

**PARKING ANALYSIS  
CHURCH STREET PEDESTRIAN DISTRICT**

**PREPARED BY THE  
CHURCH STREET PARKING STUDY GROUP  
TOWN OF VIENNA PLANNING COMMISSION**

**FOR  
THE VIENNA TOWN COUNCIL**

**October 1, 2008**

# **PARKING ANALYSIS CHURCH STREET PEDESTRIAN DISTRICT**

## **INTRODUCTION**

On October 22, 2007, the Town Council passed a resolution directing the Planning Commission to prepare a study of parking in the Church Street Pedestrian District. The study was to examine current and future demand and supply of parking spaces, and to review both immediate and long-range options to resolve current and future demand/supply imbalances. The Council's action was a result of concerns expressed by property owners, merchants, and others about inadequate parking and other parking issues. This report presents the findings and recommendations from the Planning Commission's Study Group.

The Study Group wishes to express its appreciation for the valuable assistance provided by Town staff in preparing this report, including Greg Hembree, Linnea Fechter, Julie Morris, Marie Kisner, Craig Griffin, and Mike Wilkerson.

## **BACKGROUND – CHURCH STREET PEDESTRIAN DISTRICT**

The C-1B Pedestrian Commercial Zone, described in Chapter 18-87.1, Article 12.1, of the Vienna Town Code,<sup>1</sup> recognizes the distinctive character of Vienna's original commercial district, provides for the protection and preservation of this area, and provides incentives to encourage future development consistent with original architecture. The Town commissioned the design and construction of streetscape improvements to further the objectives of the Pedestrian District.

Owners of parcels located in the Pedestrian District have the option to redevelop properties under the standards enumerated in Section 18-87.3 of the Town Code, which are generally consistent with those of the C-1A, Special Commercial Zone. Alternatively, owners may redevelop properties using design features in Section 18-87.5. These design features, hereafter called the Church Street Vision Standards, include the Conceptual Architectural Renderings provided in 18-87.5A., the general design elements listed in 18-87.5B, and the Conceptual Plan shown in 18-87.5C.

For this study, the two most important provisions affecting redevelopment under the Church Street Visions Standards of the C-1B Pedestrian Zone are two "by right" incentives: (1) a reduction in parking requirements for any commercial establishment from 1 space per 200 square feet of total floor area<sup>2</sup> to 1 space per 600 square feet of floor area, and (2) a permitted Floor to Area ratio (FAR= total floor area/total lot area) up to 0.7. In addition, bonus incentives allowing increased lot coverage or parking modifications may be granted in return for the developer providing building design and site plan features desired by the Town Council. All of these provisions enhance the property value by increasing the permitted development intensity over that allowed under the provisions of the C-1A Zone.

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<sup>1</sup> The District was created April 1996, amended July 1999, and amended again in February 2000.

<sup>2</sup> Total floor area is defined as the interior space of all floors of a building minus stairways, elevators, and any attics or cellars with a ceiling height of six feet or less.

In the Town's C-1A commercial areas, the general on-site parking requirement for commercial offices, professional offices, and retail establishments is 1 space per 200 square feet of total floor area; restaurants are required to provide 1 space for every 4 seats. The substantial reduction in required parking spaces for redevelopment under the Church Street Vision Standards allows the landowner more space for development, up to a FAR of 0.7. The standard parking requirement (including restaurant parking) in other commercial areas of the Town, coupled with building height limitations, has limited the opportunities for individual parcels to reach a FAR of 0.7.<sup>3</sup> The bonus provisions allow the landowner, with Council approval, to obtain additional reductions in requirements for lot coverage and parking (but not building height).

## **STUDY METHODOLOGY**

The Commission's Study Group reviewed parking associated with businesses located on and fronting Church Street between Lawyers Road NW and Dominion Road NE. The study also included parking on those portions of Center Street North and Dominion Road NE that are adjacent to properties fronting on Church Street. The geographical extent of the study area, shown in Figure 1, does not include the entire Church Street Pedestrian District.

The parking analysis consisted of three major parts: (1) collection of data on current parking demand and supply and other parking issues; (2) projection of future parking demand and supply; and (3) examination of alternatives to improve near-term and long-term parking in the Church Street corridor.

### **Part 1: Data Collection – Current Parking Demand and Supply and Parking Habits**

- Develop, from Town records, an inventory of properties, businesses, land uses, and available parking within the defined study area.
- Conduct field survey to verify inventory of on-site and on-street parking spaces.
- Survey property owners and business owners/managers regarding customer and employee parking practices. (A survey instrument was mailed to all property owners and business owners/managers, and was also posted on the Town's web site.)
- Survey the general public about their parking experiences in the study area. (A survey instrument was included in the Town's March 2008 Newsletter and also posted on the Town's web site.)
- Conduct field survey of utilization of on-street and on-site parking.

### **Part 2: Project and Analyze Future Parking Demand and Supply**

- Project future parking needs based on 1 space for every 200 square feet of floor area in the District (1:200 is the Town standard for commercial/retail establishments, except for those redeveloping under the Church Street Vision Standards, where the ratio is 1:600). This projection will assume that, over 20 years, most parcels would redevelop at the higher density levels allowed under the provisions of the Church Street Vision Standards.

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<sup>3</sup> The small number of commercial buildings in Vienna that approach or exceed an FAR of 0.7, such as the White Oak office condominium, typically have obtained waivers from required parking standards, and predate the current height limitations.

- Project future parking availability under the 1:200 and 1:600 parking ratios, as well as a mid-point 1:400 ratio. Again, it was assumed that most new development would occur under the Church Street Vision Standards.
- Compare the projected parking needs with projected parking availability to estimate parking shortfall or surplus.
- **Part 3: Examine Alternatives to Mitigate Current and Future Parking Shortages and Other Issues**
  - Enhanced administrative oversight through certificate of occupancy or other available authorities.
  - Legislative remedies, such as revised parking requirements under Church Street Vision Standards and/or revised site plan requirements.
  - Structural increases to parking supply through Town-owned facilities or additional parking incorporated into future Church Street Vision projects.

## **PART 1: CURRENT PARKING DEMAND AND SUPPLY AND PARKING HABITS**

### **Current Parking Profile**

The study area includes 22 parcels (1 undeveloped), and over 60 commercial/retail establishments (some of which were vacant during the survey). There is also a condominium complex of 36 units, as well as 10 residences which are located above commercial/retail space at 3 locations.

There are approximately 428 on-site parking spaces and 55 on-street parking spaces in the study area. These numbers are not precise because several lots and some on-street spaces were not striped at the time of the study. (Several on-street spaces on Center Street N that were not striped at the start of the study have subsequently been striped by the Department of Public Works.) In addition, field surveys showed that some on-site parking spaces were not available due to property owners occupying parking spaces with storage containers, trash containers, or inoperable vehicles. The number of on-site spaces has not been reduced to reflect these situations. In addition, a flooding problem apparently prevents or limits use of garages associated with the condominiums at 100 Church Street NW (a sign at the Center Street entrance to the complex alerts residents to the situation). Multiple curb cuts restrict the Town's ability to optimize the number of on-street parking spaces. These curb cuts also make Church Street less pedestrian friendly.

In order to quantify the magnitude and possible locations of parking shortages, the Study Group compared the existing 428 on-site parking spaces against the number of spaces that would be required under the 1:200 parking ratio. For the purposes of estimating the shortage, the ratio was applied to all properties in the study area, including the three properties already redeveloped under the Church Street Vision Standards (residential parking standards were applied to the condominium complex at 100 Church NW). These calculations are not intended to reflect actual parking requirements in site plans.

The results of this analysis are shown in Table 1 and Figure 1. In total, by applying the C-1A parking standard of 1:200, there is a shortfall of 246 spaces. A significant portion of this shortfall can be attributed to the fact that available parking at over half of the non-Vision properties is less than the 1:200 parking standard. The balance of the shortfall reflects the impact of the lower parking requirements for redevelopment under the Vision Standards and the reduced parking requirements in the approved site plan for the condominium complex. Most noteworthy, as shown in Figure 1, is that four of the nine properties that do not reach the 1:200 standard, all three Vision properties, and the condominium complex, are all in the one block stretch of Church Street NW.

<b>TABLE 1: ESTIMATE OF CURRENT ON-SITE PARKING SHORTAGE BASED ON 1:200 PARKING RATIO (not intended to reflect site plan requirements)</b>				
	<b>Number of Parcels</b>	<b>Spaces Required @ 1:200***</b>	<b>Spaces Provided</b>	<b>Estimated Parking Shortfall</b>
Exceeds 1:200 standard	7	149	188	---
Exactly meets 1:200 standard	1	12	12	---
Does not meet 1:200 standard	9	237	118	119
Undeveloped	1	---	---	---
Church Street Vision Properties*	3	165	74	91
Condominiums (36)**	1	72	36	36
<b>TOTAL</b>				<b>246</b>

\* All properties comply with 1:600 parking standard, not including any bonus incentives.

\*\* 1 space per unit approved in site plan; 2 spaces per unit required under current Town Code. Available parking not reduced to reflect flooding problem.

\*\*\* Excludes any additional parking required for restaurants.

The Study Group cautions that Table 1 reflects a “worst case scenario” that would result from peak parking demand occurring simultaneously for all properties. This is unlikely to occur since peak demand periods vary between establishments. In addition, several professional offices and businesses are closed on Sunday and a few are also closed on Saturday. While unauthorized, the undeveloped property at 120 Church NW is utilized by many visitors to the District, and helps mitigate the current parking shortage. Nevertheless, even with these considerations, it is reasonable to assume that a significant shortfall in available parking exists, especially since the required spaces have not been adjusted upward for restaurant parking. Although there are excess spaces on seven properties that theoretically could be used to mitigate a District-wide shortage, owners are not required to share these spaces and, in fact, may not be willing to do so.

FIGURE 1: MAP OF STUDY AREA WITH REQUIRED AND PROVIDED PARKING

Study Group members made a number of visits to the District to view actual parking patterns and utilization of parking spaces. Parking occupancy data were collected on Wednesday, December 19, 2007, by hour and location. While the collection date was during the holiday season and may not be fully representative of the entire year, the Study Group still considers it a useful perspective. Figure 2 shows the utilization of on-site parking spaces according to the hour of the day and business location (data is organized by the **n**orth or **s**outh side of Church Street and **e**ast or **w**est of Center Street; for example, “nw” is the north side of that part of Church Street west of Center Street). Utilization rates were highest west of Center Street, particularly on the south side of Church Street, where occupancy rates were almost 70 to over 80 percent for much of the day. While less than 100 percent, this is an average utilization rate, meaning that at some locations visitors were probably experiencing problems finding on-site parking spaces. In addition, these mid-day occupancy rates are close to the generally accepted industry standards where customers experience delays and general frustration with the parking situation.

**FIGURE 2**  
**On-site parking December 19, 2007 Church Street**

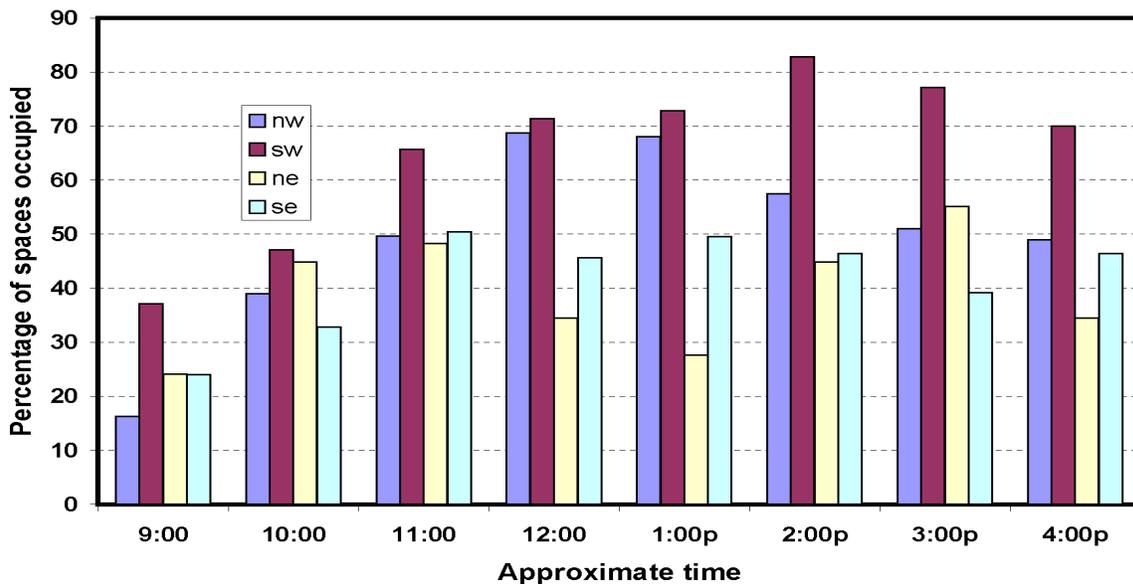
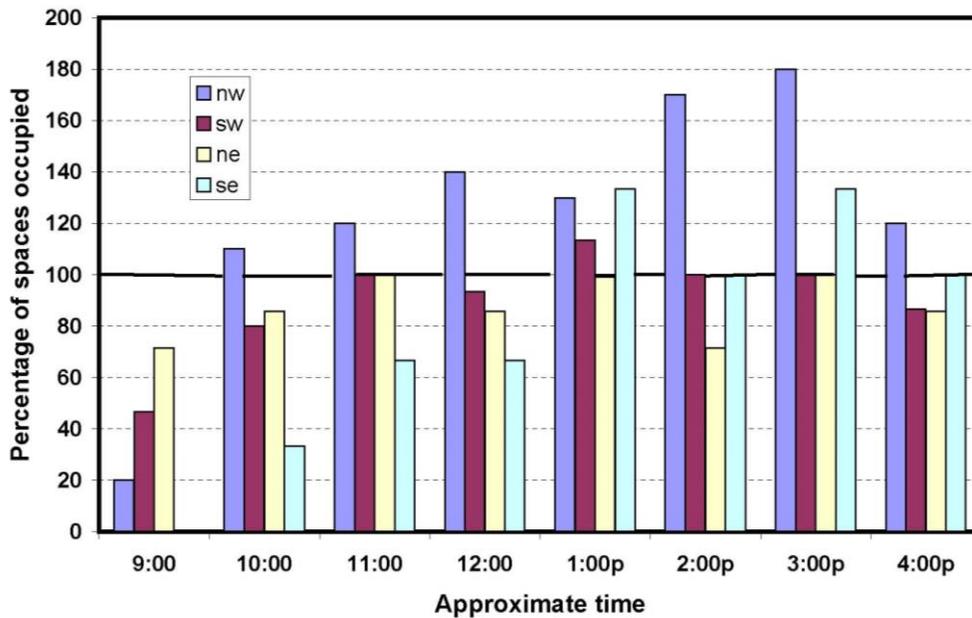


Figure 3 shows occupancy rates for on-street parking. On the day of the survey, there was a dramatic lack of available on-street spaces at one or more of the four locations for much of the day. In many instances actual parking exceeded 100 percent of the total on-street spaces due to illegal parking in un-striped areas. The mid-day peak occupancy rates for both on-site and on-street parking appear to be meal related.

Additional information about the field survey is provided in Attachment A.

**FIGURE 3**

**On-street parking December 19, 2007 Church Street**



**Results of Parking Surveys**

Property Owners and Business Owners/Managers Survey: The survey instrument, provided in Appendix B, was sent out to 58 Property and Business Owners and Business Managers; 22 responses were received, all but 2 from business owners/managers. Key findings from the responses are provided below. However, the Study Group cautions that, due to the lower than hoped for response level (38 percent), some of the findings may not be representative of the entire District.

- On-site parking generally is limited to customers and employees associated with each location, including residents where applicable. An exception is any property developed under the guidelines of the Church Street District, which requires open parking.
- Most employees are allowed to park on-site. However, employees for three businesses and one multi-tenant building are required or requested to park off-site. The three businesses have a significant number of employees; the multi-tenant building is new and not yet fully occupied, so the number of employees is unknown at this time. Two of the three businesses and the multi-tenant building are Vision properties. If on-street parking is utilized by employees, this reduces the number of spaces available for visitors, probably for a large portion of the day, even though there is a posted two hour limit for most on-street parking.
- Most of the responding businesses are open Monday through Saturday, and generally have the same number of employees present on all days. Most businesses are closed on Sundays or maintain only a skeletal staff. There are exceptions to this pattern, including one location that does most of its business on the weekends, with a significant increase in employees on Saturday compared to weekdays, and with Sunday staffing the same as a weekday. This location requires employees to park off-site.
- Most businesses indicated that the majority of their customers (70-100%) parked on-site.

General Public Survey: Responses were received from 129 individuals, 87% of whom live within the Town. The survey instrument is provided in Appendix C. Approximately 62% of the respondents visited the Church Street District at least once a week, with 20% of the respondents averaging 4-7 visits per week. Visits were almost evenly spread between weekdays and weekends, and between times of the day, with a slight advantage to weekday and afternoon visits.

- Almost half of the respondents visited more than one establishment during a visit, with the most frequent destinations being retail and dining establishments. More than 95% of visits are completed in less than 2 hours.
- The majority of the respondents (55%) utilize both on-street and on-site parking. Most of the remaining respondents (32%) usually park on the street. Only 5% of visitors park primarily on-site. A significant 9% of the respondents biked or walked to Church Street. These responses appear inconsistent with the business owner/manager responses that 70-100 percent of customers parked primarily on-site, although the public respondents may not be visiting the businesses that responded to the survey.
- Availability and proximity of parking is a major factor for visitors to the Church Street District. Difficulty in finding parking has been encountered by 82% of the respondents, with 39% experiencing difficulties more than half or nearly all the time. Over 95% of the respondents stated they go somewhere else or come back another time if they have to park more than a block away from their destination.
- The survey responses from the public identified the most difficult times to find available or convenient parking. Weekends, evenings, and lunch time dominated the responses, with restaurant parking as the most difficult location. Parking for special events was included 11 times. Interestingly, the Farmers Market was the most mentioned special event (6 times). Since the Farmers Market is outside the study area for this report, the responses may not be germane to the study. However, customers of the Farmers Market may be “spilling over” into the study area, and occupying spaces intended for customers of Church Street businesses. Demand for parking spaces next to the WO&D Trail by cyclists during the summer further exacerbates the Farmers Market situation (and weekend parking problems generally).

Time period	# of Responses*
Weekends	19
Evenings	17
Lunch time/early afternoon	13
Almost anytime	4
Rush hour	3
Special events	11

\* Some respondents did not identify difficult parking times, while others identified more than one time period

## **Parking Suggestions – Consolidated Survey Comments**

Responses from the public, property owners, and business owners/managers identified a wide range of possible actions to increase the number of parking spaces and improve the utilization of available parking in the Church Street District. By far, the most frequently mentioned solution was a Town parking garage or lot. Other suggestions to increase the number of parking spaces included consolidation of driveway entrances (which might provide more on-street parking) and conversion to angled parking and/or making Church Street one-way.

Suggestions to improve utilization of current parking include better sharing of parking by Church Street businesses, improved striping, and more and better signage to identify legal parking and to direct visitors to parking alternatives. Improved safety, including lighting, would encourage visitors to utilize spaces they might otherwise decline to use. Safety was identified as a specific issue for garages, particularly underground parking.

Suggestion	Public Comments	Property Owners/ Business Owners	Total Responses*
<b>Increase Number of Parking Spaces</b>			
Town parking garage/lot	26	3	29
Increase Vision parking standards	2	3	5
Angled parking and/or one-way traffic	3	1	4
<b>Better Utilization of Available Parking</b>			
Improve sharing of parking	6	---	6
Improve signage and striping	4	1	5
More handicapped spaces	4	---	4
More safety features	4	---	4
Limit maximum parking time	2	---	2
Improve delivery truck parking	1	2	3

\* Some respondents provided more than one suggestion; some did not provide any suggestions

## **PART 2: FUTURE PARKING DEMAND AND SUPPLY**

### **Projected Future Parking Supply**

Future parking supply was estimated by assuming redevelopment of all properties at the maximum allowable FAR of 0.7. The Church Street Vision Standard of 1 space per 600 square feet of floor area was then applied to the projected floor area of each redeveloped property. The forecast was also calculated at the standard of 1 space per 200 square feet, as well as a mid-range ratio of 1:400. (Required parking from site plans was used in all calculations for the three properties already redeveloped according to the Church Street Vision Standards.) Table 4 shows the total supply of on-site parking that would be available in the District at each of the parking ratios of the redevelopment build out.

Appendix D provides an inventory of Church Street properties and businesses, including estimates of future parking supply by parcel.

<b>TABLE 4: PROJECTED ON-SITE PARKING SUPPLY PEDESTRIAN DISTRICT REDEVELOPED AT 0.7 FAR</b>	
<b>Parking Ratio (spaces per sq. ft. of floor area)</b>	<b>Number of On-Site Parking Spaces Provided*</b>
1:200	1,086
1:400	585
1:600	416

\*Parking supply for three properties already redeveloped under Church Street Vision Standards based on approved site plans and not ratio calculations.

**Future Parking Demand and Comparison to Projected Supply**

To project future parking demand, it was assumed that the 1:200 parking standard will accurately reflect parking demand. This ratio was applied to the same floor area used to estimate parking supply. Table 5 compares the estimated parking demand with the amount of parking that would be available at each of the three parking ratios. Continued use of the current parking provisions of the Church Street Vision Standards will present a significant challenge for the Town, particularly if parking-intensive uses, such as multiple restaurants, are included in redevelopment projects. Since both the parking ratio of 1:600 and a development density of up to 0.7 FAR are by right for those properties redeveloping under the Vision Standards, the projected shortfall of 761 spaces is not considered unrealistic. Any bonus density awards by the Town Council would increase the shortfall.

<b>TABLE 5: COMPARISON OF FUTURE PARKING DEMAND AND SUPPLY FOR ON-SITE SPACES PEDESTRIAN DISTRICT REDEVELOPED AT 0.7 FAR*</b>			
<b>Supply Parking Ratio</b>	<b>Parking Available at Each Ratio</b>	<b>Parking Demand at 1:200</b>	<b>Parking Shortage</b>
1:200	1,086	1,177	91**
1:400	585	1,177	592
1:600	416	1,177	761

\* Excludes any additional parking supply or demand for restaurants.

\*\* Reflects three properties already developed under Church Street Vision Standards.

## **PART 3: ALTERNATIVES TO MITIGATING PARKING SHORTAGES**

### **Administrative Control and Enforcement**

There are certain conditions and events which affect the parking situation in the commercial areas of the Town, including the Church Street Pedestrian District. Some of these conditions can be addressed by administrative or regulatory action of the Town, usually through the Zoning Administrator. In other situations the authority of the Zoning Administrator appears to be limited by Virginia law or current Town Code. The discussion below describes some of these situations affecting parking and the Study Group's understanding of the Zoning Administrator's authority to deal with them.

- **Non-compliance with approved site plan.** On-site parking requirements are established as part of the approval process for site plans. Over time, businesses may fall into non-compliance through actions such as blocking required parking spaces with storage containers, trash dumpsters, or inoperable vehicles. In cases where there are violations of Code with respect to parking requirements or where a building owner or tenant is not in compliance with parking conditions that may have been proffered to obtain approval of a site plan, the Zoning Administrator is authorized by Virginia law and Town Code to enforce compliance by withdrawal of the Certificate of Occupancy. However, the Zoning Administrator's enforcement actions must be based on non-compliance with specific Code provisions or proffered site plan conditions. This applies to all commercial areas, including the Church Street Pedestrian District.
- **Changes in uses.** Over time, uses on a particular site may change. However, as long as the uses are appropriate for the zone and all other requirements are being met, the Zoning Administrator has limited control over such changes. This limited authority has significant implications for changes involving restaurants, either proposed expansions or new uses. Such changes could greatly affect the pattern and intensity of demand for on-site and on-street parking spaces. (See Figures 2 and 3 for the impact of popular restaurant establishments on the parking patterns in the Church Street District.)

For all commercial zones except the Church Street Pedestrian District properties developed under the Vision Standards, there are specific parking requirements for restaurants, which are reflected in approved site plans. The Zoning Administrator can enforce compliance with these requirements through the Occupancy Permit, and can increase the parking requirements to reflect a proposed expansion of a restaurant or conversion of space to restaurant use.

For properties developed under the Vision Standards, the Zoning Administrator's enforcement power is limited because parking requirements are not differentiated by use. Although planned uses may be known during the initial site plan process, there are no separate parking requirements for restaurants, nor is there a regulatory mechanism after the site plan approval to address parking requirements for a proposed expansion or new use involving a restaurant (development must still meet the 1:600 standard and any other requirements that apply).

If the Church Street Vision Standards in the Town Code were revised to include separate parking requirements for restaurants similar to other commercial zones, these requirements would be reflected in site plans – *when the planned restaurant use is known at the time of the site plan*. The site plan could be enforced by the Zoning Administrator, including a parking evaluation of any proposed expansion of a restaurant use identified in the site plan. However, without an additional change in Code, the Zoning Administrator could not evaluate the parking impact of new restaurant uses not identified in the original site plan. The Study Group believes revisions to the Vision Standards to apply restaurant parking requirements at the initial site plan and subsequent changes would provide a valuable tool to mitigate future parking shortfalls.

- Clustering of uses. The clustering of similar uses, particularly high intensity uses, could overburden the supply of on-site and on-street parking in the immediate vicinity of their location. However, if all establishments are operating in conformance with valid site plans, the Zoning Administrator can not use the Certificate of Occupancy to mitigate the situation. While these parking shortages may be inconvenient, they do not constitute a nuisance, and can not be regulated as such. (A problem must occur “at all times and under all circumstances” to be considered a nuisance.<sup>4</sup>)
- Employee Parking. There have been complaints about employees occupying on-street parking for long periods in violation of parking limits. Three survey responses from property owners and business owners/managers indicated that employees were either requested or required to park off-site to free up parking spaces for customers. This situation is unlikely to improve with redevelopment under the by-right parking ratios in the Vision Standards, which forces businesses to save scarce parking for customers. This should be a consideration in evaluating possible changes to the parking ratios in the Vision Standards. In addition, when considering bonus incentives the Town may want to factor in the issue of employee parking, and whether the applicant’s site plan includes a strategy for ensuring that employee parking does not impact the availability of on-street parking in the Church Street District or migrate to residential areas.

### **Legislative Changes to the Church Street Pedestrian District**

Revised Parking Requirements. Revising the provisions of the C1-B zone to increase the parking required for redevelopment under the Vision Standards would provide another piece of a comprehensive parking strategy. Revised Vision Standards could address the 1:600 parking ratio, as well as adopt a special parking ratio for restaurants similar to the requirements that apply to other commercial areas (1 space for every 4 seats). There are several options to “mix and match” these revisions; three examples are described below:

- Revise parking standard to 1:400. This option would increase the parking standard for the Church Street Vision Standards to 1:400, providing more parking but still less than the parking required in the other commercial districts. Town Council would also be able to provide additional parking relief as a bonus for certain design features, as the bonus density authority would not be affected by this change.

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<sup>4</sup> Turner vs Caplan, 268 Va. 122, 127-128, 596 S. E. 2d 525, (2004)

- Add parking requirement for restaurants. This option would retain the by-right 1:600 standard but impose stricter standards for space occupied by restaurants. For example, a 1,800 square foot restaurant would require only 3 parking spaces under the 1:600 ratio, which would not even be enough to accommodate staff. However, if the restaurant has 40 seats, the requirement would increase to 10 spaces (1 for every 4 seats). The restaurant parking ratio for the Vision Standards would not necessarily have to be the same as other commercial areas. In keeping with the spirit of the C1-B zone to provide incentives to redevelop under the Vision Standards, the ratio could be less, such as 1 space for every 6 seats.
- Revise standard to 1:400 and add restaurant requirement. This option would combine the elements of the two options above to provide the largest increase in parking requirements. Bonus provisions would still be in effect.

The Study Group acknowledges that there may be concerns that increased parking requirements may discourage redevelopment under the Vision Standards. However, the Study Group believes the parking shortage will be exacerbated under the current standards, and that revised standards should be considered. The table below illustrates the potential impact of the revised standards described above by applying them to the restaurants in the three properties already developed under the Vision Standards. The impact of bonus incentives is not reflected in this table.

Restaurant Address on Church Street	Restaurant Size		Number of Spaces Based on Floor Area		Number of Spaces Based on Seats	
	Floor Area	Rest. Seats	1:600	1:400	1:4 seats	1:6 seats
101 NW	1,028	24	2	3	6	4
111 NW #1	2,320	84	4	6	21	14
111 NW #2	2,175	30	4	6	8	5
144 NW	1,500	32	3	4	8	6

An example of the Code revisions that would be required to implement new parking standards is provided in Appendix E.

Additional Parking Studies. The survey responses indicated possible parking issues in areas of the Church Street Corridor not included in the study, i.e., between Dominion Road and Mill Street NE. This situation may be worthy of further evaluation. To be most useful, this evaluation should consider likely development scenarios and their impact on parking, as well as their consistency with the Town vision for that area. The study area would be bounded by Church Street NE, Dominion Road NE, Mill Street NE, and Ayr Hill Avenue NE.

Public Parking Facilities: Using public parking lots or garages to solve parking shortages was the most frequently mentioned suggestion in survey responses (see Table 3). The Study Group considered two basic approaches to providing such facilities—stand-alone facilities owned by the Town, and facilities integrated into redevelopment projects (i.e., parking spaces in excess of those required for redevelopment under the Vision Standards). These approaches are not mutually exclusive, and could be used together as part of a comprehensive parking solution.

In general, Town-owned parking facilities would be concentrated in a few large structures, while facilities incorporated into redevelopment projects would be smaller and spread throughout the District. Town-owned facilities would require a significant capital investment; the Town’s contribution to parking facilities included in redevelopment projects would be in the form of bonus incentives resulting in increased density. Each approach is discussed below, as are issues relating to safety and parking fees.

- Stand-Alone Town Facilities. A Town-owned parking facility could take several forms, ranging from a surface parking lot to a stand-alone parking structure which has both above and below ground parking levels. In order to provide a general perspective of the alternatives, the Study Group analyzed the capital investment and annual operating costs for four different facilities constructed on a parcel of approximately one half-acre. The one-half acre size was chosen since it could provide 200 additional spaces – close to the current parking shortfall – in a 3-story parking structure using a “two bay” parking design (a common and efficient design). This is not to suggest that smaller parcels could not be used. For example, a “one bay” design could be constructed on a parcel of approximately half this size, with approximately half the number of parking spaces.

The Study Group would emphasize that not only does the comparison not cover all possible alternatives, it is not a substitute for a detailed financial analysis of a real-life proposal. The Study Group also notes that the comparison does not address esthetic, technical, or other non-economic issues. For example, there may be concerns about the size and appearance of a large parking structure, height limitation issues with a three story above ground parking garage, or geological issues with constructing an underground parking garage.

Table 7 compares the four facilities, including an estimate of capital investment and annual operating expenses for each. Total investment costs provide a measure of the level of bond indebtedness that may be required for construction of a stand-alone parking facility. A capital cost per parking space is provided as a benchmark for comparison of the four facilities.

If parking fees are to be charged, Table 7 provides an estimate of the required revenue per space per day in order to cover all cash flow associated with the structure (i.e., operating expenses, debt service, and repayment). Due to a number of factors that are outside the scope of this project, this estimate may vary from the required daily revenue per space calculated by a professional parking consultant as part of a feasibility analysis. Nevertheless, the Study Group believes the estimates provide a useful frame of reference. The Study Group believes that, at least in the short term, realistic limits on hourly fees coupled with likely low to moderate “fill” rates (i.e., how much of the day spaces are occupied), will

**TABLE 7: ILLUSTRATIVE COMPARISON OF TOWN-OWNED PARKING FACILITIES**  
**(Based on a 23,000 sq. ft. parcel of land)**  
**(See Appendix F for Additional Detail)**

Type of Facility	Land Cost	Demo, Design & Construction	Total Capital Investment	# of Spaces	Investment/Space	Annual Operating Expenses**	Daily Revenue/Space for Subsidy Free Facility***	Annual Revenue Needed for Subsidy Free Facility****
Three Story Structure (above ground)*	\$4,092,968	\$4,405,000	\$8,497,968	200	\$42,490	\$130,000	\$11.28	\$811,899
Surface Parking	\$4,092,968	\$ 130,500	\$4,223,468	67	\$63,037	\$ 10,050	\$14.47	\$348,952
Two Story Structure (above ground)	\$4,092,968	\$2,939,375	\$7,032,343	133	\$52,875	\$86,450	\$13.59	\$650,743
Three Story Structure (2 above, 1 below)	\$4,092,968	\$5,126,875	\$9,219,843	183	\$50,382	\$118,950	\$17.94	\$858,774

\* Base Case

\*\* Includes costs associated with maintenance, collection of fees, and enforcement.

\*\*\* Revenue per space per day (2009 dollars) required to cover: (1) total capital investment, including land, with a 20 year repayment period @ 5% interest; (2) annual operating costs.

\*\*\*\* Annual revenue required to cover each facility's capital investment and operating costs.

prevent the Town from achieving this revenue stream, with the result that the cost of the facility will have to be subsidized by the Town.

In addition, Table 7 shows the total annual revenue required to cover all costs. This number is significant in that it shows the Town's financial exposure if it wants to provide free parking, or if it recovers only a portion of its investment, either by choice or the revenue stream does not provide the desired results, as described above. The estimate of total costs has not been adjusted for any additional business or sales tax revenue that might be generated as a result of the structure. Additional discussion on parking fees is provided later in the report.

General conclusions about the facility options include:

- Surface parking, which is probably the parking preference of most visitors, offers the lowest capital investment and annual operating costs, as well as the lowest total annual revenue. However, surface parking provides the fewest number of parking spaces per square foot of land (33-50% of the spaces provided by other options). One variation of this option would be to construct surface parking and then convert it to structured parking in the future if justified by the severity of the parking shortfall.
- Above ground structured parking makes better economic use of the land than surface parking (i.e., more parking spaces per square foot), but total construction costs, construction costs per space, and annual revenue requirements are significantly higher than surface parking. The land requirements for a 200 space parking structure are high (23,000 square feet, including setbacks), although construction costs are the largest share of total capital investment for all options except for surface parking.
- Structured parking which includes an underground parking level makes efficient use of the land, but construction costs for underground spaces are twice that of above ground spaces, significantly increasing the level of capital investment. Of all the parking alternatives, underground parking is probably the least favored by the public. As discussed later, security concerns may be a factor in this view.

Appendix F provides an expanded discussion on the economics of parking structures, as well as illustrative photographs of parking structures.

- Public Parking as Part of Redevelopment Projects. As previously described, redevelopment under the Church Street Vision Standards requires 1 parking space for every 600 square feet of floor space. Under the Vision Standards, these parking spaces must be made available to the general public, and use can not be limited to customers of those businesses located on the redeveloped property. Redevelopment proposals that include additional parking above and beyond the required parking are eligible for incentive bonuses. In the one example to date – 111 Church Street, NW -- 26 parking spaces were required and 45 were provided, a net of 18 additional parking spaces. Incentive bonuses resulting in a higher FAR (.92) were provided to the developer.<sup>5</sup>

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<sup>5</sup> In practice, the benefits from the increased parking at this location have been nullified by the impact of the associated restaurant parking, reinforcing the need to consider a separate parking standard for restaurants, and/or make planned uses a factor when considering bonus incentives.

Additional public parking incorporated into future redevelopment projects would help mitigate the parking shortage. The distribution of this additional parking in several redevelopment projects throughout the District would be more convenient to visitors than one or two stand alone parking facilities. At the same time, however, it should be noted that it could take several projects to add additional parking spaces equal to what a parking facility could provide.

The Study Group wrestled with the question of whether the Town should be receptive to redevelopment proposals incorporating significant amounts of additional parking, e.g., a “mini” parking garage. The Study Group did not identify any inherent disadvantages, although visitor safety would need to be addressed, since these spaces would be open parking without the more active management control that would be found with Town facilities, especially if fees are being charged. Any such proposals should be evaluated carefully in terms of net benefits to the Town.

- Parking Fees. Whether to charge parking fees – and how much – is one of the most complex elements in the consideration of parking facilities. Charging fees would allow the Town to recover all or a portion of its annual cash flow for operating expenses and the financing of capital investments. However, charging fees for the use of individual facilities is unlikely to work optimally as long as there is free on-street parking in the District and adjacent neighborhoods. If fees are being considered for Town parking facilities, then meters for on-street parking should be considered as well. (It is the Study Group’s view that on-street meters should only be implemented as part of a comprehensive parking plan.) Unfortunately, spill-over parking into residential areas may be a “domino effect” from the institution of pay parking, and may require parking restrictions in adjacent residential areas. Spill-over parking could also extend to adjacent commercial areas on Maple Avenue E/W, or onto Mill Street NE and Dominion Road NE.

From a strictly revenue generation standpoint, a fee structure would be set as high as possible without discouraging use of the facility. However, the Town may wish to charge a reduced rate in order to avoid discouraging visitors to the District. Reduced rates might also make parking in residential areas less attractive. The obvious trade-off with reduced fees is the substantial cash flow for annual operating expenses and capital investment costs that will have to be borne by the Town (see last column of Table 7 for the annual cash flow associated with different parking facilities).

If fees are to be charged, consideration should be given to similar fee structures for on-street parking and parking lots/structures so that visitor parking habits are not determined by differences in fees between the two options. While pay parking might reduce instances of all day on-street parking by employees, it does not solve the problem of where they will park; they may be likely to move to residential areas. Other solutions, including reduced monthly parking rates in public parking lots/structures, should be investigated.

- Safety Issues. The Study Group is very concerned about safety issues concerned with public parking. Parking structures that are not well-lit, maintained, and monitored may be a risk to Town citizens and visitors, and will discourage optimum use. Access to Town-owned parking facilities should be restricted during “off-hours.” Camera monitoring by the Vienna Police Department or a private security firm should be considered. Parking safety and liability issues should be addressed during the consideration of any parking facility, whether it is Town-owned or part of a Church Street redevelopment project.

## Conclusions

A parking shortage exists in the District, which will likely get worse with redevelopment. There is no “silver bullet” solution to this shortage, particularly in the short-term. A public parking garage would provide relief, but would require a significant investment that needs further analysis by the Town. However, there are a number of actions that could be considered by the Town.

### Enhanced Administrative Oversight and Planning

- The Town should continue to require the identification of the types of planned commercial uses on site plans during the site plan and bonus incentives review and negotiation process. The Town may wish to formalize use identification with a Code change to the site plan requirements in the Vision Standards.
- The Town may wish to notify property owners of their responsibility to ensure that on-site parking is striped and accessible to customers. Owners should, where applicable, remove inoperable vehicles, storage containers, or other items blocking the use of parking spaces required by the Certificate of Occupancy. All trash receptacles should be enclosed and placed in the rear of the building.
- The Town, working with property owners, may wish to evaluate the flooding conditions on Center Street North that affect the use of the condominium garages. The evaluation should determine the cause of the flooding and assess necessary remedial action.
- The Town should review parking signage, including time limits, to ensure it is consistently posted in all areas of the District. The Town should continue to enforce the time limits.
- The Town should seek opportunities, particularly as part of redevelopment applications, to reduce the number and size of curb cuts in the Church Street District.
- The Town should confirm that there are not any technical or other impediments to completing the alley across the back of the properties on the north side of Church Street in the NW quadrant. If impediments should exist, the Town should evaluate options of how the alley property could best be used.
- The Town may wish to conduct an analysis to determine if parking standards need to be adjusted to reflect uses with high number of employees or business vehicles, or if the impact of such uses should be considered in granting bonus incentives.
- Some uses, such as grocery and restaurant businesses, entail the use of tractor trailers or other large delivery trucks that block traffic and occupy multiple parking spaces. Their impact will become more severe as the District redevelops, deliveries become more frequent, and parking more scarce. The Town may wish to commission a study that examines the long-term parking implications of delivery vehicles and possible amendments to the zoning code to mitigate their impact. The Council, for example, could require specification of mode and/or time of deliveries, particularly by large trailers, in conjunction with the specification of building use as part of a site plan approval process.
- Although opportunities may be limited, the Town should encourage sharing arrangements between property/business owners with “excess” parking spaces and those with parking shortages.
- The Town should encourage developers to consider parcel consolidation when it would enhance the stability and economic viability of the District.

### Possible Legislative Changes to the Church Street Vision Standards

- Revise the by-right parking ratio from 1:600 to 1:400. This will still provide an incentive for redevelopment under the Vision Standards compared to other commercial zones, which have a parking ratio of 1:200, but will slow the growth in the parking shortfall. The Town Council could still reduce parking requirements for individual projects through bonus incentives.
- Add a new parking requirement for restaurants. If set lower than 1:4, it will still provide an incentive for redevelopment under the Vision Standards compared to other commercial zones (can be used separately or in conjunction with a change in the general parking ratio). Incentive bonuses could also reduce the restaurant parking requirement.
- Add Code language requiring any proposal for a new or expanded restaurant not included in an approved site plan be subject to an analysis to ensure that adequate parking will be provided.
- Consider any appropriate Code changes based on the evaluation of parking and other issues within the area bounded by Church Street NE, Dominion Road NE, Mill Street NE, and Ayr Hill Avenue NE.

## **APPENDICES**

Appendix A: Field Survey of Parking Habits

Appendix B: Survey Forms for Property Owners and Business Owners/Managers

Appendix C: Survey Form for Public Input

Appendix D: Inventory of Properties and Businesses, Including Parking Data, in the Study Area

Appendix E: Examples of Changes to Town Code to Adopt Revised Parking Standards

Appendix F: Information on Parking Facilities

## Appendix A

### Field Survey of Parking Habits

The daytime hourly field survey occurred on Wednesday December 19, 2007. Hourly counts were taken. Some of the on-site parking areas have since been striped by owners so that available space counts shown are approximate.

Table A -1: Available spaces and percent of spaces occupied December 19, 2007 by time of day.

# Space		Percent of on-site spaces occupied							
Location	On-site	9:00a	10:00a	11:00a	12:00p	1:00p	2:00p	3:00p	4:00p
sw	70	37	47	66	71	73	83	77	70
se	125	24	33	50	46	50	46	39	46
ne	141	24	45	48	34	28	45	55	34
nw	29	16	39	50	69	71	57	51	49

# Spaces		Percent of street spaces occupied							
Location	Street	9:00a	10:00a	11:00a	12:00p	1:00p	2:00p	3:00p	4:00p
sw	15	47	80	100	93	113	100	100	87
se	3	0	33	67	67	133	100	133	100
ne	10	71	86	100	86	100	71	100	86
nw	7	20	110	120	140	130	170	180	120

sw = represents businesses fronting the south side of Church Street west of Center Street in the study area.

se = represents businesses fronting the south side of Church Street east of Center Street in the study area.

ne= represents businesses fronting the north side of Church Street east of Center Street in the study area.

nw= represents businesses fronting the north side of Church Street west of Center Street in the study area.

Appendix B

Survey Forms for Property Owners and Business Owners/Managers

**PROPERTY OWNER SURVEY FORM**

*NOTE: If there is just one business on the property, and the property owner and the business owner are the same, please fill out only the business owner survey form.*

<b>Respondent Information</b>	
Property Address	
Owner or respondent's name	
Number of businesses/units on the site	
Number of residential units on the site	
Phone number and/or e-mail if we may contact you about your response	

<b>Parking Information</b>			
How many on-site parking spaces do you have?			
If parking spaces are allocated, please provide number of each?	Employee Parking	Reserved Parking Only For On-Site Business(es)/Residences	Available to General Public
Please describe how you monitor and enforce parking restrictions?			
Are employees requested or required to park off-site in order to preserve parking spaces for clients/customers?			

<b>Comments</b>	
Are you aware of any parking problems for the employees or customers of business(es) located on your property?	
Please provide any comments or suggestions that you have about parking problems and possible improvements.	

## BUSINESS OWNER OR MANAGER SURVEY FORM

Respondent Information	
Street Address	
Name of Business	
Business Type – retail; professional service; clinic/medical; food service; other (specify)	
Days and Hours of Operation	
Your Name	
Your Title	
Phone number and/or e-mail if we may contact you about your response	

Employee Information and Parking Practices			
Number of employees?	Weekdays	Saturday	Sunday
Average			
Maximum			
If there are unusual situations not covered by the above, please describe			
Where do employees park?	Park On-Site	Park on Street or Other	Walk/Public Trans/Bicycle
Estimate number of employees for each			
For street parking, what are the most commonly used locations (e.g., Church, Center, Dominion, and Mill Streets, residential streets; other)			
If there are significant variations in the number of employees based on the day of the week, hour of the day, or other factors, please describe			
If employees have trouble finding parking, please describe			
Are employees requested or required to park off-site in order to preserve parking spaces for clients/customers?	Yes <input type="checkbox"/> No <input type="checkbox"/>		

<b>Customer Information</b>			
<b>Are time &amp; number of clients/ customers controlled, e.g., through appointments?</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>		
<b>What is the number of clients/customers at any single time during regular business hours?</b>	<b>Weekdays</b>	<b>Saturday</b>	<b>Sunday</b>
Average number			
Maximum number			
Identify peak time if applicable			
<b>For Food Service or Other Applicable Business</b>			
Do you offer delivery service? If so, how many delivery vehicles are in service at any one time?			
Do you offer your product on a carryout basis?			
<b>How do customers arrive/where do they park? (your best guess)</b>	<b>Drive-- Park On-Site</b>	<b>Drive-- Park on Street</b>	<b>Public Transp./ Walk /Bicycle/Other</b>
Estimate the percentage of your total customers that fall into each category			
For street parking, what are the most commonly used locations (e.g., Church, Center, Dominion, and Mill Streets; residential streets; other)			
<b>Describe any difficulty your customers have in finding parking on a regular basis. Are there significant variations based on day of the week, hour of the day, etc.? Are there special events with significant parking demands? Can you provide an estimate of the additional parking requirements.</b>			

<b>Delivery Information</b>	
Number of deliveries/week to your business?	
Which days?	
What time (am or pm if you can't be specific)	
Where do deliver vehicles park to unload – on premises, public parking, in the street?	
Length of time for average delivery?	

<b>Comments</b>	
Please provide any comments or suggestions that you have about parking problems and possible improvements.	

Appendix C

Survey Form for Public Input

# Church Street Parking Survey

Bring or mail completed survey by March 16 to the Department of Planning & Zoning,  
Vienna Town Hall, 127 Center St., S., Vienna, VA 22180.  
The survey may also be completed online at [www.viennava.gov](http://www.viennava.gov).

1. Name and address (optional)

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2. Do you live within the town limits? Yes No

3. How frequently do you visit Church Street establishments? (from Lawyers Road to Dominion Road)  
4-7 days a week 1-3 days a week Less than once a week

4. When do your visits primarily occur?  
Weekdays Weekends Evenly Spread

5. What time of day?  
Morning Afternoon Evening Evenly spread

6. Normally, do you visit more than one establishment per trip? Yes No

7. What is the purpose of your visits? (check all that apply)  
Shopping Dining Business Services Church St. Employee

8. What is the average duration of your visit?  
Less than an hour 1-2 hours More than 3 hours

9. Where do you park?  
On site of establishment On the street Both Walk/Bike

10. How often do you have difficulty finding a parking space?  
Never Occasionally About half the time Nearly every time

11. Does it make a difference how close you park to your destination? Yes No

12. If yes, how far is too far away? At what point would you decide to go somewhere else, or come back later?  
Must be right in front Anything further than a block away Anything further than two blocks away

13. Is there a pattern to when you have difficulty parking (time of day, day of week, establishment being visited)?

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14. Do you have any suggestions to improve the parking situation in the Church Street district?

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## Appendix D

### Inventory of Properties and Businesses, Including Parking Data, in the Study Area



D, p3

D, p4

## Appendix E

### Examples of Changes to Town Code to Adopt Revised Parking Standards

#### Chapter 18 C1-B Pedestrian Commercial Zone Regulations

##### 18-87.5 J. Parking and Circulation Requirements

###### 1. ~~Standard~~ **Required** Parking Spaces

a. All parking shall be provided at a net ratio of one space per ~~600~~ **400** square feet of total floor area, *except for restaurant use, which shall require one space for every 4 seats.*

*b. Planned uses must be identified on the site plan, accompanied by a schedule showing compliance with the above parking requirements. Any proposed change in uses after site plan approval must demonstrate continued compliance with the parking standards.*

~~b-~~ c. Standard parking spaces shall measure nine by eighteen feet (9'x18').

~~c-~~ d. Parking aisles shall have a minimum width of twenty-two (22) feet.

**ECONOMICS OF A PARKING STRUCTURE IN CHURCH STREET AREA****Base Case: Three Stories Above Ground**

**Number of Spaces** 200 Above Ground 300 sq ft/space

**Initial Asset Creation**

Land	Total Floor Area*	Floors	Land Area*	Cost per sq ft**	Cost of Land
	60,000	3	23,000	\$ 178	\$ 4,092,968

**\*Floor and Land Area:** Based on most efficient 2-bay design, slope floor which requires frontage of 120 feet. To obtain 200 spaces in a 3 story, 2 bay design, the garage must run 167 feet.  $120 \times 167 = 20,000$  sq feet Added to this is 3,000 sq feet to meet C-1A setback requirements. Source: Conversations with David D. Haresign

**\*\*Cost per square foot**

Selling Price of 137 Church Street NW (11/21/2007) (FFX County Records)	\$	1,650,000
Area (sq. ft.)		9,272
Cost per sq foot	\$	178

**Demolition**

Building Area	Cost per sq ft*	Total Demo Costs
3,000	\$ 10	\$ 30,000

**\*Cost per square foot:** International Parking Institute website, Frequently Asked Questions

**Construction**

	Base Cost per Space*	Cost Adjust Factor	Adjusted per Space Costs**	Total Construction Costs
Above Ground	\$ 17,500	1.25	\$ 21,875	\$ 4,375,000

**\*Base Cost per Space:** This figure represents was derived from RS Means Quick Cost Estimator, and includes total contractor direct costs, contractor overhead and profit, and architectural fees, for a basic structure with face brick

**\*\*Adjusted per Space Costs:** This figure is consistent with the per space cost of \$22,326 per space for the recently opened VRE parking facility in Burke, VA. Source: FFX County Website

<b>Total Design/Construction and Demo Costs</b>	\$	4,405,000
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**Total Costs for Asset Creation**

<b>\$ 8,497,968</b>
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per space	\$	42,490
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	Cost per Space*	Cost Adjust Factor	Adjusted Cost per Space	Total Operating Costs
<b>Annual Operating Costs</b>	\$ 650	1	\$ 650	<b>\$ 130,000</b>

**\*Cost per space:** International Parking Institute website, Frequently Asked Questions.

**Financing Schedule**  
**Three Story, Above Ground Parking (200 spaces)**

<b>Loan Values</b>	
Loan Amount	\$8,497,968
Annual Interest Rate	5.00 %
Loan Period in Years	20
Number of Payments Per Yr	1
Start Date of Loan	6/30/2008
Optional Extra Payments	-----

<b>Payment Summary</b>	
Scheduled Payment	\$ 681,898.94
Scheduled Number of Payments	20
Actual Number of Payments	20
Total Early Payments	\$ -
Total Interest	\$ 5,140,010.76

<b>Pmt No.</b>	<b>Payment Date</b>	<b>Beginning Balance</b>	<b>Scheduled Payment</b>	<b>Extra Payment</b>	<b>Total Payment</b>	<b>Principal</b>	<b>Interest</b>	<b>Ending Balance</b>
1	6/30/2009	\$ 8,497,968.00	\$ 681,898.94	\$ -	\$ 681,898.94	\$ 257,000.54	\$ 424,898.40	\$8,240,967.46
2	6/30/2010	8,240,967.46	681,898.94	-	681,898.94	269,850.57	412,048.37	7,971,116.90
3	6/30/2011	7,971,116.90	681,898.94	-	681,898.94	283,343.09	398,555.84	7,687,773.80
4	6/30/2012	7,687,773.80	681,898.94	-	681,898.94	297,510.25	384,388.69	7,390,263.56
5	6/30/2013	7,390,263.56	681,898.94	-	681,898.94	312,385.76	369,513.18	7,077,877.79
6	6/30/2014	7,077,877.79	681,898.94	-	681,898.94	328,005.05	353,893.89	6,749,872.75
7	6/30/2015	6,749,872.75	681,898.94	-	681,898.94	344,405.30	337,493.64	6,405,467.45
8	6/30/2016	6,405,467.45	681,898.94	-	681,898.94	361,625.57	320,273.37	6,043,841.88
9	6/30/2017	6,043,841.88	681,898.94	-	681,898.94	379,706.84	302,192.09	5,664,135.04
10	6/30/2018	5,664,135.04	681,898.94	-	681,898.94	398,692.19	283,206.75	5,265,442.85
11	6/30/2019	5,265,442.85	681,898.94	-	681,898.94	418,626.80	263,272.14	4,846,816.05
12	6/30/2020	4,846,816.05	681,898.94	-	681,898.94	439,558.14	242,340.80	4,407,257.92
13	6/30/2021	4,407,257.92	681,898.94	-	681,898.94	461,536.04	220,362.90	3,945,721.88
14	6/30/2022	3,945,721.88	681,898.94	-	681,898.94	484,612.84	197,286.09	3,461,109.03
15	6/30/2023	3,461,109.03	681,898.94	-	681,898.94	508,843.49	173,055.45	2,952,265.54
16	6/30/2024	2,952,265.54	681,898.94	-	681,898.94	534,285.66	147,613.28	2,417,979.88
17	6/30/2025	2,417,979.88	681,898.94	-	681,898.94	560,999.94	120,898.99	1,856,979.94
18	6/30/2026	1,856,979.94	681,898.94	-	681,898.94	589,049.94	92,849.00	1,267,930.00
19	6/30/2027	1,267,930.00	681,898.94	-	681,898.94	618,502.44	63,396.50	649,427.56
20	6/30/2028	649,427.56	681,898.94	-	649,427.56	616,956.18	32,471.38	0.00

**Break-Even Cash Flow**  
**Three Story, Above Ground Parking (200 spaces)**  
 (numbers may not add due to rounding)

	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Escalation of O&M	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
<b>Costs</b>										
Financing	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94
O&M	\$130,000	\$135,200	\$140,608	\$146,232	\$152,082	\$158,165	\$164,491	\$171,071	\$177,914	\$185,031
Total	\$811,898.94	\$817,098.94	\$822,506.94	\$828,131.26	\$833,980.55	\$840,063.82	\$846,390.41	\$852,970.07	\$859,812.92	\$866,929.48
<b>Break-Even Revenues</b>										
Annual Revenues/ space	\$ 4,059.49	\$ 4,085.49	\$ 4,112.53	\$ 4,140.66	\$ 4,169.90	\$ 4,200.32	\$ 4,231.95	\$ 4,264.85	\$ 4,299.06	\$ 4,334.65
Daily Revenues/ space	\$ 11.28	\$ 11.35	\$ 11.42	\$ 11.50	\$ 11.58	\$ 11.67	\$ 11.76	\$ 11.85	\$ 11.94	\$ 12.04
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
Escalation of O&M	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
<b>Costs</b>										
Financing	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94	\$681,898.94
O&M	\$192,432	\$200,129	\$208,134	\$216,460	\$225,118	\$234,123	\$243,488	\$253,227	\$263,356	\$273,890
Total	\$874,330.70	\$882,027.97	\$890,033.13	\$898,358.50	\$907,016.88	\$916,021.60	\$925,386.50	\$935,126.00	\$945,255.09	\$955,789.33
<b>Break-Even Revenues</b>										
Annual Revenues/ space	\$ 4,371.65	\$ 4,410.14	\$ 4,450.17	\$ 4,491.79	\$ 4,535.08	\$ 4,580.11	\$ 4,626.93	\$ 4,675.63	\$ 4,726.28	\$ 4,778.95
Daily Revenues/ space	\$ 12.14	\$ 12.25	\$ 12.36	\$ 12.48	\$ 12.60	\$ 12.72	\$ 12.85	\$ 12.99	\$ 13.13	\$ 13.27

# ECONOMICS OF A PARKING STRUCTURE IN CHURCH STREET AREA

## Surface Parking

Number of Spaces

67	Above Ground
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## Initial Asset Creation

Land	Spaces	Land Area*	Cost per sq ft**	Cost of Land
	67	23,000	\$ 178	\$ 4,092,968

\* **Land Area:** Based on the same square footage used in parking structure calculations.

\*\***Cost per square foot**

Selling Price of 137 Church Street NW (11/21/2007) (FFX County Records)	\$ 1,650,000
Area (sq ft)	9,272
Cost per square foot	\$ 178

Demolition	Building Area	Cost per sq ft*	Total Demo Costs
	3,000	\$ 10	\$ 30,000

\***Cost per square foot:** International Parking Institute website, Frequently Asked Questions

Construction	Base Cost per Space*	Cost Adjust Factor	Adj Cost	Total Design/Construction Costs
Above Ground	\$ 1,500	1	\$ 1,500	\$ 100,500

\***Cost per square foot:** International Parking Institute website, Frequently Asked Questions \***Base Cost per Space:**

<b>Total Design/Construction and Demo Costs</b>
\$ 130,500

<b>Total Costs for Asset Creation</b>	<b>\$ 4,223,468</b>
per space	\$ 63,037

	Cost per Space*	Cost Adjust Factor	Adj Cost	Total Operating Costs
<b>Annual Operating Costs</b>	\$ 150	1	\$ 150	\$ 10,050

\***Cost per space:** Parking Structures, Planning, Design, Construction, Maintenance, and Repair, Anthony Chrest Mary S. Smith, Sam Bhuyan, Mohammad Iqbal, and Donald R. Monohan, Springer, 2001, at p. 26 Note: this is a 1999 figure for unattended surface parking which was inflated by 4% per year.

# ECONOMICS OF A PARKING STRUCTURE IN CHURCH STREET AREA

## Two Stories Above Ground

**Number of Spaces** 133 Above Ground 300 sq ft/space

## Initial Asset Creation

Land	Total Floor Area*	Floors	Land Area*	Cost per sq ft**	Cost of Land
	40,000	2	23,000	\$ 178	\$ 4,092,968

**\*Floor and Land Area:** Based on most efficient 2-bay design, slope floor which requires frontage of 120 feet. To obtain 133 spaces in a 2 story, 2 bay design, the garage must run 167 feet.  $120 \times 167 = 20,000$  sq feet Added to this is 3,000 sq feet to meet C-1A setback requirements. Source: Conversations with David D. Haresign

### \*\*Cost per square foot

Selling Price of 137 Church Street NW (11/21/2007) (FFX County Records)	\$	1,650,000
Area (sq ft)		9,272
Cost per square foot	\$	178

Demolition	Building Area	Cost per sq ft*	Total Demo Costs
	3,000	\$ 10	\$ 30,000

**\*Cost per square foot:** International Parking Institute website, Frequently Asked Questions

Construction	Base Cost per Space*	Cost Adjust Factor	Adjusted Cost**	Total Design & Construction Costs
Above Ground	\$ 17,500	1.25	\$ 21,875	\$ 2,909,375

**\*Base Cost per Space:** This figure represents was derived from RS Means Quick Cost Estimator, and includes total contractor direct costs, contractor overhead and profit, and architectural fees, for a basic structure with face brick

**\*\*Adjusted per Space Costs:** This figure is consistent with the per space cost of \$22,326 per space for the recently opened VRE parking facility in Burke, VA. Source: FFX County Website

<b>Total Design/Construction and Demo Costs</b>	\$	2,939,375
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<b>Total Costs for Asset Creation</b>	\$	<b>7,032,343</b>
	per space	\$ 52,875

	Cost per Space*	Cost Adjust Factor	Adjusted Cost	Total Operating Costs
<b>Annual Operating Costs</b>	\$ 650	1	\$ 650	\$ 86,450

**\*Cost per space:** International Parking Institute website, Frequently Asked Questions.

# ECONOMICS OF A PARKING STRUCTURE IN CHURCH STREET AREA

## Three Stories, Two Above, One Below

<b>Number of Spaces</b>	<b>183</b>	Above Ground	133	300 sq ft/space
		Below Ground	50	300 sq ft/space

## Initial Asset Creation

	Total Floor Area*	Floors	Land Area*	Cost per sq ft**	Cost of Land
<b>Land</b>	54,900	3	23,000	\$ 178	\$ 4,092,968

\***Floor and Land Area:** Based on most efficient 2-bay design, slope floor which requires frontage of 120 feet.

To obtain 200 spaces in a 3 story, 2 bay design, the garage must run 167 feet. 120 x 167 = 20,000 sq feet

Added to this is 3,000 sq feet to meet C-1A setback requirements. Source: Conversations with David D. Haresign

### \*\*Cost per square foot

Selling Price of 137 Church Street NW (11/21/2007) (FFX County Records)	\$	1,650,000
Area (sq ft)		9,272
Cost per square foot	\$	178

## Demolition

Building Area	Cost per sq ft*	Total Demo Costs
3,000	\$ 10	\$ 30,000

\***Cost per square foot:** International Parking Institute website, Frequently Asked Questions

## Construction

	Base Cost per Space*	Cost Adjust Factor	Adj Cost/ Space**	Total Construction Costs
Above Ground	\$ 17,500	1.25	\$ 21,875	\$ 2,909,375
Below Ground			\$ 43,750	\$ 2,187,500
<b>Total Construction Costs</b>				<b>\$ 5,096,875</b>

\***Base Cost per Space:** This figure represents was derived from RS Means Quick Cost Estimator, and includes total contractor direct costs, contractor overhead and profit, and architectural fees, for a basic structure with face brick

\*\***Adjusted per Space Costs:** This figure is consistent with the per space cost of \$22,326 per space for the recently opened VRE parking facility in Burke, VA. Source: FFX County Website. Below ground costs can be double above ground costs, and a few spaces are lost. Source: Conversations with David T. Haresign

<b>Total Costs Design/Const/Demo</b>	\$	5,126,875
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## Total Costs for Asset Creation

**\$ 9,219,843**

per space \$ 50,382

	Cost per Space*	Cost Adjust Factor	Adj Cost/ Space	Total Operating Costs
<b>Annual Operating Costs</b>	\$ 650	1	\$ 650	<b>\$ 118,950</b>

\***Cost per space:** International Parking Institute website, Frequently Asked Questions.