

Access Management Plan for Robert Smalls Parkway (SC 170)

**Prepared for:
Beaufort County**



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December 2003

Robert Smalls Parkway (SC 170) Access Management Standards

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The SC 170 corridor is a key arterial in Beaufort County, linking the Town of Port Royal, City of Beaufort, and areas to the north to Bluffton, Hilton Head Island, and Savannah. Recent roadway widening has increased the capacity along SC 170; however, strong projected growth along the corridor is expected to result in demands that fully utilize this additional capacity. Therefore, it is vital to maximize the available throughput capacity on this existing roadway corridor to maintain the ability to serve long trips along this primary arterial as growth occurs in the future.

Recognizing the need to plan for the future of SC 170 north of the Broad River, in late 2001, the City of Beaufort, Town of Port Royal and Beaufort County adopted by resolution the Robert Smalls Parkway Joint Corridor Plan. This plan called for a uniform set of development standards across the three jurisdictions, the establishment of a non-motorized trail along both sides of the Corridor, and consistent access management standards. This Access Management Study is one of the recommendations of the Joint Corridor Plan, which called for a more in-depth study to bring forth specific access management standards and identify future signalized intersections. This study covers the portion of SC 170 that is between the Broad River and the SC 280 (Parris Island Gateway) intersection.

Need for Access Management Standards

The 2002 review of the Beaufort County Comprehensive Plan Land Use Element indicates southern Beaufort County grew by 73% in the 1990s, and the county as a whole was the fastest growing county in South Carolina. The future land use plan indicates the county has a capacity for 177,000 additional residents. This additional growth will further strain the arterial roadway network in Beaufort County, including the US 278 and SC 170 corridors.

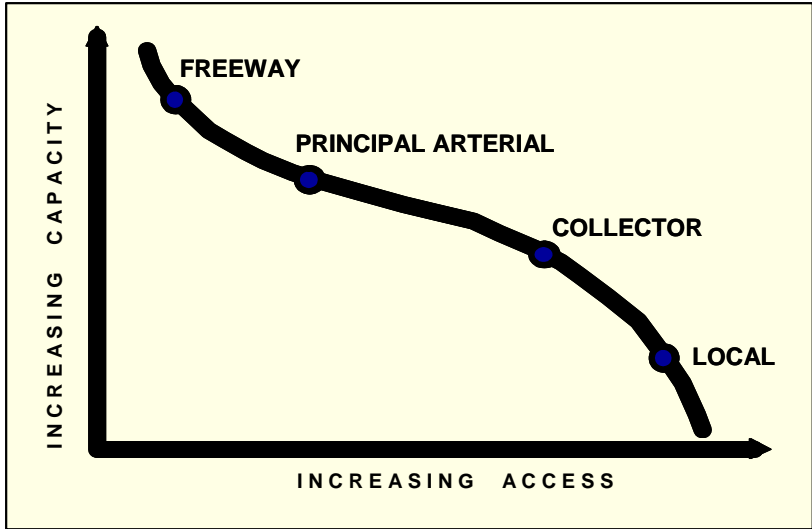
The SC 170 corridor is designated as a principal arterial on the County's Functional Classification Map. SC 170 and US 278 are the only roads in southern Beaufort County providing for long distance through travel. Therefore, the through capacity along these roadways must be preserved, as indicated in the Comprehensive Plan. Preserving the throughput capacity in a manner consistent with serving long trips along the corridor means preserving capacity at a reasonable corridor level of service (LOS) to allow consistent travel times with minimal stopping.

Physical barriers provide constraints on implementation of new parallel principal arterials, including:

- Distances between Beaufort and Bluffton/Hilton Head
- Wetlands and waterways which limit capacity expansion
- Increased development reducing available routes and increasing right-of-way costs

Therefore, preservation of the existing capacity to satisfy long trips is needed to accommodate the planned growth, as indicated in the County's Comprehensive Plan.

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As this graphic shows, as a roadway provides more access, it will experience reduced capacity. A principal arterial such as Robert Smalls Parkway focuses on mobility as a priority over local access.

The County’s Comprehensive Plan along with the Robert Smalls Parkway Joint Corridor Plan have recognized the importance of mobility for the SC 170 corridor. Because of Beaufort County’s natural constraints and the prohibitive cost of constructing a parallel route, the operational strategy for the SC 170 corridor focuses on the following:

- Maximizing the throughput capacity.
- Using existing parallel roadways to satisfy shorter trips, and installing additional parallel roadway connections.
- Using backside connections and interparcel access to minimize the need for travel along SC 170 to access development generated trips from within the local area.

In addition to the operational benefits of less frequent interruptions to mainline traffic flow, the spacing of access points facilitates use of minor arterials and collectors to provide connections to final trip origins/destinations.

Alternative routes, backside access, and interparcel access can reduce the need for local trips to travel along Robert Smalls Parkway. Providing alternative access in conjunction with limiting the number of Robert Smalls Parkway access points can result in alternative routes than are more time effective than the primary arterial for local travel. With alternative travel for local trips, the Robert Smalls Parkway corridor will service a higher proportion of longer trips, which have no other alternative for north/south travel. Limiting access points to Robert Smalls Parkway will result in less friction from signals and turning vehicles and, therefore, a smoother traffic flow with improved travel time reliability.

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Recommended Access Management Standards

The application of access management standards can improve the efficiency of a transportation network. Access management is a tool that can help prevent traffic congestion by limiting and controlling vehicles entering, exiting, and turning along a corridor. Minimizing the potential disruptions to the vehicles in the roadway facilitates traffic movement. Effective access standards benefit a community by reducing accidents, increasing roadway capacity, providing better access to businesses, and improving mobility.

The recommended access management standards for Robert Smalls Parkway include the following elements:

- Signal Spacing
- Signal Operations to Maximize Throughput
- Future Medians
- Number of Driveways
- Driveway Spacing and Corner Clearance
- Driveway Design
- Driveway Linkages
- Backside Access
- Deceleration Lanes
- Driveway Retrofit Techniques

The following sections explain the various access management techniques and establish standards for each technique for application along the Robert Smalls Parkway corridor.

Signal Spacing and Future Signal Locations

The placement of traffic signals significantly impacts the ability to move traffic along a roadway. Signals placed too close together can impede the flow of traffic on the roadway. Traffic signals should only be erected if they are warranted for a particular location and, if warranted, should follow specific placement guidelines. The following signal spacing is recommended for Robert Smalls Parkway:

- Full signalized access – 3200' spacing
- Directional signalized access – 1,900' spacing

A full signalized access location provides signalized access to both sides of the arterial. A directional signalized access provides signalized access to one side of the arterial. By providing access to only one side of highway, signal operations are simplified allowing more time to through movements.

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The signalized access spacing requirements indicated above were used as a starting point and modified to indicate likely signalized access needs as reflected by local development patterns and existing roadway network along Robert Smalls Parkway. The resulting signalized access locations are shown in Figure 1 and are listed below:

- Location 1 – SC 280 (full signal access)
- Location 2 – W. K. Alston Road (full signal access)
- Location 3 – Goethe Hill Road – southwest intersection (full signal access)
- Location 4 – Castle Rock Road (full signal access)
- Location 5 – Approximately 3200' southwest of Castle Rock Road (full signal access)
- Location 6 – Broad River Road at location realigned to the north (directional signal access –northwest side)
- Location 7 – SC 802 (full signalized access)

These signalized access locations result in a minimum spacing between full-signalized intersections of 2,300' with an average spacing of 3,200'.

Coordinating Signal Operations to Maximize Throughput

Maintaining throughput capacity along the Robert Smalls Parkway corridor requires maximizing the available green time along the corridor. Therefore, all signalized intersections shall provide a minimum of 55% of the signal cycle length for through movement green time for Robert Smalls Parkway. Along the corridor as a whole, an average of 65% of the signal cycle shall be allocated for through movement green time for Robert Smalls Parkway.

Future Installation of Medians

The cross-section of Robert Smalls Parkway currently consists of four travel lanes and a center turning lane. The Robert Smalls Parkway Joint Corridor Plan, however, calls for the installation of landscaped medians at a future date. In the event that medians are installed, median breaks will correspond to the signal locations called forth in this study. As development proposals are reviewed along the corridor, applicants are encouraged to consider alternative means of parcel access to connect to proposed signalized intersections.

Driveway Spacing

A minimum of one point of access to a property will be allowed. Additional access points above the one permitted may be granted provided the continuous roadway frontage of the property exceeds 500 feet. Single parcel access is strongly discouraged. Joint access driveways are encouraged for small parcels to adhere to the 500-foot spacing. Driveways should be limited

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to the number needed to provide adequate access to a property. Factors such as alignment with opposing driveways and minimum spacing requirements will have a bearing on the location and number of driveways approved. Refer to Table 1.

Table 1
Maximum Number of Driveways per Frontage

Length of Frontage	Maximum Number of Driveways
500 feet or less	1
500+ to 1,000 feet	2
1,000+ to 1,500 feet	3
1,500+ to 2,000 feet	4
More than 2,000 feet	4 plus 1 per each additional 500 feet of frontage

A minimum spacing of 500’ shall be maintained along Robert Smalls Parkway between a driveway and a signalized intersection. Within 500 feet of signalized intersections, access shall be off the secondary road. Driveway spacing shall be measured from the closest edge of pavement to the next closest edge of pavement.

Driveway Design

Traffic entering and exiting developments creates potential conflict with vehicles traveling on the roadway. Appropriate driveway design can improve safety and reduce congestion. Driveways should be designed to allow vehicles to enter and exit the roadway quickly and safely with minimum impact to the traffic on the roadway. Driveways should have appropriate turn radii and driveway width. The throat of a driveway must be adequate in depth in order to allow a vehicle to queue as it enters or exits the highway. An access point must also be designed to accommodate appropriate vehicle types. Driveway width and turning radii shall conform to SCDOT’s Access and Roadside Management Standards.

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Driveway Linkages

There are several techniques for linking driveways to improve access from the roadway and between parcels. Shared driveways serve two or more adjacent properties that may or may not be comprised of land from each property. Shared driveways allow for larger driveway spacing and improved management of traffic entering and exiting a development.

Cross access driveways interconnect the parking facilities of two or more abutting properties. They are always comprised of land from both properties. Cross access driveways provide an opportunity for vehicles to move between developments without using the roadway. Cross access driveways reduce traffic on the roadway and reduce the potential for conflict between entering, exiting, and through traffic.

The land comprising the shared or cross access driveways should be recorded as an easement and serve as a covenant attached to the property. Joint maintenance agreements should also be incorporated into the property deed. Linkages requiring mutually executed easements should be required between adjoining properties to provide movement without requiring a return to the public roadway.

A circulation road may be used as the linkage when a uniform setback line is established on a number of properties so that drives at the front of the building can be interconnected. A common road should be provided if possible to avoid the stripping of lots.

A system of joint-use driveways and cross access easements should be established wherever feasible. Vehicle and pedestrian links to adjacent properties with provisions for stubbed out connections should be required when adjacent land is not developed.

Backside Access

The development of backside access roads provides an opportunity to remove turning traffic from the roadway and serve businesses with alternate access. Backside access to businesses provides exposure to a greater number of businesses, thus increasing commercial value, and improving intersection spacing on cross roads. Traffic that would otherwise enter and exit from the main roadway has access to a large number of businesses from a safer, less conflicting location.

Where feasible, a backside access road should be provided. Developments should be designed to connect to existing backside access, where provided. Where feasible, a continuous backside access road shall be provided either immediately behind the buffer yard or, if outlots are provided, along the rear property line of the outlots.

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Where backside access does not exist, developments should be designed to allow for future backside access through construction of circulation roads to the rear and parking on the side and in the rear of properties. Figure 1 provides recommended locations for backside access and alternative roadway connections.

Deceleration Lanes

Deceleration lanes on corridors providing access into developments that produce a substantial number of trips can reduce the slowing and stopping of traffic caused by turning vehicles. The purpose of a deceleration lane is to enhance motorist safety and the through movement of vehicles on the corridor. These lanes are desirable features on any road, but offer the most benefit on principal arterials such as Robert Smalls Parkway. These lanes are needed when the volume of traffic turning at a site is high enough in relation to the through traffic to constitute the potential for disruption.

Retrofitting Existing Driveways

Opportunities to bring existing driveways to the current standards appear when a business changes ownership or when any improvements to the existing driveways or parking lots occur. As changes are made to previously developed property or to the roadway, driveways will be evaluated for the need to be relocated, consolidated, or eliminated if they do not meet the access management standards.

Traffic Impact Analysis

A traffic impact analysis study should be provided for proposed developments along the Robert Smalls Parkway corridor anticipated to generate at least 50 peak-hour trips. The study should measure development against the traffic service level goals in order to correctly ascertain needed roadway facilities stimulated by new development. A traffic impact study will also enable review and evaluation of the anticipated traffic impact of proposed development along with recommended roadway mitigation measures as appropriate.

A detailed traffic impact study should evaluate the need for deceleration lanes, turn lanes and access control. Where signalized access is recommended at locations other than those indicated in the plan, an arterial analysis should be provided to ensure arterial capacity and traffic progression bandwidth along Robert Smalls Parkway are not adversely affected.

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Additional Guidelines

In addition to the aforementioned guidelines, it is recommended that multimodal access be considered, planned and incorporated. Signalized intersections should have marked crosswalks and appropriate crosswalk signalization. The Beaufort County Trails and Blueway Master Plan should be incorporated.

Unless specifically stated otherwise, *SCDOT Roadside Management Standards* should be followed. The recommended guidelines in this document should be utilized in addition to the SCDOT strategies. When they are in conflict, the stricter requirement shall govern.