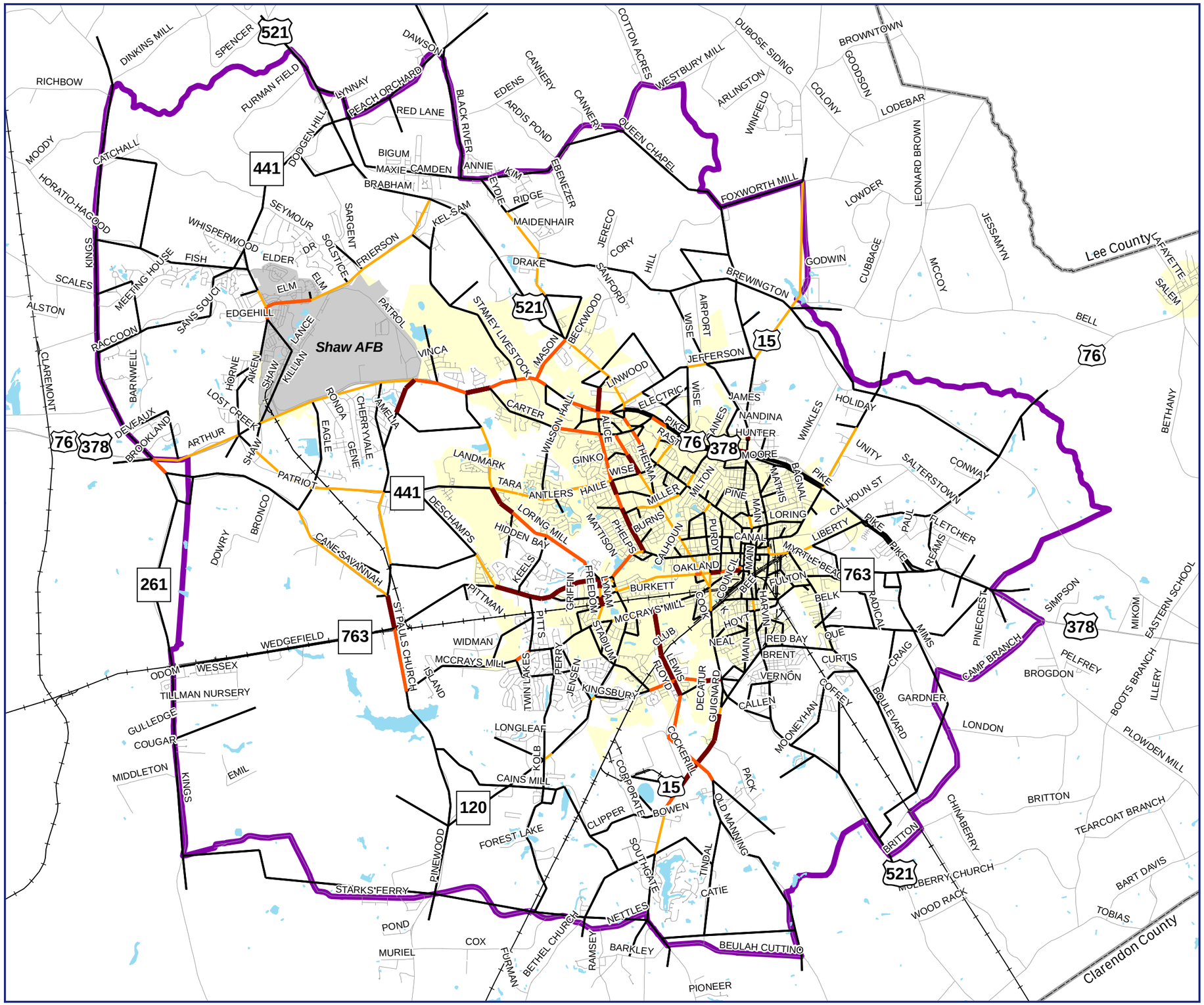
The Existing + Committed (E+C) conditions shown in **Figure 5.1** includes this project in addition to current projects under construction and existing facilities. Compared to **Figure 4.2**, which shows the current (2000) congested corridors in Sumter, the E+C project address but not solve the congestion problems on Alice Drive not to mention congestion throughout the SUATS region. Congestion slightly improves on Alice Drive but worsens on several roads, including Wedgefield Road, US 76/378 between Mason Road and Shaw AFB, Wise Drive, Loring Mill Road, Frierson Road, Guignard Drive, US 15 north and south of the city limits, and Mason Road

Recommendations

As we evaluate the transportation network over the next 25 years, it is evident that increasing demands will be placed on the existing road network. With limitations to new construction including natural and man-made barriers it will become even more important to protect the integrity of the existing system. This document provides a list of proposed improvements specific to key corridors throughout the region. The list includes projects that emerged during discussions with area stakeholders, local officials, the Transportation Plan Advisory Group (TPAG), and the general public.

Recommendations are placed into three categories: Operational/Design Improvements, Existing Road Widening, and New Location Construction. It should be noted that, wherever possible, the recommendations emphasize the protection of existing roadways through the inclusion of plantable medians and better access management design. That is, if a corridor warrants widening or other capacity improvements, a median may be proposed to improve safety, control access, and to enhance the corridor aesthetics.

The following list details recommended improvements for specific corridors. However, the list does not represent all roadway improvements recommended in the region. Additional improvements (i.e., bicycle/pedestrian improvements, intersection laneage, interchange upgrades, and operational and spot safety) have been proposed as part of the multimodal recommendations presented in subsequent chapters. In addition, not all of these projects will be contained in the fiscally constrained plan. However, all represent candidates for inclusion in the Vision Plan.



SUATS Long-Range Transportation Plan

Figure 5.1

2030 Congested Corridors

(Existing Plus Committed Projects)

Legend

Congested Corridors (volume/capacity)

- Network Road (v/c < 0.8)
- Approaching Capacity (v/c = 0.8 - 1.0)
- At Capacity (v/c = 1.0 - 1.2)
- Over Capacity (v/c > 1.2)
- SUATS Study Area Boundary
- County Boundary
- City Limits
- Shaw Air Force Base
- Bodies of Water
- Other Streets
- Railroad

*Source: SUATS Transportation Model

November 2007

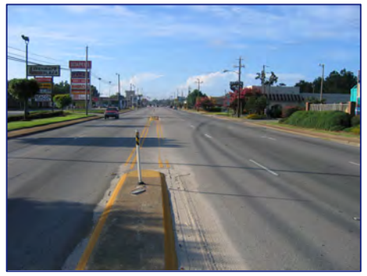
N W E S

0 0.8 1.6 Miles

Kimley-Horn and Associates, Inc

Principal and Minor Arterials

Operational/Design Improvements



Operational and design improvements typically occur without altering the existing right-of-way. These projects include retrofitting a median into an existing two way left turn lane or implementing other access management strategies. Although these improvements will slightly increase the capacity of the roadway, the main outcome of the projects will be to enhance access and mobility while increasing traffic safety along the corridor. The following roadways are recommended for operational and design improvements.

- **Brewington Road** – US 521 to US 378
- **Broad Street** – Robert Graham Freeway (US 76/378 Bypass) to Washington Street
- **Washington Street** – Broad Street to Liberty Street
- **Bultman Drive** – Broad Street to Miller Road
- **Kings Highway (SC 261)** – US 76/378 to Cane Savannah Road
- **Cane Savannah Road** – Kings Highway (SC 261) to St. Pauls Church Road
- **St. Pauls Church Road** – Cane Savannah Road to Cains Mill Road
- **Cains Mill Road** – St. Pauls Church Road to Clipper Road
- **Clipper Road** – Cains Mill Road to US 15
- **Pocalla Road** – South Guignard Drive to Lafayette Drive
- **Lafayette Drive** – Pocalla Drive to US 76/378
- **Liberty Street** – Washington Street to Alice Drive
- **Red Bay Road** – US 15 to Boulevard Road
- **US 521** – US 76/378 to Camden Highway
- **Robert Graham Freeway (US 76/378 Bypass)** – Carter Road to US 76 split

US 76/378 Bypass Improvements

Several alternative solutions were examined to address the existing and projected future problems facing the US 76/378 Bypass. Analysis was initiated as a part of the project identification process for the 2006 Sales Tax Referendum. During this process, the need was expressed for creating a corridor that was well-connected, safe, and an attraction rather than a hindrance for businesses and industries.

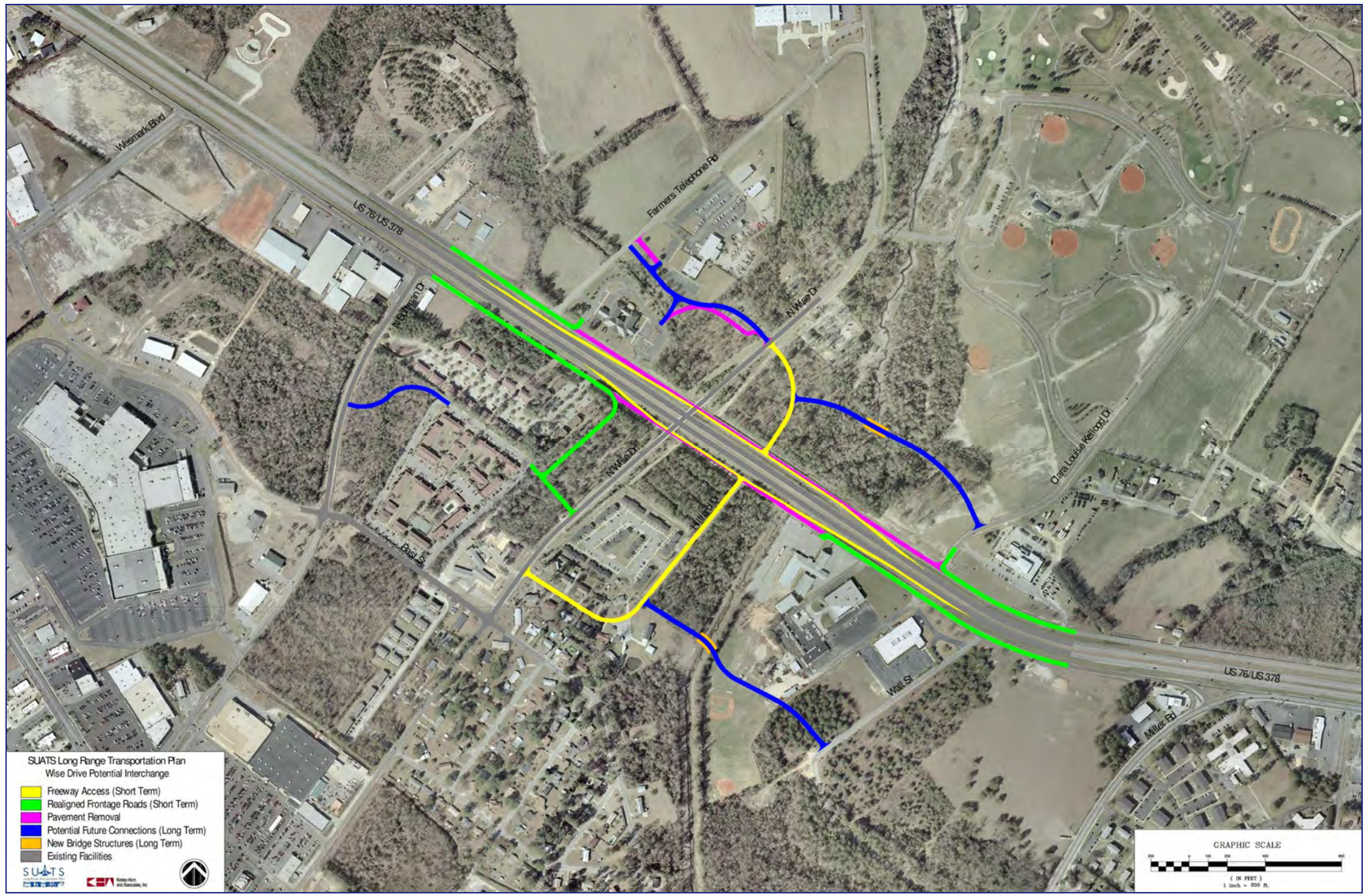
The Bypass was examined in two different ways. First, the idea was proposed for converting the current two-way frontage roads into one-way frontage roads. This option would improve safety by eliminating many of the conflicts inherent in the current two-way system and deficient interchange points. However, this change would also cause a significant shift in driving patterns and business access. Ultimately, the one-way alternative was not pursued.

The next analysis method applied to the Bypass was to evaluate critical interchange points along the corridor and identify ways for those points to be improved. This analysis method focuses on providing improved access to US 76/378 through its frontage road and interchange system. As a part of this analysis, three key locations were identified as focal points for improvement:

- Wise Drive Interchange
- Wesmark Boulevard Overpass
- Lafayette Drive/Main Street Interchange

Wise Drive currently has an overpass but no access to the US 76/378 Bypass. This road is centrally located between the Broad Street interchange and a partial access point on Miller Drive spaced over 1.7 miles apart, and would serve as a vital link for north-south connectivity as well as for business viability in the area. This cost-effective concept re-routes the existing frontage roads to allow spacing for full acceleration and deceleration ramps from the US 76/378 Bypass. The ramps will connect to Wise Drive through the use of a "square loop" design, allowing existing and future developments access to both the freeway and Wise Drive. The short-term portion of this plan will require several facilities on new locations, pavement removal, and the realignment of frontage roads. Long-term improvements to this location will include new connections between the realigned frontage roads and Wise Drive. These improvements could be funded as part of future development projects in the area. The concept will is sensitive to the land uses in the area, and will not require the relocation of any businesses or residences. The proposed improvements recommended for the Wise Drive interchange are shown in **Figure 5.2**.

Figure 5.2 Wise Drive Interchange Improvements



The next point analyzed was the Wesmark Boulevard connection with US 76/378. Members of the public and TPAG members had expressed a desire to explore having an interchange or intersection retrofitted at this location. The intersection alternative would create a signalized intersection with the Bypass where there is currently a free flow condition. This would significantly degrade the performance of the US 76/378 Bypass in this location, thereby making an intersection infeasible. An interchange was also considered to provide access from Wesmark Boulevard to the Bypass. However, the proximity of this roadway to the existing Broad Street interchange results in a distance too small to meet minimum interchange spacing requirements established by SCDOT and AASHTO. The final alternative analyzed looked at providing enhanced cross-access by extending Wesmark Boulevard across US 76/378, and constructing a new bridge over the Bypass. Access to the existing service roads would be enhanced by providing two new intersection points. Ultimately, this alternative was determined to be the most effective way to enhance access while continuing to provide a high level of service to the Bypass. The recommended improvements for the Wesmark Boulevard overpass are shown in **Figure 5.3**.

Figure 5.3 Wesmark Boulevard Overpass Improvements

Finally, the interchange of Lafayette Drive/Main Street with US 76/378 was analyzed as a part of the *Lafayette Drive Corridor Study*, completed in March 2007. The recommendations proposed in this plan intend to create an easily accessible freeway that promotes travel to and from downtown Sumter on both Main Street and Lafayette Drive. The improved ramps should limit driver confusion and provide a more convenient point of access for heavy vehicles traveling from the industrial parks south of downtown. The ramps also should provide adequate acceleration and deceleration distance, based on guidelines proposed by both SCDOT and AASHTO. The entrance and exit ramps are set up in a simple diamond configuration, with the deceleration lanes approximately 450 feet long and the acceleration lanes approximately 1,000 feet long. In order to provide adequate spacing for the ramps, the frontage roads must be rerouted away from the ramp termini. Adjacent land uses were preserved during this effort.

The intersection of Main Street and Lafayette Drive also poses congestion problems under current conditions. The design of the intersection with the current skew presents a safety problem for drivers and pedestrians. The proposed treatment at this location includes realigning the intersection to make Lafayette Drive the predominant through movement, shifting traffic from the two-lane Main Street to the four-lane Lafayette Drive. The additional laneage should reduce congestion at this location and throughout the corridor. Vehicles that still prefer to make the trip into downtown from the bypass will have a free flow right turn allowing them to make the movement with little conflict. **Figure 5.4** shows the proposed improvements recommended to this interchange as a part of the *Lafayette Drive Corridor Study*.

Figure 5.4 Lafayette Drive/Main Street Interchange Improvements

Existing Road Widening

Roads recommended to be widened represent facilities currently operating over capacity or projected to be over capacity. Additional lanes should accommodate the additional traffic volumes projected for 2030. A typical widening project should be constructed in two lane phases, with the use of two-way left turn lanes minimized to only those locations where traffic volumes or adjacent land uses require them. Numerous studies have shown that raised medians are safer than two-way left turn lanes. The following facilities are recommended for widening in the SUATS region.

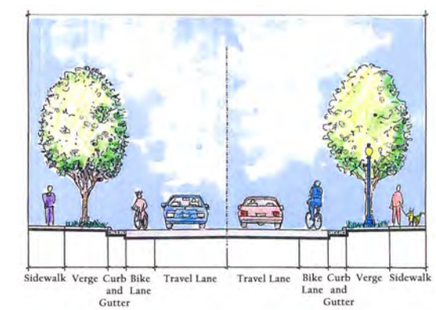
- **Alice Drive** – Wise Drive to US 521 – widen to multilanes
- **Camden Highway** – Queen Chapel Road to US 521 – widen to 4 lane divided
- **Frierson Road** – Sargent Road to US 521 – widen to 4 lane divided
- **Lewis Road** – McCrays Mill Road to US 15 – widen to 3 lane
- **Loring Mill Road** – US 76/378 to Wedgefield Road – widen to 4 lane divided
- **Patriot Parkway (SC 441)** – Loring Mill Road to Frierson Road – widen to 4 lane divided
- **Wise Drive** – Loring Mill Road to Alice Drive – widen to 4 lane divided
- **Manning Road** – Lafayette Drive (US 15) to Guignard Parkway – widen to 4 lane divided
- **Mason Road** – Camden Highway (US 521) to Broad Street – widen to 4 lanes divided
- **Terry Road** – Broad Street to Carter Road – widen to 4 lane divided; realign with Mason Road
- **Wedgefield Road (SC 763)** – Deschamps Road to Pinewood Road – widen to 4 lane divided
- **Westmark Boulevard** – Broad Street to Broad Street extension – widen to 2 lane divided, reserve ROW for four lane divided

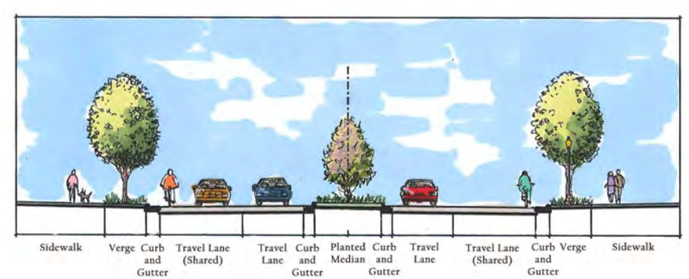
New Location Construction

In some instances, traffic congestion can be alleviated by providing alternative routes between over-capacity facilities. These connections typically are constructed as collector streets. However, sometimes it is necessary to provide new connections in the form of a principal or minor arterial. Newly constructed arterials should improve the continuity between higher-level roadways. The only new construction project recommended as an arterial is an extension of Red Bay Road between Boulevard Road and US 76/378.

Collectors

The projects previously listed represent only the principal and minor arterials recommended in the plan. Collector streets are recommended throughout the region to improve the general connectivity of the road network. The collector street system provides critical connections in the transportation network by bridging the gap between arterials and locals. Collectors gather traffic from neighborhoods and distribute it to the system of major and minor thoroughfares throughout the area. Recommended collector streets connect some of Sumter's key facilities and growing neighborhoods. These new facilities are envisioned to have two lanes and often have exclusive left turn lanes at intersections with principal and minor arterials and less frequently at intersections with other collectors. As the images on this page show, collectors can include a variety of features depending on the surrounding land use context. **Figure 5.5** shows all of the proposed principal and minor arterial projects, as well as proposed collector streets. This chapter concludes with typical cross sections for new and retrofitted roadways.





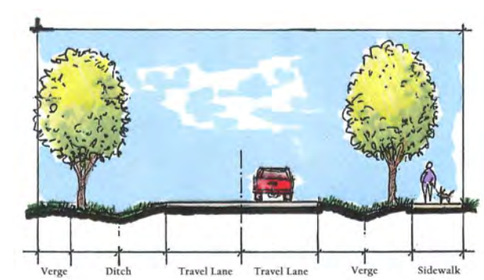


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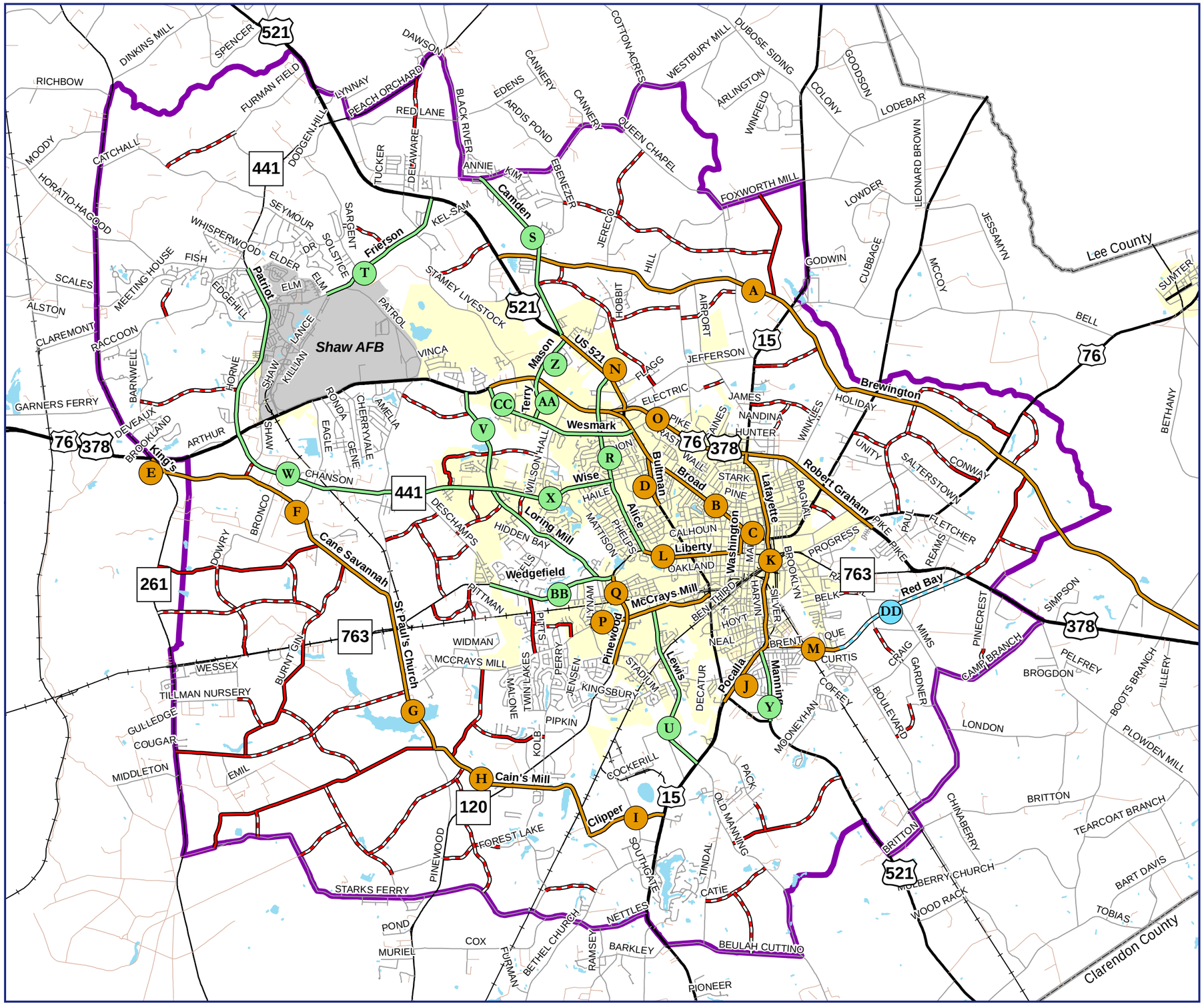
Figure 5.5

Recommended Roadway Projects



Legend

Projects - Roadway

- Operational/Design Improvement
- Widen Existing
- Proposed New Location - Arterial

Projects - Collector Streets

- Existing Collector Improvement
- Proposed New Location - Collector
- SUATS Study Area Boundary
- County Boundary
- City Limits
- Shaw Air Force Base
- Bodies of Water
- US Highway
- SC Highway
- Street
- Dirt Road
- Railroad
- K Matrix ID

November 2007

0 0.75 1.5 Miles

Evaluation Matrix

A qualitative screening was performed to assess the potential environmental impacts of projects included in the *SUATS Long-Range Transportation Plan*. This analysis consisted of overlaying roadway project alignments/locations onto a series of maps that depict natural features, cultural/community sites, and demographic data. A windshield survey of project corridors was also conducted to verify noteworthy features. In addition, the screening considers elements for which GIS coverages were available. The results of this evaluation are summarized in matrix form and represent a qualitative assessment of potential project issues. As shown in **Table 5.1** the matrix evaluation criteria are grouped into four separates areas:

- Environment/Natural Features
- Cultural and Economic Resources
- Environmental Justice
- Mobility and Implementation

Potential project impacts (if any) are classified as "Minor," "Moderate," or "Major" for each of the above categories. This determination is based on a combination of objective and subjective criteria. For example, impacts generally are considered less severe if the project involves operational/design improvements rather than widening or new location construction. The following is a brief description for each of these categories.

Environment/Natural Features

This section primarily focuses on natural features related to water quality and threatened/endangered species as well as manmade hazards such as superfund sites. The characterization of impacts primarily is related to the presence of these features within a project corridor. As the frequency of these issues is noted, the severity index increases from no impact to major impacts. Specific features in this category include:

- Wetland Crossings
- Stream Crossings
- Underground Storage Tanks
- Hazardous Waste Sites
- Superfund Sites

The following guidelines were used to rate project impacts in this category:

Minor Impacts

- Road widening with single small creek crossing
- Road widening near sensitive area
- Minimal hazardous waste/superfund areas affected

Moderate Impacts

- Road widening with multiple creek crossings
- Road widening through sensitive area
- New alignment with single small creek crossing
- New alignment near sensitive area
- Multiple hazardous waste/superfund sites with minor impact areas

Major Impacts

- New alignment along stream
- New alignment with multiple stream crossings
- New alignment through sensitive area
- Road widening or new alignment with numerous impacts
- Numerous hazardous waste/superfund sites with significant areas affected

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Table 5.1 - Roadway Project Evaluation Matrix (Modified September 13, 2007)

			ENVIRONMENTAL/ NATURAL FEATURES					CULTURAL/ECONOMIC					ENVIRONMENTAL JUSTICE			MOBILITY AND IMPLEMENTATION	
ID	Facility	Description	Wetlands	401 Certification Sites	Underground Storage Tanks	Hazardous Waste Sites	Superfund Sites	Schools/Hospitals	Churches / Cemeteries	Park Properties	Historic Resources	Protected Land	Minority	Hispanic	Low Income	Constructability	Travel Demand Benefits
Operational/Design Improvements																	
A	Brewington Road	US 521 to US 378 - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	**		*	*	*	*					**		**	1	1
B	Broad Street	US 76/378 to Washington Street - access management strategies														1	2
C	Washington Street	Broad Street to Liberty Street - access management strategies														1	1
D	Bultman Drive	Broad Street to Miller Road - access management strategies														1	1
E	Kings Highway (SC 261)	US 76/378 to Cane Savannah Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	**										**		**	1	1
F	Cane Savannah Road	Kings Highway (SC 261) to St. Pauls Church Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	**					*					**		**	1	1
G	St. Pauls Church Road	Cane Savannah Road to Cains Mill Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	***										**		*	1	1
H	Cains Mill Road	St. Pauls Church Road to Clipper Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	**			*	***	**					*			1	1
I	Clipper Road	Cains Mill Road to US 15 - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	*		*		**						*	*		1	1
J	Pocalla Road	S Guignard Drive to Lafayette Drive - access management strategies - freight route			**				*				**	*	**	1	1
K	Lafayette Drive	Pocalla Road to US 76/378 - access management strategies - freight route	**				*	*	*	*	*		**	*	**	1	2
L	Liberty Street	Washington Street to Alice Drive - access management strategies/streetscape														1	2
M	Red Bay Road	US 15 to Coleman Road - 4 lane divided - freight route	**				*		*				**		**	2	1
N	US 521	Thomas Sumter Highway to Robert Graham Freeway (US 76/378) - access management strategies														1	1
O	US 76/378	Carter Road to US 76 split - interchange and access improvements														2	3
P	McCrays Mill Road	Stadium Road to Guignard Drive - access management strategies	**			*							**		**	1	1
Q	Pinewood Road	Stadium Road to Wedgefield Road - access management strategies	*		**			*	*	*			*			1	1
Widen Existing																	
R	Alice Drive	Wise Drive to US 521 - widen to multilane	*	*	*			*	**	*			**		*	2	3
S	Camden Highway	Queen Chapel Road to US 521 - widen to 4 lane divided	**							*			**			2	2
T	Frierson Road	Shaw AFB Frierson Road Gate to US 521 - widen to 4 lane divided	**									*	**	*	**	2	2
U	Lewis Road	McCray's Mill Road to US 15S - widen to 3 lane	***		*			*	*				***	*		2	2
V	Loring Mill Road	US 76/378 to Wedgefield Road - widen to 4 lane divided	***	*									**			2	2
W	Patriot Parkway	Loring Mill Road to Fish Road - widen to 4 lane divided	*		*				*			**	***		**	2	2
X	Wise Drive	Loring Mill Road to Alice Drive - widen to 4 lane divided	**	*				*	*							2	2
Y	Manning Road	Lafayette Drive (US 15) to Guignard Parkway - widen to 4 lane divided	*		**				*				***		**	2	2
Z	Mason Road	Camden Highway (US 521) to Broad Street - widen to 4 lane divided	**						**				**		**	2	2
AA	Terry Road	Broad Street to Carter Road - widen to 4 lane divided; realign with Mason Road	*										***	***	**	3	2
BB	Wedgefield Road (SC 763)	Deschamps Road to Pinewood Road - widen to 4 lane divided	*		**			*					*			2	2
CC	Westmark Boulevard	Broad Street to Broad Street Extension - widen to 2 lane divided, reserve ROW for 4 lane divided			*								**	**	**	2	2
New Location																	
DD	Red Bay Road	Coleman Street to US 76/378 - 2 lane - freight route, reserve ROW for 4 lane divided	***										**		***	1	2

- Qualitative screening only. Observations were made by overlaying potential alignments on map with environmental and community resource information. Limited field review was conducted.
- General "rules of thumb" were followed (see "Key" examples below) to assess potential impacts to environmental issues.
- Not intended to determine impacts, only to identify those communities in proximity to various projects in the long range plan. A more detailed analysis including a field survey will need to be undertaken to determine specific community impacts on a project-by-project basis when individual project studies are begun.
- "*" - impact on areas composed of greater than 50% of the population is of the selected demographic. If marked, these communities will need to be included in an environmental justice assessment when individual project studies are undertaken.

Envornmental/Natural Features; Cultural/Economic Features; Environmental Justice

*	**Minor** - Widening; single small creek crossing; near sensitive "wetland" area.
**	**Moderate** - Widening: multiple small creek crossing; cross or near edge of sensitive area. New Location: single small creek crossing or near sensitive area.
***	**Major** - New alignment: along stream; multiple impacts; through middle of sensitive area.

Constructability

1	Low impact, easy to implement
2	Moderate impact to utilities, relocations, bridges, traffic control, etc.
3	High impact to utilities, relocations, bridges, traffic control, etc.

Travel Demand Benefits

1	Provides a low level of congestion relief to roadway system
2	Provides a moderate level of congestion relief to roadway system
3	Provides a high level of congestion relief to roadway system

Cultural/Economic Features

This category indicates the presence of community services, cultural resources, and institutions including schools, churches, parks, protected lands, and historic areas. The impacts to these types of community resources often are based on proximity or when right-of-way is required from these sites. In the most extreme cases, buildings may be directly impacted.

More specifically these features include:

- Schools
- Hospitals
- Churches/cemeteries
- Park properties
- Historic resources
- Protected land

The following guidelines were used to rate project impacts in this category:

Minor Impacts

- Road widening within proximity to a community resource or sensitive area where no right-of-way is required nor are community resource buildings/structures directly affected
- New alignment within proximity to community resources where minor amounts of right-of-way are required in locations that do not impact the significance, operation, or relative safety of the community resource

Moderate Impacts

- Road widening within proximity to a community resource or sensitive area where minimal amounts of right-of-way are required but no community resource buildings/structures are directly affected
- New alignment that requires measurable amounts of right-of-way from community resource properties where some impacts to the property are anticipated but do not include impacts to community resource buildings/structures

Major Impacts

- Roadway widening and new location projects where significant right-of-way and possible direct impacts to buildings/structures are expected

Environmental Justice Considerations

Environmental justice reviews conducted at the systems planning level typically involve the analysis of available demographic data from the US census. When reviewing the LRTP, it is important not only to consider specific project impacts but also the distribution of projects and transportation investments throughout the study area. The plan seeks to minimize disproportionate impacts to minority and low-income groups through proactive planning. For the purposes of this screening exercise, projects were evaluated for their relative impacts to the following groups:

- Minority
- Hispanic
- Low-income

The following guidelines were used to rate project impacts in this category:

Minor Impacts

- Road widening or new alignment within proximity or adjacent to minority and/or low-income communities areas where 50% or more of the population is either minority, Hispanic, or low-income

Moderate Impacts

- Road widening or new alignment that passes directly through a minority and/or low-income community where 50% or more of the population is either minority, Hispanic, or low-income

Major Impacts

- Roadway widening and new location projects where significant right-of-way and possible direct impacts to buildings/structures are expected within areas with 50% or more of the population is either minority, Hispanic, or low-income

Mobility and Implementation Factors

As projects are considered, it is important to understand the relative benefits as well as the difficulties that may be encountered during implementation. For this reason, the relative mobility benefits and constructability difficulties have been included in this evaluation. This process is one of the first steps in understanding the expected ratio between costs and benefits. While this evaluation is not intended as a quantitative assessment of specific benefits and project costs, providing this information empowers planners to select projects for inclusion in the plan that have a realistic chance of being implemented. This information also is used when considering the rudimentary grouping of projects into respective horizon years and Vision Plan.

Constructability

For the purposes of this evaluation, project constructability was considered to ascertain the difficulties associated with project permitting, physical construction, costs, and even traffic control. Projects with challenging constructability issues may be more costly due to impacts on design and delays associated with maintaining traffic flow during construction. An example of a project with minor constructability issues would be a road widening project where sufficient right-of-way exists and few sensitive areas are affected. Conversely, an example of a major constructability challenge could be a bridge replacement project where sensitive environmental features of the built and natural environment are present and where limited crossing alternatives exist. In this example, an atypical bridge design may be necessary and creative solutions may be required to maintain traffic flow. Both conditions likely would extend the duration of construction and impact project cost. The following guidelines were used to rate project impacts in this screening process:

Minor Constructability Impacts

- Road widening where little or no right-of-way is required and few sensitive environmental features are present. Traffic can be maintained during construction along the existing facility.
- New alignment project located outside of sensitive areas where few impacts to the built environment are expected.

Moderate Constructability Impacts

- Road widening where some sensitive areas are impacted. Traffic can still be maintained but there may be disruptions along links in the corridor. Environmental permitting may impact project schedule.
- New alignment projects that traverse through a sensitive area but where no changes in typical design area required. Environmental permitting may impact project schedule.

Major Constructability Impacts

- Road widening or bridge replacement project that traverses sensitive environmental areas for a significant length where atypical designs are required as well as significant environmental permitting process is expected. Creative designs and traffic control may be necessary to implement.
- New alignment with multiple environmental impacts and/or structures. Creative design solutions and significant permitting will be required.

Travel Demand Benefits

The assessment of mobility benefits also has been considered during this process. While all of the previous evaluation criteria relate to a project's potential impacts, this category seeks to qualify the relative travel benefits associated with implementing the project. The Sumter Tranplan model was utilized to determine how each project impacts traffic mobility and congestion to adjacent corridors. The Highway Project Evaluation Matrix expresses these benefits by rating each project as 1, 2, or 3 based on the following criteria:

- **Rating of 1**: Provides a low level of congestion relief to roadway system
- **Rating of 2**: Provides a moderate level of congestion relief to roadway system
- **Rating of 3**: Provides a high level of congestion relief to roadway system

Evaluation Matrix as a Planning Tool

The collection and consideration of environmental, cultural, and socioeconomic data during the development of the LRTP serves as another tool to ensure the plan respects the presence of environmentally sensitive areas within the region. When considered with best practices, this data resulted in selecting roadway projects and alignments that minimized impacts. Therefore, this analysis was used not only to eliminate any candidate projects with "fatal" flaws but also to improve those projects that provide true benefits to the transportation network. The information obtained from this exercise enhanced proposed projects by adjusting alignments to avoid potential impacts to environmental, cultural and socioeconomic elements within the community. Finally, this screening process allows early identification of likely impacts and areas of uncertainty that will need to be investigated more fully as a particular project moves forward through more detailed planning and design. The Highway Project Evaluation Matrix can be seen in **Table 5.1**.

Highway Project Total Benefit and Impact Rankings

A ranking process was conducted for the purpose of identifying those highway projects to be considered in the financially constrained plan. A ranking process was developed using the environmental/natural, cultural and economic, environmental justice, and mobility and implementation factors. The ranking was based on "weighted values" identified by the Transportation Plan Advisory Group. The ranking process was based on the following three steps:

Step 1: Identify "weighted values" of evaluation criteria

Level of Impact Values	
Environmental/Natural Features	13 points
Cultural/Economic Features	24 points
Environmental Justice	12 points
Constructability	14 points
Traffic Demand Benefits	
Traffic Demand Benefits (Mobility)	37 points
Total Points	*100*

Step 2: Convert Level of Impact Values to point values (total potential points 63)

The lower the potential impact of the project, the higher score it received.

Step 3: Develop traffic demand benefits (expanded from Table 5.1) based on the following criteria:

Relief of Existing Congestion (based on 2004 volume-to-capacity ratio)
Relief of Future Congestion (based on 2030 travel model v/c)
Total 2030 Volume
Support Connectivity

The results of this analysis are shown in **Table 5.2** – Highway Project Total Benefit and Impact Matrix. As presented in the table, a mix of widening and operational/design improvement projects rose to the top. The top six "ranked" highway projects include:

1. **US 76/378** – The operation/design improvements to US 76/378 from Carter Road to the US 76 split will improve access and relieve congestion. The improvements include construction of interchanges at Wise Drive and Lafayette Drive and access improvements along the corridor.
2. **Alice Drive** – This project widens to multilane the existing section of Alice Drive from Wise Drive north to US 521. This project will have only minor potential impacts while providing a high level of congestion relief.
3. **Broad Street** – The operation/design improvements along Broad Street will include access management improvements intended to relieve congestion along this corridor. This project should provide high levels of existing and future congestion.
4. **Liberty Street** – the operation/design improvements along Liberty Street include implementing access management strategies and streetscape enhancements to improve corridor aesthetics and reduce congestion. This project should provide moderate levels of congestion relief.
5. **Lafayette Drive** – the operation/design improvements along Lafayette Drive include streetscape enhancements, access management strategies, and signal system upgrades intended to improve mobility and access along the corridor. This project should provide high levels of congestion relief while enhancing aesthetics along the corridor.
6. **Wedgefield Road** – The widening of Wedgefield Road from Deschamps Road to Pinewood Road provides a high level of congestion relief while creating only minor potential impacts to wetlands, schools/hospitals, and minority communities.

Table 5.2 - Roadway Project Total Benefit and Impact Matrix (Modified September 13, 2007)

ID	PROJECT TYPE	Facility	Description	Relief of Existing Congestion	Relief of Future Congestion	Total Volume	Promotes Connectivity	Traffic Demand Benefit Rankings (0-37)	Project Impact Rankings (0-63)	Total Rankings (0-100)
Tier 1										
O	Operational/Design	US 76/378	Carter Road to US 76 split - interchange and access improvements	*	***	***		37	58	95
R	Widen Existing	Alice Drive	Wise Drive to US 521 - widen to multilane	*	**	**		37	56	93
B	Operational/Design	Broad Street	Robert Graham Parkway (US 76/378) to Washington Street - access management strategies	**	**	*	*	25	63	88
L	Operational/Design	Liberty Street	Washington Street to Alice Drive - access management strategies/streetscape	*	*	**	*	25	63	88
K	Operational/Design	Lafayette Drive	Pocalla Road to US 76/378 - access management strategies - freight route	*	**	**	*	25	58	83
BB	Widen Existing	Wedgefield Road (SC 763)	Deschamps Road to Pinewood Road - widen to 4 lane divided	*	***	**	*	25	58	83
Tier 2										
X	Widen Existing	Wise Drive	Loring Mill Road to Alice Drive - widen to 4 lane divided	*	*	**		25	56	81
DD	New Location	Red Bay Road	Boulevard Road to US 76/378 - 2 lane - freight route, reserve ROW for 4 lane divided	*	*	*	**	25	55	80
S	Widen Existing	Camden Highway	Queen Chapel Road to US 521 - widen to 4 lane divided	*	**	*	*	25	55	80
T	Widen Existing	Frierson Road	Shaw AFB Frierson Road Gate to US 521 - widen to 4 lane divided	*	**	*	*	25	54	79
Y	Widen Existing	Manning Road	Lafayette Drive (US 15) to Guignard Parkway - widen to 4 lane divided		**	*	*	25	54	79
W	Widen Existing	Patriot Parkway	Loring Mill Road to Fish Road - widen to 4 lane divided	*	*	*	*	25	53	78
V	Widen Existing	Loring Mill Road	US 76/378 to Wedgefield Road - widen to 4 lane divided	*	**	***		25	53	78
U	Widen Existing	Lewis Road	McCray's Mill Road to US 15 South - widen to 3 lane	*	*	*	*	25	52	77
Z	Widen Existing	Mason Road	Camden Highway (US 521) to Broad Street - widen to 4 lane divided	*	**	*	*	25	52	77
C	Operational/Design	Washington Street	Broad Street to Liberty Street - access management strategies	*	***	***		12	63	75
D	Operational/Design	Bultman Drive	Broad Street to Miller Road - access management strategies	*	**	**		12	63	75
N	Operational/Design	US 521	Camden Highway to Robert Graham Freeway (US 76/378) - access management strategies	*	**	**	*	12	63	75
Q	Operational/Design	Pinewood Road	Stadium Road to Wedgefield Road - access management strategies	*	**	**		12	63	75
CC	Widen Existing	Westmark Boulevard	Broad Street to Broad Street Extension - widen to 2 lane divided, reserve ROW for 4 lane divided	*	**	**		12	63	75
Tier 3										
I	Operational/Design	Clipper Road	Cains Mill Road to US 15 - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	*	***	**		12	62	74
AA	Widen Existing	Terry Road	Broad Street to Carter Road - widen to 4 lane divided; realign with Mason Road	*	**	*	*	25	47	72
J	Operational/Design	Pocalla Road	S Guignard Drive to Lafayette Drive - access management strategies - freight route	**	***	*		12	60	72
A	Operational/Design	Brewington Road	US 521 to US 378 - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	**	***	**		12	58	70
F	Operational/Design	Cane Savannah Road	Kings Highway (SC 261) to St. Pauls Church Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	*	***	**		12	58	70
E	Operational/Design	Kings Highway (SC 261)	US 76/378 to Cane Savannah Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	*	**	**		12	58	70
G	Operational/Design	St. Pauls Church Road	Cane Savannah Road to Cains Mill Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	*	**	**		12	58	70
P	Operational/Design	McCrays Mill Road	Stadium Road to Guignard Drive - access management strategies		*	*		12	58	70
H	Operational/Design	Cains Mill Road	St. Pauls Church Road to Clipper Road - shoulder and edge treatment - freight route, reserve ROW for 4 lane divided	*	*	*	*	12	57	69
M	Operational/Design	Red Bay Road	US 15 to Coleman Road - access management strategies/streetscape		**	*	*	12	54	66

NOTES

Project Evaluation Matrix - Weighted Rankings
(Weighted values identified by study team)

Traffic Demand Benefits (Mobility)	37 points
Constructability	14 points
Environmental Justice	12 points
Cultural/Economic Features	24 points
Environmental/Natural Features	13 points

Traffic Demand Benefits - Criteria Evaluation (Total of 37 points)

Relief of Existing Congestion
(Based on 2003 v/c)
*** - Relieves a high level of congestion
** - Relieves a moderate level of congestion
* - Relieves a low level of congestion
0 - Does not relieve congestion

Relief of Future Congestion
(Based on 2030 travel model v/c)
*** - Relieves a high level of congestion
** - Relieves a moderate level of congestion
* - Relieves a low level of congestion
0 - Does not relieve congestion

Total 2030 Volume
*** - Volume greater than 25,000
** - Volume between 10,000 and 25,000
* - Volume less than 10,000

Connectivity
* - Promotes local or regional connectivity
0 - Does not promote local or regional connectivity

Project Impact Ranking (Total of 63 points)
Reflects Environmental/Natural Features, Cultural/Economic Features, Environmental Justice, and Constructability
The lower the impact of the project, the higher score it received

The six projects representing Tier 1 should be considered first for implementation because they have the greatest benefits and the least impacts. Tier 2 projects also have substantial benefits in terms of congestion relief and connectivity but also have more potential impacts. Some of these projects will appear on the financially constrained plan, while others will appear on the Vision Plan. The benefits of the Tier 3 projects are substantially lower than the other two tiers. These projects will appear on the Vision Plan.

Access Management

In an environment of revenue-constrained transportation planning and competing agendas, ***access management*** is not just good policy but essential to the integrity of the entire transportation network. Access management balances the needs of motorists using a roadway with the needs of adjacent property owners dependent upon access to the roadway. Access management results from a cooperative effort between state and local agencies and private land owners to systematically control the "location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway."[1]

A corridor with poor access management includes endless driveways and several traffic signals. The result effects all motorists as commute times increase, fuel efficiency lowers and vehicle emissions rise. Poor access management has a direct impact on the livability and economic vitality of commercial corridors, ultimately discouraging potential customers. Signs of a corridor with poor access management include:

- More crashes between motorists, pedestrians, and cyclists
- Increasingly poor efficiency of the roadway
- Congestion outpacing growth in traffic
- Spillover cut-through traffic on adjacent residential streets
- Limited sustainability of commercial development

As development continues to sprout around heavily traveled corridors, protecting the through capacity will be important for the well being of the transportation system and economic vitality of the region. Without access management, the function and character of major roadway corridors can deteriorate rapidly and adjacent properties can suffer from declining property values and high turnover. Access management benefits all users as shown in **Table 5.3**.

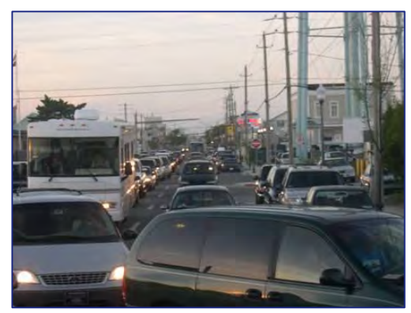


Table 5.3 - Benefits of Corridor Access Management

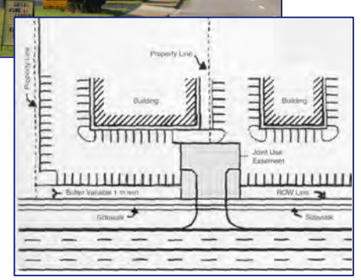
User	Benefit
Motorists	▪ Fewer delays and reduced travel times ▪ Safer traveling conditions
Bicyclists	▪ Safer traveling conditions ▪ More predictable motorist movements ▪ More options in a connected street network
Pedestrians	▪ Fewer access points and median refuges increases safety ▪ More pleasant walking environment
Transit Users	▪ Fewer delays and reduced travel times ▪ Safer, more convenient trips to and from transit stops in a connected street and sidewalk network
Freight	▪ Fewer delays and reduced travel times lower cost of delivering goods and services
Business Owners	▪ More efficient roadway system serves local and regional customers ▪ More pleasant roadway corridor attracts customers ▪ Improved corridor aesthetics ▪ Stable property values
Government Agencies	▪ Lower costs to achieve transportation goals and objectives ▪ Protection of long-term investment in transportation infrastructure
Communities	▪ More attractive, efficient roadways without the need for constant road widening

[1] Access Management Manual, Transportation Research Board, National Academy of Sciences, Washington DC, 2003

Access Management Strategy Toolkit

Access management is not a one-size fits all solution to corridor congestion. Successful strategies differ throughout a region and even along the same road. The toolkit provides a general overview of the various strategies available to mitigate congestion and its effects. A comprehensive access management program includes evaluation methods and supports the efficient and safe use of the corridors for all transportation modes. The purpose of the toolkit is to provide local engineering and planning officials with access management strategies as well as an overview of their application and use.

Driveway Treatments



Number of Driveways

In many cases, new development occurs adjacent to an existing site or adjacent to another new development. In these cases, driveway permit applicants should be encouraged to seek cross access easements/agreements from an existing adjacent property or coordinate with an adjacent proposed development to create interconnected internal circulation systems and shared-use external driveways. Approximate construction cost varies and is usually the responsibility of private development.

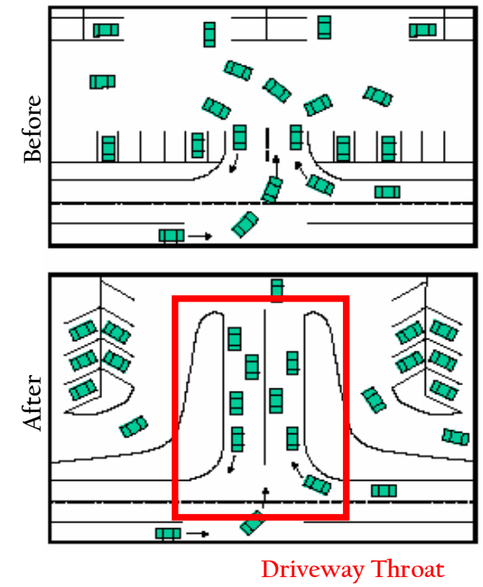
Driveway Placement/Relocation

Driveways located close to intersections create and contribute to operational and safety issues. These issues include intersections and driveway blockages, increased points of conflict, frequent/unexpected stops in the through travel lanes, and driver confusion as to where vehicles are turning. Driveways close to intersections should be relocated or closed, as appropriate. As a best planning practice, no driveway should be allowed within 100 feet of the nearest intersection.

On-Site Treatments

Improved On-Site Traffic Circulation

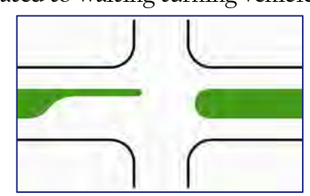
On-site traffic circulation can be improved by managing the driveway throat length, the distance from the edge of the public street to the first internal site intersection. An adequate separation should be provided (minimum 100 feet for large shopping centers) to prevent internal site operations from affecting an adjacent public street, ultimately causing spillback problems. Approximate construction cost varies and is usually the responsibility of private development.



Turn Treatments

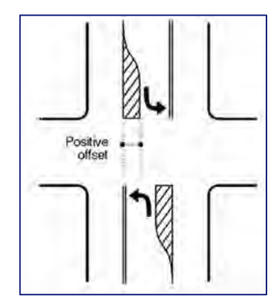
Left Turn Storage Bays

Where possible, exclusive left-turn lanes/bays should be constructed to provide adequate storage space for turning vehicles, exclusive of through traffic. The provision of these bays reduces vehicle delay related to waiting turning vehicles and may also decrease the frequency of rear-end and other collisions attributable to lane blockages. In some cases turn bays/lanes can be constructed within an existing median, in other cases, additional right-of-way is required and construction may be more costly.



Offset Left Turn Treatment

Exclusive left turn lanes at intersections are generally configured to the right of one another, which causes opposing left turning vehicles to block one another's forward visibility. An offset left turn treatment involves shifting the left turn lanes to the left, adjacent to the innermost lane of oncoming through traffic. In cases where permissive left turn phasing is used, this treatment can improve efficiency by reducing crossing and exposure time and distance for left-turning vehicles. In addition, the positive off-set improves sight distance and may improve gap recognition. Where there is sufficient median width, this treatment can be easily retrofit. Where there is not sufficient right-of-way width, the construction of this treatment can be difficult and costly. Approximate construction cost varies.



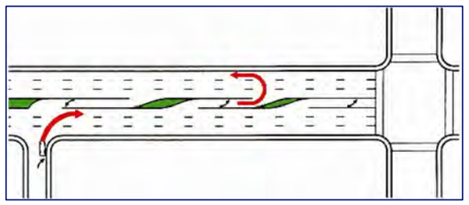
Median Treatments

Non-Traversable Median

These features are raised or depressed cross section elements that physically separate opposing traffic flows. Inclusion in a new cross section or retrofit of an existing cross section should be considered for some multi-lane arterials (general) and for multi-lane roadways with high pedestrian volumes, high collision rates, or in locations where aesthetics are a priority. As these treatments are considered, sufficient spacing and locations for U- and left-turn bays must be identified. Approximate construction cost varies.

- *Advantages*—increased safety and capacity by separating opposing vehicle flows, providing space for pedestrians to find refuge, and restricting turning movements to locations with appropriate turn lanes
- *Disadvantages*—increased emergency vehicle response time (indirect routes to some destinations), inconvenience, increased travel distance for some movements, and potential opposition from the general public and affected property owners.

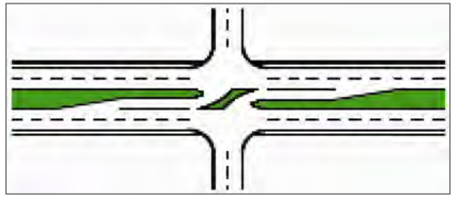
Median U-Turn Treatment



These treatments involve prohibiting or preventing minor street left turns at signalized intersections. Instead, these turns are made by first making a right-turn and then making a U-turn at a nearby median opening. These treatments can increase safety and efficiency of roadway corridors with high volumes of through traffic, but should not be used where there is not sufficient space available for the provision of U-turn movements. The location of U-turn bays must consider weaving distance, but also not contribute to excessive travel distance. Approximate construction cost is $50,000 - $60,000 per median opening.

- *Advantages*—reduced delay for major intersection movements, potential for better two-way traffic progression (major and minor street), fewer stops for through traffic, and fewer points of conflict (for pedestrians and vehicles) at intersections.
- *Disadvantages*—increased delay for some turning movements, increased travel distance, increased travel time for minor street left turns, and driver confusion.

Directional Crossover (Left-Over Crossing)



When a median exists on a corridor, special attention must be given to locations where left turns are necessary. A left-over is a type of directional crossover that prohibits drivers on the cross road (side street) from proceeding straight through the intersection with the main road. To accomplish this movement, a right turn followed by a U-turn is required. Such designs are appropriate in areas with high traffic volumes on the major road and lower volumes of through traffic on the cross road. The treatment is especially helpful in locations where traffic needs to make left turns from the main line onto the minor street. A properly implemented left-over crossing reduces delay for through-traffic and diverts some left-turn maneuvers from intersections. By reducing the number of conflict points for vehicles along the corridor, these treatments improve safety.

Intelligent Transportation System

Closed Circuit Television Traffic Monitoring

Closed Circuit Television (CCTV) cameras are primarily used on interstate facilities and major arterials to provide visual traffic volume and flow information to traffic management or monitoring centers. These centers use this information to deploy incident response patrols/equipment and to provide roadway travel delay information to motorists. By having visual roadway information, traffic management centers are able to identify incidents quickly and respond appropriately and efficiently, helping to reduce the effect of incidents on a single location or on multiple roadways. Approximate construction cost is $20,000 per location.

Adaptive Signal Control

This technology involves continuously collecting automated intersection traffic volumes and using the volumes to alter signal timing and phasing to best

accommodate actual—real time—traffic volumes. Adaptive signal control can increase isolated intersection capacity as well as improve overall corridor mobility by up to twenty percent during off-peak periods and ten percent during peak periods. Approximate construction cost is $250,000 per system and $10,000 per intersection in addition to 25% of capital costs in training, etc.

Emergency Vehicle Preemption

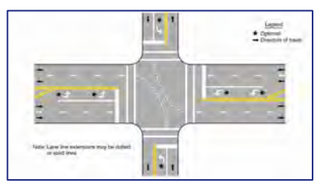
This strategy involves an oncoming emergency or other suitably equipped vehicle changing the indication to green of a traffic signal to favor the direction of desired travel. Preemption improves emergency vehicle response time, reduces vehicular lane and roadway blockages, and improves the safety of the responders by stopping conflicting movements. Approximate construction cost is $5,000-$7,000 per intersection plus $2,000 per equipped vehicle.

Signalization

The volume of traffic attracted to some side streets or site driveways is more than can be accommodated acceptably under an unsignalized condition. Delays for minor street movements as well as left-turn movements on the main street may create or contribute to undue delays on the major roadway and numerous safety issues. The installation of a traffic signal at appropriate locations can mitigate these types of issues without adversely affecting the operation of the major roadway. Approximate construction cost is $50,000 to $60,000 per signal.

Intersection and Minor Street Treatments

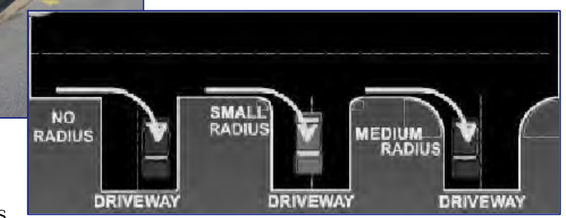
Skip Marks (Dotted Line Markings)



These pavement markings can reduce driver confusion and increase safety by guiding drivers through complex intersections. Intersections that benefit from these lane markings include offset, skewed or multi-legged intersections. Skip marks are also useful at intersections with multiple turn lanes. The dotted line markings extend through the intersection the line markings of approaching roadways. The markings should be designed not to confuse drivers in adjacent or opposing lanes.

Intersection and Driveway Curb Radii

Locations with inadequate curb radii have the potential to necessitate that turning vehicles use opposing travel lanes to complete their turning movement. Inadequate curb radii may cause vehicles to "mount the curb" as they turn a corner and cause damage to the curb and gutter, sidewalk, and any fixed objects located on the corner. This also may endanger pedestrians standing on the corner. Curb radii should be adequately sized for area context and likely vehicular usage.

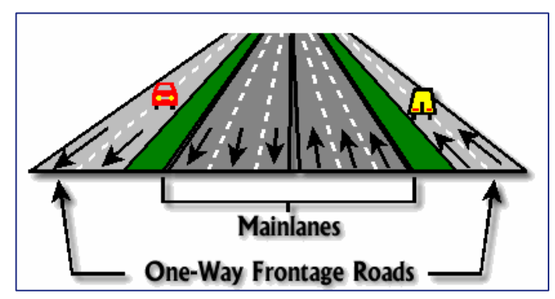


Minor Street Approach Improvements

At signalized intersections, minor street vehicular volumes and associated delays may require that a disproportionate amount of green time be allocated to the minor street, contributing to higher than desired main street delay. Often, with laneage improvements to the minor street approaches, such as an additional left-turn lane or right-turn lane, signal timing can be re-allocated and optimized.

One-Way Frontage Roads

Many older major roadway corridors have two-way service roads along both sides of the street. Converting these service roads to one-way with slip ramps has the potential to improve their safety and efficiency—decreasing the number of intersection conflict points from 96 (two-way) to 36 (one-way) at minor road intersections and also reducing confusion at intersections. If applied to the US 378 Bypass, the addition of "back door" collector street access will be needed prior to one-way conversion. Approximate construction cost is $1,000,000 per mile.



Types of Corridors and Potential Solutions

Some access management strategies are better suited to one corridor type than another. **Table 5.4** lists four popular cross sections with local examples and the potential access management strategies.

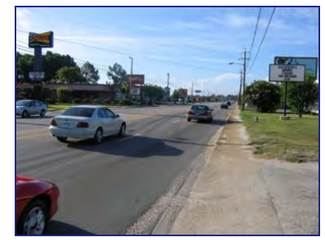
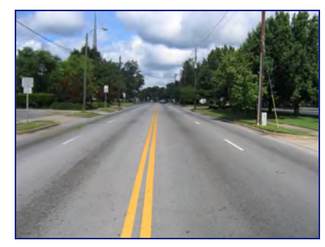
SUATS Access Management Corridor Strategies

Sumter can proactively combat worsening congestion and deteriorating corridors by implementing appropriate access management strategies. The following five strategic corridors were identified for detailed analysis and recommendations:

- Liberty Street (Alice Drive to Main Street)
- Broad Street (Market Street to Wise Drive)
- Bultman Drive (Broad Street to Kilgo Street)
- McCrays Mill Road (Stadium Road to Lewis Road)
- Pinewood Road (Stadium Road to Oakland Avenue)

With the proper steps taken now, these corridors will foster future growth, accommodate increases in traffic, and contribute to the success of the overall transportation system.

Table 5.4 – Types of Corridors and Potential Solutions

Cross Section		Access Management Strategy	
Five Lanes (Predominantly Retail Land Uses) Local Example ▪ Broad Street ▪ Bultman Drive ▪ Lafayette Drive ▪ McCrays Mill Road		▪ Adaptive signal control ▪ Median U-turn treatment ▪ Non-traversable median treatment ▪ Offset left turn treatment ▪ Intersection and driveway curb radii ▪ Left-turn storage bays	▪ Minor street approach improvements (left-turn lane and right-turn lane) ▪ Emergency vehicle preemption ▪ Driveway throat length ▪ Consolidate driveways/cross access ▪ Driveway placement/relocation
Four-Lane Divided with Landscaped Median Local Example ▪ Broad Street west of Robert Graham Freeway (US 76/378 Bypass)		▪ Adaptive signal control ▪ Median U-turn treatment ▪ Offset left turn treatment ▪ Intersection and driveway curb radii ▪ Minor street approach improvements (left-turn lane and right-turn lane)	▪ Emergency vehicle preemption ▪ Driveway throat length ▪ Consolidate driveways/cross access ▪ Driveway placement/relocation ▪ Signalization (driveways) ▪ Left-turn storage bays
Four-Lane Undivided Local Example ▪ Liberty Street		▪ Adaptive signal control ▪ Offset left turn treatment ▪ Intersection and driveway curb radii ▪ Minor street approach improvements (left-turn lane and right-turn lane) ▪ Emergency vehicle preemption	▪ Driveway throat length ▪ Consolidate driveways/cross access ▪ Driveway placement/relocation ▪ Signalization (driveways) ▪ Left-turn storage bays
Four-Lane with Service Roads and Partially Controlled Access Local Example ▪ Robert E. Graham Freeway (US 76/378 Bypass)		▪ Adaptive signal control ▪ CCTV traffic monitoring ▪ Non-traversable median treatment	▪ One way frontage road system with skip ramps ▪ Emergency vehicle preemption

Liberty Street Corridor (Alice Drive to Main Street)

Liberty Street is a principal arterial connecting the downtown business district to the nationally acclaimed Swan Lake-Iris Gardens. On an average day, up to 15,000 vehicles travel this stretch of road. The character of Liberty Street varies, and for analysis purposes, the corridor was subdivided into three segments that share similar cross sections and land uses - Alice Drive to Swan Lake, Swan Lake to Guignard Drive, and Guignard Drive to Main Street.

Figures 5.6A and **5.6B** display the Liberty Street Corridor access management strategies. Local officials and advocacy groups such as the Friends of Swan Lake would like these strategies to be enhanced during the development of a streetscape project for the Liberty Street Corridor. This project would lay the groundwork for aesthetic improvements to create a gateway to Sumter and Swan Lake-Iris Gardens.

General Recommendations

The entire corridor between Alice Drive and Main Street would benefit from consolidating driveways. In some areas, the corridor is transforming from residential to commercial uses. In areas such as between Walker Avenue and Wright Street, residences could share access to Liberty Street. In the commercial sections, businesses and roadway users would benefit from the shared access, ultimately reducing driver confusion caused by left-turning vehicles.

Specific Recommendations

Recommendation #1 – The approximately ¼-mile section between Alice Drive and Swan Lake is mostly a 5-lane section with a two-way left turn lane. The City should work with local land owners to encourage improvements to on-site circulation and consolidate driveways. A median treatment that restricts access to right-in/right-out will reduce safety concerns and improve the capacity and aesthetics of the roadway. In particular, the intersection of Liberty Street and Alice Drive suffers from high traffic volumes and a confusing design. Two of the three legs of the intersection operate at level of service F. This intersection should be improved by considering following:

- Add skip marks for all motorists turning left
- Move driveway access away from intersection to avoid vehicle conflict
- Install channelized right-in/right-out island
- Install a gateway sign to welcome visitors to the community

Recommendation #2 – From Swan Lake to Guignard Drive, Liberty Street remains a 5-lane section with a two-way left turn lane. As the road approaches Guignard Street, adjacent land uses become mostly commercial. The following two measures are recommended:

- Construct a non-traversable landscaped median in lieu of the two-way left-turn lane to control access and increase safety
- Move driveway access away from the intersection with Artillery Drive to improve traffic flow and reduce congestion

Recommendation #3 – Between Guignard and Main Streets the cross section changes to four lanes with multiple side roads and driveways servicing adjacent commercial property. To improve the function and safety of this segment, the following recommendations should be considered:

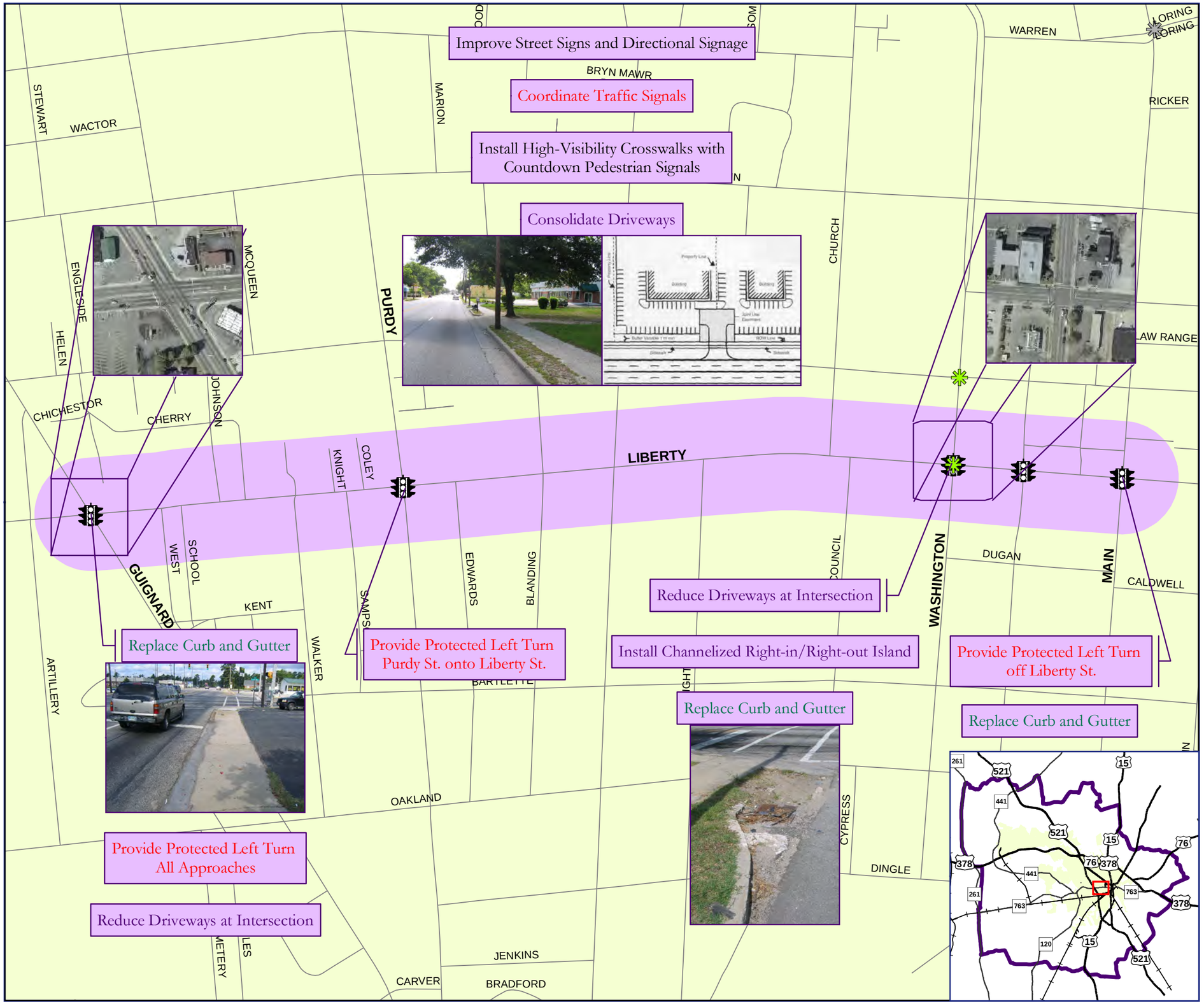
- Coordinate traffic signals to reduce driver delay and frustration in the area
- Increase signage in advance of intersections to reduce driver confusion and improve safety
- Consolidate driveways to combine turning movements, increase safety, limit driver confusion, and ease congestion
- Improve on-site traffic circulation to prevent spillback issues and safety problems on Liberty Street

Several recommendations can improve the intersections along this section of Liberty Street. These recommendations include:

- Replace curb and gutter and provide protected left turns for all approaches at Guignard Street
- Provide protected left turns for motorists turning left onto Liberty Street from Purdy Street
- Move driveway access away from intersection with Washington Street
- Install channelized right-in/right-out islands to control access and improve traffic flow

Liberty Street and Alice Drive

Liberty Street at Swan Lake



SUATS Long-Range Transportation Plan

Figure 5.6A

Access Management Strategies

Liberty Street Corridor (East)

Legend

- City Limits
- Bodies of Water
- Level Of Service D
- Level Of Service E
- Level Of Service F
- Streets
- 7 to 10 crashes
- 11 to 20 crashes
- 21 to 30 crashes
- Existing Traffic Signals

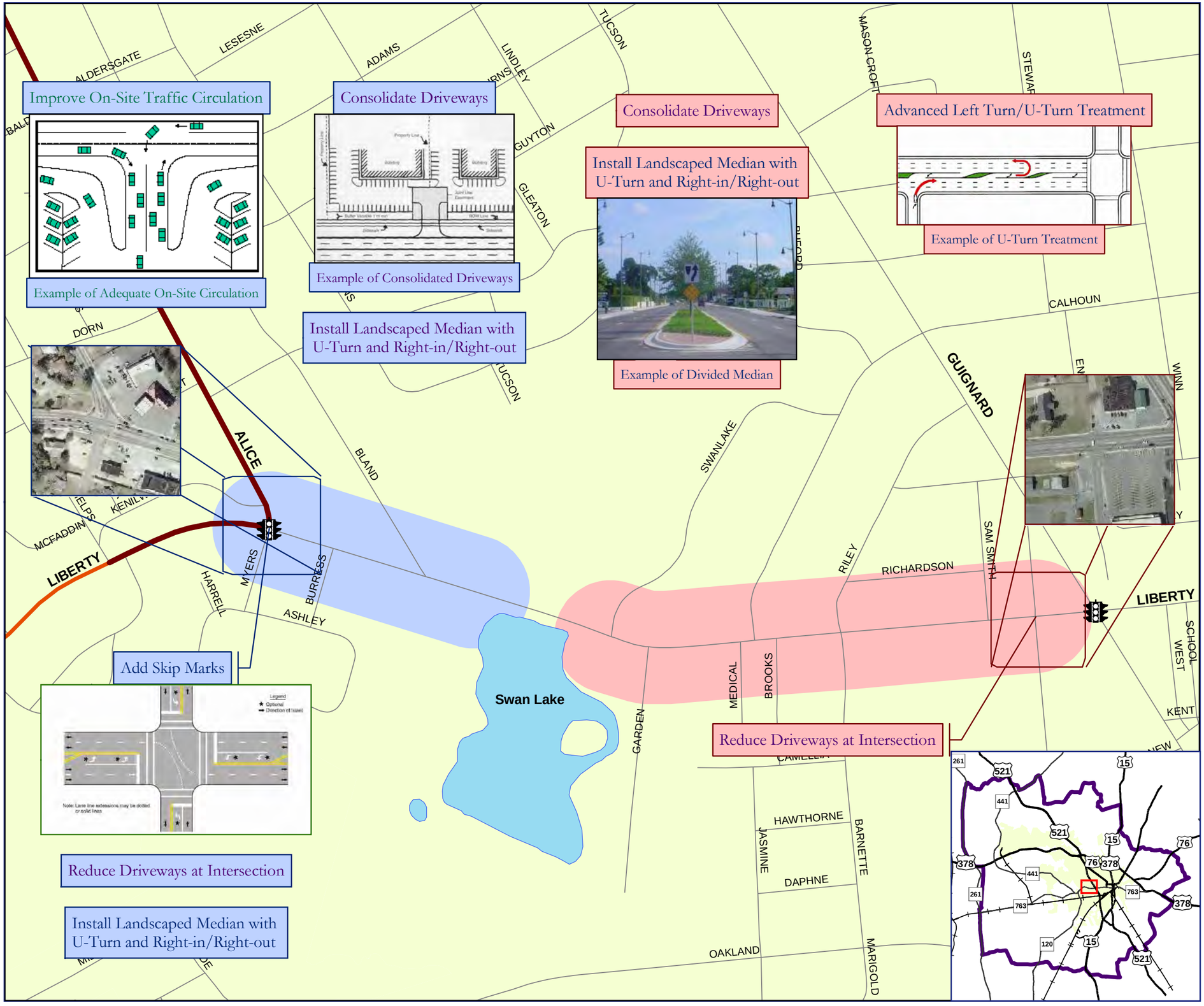
General Improvements
Driveway Treatments
On-Site Treatments
Median/Turn Treatments
ITS

Level of Service determined by Volume-to-Capacity ratios based on 2004 Sumter Average Daily Traffic Projections

November 2007

0 0.05 0.1 Miles

Kimley-Horn and Associates, Inc



SUATS Long-Range Transportation Plan

Figure 5.6B

Access Management Strategies

Liberty Street Corridor (West)

Legend

- City Limits
- Bodies of Water
- Level Of Service D
- Level Of Service E
- Level Of Service F
- Streets
- 7 to 10 crashes
- 11 to 20 crashes
- 21 to 30 crashes
- Existing Traffic Signals

General Improvements
Driveway Treatments
On-Site Treatments
Median/Turn Treatments
ITS

Level of Service determined by Volume-to-Capacity ratios based on 2004 Sumter Average Daily Traffic Projections

November 2007

0 0.04 0.08 Miles

Kimley-Horn and Associates, Inc

Broad Street Corridor (Market Street to Wise Drive)

This segment of Broad Street is classified as a principal arterial connecting downtown with points west via US 76/378. Broad Street is highly developed, and with Sumter Mall, shopping centers and restaurants, the corridor serves as the commercial heart of the city. Approximately 29,400 vehicles travel on Broad Street west of Bultman Drive, and the segment operates at a Level of Service D. East of Broad Street carries 18,400 vehicles. Three intersections on the corridor are noted as high crash locations. **Figure 5.7** displays the Broad Street Corridor access management strategies.

General Recommendations

Between 2003 and 2005, a total of 96 crashes occurred at the Broad Street intersections with Market Street, Wesmark Boulevard, and Gion Street. The crashes likely resulted from congestion and driver confusion due to the many conflicts and distractions presented to the driver in the area. The following recommendations will ease congestion, reduce driver confusion, and improve safety:

- Consolidate driveways to combine turning movements, increase safety, limit driver confusion, and ease congestion
- Replace two-way left turn lanes with a median treatment
- Restrict access to right-in/right-out at site driveways to reduce vehicle conflicts and improve safety along the main line
- Relocate and consolidate driveways away from intersections with Wesmark Boulevard, Bultman Drive, and Wise Drive

Specific Recommendations

Recommendation #1 – The intersection of Broad and Market Streets is a T-intersection with dual left turn lanes from Market onto southbound Broad Street. For the three-year period ending in 2005, 12 crashes occurred here. The following suggestions should improve the safety of the intersection:

- Add skip marks for motorists turning left off Market Street
- Replace curb and gutter to better define the roadway

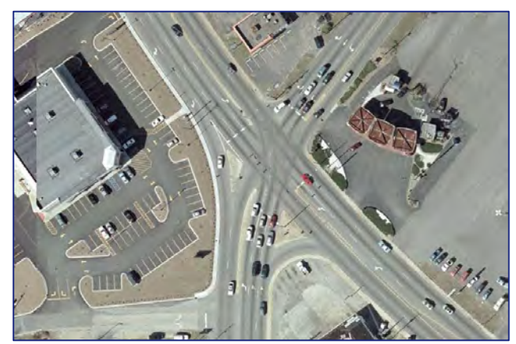
Recommendation #2 – The following recommendations are intended to improve the safety and function of the corridor between Wesmark Boulevard and Bultman Drive, including the intersection of Broad and Gion Streets at which 29 crashes occurred:

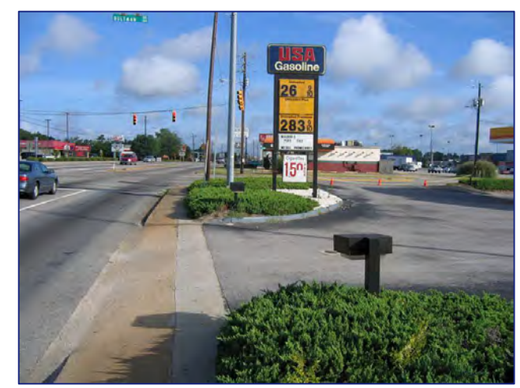
- Move or close driveway access near Wesmark Boulevard intersection
- Construct a non-traversable landscaped median with u-turn and right-in/right-out access as a means to improve traffic flow and reduce crashes at the intersections with Gion Street and Sumter Mall
- Restrict access to right-in/right-out at site driveways by installing channelized islands
- Consolidate driveways in front of Sumter Mall to ease congestion and improve safety

Recommendation #3 – The Broad Street intersections with Bultman Drive and Wise Drive can be improved with the following recommendations:

- Upgrade signalization to provide protected left turn for all approaches at the Broad Street and Bultman Drive intersection
- Add skip marks for left tuning movements on all approaches to the intersection with Bultman Drive
- Move driveway access away from both intersections
- Replace curb and gutter at the intersection with Wise Drive

Broad Street and Gion Street





Broad Street and Bultman Drive

SUATS Long-Range Transportation Plan

Figure 5.7

Access Management Strategies

Broad Street Corridor

Legend

- City Limits
- Bodies of Water
- Level Of Service D
- Level Of Service E
- Level Of Service F
- Streets
- 7 to 10 crashes
- 11 to 20 crashes
- 21 to 30 crashes
- Existing Traffic Signals

General Improvements
Driveway Treatments
On-Site Treatments
Median/Turn Treatments
ITS

Level of Service determined by Volume-to-Capacity ratios based on 2004 Sumter Average Daily Traffic Projections

November 2007

0 0.05 0.1 Miles

Kimley-Horn and Associates, Inc

Bultman Drive Corridor (Broad Street to Kilgo Street)

Bultman Drive, a minor arterial, connects Broad Street to Guignard Street and provides an alternative route to downtown. On an average day, up to 16,000 vehicles travel north of Gayle Street and 23,500 vehicles travel south of Gayle Street. Shops and offices line the roadway as it shifts from a five lane cross-section with two-way left turn lanes to four lanes with dedicated left turn lanes at intersections. **Figure 5.8** displays the Bultman Drive Corridor access management strategies.

General Recommendations

The property owners on Bultman Drive should be encouraged to seek cross access easements/agreements with adjacent property owner to create interconnected internal circulation. In addition, driveways along the corridor should be consolidated to combine turning movements and ease congestion. Some adjoining parcels provide cross access but fail to consolidate driveways. The two-way left turn lanes should be retrofitted with a non-traversable landscaped median with u-turn and right-in/right-out access.

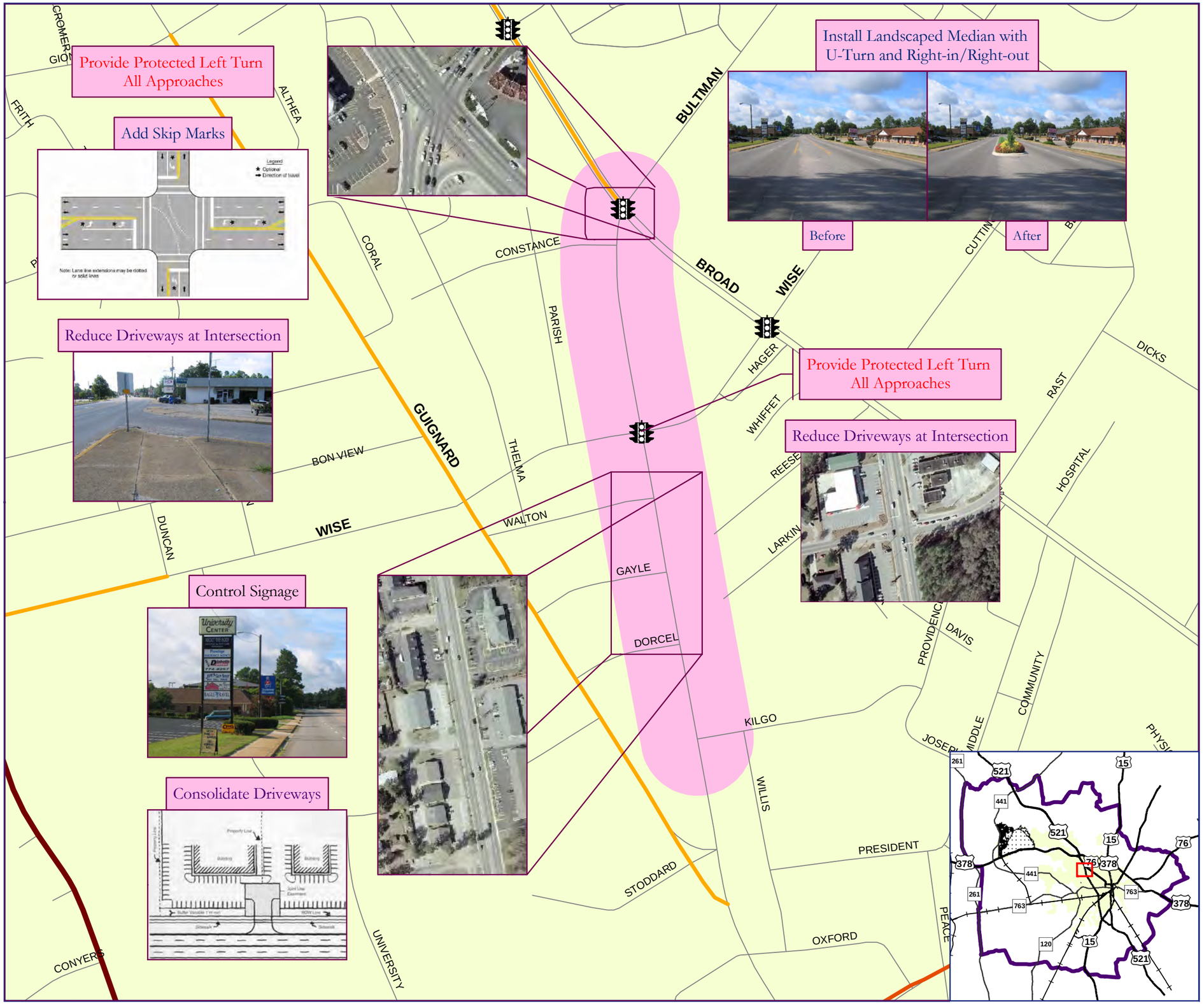
Specific Recommendations

Recommendation #1 – The following recommendations for the intersection of Bultman Drive and Broad Street repeat those found in the Broad Street Corridor recommendations:

- Upgrade signalization to provide protected left turn for all approaches at the Broad Street and Bultman Drive intersection
- Add skip marks for left tuning movements on all approaches to the intersection with Bultman Drive
- Consolidate and move driveways within 75 feet of intersection

Recommendation #2 – More than 20,000 vehicles per day pass through the intersection of Bultman Drive and Wise Drive. High volumes of left turns and multiple driveways affect the function and safety of the intersection. The following recommendations are intended to improve these conditions:

- Upgrade signalization to provide protected left turn for all approaches
- Consolidate and move driveways within 75 feet of intersection



SUATS Long-Range Transportation Plan

Figure 5.8

Access Management Strategies

Bultman Drive Corridor

Legend

- City Limits
- Bodies of Water
- Level Of Service D
- Level Of Service E
- Level Of Service F
- Streets
- 7 to 10 crashes
- 11 to 20 crashes
- 21 to 30 crashes
- Existing Traffic Signals

General Improvements
Driveway Treatments
On-Site Treatments
Median/Turn Treatments
ITS

Level of Service determined by Volume-to-Capacity ratios based on 2004 Sumter Average Daily Traffic Projections

November 2007

0 0.04 0.08 Miles

Kimley-Horn and Associates, Inc

McCrays Mill Road Corridor (Stadium Road to Lewis Road)

McCrays Mill Road is a recently widened minor arterial running east to west. In 2004, 11,600 vehicles traveled McCrays Mill Road west of Pinewood Drive, with the total dipping to 6,000 east of the intersection. **Figure 5.9** displays the McCrays Mill Road Corridor access management strategies.

General Recommendations

Consolidating driveways is recommended to combine turning movements, increase safety, limit driver confusion, and ease congestion along the entire corridor.

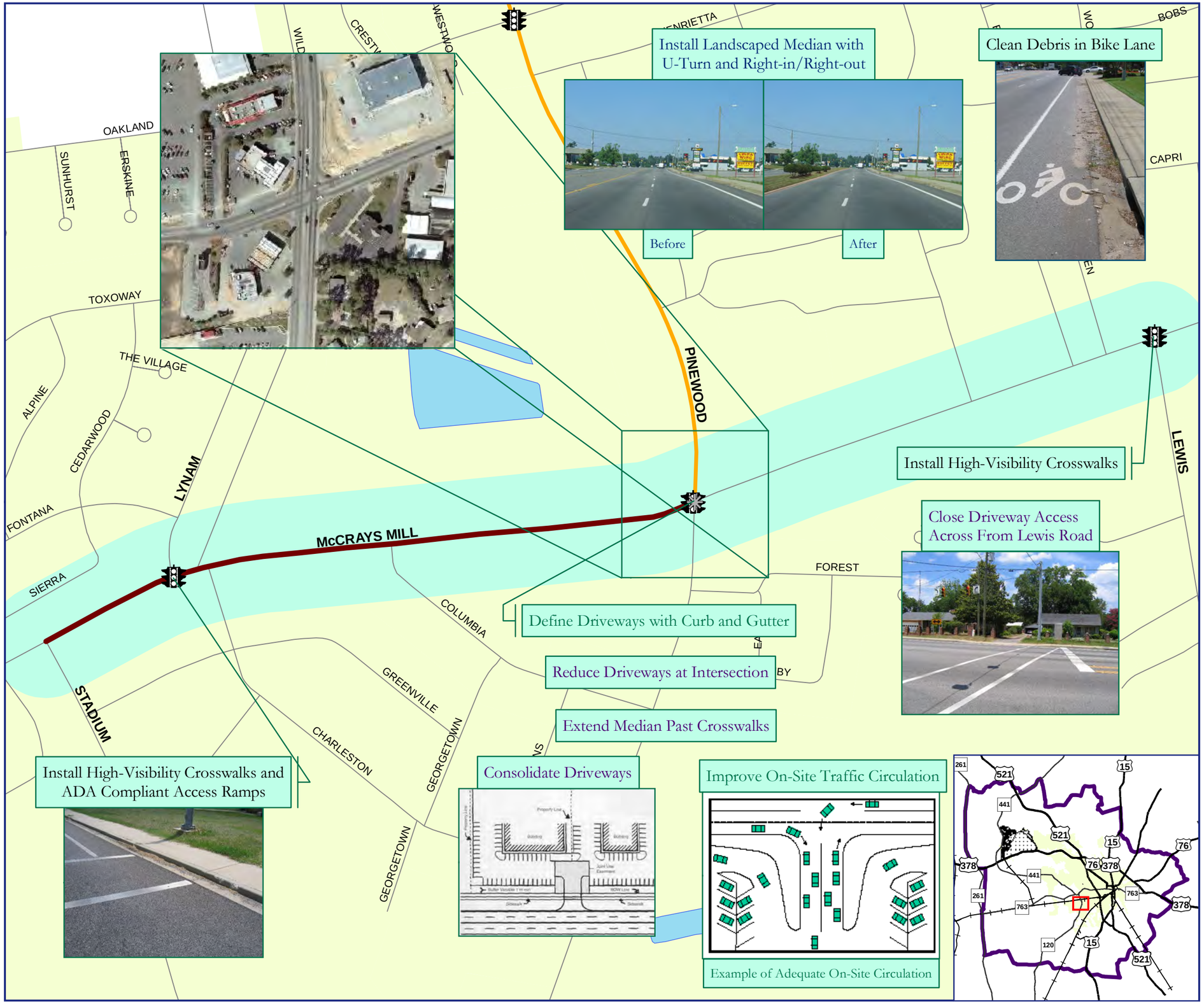
Specific Recommendations

Recommendation #1 – On an average day, 32,200 vehicles enter the intersection of McCrays Mill and Pinewood Roads. Between 2003 and 2005, nine crashes resulting in three injuries occurred at the intersection. Both roads operate at a poor level of service, with McCrays Mill Road west of Pinewood Road operating at LOS F and Pinewood Road north of McCrays Mill Road operating at LOS D. The number of crashes and poor function of the roadway could be improved by implementing the following recommendations:

- Consolidate and better define driveways with curb and gutter to combine turning movements, increase safety, limit driver confusion, and ease congestion
- Move or consolidate driveway access away from intersections
- Improve on-site traffic circulation

Recommendation #2 – East of Pinewood Road, a two-way left turn lane divides the two travel lanes. The turn lane should be replaced with a landscaped median with u-turn and right-in/right-out access to control access and increase safety.

McCrays Mill Road and Pinewood Road



SUATS Long-Range Transportation Plan

Figure 5.9

Access Management Strategies

McCrays Mill Road Corridor

Legend

- City Limits
- Bodies of Water
- Level Of Service D
- Level Of Service E
- Level Of Service F
- Streets
- 7 to 10 crashes
- 11 to 20 crashes
- 21 to 30 crashes
- Existing Traffic Signals

General Improvements
Driveway Treatments
On-Site Treatments
Median/Turn Treatments
ITS

Level of Service determined by Volume-to-Capacity ratios based on 2004 Sumter Average Daily Traffic Projections

November 2007

0 0.05 0.1 Miles

Kimley-Horn and Associates, Inc.

Pinewood Road Corridor (Stadium Road to Oakland Avenue)

The Pinewood Road Corridor is a five-lane minor arterial with two-way left turn lanes. North of McCrays Mill Road in 2004, the corridor carried 20,600 vehicles at level of service D. Approximately 12,900 vehicles traveled south of McCrays Mills Road. **Figure 5.10** displays the Pinewood Road Corridor access management strategies.

General Recommendations

To improve the level of service on Pinewood Road, a non-traversable landscaped median with u-turn and right-in/right-out access should replace the two-way left turn lane. This median will control access, increase safety, and ease congestion. Also, implementing emergency vehicle preemption for the fire station on Stadium Road will reduce vehicle conflict and improve overall safety in the area.

Specific Recommendations

Recommendation #1 – Development along the Pinewood Road Corridor has focused at the McCrays Mill Road intersection. The following recommendations for this intersection repeat those found in the McCrays Mill Road Corridor recommendations:

- Consolidate and better define driveways with curb and gutter to combine turning movements, increase safety, limit driver confusion, and ease congestion
- Move or consolidate driveway access away from intersections
- Improve on-site traffic circulation

Recommendation #2 – North of the McCrays Mill Road intersection, several driveways serve the strip mall and outparcels west of Pinewood Road. To improve the traffic entering and existing this shopping area and to prevent internal site operations from affecting Pinewood Road, driveways should be consolidated and on-site traffic circulation improved.

Pinewood Road south of Millwood Elementary School

Pinewood Road south to McCrays Mill Road

Pinewood Road north of McCrays Mill Road

SUATS Long-Range Transportation Plan

Figure 5.10

Access Management Strategies

Pinewood Road Corridor

Legend

- City Limits
- Bodies of Water
- Level Of Service D
- Level Of Service E
- Level Of Service F
- Streets
- 7 to 10 crashes
- 11 to 20 crashes
- 21 to 30 crashes
- Fire Departments
- Existing Traffic Signals

General Improvements
Driveway Treatments
On-Site Treatments
Median/Turn Treatments
ITS

Level of Service determined by Volume-to-Capacity ratios based on 2004 Sumter Average Daily Traffic Projections

November 2007

0 0.075 0.15 Miles

Kimley-Horn and Associates, Inc

Complete Streets

A Complete Street is a community-oriented street that safely and conveniently accommodates all modes of travel. Such a street allows pedestrians, bicyclists, motorists, and transit users to use the street safely and conveniently regardless of their age or ability to move. The citizens, business owners, and local officials in the SUATS region recognize the importance of a shift away from an automobile-dominated roadway and toward a balance, multi-modal transportation system that respects all users of the roadway and the rights of adjacent land owners. The concepts presented in the section extend to all the elements that follow, including the Bicycle and Pedestrian Element, Transit, and Freight Elements. Complete streets as described below are divided into four basic zones or realms – context realm, pedestrian realm, travelway realm, and intersection realm. The Future Highway Element concludes with a series of illustrations that show typical cross section and plan views of street of different street types. Together these street designs ensure the needs of all users are accommodated.

Context Realm

The context realm is defined by buildings that frame the major roadway. Guidance for the context realm focuses on four areas of consideration.

Building Form and Massing

High-quality street design should be supplemented with buildings located close to the street that frame the public space enjoyed by pedestrians. In more urban areas, these buildings should be located directly behind the sidewalk, and with stairs, stoops, or awnings, may even encroach into the pedestrian realm to provide visual interest and access to the public space. Suburban environments that must incorporate setbacks for adjacent buildings should limit this distance to 20 feet or less and avoid off-street parking between buildings and the pedestrian realm. Larger setbacks in these suburban areas will diminish the sense of enclosure afforded to the pedestrian and move access to the buildings farther away from the street. In both environments, building heights should measure at least 25% of the corridor width. That is, a 100-foot wide roadway right-of-way should be framed by buildings that are at least 25 feet high on both sides with facades that are at most 20 feet from the edge of right-of-way.

Architectural Elements

Careful placement and design of buildings adjacent to the major roadway offer opportunities for meaningful interaction between transportation and land use. These opportunities are greatly enhanced when land uses such as restaurants, small shops and boutiques, residential units and offices are located adjacent to the street. Building scale and design details incorporated into individual buildings foster a comfortable, engaging environment focused on the pedestrian. Common building design treatments generally favored in a pedestrian environment include awnings, porches, balconies, stairs, stoops, windows, appropriate lighting, promenades, and opaque windows.

Transit Integration

Areas targeted for high-quality transit service must be supported through land use and zoning policies that sustain transit-oriented development and reflect the benefits of increased access to alternative modes of travel. Policy examples include appropriate densities and intensities for supporting transit use, parking ratios that reflect reduced reliance on the automobile, and setback and design guidelines that result in pedestrian supportive urban design. In addition, potential transit service identified for transportation corridors within the community should take into consideration the land use, density/intensity, and urban design characteristics of the surrounding environment before selecting proposed technologies or finalizing service plans.

Site Design

The complete street is truly integrated into the surrounding environment when the interface between the site and the street is complementary to the pedestrian environment created along the entire corridor. Access to the site should be controlled through a comprehensive access management program to minimize

excessive driveways that create undesirable conflicts for traveling pedestrians. Building orientation, further defined by landscape and architectural elements incorporated into the site, should reinforce the public space protected between the buildings. Public paths through sites should be provided to shorten blocks longer than 600 feet.

Pedestrian Realm

The pedestrian realm extends between the outside edge of sidewalk and the face-of-curb located along the street. Safety and mobility for pedestrians within this 'public' realm is predicated upon the presence of continuous sidewalks along both sides of the street built to a sufficient width for accommodating different space needs within different environments; such as suburban verses downtown settings. The quality of the pedestrian realm is also greatly enhanced by the presence of high-quality buffers between pedestrians and moving traffic, safe and convenient opportunities to cross the street, and consideration for shade and lighting needs. Each is discussed below.

The pedestrian realm may consist of up to four distinct functional zones – frontage zone, throughway zone, furnishing zone, and edge zone. The frontage zone is located near the back of sidewalk and varies in width to accommodate potential window shoppers, stairs, stoops, planters, marquees, outdoor displays, awnings or café tables. The throughway zone provides clear space for pedestrians to move between destinations and varies in width from 5 to more than 10 feet based on the anticipated demand for unimpeded walking area. The furnishing zone provides an important buffer between pedestrians and moving traffic. It generally measures at least 8 feet wide to accommodate street trees, planting strips, street furniture, utility poles, sign poles, signal and electrical cabinets, phone booths, fire hydrants, bicycle racks or retail kiosks targeted for the pedestrian realm. The edge zone is incorporated into the pedestrian realm concurrent with the presence of on-street parking to allow sufficient room for opening car doors.

Incorporation of one or more of these function zones is generally based upon the context of the surrounding built environment. For example, a more urban, downtown environment will include all four zones in the pedestrian realm and could measure up to 24 feet wide. An equally important link to the pedestrian network that is located in a more suburban setting may omit one or more of the function zones listed above; with an overall minimum width of 10 feet.

Recommended design elements for promoting a healthy pedestrian realm generally focus on one of four areas of concentration: pedestrian mobility, quality buffers, vertical elements, and public open space. Together, these best practices can be implemented in both urban and suburban environments, to varying degrees, for promoting healthy pedestrian environments.

Pedestrian Mobility

The presence of a comprehensive, continuous pedestrian network serves as the foundation for fostering a walkable community that supports active transportation and mode choice. Sidewalks generally provide clear zones of 5 to 10 feet wide to accommodate pedestrian travel. In more urban environments, amenities in the frontage zone and furniture zone will greatly increase the overall width of the corridor as compared to more suburban settings. Mid-block pedestrian crosswalks should be incorporated into the urban fabric as needed to ensure convenient and safe crossing opportunities are provided approximately every 300 feet. As a general rule, mid-block crossings should be considered on two-lane streets with a block length greater than 500 feet when the posted speed limit for the travel lanes does not exceed 40 miles per hour.

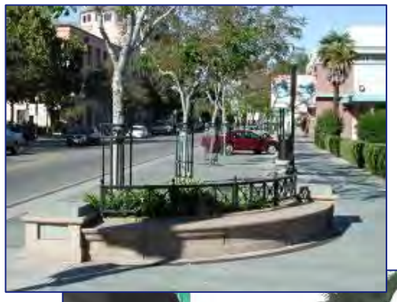
Quality Buffers

Lateral separation between pedestrians and moving traffic greatly enhances the character of the pedestrian realm. The amount of separation incorporated into the pedestrian realm may vary between corridors based on the context of the surrounding built environment or on streets with different travel speed and/or traffic volume characteristics. In downtown areas, on-street parking, either parallel or angled, provides sufficient distance (8 to 18 feet) for separating pedestrian and vehicle traffic. Likewise, landscape planting areas at least 5 feet wide incorporated into either urban or suburban environments provide adequate lateral separation for pedestrians. In urban areas, street trees may be placed in tree wells within an overall hardscaping surface instead of using suburban-style grass areas.

Vertical Elements

Vertical elements traditionally incorporated into the pedestrian realm include street trees, pedestrian-scale street lighting, and utilities. Street trees provide necessary shade to pedestrians and soften the character of the surrounding built environment. They should be spaced between 15 and 30 feet apart, be adapted to the local environment, and fit the scale and character of the surrounding area. Pedestrian-scale street lighting incorporated into the pedestrian realm should use metal halide fixtures mounted between 12 and 20 feet high. Utilities should not interfere with pedestrian circulation or block entrances to buildings, curb cuts, or interfere with sight distance triangles. In some cases, burying utilities avoids conflict and clutter caused by utility poles and overhead wires. Relocation of overhead utilities to tall poles on just one side of the roadway is a cost-effective aesthetic alternative to burial of utilities in a duct bank under the road.

Public Open Space



The pedestrian realm serves a dual purpose within the built environment – acting as both a transportation corridor and a public open space accessible to the entire community. Therefore, specific design elements incorporated into the pedestrian environment should reinforce this area as a public space; including opportunities for visitors to enjoy the unique character of the corridor in both formal and informal seating areas. Public art and/or specialized surfaces and materials introduced into the pedestrian realm are appreciated by slower moving pedestrians. In more urban areas, street furniture and/or outdoor cafes provide opportunities for 'people watching' that foster community ownership in the pedestrian realm. Furthermore, building encroachments in downtown areas, such as stairs and stoops, provide for interesting points of access to the pedestrian realm. Lastly, awnings and canopy trees provide shade which is helpful in the temperate climate of this region.

Travelway Realm

The travelway realm is defined by the edge of pavement, or curb line in more urban areas, that traditionally accommodates the travel or parking lanes needed to provide mobility for bicycles, transit vehicles, and automobiles sharing the transportation corridor. This area also separates the two pedestrian realms defined within the complete street and may provide carefully-designed crossing opportunities between intersections. Recommended design elements incorporated into the travelway realm serve to achieve greater balance between travel modes sharing the corridor and favor design solutions that promote human scale for the street and minimize pedestrian crossing distance. Guidance for the travelway realm focuses on two areas of consideration – modes of travel and medians.

Multimodal Corridors

Balance between travel modes within a transportation corridor provides choice for mobility that could lead to reduced congestion on major roadways and a healthier citizenry. On a complete street, safe and convenient access to the transportation network for bicycles, transit vehicles, and automobiles is afforded within the travelway realm. Travel lanes for automobiles and transit vehicles should measure between 11 and 13 feet wide to manage travel speeds and reinforce the intended character of the street. Parking lanes incorporated into the travelway realm should not exceed 8 feet in width (including the gutter pan) and may be protected by bulb-outs evenly spaced throughout the corridor. Bus stops located along the corridor should be well-designed to include shelters and benches that comfort patrons while waiting for transit service. On-street bicycle lanes (typically 4 to 6 feet wide) should be considered when vehicle speeds range from 30 to 40 miles per hour. Wide outside lanes may be preferred on streets with slower speeds. To avoid situations where citizens with only basic skills may be attracted to a corridor, designated bicycle routes on parallel corridors may be the best option when speeds on the major street exceed 40 mph. According to state law, bicyclists are considered vehicles and are permitted on all corridors except freeways and access-controlled highways.

Median Treatments

Medians are often incorporated into the travelway realm to provide dedicated left turn lanes, opportunities for landscaping, and pedestrian refuge at crossings. They generally vary in width from 10 feet on some collector streets to 16 feet wide on suburban boulevards. The width depends on the intended application of the median and the limitations set forth by the context of the surrounding built environment. Medians also reinforce other access management solutions provided within the travelway to reduce the number of conflict points and maintain the human scale intended for the complete street. In addition to center medians, other access management solutions incorporated into the travelway realm should limit the number of individual driveways along the corridor and avoid the use of right turn deceleration lanes. Together, these improvements will reduce the overall pedestrian crossing distance for the travelway and maximize the safety for pedestrians traveling inside the pedestrian realm.

Intersection Realm

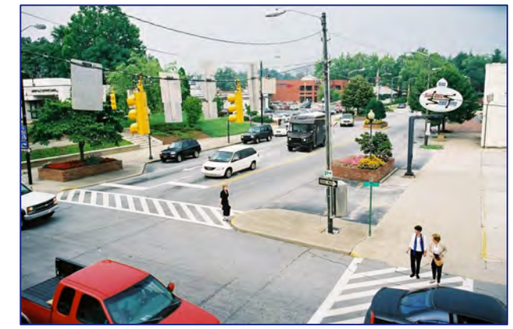
The intersection realm requires careful consideration for the concerns of multiple travel modes that could meet at major intersections within the transportation system. Recommendations for improving the multimodal environment in and around these major intersections focus on two areas of concentration – operations and geometric design.

Operations

In terms of operations, traffic signals or roundabouts are the most appropriate applications for traffic control devices that could also maintain the pedestrian scale of the street reinforced in the context, pedestrian, and travelway realms. The merits of a traffic signal verses a roundabout for intersection control should be determined on a case-by-case basis by considering issues such as desired speed of traffic, availability of right-of-way, anticipated traffic patterns, and the context of the built environment surrounding the intersection.

Geometric Design

Geometric considerations for the intersection should reinforce the operational characteristics of the traffic signal or roundabout. At traffic signals, this includes the introduction of curb extensions, or bulb-outs, to shorten pedestrian crossing distance and protect on-street parking near the intersection. Curb return radii for signalized intersections should be 15 to 30 feet to control turning speed. At roundabouts, special consideration should be given to entry and exit speeds, pedestrian refuge in the splitter islands, and predictability of movements for pedestrians, bicycles, and vehicles. Both intersection treatments may consider special pavement markings to distinguish pedestrian areas or bicycle lanes provided these surfaces need to be stable, firm, and slip resistant. Additional consideration should be given to maintaining adequate sight triangles in the intersection, addressing the treatment of bicycle lanes through the intersection, and complying with ADA requirements for crosswalk and curb ramp design.



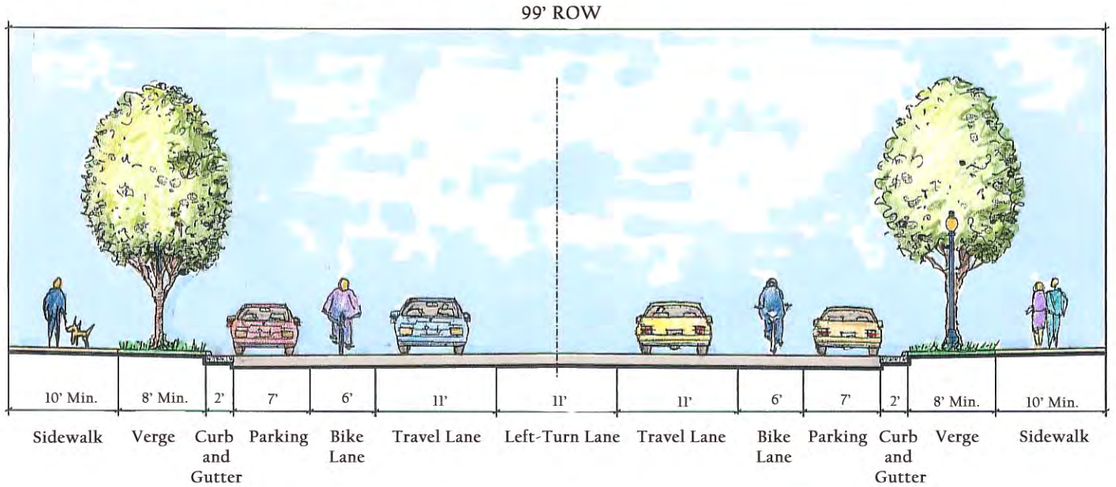
Recommended Typical Cross Sections

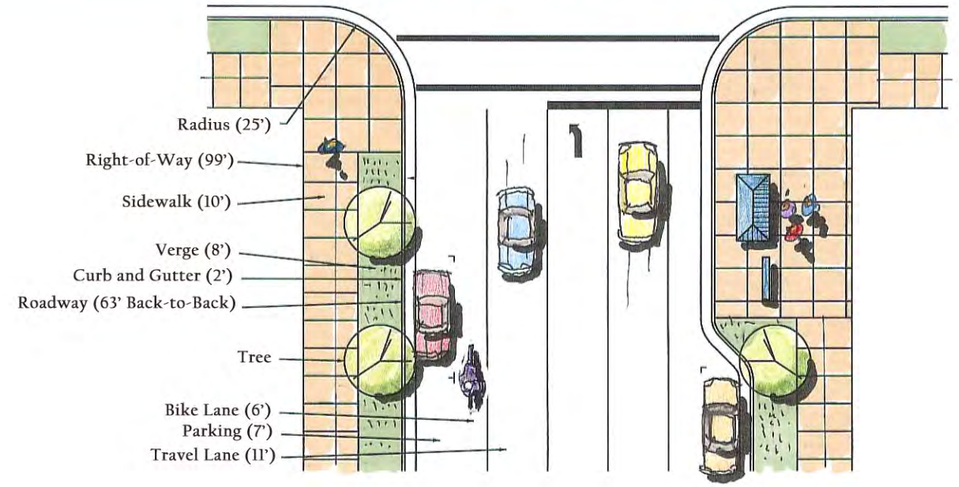
The following pages illustrate typical cross sections and plan views for streets in the SUATS region. The cross sections reflect the concept of community-oriented streets that provide safe and convenient travel for all modes. To create a transportation network that respects the needs of pedestrians, bicyclists, and motorists, certain elements may require designs different from the current norm. The right-of-way width of the recommended cross sections range from 55 feet for residential collectors to 110 feet for suburban boulevards. Within the right-of-way, the sidewalks and verge areas are wider than typically found in the SUATS region today. Likewise, some travel lane widths are narrower than the standard 12 feet now provided by SCDOT. The construction of complete street will require close coordination with local, state, and federal authorities.

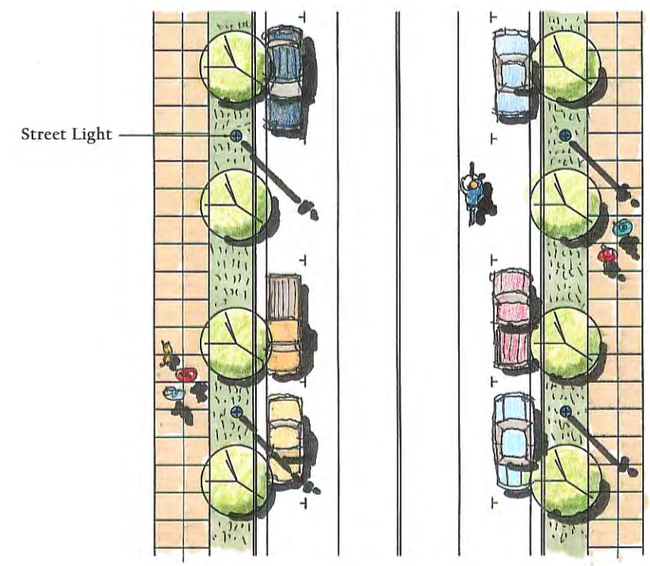
SUATS
Long-Range Transportation Plan

Avenue

2-Lane, Parking, Left-Turn Lane, Bike Lanes







Plan
Not To Scale

Context Sensitive Design Features

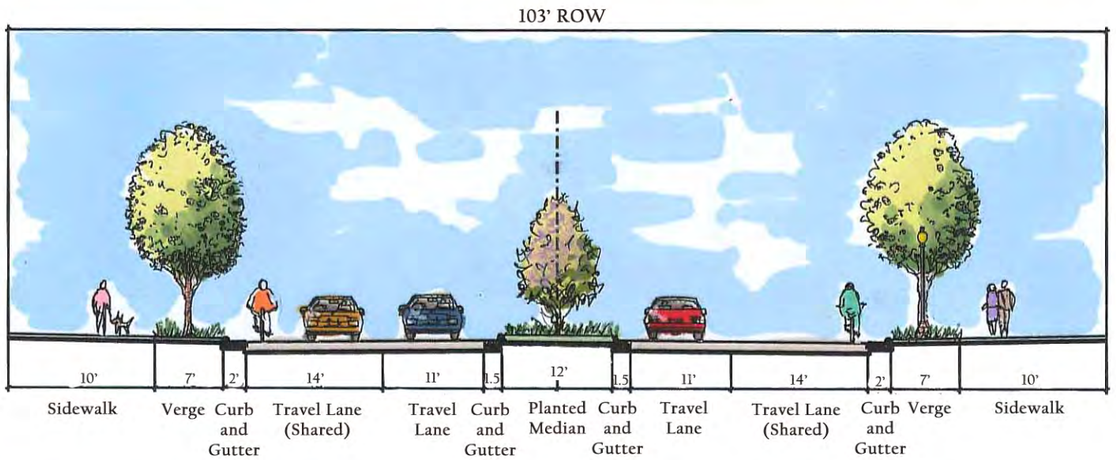
This Avenue is designed to limit automobile travel speeds to 35 miles per hour. It provides two travel lanes and bike lanes. Street trees along both sides of the street provide shade and help soften the built environment. Wide sidewalks are preferred for both sides of the street in more urban areas to encourage outdoor seating and walkability. However, five-foot sidewalks on each side of the street are acceptable in less dense areas. Building setbacks should be limited to encourage a sense of enclosure. Context sensitive design considerations should include:

- Striped Crosswalks at intersections and mid-block crossings
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalks)
- Pedestrian-level Lighting
- On-Street Parking (only where it will be used most of the time)
- No Right Turn Lanes

SUATS
Long-Range Transportation Plan

Boulevard

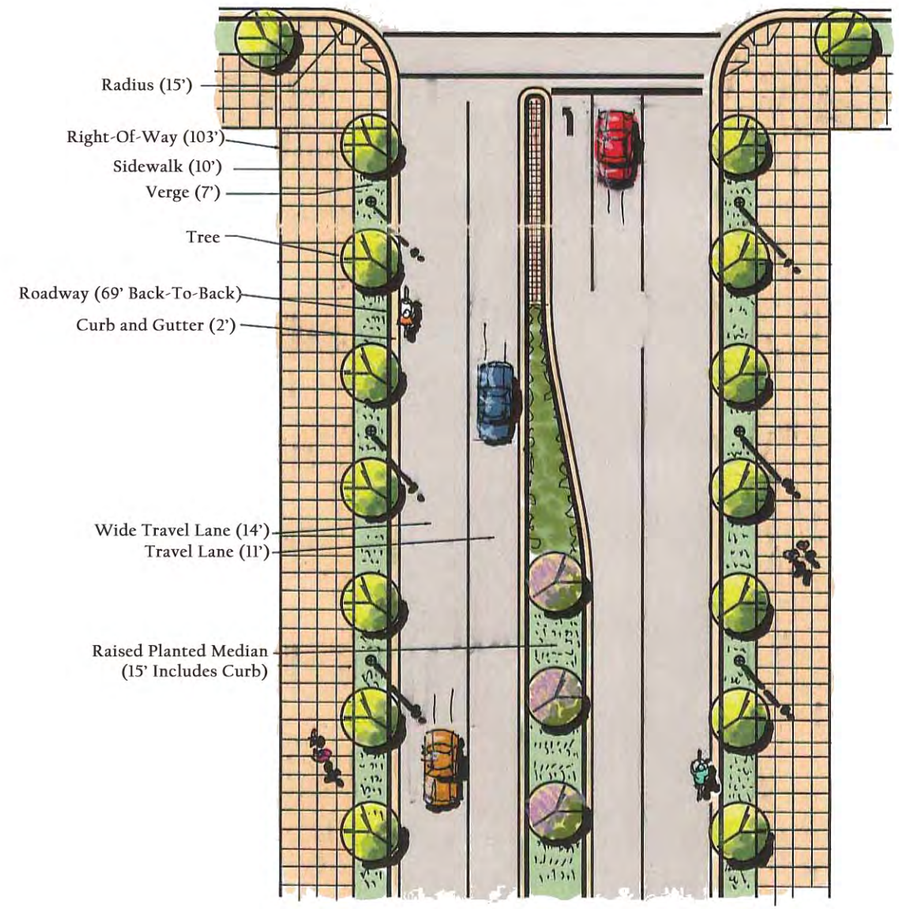
4-Lane Divided, Raised Median, Wide Outside Lanes, Sidewalks, Landscaping



Context Sensitive Design Features

This Boulevard is designed to limit automobile travel speeds to 45 miles per hour. It provides four travel lanes including wide outside lanes to accommodate experienced cyclists. Street trees along both sides of the street provide shade and help soften the built environment. Wide sidewalks are preferred for both sides of the street in more urban areas. However, five-foot sidewalks on both sides of the street are acceptable in less dense areas. Building setbacks should be limited to encourage a sense of enclosure. Context sensitive design considerations should include:

- Plantable Median
- Striped Crosswalks at intersections and mid-block crossings
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk or multi-use path)
- Pedestrian-level Lighting
- On-Street Parking (only where it will be used most of the time)

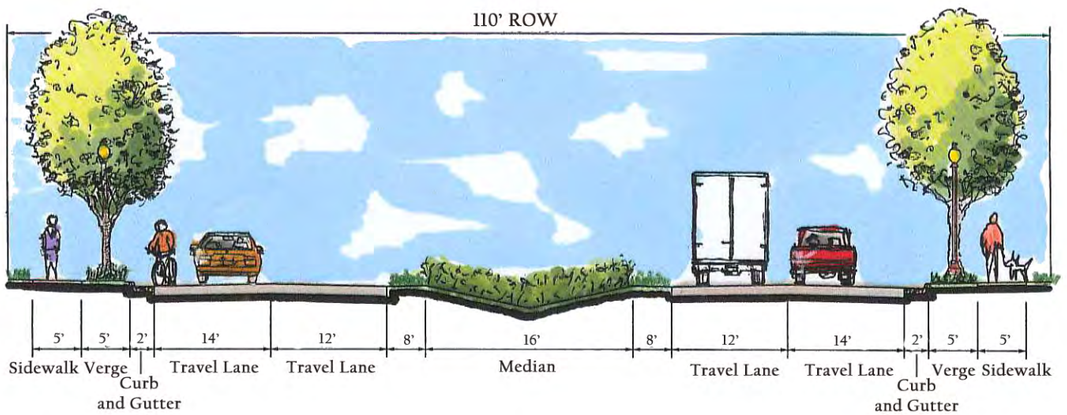


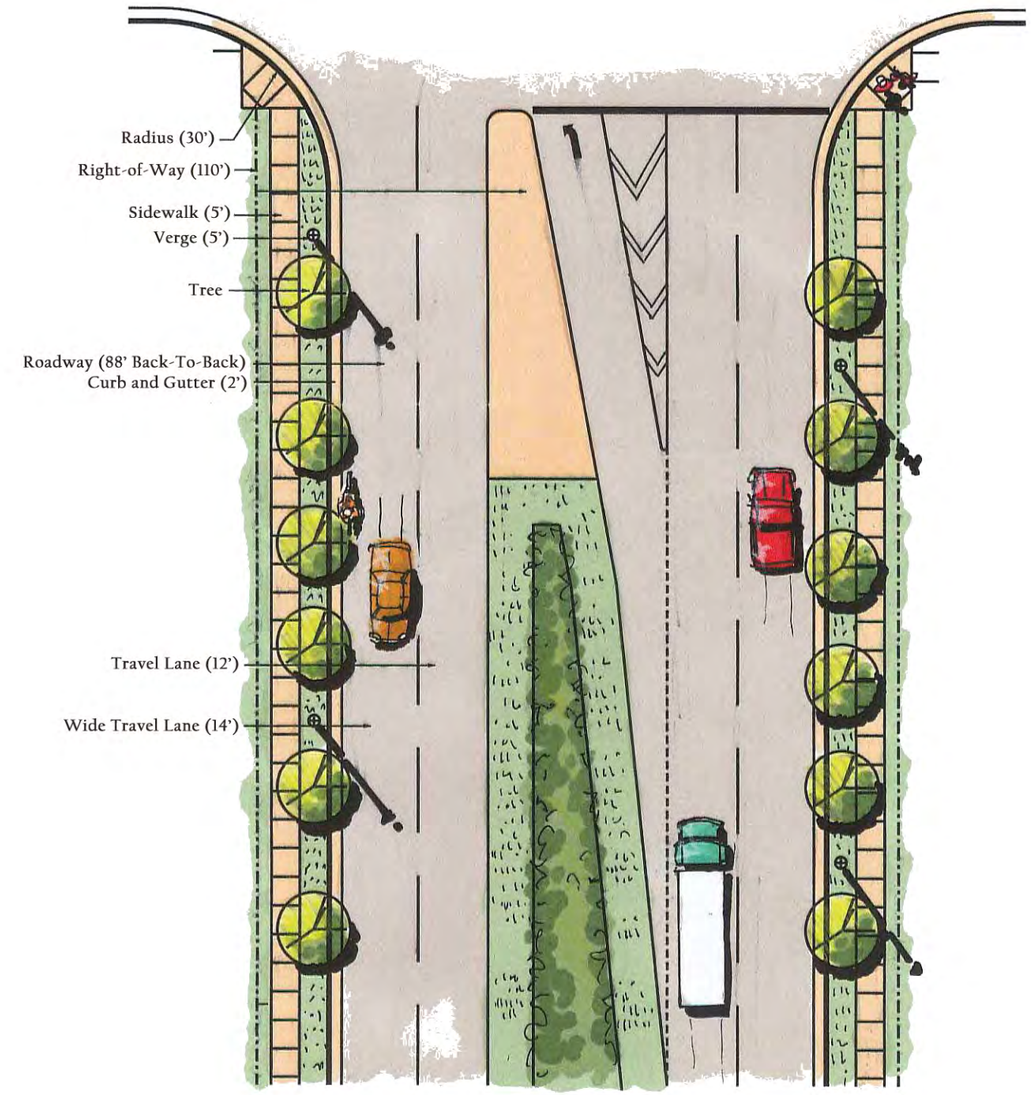
Plan
Not To Scale

SUATS
Long-Range Transportation Plan

Suburban Boulevard

4-Lane Divided, Advanced Left-Turn, Sidewalks, Landscaping





Plan
Not To Scale

Context Sensitive Design Features

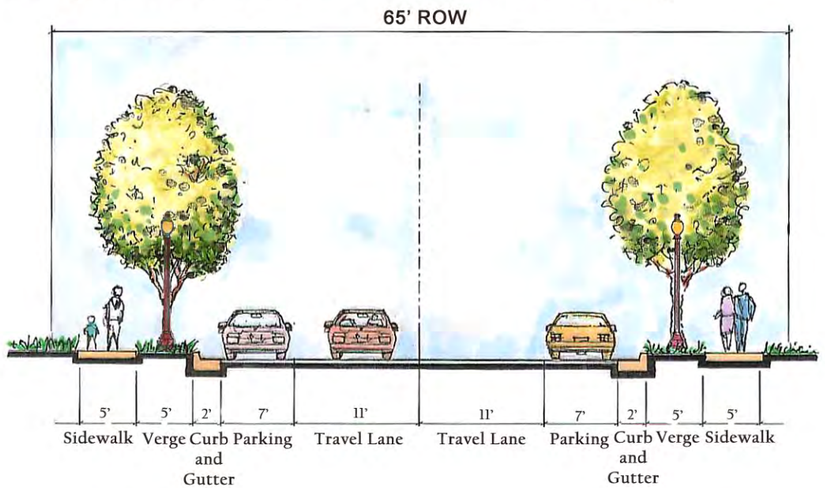
This Suburban Boulevard is designed to limit automobile travel speeds to 45 miles per hour. It provides four travel lanes including wide outside lanes to accommodate experienced cyclists. Street trees along both sides of the street provide shade and help soften the built environment. Sidewalks are preferred for both sides of the street in suburban areas; however, a ten-foot, multiuse path on one side of the street is acceptable in less dense areas. A natural buffer extends from the back of the sidewalk to the private property line along the entire corridor. Context sensitive design considerations should include:

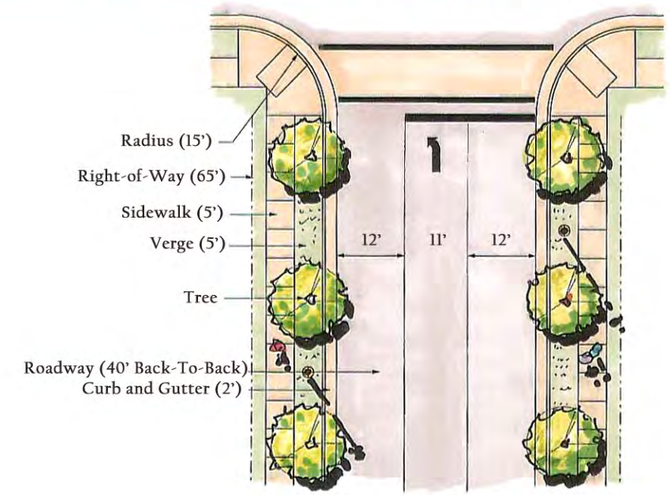
- Plantable Median
- Striped Crosswalks at intersections
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk or multi-use path)

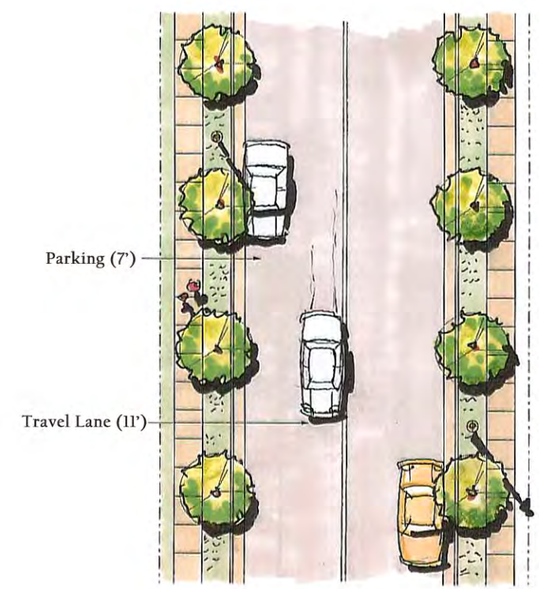
SUATS
Long-Range Transportation Plan

Commercial Collector - Type A

2-Lane, Parking, 40' Back-To-Back, Sidewalks, Landscaping







Plan
Not to Scale

Context Sensitive Design Features

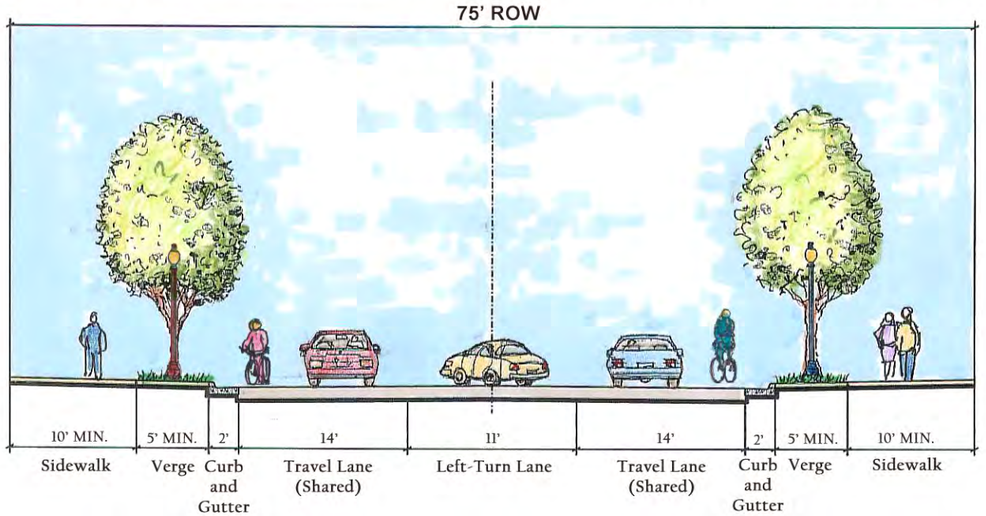
This Commercial Collector is designed to limit automobile travel speeds to 25 miles per hour. It provides two travel lanes with formal parallel parking spaces along both sides of the street. In more urban areas, a fifteen-foot sidewalk with street trees placed in individual planters and pedestrian scale street lighting spaced comfortably apart maximize the sidewalk width for commercial activity along both sides of the street. The on-street parking calms traffic, and with the street trees, buffers pedestrians from the travelway. Context sensitive design considerations should include:

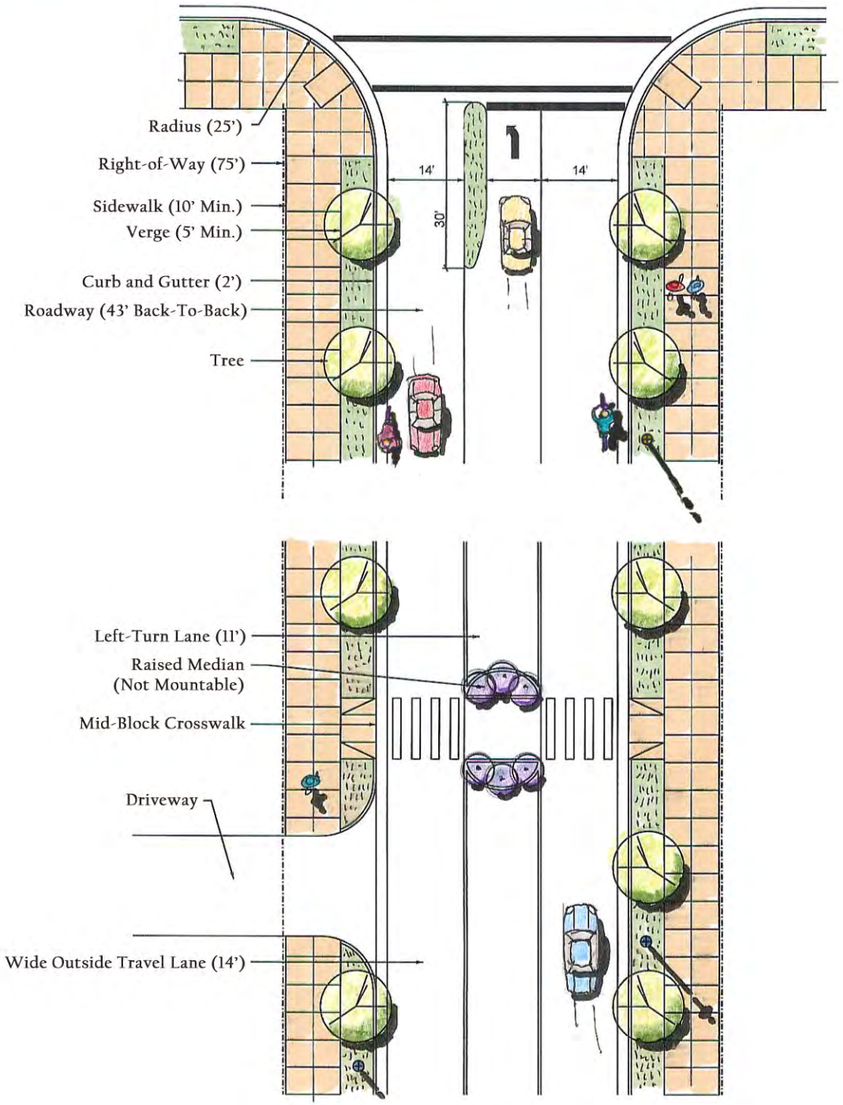
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk vs. multi-use path)
- Street Lighting (height/placement concerns)
- Need for On-Street Parking

SUATS
Long-Range Transportation Plan

Commercial Collector - Type B

3-Lane, Left-Turn Lane, 43' Back-To-Back, Sidewalks, Wide Outside Lanes, Landscaping





Plan
Not to Scale

Context Sensitive Design Features

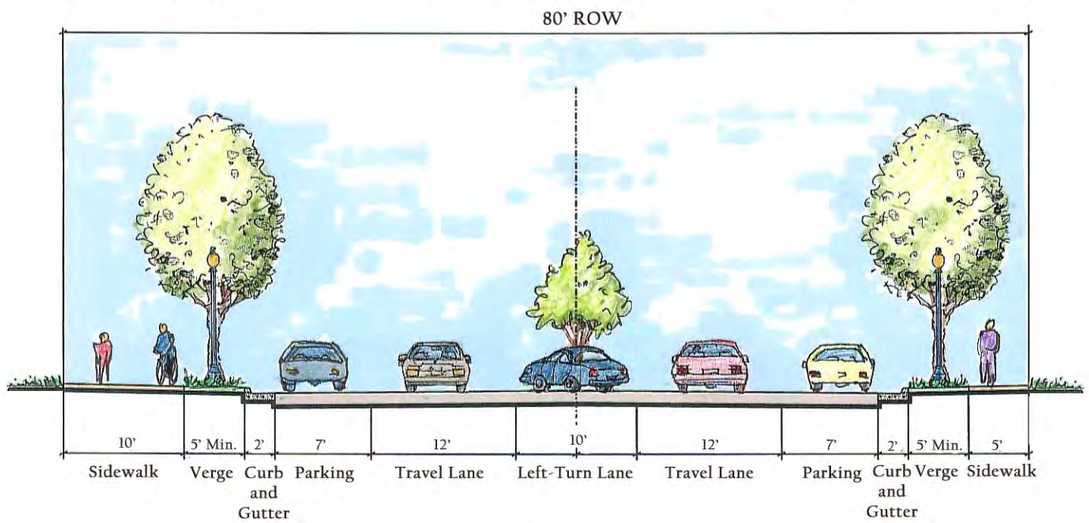
This Commercial Collector is designed to limit automobile travel speeds to 30 miles per hour. It provides two fourteen-foot travel lanes along both sides of the street. The wide travel lanes provide opportunity for motor vehicles and bicycles to share the travel corridor and should be designated as official bicycle routes within the community supplemented by appropriate signage. An eleven-foot center left-turn lane separates the two travel lanes. In the event that a left-turn lane is not incorporated into the design for a specific collector street, a planted median will be sufficient. In more urban areas, a fifteen-foot sidewalk with street trees placed in individual planters and pedestrian scale street lighting spaced comfortably apart maximizes the sidewalk width for commercial activity along both sides of the street. Context sensitive design considerations should include:

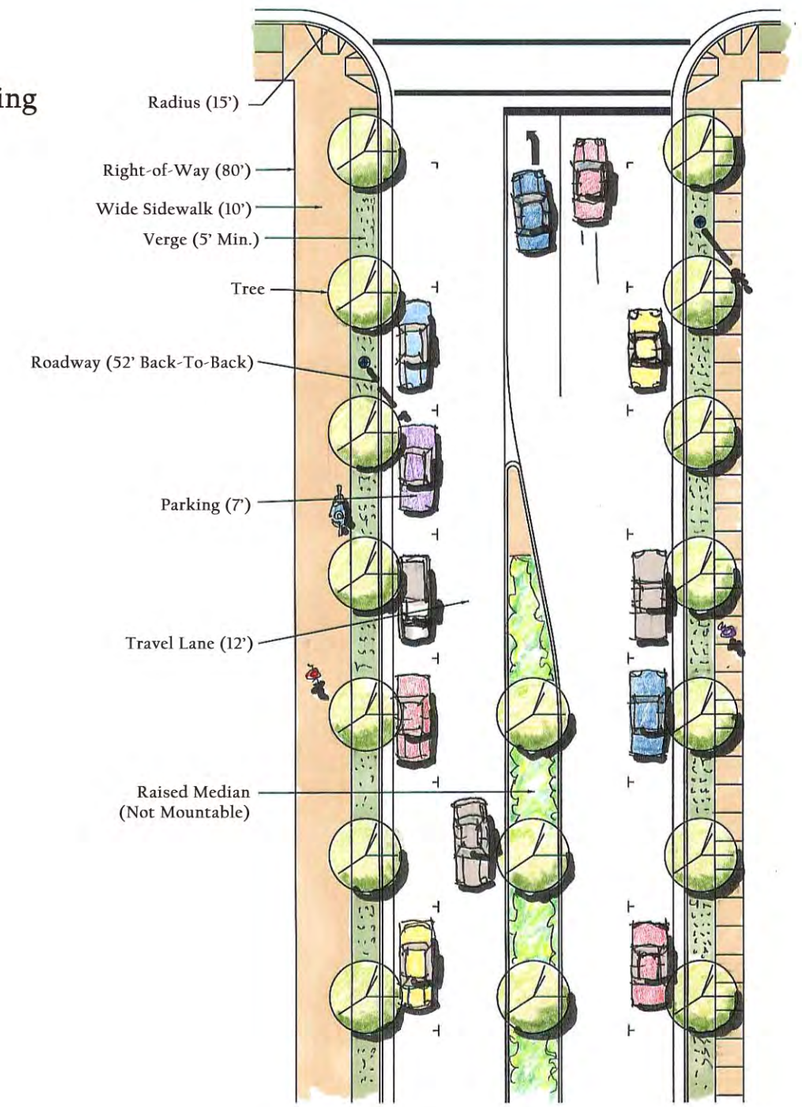
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk vs. multi-use path)
- Street Lighting (height/placement concerns)
- Need for On-Street Parking

SUATS
Long-Range Transportation Plan

Commercial Collector - TYPE C

2-Lane Divided, Raised Median or Left-Turn Lane, 52' Back-To-Back, Sidewalks, Parking, Landscaping





Plan
Not to Scale

Context Sensitive Design Features

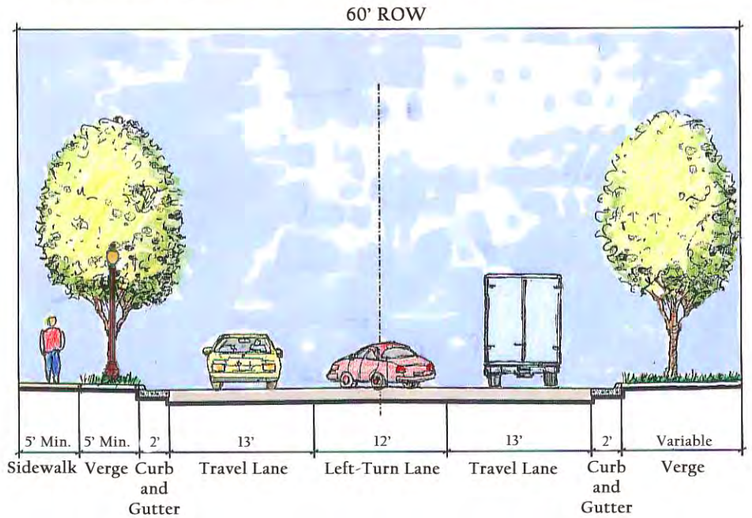
This Commercial Collector is designed to limit automobile travel speeds to 30 miles per hour. It provides two travel lanes and on-street parking with street trees along both sides of the street to provide shade and help soften the built environment. Sidewalks are preferred for both sides of the street in more urban areas. However, a ten-foot multiuse path on one side of the street is acceptable in less dense areas. A ten-foot planted median separates the two travel lanes and provides opportunities for left-turn bays and pedestrian refuge. Context sensitive design considerations should include:

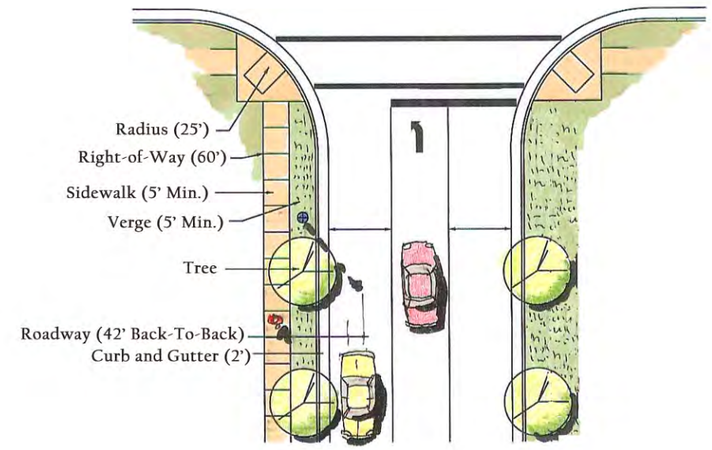
- Striped Crosswalks at intersections and mid-block crossings
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk or multi-use path)
- Pedestrian-level Lighting
- On-Street Parking (only where it will be used most of the time)
- No Right Turn Lanes

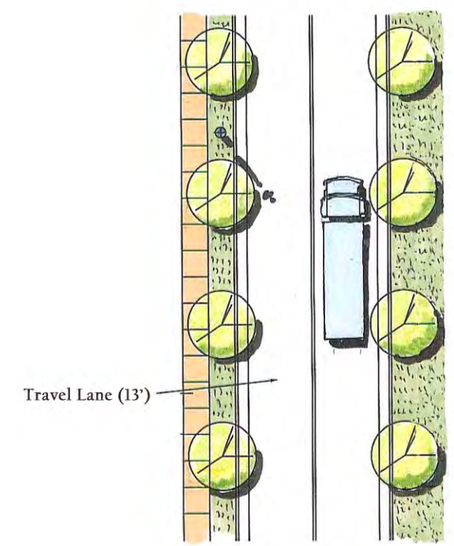
SUATS
Long-Range Transportation Plan

Industrial Collector

2-Land Divided, Left-Turn Lane, 42' Back-To-Back







Plan
Not To Scale

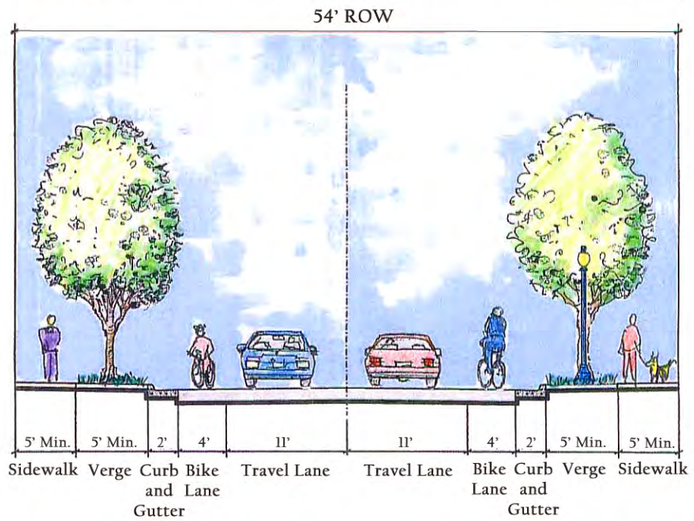
Context Sensitive Design Features

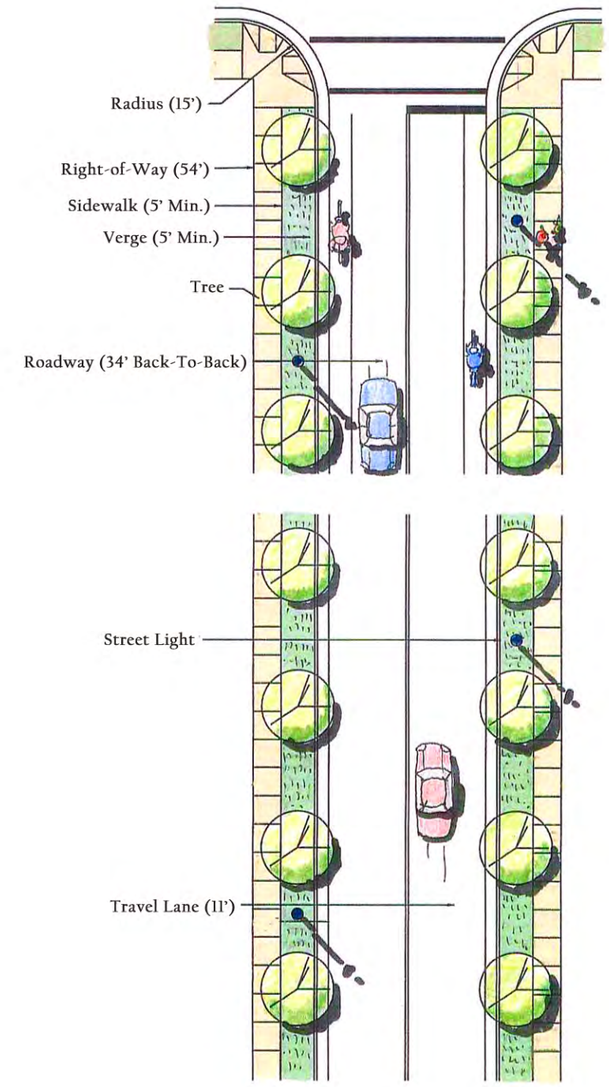
This Industrial Collector is designed to limit automobile travel speeds to 30 miles per hour. It provides two travel lanes with opportunities for center left turn bays, where needed. The larger curb radius allows larger trucks to turn without damaging the curb. The wide travel lanes better accommodate larger vehicle traffic and provide the opportunity for motor vehicles and bicycles to share the travel corridor. In these instances, the facilities should be designated as official bicycle routes and supplemented by appropriate signage. Street trees are envisioned along both sides of the street to provide shade and help soften the built environment. Sidewalks are preferred for both sides of the street to connect complementary land uses. However, a ten-foot multiuse path along one side of the street is acceptable in less intense areas. Context sensitive design considerations should include:

- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk vs. multi-use path)
- Street Lighting (height/placement concerns)

Residential Collector

2-Lane, 34' Back-To-Back, Sidewalks, Striped Bike Lanes, Landscaping





Plan
Not To Scale

Context Sensitive Design Features

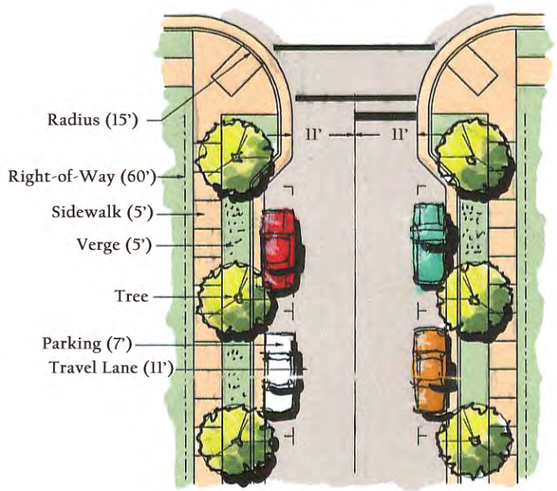
This Residential Collector is designed to limit automobile travel speeds to 25 miles per hour. It provides two travel lanes including striped bike lanes to accommodate all levels of cyclists. Street trees along both sides of the street provide shade and help soften the built environment. Sidewalks are preferred for both sides of the street in more urban areas; however, a ten-foot multiuse path or a five-foot sidewalk on one side of the street is acceptable in less dense areas. A natural buffer extends from the back of the sidewalk to the private property line along the entire corridor. Context sensitive design considerations should include:

- Striped Crosswalks at intersections and mid-block crossings
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk or multi-use path)
- Pedestrian-level Lighting
- No Right Turn Lanes

SUATS
Long-Range Transportation Plan

Residential Intersection Treatments

Residential A



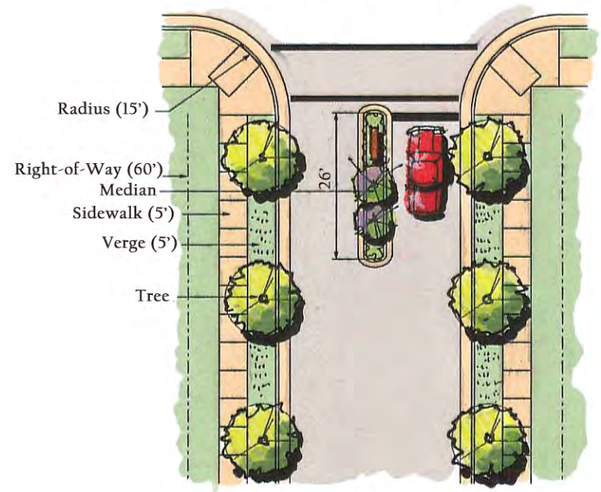
Plan
Not To Scale

Context Sensitive Design Features

Context sensitive design considerations should include:

- On-street Parking (only in high-density residential or transitional areas)
- Intersection Bulb-outs to accommodate safe pedestrian crossing
- Narrow Lanes to encourage traffic calming
- Highly Visible Crosswalks

Residential B



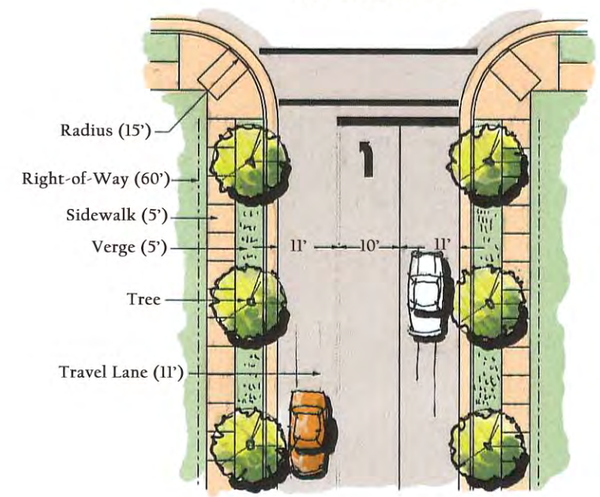
Plan
Not To Scale

Context Sensitive Design Features

Context sensitive design considerations should include:

- Plantable Median Island as a gateway feature to introduce residential area
- Narrow Lanes to encourage traffic calming
- Highly Visible Crosswalks

Residential C



Plan
Not To Scale

Context Sensitive Design Features

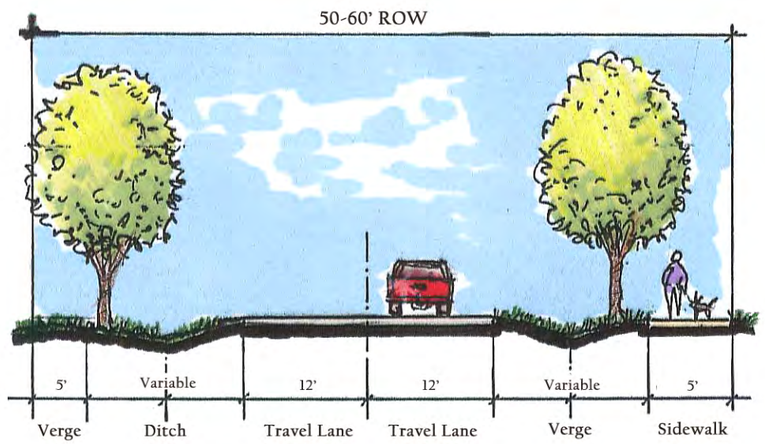
Context sensitive design considerations should include:

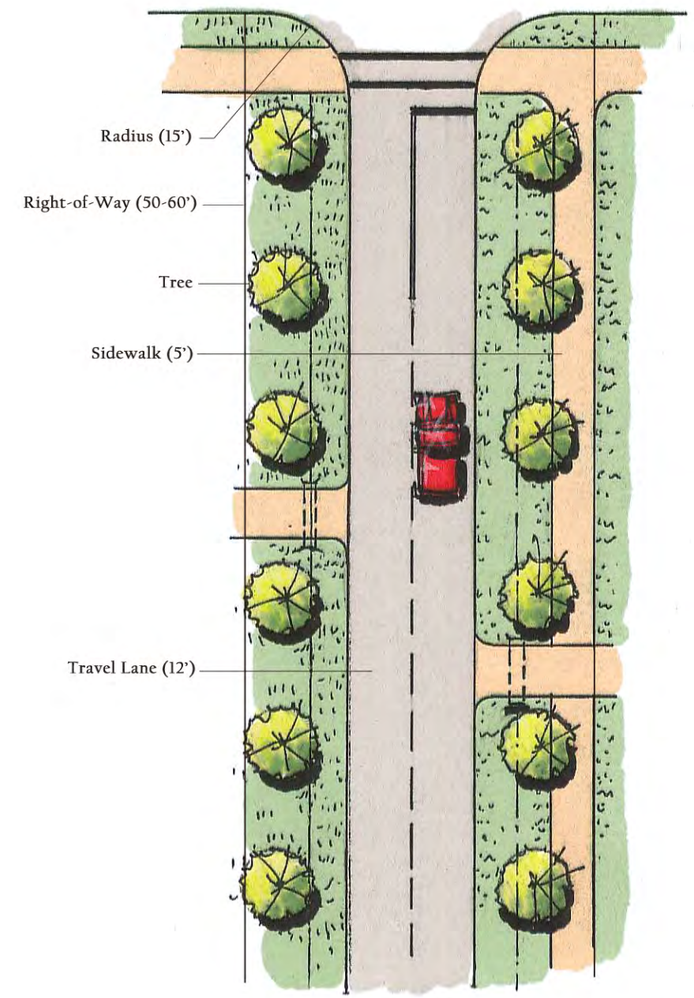
- Left-Turn Bay to accommodate a connection to a busy arterial
- Narrow Lanes to encourage traffic calming
- Highly Visible Crosswalks

SUATS
Long-Range Transportation Plan

Rural Collector

2-Lane, Sidewalks, Landscaping





Plan
Not To Scale

Context Sensitive Design Features

This Rural Collector is designed to limit automobile travel speeds to 35 miles per hour. It provides two travel lanes with street trees along both sides of the street to provide shade. A sidewalk is preferred for one side of the street. However, a ten-foot multiuse path on one side of the street is acceptable as well. A natural buffer extends from the back of the sidewalk to the private property line along the entire corridor. Context sensitive design considerations should include:

- Striped Crosswalks at intersections
- Drainage (swale vs. curb and gutter)
- Street Trees (formal vs. random plantings)
- Pedestrian Circulation (sidewalk or multi-use path)
- No Right Turn Lanes
- Paved or Grass Shoulders