



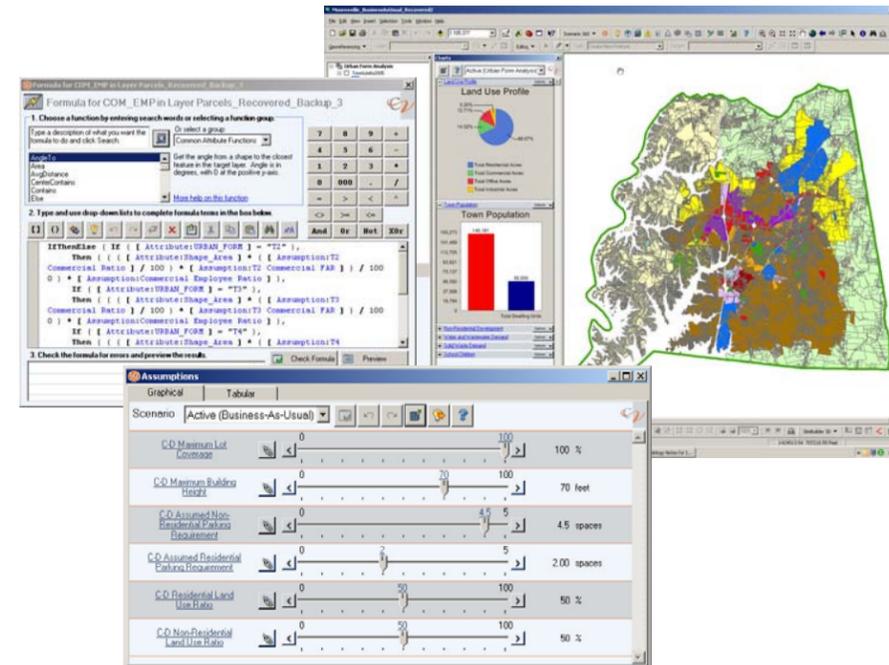
Chapter 9 — Scenario Planning

Scenario planning represents the next generation of analytical processes created to evaluate the influence of development intensities and land use patterns on the efficiency of a proposed transportation system. Visualization of the interaction between land use and transportation decisions, as well as causal factors that explain the push-pull relationship between them, provide community leaders with the information they need to evaluate the consequences of potential actions. Building on this momentum, the Federal Highway Administration, Environmental Protection Agency, and other federal agencies are actively promoting the use of scenario planning models by state departments of transportation, metropolitan planning organizations, and local governments to better integrate transportation and land use decisions in the Long Range Transportation Plan.

The SUATS Metropolitan Planning Organization is leading the movement in South Carolina to incorporate scenario planning in the process of developing its Long Range Transportation Plan (LRTP). A spatial data planning model using Community Viz software was developed that evaluates the impacts of land use decisions on surrounding public facilities and services. An enhanced spatial data planning model was developed by the consultant preparing the LRTP to measure the influence of urban form on regional travel behavior.

Evaluating the relationship between urban form and regional travel behavior in a scenario planning analysis produces several benefits. When considered together, decisions and investments regarding both elements can have a significant bearing on the SUATS study area:

- The impacts to sensitive land uses can be minimized when facilities identified for transportation investments are located *after* considering appropriate land use patterns and development intensities for the area.
- Prime locations for development can be stimulated if transportation investments consider available capacity or appropriate mobility options.
- Complementary activities can be placed next to existing or planned transportation infrastructure, making the most of land use opportunities and dedicated transportation investments.



- The quantity and location of travel demand can be influenced by land use decisions, making the possibility of real choices for various modes of travel both accessible and attractive.

Urban Form & Travel Behavior

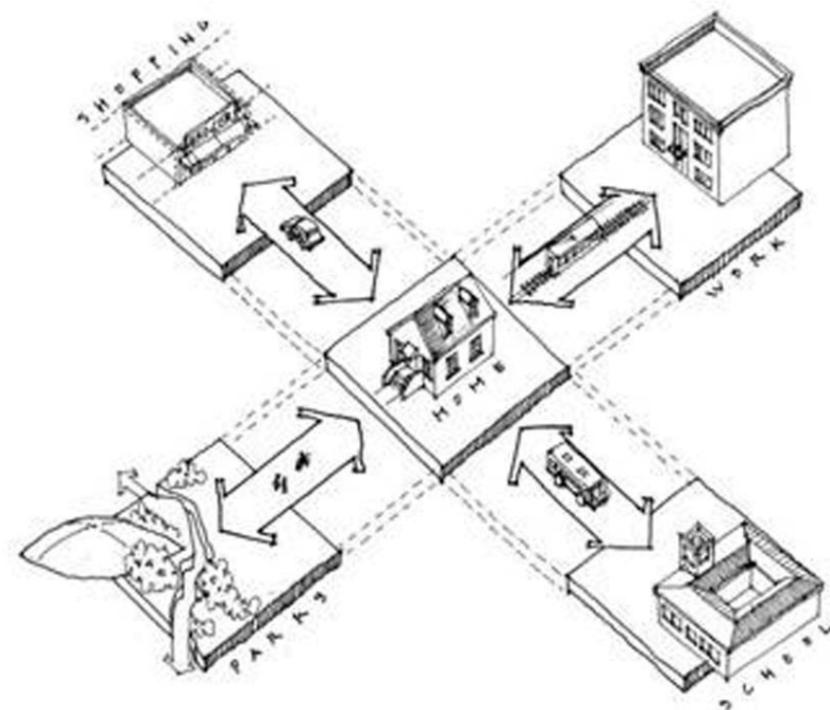
Scholars explain urban form as the spatial footprint of our cities; it is measured by street patterns, block length, mix of land uses, maximum building height, average residential density, and non-residential intensity. Categorization of these design elements measures a city's coherence, and follows a natural progression from rural to suburban to urban. Urban form categories and the surrounding transportation system often influence each other in a cyclical pattern.

Elements of transportation — including roads and pedestrian, bicycle, and transit facilities — impact how land is developed in terms of density and even



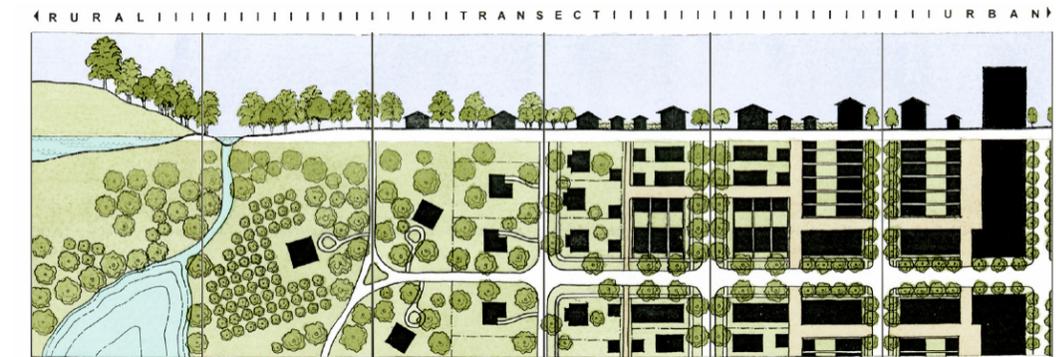
types of land use. Further, where land uses fall and how they are distributed inevitably impacts decisions regarding where people travel and how transportation facilities are prioritized. If low-density development is spread out, the residents of such areas must rely almost entirely on automobiles to get from one location or land use to another. On the other hand, denser urban centers that combine complementary land uses near each other enable greater choice in transportation.

Reorganization of urban form in the SUATS study area for a more efficient transportation system requires that community leaders evaluate the four Ds commonly associated with the relationship between land use, urban design, and transportation – density, diversity, design and destinations. By doing so, the SUATS MPO and City and County of Sumter will collectively be able to shorten the commuting distance between complementary land uses, provide more travel choices, and create a more efficient transportation system.



The Transect¹

The transect is an urban planning model developed by Andres Duany, an American architect and urban planner who co-founded the Congress of New Urbanism in 1993. The transect provides a framework for organizing the components of urban form within the human environment. It follows a continuum from natural environment to urban center, with discrete categories established for specific urban form categories that vary by level of intensity and urban character (see diagram below).



The plan above illustrates how the transect classifies elements of the human environment from rural to urban, in a left-to-right sequence. (Source: Duany, Plater-Zyberk, 2007)

These discrete categories become the basis for organizing components of the built environment: densities/intensities, street patterns, land use, and other physical elements. In planning for new development and redevelopment, purposeful combination of the components that define specific urban form categories creates immersive environments – places that have an integrity and coherence about them to reinforce an intended sense of place. At the boundaries between urban form categories, an overlap of defining elements allows them to fit together smoothly.

The transect applied to the SUATS study area was divided into six discrete urban form categories: natural areas, rural, suburban, general urban, urban core, and a special district created to represent the Shaw Air Force Base. As defined by the mix of land uses, average residential density and non-residential intensity, typical street pattern and block lengths, and maximum building height, each urban form category represents a unique development pattern in the SUATS study area. The illustrations that follow in **Figures 9.1 through 9.6** describe in detail the physical elements used to define the six urban form categories.

¹ Description of the transect developed from various publications of Andres Duany and Emily Talen: *Transect Planning*, 2002; *Making the Good Easy: The Smart Code Alternative*, 2002; and *A New Theory of Urbanism*, 2000.



Natural areas remain generally undeveloped to preserve the integrity of the landscape and protect local natural resources.

Local Examples:



Environmentally-sensitive area near Patriot Parkway



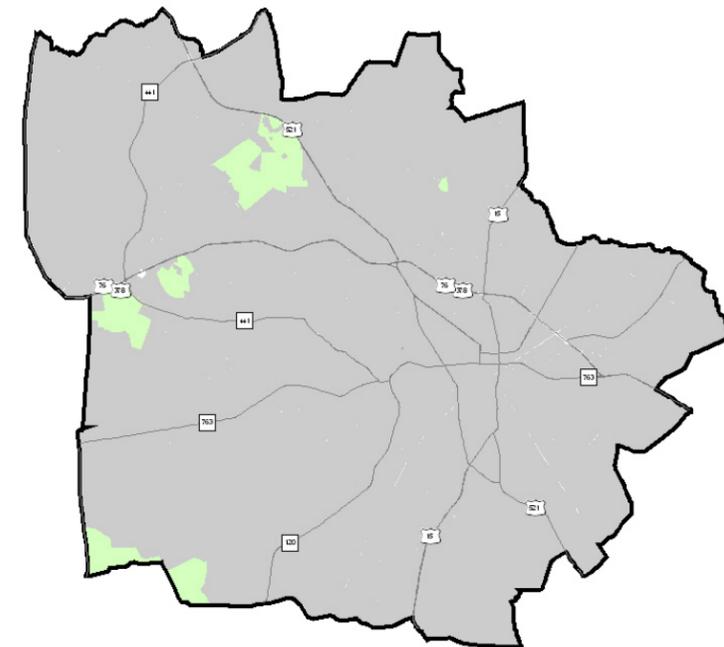
Aircraft protection zones serving Shaw AFB

**Environmentally Sensitive Areas
General Development Characteristics**

Average Base Residential Density	0.2 d.u. / acre
Typical Street Pattern	Curvilinear
Typical Block Length	N/A
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	2 stories
Site Efficiency Factor	10%
Mix of Land Uses	
Residential Ratio	2%
Commercial Ratio	0%
Office Ratio	0%
Industrial Ratio	0%
Open Space Ratio	98%
Non-Residential Intensities	
Commercial FAR	0.05
Office FAR	0.05
Industrial FAR	0.05
Persons per Household*	2.68

*Persons per household data derived from 2000 U.S. Census data for Sumter County, SC

This table summarizes general development characteristics for natural areas that were incorporated into the scenario planning analysis. These areas remain generally undeveloped to protect local natural resources; however, isolated large-lot, single-family homes could be built in natural areas subject to the principles of low-impact development.



Natural areas include land zoned for Conservation Preservation in the City and County of Sumter Zoning Ordinance and land identified in the aircraft protection zones (APZs) for Shaw Air Force Base.

Urban Form Category Descriptions
T1 – Natural Areas Figure 9.1



Rural areas support primarily low-density, residential development at the outskirts of the urbanized area.

Local Examples:



Buckhorn of Wedgefield Subdivision



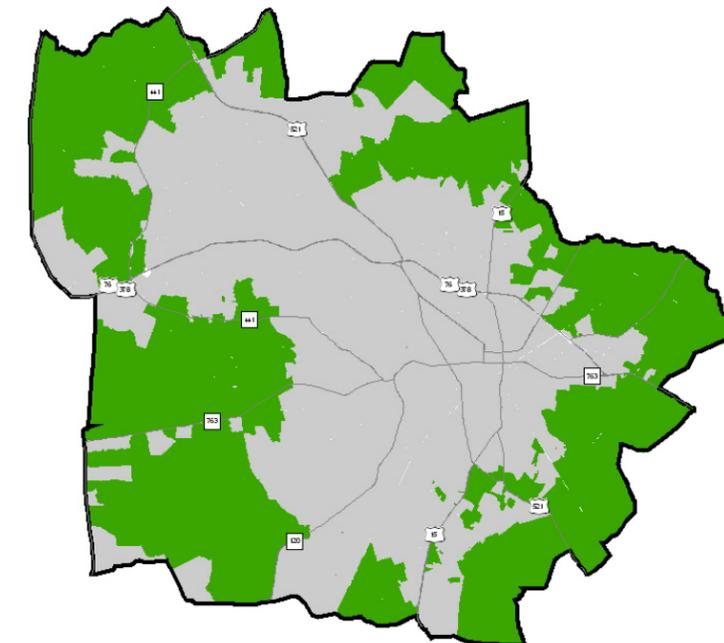
Claremont Road at Kings Highway

**Rural Areas
General Development Characteristics**

Average Base Residential Density	0.5 d.u. / acre
Typical Street Pattern	Curvilinear
Typical Block Length	N/A
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	2 stories
Site Efficiency Factor	60%
Mix of Land Uses	
Residential Ratio	35%
Commercial Ratio	0%
Office Ratio	0%
Industrial Ratio	0%
Open Space Ratio	65%
Non-Residential Intensities	
Commercial FAR	0.15
Office FAR	0.15
Industrial FAR	0.10
Persons per Household*	2.68

*Persons per household data derived from 2000 U.S. Census data for Sumter County, SC

This table summarizes general development characteristics for rural areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types in low-density development patterns. The predominate land use type is single-family residential; however, small pockets of commercial and industrial uses spread throughout the landscape may exist to serve rural residents.



Rural areas represent land primarily at the extremes of the study area.

Urban Form Category Descriptions
T2 – Rural Figure 9.2



Suburban areas support low-density residential and non-residential development characteristic of most U.S. cities developed after World War II.

Local Examples:



Lindley Street (Burns Down Subdivision)



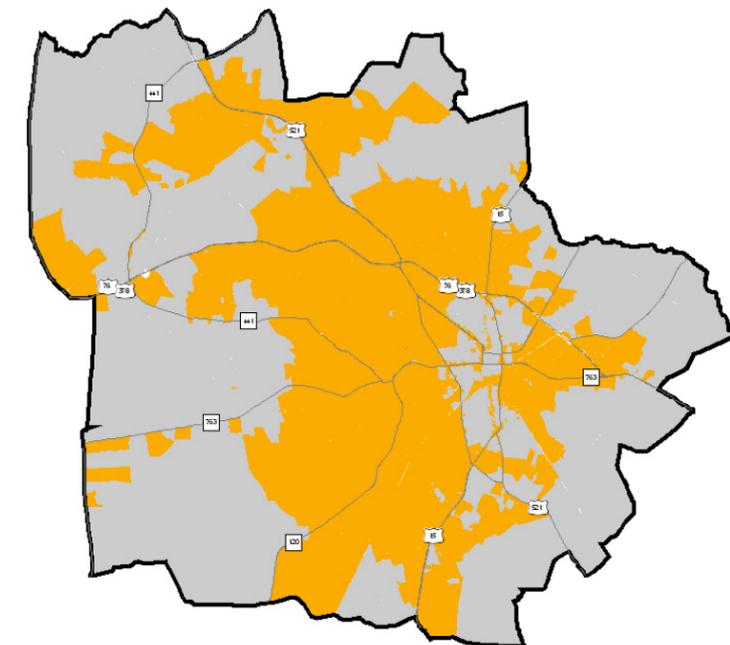
Broad Street near Wise Drive

**Suburban Areas
 General Development Characteristics**

Average Base Residential Density	2.5 d.u. / acre
Typical Street Pattern	Curvilinear / Radial
Typical Block Length	N/A
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	3 stories
Site Efficiency Factor	55%
Mix of Land Uses	
Residential Ratio	13%
Commercial Ratio	10%
Office Ratio	12%
Industrial Ratio	5%
Open Space Ratio	60%
Non-Residential Intensities	
Commercial FAR	0.20
Office FAR	0.20
Industrial FAR	0.05
Persons per Household*	2.68

*Persons per household data derived from 2000 U.S. Census data for Sumter County, SC

This table summarizes general development characteristics for suburban areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types in relatively low-density development patterns. Residential, commercial, office, and industrial uses are prevalent in the suburban landscape; however, the separation between complementary land uses often necessitates travel by automobile to satisfy daily needs.



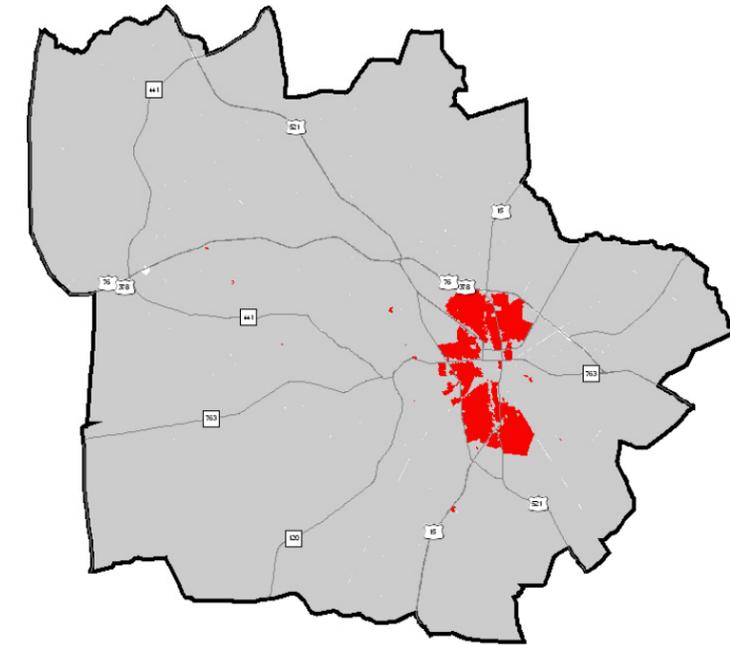
Suburban areas include land with generally low-density expansive development patterns along most major thoroughfares and newer residential subdivisions inside city limits.

Urban Form Category Descriptions
 T3 – Suburban Figure 9.3



**General Urban
General Development Characteristics**

Average Base Residential Density	5.0 d.u. / acre
Typical Street Pattern	Grid
Typical Block Length	N/A
General Land Use Pattern	Isolated
Maximum Building Height (stories)	3 stories
Site Efficiency Factor	55%
Mix of Land Uses	
Residential Ratio	13%
Commercial Ratio	7%
Office Ratio	25%
Industrial Ratio	0%
Open Space Ratio	55%
Non-Residential Intensities	
Commercial FAR	0.30
Office FAR	0.30
Industrial FAR	0.15
Persons per Household*	2.68



General urban areas include land that surrounds the historical downtown for Sumter.

General urban areas represent the first tier of expansion from the traditional downtown center of Sumter. The short blocks and grid street pattern originating from the downtown extend to relatively dense neighborhoods, which are separated by multilane radial streets that traverse several miles from the downtown center.

Local Examples:



Washington Street near Loring Drive



Calhoun Street near Purdy Street

*Persons per household data derived from 2000 U.S. Census data for Sumter County, SC

This table summarizes general development characteristics for general urban areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types, but supports more dense development patterns compared to previous urban form categories. Residential, commercial, office, and industrial uses are prevalent in the general urban landscape, and the grid street pattern and shorter block lengths support travel mode choices between complementary land uses.

Urban Form Category Descriptions
T4 – General Urban Figure 9.4



**Urban Core
General Development Characteristics**

Average Base Residential Density	10.0 d.u. / acre
Typical Street Pattern	Grid
Typical Block Length	N/A
General Land Use Pattern	Mixed
Maximum Building Height (stories)	6 stories
Site Efficiency Factor	90%
Mix of Land Uses	
Residential Ratio	40%
Commercial Ratio	10%
Office Ratio	35%
Industrial Ratio	0%
Open Space Ratio	15%
Non-Residential Intensities	
Commercial FAR	0.50
Office FAR	0.75
Industrial FAR	0.25
Persons per Household*	2.68



The urban core represents the historical center of Sumter, and continues to be the government and medical hub for the community. A fine mix of residential and non-residential land uses occurs block-by-block and vertically within certain buildings.

Local Examples:



Main Street south of Hampton Street

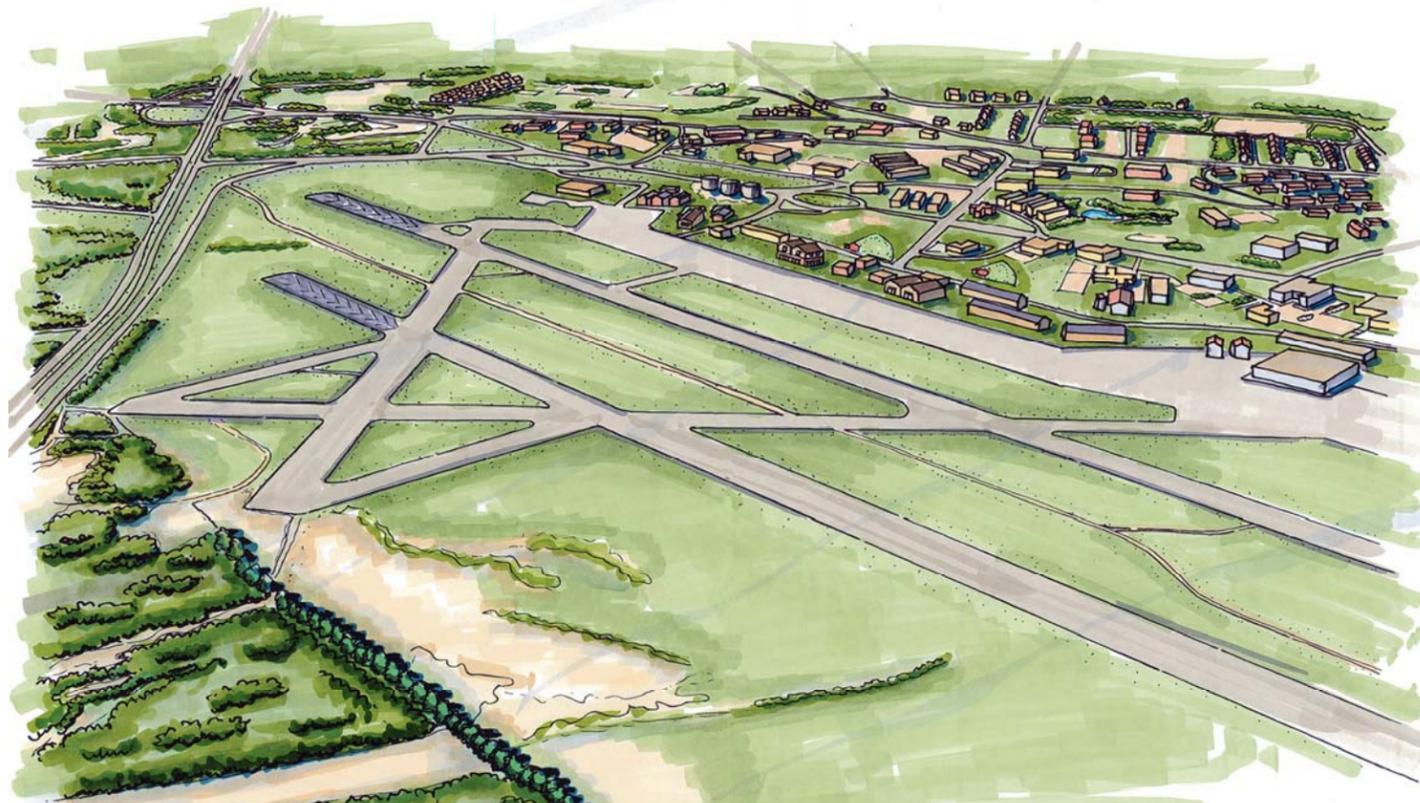
Dugan Street between Sumter Street and Main Street

*Persons per household data derived from 2000 U.S. Census data for Sumter County, SC

This table summarizes general development characteristics for the urban center that were incorporated into the scenario planning analysis. Generally, this urban form category mixes different land use types by block and by building; and supports more dense development patterns compared to previous urban form categories. Residential, commercial, and office uses are prevalent in the general urban landscape, and the grid street pattern and shorter block lengths support travel mode choices between complementary land uses.

The urban core includes land that lies within the historical limits for downtown Sumter.

Urban Form Category Descriptions
T5 – Urban Core Figure 9.5

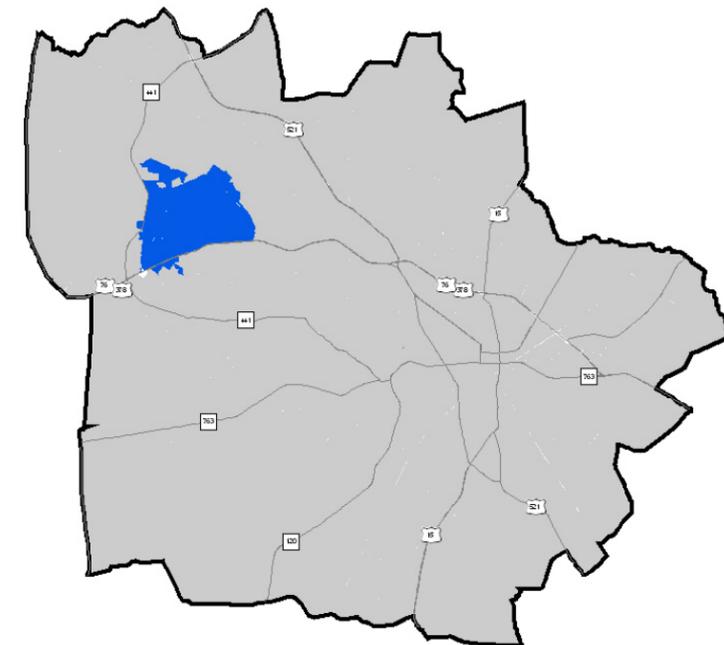


**Special District
General Development Characteristics**

Average Base Residential Density	6.0 d.u. / acre
Typical Street Pattern	Grid
Typical Block Length	N/A
General Land Use Pattern	Mixed
Maximum Building Height (stories)	4 stories
Site Efficiency Factor	60%
Mix of Land Uses	
Residential Ratio	20%
Commercial Ratio	0%
Office Ratio	0%
Industrial Ratio	60%
Open Space Ratio	20%
Non-Residential Intensities	
Commercial FAR	0.20
Office FAR	0.20
Industrial FAR	0.10
Persons per Household*	2.68

*Persons per household data derived from 2000 U.S. Census data for Sumter County, SC

This table summarizes general development characteristics for Shaw Air Force Base that were incorporated into the scenario planning analysis. Generally, this urban form category supports military operations and surrounding off-base housing for enlisted families.



The Shaw Air Force Base special district includes all land zoned for military operations (SHAW) in the City of Sumter Zoning Ordinance.

This special district recognizes certain development restrictions associated with Shaw Air Force Base for military operations, and the spatial impact that the base and its immediate environs have on the region.

Local Examples:



Off-Base Housing near West Hampton Avenue



Entrance to Shaw Air Force Base (Guard Gate)

**Urban Form Category Descriptions
T6 – Special District (Shaw AFB) Figure 9.6**

Development Scenarios

Two extreme future year development scenarios were created for the Long Range Transportation Plan that measure the impact urban form may have on the demand factors (i.e., trip generation, trip length, travel distance, and travel mode choice) that influence the efficiency of the transportation system. Both development scenarios represent the same study area, planning horizon year (2030), and control totals for population, number of households, and number of employees by commercial, office, and industrial categories reported in the 2030 Sumter Area Transportation System (SUATS) Regional Travel Demand Model maintained by the South Carolina Department of Transportation. Differences between the two development scenarios were limited to the 4 Ds commonly associated with the relationship between land use, urban design, and transportation – density, diversity, design, and destinations.

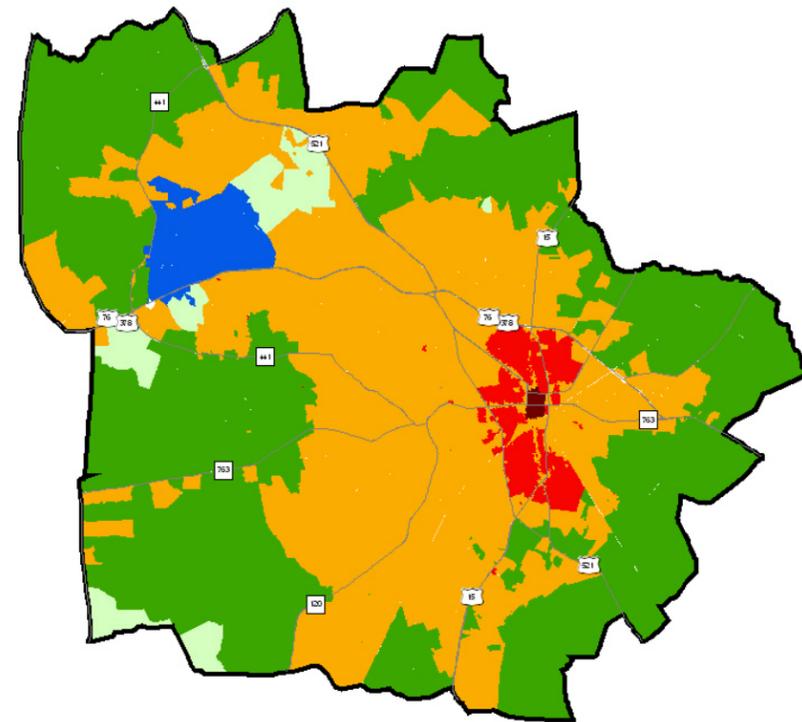
For the purposes of land use scenario planning, a study area similar to the LRTP study area was used. Areas beyond the metropolitan areas of the county were excluded to maintain a compact urban form analysis. A detailed description of the two future year development scenarios is provided below.

Sprawl Development

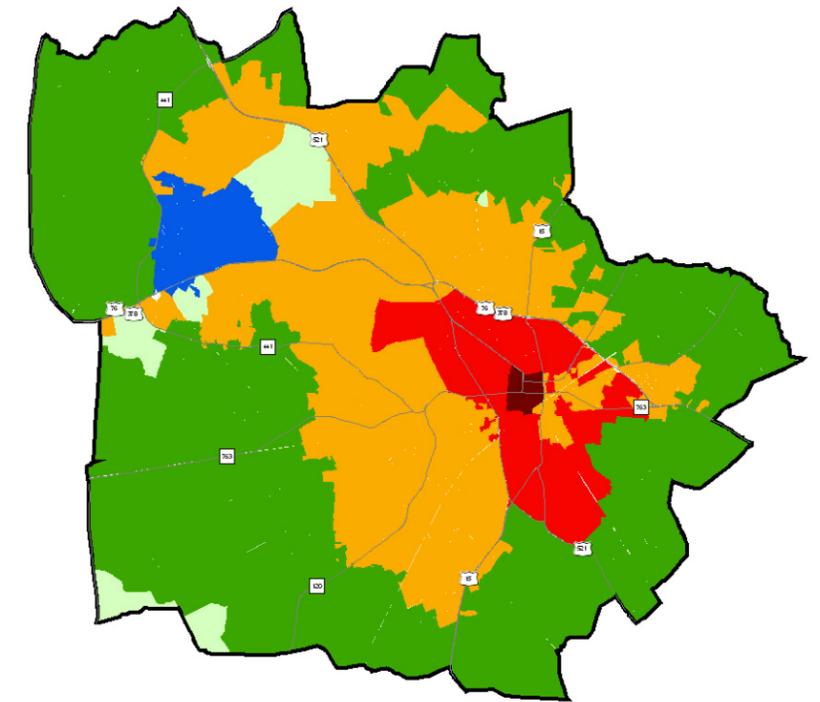
The sprawl development scenario represents a continuation of adopted plans, programs, and policies administered in the City and County of Sumter Comprehensive Plans, and implementing zoning ordinances, to accommodate future year growth through 2030. The historical central business district, originating from the intersection of Liberty Road and Main Street, represents the only location for concentrated, mixed-use development. Surrounding downtown, low-density development and the physical distance between complementary land uses tend to promote automobile travel, particularly since safe, convenient facilities are not easily available for pedestrians and bicyclists. Increased traffic means less mobility for Sumter citizens and others traveling through the region.

Compact Development

The compact development scenario represents a paradigm shift in planning philosophy for the City and County of Sumter toward more sustainable



Sprawl Development Scenario



Compact Development Scenario

Legend

- | | |
|--------------------|--------------------------|
| Natural Areas (T1) | General Urban (T4) |
| Rural (T2) | Urban Core (T5) |
| Suburban (T3) | Shaw Air Force Base (T6) |



development – measured by environmental stewardship and equitable distribution of community resources – that reflects the community’s unique character and local values. Under this planning scenario, future year growth anticipated for 2030 was directed to an expanding downtown core and high-growth corridors along Broad Street, Guignard Road, Lafayette Drive, and Manning Avenue. **The diversity of close-by, complementary land uses and local travel options within the designated activity centers encourages better distribution of trips and shorter trip lengths, thereby reducing the number of vehicles region-wide vying for similar routes.** This scenario also assumes a safe environment for pedestrians and bicyclists to travel from one land use to another.

Scenario Planning Results

The SUATS Metropolitan Planning Organization is committed to fostering a more efficient, multimodal transportation system, supportive of an overarching community goal for the City and County of Sumter to implement a more sustainable land use plan that reflects the unique character and local values celebrated by its citizens. Comparative statistics for the two development scenarios confirm that reorganization of urban form throughout the study area into a more compact, nodal development pattern significantly improves the efficiency of the transportation system, while preserving unspoiled natural areas immediately surrounding the SUATS study area.

Summary statistics for evaluating the impacts of sprawl development and compact development scenarios were reported using Community Viz software and the 2030 SUATS Regional Travel Demand Model maintained by the South Carolina Department of Transportation. Measures of Effectiveness (MOEs) generated by the two software programs articulate the significance of reorganizing development densities/intensities and land use patterns to improve efficiency of the regional transportation system.

Compared to a sprawling development pattern, the alternative development scenario emphasizes compact, walkable urban and neighborhood centers, and supports future opportunities for regional bus transit for higher order trips. Higher order trips typically represent trip lengths over one-half mile in length, whereby walking or bicycling would not be the primary means of travel between two destinations. Non-motorized modes of transportation could provide

connections to transit stops and/or close-by land uses that make alternatives to single-occupant automobile travel more viable.

Viable travel alternatives and more compact, mixed-use centers also reduce travel distance between complementary land uses and reliance on the automobile for day-to-day activities. This leads to less vehicle miles traveled, less vehicle hours traveled, and higher average automobile travel speeds (system-wide) compared to a more sprawling development pattern. Further, vehicle miles traveled at times of highest demand on the transportation system are reduced by nearly 8%, resulting in a more efficient transportation system. Table 9-1 summarizes the MOEs from the 2030 SUATS Regional Travel Demand Model for the two development scenarios.

Table 9-1
Comparison of Daily Travel Characteristics

Measure of Effectiveness (MOE)	Sprawl Development Scenario	Compact Development Scenario	Improvement
Total Population	108,873	108,876	N/A
Total Trips (1,000s)	638	632	Reduced 6,000 trips
Trips per Person	5.86	5.81	Reduced 0.05 trips per person
Vehicle Miles Traveled (1000s)	3,219	3,133	Reduced 86,000 vehicle miles
Vehicle Miles Traveled per Person	29.57	28.77	Reduced 0.8 vehicle miles per person
Vehicle Hours Traveled (1000s)	103	100	Reduced 300 vehicle hours
Vehicle Hours Traveled per Person	0.95	0.92	Reduced 0.03 vehicle miles per person
Average Travel Speed	31.16	31.19	Increased average travel speed 0.03 mph
Vehicle Miles Traveled at LOS E (1000s)	478	440	Reduced 38,000 congested vehicle miles traveled
% Vehicle Miles Traveled Over Capacity	14.86%	14.06%	Reduced congested vehicle miles traveled 0.8 percent



A compact development scenario also reduces the spatial footprint of urban development on surrounding hinterlands. Urban and neighborhood centers identified in the hypothetical scenario would limit creeping low-density, sprawl development patterns and reduce accompanying public infrastructure costs.

Output data from Community Viz indicates that up to 56.8% of the total land area included in the study area could be maintained in a rural context compared to 49.0% in the sprawl development scenario – while accommodating the same growth projections for 2030. Beyond environmental stewardship, the compact development scenario supports prudent fiscal responsibility for capital improvements planning and room for purposeful growth beyond the 25-year planning horizon. Table 9-2 summarizes the land use profile, by urban form category, for both sprawl and compact development scenarios.

Detailed study and public outreach for reaffirming the City and County of Sumter’s long-term vision toward a sustainable land use plan is being prepared independent of this document, in advance of the 2020 Comprehensive Plan Update, scheduled for completion in December 2009. Plans, programs, and policies recommended during this concurrent planning process may be included in the City and County of Sumter Comprehensive Plans. The resulting document will serve as the official adopted statement on land use by the City and County Councils, and will serve as the blueprint for long-term sustainable growth in the community. The Long Range Transportation Plan serves as a companion document to the City and County Comprehensive Plan.

Policy and Guidelines Toolbox

The following policies and guidelines serve as a toolbox for the SUATS Metropolitan Planning Organization and the City and County of Sumter to strengthen the connections between the four D’s commonly associated with improving the relationship between land use, urban design, and transportation – density, diversity, design, and destinations. By doing so, community leaders will be able to shorten commuting distance between complementary land uses, provide more travel choices, and create a more efficient transportation system. These tools were selected following discussions with City and County planning staff and a review of local zoning and development standards ordinances.

Table 9-2
Comparison of Scenario Land Use Profiles

Urban Form Category	Sprawl Development Scenario		Compact Development Scenario		Net Change	
	Acres	%	Acres	%	Acres	%
Natural Area	4,071	3.6%	4,244	3.8%	173	0.2%
Rural	55,168	49.0%	64,015	56.8%	8,847	7.8%
Suburban	47,642	42.3%	33,346	29.6%	- 14,296	- 12.7%
General Urban	2,595	2.3%	7,593	6.7%	4,998	4.4%
Urban Core	134	0.1%	382	0.3%	248	0.2%
Shaw AFB Special District	3,097	2.7%	3,127	2.8%	30	0.1%
Total	112,707	100.0%	112,707	100.0%	0	0.0%

Tool 1: Promote Sustainable Land Development

A development can have a positive or negative impact on the transportation system, either creating more congestion or providing alternate routes for traffic. The City and County should not only consider how a mix of land uses will relate when considering development opportunities but also keep in mind the way each use is accessed. If sustainable land development principles are followed, local officials can plan for land use and developments that reduce congestion. Offering smart alternatives will help limit the number and lengths of local trips as well as provide alternatives to the already congested corridors in the SUATS study area.



Efficient travel between land uses can be encouraged by promoting development patterns that favor higher densities and intensities, a mix of land uses, and an environment that accommodate transit, bicycles, pedestrians. In turn, the transportation system should connect complementary land uses and focus on more efficient travel behavior defined by mode and route choices.

To encourage on-site improvements for promoting a more sustainable land development pattern, the area's transportation system should favor efficient travel between interior destinations and safe, predictable connections to adjacent properties. The orientation of buildings and parking lots should favor a "park once" mentality, whereby the design, location, and supply of parking promote a more balanced transportation environment that facilitates walking once arriving to the site.

By not providing excessive parking, the City and County will encourage pedestrian and bicycle travel and discourage automobile travel. Pedestrian walkways within a newly or re-developed site should connect building entrances and provide safe crossings. Locating parking and vehicle driveways away from building entrances also will encourage pedestrian activity. At the edges of development, rules and standards should be adopted that require purposeful connections to the public sidewalk and greenway system for promoting alternative modes of travel for accessing the site.

Tool 2: Support Efforts to Increase Connectivity Within and Between Developments

Street connectivity refers to the directness of routes and the density of connections (i.e., intersections) within a transportation system. As connectivity increases, travel distances decrease and route options increase, allowing the transportation system to be used more efficiently by pedestrians, bicyclists, transit, and automobiles. When the local street network is not sufficient, arterials often become the preferred travel route. Unfortunately, this reduces regional mobility for through traffic.

A highly connected transportation system includes several options for entering or leaving a new development. Whenever possible, these options are located on secondary roads rather than highways. The number of street systems without access to other roads should be limited, just as cul-de-sacs would be restricted to areas where topography, environment, or existing development make other

Sustainable Transportation Initiatives in Land Development:

Compact, Mixed-Use Development

Newer development initiatives recognize the benefits of increased density, mixture of land uses, and pedestrian-friendly design on the regional transportation system.



Park Once Districts

To promote sustainable land development, buildings should be oriented and parking located to favor a "park once" mentality. Excessive parking should be discouraged.



Reorganization of traditional suburban scale development creates a "park once", walkable environment.



Traditional "sea of asphalt parking" typically serves big box suburban development.

street connections prohibitive. Stub-outs should be encouraged and signed to accommodate future street extensions and connections with neighboring parcels. The City and County also should encourage developments to include regulations that require minimum street spacing, which will support efforts to diffuse traffic congestion and more easily connect with other streets and developments.

Connectivity in the area should not be limited to automobiles, however. Encouraging a network of connected pedestrian and bicycle facilities offers more transportation alternatives, especially when that network provides access to a variety of land uses, roadways, and developments. Greenway, bicycle, and pedestrian connections are highlighted in Chapter 6.



Connections need to be not only planned but also implemented during the development review process. Promoting a highly connected transportation system through implementation will require revisions to local zoning and subdivision ordinances. In addition, the City and County of Sumter should develop clear traffic impact study (TIS) guidelines, which require a TIS, prepared by a professional engineer specializing in traffic operations, accompany all development applications or any other development deemed necessary by the Planning Director for review. The study will facilitate the review process and promote connectivity within and between developments.

Tool 3: Promote Development Design to Manage Access and Reduce Congestion Levels on Major Roadways

For the study area to truly achieve transportation efficiency, the City and County will need to consider the potential conflicts between the transportation system's mobility (transportation) and accessibility (land use). Access management will help balance mobility and accessibility.

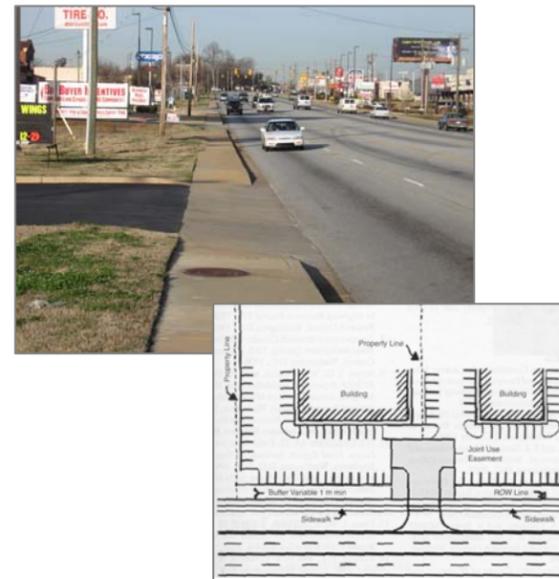
From a land use perspective, the number, location, and spacing of driveways along the street network significantly impact vehicular movements and levels of congestion. Land use and transportation professionals agree that the number of driveways or curb cuts serving a property should be minimized and that regulations and incentives can be used to encourage shared-use driveways. Sumter can promote greater street network efficiency through cross access agreements, which limit the number of driveways and allow roadway access for multiple parcels across a single property.

Building on the momentum of this collaborative planning process, local leaders should partner with SCDOT to review the state's current access management guidelines and local ordinances that regulate access to the street network. Following this review, a formal access management overlay ordinance should enforce consistent access management standards that ensure the proper function of existing and planned arterials for mobility. In particular, minimum spacing and maximum driveways per development should be regulated. Strengthening and enforcing minimum lot frontage requirements will prevent the establishment of small frontage lots along the corridor. In addition, regulations should encourage the construction of parallel routes for backdoor access. These routes can be integrated into the local street system when small frontage lots are unavoidable.

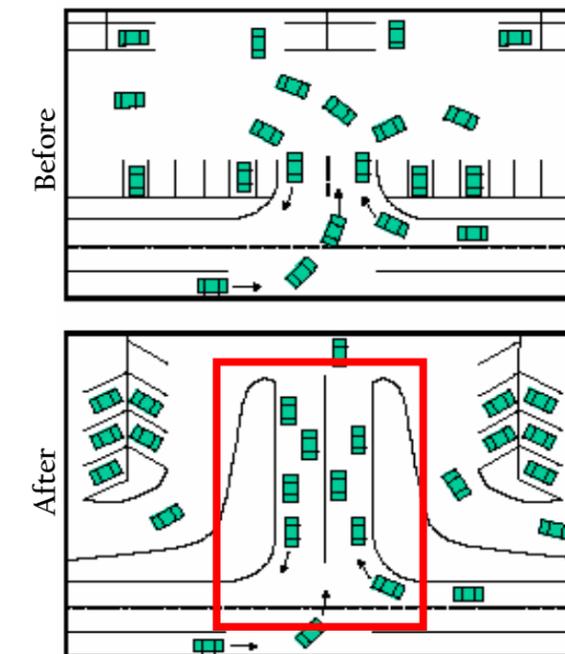
Implementation of access management tools can be accomplished in a number of ways — changing local zoning ordinances, developing an access management overlay ordinance, or approving rules and regulations for the subdivision and site plan review process to include application of access management solutions. More detailed access management techniques are discussed in Chapter 5.

Access Management Examples:

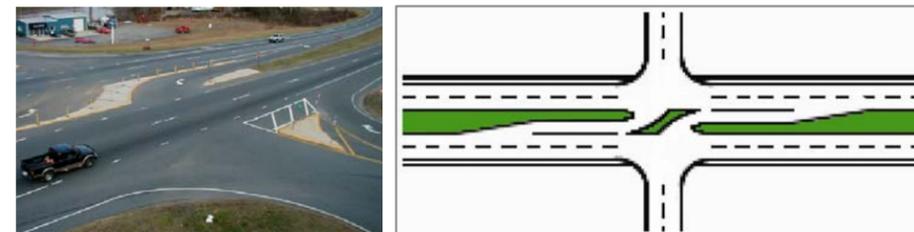
Shared Driveway Use



Internal Site Circulation



Regulating Left Turns (i.e. left-over treatment)





Tool 4: Encourage Growth Management Initiatives to Manage Growth

It is clear that mobility and congestion are directly affected by growth. The rate and direction of growth are capable of canceling the benefits of new transportation improvements if proper planning has not occurred. Some communities in the state facing similar growth pressures to Sumter have implemented growth management tools for influencing the location and timing of new development consistent with available infrastructure.

Growth management tools in the State of South Carolina are somewhat limited; however, two tools gaining favor among communities of similar size to Sumter are adequate public facilities ordinances and capital improvement plans. An adequate public facilities ordinance controls the timing and location of development. In this instance, development is approved conditionally upon proof that sufficient public facilities and services are present or will be provided to maintain adopted level of service standards (e.g., transportation mobility). The second tool, a capital improvements plan (CIP), guides future funding, schedule, and construction of large dollar, capital improvements so that necessary infrastructure is in place consistent with demand. By scheduling long-term capital improvements over the long-term planning horizon, a CIP restricts the extension of services into areas where development should be limited until a time that is appropriate.

An additional growth management tool gaining favor in South Carolina is developer impact fees. Developer impact fees and system development charges are another funding option for communities looking for ways to pay for transportation infrastructure. They are most commonly used for water and wastewater system connections or police and fire protection services but they have recently been used to fund school systems and pay for the impacts of increased traffic on existing roads. Impact fees place the costs of new development directly on developers and indirectly on those who buy property in the new developments. Impact fees free other taxpayers from the obligation to fund costly new public services that do not directly benefit them. Only a handful of communities in South Carolina have approved the use of impact fees (e.g. Berkeley County).

Recommendations

The scenario planning analysis confirms that reorganization of urban form throughout the study area into a more compact, nodal development pattern significantly improves the efficiency of the transportation system, while preserving unspoiled natural areas immediately surrounding the SUATS study area. Successful implementation of a compact, nodal development pattern will require fundamental changes to certain land use plans, programs, and policies administered by the City and County of Sumter. Purposeful coordination among private landowners, officials for City and County government, and the South Carolina Department of Transportation to combine land use and transportation planning processes traditionally completed in isolation will ensure a more efficient and fiscally responsible regional transportation system.

Building on the Policy and Guidelines Toolbox, the following recommendations are intended to improve the relationship between urban form and travel behavior in the SUATS study area.

Desired Outcome: Improved coordination between land use and transportation

Transportation facilities can impact the density, intensity, and types of land uses. The location and type of land uses, in turn, influence where and how people travel. Promoting development patterns that favor higher densities and intensities, a mix of land uses, and an environment that accommodates pedestrians helps encourage the efficient use of the transportation system. These developments should be supported by a comprehensive transportation system that connects complementary land uses.

Recommended Action: Review/revise requirements for a traffic impact study that accompanies major subdivision or site plans.

A traffic impact study (TIS) varies in detail and complexity depending on the type, size, and location of the development. The City of Sumter currently requires all major subdivision or site plans that exceed certain minimum criteria complete a traffic impact study (see Section 7.d.10.b of the City's Zoning and Development Standards Ordinance). However, the minimum criteria do not address all projects that traditionally could have a significant impact on the regional transportation system (e.g., large scale, single-family subdivisions).



The City and County of Sumter should develop clear traffic impact study (TIS) guidelines, which require a TIS, prepared by a professional engineer specializing in traffic operations, accompany all development applications or any other development deemed necessary by the Planning Director for review, with the magnitude of the study depending on the size and scope of the project.

Recommended Action: Revise rates required for determining trip generation potential for major subdivisions or site plans.

The City of Sumter Zoning and Development Standards Ordinance requires that trip generation for major subdivision or site plans be calculated using rates published in Exhibit 15 – *Trip Generation Rates by Major Land Use Category*. These rates are now outdated, and should be revised to reflect data published in the Institute of Transportation Engineers’ (ITE) *Trip Generation*, Seventh Edition (2003). Further, City staff may want to delete Exhibit 15 in its entirety, and replace it with a statement that any required traffic impact study be performed using the most recent edition of ITE’s *Trip Generation Manual*.

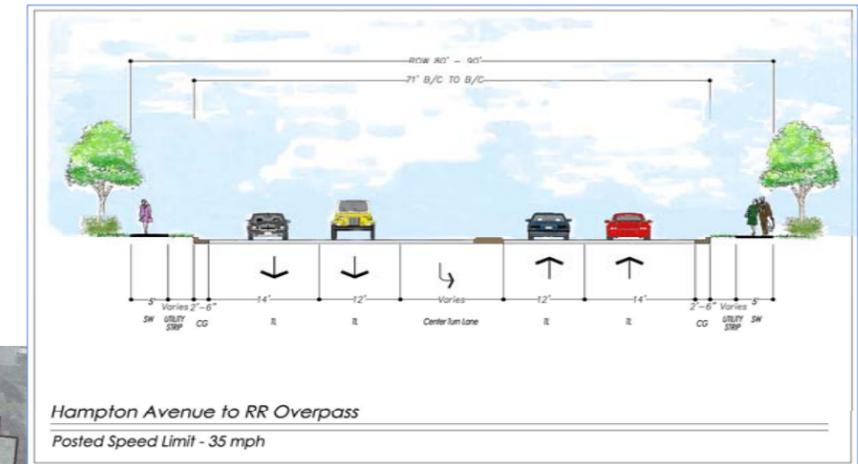
Recommended Action: Define common design elements along the corridor.

The City and County should work together to define common design elements that collectively reinforce a sense of place for high-profile corridors identified within the study area. These design elements then should be used to promote effective decisions regarding appropriate land use and development patterns for the area. In addition, a streetscape plan for specific corridors (e.g., Broad Street, Bultman Drive, Liberty Street, McCrays Mill Road, or Pinewood Road) should be developed as a community initiative for protecting the long-term sustainability of the community. Elements of the streetscape plan may include plantable medians, street trees, highly visible crosswalks, pedestrian countdown signals, pedestrian-level lighting, and utility consolidations. This plan should be coordinated with the access management strategies presented in Chapter 5.

Recommended Action: Increase the minimum sidewalk width for major or minor subdivision and site plans.

The City of Sumter Zoning and Development Standards Ordinance requires that sidewalks measure a minimum 4 ½ feet in width. City officials should consider increasing the minimum width to 5 feet in residential neighborhoods with a 5-foot vegetative buffer from the street, and up to 12 feet in width in retail centers or downtown that may accommodate benches, outdoor seating, etc. See Chapter 6 for more detailed sidewalk recommendations.

Common Design Elements from the Lafayette Drive Corridor Study:



Lafayette Drive near Piggly-Wiggly looking northbound

Addition of median and streetscape elements



***Recommended Action:* Promote compact development design principles.**

The City and County of Sumter should consider including the guiding principles for compact development in their respective Comprehensive Plans for implementing a more efficient transportation system.

Desired Outcome: Efficient use of the transportation system

An efficient transportation system includes an interconnected network of different size streets that offer varying levels of access and mobility depending upon their intended function. Connections to and between these streets should be planned in order to decrease travel distances and increase route choice. This allows the transportation system to be used more efficiently by pedestrians, bicyclists, transit, and automobiles.

***Recommended Action:* Revise street width and right-of-way requirements to implement complete street design principles.**

The City of Sumter Zoning and Development Standards Ordinance requires that all streets be designed to the minimum standards set forth in Exhibits 17 and 18. City and County officials should revise the right-of-way profiles and street width requirements included in existing ordinances to mimic the recommended typical sections included in the Long Range Transportation Plan (see Chapter 5).

***Recommended Action:* Adopt an access management overlay ordinance.**

Access management overlay ordinances have been adopted across the country to complement existing local zoning and subdivision regulations. An overlay ordinance will not change the rules and requirements associated with the underlying zoning district. The ordinance will provide a legal framework for the City and County to administer and enforce consistent access management standards along high-profile corridors.

The ordinance should contain rules and requirements for the “core” components of a comprehensive access management strategy, including minimum spacing standards for traffic signals, median openings, and driveways; provisions for corner clearance, joint access, and connectivity; and design requirements for building access connections. The ordinance also should require cross access between adjacent properties, consolidation/elimination of excessive driveways, and retrofitting site access to the side and rear portions of the site. These

standards would be applicable to all properties directly abutting corridors with an access management overlay designation.

***Recommended Action:* Adopt a formal connectivity ordinance.**

A formal connectivity ordinance will increase the connections between existing and new developments and redevelopments by requiring coordination between the vehicular and non-vehicular circulation systems. Such ordinances have been instituted in cities and counties across the nation, including several localities in the Carolinas.

A standard connectivity ordinance embraces connections as a way to reduce the burden on arterial streets by offering a variety of routes between two destinations. In Cary, NC, connectivity is calculated by dividing the number of street links by the number of street nodes and intersections. A development must have a connectivity index of 1.2 or greater. This requirement can be waived by the Planning Director if it is deemed unreasonable to require such connections. However, when the requirement is waived, a six-foot pedestrian trail must be provided to link cul-de-sacs within a residential development. (See Section 7.10 at <http://vic.townofcary.org/index.htm>)

A connectivity ordinance should be adopted by the City and County, using one of several numerical standards. The ordinance should limit the number of cul-de-sacs to areas where topography, environment, or existing development make other street connections prohibitive.

Street connectivity ordinances have been adopted throughout the United States, including the following localities in the Carolinas:

- Lancaster County, SC
- Rock Hill, SC
- Cary, NC
- Conover, NC
- Cornelius, NC
- Huntersville, NC
- Raleigh, NC