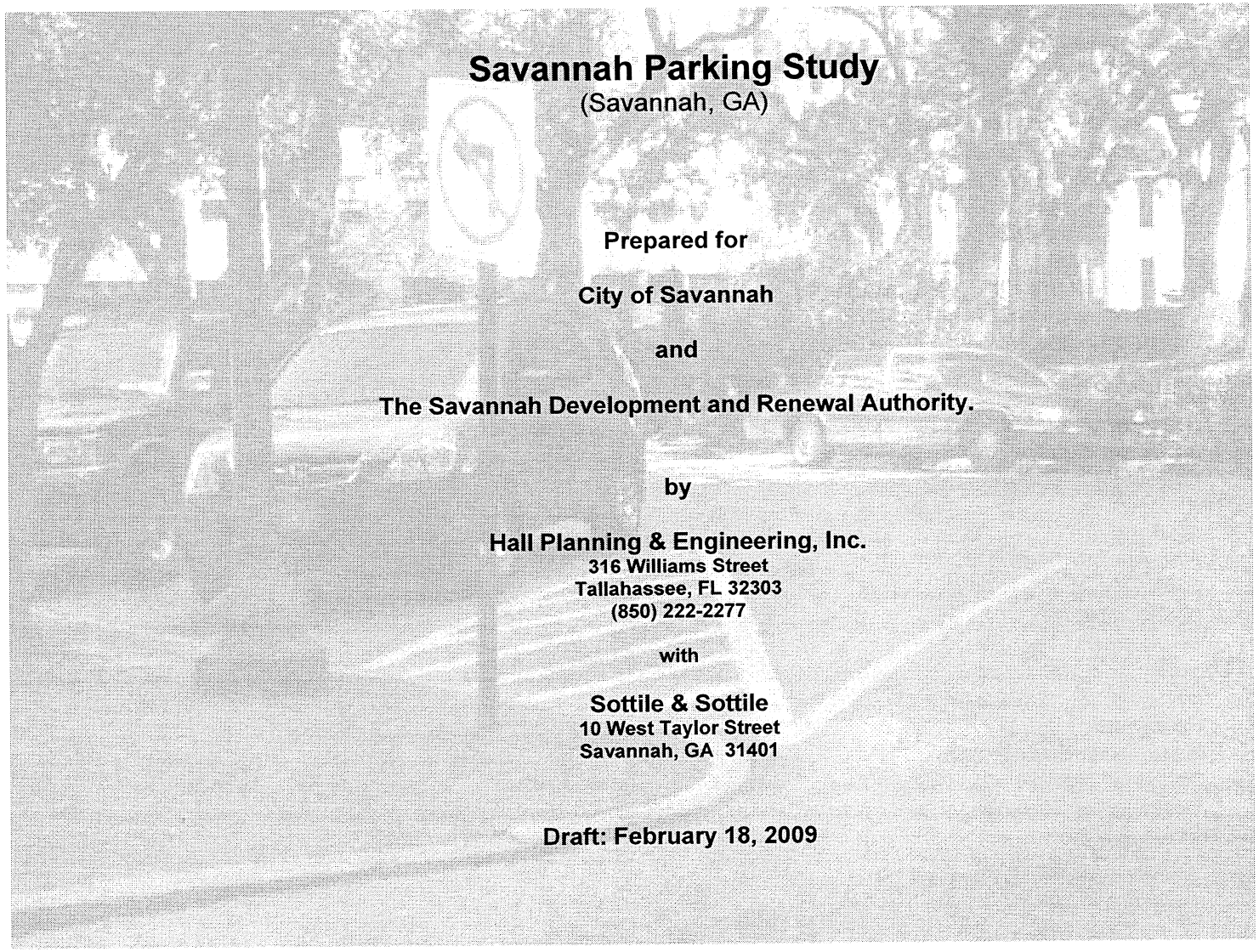
HPE
Hall Planning & Engineering, Inc.



Savannah Parking Study

(Savannah, GA)

Prepared for

City of Savannah

and

The Savannah Development and Renewal Authority.

by

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BACKGROUND

The purpose of this transportation study is to identify conceptual parking plans to establish the functional, physical and operational character of Savannah's parking system. The study is applied to three pilot areas: Broughton Street, Johnson Square and Oglethorpe Square. The strategies proposed for the pilot areas are developed with the understanding that they can also be applied in surrounding wards to increase the inventory of parking throughout the city center.

An important study goal is to build on previous initiatives and balance effective mobility and parking, while preserving the highly walkable character for which Savannah is famous.

Previous Work

This study builds upon and complements previous work related to parking and mobility conducted for the City of Savannah. Most notably are the following relevant initiatives:

- The Downtown Savannah Master Plan
- The Visitor Mobility Plan
- The Broughton Street Streetscape Study
- The Historic Savannah Wayfinding Program

Downtown Master Plan

The Savannah Development and Renewal Authority (SDRA) in partnership with the City of Savannah and Metropolitan Planning Commission (MPC) is developing the Downtown Master Plan to serve as a fundamental tool to promote quality of life issues, ensure a balance between preservation and development initiatives, foster diversity and connectivity downtown, and coordinate existing and future planning efforts and planned development projects.

The Downtown Master Plan is currently in its third phase of development, and is undergoing final edits. The Plan will be reviewed by the Mayor and City Council and the Metropolitan Planning Commission for approval and inclusion as an addendum to the Tricentennial Plan. Phase I concluded in March 2006 and included a series of public work sessions to formalize the vision and guiding principles for the plan. A market analysis and a transportation and mobility study were also conducted as part of this process.

Phase II included a comprehensive planning session with the Master Plan Steering Committee to review and comment on eight specific focus areas within the master plan boundaries based on the vision and guiding principles.

The Mobility chapter of the Master Plan addresses transportation as a complete system that respects the highly walkable nature of Savannah, while providing mobility for its residents, students and large number of visitors. This chapter identified a list of issues and recommendations related to mobility in Downtown Savannah ranging from street design improvements along Bay Street to parking and transit. Parking recommendations are made to increase parking supply, while better managing existing supply.

Visitor Mobility Plan

An outgrowth of the Master Plan process was the development of the Visitor Mobility Plan. This plan was charged with providing a comprehensive, integrated mobility solution for residents and visitors in the Savannah Historic/ Convention District as a means of continuing the economic

health of downtown and growing tourism. The Visitor Mobility Plan identified the following eight key investments that would help to achieve the initiative's goals:

- Expand existing water ferry service
- Begin expanded *CAT Shuttle* circulator service
- Initiate streetcar service on River Street
- Branding
- Continue underwriting transportation costs for selected groups
- Develop *Walk Savannah*
- Establish a mobility management function
- Front line staff development program.

Broughton Street Streetscape Plan

SDRA guided a comprehensive 16-month community and committee based planning process to update the 1986 Broughton Street Urban Redevelopment Plan. This process aimed to develop a renewed vision for Broughton Street and to offer strategies and solutions to enhance business and property development and to balance the needs of the commercial, entertainment and residential uses now predominant in the area.

Upgrading declining infrastructure was identified as a critical component of this revitalization. Through the Broughton Street Streetscape Plan and its recommendations, SDRA and the City of Savannah are making short and long term improvements along Broughton Street. The plan identifies specific design elements, such as trees, paver types, benches, bike racks, lighting and transit shelters that will improve the quality of the streetscape along Broughton Street.

Historic Savannah Wayfinding Program

The Historic Savannah Wayfinding Program was initiated by Savannah's Mobility Management Board to develop a wayfinding and signage program that reduces vehicular traffic in the Historic District and promotes the walkability of the city. The program was specifically developed with minimum vehicular signage to clearly mark routes to the historic district and public parking facilities. The primary signage system for the program includes directional signs, orientation maps and information kiosks at pedestrian level.

The design of the signs is inspired by the gardens and ornamental ironwork of Savannah, utilizing subtle details meant to be seen up close. The overall effect of the signs is one that creates a unique identity that reflects the character of Historic Savannah.

Summary of Recommendations

We recommend that Savannah advance to a new level of parking operation to more efficiently manage the town's parking supply. To maintain a proper balance between vehicular traffic mobility and excellent pedestrian mobility, for which Savannah is internationally known, the compact urban form must be maintained. This compact urban form is a vital component of Savannah's success and will continue to make it a place people want to visit. It will also elevate Savannah's place in the future as a sustainable city, in sharp contrast to the many sprawling, suburban locations dotting the nation's landscape. While sufficient space must be allocated to the parking function, any over supply of parking spaces could harm the compact, walkable scale. Standard suburban parking practice has proven this with large, often mostly

vacant parking lots and should be avoided in Savannah where possible.

Therefore, we recommend continuing a system of paid parking in the most active areas, plus enhanced management of strategically placed public and reserved parking within the town. These actions will increase availability of parking in the most active areas for business and other shorter term visits while ensuring an adequate supply of parking for residents and visitors. The goal is increased turnover where needed and reasonably convenient longer term parking elsewhere, all within Savannah's compact, walkable urban form.

Parking system operation, including signage, pricing and enforcement, is key to adequate parking supply and availability via turnover. Parking and loading operations also improve economic opportunities for businesses in the downtown. Loading/unloading for commercial vehicles, is also vital to businesses, residents and visitors.

HPE's findings and recommendations are listed here and described in further detail below:

1. Provide more bicycle racks.
2. Implement new technology to monitor on-street parking occupancy.
3. Create a seasonal pricing scheme.
4. Post any new parking regulations on the City website.
5. Prohibit parking on Broughton Street more than once daily.
6. Shorten bus stop bays on Broughton Street, Barnard Street and Bull Street.
7. Establish legal language justifying deviation from State Codes in urban, walkable settings.
8. Replace head-in angle parking with reverse (back-in) angle parking to increase safety and parking inventory.

METHODOLOGY

Rick Hall and Tracy Hegler from HPE conducted two separate field visits and participated in various meetings on July 15-16, 2008 and October 27-28, 2008. Also participating, were Christian Sottile and Kirsten Sparenborg from Sottile & Sottile and representatives from the City of Savannah and Savannah Development & Renewal Authority (Sean Brandon, Bridget Lidy, Lise Sundrla and Randall Toussaint). During these two visits, HPE collected data pertaining to the amount and location of available on-street parking in the three pilot locations, while assessing the area's traffic flow characteristics and walkability.

During these two visits to Savannah, HPE also met with the following constituents to gain further insight into parking issues:

- City of Savannah
- Savannah Development and Renewal Authority
- Members of the Downtown Business Association Board
- Members of the Downtown Constituents Group
- Convention and Visitors Bureau

HPE has reviewed three pilot locations in downtown Savannah to potentially increase available on street parking and improve comfort level for pedestrians and bicyclists. Pilot locations are Broughton Street, Johnson Square and Oglethorpe Square. These recommendations per location

are intended to be used as a guide for parking policies throughout Savannah in areas of similar context and character. Thus, this report spends a great deal of time identifying and describing the character of each pilot location

The three pilot locations are located in the historic and highly walkable downtown of Savannah Georgia (see **Figure 1**).

Figure 1: Approximate Overall Study Area

The field analysis for the Broughton Street pilot location focused on eight blocks between Lincoln Street and MLK Jr. Boulevard (see **Figure 2**).

Figure 2: Broughton Street Study Area

The field analysis for the Johnson Square pilot location is bounded by Bryan Street, Congress, Whitaker, and Drayton Street (see **Figure 3**).

Figure 3: Johnson Square Study Area

The field analysis for the Oglethorpe Square pilot location is bounded by State Street, York, Drayton, and Lincoln Street (see **Figure 4**).

Figure 4: Oglethorpe Square Study Area

Walkability

An important assumption of this analysis is the desire to maintain the highly walkable character of Savannah. A walkable community is one that encourages the use of a mix of modes (pedestrian, bicycle, transit and motor vehicle). Walkable communities are created by a number of factors; a few are listed below:

- On-street parking
- Mixture of uses and densities
- Streets with managed speeds
- Connected network of streets
- Buildings fronting streets
- Sidewalks
- Narrow streets

All of these factors exist in Savannah's downtown, leading to its highly walkable nature. This report places a lot of importance on the need to maintain this great attribute of Savannah, and even to suggest the spreading of walkable transportation and parking policies outside of the downtown. Walkable policies often stand in sharp contrast to suburban or conventional policies that were created to serve the single use function of the automobile. The places that were created by conventional transportation and parking policies promote higher speeds (to serve the greatest need of the automobile) and are not walkable or human scale.

Speed is a major component of walkable communities. Pedestrians have a 45% chance of being killed in any collision with a vehicle traveling 30 mph, increasing to 85% for a vehicle traveling 40 mph.

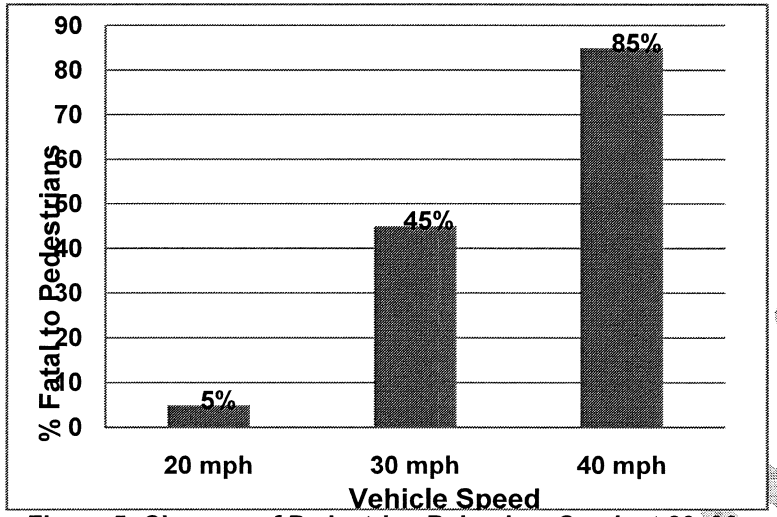


Figure 5: Chances of Pedestrian Dying in a Crash at 20, 30, and 40 mph

In walkable communities, therefore, a major traffic engineering and planning goal is to manage vehicle speeds to 25, 20, or 15 mph, based on location and context. This is true for Savannah.

This report will identify policies that will maintain pedestrian-friendly speeds, while still serving the mobility needs of all users.

Walkability Index

HPE measured the "walkability" of the three pilot areas in order to assess total mobility. Important to this effort is utilizing walkability index data for both existing and proposed conditions.

For HPE's Walkability Index, the following eleven criteria indicate the quality of the walking experience as applied to existing conditions of the three pilot areas:

1. Speed
2. Pavement Width
3. On-street Parking
4. Sidewalk Width
5. Connectivity
6. Pedestrian Features
7. Street Enclosure
8. Land Use Mix
9. Façade Design
10. Transit/Bicycle

A complete technical memo including the results of the three pilot areas can be found in **Appendix A**.

The results of applying the HPE Walkability Index to Broughton Street are an average of 88.6 points out of 100 (See **Appendix B** for full assessment). This indicates that Broughton Street is "very walkable."

The results of applying the HPE Walkability Index to Johnson Square are an average of 67.75 points out of 100 (See **Appendix C** for full assessment). This indicates that Johnson Square is "moderately walkable." The score is

somewhat lower than that obtained for Broughton Street. The main difference is land use and enclosure – land uses around the square were much less diversified and the buildings around the square are far larger and taller than those along Broughton Street, with much fewer entrances.

The results of applying the HPE Walkability Index to Oglethorpe Square are an average of 67 points out of 100 (See **Appendix D** for full assessment). This indicates that Oglethorpe Square is "moderately walkable." The score is somewhat lower than that obtained for Broughton Street. Though the street enclosure is more intimate than that of Johnson Square, there are still a lower number of land uses and building entrances, generating the lower figure.

FINDINGS AND RECOMMENDATIONS

Context

HPE's work included an understanding of the context and function of each study area. Certain parking elements and policies are only appropriate in certain contexts. The contextual traits of each area can be linked to a specific Transect zone.

Transect Zones

The Transect organizes the natural, rural, suburban, and urban landscape into categories of density, complexity, and intensity. One operating principle of the Transect is that certain forms belong in certain environments; for example, an apartment building belongs in a more urban setting, and a house on a large lot belongs in a more rural setting. Some kinds of thoroughfares are urban (streets), and some are rural (roads). The same is true for parking elements.

A transect is a cut or path through part of the environment showing a range of different habitats. Biologists and ecologists use transects to study the many symbiotic elements that contribute to habitats where certain plants and animals thrive.

Human beings also thrive in different habitats. Some people prefer urban centers over rural places, while others thrive in the rural or sub-urban zones. Before the automobile, American development patterns were significantly more walkable, and transects within towns and city neighborhoods revealed areas that were less urban and more urban in character. These varying levels of urbanism can be analyzed as natural transects are analyzed.

To systemize the analysis and coding of traditional patterns, a prototypical American rural-to-urban transect has been divided into six Transect Zones, or T-zones, for application on zoning maps. Standards were written for the first transect-based codes, eventually to become the SmartCode, which was released in 2003 by Duany Plater-Zyberk & Company.[1]

The following are the six transect zones:

- T-1 Natural Zone consists of lands approximating or reverting to a wilderness conditions, including lands

[1]Indented information and image taken from the Center for Applies Transect Studies (CATS) website: www.transect.org.

unsuitable for settlement due to topography, hydrology or vegetation.

- T-2 Rural Zone consists of sparsely settled lands in open or cultivated state. These include woodland, agricultural land, grassland and irrigable desert. Typical buildings are farmhouses, agricultural buildings, cabins and villas.
- T-3 Sub Urban Zone consists of low density residential areas, adjacent to higher zones with some mixed use. Home occupations and outbuildings are allowed. Planting is naturalistic and setbacks are relatively deep. Blocks may be large and the roads irregular to accommodate natural conditions.
- T-4 General-Urban Zone consists of mixed use but primarily residential urban fabric. It may have a wide range of building types: single, sideyard and rowhouses. Setbacks and landscaping are variable. Streets with curbs and sidewalks define medium-sized blocks.
- T-5 Urban Center Zone consists of higher density mixed used buildings that accommodate retail, offices, rowhouses and apartments. It has a tight network of streets, with wide sidewalks, steady street tree planting and buildings set close to the sidewalks.
- T-6 Urban Core Zone consists of highest density and height, with the greatest variety of uses, and civic buildings of regional important. It may have larger blocks, streets have steady street tree planting and buildings set close to the wide sidewalks. Typically only large towns and cities have an urban Core Zone.
- Special Districts consists of areas with buildings that by their Function, Disposition or Configuration cannot, or should not, conform to one or more of the six normative Transect Zones.[2]

[2] Transect Zone Description from SmartCode Version 9.0; page ix; www.smartcodecentral.com.

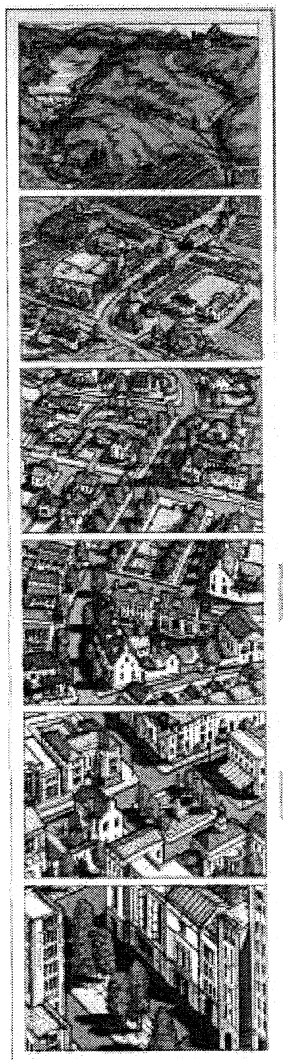


Figure 6: Transect Zone Illustration
(Credit: Duany Plater-Zyberk & Co.)

Broughton Street

The context along Broughton Street varies only slightly throughout the eight block study area.

The west end (between Martin Luther King Jr. Blvd and Montgomery Street) is dominated by County Offices and a small number of land uses. This first block does not have any on-street parking on the south side and limited spaces on the north side of the Street. The parking structure on the south side is unadorned, not human-scaled and lacks the multiple entrances needed to invite pedestrian activity along the street. These elements are harmful to the walkability and urban character of the block. In this block, Broughton Street is slightly wider, and faster vehicle travel speeds were observed.

Fortunately, there are plans to renovate the County Office building within the next several years. This renovation will locate the bus stop inside the building, potentially freeing space along Broughton Street for additional parallel parking spaces. Those potential spaces are not considered in this study because a final plan has not been determined for the renovation. The City should continue to monitor the renovation process, however, and capture the space for parking as it becomes available.

The next six blocks eastward are very urban in nature, with a large number of land uses, articulated building style, wide sidewalks, multiple business entrances, on-street parking and street trees. The presence of these characteristics leads to slower speeds and exhibit great walkability. Parking turnover is high based on observation and due to the large number of land uses.

The easternmost block in the study area, between Abercorn and Lincoln Streets, is slightly less walkable, due primarily to the decrease in land uses and front doors, as well as the presence of plain and uninviting architecture. The southside is dominated by the Savannah College of Art and Design (SCAD) Library with an entrance only on the street corner and a limited use entrance for an art gallery on Lincoln Street.

Broughton Street is demonstrative of an urban center or T-5 zone.

Johnson Square

Johnson Square is one of the densest and most urban areas in downtown Savannah. It is dominated by large corporations and banking offices. As such, it resembles the most urban transect zone, T-6.

Oglethorpe Square

Oglethorpe Square is the least urban pilot area analyzed. This square though mostly T-5, borders closely with a T-4, general urban, zone, whereby the uses are less diversified, the intensity of development is lower and the character is more residential than that of Johnson Square.

Function

In this section, HPE classifies the function of parking for each pilot area. Standard parking, loading zones, transit loading and other key functions are identified.

Parking in the City of Savannah is managed through the use of various control devices including parking meters, signs, off-street surface parking lots and, where appropriate, no controls at all. Parking controls are necessary to assure that the on-street parking supply is used in a manner consistent with the adjacent land use and the demand for parking which accompanies that land use. For example, retail and commercial areas typically have many customers visiting for short periods of time. This means that the curbside parking near retail businesses should not be occupied by all day parkers and turnover of these parking spaces is needed to provide parking for numerous users throughout the day.

It is essential for Savannah to regulate parking use, to encourage more efficient use of parking resources and more efficient travel. The City of Savannah should make the most convenient parking spaces available to certain higher-value uses. The Victoria Transport Policy Institute (VTPI) identifies the following as typical strategies, in its On-line TDM Encyclopedia:

- Regulate based on the type of vehicles or users. For example, during peak periods dedicate the most convenient spaces for service vehicles, customers, rideshare vehicles, and vehicles used by disabled people.
- Limit parking duration (5-minute loading zones, 30-minutes adjacent to shop entrances, 1- or 2-hour limits for on-street parking in commercial areas), to

encourage turnover and favor shorter-term users (since higher priority trips, such as deliveries and shopping, tend to park for shorter duration than lower priority trips).

- Encourage employees to use less convenient parking spaces (such as parking lots at the urban fringe) during peak periods, in order to leave the most convenient spaces for customers. Develop a system to monitor use of parking facilities and send reminders to employees who violate these guidelines.
- Charge higher parking prices and shorter payment periods for more convenient spaces. For example, in prime central locations charge $0.25 for each 15-minute period with a two-hour maximum, while at the fringe charge $2.00 for 4-hours, with no smaller time periods available.
- Implement more flexible pricing methods which allow motorists to pay for only the amount of time they park, which makes shorter parking periods relatively attractive.
- Limit use of on-street parking to area residents, or provide discounts to residents for priced parking.
- Limit on-street parking of large vehicles (e.g., vehicles over 22 feet long or trailers) to ease traffic flow and discourage use of public parking for storage of commercial vehicles.
- Prohibit on-street parking on certain routes at certain times (such as on arterials during rush hour), to increase traffic lanes.[3]

[3] Victoria Transport Policy Institute "On-line TDM Encyclopedia"; http://www.vtpi.org/tdm/.

Broughton Street

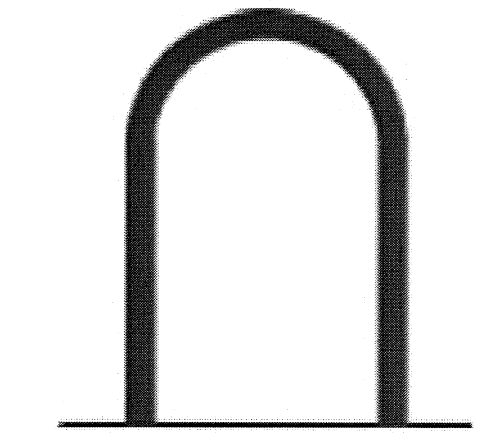
Parking along Broughton Street primarily serves business customers. Shoppers and diners patronizing Broughton Street establishments see the on-street parking as premium. This parking function is appropriate with the context of Broughton Street.

Bicycle parking, storage and changing facilities are important ways to provide convenience and security for cyclists at destinations. If bicycle parking and storage are inadequate, improvements can reduce automobile parking and travel demand. Effective bicycle parking requires a properly designed rack in an appropriate location for the type of use.

Appropriate to the context and character of Broughton Street, a minimum of one bicycle rack, capable of supporting two bikes should be provided within the public frontage for every five vehicular parking spaces. The design of the bicycle rack should be consistent with the City of Savannah's "Bike Rack Program". The program suggests use of the Inverted "U" rack, shown below, which supports two bikes. However, the program notes that a different rack will be utilized along Broughton Street based on the recommendation of the Broughton Street Streetscape Plan. HPE recommends the Inverted "U" design.

Recommendation: Provide more bicycle racks.

This focus on alternative modes of mobility is something Savannah should continue to encourage, as it strives to increase its sustainability.



Freight and loading functions are appropriately allocated to the rear lanes of Broughton Street, freeing as much room as possible for customer parking along the main street. This policy should continue to be enforced.

There are four bus stops along Broughton Street within the pilot study area, or one stop every two blocks. This transit coverage is reflective of the urban nature of Broughton Street and should be maintained.

Johnson Square

Parking in Johnson Square is in very high demand and is controlled by parking meters of various time restrictions; including several 30 minute meters. Spillover parking utilizes the Bryan Street Garage, and soon, the newly constructed Ellis Square Garage.

There are six freight/loading zones in Johnson Square, one tour bus stop and one valet zone. The number of loading zones for the context and character of land uses around Johnson Square is appropriate. Their size and location (shown in a later section) are also appropriate to the needs of an urban, T-6 environment.

Appropriate to the context and character of Johnson Square, a minimum of one bicycle rack, capable of supporting two bikes should be provided within the public frontage for every five vehicular parking spaces. The design of the bicycle rack should be consistent with the City of Savannah's "Bike Rack Program". The program suggests use of the Inverted "U" rack, shown above, which supports two bikes.

Oglethorpe Square

Parking in Oglethorpe Square is located on the outside lane (non-square side) only. Spillover parking utilizes the State Street Garage. Most spaces serve the Square's customers, visitors and residents, consistent with its context and adjacent land uses.

There are four freight/loading zones in Oglethorpe Square, one tour bus stop and one valet zone. The number of loading zones for the context and character of land uses around the Square is appropriate. Their size and location (shown in a later section) are also appropriate to the needs of an urban, T-5 environment.

Also appropriate to the context and character of Oglethorpe Square, a minimum of one bicycle rack, capable of

supporting two bikes should be provided within the public frontage for every five vehicular parking spaces. The design of the bicycle rack should be consistent with the City of Savannah's "Bike Rack Program". The program suggests use of the Inverted "U" rack, shown above, which supports two bikes.

Timing

The duration of regulated parking spaces is established by functional group and context zone and adjacent use. Specific duration, time of day and day of week regulations are reviewed for application by context zone and pilot area plan.

Efficient parking is achieved through proper placement, pricing, monitoring and enforcement. Savannah's compact, highly walkable urban structure requires even greater focus on these strategies than standard suburban patterns where walking is not a significant factor. We propose the following strategies for planning and operations that will optimize parking, offering financial benefits to local businesses, while adequately accommodating residents and visitors.

1. Monitoring
2. Pricing and Payment
3. Duration
4. Enforcement
5. Education

These strategies should be applied to each pilot area and could be considered for use in any context throughout the City.

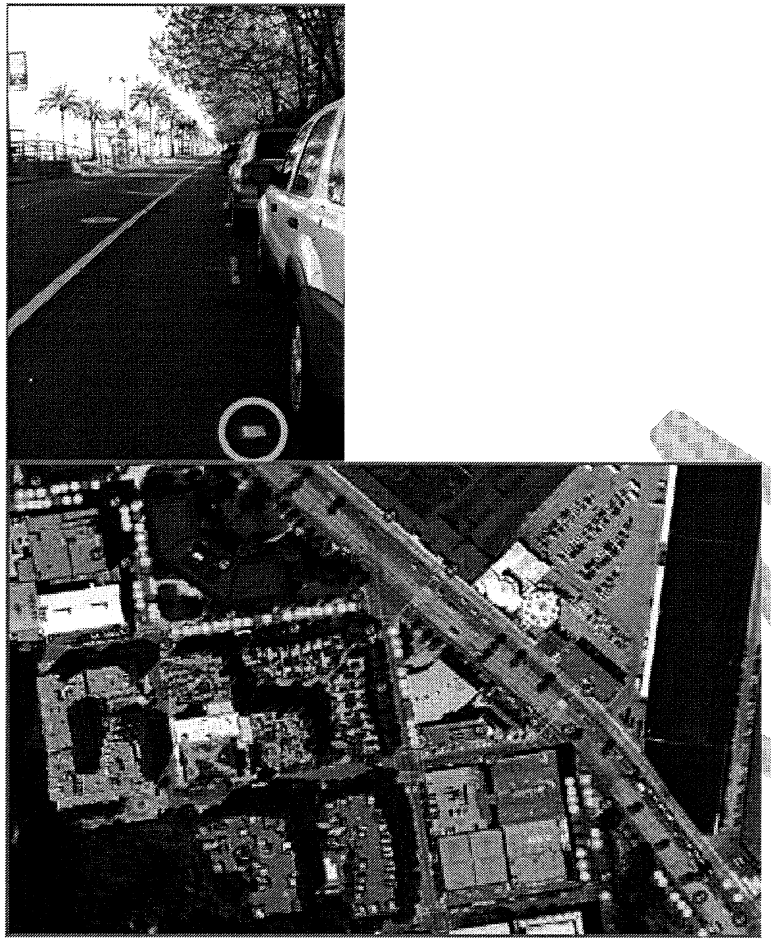
Monitoring

Very little statistical data exists for Savannah's on-street parking in terms of occupancy and turnover rates. HPE suggests Savannah implement a program of parking monitoring that will provide the background information to make flexible parking policies that will optimize seasonal use and provide local businesses with increased exposure and turnover.

Recommendation: Implement new technology to monitor on-street parking occupancy.

HPE research identified a unique monitoring program that uses sensors to collect parking data. These sensors are a budding technology provided by the company Streetline Networks. Streetline is located in San Francisco, California. Their sensors are combined with web-based applications to provide useful reports and real time data to make the best parking management decisions, such as time limits and pricing.

The sensors appear to the driver as 4 inch by 4 inch raised pavement markers and are placed on the surface of each parking stall in the desired area to be monitored. Installation is completed in a matter of minutes and requires no trenching, coring, or wiring of any kind.



All Streetline parking data is geo-coded and can be linked with any GIS system. This screenshot shows real-time parking data in San Francisco displayed in Google Earth.

Figure 7: Streetline Sensors

Streetline sensors provide a variety of useful data. They record the exact start and end time of a parking session. Reports can be generated that detail space turnover, occupancy rates, and space availability. The sensors also can be linked to hand-held parking citation devices to alert parking officers of violations, thus increasing efficiency and revenue potential. In addition, every space and transaction is geocoded for GIS map presentation making it easy to identify parking trends.

The sensors themselves are self powered with a battery life of 5-10 years, are completely wireless and are very durable.

The minimum number of installed spaces for cost effectiveness is 25. The three pilot areas utilized in this study with approximately 335 spaces would be a cost-effective site application. HPE recommends that every space be monitored. This provides a complete sample of the parking demand for all seasons and weekends. The fees paid to initiate the program include Streetline's installation and management of the system, training, and a web interface to view the information. Parking revenues could be used to operate the system after initial capital costs for installation.

Cost for system with vehicle sensors:

$300 one time installation per space x 335 recommended spaces = $100,500 one time fee

$10 per space per month for Streetline to monitor spaces and supply client with a web interface for the information x 335 spaces = $3,350 per month

User training is free. More information can be found at: http://www.streetlinenetworks.com/.

The sensors are currently being tested in San Francisco in 6,000 of its 24,000 metered parking spaces in a trial of a wireless sensor network that will announce which of the spaces are free at any moment. Drivers will be alerted to empty parking places either by displays on street signs, or by looking at maps on screens of their smartphones. They may even be able to pay for parking by cell phone, and add to the parking meter from their phones without returning to the car.

The benefits of this system are numerous. Particularly, the ability to collect data on space turnover and occupancy rates enables the City to establish an efficient pricing system, which can vary by time of day and seasonally (more detail to follow in "Pricing" section), maximizing profits. This information can also be utilized as real-time data that can enable drivers to find a spot more quickly and efficiently.

The system is also considered a sustainable solution to congestion and carbon dioxide emissions, which are significantly increased by drivers searching for a space. A study by Donald Shoup found that over a year, driving in circles amounts to 1,825 vehicle miles traveled (VMT) for each curb space, which is greater than half the distance across the country.[4]

This system cost must be compared to the labor cost of collecting even a portion of the necessary parking management data. Equating manual labor to match the sensor system level of detail, with occupancy and duration by time of day for individual spaces, for every hour of the year would prove cost-prohibitive. The sensor system, instead, is very cost-effective when a decision is made to manage parking supply on a fee per space basis.

Pricing and Payment

According to Todd Litman, most parking is inefficiently priced; it is provided free, significantly subsidized or automatically included with building purchases and rents, forcing consumers to pay for parking facilities regardless of whether or not they want it.[5]

On-street pricing should be carefully crafted to optimize availability via adequate turnover, especially in peak seasons. One common strategy is to set hourly rates based on monitored occupancy rate of Savannah's spaces. Donald Shoup recommends the optimum occupancy rate at 85 percent (15 percent vacancy rate). The parking rate is too low if the occupancy rate is greater than 85 percent and too high if below.

For Johnson Square and Oglethorpe Square, 15 of its 103 spaces and 13 of its 88 spaces, respectively, would be available. Shoup suggests the right price will emerge when the desired occupancy rate is achieved. In other words, the City of Savannah should monitor, through the system described above, a selection of pricing to determine what will yield its desired occupancy/vacancy rate.

HPE suggests utilizing the industry standard of 85 percent occupied and 15 percent vacant. Once that rate has been achieved, the pricing is correct. Meters can be dynamic,

[4] Donald Shoup. "Cruising for Parking," *Transport Policy.* Vol. 13, No. 6, November 2006, pp. 479-486. http://shoup.bol.ucla.edu/Cruising.pdf

[5] Litman,Todd; *Parking Management: Strategies, Evaluation and Planning;* Victoria Transport Policy Institute (VTPI); http://www.vtpi.org/park_man.pdf.

offering a variety of prices for peak and off-peak hours, or even seasonally.[6]

A hypothetical daily pricing scheme for meters follows:

Time of Day	Price Per Hour	Minutes per $0.25
Midnight – 6 a.m.	Free	
6 a.m. – 8 a.m.	$0.50	30
8 a.m. – 6 p.m.	$1.00	15
6 p.m. – midnight	$0.50	30

Recommendation: Create a seasonal pricing scheme.

HPE recommends that Savannah create a seasonal pricing scheme to optimize parking space availability and profit. This is a dynamic process requiring monitoring and adjustment. HPE recommends the following typical practice of establishing the pricing:

- Start with a range that is expected to yield an 85% occupancy rate (may look to other local markets such as Charleston, SC for initial guidance)
- Monitor occupancy over short and long term
- Adjust rates accordingly to develop seasonal variation.

This strategy provides opportunities to utilize high season profits to recoup costs from lower season revenues and/or to provide a marketing budget for the Mobility and Parking Services Department. A seasonal scheme can also build-in parking holidays and be used during low season to attract more shoppers to the area

Savannah could consider the following pricing categories to start, based in part on comparable rates in Charleston, SC:

Off-peak season (define dates) - $0.75 per hour
Mid-peak season (define dates) - $1.00-1.50 per hour
Peak season (define dates) - $2.00 per hour

The City of Savannah utilizes pay and display meters for fee collections. These meters differ from traditional single space parking meters in that one machine can service a much higher number of vehicles. The meters reduce sidewalk clutter and personnel costs of maintaining the meters.
HPE's observation is that the pay and display meters are technologically appropriate for the City of Savannah, as long as the meters are capable of altering the fee based on recommendations above.

Duration

Litman provides the following general guidelines for limiting parking duration:

1. Very short time periods (3-10 minutes) accommodate passenger drop-offs and deliveries – use in front of schools, theaters, hotels and transportation terminals
2. Short time periods (15-30 minutes) accommodate quick errands. This is appropriate for the most convenient parking spaces at post offices, convenience stores and other similar destinations

[6] Pricing and parking occupancy information obtained from Donald Shoup. *The High Cost of Free Parking.* 2005. Chicago, IL: The American Planning Association. pp. 297-303.

3. Medium time periods (1/2-4 hours) accommodate longer errands and activities, such as shopping and dining. Customers often find that 1 hour is inadequate for a shopping trip, meal or errand, so 90-minute or 2-hour limits are common
4. 3- or 4-hour limits are commonly applied to prevent commuters from using parking spaces in business districts and nearby residential streets, although some commuters will simply move their vehicles once or twice a day.
5. Long time periods (8 or more hours) accommodate commute trips and residential parking (Littman, 81).

In general, the duration of parking within the three pilot areas is appropriate.

Parking along Broughton Street is free and limited to two hours with restrictions allowing parking only once in each of two zones daily. Broughton Street is divided into two parking zones: red and blue, split by Bull Street.

Broughton Street merchants have witnessed a large number of people moving from one zone to the other, essentially allowing for free parking on Broughton Street for four hours a day. This is especially attractive to employees of the shops along Broughton Street, hindering the ability for customers to utilize the prime spots in front of each business.

Studies have shown that a single parking space in front of a business can yield significant sales annually to that business. It is estimated that one space can yield $200,000 annually in retail sales to the adjacent business.[7] Therefore, Broughton Street merchants cannot afford to have on-street parking occupied by employees or staff.

HPE recommends that the City of Savannah update its current parking zone policy to prohibit parking on Broughton Street more than once daily. In other words, moving from one zone to another would be prohibited, providing only two hours of parking per day along Broughton Street. This is a reasonable amount of time for customers, but limited enough to deter long-term employee use of the on-street parking.

Recommendation: Prohibit parking on Broughton Street more than once daily.

More research should be made to determine if the 15-minute spaces around Johnson Square are still appropriate for the adjacent land uses, or if slight time increases would be more useful. (There appear to be no 15-minute spaces around Johnson Square.)

Enforcement

A parking operation is only as effective as its enforcement. Enforcement involves organization of personnel procedures, technical equipment selection and is strongly related to education of users. Savannah's Mobility and Parking Department staff knows best the current and potential parking procedures and the personnel available to manage these tasks. Thus, details regarding personnel needed will be left to subsequent discussions.

[7] Estimate provided by Robert Gibbs of the Gibbs Planning Group. http://www.gibbsplanning.com/default.html

Education

The City of Savannah's current parking services website displays pertinent information in an efficient manner. The City could improve its website to include the following information:

- Maps to parking garages and locations of pay and display meters
- Street cleaning policies and maps showing schedules

Recommendation: Post any new parking regulations on City website.

Also, any changes to parking strategies will require user education to ensure proper operations. HPE suggests the City post new parking regulations on its website and on conspicuous signs posted in parking areas. The home page should alert users to new policies that can be read there or found on the Parking Services page.

Several good examples exist. The City of Madison's parking page has a convenient "What's New" section on its home page. Other websites of note are the City of Chicago's, which offers an interactive tool to help locate the nearest space; the City of Sacramento's, which provides great detailed instructions on using its pay-and-display meters as well as a section clearly delineating on-street and off-street parking locations and policies; and the City of Santa Monica's, whose page opens to a map illustrating currently open spaces within garages and lots. This last tool is updated every five seconds and would work in conjunction with the sensor monitoring system described above.

Layout

The physical layout types and dimensions are delineated for use in each context zone and pilot area. The physical form of public parking types, including on-street, parallel, angle and perpendicular parking and parking in lots and structures are established by context zone and pilot area plan.

Existing

The following graphics illustrate the existing on-street parking supply for the three pilot areas.

Figures 8-11 illustrate the location of Broughton Street's 143 spaces. All spaces have two hour limits, unless otherwise noted on the graphic. Specifically, there are seven 30-minute spaces on the northside of Broughton Square in Block 7, between Drayton Street and Abercorn Street. These spaces are intended to serve the adjacent utility company for quick payment drop-offs.

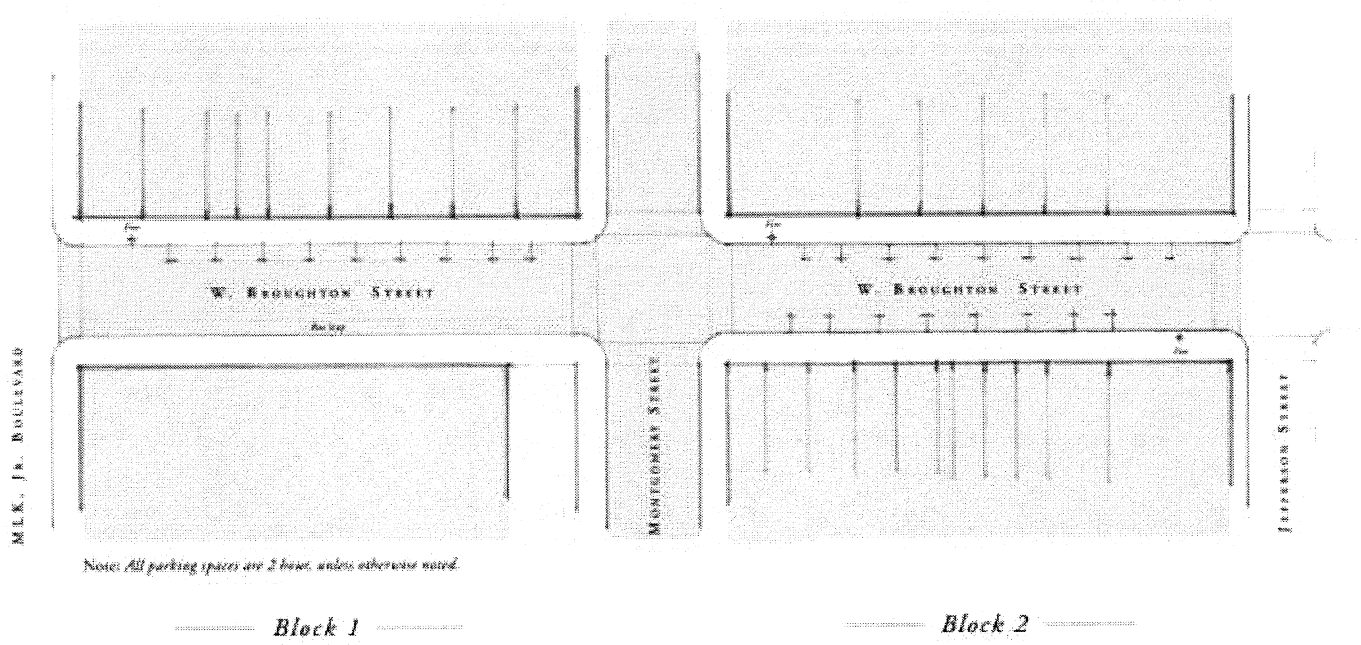


Figure 8: Broughton Street Existing Conditions (Blocks 1 and 2; Martin Luther King, Jr. Blvd to Jefferson Street)
Illustration prepared by Sottile & Sottile

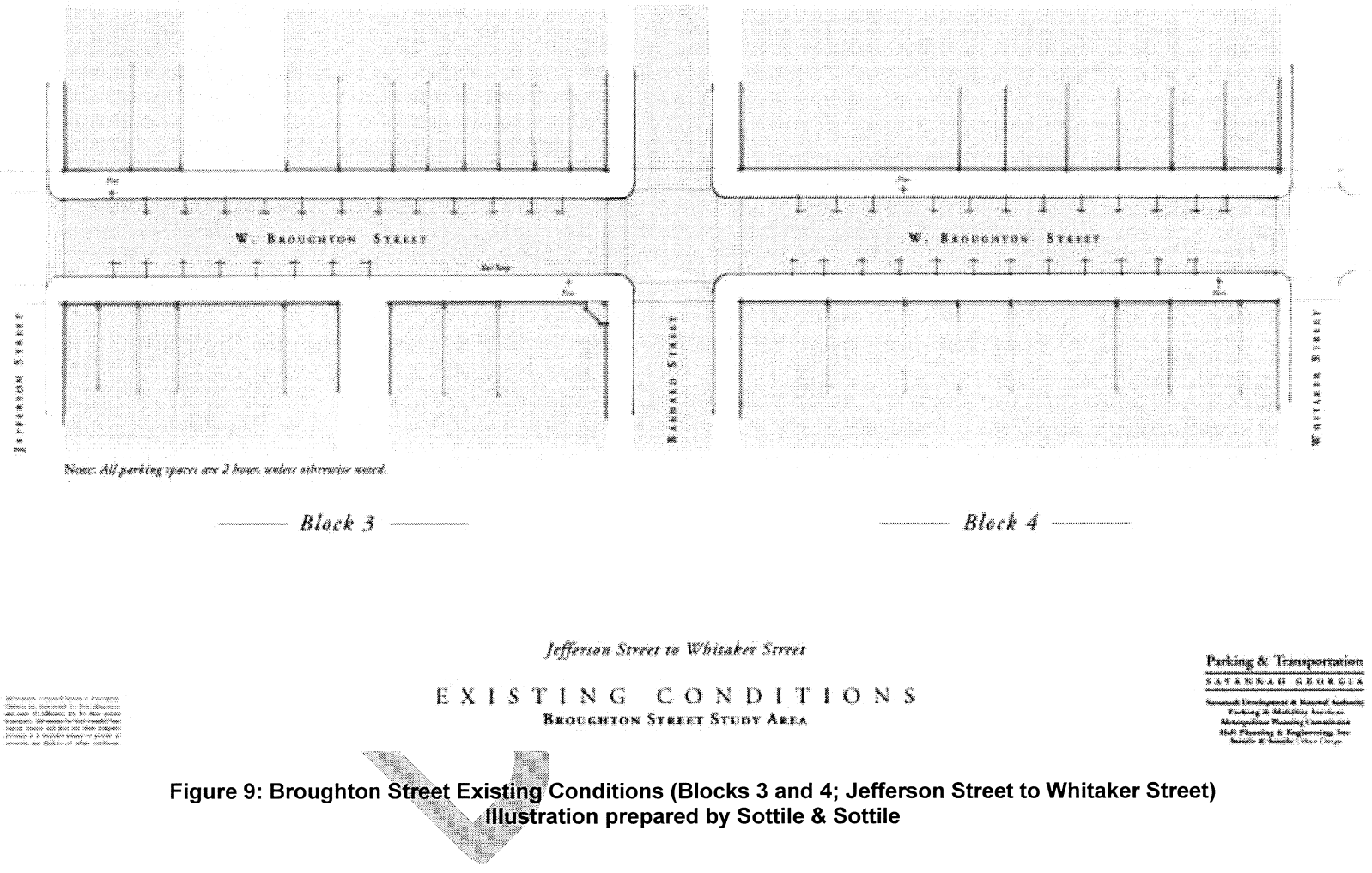


Figure 9: Broughton Street Existing Conditions (Blocks 3 and 4; Jefferson Street to Whitaker Street)
Illustration prepared by Sottile & Sottile

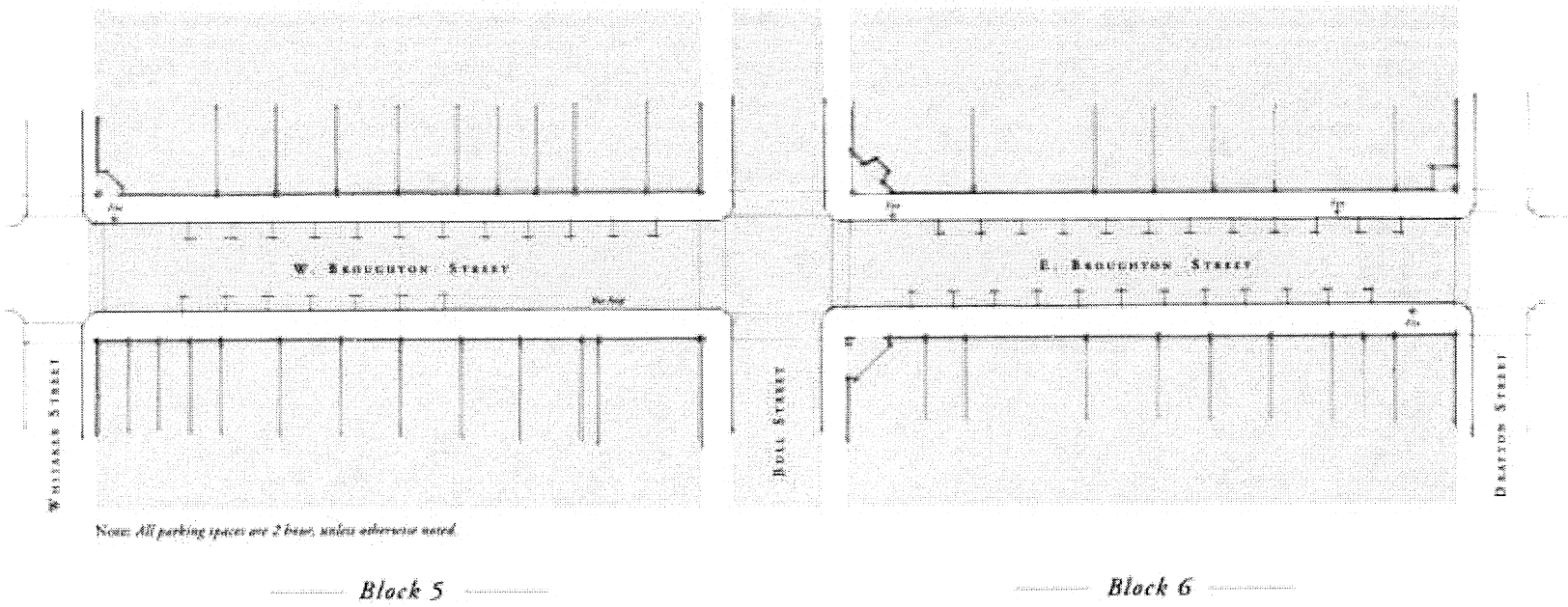


Figure 10: Broughton Street Existing Conditions (Blocks 5 and 6; Whitaker Street to Drayton Street)
Illustration prepared by Sottile & Sottile

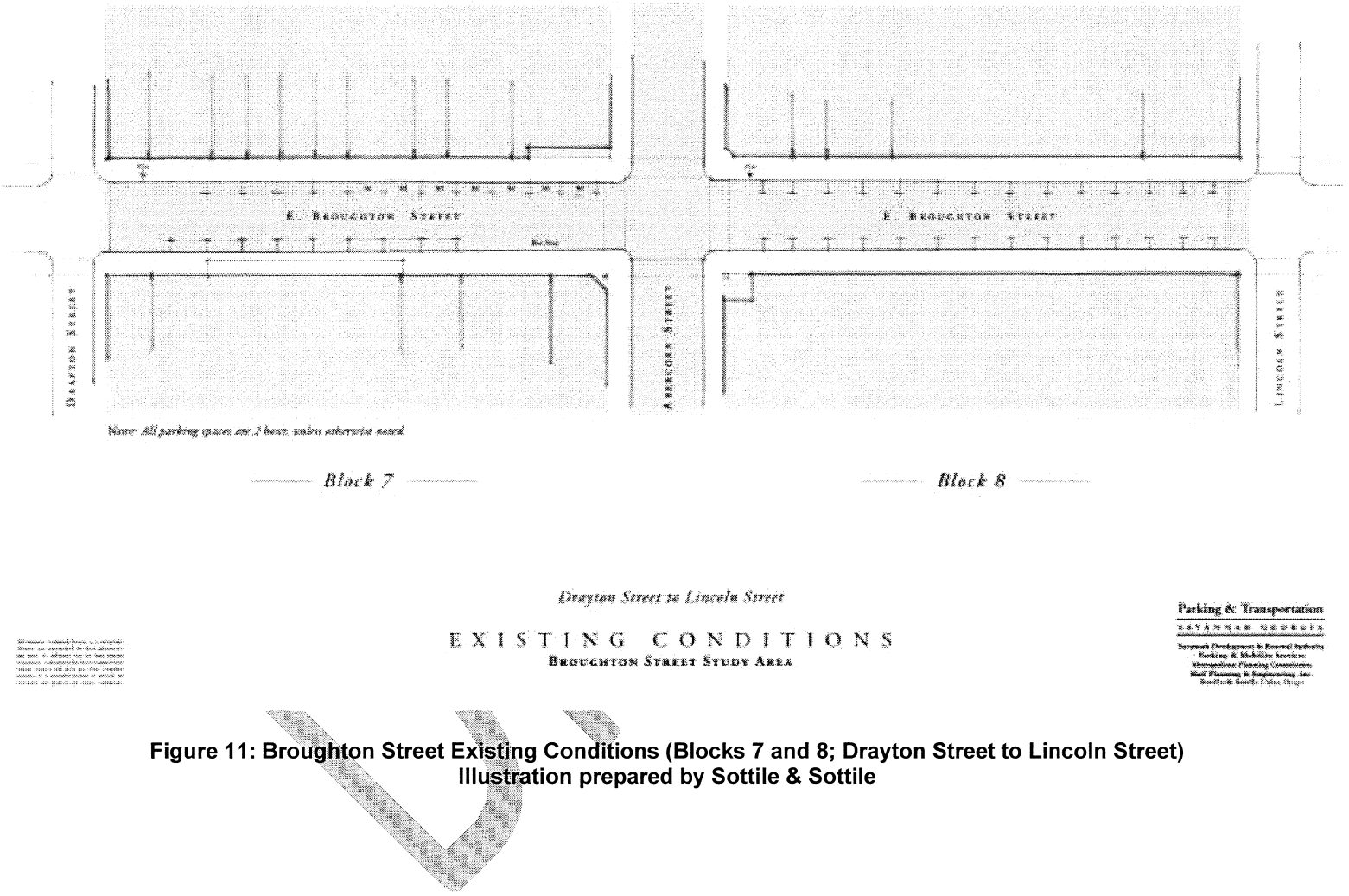


Figure 11: Broughton Street Existing Conditions (Blocks 7 and 8; Drayton Street to Lincoln Street)
Illustration prepared by Sottile & Sottile

Figure 12 illustrates the location of Johnson Square's 106 spaces, as well as freight, loading, bus and valet zones. There are 94 general parking spaces, five handicap accessible spaces, six freight/loading zones and one tour bus stop. Spaces within the Johnson Square study area range in duration from 30 minutes to 1 hour. One 5-hour and four 10-hour handicap accessible spaces are present, as indicated on the following graphic.

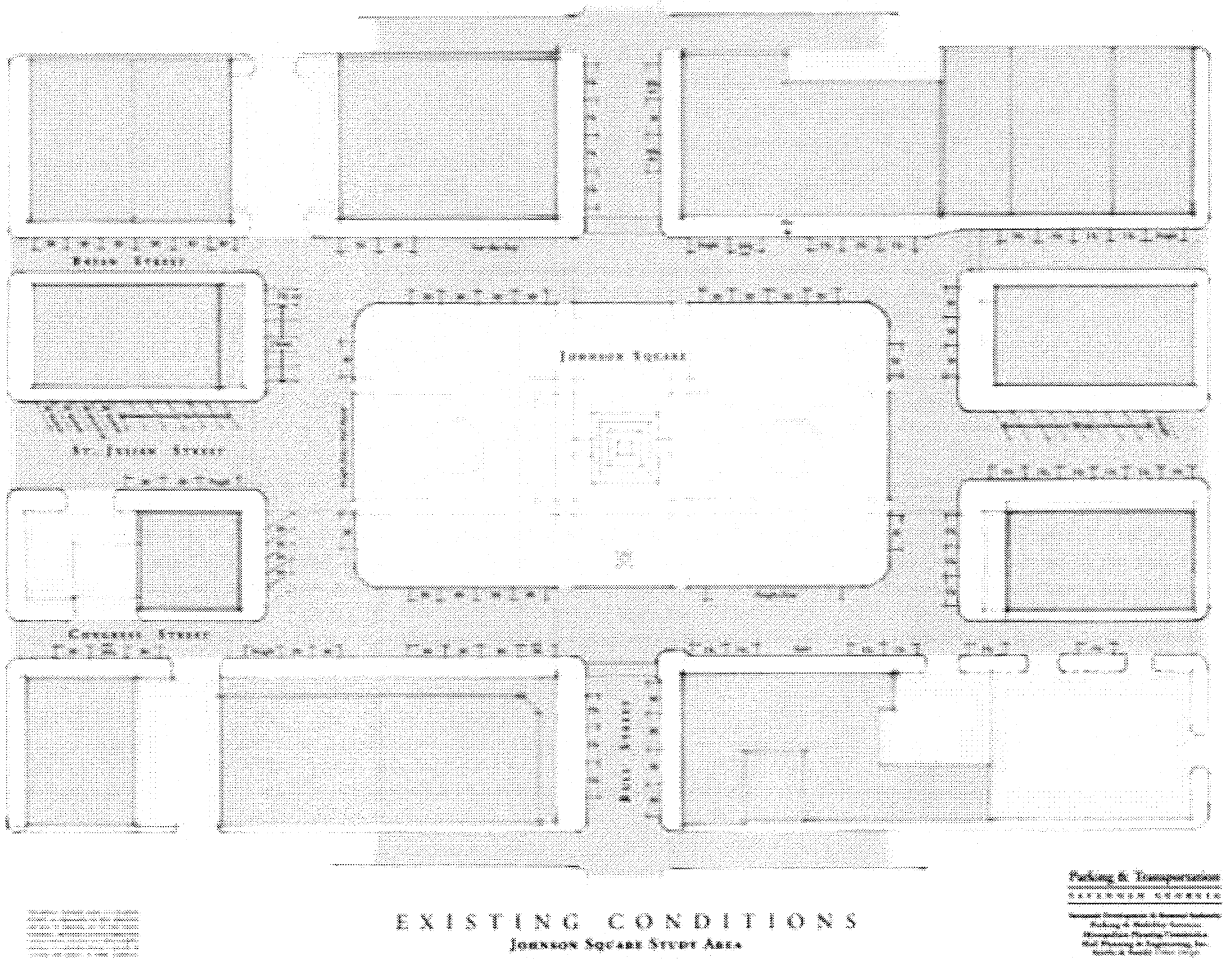


Figure 12: Johnson Square Existing Conditions
Illustration prepared by Sottile & Sottile

Figure 13 illustrates the location of Oglethorpe Square's 89 spaces, as well as freight and loading zones. There are 80 general spaces, four handicap accessible spaces and five freight/loading zones. Spaces within the Oglethorpe Square study area range in duration from 15 minutes to 5 hours. There are four handicap accessible spaces around the square, as indicated on the following graphic: one 2-hour, one 3-hour, one 5-hour and one 10-hour.

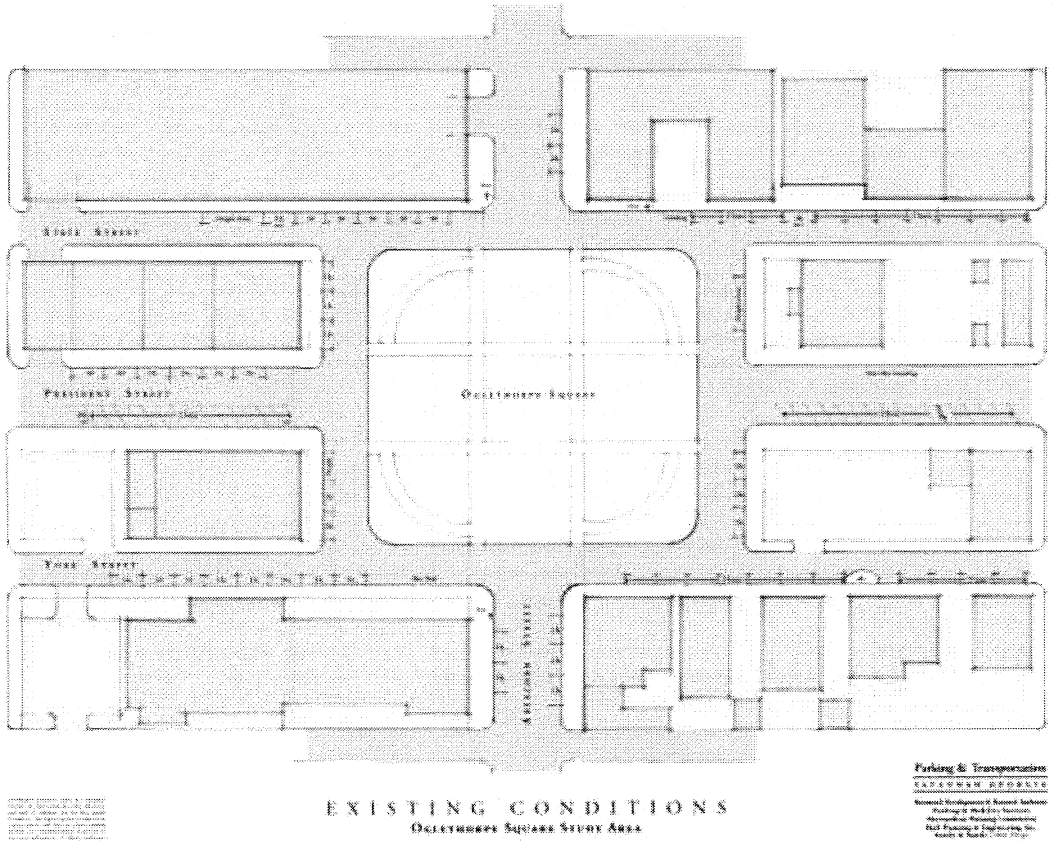


Figure 13: Oglethorpe Square Existing Conditions
Illustration prepared by Sottile & Sottile

Proposed

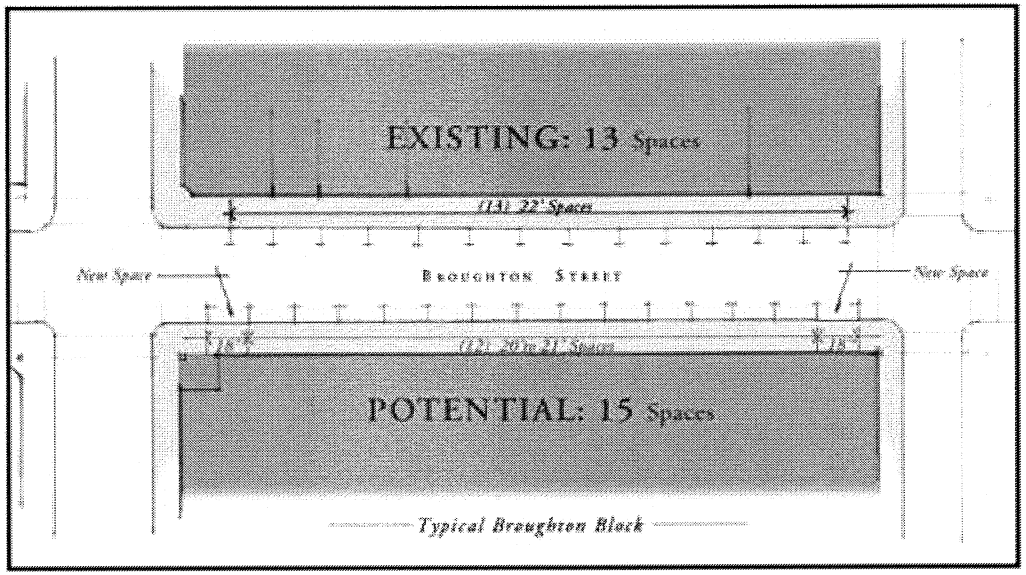
The following sections illustrate possible revisions to the layout of parking in the three study areas. The illustrations are as precise as possible, based on field research.

Broughton Street

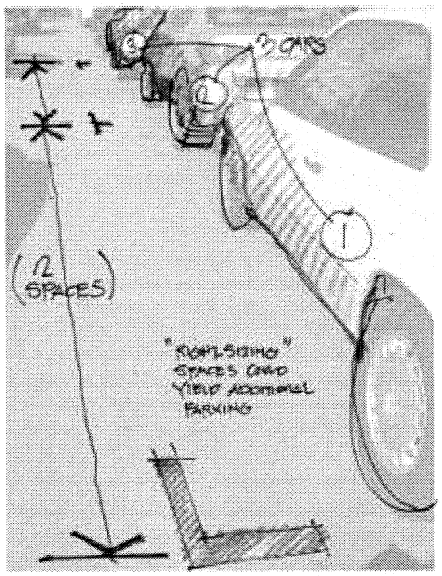
The bus stops along Broughton Street are mostly 100 feet in length, with the exception of the stop in the first block at Broughton and Martin Luther King, Jr. Blvd. Here the bus stop occupies the entire length of the block face, 300 feet. The 100-foot length is a standard requirement for deceleration and acceleration of 40 feet transit buses in a less than 25 miles per hour environment. However, given the very low speed and urban nature of the area, along with a shorter bus bay precendent at Oglethorpe Square, HPE investigated the opportunity to shorten these bays, particularly for the two stops at Barnard and Bull Streets. A cursory AutoTurn analysis illustrated that the bay could be reduced to 80 feet, if drivers slowed to 5mph before merging into the bus stop from the travel lane. This would yield enough room to acquire one extra space at each block. The City of Savannah should talk to the appropriate transit agencies to ensure this will work with their buses.

Recommendation: Shorten bus stop bays at Barnard and Bull Streets.

Extra spaces were also achieved by following the precedents established throughout the corridor pertaining to parking stall size and distance from fire hydrants and crosswalks (see **Figures 14 and 15** as illustration).

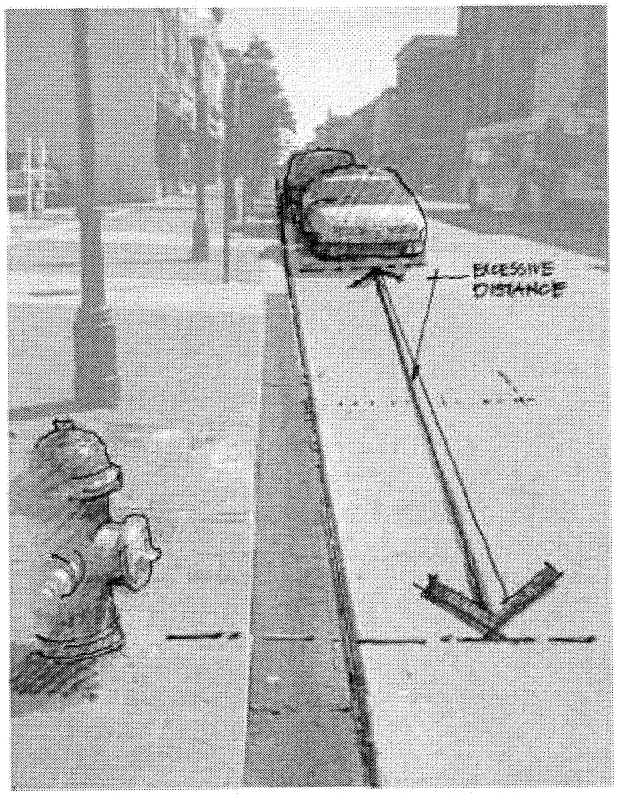


Broughton Street: Increased Parking Concept/Strategy



3 Cars Parked within 2 Spaces Suggests the Potential for Additional Parking Spaces by "Right-Sizing" Spaces

Figure 14: Broughton Street Increased Parking Concept/Strategy
Illustration prepared by Sottile & Sottile



Excessive Distance between last marked parking space and fire hydrant

Potential for an Additional Parking Space in the Distance beyond the last marked parking space and the crosswalk

Figure 15: Broughton Street Increased Parking Concept/Strategy
Illustration prepared by Sottile & Sottile

The standard stalls are 7.5 to 8 feet wide and between 20 and 22 feet long. In some instances, the stalls are shorter at the end of the block where the ability to maneuver in and out of these spaces is easier. These dimensions are more than suitable for the standard automobile.

Broughton Street has proven the safety of leaving a minimum of 10 feet of space on each side of a hydrant and prohibiting parking within 10 feet minimum of a crosswalk.

This standard conflicts with State of Georgia codes that prohibit parking:

- Within 15 feet of a fire hydrant;
- Within 20 feet of a crosswalk at an intersection;
- Within 30 feet upon the approach to any flashing signal, stop sign, yield sign, or traffic –control signal located at the side of a roadway (O.C.G.A § 40-6-203(a)(2)).

Recommendation: Establish legal language justifying deviation from State Codes in urban, walkable settings.

These standards are appropriate for many places, particularly in suburban locations where motor vehicle speeds are high and connectivity is low. They are not appropriate in an urban, walkable place like Savannah, where speeds are low enough to provide ample turning of vehicles onto side streets and where multiple connections and locations are available for fighting fires. In fact, these urban standards are quite necessary in creating a walkable, thriving community and something many new towns are striving to replicate.

The City of Savannah should work with appropriate advocacy groups around the state to augment State Code. The language may be refined as follows:

GEORGIA CODE

*** Current through the 2008 Regular Session ***

TITLE 40. MOTOR VEHICLES AND TRAFFIC
CHAPTER 6. UNIFORM RULES OF THE ROAD
ARTICLE 10. STOPPING, STANDING, AND PARKING
PART 1. GENERAL PROVISIONS

O.C.G.A. § 40-6-203 (2008)

§ 40-6-203. Stopping, standing, or parking prohibited in specified places; stopping or standing for collecting municipal solid waste or recovered materials

(a) Except when necessary to avoid conflict with other traffic, or in compliance with law or the directions of a police officer or official traffic-control device, no person shall:

(1) Stop, stand, or park a vehicle:

(A) On the roadway side of any vehicle stopped or parked at the edge of a curb of a street;

(B) On a sidewalk;

(C) Within an **intersection;**

(D) On a crosswalk;

(E) Between a safety zone and the adjacent curb or within 30 feet of points on the curb immediately opposite the ends of a safety zone, unless a different length is indicated by signs or markings;

(F) Alongside or opposite any street excavation or obstruction when stopping, standing, or parking would obstruct traffic;

(G) Upon any bridge or other elevated structure upon a highway or within a highway tunnel;

(H) On any railroad tracks;

(I) On any controlled-access highway;

(J) In the area between roadways of a divided highway, including crossovers; or

(K) At any place where official signs prohibit stopping;

(2) Stand or park a vehicle, whether occupied or not, except momentarily to pick up or discharge a passenger or passengers:

(A) In front of a public or private driveway;

(B) Within 15 feet, or 10 feet for Downtown (or Urban Walkable) Character Areas, of a fire hydrant;

(C) Within 20 feet, or 10 feet for Downtown (or Urban Walkable) Character Areas, of a crosswalk at an **intersection;**

(D) Within 30 feet, or 15 feet for Downtown (or Urban Walkable) Character Areas, upon the approach to any flashing signal, stop sign, yield sign, or traffic-control signal located at the side of a roadway;

(E) Within 20 feet of the driveway entrance to any fire station or on the side of a street opposite the entrance to any fire station within 75 feet of such entrance (when properly posted); or

(F) At any place where official signs prohibit standing; or

(3) Park a vehicle, whether occupied or not, except temporarily for the purpose of and while actually engaged in loading or unloading property or passengers:

(A) Within 50, or 30 feet for Downtown (or Urban Walkable) Character Areas, feet of the nearest rail of a railroad crossing; or

(B) At any place where official signs prohibit parking.

(b) No person shall move a vehicle not lawfully under his control into any prohibited area or to such a distance away in deviating from state standards. the curb as is unlawful.

(c) Notwithstanding any other provision of law, any vehicle used solely for the purpose of collecting municipal solid waste or recovered materials as defined in Code Section 12-8-22 may stop or stand on the road, street, or highway for the sole purpose of collecting such waste or materials; provided, however, that such vehicle shall maintain flashing hazard lights at all times that it is engaged in stopping or standing for the purpose of waste or materials collection.

HISTORY: Ga. L. 1953, Nov.-Dec. Sess., p. 556, § 92; Code 1933, § 68A-1003, enacted by Ga. L. 1974, p. 633, § 1; Ga. L. 1989, p. 14, § 40; Ga. L. 1990, p. 2048, § 5; Ga. L. 1994, p. 639, § 1.

This language should emphasize that only in an urban and walkable context can the State Codes be waivered and more flexible ones applied. The context should be guided by Georgia State definitions for "character areas" as defined by the Georgia Department of Community Affairs (DCA).

New local planning standards have been established by the DCA that require communities (local governments, in their comprehensive plans) to delineate ***character areas*** and implement development strategies for each of them. This approach differs from ***conventional land use planning***, which is organized around the ***future land use map*** which shows mostly single-function land use districts.

DCA defines ***character area*** in the administrative rules as: "A specific geographic area within the community that:

- Has unique or special characteristics to be preserved or enhanced (such as a downtown, a historic district, a neighborhood, or a transportation corridor);
- Has potential to evolve into a unique area with more intentional guidance of future development through adequate planning and implementation (such as a strip commercial corridor that could be revitalized into more attractive village development pattern); or
- Requires special attention due to unique development issues (rapid change of development patterns, economic decline, etc.)

Each *character area* is a planning sub-area within the community where more detailed, small-area planning and implementation of certain policies, investments, incentives, or regulations may be applied in order to preserve, improve, or otherwise influence its future development patterns in a manner consistent with the community vision."[8]

If done, Broughton Street could net an additional 8 spaces (see **Figures 16-19**).

[8]Jerry Weitz & Associates, Inc., "Techniques and Guidance for Delineating and Implementing Character Areas," Georgia Department of Community Affairs, Draft 2005, Excerpted by DCA Staff; prepared for Office of Planning and Policy Growth, DCA.

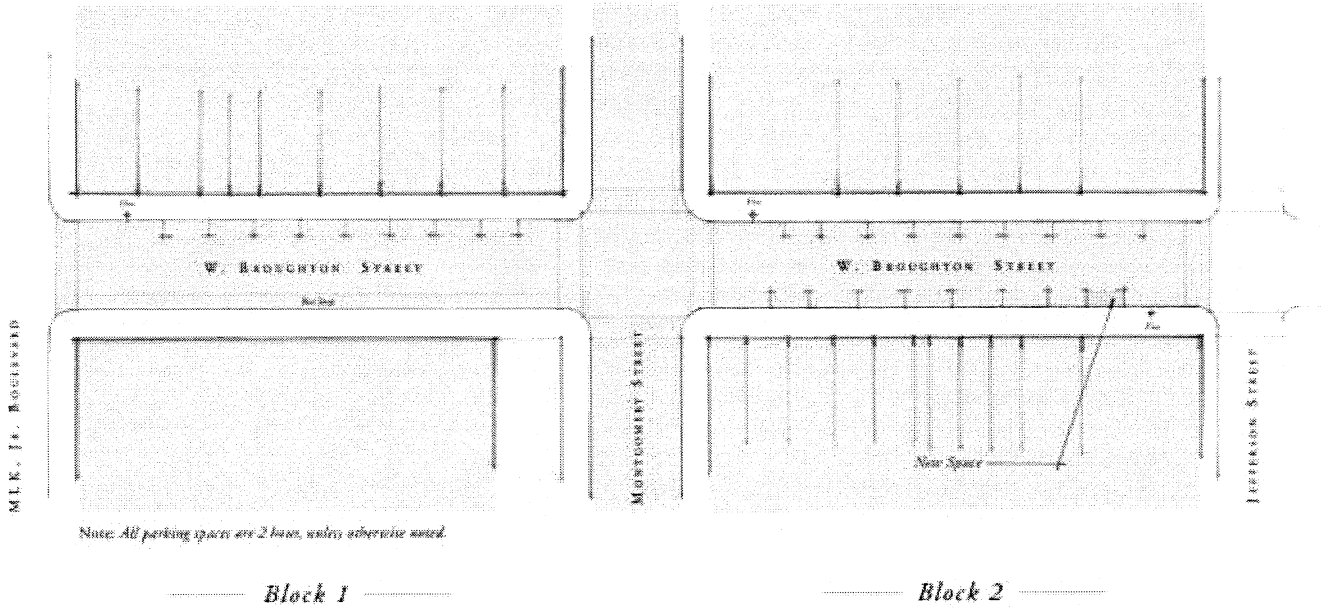


Figure 16: Broughton Street Potential Conditions (Blocks 1 and 2; Martin Luther King, Jr. Blvd to Jefferson Street)
Base illustration prepared by Sottile & Sottile

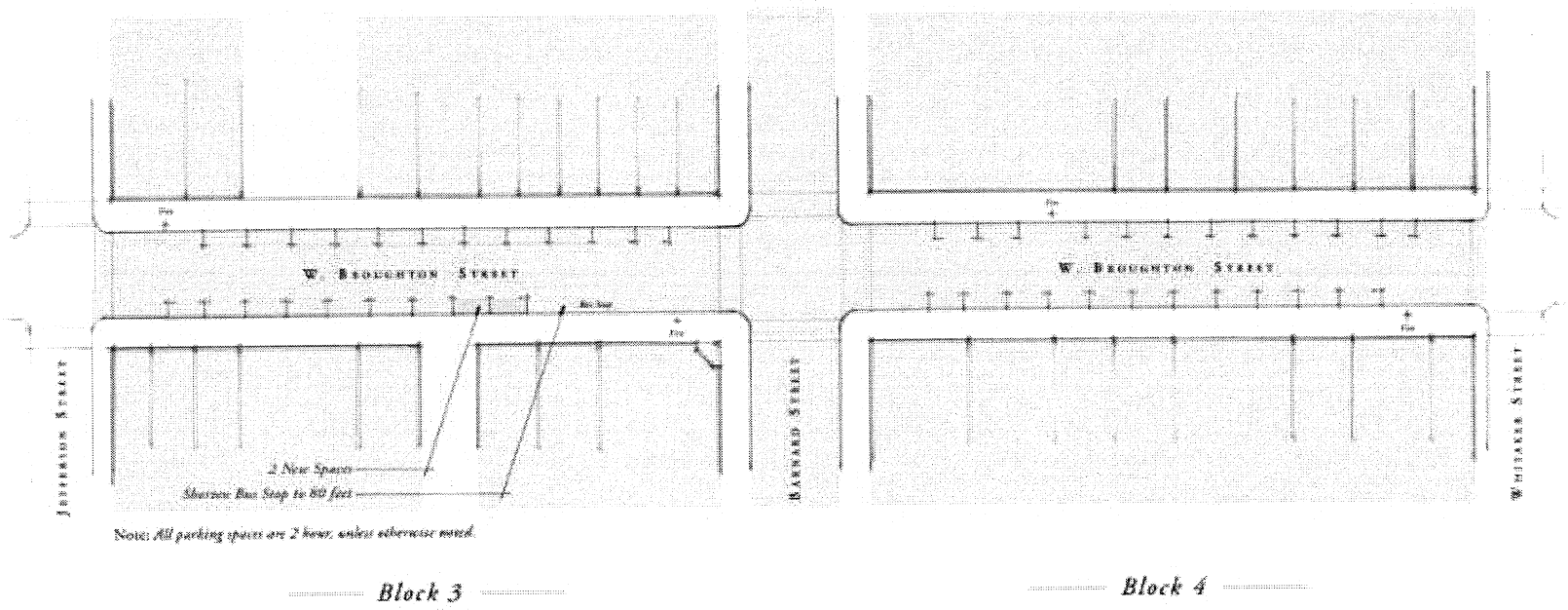


Figure 17: Broughton Street Potential Conditions (Blocks 3 and 4; Jefferson Street to Whitaker Street)
Base illustration prepared by Sottile & Sottile

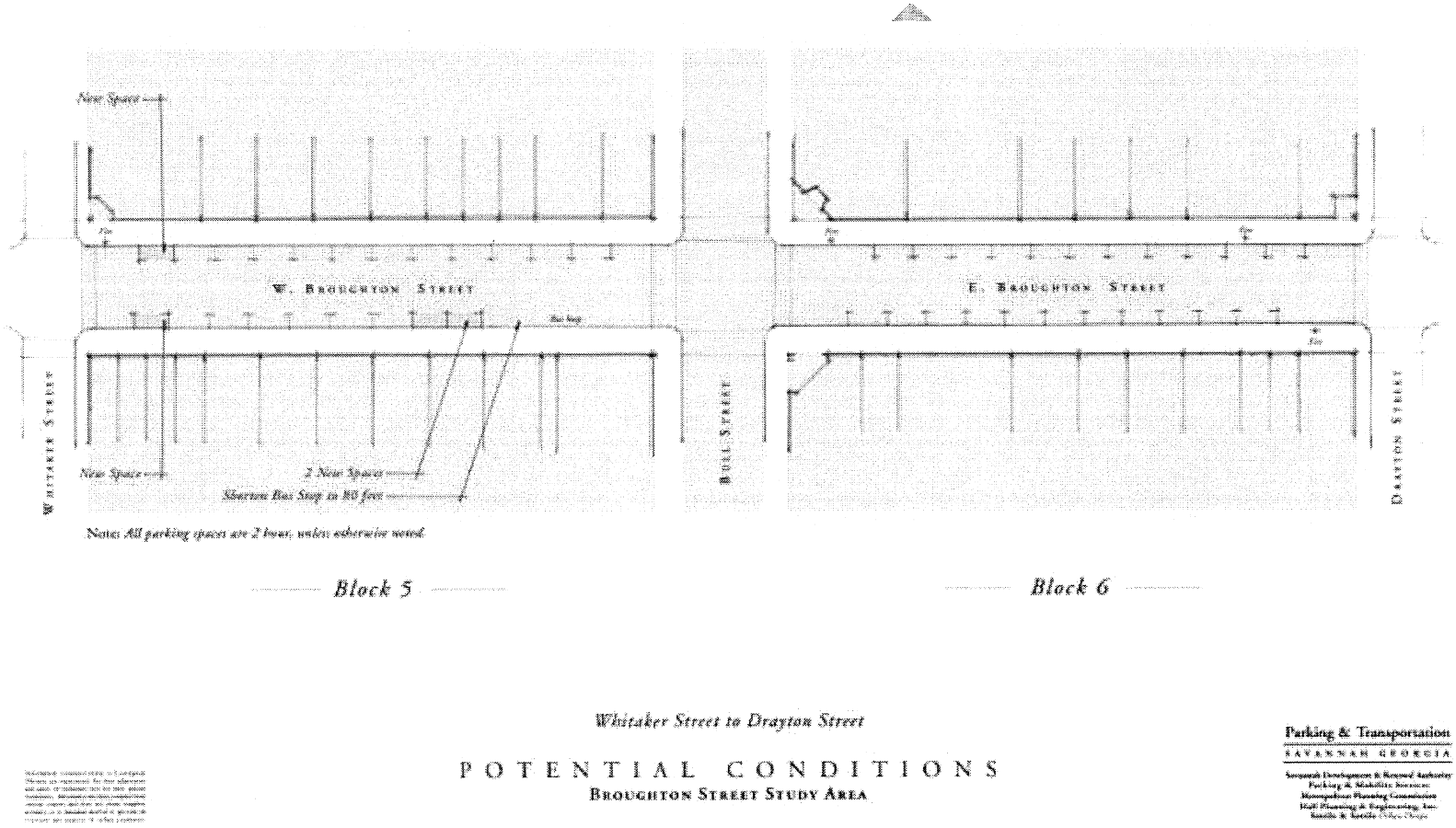


Figure 18: Broughton Street Potential Conditions (Blocks 5 and 6; Whitaker Street to Drayton Street)
Base illustration prepared by Sottile & Sottile

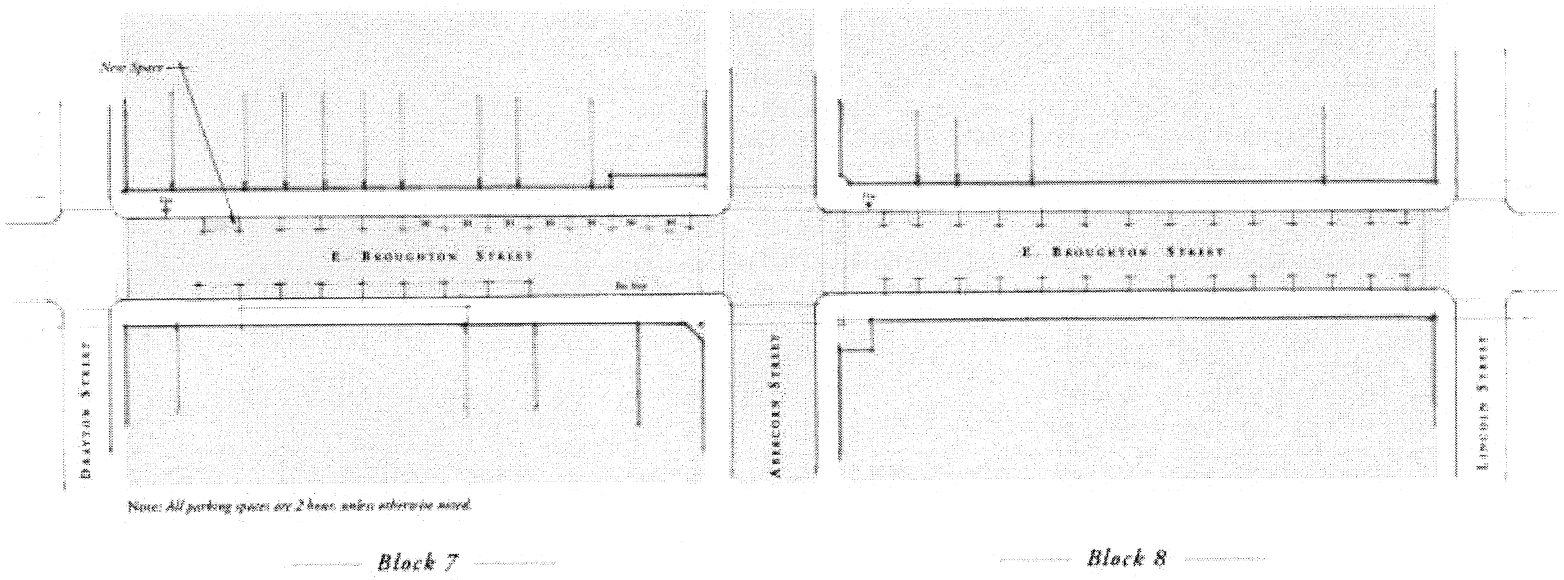


Figure 19: Broughton Street Potential Conditions (Blocks 7 and 8; Drayton Street to Lincoln Street)
Base illustration prepared by Sottile & Sottile

Johnson Square

Recommendation: Replace head-in angle parking with reverse angle parking.

Currently, head-in angled parking exists in spots along Johnson Square, but HPE recommends utilizing reverse (or back-in) angle parking. Reverse angled parking has been utilized in cities all over the country, such as Seattle, Tucson, Birmingham, Salt Lake City, and Washington DC.[9]

Figure 20: Reverse Angle Parking in Vancouver; Shows benefit of loading cars from the curb

As shown in **Figures 20 and 21** spaces are angled in the opposite direction and the entrance maneuver is quite similar to parallel parking, but requires one less step:

1. The operator pulls past the parking space with blinker actuated to indicate intent to park
2. The operator proceeds in reverse into the 45 or 60 degree space.

The principal benefits of this recommendation are to increase parking inventory and increase safety.

Figure 21: Steps to Reverse Angle Parking

[9] The images and information on reverse angle parking was obtained from the report, "Back-in/head-out Angle Parking" by Nelson\Nygaard Consulting Associates. 785 Market Street, Suite 1300, San Francisco, CA 94103. January 2005.

Cities have cited numerous safety benefits and reduction in crashes with reverse angled parking. This is due to the fact that users re-entering the traffic from a back-in angled space has a clear advantage over parallel and head-in parking spaces. Drivers in back-in angled spaces have optimum viewing of on-coming traffic making it easier to exit the space. They are also able to see pedestrians and cyclists more easily and do not have their vision impeded by varying car lengths. Others have also cited the advantages of the "safety zone" that is created by opening car doors in reverse angled spaces, which prevent children from entering the street, as the doors act as a barrier and guide them safely to the sidewalk.

Additional spots are proposed around Johnson Square by utilizing the wide right of way on the south side and east side of the square to introduce angled parking. Doing so yields 9 additional spots. **Figure 22** below shows these additional parking spaces and assumes the valet zone in front of the Club moves slightly to the east. The additional spots not only provide more supply and garner economic returns, but also help to further slow traffic, as illustrated in **Figure 23** below. **Figure 23** demonstrates the relationship between lane width and speeds; particularly that higher travel speeds were observed around Johnson Square where pavement width is 40 feet than were witnessed on Oglethorpe Square.

The right of way on Congress Street (south side of the square) is currently 42 feet from face of curb to face of curb, with sufficient room to introduce 17-foot angled parking. The cross section then would consist of existing parallel parking along the inside of the square, a 16-foot travel lane and 17-foot angled parking along the outside of the travel lane (non-square side). Typical urban parking standards require only 11.8 feet of a one way travel lane double loaded with 60 degree angle parking.[10]

The right of way width of Bull Street on the east side of Johnson Square is 40 feet, with sufficient room to introduce 17-foot angled parking. The cross section would consist of existing parallel parking along the inside of the square, a 14-foot travel lane and 17-foot angled parking along the outside of the travel lane (non-square side).

[10] See Miami21 SmartCode at http://www.miami21.org/ for suggested parking standards.

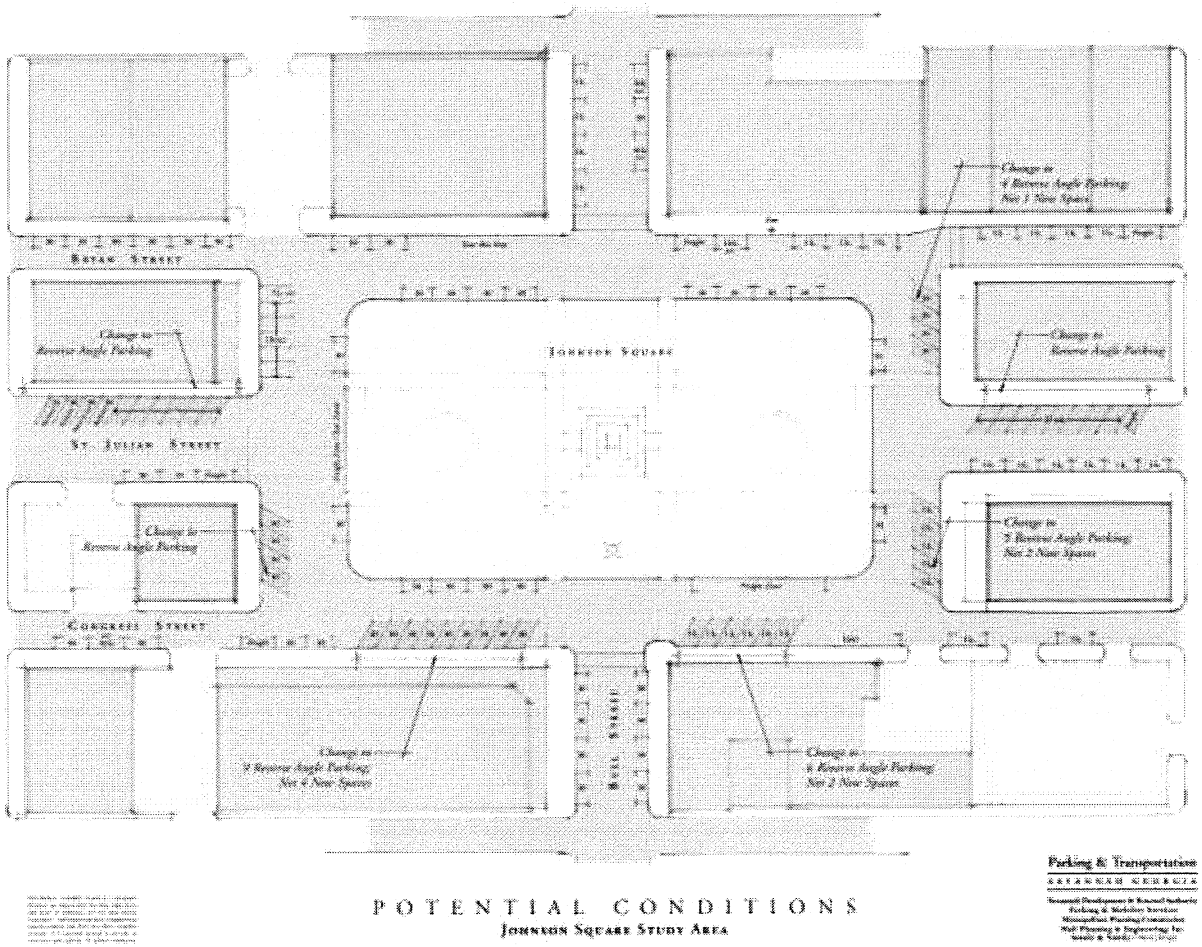
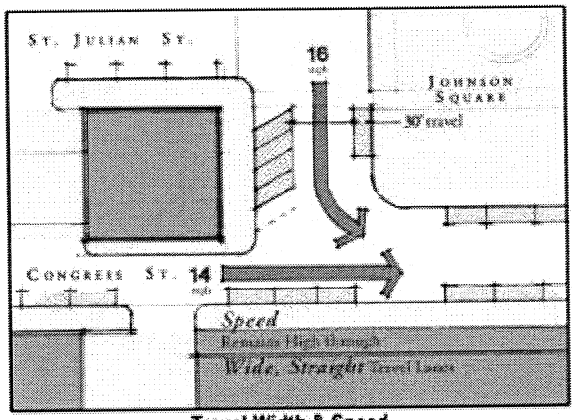
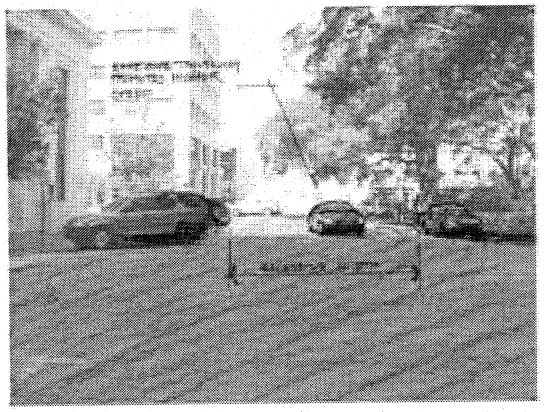


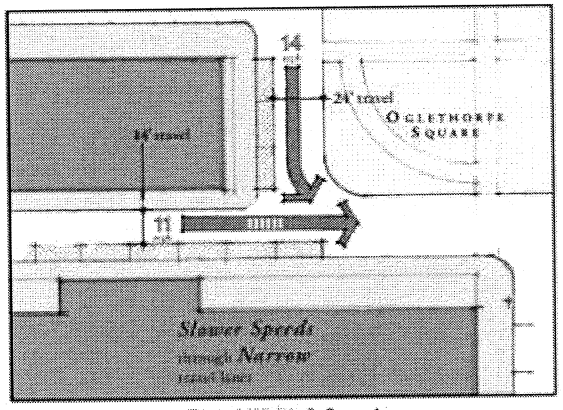
Figure 22: Johnson Square Potential Conditions
Illustration prepared by Sottile & Sottile



Travel Width & Speed
Johnson Square: Excessive Width & Speed



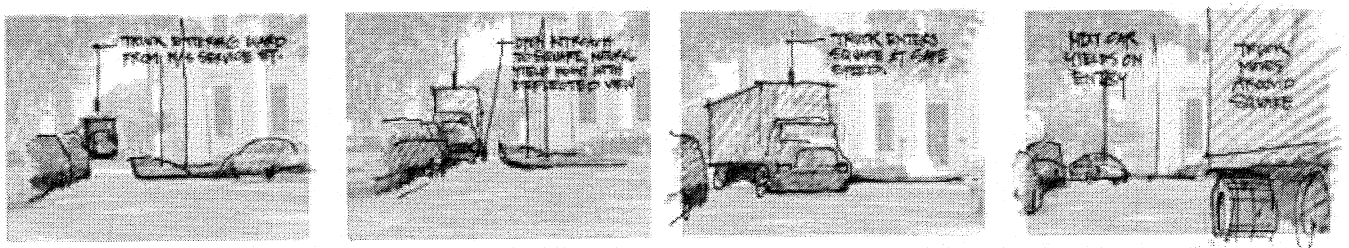
Vehicles Move around the Square in an Excessively Wide Travelway, Promoting Higher Speeds



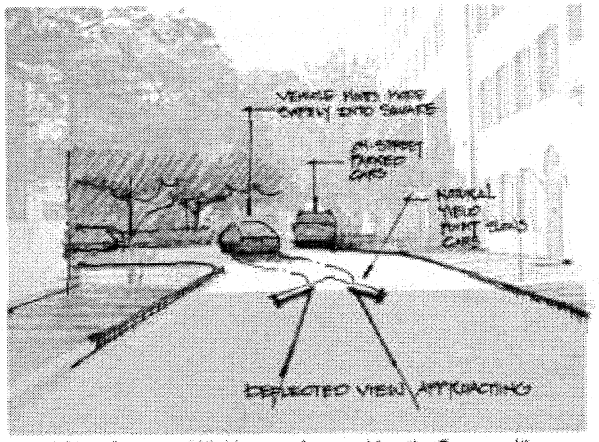
Travel Width & Speed
Oglethorpe Square: Moderated Width & Speed

Figure 23: Travel Lane & Width and Speed Relationship
Illustration prepared by Sottile & Sottile

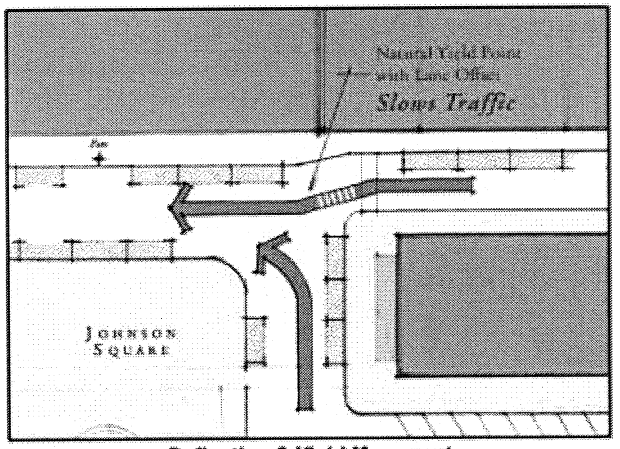
Figure 24 illustrates how automobiles are deflected when entering Johnson Square form the northeast. This deflection serves as a unique design feature that is capable of managing travel speeds and should be maintained. **Figure 25** illustrates how the conversion of parallel spaces to angled help to deflect vehicles entering Johnson Square from the southwest, thus managing the speeds that were shown to be slightly high in **Figure 23** above.



Truck Slows and Yields upon Approaching the Square with a Deflected Entrance, then Proceeds at a Safe Speed

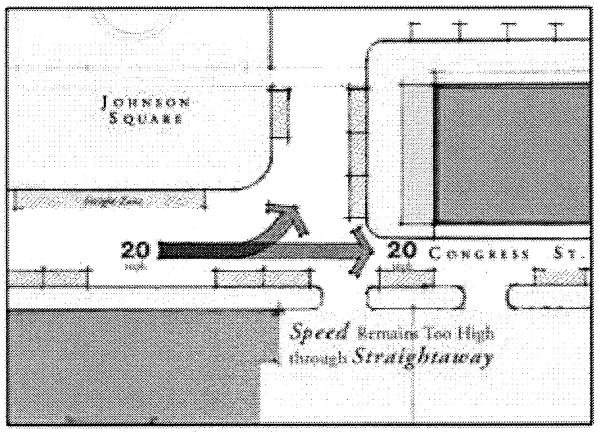


Vehicle Slows and Yields upon Approaching the Square with a Deflected View, then Enters the Square at Safe Speed

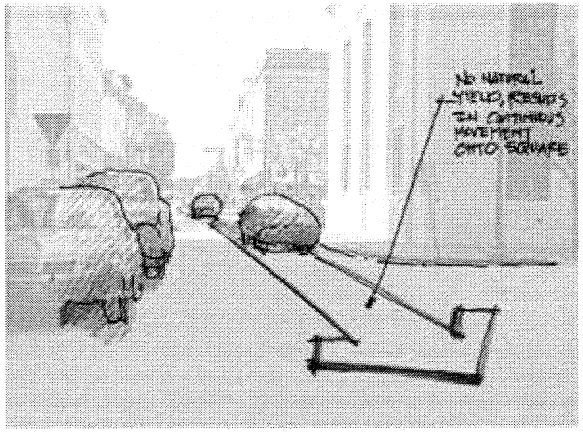


Deflection & Yield Movement
Safe Existing Condition Entering Johnson Square

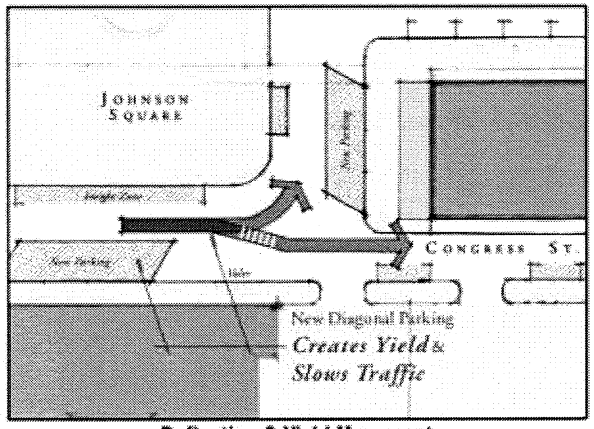
Figure 24: Existing Deflection entering Johnson Square from Northeast
Illustration prepared by Sottile & Sottile



Deflection & Yield Movement
Unsafe Speed, Exiting from Johnson Square



Vehicles Move into the Square via a Straightaway, with no Indication to Slow and Yield



Deflection & Yield Movement
Safer Deflection Condition Created by New Parking

Figure 25: New Deflection entering Johnson Square from Southwest
Illustration prepared by Sottile & Sottile

Oglethorpe Square

Parking in Oglethorpe Square is a mixture of parallel and angled parking. There is no parking on the entire square-side of the street. The narrow travel lanes, averaging 25 feet, would prevent the ability to place any extra spaces along the inside.

HPE proposes reverse angle parking, as discussed above for Oglethorpe Square, shown in **Figure 26** below.

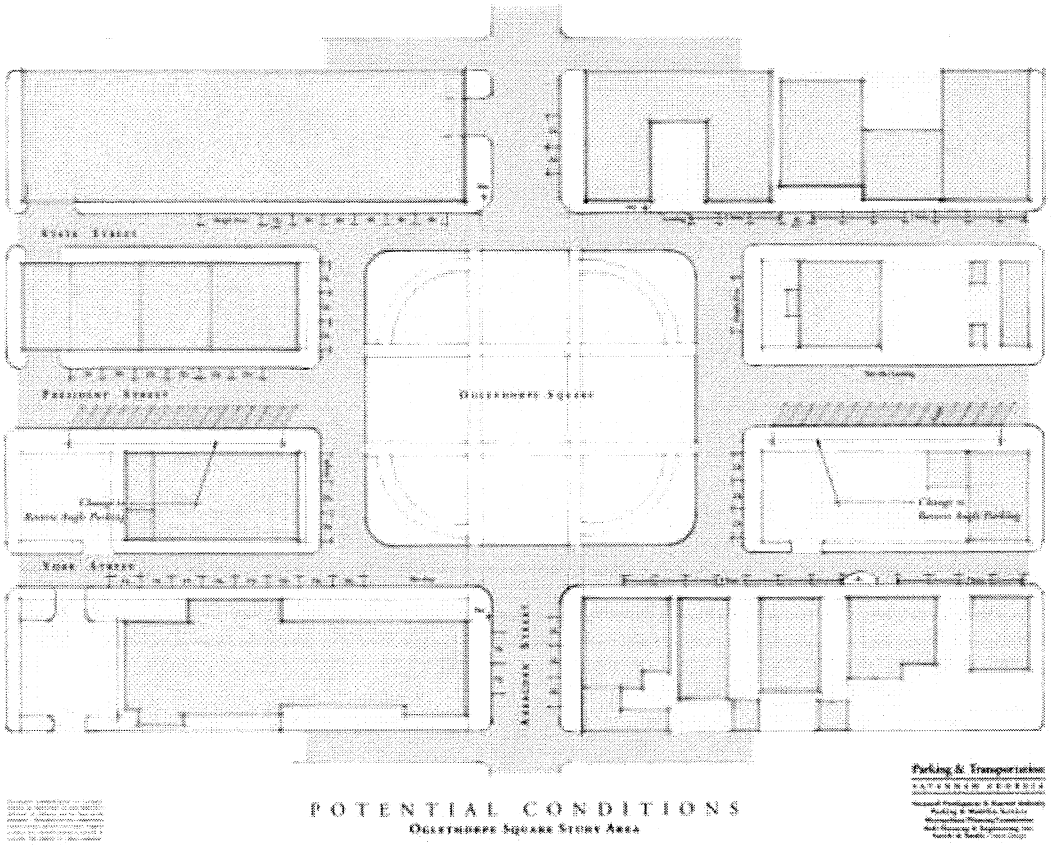


Figure 26: Oglethorpe Square Potential Conditions
Base illustration prepared by Sottile & Sottile

CONCLUSIONS

The City of Savannah has an opportunity to increase its on-street parking supply, while maintaining the balance between vehicular use and high volumes of pedestrian movement for which the city is famous. This increase in supply coupled with the recommended strategies to increase turnover will result in improved economic opportunities for businesses in the downtown. The field analysis identified opportunities within the three pilot study areas alone that could yield up to 15 new on-street parking spaces. These new spaces would be created through improvements to existing parking configurations. The strategies proposed for the pilot areas have been developed with the understanding that they can also be applied in surrounding wards to increase the inventory of parking throughout the city center.

APPENDIX A

Walkability Index Technical Memo

APPENDIX B

Walkability Index Results for Broughton Street

APPENDIX C

Walkability Index Results for Johnson Square

APPENDIX D

Walkability Index Results for Oglethorpe Square