

**BOARD OF SUPERVISORS
FINANCE/GOVERNMENT OPERATIONS AND
ECONOMIC DEVELOPMENT COMMITTEE
ACTION ITEM**

SUBJECT: **CONTRACT AWARD/Construction of the Pennington Lot Parking Garage**

ELECTION DISTRICT: Leesburg

CRITICAL ACTION DATE: November 15, 2016

STAFF CONTACTS: Mark Hoffman, Transportation and Capital Infrastructure
Joe Kroboth, III, Transportation and Capital Infrastructure
Christopher Bresley, Finance and Procurement

PURPOSE: To award a contract for the construction of the Pennington Lot Parking Garage.

RECOMMENDATION: Staff recommends that the Finance/Government Operations and Economic Development Committee recommend to the Board of Supervisors (Board) that the Purchasing Agent be authorized to award a contract for the Construction of the Pennington Lot Parking Garage to Howard Shockey & Sons, Inc. in the estimated amount of \$12,684,580.

BACKGROUND: Invitation for Bid No. 356 was issued on September 1, 2016 for the Construction of the Pennington Lot Parking Garage. Six (6) bids were received on October 26, 2016 with Howard Shockey & Sons, Inc. being the lowest responsive and responsible bidder in the amount of \$12,684,580. The six bids were as follows:

Name	Bid Price
Howard Shockey & Sons, Inc.	\$12,684,580
Branch & Associates Inc.	\$12,987,000
Scheibel Construction	\$13,896,000
FHP Tectonics Corp.	\$14,197,000
Forrester Construction	\$14,298,880
Harkin Builders	\$14,399,000

The Pennington Lot Parking Garage is a four (4) level parking garage located to the east of the Pennington Parking Lot that is adjacent to the Church Street Extension in downtown Leesburg, Virginia. In addition to the construction of the parking garage, the work includes modifications to the Church Street Extension and associated storm water management and streetscaping. The four (4)

level parking garage provides 717 parking stalls in the 315'x 185' footprint. The garage is accessed via a vehicular entry/exit at grade from the southern parking bay of the existing Pennington Lot.

On October 16, 2013 the Board approved the contract for the Phase III Expansion of the Courts Complex project (8-0-1), which included all architectural and engineering services for the design and construction administration for a structured parking garage at the current Pennington Parking Lot site, new construction of an 85,000 GSF Courts building at the Church Street Parking Lot site and renovation to the existing Courts Complex.

On July 2, 2014 the Board approved (9-0) the additional scope for Phase IV 7,000 square feet, thus modifying the adopted project scope from 85,000 square feet to a maximum of 92,000 square feet.

On January 21, 2015 the Board approved the addition of approximately 180 parking spaces (9-0), or the equivalent of one additional deck, to the structured parking garage to be developed with the Courts Phase III project on the Pennington Parking Lot.

ISSUES: The Pennington Parking Structure is integral for support of the existing and new 92,000 square foot courthouse in addition to providing opportunities for future Courthouse growth. The new Courthouse cannot begin construction until the Pennington Parking Structure is complete because the new Courthouse will displace the existing courthouse parking located at the Church Street lot (northeast corner of Church Street and Edwards Ferry Road/Market Street).

While developing the Courts project, for more than two-years the County has experienced a shortage of parking necessary to support the Government Center operations in the downtown area. Recognizing this shortage, on January 21, 2015 staff brought a request to the Board for consideration to add an additional level of parking on the Pennington Lot Garage to aide in mitigating the parking situation. The original plan for the Pennington Parking Garage was to construct a three-level parking structure. This staff proposal for an additional level would increase the structure from three to four-levels and add approximately 180 spaces. The Board unanimously approved the recommendation and directed staff to proceed with all land use approvals and facility designs for a four-level parking garage on the Pennington lot.

County staff proceeded with the Board's direction and prepared applications to the Town of Leesburg for Town plan amendments, a special exception, site and building plans for a four level parking garage on the Pennington Lot. On February 23, 2016, the Town Mayor and Council approved the County's applications for up to a four level parking structure, allowing the project to move forward.

Throughout the land entitlement process required for the project in the Town of Leesburg, several residents expressed concern over the height and visual impacts of the proposed parking garage. Despite the design team's efforts to add buffering and landscape screening to hide the garage, some residents remain opposed to a four level structure. In addition to the height, a few questioned the number of parking spaces actually required to serve the courts facility as compared with the number of spaces provided by a four level structure.

The Director of Transportation and Capital Infrastructure sent an October 28, 2016 memorandum (Attachment 2) to the Board providing background on the Board's direction to add a fourth level and two separate independent sets of calculations for parking demand. One set of calculations prepared by a Town resident and another by the County's traffic engineering consultant for the

project. Both calculations conclude a three level parking garage would provide an adequate number of parking spaces to serve the Courts Facility and the Government Center overflow. These calculations use parking and door count data collected in 2015, extrapolated for the increased size of the planned Courts Facility, to approximate the number of spaces needed to serve both the Expanded Courts Facility and the Government Center overflow.

The analytical results provided in Attachment 2 indicate a three-level structure is capable of meeting the minimum anticipated peak parking demand for the Courts Phase III project along with the overflow from the Government Center. However, staff is concerned the data collected and used to compute the peak demand may have omitted two potential additional parking needs; those being an unknown quantity of County fleet vehicles that are needed to support Department operations and an unknown quantity of individuals that may have chosen to park on-street when the data was collected. Because these unknown quantities cannot be identified with any degree of certainty, Staff believes, and recommends, that a fourth level is and will be needed as a result of current parking issues at the County Government Center, the current planned expansion of the Courts facility, any future expansion of the courts complex, and to provide much needed parking for the downtown area, as well as Town of Leesburg events.

FISCAL IMPACT: Sufficient funding is appropriated in the Courts Complex (Phase III) project in the Capital Fund to award the construction contract to Howard Shockey & Sons, Inc. in the estimated amount of \$12,684,580. In addition to the contract award for construction, staff estimates third party costs of \$550,000; utility connection costs of \$150,000 and \$650,000 to adequately fund a construction contingency. When factoring in these additional costs the estimated total to construct the Pennington Lot Garage is \$14,034,580. This project is funded with lease revenue financing. The remaining unspent, unencumbered balance in the Courts Phase III Expansion Project account is \$71,350,765, which is sufficient for the construction contract award, required third party costs, utility connections, and to adequately fund a construction contingency.

It should be noted that the Pennington Lot Garage is one phase of a multi-phase Courts Complex project with a current total budget of \$79,926,695. Design for the total project was budgeted at \$9,826,695, the Phase III addition to the Courts Complex is budgeted at \$57,100,000, and construction of the Pennington Lot Garage is budgeted at \$13,000,000. In order to provide adequate funding for third party costs, utility connections, and a sufficient contingency, funds will need to be borrowed from the Phase III 92,000 square feet new courts building or the Phase III Renovation of the existing Courts Complex, which may cause a funding issue when that phase is ready for construction.

ALTERNATIVES:

1. Recommend to the Board that the Purchasing Agent be authorized to award a contract for the Construction of the Pennington Lot Parking Garage to Howard Shockey & Sons, Inc. in the estimated amount of \$12,684,580.
2. Do not recommend award of contract and direct staff on how to proceed

DRAFT MOTIONS:

1. I move that the Finance/Government Operations and Economic Development Committee recommend to the Board of Supervisors that the Purchasing Agent be authorized to award a contract for the Construction of the Pennington Lot Parking Garage to Howard Shockey & Sons, Inc. in the estimated amount of \$12,684,580.

OR

2. I move an alternate motion.

ATTACHMENT:

1. Capital Improvement Program: FY 2017 Adopted Budget, page 10-42.
2. October 28, 2016 Memorandum from the Director of Transportation to the Board of Supervisors



Courts Complex (Phase III)

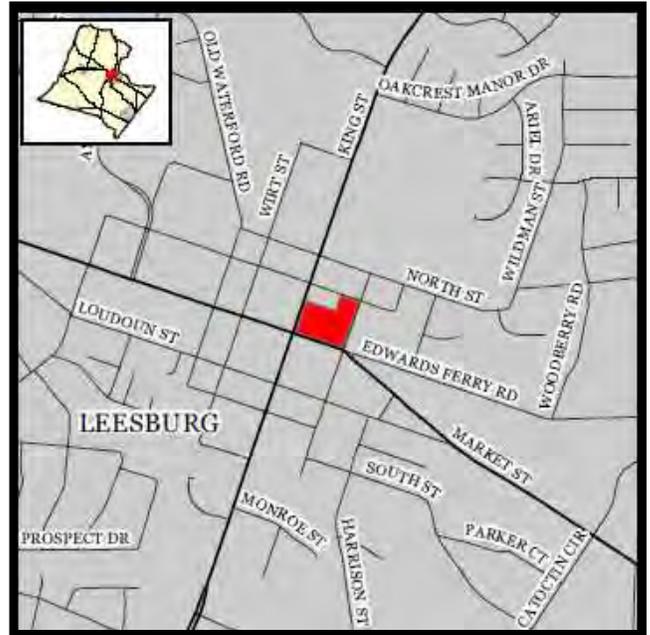
Project Description – C02140

This project provides funding to construct a new 92,000 square foot facility for the General District Court and court administrative support functions, a 725 space parking garage, and the renovation of approximately 40,000 square feet of the current Courts Complex facility in the Town of Leesburg.

Funding in prior fiscal years provided for the design of all components of the Phase III project, and the construction of a 530 space parking garage on the site of the Pennington Parking Lot adjacent to the Courts Complex. Funding in FY 2017 would construct the 92,000 square foot Phase III addition to the Court Complex, and provide a 195 space expansion to the structured parking facility at the Pennington Lot. Funding in FY 2020 would renovate approximately 40,000 square feet of the Phase I and II Courts Complex.

The volume and pace of growth impacts judicial system demands for service (caseloads), judgeship requirements, staff needs, and ultimately, space requirements. A new General District Court building was recommended in a 1997 court study. Phases I and II of the Courts Complex expansion included the renovation of the old courts and administration buildings, and the construction of new court facilities from FY 1998 through FY 2004.

A Courts Facility Assessment and Expansion Plan were developed to define the scope of the Phase III Courts Complex expansion. The design phase began in FY 2014 and is scheduled over a two year period to coordinate land use, planning and transportation issues with the Town of Leesburg.

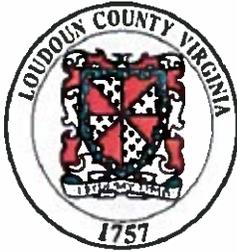


Funding Plan

This project is funded using lease revenue financing.

	Prior							6 Year	Future	Project
Capital (\$ in 1000s)	Alloc.	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Total	FY's	Total
Land	-	-	-	-	-	-	-	-	-	-
Professional Services	9,310	-	-	-	-	-	-	-	-	9,310
Construction	13,000	52,100	-	-	7,800	-	-	59,900	-	72,900
Furniture, Fixtures & Equip	-	5,000	-	-	-	-	-	5,000	-	5,000
Other	-	-	-	-	-	-	-	-	-	-
Total Cost	22,310	57,100	-	-	7,800	-	-	64,900	-	87,210
Local Tax Funding	2,010	-	-	-	-	-	-	-	-	2,010
Fund Balance	-	-	-	-	-	-	-	-	-	-
General Obligation Bonds	-	-	-	-	-	-	-	-	-	-
Lease Revenue Financing	20,300	57,100	-	-	7,800	-	-	64,900	-	85,200
State Capital Assistance	-	-	-	-	-	-	-	-	-	-
Federal Funding	-	-	-	-	-	-	-	-	-	-
Total Financing	22,310	57,100	-	-	7,800	-	-	64,900	-	87,210

Operating Impact (\$ in 1000s)	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Total
FTE	-	-	-	-	-	-	-
Personnel	-	-	-	-	-	-	-
O&M	-	-	-	-	-	524	524
Debt Service	250	1,388	3,268	5,719	6,890	7,290	24,805
Total Impact	250	1,388	3,268	5,719	6,890	7,814	25,329



Loudoun County, Virginia

www.loudoun.gov

Department of Transportation and Capital Infrastructure – MSC #64
101 Blue Seal Drive, S.E., Suite 102, P.O. Box 7500, Leesburg, VA 20177-7100
Telephone (703) 737-8624 • Fax (703) 737-8513

MEMORANDUM:

To: Chair Randall and Board Members

From:  Joe Kroboth, III, PE, LS, Director
Transportation and Capital Infrastructure

Through: Tim Hemstreet, County Administrator

Ref: Courts Expansion Phase III and Pennington Parking Garage

Date: October 28, 2016

The Courts Phase III Expansion Project has been underway for nearly three years. The Project includes the construction of a new District Court Building at the intersection of Church Street and Edwards Ferry Road and a parking garage along North Street within the Town of Leesburg.

While developing the Courts project, for more than two-years the County has experienced a significant shortage of parking necessary to support the Government Center operations in the downtown area. Recognizing this shortage, on January 21, 2015 staff brought a request to the Board for consideration to add an additional level of parking on the Pennington Lot Garage to aide in mitigating the parking situation (Attachment 1). The original plan for the Pennington Parking Garage was to construct a three-level structure. This staff proposal for an additional level would increase the structure from three to four-levels and add approximately 180 spaces. The Board unanimously approved the recommendation and directed staff to proceed with all land use approvals and facility designs for a four-level parking garage on the Pennington lot (Attachment 2).

County staff proceeded with the Board's direction and prepared applications to the Town of Leesburg for two Town plan amendments, a special exception, site and building plans for a four level parking garage on the Pennington Lot. On February 23, 2016, the Town Mayor and Council approved the County's applications allowing the project to move forward. During the Town's public process, leading toward these approvals, several residents expressed concerns over the need for a four-level parking garage and the negative visual impacts of having a parking garage near residential properties. In response to this request, County staff worked with our consultant to enhance the separation buffers and vegetation in an effort to better hide the parking garage from adjacent property owners. Several rendering were prepared to demonstrate the view shed of the garage from these properties (Attachment 3).

In July 2016, County staff was contacted by one of the Leesburg Residents who spoke at the Town's public hearing for the project. This particular Resident has specialized knowledge in statistical analysis and operates a business providing these types of calculation services. The initial discussions with the Resident sought information on our parking analysis to better understand how we concluded the need for a four-level parking garage. Staff continued dialog with this resident and continue to interact with him through to present day. On September 15, 2016, this Resident provided County staff with his own analysis for parking demand using statistical methods (Attachment 4). His calculations present conclusions that a three level parking garage can provide adequate parking to serve both the Courts Expansion and the Government Center needs. Staff reviewed this material and requested a meeting to gain better understanding of his processes and procedures used, as they were non-typical in the traffic engineering industry. Since our meeting with the Resident, held on September 21st, County staff and our Consultant have reviewed his analysis and commentary on our process. We then attempted to replicate his results using our project information and his statistical methods. We have been able to replicate his analysis and results (Attachment 5), within a reasonable tolerance, concluding a three-level parking garage would provide a sufficient number of parking spaces for the Courts Expansion and Government Center overflow, assuming the data collected is representative of the actual parking needs for the facilities.

The statistical analysis, although seeming very logical and producing reasonable results, does have limitations that leave staff to recommend the Board proceed with caution if they would like to consider returning to a three-level garage. Staff's concern center around the data collected to compute the Courts parking demand used as the basis of the process. The statistical method used is based on data collected in 2015 on the number of cars parked in certain lots, assumed to be individuals conducting business in the Courts and the Government Center. From these counts, using recommended practices from the Urban Land Institute the peak parking demand for the Courts Project was computed, and the excess or overflow from the Government Center was added to determine the total number of spaces needed to meet the demand. This process is distinctly different from that required by the Town zoning ordinance.

Due to the parking shortage experienced at the Government Center when the 2015 data was collected, many county fleet vehicles that were normally located in the downtown area, in close proximity to the Departments for which they are assigned to, were relocated to a satellite location as a mitigation measure to ease the parking shortage. These vehicles were not included in the counts and staff cannot estimate the number of county fleet vehicles offsite with a high level of certainty.

Another outcome from of the Town's public process was the recognition for greater controls and enforcement of commercial and governmental parking within the residential areas of the Town. Efforts to address this were included in the County's proffer statement requiring the County to pay the cost to install parking restriction signs along North Street and Slack Lane upon the Town's establishment of a residential parking district. Staff is of the belief that the data collected did not provide for an estimation of the number of individuals conducting business at the Courts or Government Center who may have parked on-street in the various neighborhoods throughout

the downtown area. Again, there is no certainty in estimating the number of vehicles that may have been utilizing on-street parking.

If the Pennington Parking Garage would be constructed as a three-level structure, it would be reasonable to estimate a reduction in construction cost of \$2.0 to \$2.5 million. The cost however, to add a fourth level in the future after construction is complete, could cost three to four times the estimated cost savings.

Recently the construction bids for the Pennington Parking Garage were received. Assuming the bids are in order, they will be presented to the Finance, Government Operations and Economic Development Committee, and subsequently the full Board for contract award in the near future. If the Board would like to engage in additional discussions on this issue, staff can be prepared to do so at your convenience.

This information is being provided to the Board in advance of this action for your review and consideration. If you have questions or need additional information, please do not hesitate to contact Mr. Hemstreet or me.

CC: Tim Hemstreet
Charles Yudd
John Sandy

Date of Meeting: January 21, 2015

#11b.

**BOARD OF SUPERVISORS
BUSINESS MEETING
ACTION ITEM**

SUBJECT: Finance/Government Services and Operations Committee
Report: Parking Needs for Loudoun County Government
Facilities in Downtown Leesburg

ELECTION DISTRICT: Leesburg

CRITICAL ACTION DATE: March 4, 2015

STAFF CONTACTS: Joe Kroboth, Transportation & Capital Infrastructure
Peter Hargreaves, Transportation & Capital Infrastructure
Randy Williford, General Services

PURPOSE: This item presents an opportunity for the Board of Supervisors to provide additional parking to support the Government Center staff parking requirements with the structured parking garage to be developed with the Courts Phase III project on the Pennington Parking Lot site in downtown Leesburg.

RECOMMENDATIONS:

Committee: On January 13, 2015, the Finance/Government Services and Operations Committee voted 5-0 to recommend that the Board of Supervisors direct staff to proceed with Option 1 utilizing existing capital appropriations to design approximately 180 additional parking spaces at the planned Courts structured parking garage on the Pennington Parking Lot site and to coordinate approvals with the Town of Leesburg as required. The Committee further moved to recommend that the Board authorize staff to provide a supplemental funding plan for the Board's consideration during the FY 2016 Capital Improvement Program budget deliberations to provide \$3,098,000 in supplemental construction funds for Option 1 in the FY 2017 Courts Phase III capital project budget.

Staff: Staff concurs with the Committee's recommendation.

BACKGROUND: On November 30, 2014, the County's lease of 43 parking spaces on the privately owned Courthouse Square parcel adjacent to the Government Center parking garage was terminated. The loss of this lease exacerbated a longstanding parking shortage issue for County vehicles and employees who work in the Government Center. Following this action, steps were taken to further manage the parking capacity issue by providing shuttle services to

and from the Government Center and the Pennington and Liberty Parking Lots in Downtown Leesburg during morning and evening hours for employees. Motor pool vehicles, mostly County/State vehicles, parked at the Government Center were relocated from the Government Center parking garage to various off-site locations to provide additional spaces for employee use. Because of the potential loss of the Courthouse Square parking was known for some time, County Administration had directed that a search be made to identify available parking spaces for lease in the downtown area. The search did not identify any available parking spaces for lease downtown.

Concurrent with these actions, the Department of Transportation and Capital Infrastructure (DTCI) has been developing the program for the new structured parking garage to be constructed on the Pennington Parking Lot site to support the courts operations as part of the Courts Phase III project. Dewberry Architects, Inc. (Dewberry) began the design process for the Courts Phase III project in November 2013 with space programming for the new General District Courthouse and the renovations of the existing Courts Complex buildings. The adopted program totaling 92,000 square feet for the Courts Phases III and IV space needs yields an overall parking requirement of 771 spaces for the entire Courts Complex. Based on that overall requirement, 532 new parking spaces in the structured parking garage at the Pennington Lot are planned for construction with the Courts Phase III project. The current site plan locating the structured parking garage on the Pennington Parking Lot site is included as Attachment 1.

The structured parking garage is on track for a rezoning application to be submitted to the Town of Leesburg later this month. With the parking constraints at the Government Center and the timing of the Courts project development, there is an opportunity for the Board to address the parking capacity issue by considering the addition of spaces to the new courts parking garage.

ISSUES:

Existing Parking Deficiency: The formerly leased Courthouse Square parcel included 43 parking spaces that supported County employee parking at the Government Center. The Government Center parking garage provides approximately 290 spaces available for the approximately 400 County employees that work in the Government Center. With the loss of the additional parking at the Courthouse Square parcel, parking availability became an even greater issue for employees at the Government Center. Due to the upcoming construction at the Courthouse Square parcel, there is no opportunity to reinstate this supplemental parking. The deficiency of more than 100 parking spaces remains an issue.

Options for the New Courts Parking Garage as a Solution: The structured parking garage planned with the Courts Phase III project currently provides for approximately 180 spaces per floor of parking and 532 spaces in total. These spaces are required to support the Courts programs, however, given that the garage is in early design, there is an opportunity to consider supplemental parking for the Government Center at the Pennington Parking Lot site. Two possible options exist using the planned Courts garage to address the parking capacity issue. Option 1 is to provide approximately 180 spaces, one additional full deck, with the Courts Phase III project for County Government Center staff parking. Option 2 is to provide 100 spaces,

approximately two-thirds of an additional deck, with the Courts Phase III project to meet the current 100 space deficiency at the Government Center garage. Issues for consideration with both of these two options are as follows:

- **Garage Design:** Adding an additional deck, either full or partial, will raise the height of the overall structured parking garage by approximately 12' making it more visible to residential neighbors including associated lighting. Efforts can be made to consider this impact and mitigate it with additional screening and buffering, if required.
- **Town of Leesburg Review:** The Town of Leesburg would have to review and approve providing additional parking on the Pennington Lot site to support the off-site Government Center use, however, this would provide a greater community benefit of providing additional public parking in Downtown Leesburg, something that is of importance to the Town. An updated parking study would likely be required by the Town of Leesburg with the rezoning application.
- **Cost Impact:** Dewberry estimates a cost of \$17,000 per space as the garage would increase to four (4) stories and additional code and life safety issues would need to be addressed in the revised design. Based on input from Dewberry, fees for redesign of the garage for either option would be required and would be in the order of 6 – 8% of the estimated construction cost. This includes redesign work for the rezoning application, lighting photometric calculations and traffic study revisions. In total, Option 1 with approximately 180 spaces would require approximately \$3,348,000 and Option 2 with 100 spaces would require approximately \$1,836,000 in funding.
- **Schedule Impact:** Given the rezoning application is planned for submission later this month, to implement a change, a revised submission would be required if additional parking were to be approved. Based on the current Courts Phase III project schedule, the critical action date for a decision to provide additional parking at the Pennington Parking Lot site would need to occur by March 2015 in order to minimize overall project delays as the construction of the structured parking garage is the first phase in the overall construction of the Courts Phase III project. Staff and Dewberry estimate a six (6) month overall project delay to the project if required action by the Board of Supervisors was taken to direct staff to implement the design change for additional parking by March 2015. The estimated six (6) month delay includes the additional time that would be necessary to modify the rezoning application, develop final construction documents and additional construction duration for the enlarged parking garage.

FISCAL IMPACT: Sufficient prior year appropriations exist within the Courts Phase III project to fund the design change services of approximately \$250,000 for either Option 1 or Option 2. Supplemental construction funding of \$3,098,000 would be required to fund Option 1 or \$1,586,000 for Option 2 parking space additions. Based on a review of the parking garage schedule, amending the parking space scope would require the supplemental construction funding be available in FY 2017. If the Board of Supervisors decides to proceed with either the Option 1 or 2 design, supplemental FY 2017 funding would be presented as a part of the Amended FY 2016 – FY 2020 Capital Improvement Program. The Board would consider the FY 2017 funding options during its FY 2016 budget deliberations.

ALTERNATIVES: The Committee recommendation for Board action to provide additional parking of 180 spaces in the structured parking garage at the Pennington Parking Lot site is necessary to minimize the impact the current Courts Phase III project schedule including the Rezoning Application process. The Board may choose either of the two options for supplemental parking proposed or direct staff to proceed with the Courts structured parking garage design as planned, and seek other solutions for Government Center parking.

DRAFT MOTIONS:

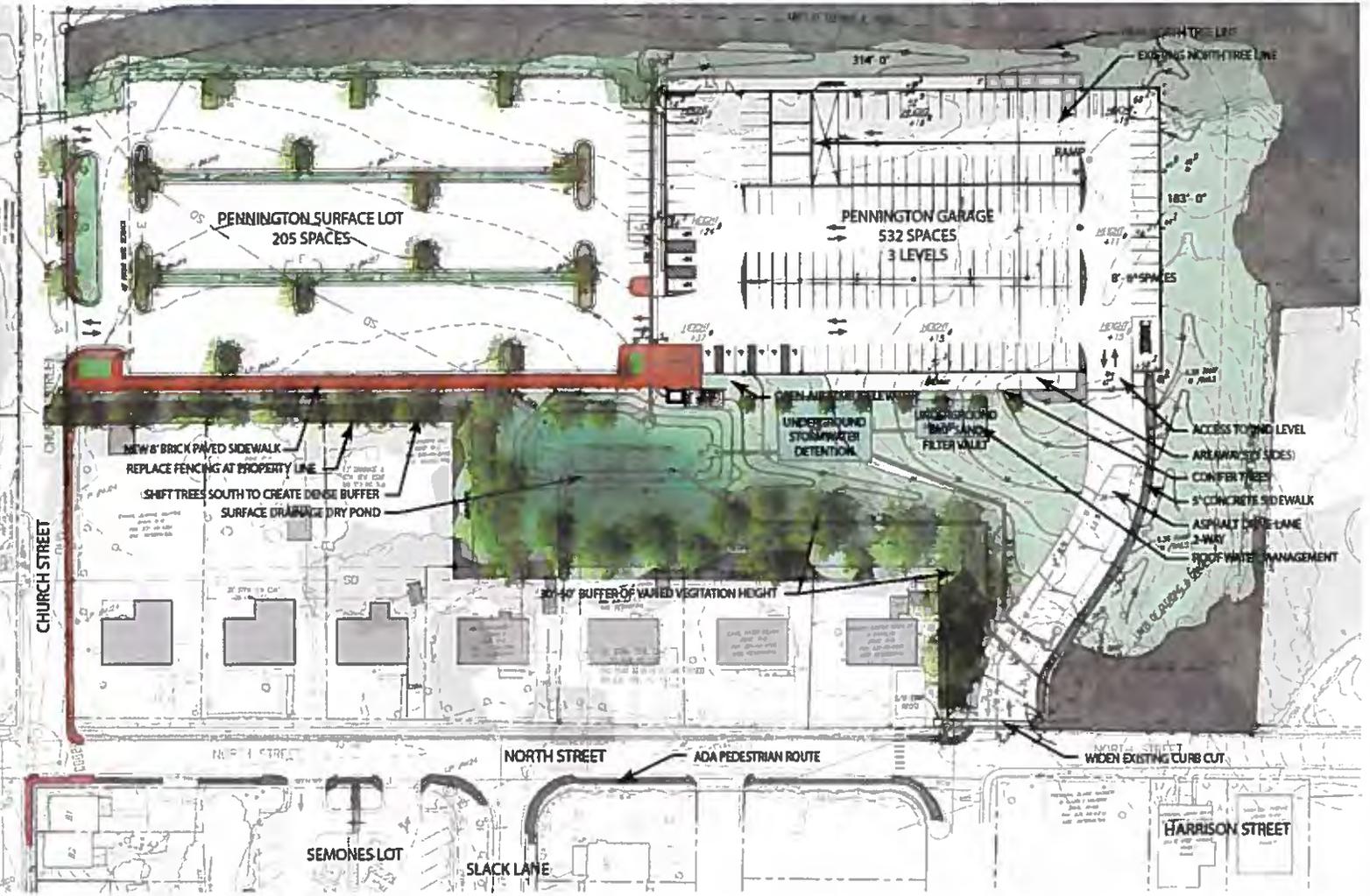
1. I move the recommendation of the Finance/Government Services and Operations Committee that the Board of Supervisors direct staff to proceed with Option 1 utilizing existing capital appropriations to design approximately 180 additional parking spaces at the planned Courts structured parking garage on the Pennington Parking Lot site and to coordinate approvals with the Town of Leesburg as required. I further move to authorize staff to provide a supplemental funding plan for the Board's consideration during the FY 2016 Capital Improvement Program budget deliberations to provide \$3,098,000 in supplemental construction funds for Option 1 in the FY 2017 Courts Phase III capital project budget.

OR

1. I move an alternate motion.

ATTACHMENTS:

1. Pennington Parking Lot Site Plan





Loudoun County, Virginia

www.loudoun.gov

Office of the County Administrator

1 Harrison Street, S.E., 5th Floor, P.O. Box 7000, Leesburg, VA 20177-7000

Telephone (703) 777-0200 • Fax (703) 777-0325

At a business meeting of the Board of Supervisors of Loudoun County, Virginia, held in the County Government Center, Board of Supervisors' Meeting Room, 1 Harrison St., S.E., Leesburg, Virginia, on Wednesday, January 21, 2015 at 4:00 p.m.

IN RE: FINANCE/GOVERNMENT SERVICES AND OPERATIONS COMMITTEE
REPORT: PARKING NEEDS FOR LOUDOUN COUNTY GOVERNMENT
FACILITIES IN DOWNTOWN LEESBURG (LEESBURG)

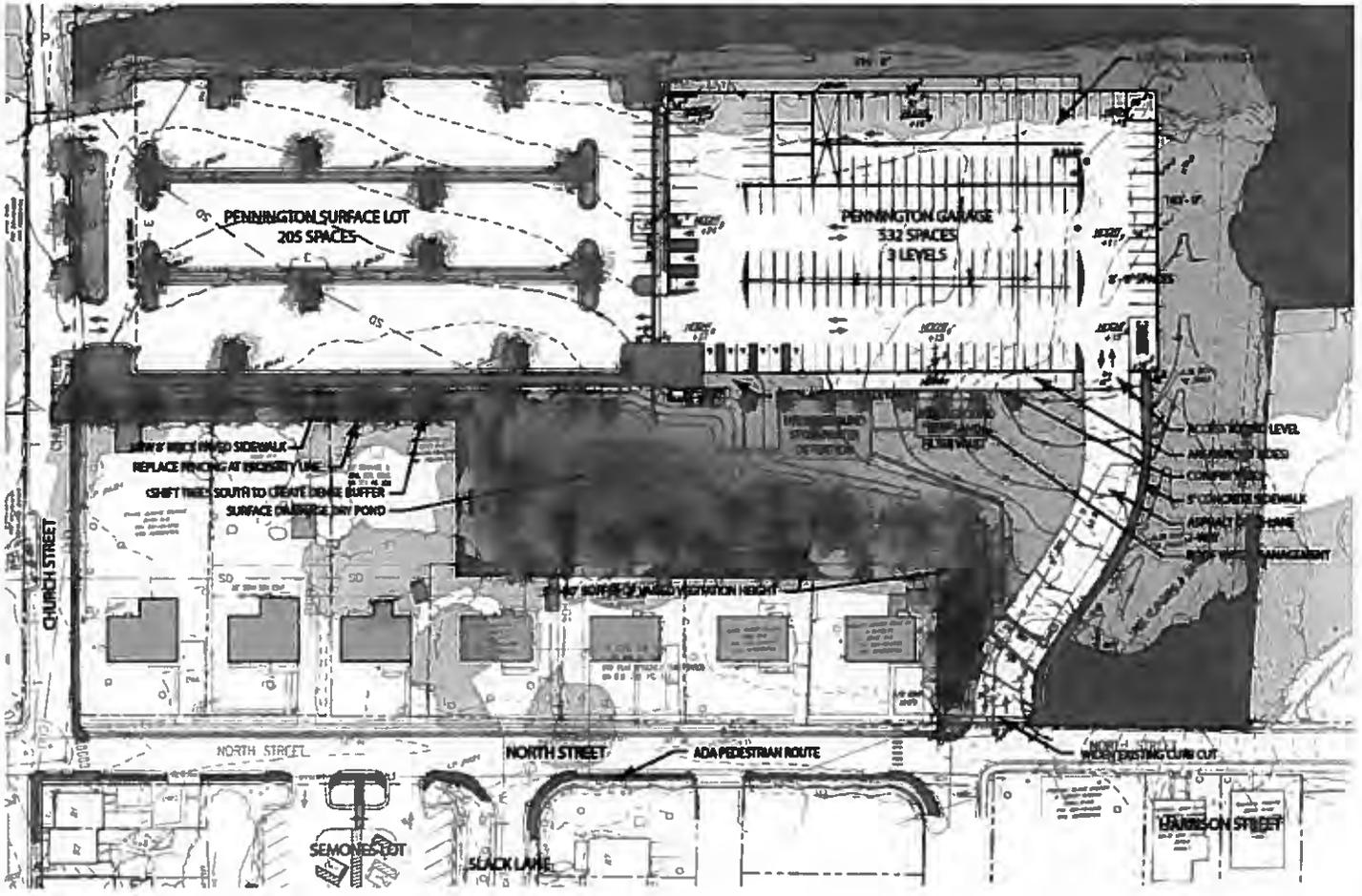
Mr. Williams moved that the Board of Supervisors approve the recommendation of the Finance/Government Services and Operations Committee to direct staff to proceed with Option 1 utilizing existing capital appropriations to design approximately 180 additional parking spaces at the planned Courts structured parking garage on the Pennington Parking Lot site and to coordinate approvals with the Town of Leesburg as required.

Mr. Williams further moved to authorize staff to provide a supplemental funding plan for the Board's consideration during the FY 2016 Capital Improvement Program budget deliberations to provide \$3,098,000 in supplemental construction funds for Option 1 in the FY 2017 Courts Phase III capital project budget.

Seconded by Mr. Buona.

Voting on the Motion: Supervisors Buona, Clarke, Delgaudio, Higgins, Letourneau, Reid, Volpe, Williams and York –Yes; None – No.

DEPUTY CLERK FOR THE LOUDOUN
COUNTY BOARD OF SUPERVISORS



3. Screening of Parking Garage

QUESTION / COMMENT	RESPONSE
Where are the evergreen trees?	127 total Evergreen Trees (55 required; 72 supplemental)

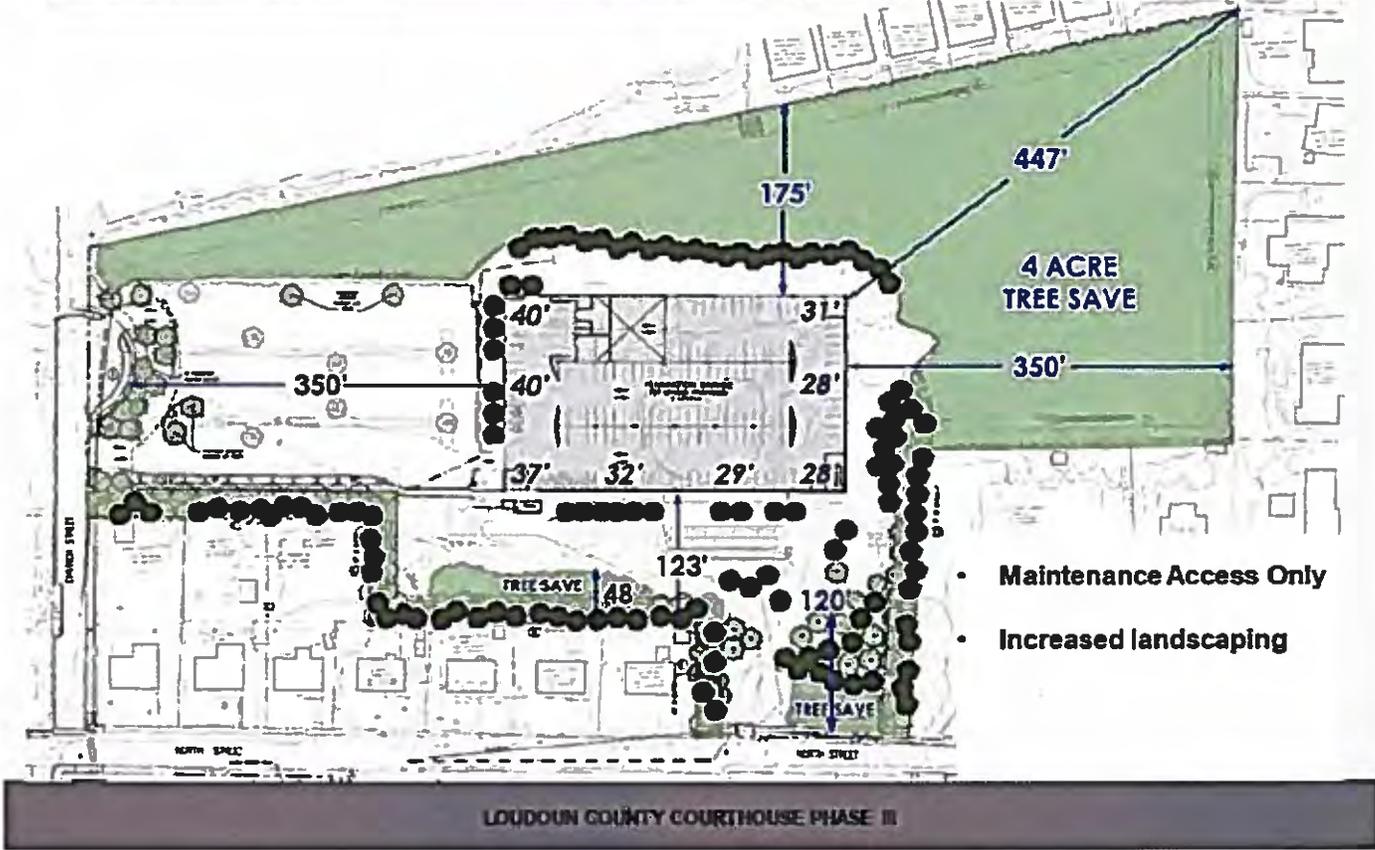


PHOTO SIMULATION - North St & Church St



PENNINGTON LOT

LOUDOUN COUNTY COURTHOUSE PHASE III

**PHOTO SIMULATION -
North St & Slack Lane**



PENNINGTON LOT

LOUDOUN COUNTY COURTHOUSE PHASE III

PHOTO SIMULATION - North St & Harrison St



PENNINGTON LOT

LOUDOUN COUNTY COURTHOUSE PHASE III

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

I. Summary

In its application to the Town of Leesburg, Loudoun County proposed building the Pennington Garage for two purposes:

1. Accommodating increased parking needs for the proposed courthouse expansion.
2. Accommodating overflow parking needs for the County Government Center Building due to spaces lost from the County no longer leasing space in the Times Mirror/Courthouse Square Lot.

In response to concerns raised about the size, appearance and expense of the Pennington Garage that was proposed to accommodate the purposes above, and to ensure that the County spends its taxpayers' money prudently, the County requested a parking demand study for the courthouse expansion project. Gorove/Slade conducted this for Dewberry Architects, the architectural consulting firm working on the courthouse expansion project. Unfortunately, in addition to several smaller issues, the study has two fundamental methodological flaws, each of which cause it to dramatically overestimate parking demand for the courthouse. If the flaws identified below are not corrected, the County stands to waste \$3 million in taxpayer money:

1. The 2016 Gorove/Slade study used 2011 data that has been rendered obsolete by a dramatic change in the relationship between courthouse square footage and door counts. The two primary data sources in the 2016 Study show the monthly peak door count-to-courthouse square footage ratio declined by 44% between 2011 and 2015. Clearly there was a fundamental shift in the relationship between courthouse square footage and courthouse door counts during this period, and using the outdated 2011 ratio skewed the study's parking demand predictions dramatically. The 2011 study had another significant shortcoming: The only day for which a parking space count was available was a low door count day, with only half the peak day door count, making that data point not representative of peak day parking.
2. The other primary set of data the 2016 study used was from a Town of Leesburg parking study conducted in 2015. This data is more recent and so more likely to reflect the true current and future relationships between door counts and courthouse square footage. Note that the Government Center Building was not leasing parking spaces at the Times-Mirror/Courthouse Square Lot when that study was conducted. This means the parking counts during the 2015 study included the courthouse area's accommodation of the overflow from the Government Center Building. The 2016 Study acknowledged this in passing, but then completely ignored this fact when using the 2015 data to calculate the courthouse's parking demand. In essence, the 2016 Study made two assumptions that are simultaneously highly questionable and blatantly contradictory, and these two assumptions caused the 2016 Study to significantly overestimate parking demand for the expanded courthouse:
 - a. The 2016 Study assumed that none (0%) of the overflow parking from the Government Center utilized space in the courthouse "parking sphere" during the 2015 study.
 - b. When predicting the parking demand after the courthouse expansion, the 2016 Study assumed that that same courthouse "parking sphere" will need to accommodate 100% of the overflow parking from the Government Center.

Once these fundamental methodological flaws are corrected, the data from the 2016 Gorove/Slade study confirm that a three level Pennington Garage will not only accommodate the expanded courthouse's needs and the overflow parking from the Government Center Building, but will provide significant additional parking spaces beyond that. The fourth level of the garage would be a complete waste of \$3 million in taxpayer money on

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

something that is not only not needed by the County, but not wanted by Leesburg or its residents, as evidenced by the recent letter from the Town Council.

II. Critique of Major Methodology Flaws

It is important when calculating parking needs ratios that the ratios be based on the most accurate and relevant information available. As the 2016 Gorove/Slade study noted, the only known available national benchmarking source for parking needs for suburban (non-urban) judicial complexes had only one data point (in Texas) and was 24 years out of date. In any case, a national, or even a state-level benchmark might have other issues of comparability, even if more data points were available. The most relevant situation from which to estimate parking demand for the Loudoun courthouse is that courthouse itself.

The 2016 study to estimate parking demand for the County was conducted by Gorove/Slade for Dewberry, a company involved with the courthouse expansion. In order to expedite the study, two prior parking and door count studies were used as the basis for most of the parking ratio calculations. One of these studies was conducted in 2011 and one in 2015. The Gorove/Slade study applied the same basic methodology to data from both studies:

- a) Observe both parking utilization and door counts at the courthouse to establish a ratio.
- b) Apply that ratio to peak door count days to estimate parking needs for those peak days.
- c) Use the number of square feet in the courthouse to convert (b) to a parking spaces per square foot ratio.
- d) Apply this ratio to the expanded courthouse's expected square feet to predict parking demand.

The Gorove/Slade study then used an average of the parking-to-square footage ratios it calculated from the 2011 and 2015 studies to predict parking demand for the post-expansion courthouse. While this may seem like a good approach, there are problems with the calculations from both the 2011 and 2015 studies.

However, as indicated in the summary, there are two major problems with using the 2011 study as a basis for projecting parking demand for the next courthouse expansion.

The first problem in using the 2011 study to predict parking demand based on courthouse square footage is that the ratio of door counts to square feet of courthouse space changed dramatically between 2011 and 2015. Comparing the door counts in the 2011 study, when the courthouse had 106,889 square feet, to the door counts in the 2015 study, when the courthouse had 169,419 square feet (a 58% increase) clearly demonstrates that the door counts per square foot of courthouse space changed dramatically between 2011 and 2015.

**Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study –
Loudoun County Courthouse Expansion**

Table 1

Door Counts and Courthouse Square Footage, 2011 to 2015 Comparison

Study Year	Courthouse Square Feet (SF)	Average Monthly Peak Day Door Count for January through March	Avg. Monthly Peak Door Count-to-1,000 SF	Highest Peak Day Door Count for January through March	3 Month Peak Door Count-to-1,000 SF
2011	106,889	1,467	13.7	1,602	15.0
2015	169,419	1,291	7.6	1,354	8.0
Change (%)	58%	-12%	-44%	-15%	-47%

Source: June 28, 2016 Gorove/Slade Technical Memorandum regarding Parking Demand Study

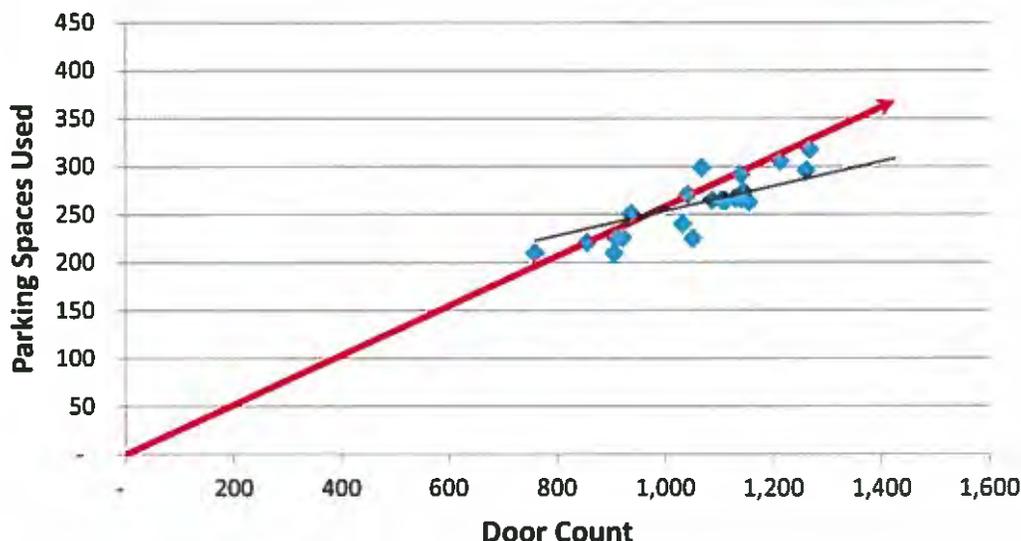
As the table above shows, peak day door counts per thousand square feet of courthouse space dropped dramatically between 2011 and 2015, 44% for the average monthly peak day and 47% for the peak day for the January through March periods. In fact, the highest door count day for **all of 2015** was only 1,437, which was lower than the average (1,467) peak day for the first three months of 2011 and 10% lower than the peak day for the first three months of 2011 (1,602). All of this clearly demonstrates that the relationship between peak door count days and the courthouse square footage changed dramatically between 2011 and 2015. And this in turn renders the 2011 data obsolete and mostly irrelevant for predicting future parking demand. Fortunately, we have more recent and extensive data from 2015 available.

The second fundamental problem with using the 2011 data is one of sampling. The only day for which parking utilization was observed in the 2011 study was a very low door count day, with slightly less than half the courthouse traffic of the peak door count day (799 versus a 1,602 peak door count during the three month period analyzed). In fact, on that day, more than half (at least 100 out of 197) of the parking spaces being used were for courthouse employees, who park all day and whose numbers do not scale with courthouse door counts, since they are generally present whether it is a peak door count day or not. Less than half (97 out of 197) of the door counts that day were courthouse visitors, who generally park for much shorter periods of time and thus use significantly fewer parking spaces per door count.

Basing a peak day projection on one low traffic day data set would thus tend to over-predict peak day parking needs. The daily data from 2015 bear out this bias. Note on the chart below that the fitted trend line (black with no arrow) has a much flatter projection trajectory than the projection line based on a single, low traffic day (red with arrow). The diamond-shaped dots are the actual parking and door count data points for March 2015 and the gap between the end points of the two lines shows the difference in projection for the average of the two peak days for 2015 (door count of 1,426).

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

March 2015 Door Counts and Parking Spaces Used with Fitted Trend Line



As the previous graph shows, this lone, low traffic day, the only parking space count data point available for 2011, very likely does not resemble the relationship between door counts and parking spaces used on peak days, when the visitor-to-employee ratio is much higher. Consequently, this makes predictions for peak usage based on this lone data point problematic and strongly biased to overestimating parking demand at peak.

Due to these two very fundamental flaws with the 2011 study, the 2015 study clearly stands out as the more relevant for predicting parking demand for the expanded courthouse, because:

1. It is the most recent, and the relationship between square footage and door counts changed dramatically between 2011 and 2015.
2. It had many more observations of parking days.
3. It had an observed parking day that was closer to “peak parking day” for which both door counts and parking space utilization were observed. Using observations that most closely mimic “peak day” conditions should come closest to predicting actual parking situations on such peak days.

Unfortunately, the way the Gorove/Slade study used the data from the 2015 study is significantly flawed. It does not attempt to capture the important fact that the Government Center did not use the Loudoun Times Mirror Parking Lot during the time in which the 2015 study took place. This situation during the 2015 study means the 2015 study actually captured data for the combined parking needs of both the courthouse and the Government Center Building overflow. This must be taken into account to develop an accurate parking demand projection based on the 2015 data.

If the Pennington site is truly a viable location for Government Center overflow parking, then it must be the case the “courthouse parking sphere” in the 2015 study accommodated some of the 157 overflow spaces the County

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

says it needs. The Gorove/Slade study completely fails to account for this when it interprets the data from the 2015 study and then proceeds to assume that all 157 of these overflow spaces will be accommodated in that same “parking sphere” once the courthouse is expanded. In other words, the Gorove/Slade study assumes that 0% of Government Center Building overflow parking used the courthouse “parking sphere” in 2015, but then assumes that 100% of that overflow will use spaces in that same sphere after the courthouse expansion.

Neither of these assumptions in the Gorove/Slade study makes much sense on its own. Some courthouse parking was surely being used for any Government Center overflow in 2015 and, realistically, not all 100% of that overflow will use the space after the expansion, given the 1,500 foot distance between the Government Center Building and the new Pennington Garage. As a point of reference, current Leesburg Town ordinances require buildings in the B-1 district surrounding the courthouse to be within 500 feet of public parking in order to waive parking requirements. However, the Pennington Garage will be built three times this distance (1,500 feet) from where the Government Center Building is located. If the ordinance were applied to the Government Center Building, the proposed Pennington Garage would not qualify; it is an unlikely realistic comprehensive overflow parking resource for the building.

But, most notably, these two assumptions are fundamentally contradictory and yet are being used in the same analysis. Either the courthouse “parking sphere” is a viable space for the Government Center overflow or it is not a viable space for the Government Center overflow. If the County expects the courthouse parking sphere to be utilized for the 157 overflow parking spaces for the Government Center after the courthouse expansion, then it is only reasonable for it to assume that it was being used for that purpose in 2015, when the Government Center was not leasing its spaces in the Loudoun Times Mirror/Courthouse Square Lot.

A realistic projection of parking needs would either:

- a. have a consistent assumed percentage of Government Center overflow parking it that it states will park in the courthouse “parking sphere”, or else
- b. offer a convincing rationale for why that percentage would change after the courthouse expansion and by how much it would realistically change.

There has been some talk about requiring Government Center employees to use the Pennington Garage. However, employees use a variety of methods to get to work: They drive themselves, carpool with another employee, get dropped off by a spouse or friend, bicycle, walk, use public transportation, etc. The County cannot force its employees to use any particular transportation mode to get to work; therefore it cannot force them to park their vehicle, if that is how they get to work, in any particular place. The only obvious way to enforce something like this would be to require employees to take a selfie of themselves with their mode of transportation every day, with that day’s newspaper in the picture, and show that picture to the employee’s supervisor. This would be a ridiculous, cumbersome and unpopular policy. It is simply not realistic.

The 2016 study by Gorove/Slade also has some other, less significant issues, which are outlined at the end of this analysis.

III. Suggested Methods for More Accurate Parking Demand Forecast

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

Fortunately, the methodological flaws mentioned in the previous section can be addressed to produce a more accurate parking demand forecast using the data already available.

The first step is to set aside the 2011 study, since the relationship between courthouse square footage and door counts has changed so dramatically, clearly rendering the 2011 data obsolete. The 2011 study also only has one day of parking observation, which was a low traffic day and thus problematic for projecting peak traffic day parking demand. This leaves the data from the 2015 study. This analysis suggests three options for doing this.

Option A: Using the 2015 Data Only with the 2016 Gorove/Slade Study Unmodified

Even if one ignored the inconsistent assumptions and took at face value the 2016 Gorove/Slade study's 2015-based parking need calculations, those calculations show that only three levels are necessary at the proposed Pennington Garage to accommodate both the expanded courthouse's needs and the Government Center's overflow parking needs.

Using the 2015 data, the 2016 Gorove/Slade study came up with a parking demand ratio of one parking space per 474 square feet of courthouse space. Applying this to the square footage of the expanded courthouse (258,419 SF) predicts that 545 spaces will eventually be needed by the expanded courthouse, once it is complete. This results in a combined need for 702 spaces to meet the needs of both the expanded courthouse and Government Center overflow, assuming all 157 overflow parking spaces are needed, as unlikely as that is. Since a three level Pennington Garage would result in 750 spaces, there would be 48 additional spaces beyond the 2016 study's projected needs, based on the most relevant data available.

Option B: Average Using Base 2016 Gorove/Slade Study Methodology Applied to 2015 Daily Counts for March

The 2016 Gorove/Slade study used parking counts for a monthly door count peak day to calculate the parking space-to-door count ratio. This is appealing because of its likely close approximation to peak day conditions. However, it is possible that outside factors could significantly impact a single day's parking utilization. Another significant advantage of the 2015 data is that it contained parking counts for an entire month (March). This means that a daily-based parking needs projection can be calculated for each courthouse day for an entire month. An average of these projections can then be calculated using these 21 sets of data, instead of relying on this ratio calculated for a single day. Calculating an average using the whole month's parking data can be useful, if only to verify that the peak day is not an outlier. The table below shows the parking needs forecasts for each of the 21 courthouse days for the month of March. As Table 2 demonstrates, the projected parking need based on the peak door count day of March 9 was slightly higher than average, but not an outlier at all.

**Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study –
Loudoun County Courthouse Expansion**

Table 2

Parking Needs Projection Based on Average of Daily Counts

Date	Day	Door Count	Peak Parking Count	Parking Space-to-Door Count Ratio	Implied Peak Parking Space Demand (2015)	Implied Parking Space-to-SF Ratio	Implied Peak Parking Space Demand (Post-Expansion CH-Only)	Implied Peak Parking Space Demand (Post-Expansion Including GC)
3/2/2015	Mon	1,141	266	0.233	332	1.96	506	663
3/3/2015	Tue	1,213	306	0.252	360	2.12	549	706
3/4/2015	Wed	1,145	274	0.239	341	2.01	520	677
3/6/2015	Fri	909	225	0.248	353	2.08	538	695
3/9/2015	Mon	1,268	318	0.251	358	2.11	546	703
3/10/2015	Tue	1,130	267	0.236	337	1.99	514	671
3/11/2015	Wed	1,105	265	0.240	342	2.02	522	679
3/12/2015	Thu	1,112	264	0.237	339	2.00	517	674
3/13/2015	Fri	1,051	225	0.214	305	1.80	465	622
3/16/2015	Mon	1,140	292	0.256	365	2.15	557	714
3/17/2015	Tue	1,262	296	0.235	334	1.97	509	666
3/18/2015	Wed	1,087	265	0.244	348	2.05	531	688
3/19/2015	Thu	1,155	263	0.228	325	1.92	496	653
3/20/2015	Fri	759	210	0.277	395	2.33	603	760
3/23/2015	Mon	937	251	0.268	382	2.25	583	740
3/24/2015	Tue	855	221	0.258	369	2.18	563	720
3/25/2015	Wed	1,068	299	0.280	399	2.36	609	766
3/26/2015	Thu	1,042	271	0.260	371	2.19	566	723
3/27/2015	Fri	1,032	240	0.233	332	1.96	506	663
3/30/2015	Mon	921	226	0.245	350	2.07	534	691
3/31/2015	Tue	905	210	0.232	331	1.95	505	662
Average		1,059	260	0.246	351	2.07	535	692

Sources: June 28, 2016 Gorove/Slade Technical Memorandum regarding Parking Demand Study and Data Addendum for June 8, 2015 Downtown Parking Task Force Report of Findings and Recommendations

Here is how the implied numbers on Table 2, above, are calculated, consistent with the 2016 Gorove/Slade methodology:

Implied Peak Day Parking Space Demand (2015): The Parking Space-to-Door Count Ratio was multiplied by the average of the two highest door count peak days for 2016 (1,426).

Implied Parking Space-to-SF Ratio: The Implied Peak Day Parking Space Demand (2015) was divided by the 2015 courthouse square footage (169,419) and then divided by 1,000.

**Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study –
Loudoun County Courthouse Expansion**

Implied Peak Day Parking Space Demand (Post-Expansion CH-Only): The Implied Parking Space-to-SF Ratio was then multiplied by the expected new courthouse square footage post-expansion (258,419) to get expanded courthouse-only parking demand.

Implied Peak Day Parking Space Demand (Post-Expansion Including GC): The 157 overflow spaces from the Government Center were added to the expanded courthouse-only parking demand.

Since a three level Pennington Garage would result in 750 spaces, there would be 58 additional spaces beyond the projected needs, based on using all 21 days' worth of the most relevant data available using this method.

Note that if the County is determined to use every available data point to obtain a projection, the single day set of data from 2011 could be added as a data point into the average calculations, using the method just described. Table 3 on the next page shows that adding the 2011 data as another daily data set changes the results very little.

**Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study –
Loudoun County Courthouse Expansion**

Table 3
Parking Needs Projection Based on Average of Daily Counts

Date	Day	Door Count	Peak Parking Count	Parking Space-to-Door Count Ratio	Implied Peak Day Parking Space Demand (2015)	Implied Parking Space-to-SF Ratio	Implied Peak Day Parking Space Demand (Post-Expansion CH-Only)	Implied Peak Day Parking Space Demand (Post-Expansion Including GC)
3/2/2015	Mon	1,141	266	0.233	332	1.96	506	663
3/3/2015	Tue	1,213	306	0.252	360	2.12	549	706
3/4/2015	Wed	1,145	274	0.239	341	2.01	520	677
3/6/2015	Fri	909	225	0.248	353	2.08	538	695
3/9/2015	Mon	1,268	318	0.251	358	2.11	546	703
3/10/2015	Tue	1,130	267	0.236	337	1.99	514	671
3/11/2015	Wed	1,105	265	0.240	342	2.02	522	679
3/12/2015	Thu	1,112	264	0.237	339	2.00	517	674
3/13/2015	Fri	1,051	225	0.214	305	1.80	465	622
3/16/2015	Mon	1,140	292	0.256	365	2.15	557	714
3/17/2015	Tue	1,262	296	0.235	334	1.97	509	666
3/18/2015	Wed	1,087	265	0.244	348	2.05	531	688
3/19/2015	Thu	1,155	263	0.228	325	1.92	496	653
3/20/2015	Fri	759	210	0.277	395	2.33	603	760
3/23/2015	Mon	937	251	0.268	382	2.25	583	740
3/24/2015	Tue	855	221	0.258	369	2.18	563	720
3/25/2015	Wed	1,068	299	0.280	399	2.36	609	766
3/26/2015	Thu	1,042	271	0.260	371	2.19	566	723
3/27/2015	Fri	1,032	240	0.233	332	1.96	506	663
3/30/2015	Mon	921	226	0.245	350	2.07	534	691
3/31/2015	Tue	905	210	0.232	331	1.95	505	662
4/16/2010	Fri	799	197	0.247	337	3.15	815	972
Average		1,047	257	0.246	350	2.12	548	705

Sources: June 28, 2016 Gorove/Slade Technical Memorandum regarding Parking Demand Study and Data Addendum for June 8, 2015 Downtown Parking Task Force Report of Findings and Recommendations

Option C: Incorporate Reasonable Assumptions of 2015 Government Center Overflow Parking Utilization

However, another factor should also be taken into consideration when using that 2015 data: the parking spaces in the courthouse parking sphere that were being used to accommodate the overflow from the Government Center, which was not leasing space in the Loudoun Times Mirror/Courthouse Square Lot at the time the 2015

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

study was conducted. In order to isolate parking demand for the courthouse, these Government Center overflow spaces must be subtracted from the parking spaces attributable to door counts for the courthouse. The County insists that all 100% of the 157 Government Center overflow spaces must be accommodated in the courthouse parking sphere. However, even making the conservative estimate that only 30% of the Government Center overflow spaces were accommodated by the courthouse parking sphere during the 2015 study demonstrates conclusively that a four level Pennington Garage would be a complete waste of taxpayer money, as the tables on the next two pages show. Table 3 below shows the calculations described on the previous page using the 2015 data:

Table 4

**Parking Needs Estimate
Based on Peak Door Count Day (March 9) During 2015 Parking Study**

Total Parking Spaces Used, Courthouse + Overflow:	318
County Government Center Overflow (30% x 157 Spaces):	47
Total, Courthouse Only:	271
Door Counts at Courthouse:	1,268
Courthouse-Related Parking Spaces per Door Count (271 / 1,268):	0.214
Average of 2 Highest Door Counts of All of 2015	1,426
2 Day Peak Parking Spaces Needed, Courthouse Only (1,426 x .214):	305
Courthouse Square Feet in 2015:	169,419
Parking Spaces per 1,000 SF Needed, Courthouse Only (305 / (169,419 / 1,000)):	1.80
Courthouse Square Feet per Parking Space, Courthouse Only (1,000 / 1.80):	555
Expanded Courthouse SF:	258,419
Spaces Needed for Expanded Courthouse (1.80 x 258,419):	465
Spaces Needed for County Government Center Overflow (100% x 157 Spaces):	157
Total Spaces Needed for Expanded Courthouse + Government Center Overflow:	622
Total Parking Spaces with a 4 Level Garage*:	934
Parking Space Excess (+) or Deficit (-):	312
Total Parking Spaces with a 3 Level Garage*:	750
Parking Space Excess (+) or Deficit (-):	128

As the calculations on the previous page show, a three level Pennington garage would not only meet the needs of the expanded courthouse AND all 157 of the Government Center Building overflow spaces, but also would provide an additional 128 spaces beyond that.

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

IV. Other Issues with 2016 Gorove/Slade Study

There are also other, less fundamental issues with the 2016 Gorove/Slade Study, such as discrepancies between the number of spaces in the County's proposed surface lot and on-site parking. This discrepancy reduced the number of spaces mentioned in the Study by 14 from what the County proposed in its application to the Town of Leesburg (920 spaces in the 2016 Gorove/Slade study versus 934 spaces in documents submitted by the County in its application to the Town of Leesburg).

The Gorove/Slade study also changed the basis for predicting "peak usage" for parking. For the 2011 parking study, the Gorove/Slade study used the average of the two busiest door count days of each month, which is a fairly reasonable measure of peak. However, when using the 2015 study, the Gorove/Slade study used the average of the two busiest days of the entire year, which seems excessive. Does the County really want to spend millions of extra dollars to accommodate parking for two days out of the year? This does not seem to be a prudent use of taxpayer money. However, the calculations in the previous section utilized this higher peak threshold, just to maintain consistency with the Gorove/Slade calculations.

The 2016 Study also makes some vague references to "external factors" in its Findings and Recommendations section. Most of these external parking factors the study mentions do not stand up under scrutiny. These questionable external factors are addressed below:

"Public use of the Pennington lot and Government Center garage is currently promoted during non-business hours, consistent with the Town of Leesburg's current downtown visitor parking advisory. However, no studies were performed to determine the amount of parking use in the garage for non-Loudoun government building use during business hours."

This seems almost to be a non sequitur. The Government Center garage does not permit non-Loudoun government building use during business hours. It is possible that there is an enforcement issue, but that is hardly a reason to spend \$3 million to build an extra floor in a remote garage for "mandatory Government Center use", whose mandatory use would certainly present even more of a challenge to enforce.

"The Town of Leesburg's Downtown Parking Task Force submitted a report dated June 8, 2015, which states that 'The on-going growth and redevelopment in this area requires additional parking capacity'. The Task Force also recommends that the Town develop a long range plan to construct a parking garage in this general area to accommodate several hundred spaces."

If current trends hold, downtown Leesburg will certainly need more parking spaces. However, parking needs to be where parking is actually needed. The quote above was taken out of context and in this case, the context is important. The specific section ("Long Term Recommendations") of the report referenced above in the quote from the Gorove/Slade study says the following (emphasis added):

"After looking at parking demands throughout the downtown, the Task Force felt that the long term plan for addressing the ever-growing need for additional parking capacity requires that additional capacity be created.

Analysis of June 28, 2016 Draft of Dewberry (Gorove/Slade) Parking Demand Study – Loudoun County Courthouse Expansion

The area of the downtown that is experiencing the greatest demand on parking is in the South East Quadrant, the area south of East Loudoun Street and east of South King Street. Redevelopment and new construction has led to significant parking shortages near the areas of Market Station, South Street, and Church Street. The ongoing growth and redevelopment in this area requires additional parking capacity. Currently the inadequate parking has led to visitors improperly using the County garage or illegally parking in spaces that are reserved for private businesses.

The Task Force recommends that the Town develop a long range plan to construct a parking garage in this general area.”

Note that the “general area” referenced by the Gorove/Slade study is the South East Quadrant, not the North East Quadrant, where the Pennington Garage would be located. So the proposed Pennington Garage would not be situated to meet the needs identified in the task force report.

A review of the zoning and buildings near the proposed Pennington Garage (see here for a zoomable map: <http://arcg.is/2b4cba2>), coupled with the application of some basic reasoning reinforces the task force report’s suggestion for locating a new garage in the South East Quadrant. The zoning map for Leesburg shows that the area near the proposed garage is probably one of the least likely places in Leesburg for significant expansion to take place, especially for commercial or retail use. In addition to the nearby cemetery, almost all of the neighborhoods near the Pennington Garage location are zoned historic district and/or residential. And, with the exception of a few streets, a significant portion of existing housing in the neighborhood is either historic or affluent, and thus resistant to encroachment for commercial purposes. No nearby streets are zoned for multi-family use, and any new developments must incorporate sufficient parking or pay for it, in order for the new construction to be approved by the Leesburg Planning Commission and Town Council. So no significant new parking needs are on the horizon near the proposed Pennington Garage.

As the 2015 task force study indicates, a much more likely path of commercial and retail development is to the east of the Government Center Building, along and to either side of East Market Street. This area is already commercially developed in a way that could make further commercial development much more attractive than the area surrounding the proposed Pennington Garage. If and when the East Market Street area is developed, they may indeed need to build significantly more parking, but the Pennington Garage location will not be an attractive alternative for such development. However, that area would be ideal for the Government Center overflow parking, since the Government Center Building is located in the South East Quadrant.

“Any future expansion to the Courts or Government uses will result in additional parking demand, which has not been accounted for in this study.”

Please see the response to the previous “external factor”, as most of those arguments apply to this factor as well.

TECHNICAL MEMORANDUM

To: Joe Kroboth Loudoun County DTCI
 Peter Hargreaves Loudoun County DTCI
CC: Rich Brittingham Dewberry
From: Tushar Awar, P.E., PTOE
Date: October 28, 2016
Subject: Parking Demand Analysis – Loudoun County Courthouse Expansion

This memorandum presents the findings of a parking demand analysis that was conducted using the following available data and references:

- March 2015 parking occupancy data – provided by the Town of Leesburg – *See Appendix A*
- 2015 Door Counts for the Courts Facility – provided by Loudoun County – *See Table A and Appendix B*
- *Urban Land Institute's (ULI) Shared Parking (2nd Edition) manual* - This publication provides up-to-date parking parameters that are useful for existing and future parking demand estimation. ULI recommends 85th percentile of observed parking demand as an appropriate design standard, which has been used as a critical factor in this exercise in order to determine the anticipated parking demand. – *See Appendix C*

Assumptions

- The Loudoun Courthouse is primarily served by the Pennington Lot, Semones Lot, the Old Jail Lot (Church St. Lot) and On-site spaces. The March 2015 parking occupancy data provides data for the Semones Lot and Pennington Lot only. The Old Jail Lot (or Church St Lot, which is closest to the Courthouse facility) and On Site Spaces were assumed to be 100% occupied for all days, which translated to 125 spaces.
- At the time the March 2015 parking counts were conducted, the Loudoun Times Mirror/Future Courthouse Square Parking Lot was not leased by Loudoun County. To be conservative, it was assumed that approximately 30% (47 spaces) of the Government Center Overflow parking was parked in the vicinity of the Courthouse and thus included in the March 2015 parking counts. This quantity was deducted from the calculations to evaluate the parking demand from the Courthouse facility exclusively. *Please see Appendix D for parking demand calculations pertaining to the Government Center.*
- Downtown Leesburg parking dynamics will significantly change with the addition of new Courthouse, subsequent loss of parking at the existing Church Street lot, reduction of parking in the Semones Lot (reduction of 49 non-handicap-accessible parking), conversion of public on-street spaces to restricted residential parking zones, and ultimately the development of Future Courthouse Square (eliminating any chance of future parking lease agreements). It is based on these future dynamics; it was assumed that 100% of the Government Center Overflow parking will be accommodated in the Pennington Garage.

- The door count numbers were increased by 50 to account for deputies and staff that don't utilize the counter but park for the Courthouse (per direction from County staff)

A set of tables and charts are attached which reflect the findings of this exercise.

The following steps were followed:

Courthouse 2015 Peak Parking Demand

- The parking space to door count ratio for 21 data points in March 2015 were calculated (Variable C in Table A).
- The available parking data is from the month of March, 2015. No parking occupancy data was available for the rest of the months in the year. Based on available door count data, to account for a seasonal/monthly factor, the 85th percentile of the highest door counts each month (from 12 months in 2015) was calculated and applied to the door count ratios from March, 2015. See **Chart A and Table A**. 1,398 was multiplied to the 21-parking space to door count ratios from March 2015 (Variable D in Table A).
- The peak parking demand (85th percentile) for 2015 based on the existing SF of 169,419 translated to 1.77 spaces per 1,000 SF

Future Peak Parking Demand

- The 2015 peak parking demand (parking space to SF ratio) was applied to the Future Expansion SF to calculate future parking demand from the Courthouse facility, which translated to 458 spaces
- The Government Center overflow (157 spaces – See *Appendix D*) was added to the Future peak parking demand from the Courthouse facility to calculate the overall future peak parking demand of 615 spaces
- See **Table B**

Other Adjustments:

- The ULI manual references an 'effective supply factor' for parking demand. It states that *'Some have argued that recommended parking ratios should be based on the 85th percentile observation plus an additional effective supply factor of 5-10 percent. Those disagreeing point out that in many cases a system may then have enough spaces to accommodate 100th percentile accumulation, albeit inefficiently due to increased search time for available spaces'*
- A Courthouse facility is a unique land use with minimal historical data available in terms of parking. Applying engineering judgement, a 5% to 10% buffer above and beyond the peak parking demand seems relevant for a use that does not have a regular pattern of visitors and who typically have a dedicated time window allotted for their visit to the facility. The purpose of this buffer would be to allow patrons to feel that the garage is not fully occupied although it may be close to serving the peak parking demand. For eg: some patrons may turn around if they can't find open parking spots that maybe available on the third level when the other two levels are fully occupied, if the parking spaces have been provided to exactly meet the peak parking demand.
- As noted above, the peak parking demand from the Courthouse facility and the Government Center Overflow translates to an overall future peak parking demand of 615 spaces

- Assuming a 10% effective supply factor above and beyond the peak parking demand of 615 spaces, the 10% effective parking supply translates to $10\% \times 615 = 62$ additional spaces
- Hence, the overall future peak parking demand translated to $615 + 62$ spaces = **677 spaces**. See **Chart B**.

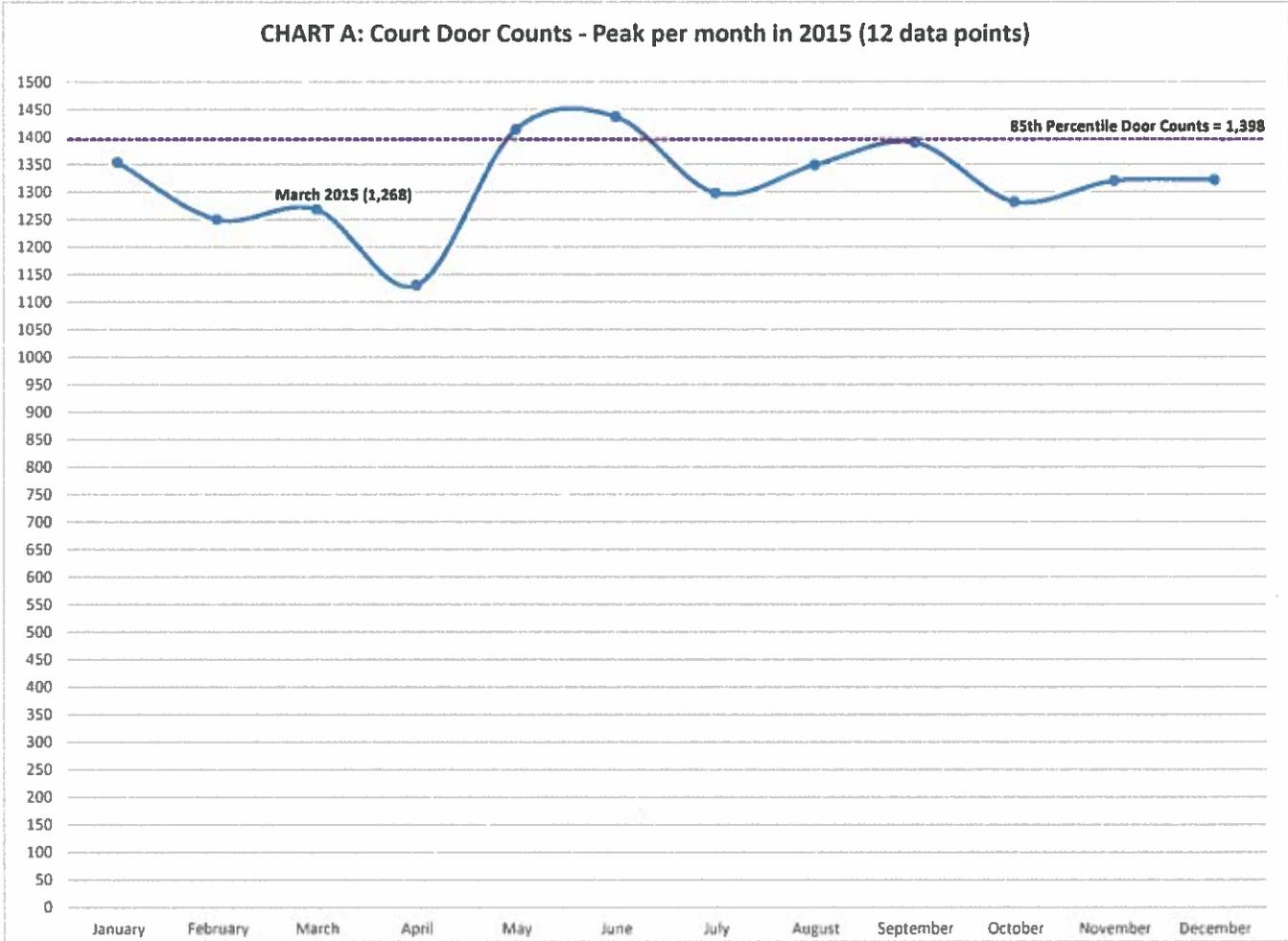
Findings

- The 3-levels of the proposed Pennington Garage will allow for a total of **750 parking spaces**, which will be available for the future Courthouse facility
- The analysis reveals that with a 10% effective supply factor accounted for and overflow parking from the Government Center, the 3 Level Pennington Garage will accommodate the future demand from the Courthouse facility.

Limitations

- This analysis is based on data collected by others over a one-month period in calendar year 2015. The data was not exclusively collected to determine the parking demand from the Courthouse facility, however the data is part of an overall parking data collection exercise for the Town of Leesburg, which included data for the Pennington and Semones lots. No new data was collected as part of this exercise.
- This analysis does not account for future expansion of the courts facility, use of the parking structure by nearby residents or special event parking in the community.
- The analysis did not include collection of data relating to County owned vehicles that normally would be parked at a downtown parking space, that may have been moved to a satellite parking area during the data collection period.

CHART A: Court Door Counts - Peak per month in 2015 (12 data points)



October 28, 2016

Prepared by: Gorove/Slade Associates, Inc.

TABLE A

	Date	Day	Door Count	Peak Parking Count	Peak Parking Count - 30% GC Overflow Parking	Parking Space-to-Door Count Ratio	Annual Peak Parking Space Demand (2015)	Annual Parking Space-to-SF Ratio (2015)
			A	B	B1 = B-47	C=B1/A	D=C*1398	E=D/169,419
1	3/2/2015	Mon	1,141	266	219	0.192	268	1.58
2	3/3/2015	Tue	1,213	306	259	0.214	299	1.76
3	3/4/2015	Wed	1,145	274	227	0.198	277	1.64
4	3/6/2015	Fri	909	225	178	0.196	274	1.62
5	3/9/2015	Mon	1,268	318	271	0.214	299	1.76
6	3/10/2015	Tue	1,130	267	220	0.195	272	1.61
7	3/11/2015	Wed	1,105	265	218	0.197	276	1.63
8	3/12/2015	Thu	1,112	264	217	0.195	273	1.61
9	3/13/2015	Fri	1,051	225	178	0.169	237	1.40
10	3/16/2015	Mon	1,140	292	245	0.215	300	1.77
11	3/17/2015	Tue	1,262	296	249	0.197	276	1.63
12	3/18/2015	Wed	1,087	265	218	0.201	280	1.65
13	3/19/2015	Thu	1,155	263	216	0.187	261	1.54
14	3/20/2015	Fri	759	210	163	0.215	300	1.77
15	3/23/2015	Mon	937	251	204	0.218	304	1.80
16	3/24/2015	Tue	855	223	176	0.206	288	1.70
17	3/25/2015	Wed	1,068	299	252	0.236	330	1.95
18	3/26/2015	Thu	1,042	273	226	0.217	303	1.79
19	3/27/2015	Fri	1,032	240	193	0.187	261	1.54
20	3/30/2015	Mon	921	233	186	0.202	282	1.67
21	3/31/2015	Tue	905	218	171	0.189	264	1.56
Average								1.67
85th Percentile								1.77
Maximum								1.95
Minimum								1.80

TABLE B

Date	Day	Door Count	Peak Parking Count	Peak Parking Count - 30% GC Overflow Parking	Parking Space-to-Door Count Ratio	Annual Peak Parking Space Demand (2015)	Annual Parking Space-to-SF Ratio (2015)	Future Peak Parking Demand (Post Expansion CH-Only)	Overall Future Peak Parking Demand (Post Expansion Including GC Overflow)	3-Level Pennington Garage Available Spaces	Surplus/Deficit	Capacity Percentile
		A	B	B1 = B-47	C=B1/A	D=C*1398	E=D/169.419	F=E*258.419	G=F+157	H	I=H-G	J=G/H
3/2/2015	Mon	1,141	266	219	0.192	268	1.58	409	566	750	184	75.50%
3/3/2015	Tue	1,213	306	259	0.214	299	1.76	455	612	750	138	81.64%
3/4/2015	Wed	1,145	274	227	0.198	277	1.64	423	580	750	170	77.30%
3/6/2015	Fri	909	225	178	0.196	274	1.62	418	575	750	175	76.61%
3/9/2015	Mon	1,268	318	271	0.214	299	1.76	456	613	750	137	81.70%
3/10/2015	Tue	1,130	267	220	0.195	272	1.61	415	572	750	178	76.29%
3/11/2015	Wed	1,105	265	218	0.197	276	1.63	421	578	750	172	77.03%
3/12/2015	Thu	1,112	264	217	0.195	273	1.61	416	573	750	177	76.42%
3/13/2015	Fri	1,051	225	178	0.169	237	1.40	361	518	750	232	69.09%
3/16/2015	Mon	1,140	292	245	0.215	300	1.77	458	615	750	135	82.04%
3/17/2015	Tue	1,262	296	249	0.197	276	1.63	421	578	750	172	77.03%
3/18/2015	Wed	1,087	265	218	0.201	280	1.65	428	585	750	165	77.95%
3/19/2015	Thu	1,155	263	216	0.187	261	1.54	399	556	750	194	74.10%
3/20/2015	Fri	759	210	163	0.215	300	1.77	458	615	750	135	81.99%
3/23/2015	Mon	937	251	204	0.218	304	1.80	464	621	750	129	82.83%
3/24/2015	Tue	855	223	176	0.206	288	1.70	439	596	750	154	79.46%
3/25/2015	Wed	1,068	299	252	0.236	330	1.95	503	660	750	90	88.02%
3/26/2015	Thu	1,042	273	226	0.217	303	1.79	462	619	750	131	82.60%
3/27/2015	Fri	1,032	240	193	0.187	261	1.54	399	556	750	194	74.11%
3/30/2015	Mon	921	233	186	0.202	282	1.67	431	588	750	162	78.35%
3/31/2015	Tue	905	218	171	0.189	264	1.56	403	560	750	190	74.66%
Average							1.67	430	587	750	163	78.32%
85th Percentile							1.77	458	615	750	135	82.04%
Maximum							1.95	503	660	750	90	88.02%
Minimum							1.80	465	622	750	128	82.95%

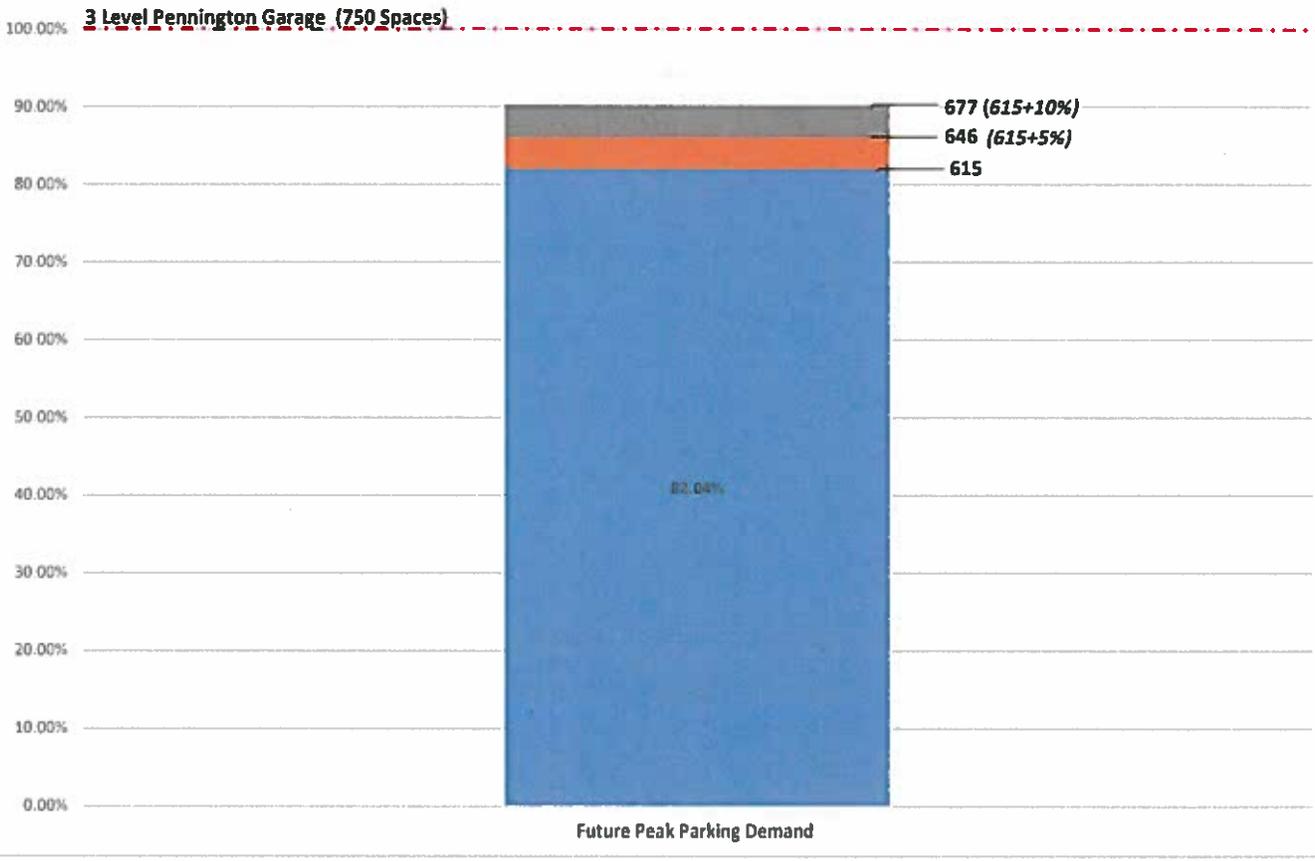
CH - Courthouse; GC - Government Center

October 28, 2016

Prepared By: Gorove/Slade Associates, Inc.

CHART B: Parking Demand Projections with Courthouse Expansion + Government Center Overflow

■ 85th Percentile Parking Demand ■ 85th Percentile Parking Demand + 5% ■ 85th Percentile Parking Demand + 10%



TECHNICAL APPENDIX

APPENDIX A

Town of Leesburg - 2015 Parking Data

APPENDIX B

Loudoun County Courts Complex Door Counts

APPENDIX C

ULI Excerpt

APPENDIX D

Government Center Parking Calculations

APPENDIX A

Town of Leesburg – 2015 Parking Data



Surface Lots - Parking Counts (March 1-31)

				Liberty	Semones	Pennington	Total Spaces		
				Total Spaces	106	68	202	376	
		Temp	Weather	Occupied	Occupied	Occupied	Total Occupied	Percent Occupied	
1-Mar	Mid Morning	NA	NA	NA	NA	NA	/		
	Mid Afternoon	NA	NA	NA	NA	NA	/		
2-Mar	Mid Morning	37	Sunny	32	64	77	173	46%	
	Mid Afternoon	37	Sunny	30	56	73	159	42%	
3-Mar	Mid Morning	32	Cloudy	30	63	118	211	56%	
	Mid Afternoon	32	Cloudy	49	61	110	220	59%	
4-Mar	Mid Morning	41	Cloudy	32	64	85	181	48%	
	Mid Afternoon	41	Rain	41	62	54	157	42%	
5-Mar	Mid Morning	NA	NA	NA	NA	NA	0	0%	
	Mid Afternoon	NA	NA	NA	NA	NA	0	0%	
6-Mar	Mid Morning	24	Sunny	29	43	57	129	34%	
	Mid Afternoon	30	Sunny	34	30	61	125	33%	
7-Mar	Mid Morning	25	Sunny	19	13	39	71	19%	
	Mid Afternoon	42	Sunny	19	1	28	48	13%	
8-Mar	Mid Morning	39	Sunny	18	1	25	44	12%	
	Mid Afternoon	56	Sunny	23	5	29	57	15%	
9-Mar	Mid Morning	44	Cloudy	33	62	131	226	60%	
	Mid Afternoon	55	Sunny	38	58	94	190	51%	
10-Mar	Mid Morning	41	Cloudy	33	56	77	166	44%	
	Mid Afternoon	54	Rain	41	62	80	183	49%	
11-Mar	Mid Morning	46	Cloudy	41	63	77	181	48%	
	Mid Afternoon	59	Cloudy	51	51	55	157	42%	
12-Mar	Mid Morning	45	Sunny	38	65	74	177	47%	
	Mid Afternoon	54	Sunny	43	59	74	176	47%	
13-Mar	Mid Morning	43	Sunny	41	46	54	141	38%	
	Mid Afternoon	54	Cloudy	45	40	59	144	38%	
14-Mar	Mid Morning	42	Rain	17	3	32	52	14%	
	Mid Afternoon	54	Cloudy	17	19	56	92	24%	
15-Mar	Mid Morning	42	Cloudy	42	2	28	72	19%	
	Mid Afternoon	54	Sunny	47	10	28	85	23%	
16-Mar	Mid Morning	40	Cloudy	48	66	101	215	57%	
	Mid Afternoon	61	Sunny	55	54	83	192	51%	

Surface Lots
Parking Counts

				Liberty	Semones	Pennington	Total Spaces	
			Total Spaces	106	68	202	376	
		Temp	Weather	Occupied	Occupied	Occupied	Total Occupied	Percent Occupied
17-Mar	Mid Morning	60	Sunny	49	64	107	220	59%
	Mid Afternoon	68	Sunny	50	56	106	212	56%
18-Mar	Mid Morning	37	Sunny	43	62	78	183	49%
	Mid Afternoon	45	Sunny	54	64	61	179	48%
19-Mar	Mid Morning	41	Sunny	41	62	76	179	48%
	Mid Afternoon	50	Sunny	48	61	74	183	49%
20-Mar	Mid Morning	34	Snow	25	38	47	110	29%
	Mid Afternoon	34	Rain	30	28	38	96	26%
21-Mar	Mid Morning						0	0%
21-Mar	Mid Afternoon	47	Sunny	15	5	35	55	15%
22-Mar	Mid Morning	43	Sunny	13	3	28	44	12%
	Mid Afternoon	50	Sunny	19	9	31	59	16%
23-Mar	Mid Morning	34	Sunny	39	53	73	165	44%
	Mid Afternoon	41	Sunny	43	43	61	147	39%
24-Mar	Mid Morning	37	Cloudy	53	48	50	151	40%
	Mid Afternoon	43	Cloudy	60	40	56	156	41%
25-Mar	Mid Morning	34	Rain	35	62	112	209	56%
	Mid Afternoon	45	Cloudy	50	61	74	185	49%
26-Mar	Mid Morning	52	Rain	41	60	88	189	50%
	Mid Afternoon	64	Sunny	58	63	83	204	54%
27-Mar	Mid Morning	43	Cloudy	36	49	66	151	40%
	Mid Afternoon	46	Cloudy	38	36	53	127	34%
28-Mar	Mid Morning	38	Sunny	19	3	32	54	14%
	Mid Afternoon	35	Sunny	13	3	24	40	11%
29-Mar	Mid Morning	31	Sunny	13	1	28	42	11%
	Mid Afternoon	40	Sunny	15	4	29	48	13%
30-Mar	Mid Morning	45	Cloudy	43	46	62	151	40%
	Mid Afternoon	59	Sunny	52	50	51	153	41%
31-Mar	Mid Morning	54	Sunny	50	39	54	143	38%
	Mid Afternoon	68	Cloudy	60	37	48	145	39%

Surface Lots
Parking Counts

APPENDIX B

Loudoun County Courts Complex Door Counts

Date	Door Count*
January	1354
February	1250
March	1268
April	1130
May	1414
June	1437
July	1298
August	1349
September	1390
October	1282
November	1320
December	1322
85th %	1398

**50 were added to the door count to account for deputies and staff*

APPENDIX C

ULI Excerpt



planned parking, proximity to transportation, and so on) and functional design (user friendliness). Even though multiple uses may be located at a single development site, if there is a mix of asphalt for surface parking surrounding each use, it may be difficult to get these bound for a retail/dining/entertainment complex to park at a nearby office building and walk to the destination. It may be necessary to use management strategies such as valet parking or to run a shuttle to more distant parking areas when it is required to meet demand. Chapter 6 includes further exploration of these issues.

Step 2: Select Parking Ratios

The methodology requires the selection for each significant land use of a parking ratio, which is the number of spaces that would be needed if the land use were located by itself in an area with little or no transit and weak pedestrian connections with other uses (the so-called cornfield development). This book recommends parking ratios for a variety of land uses often found in shared parking situations. Where uses not discussed here are included in a shared parking situation, appropriate parking ratios must be developed.

Note that this second edition includes more land uses than the first edition and features more stratification of land uses within broad categories. Individual changes will be further discussed in the section on the development of factors for each land use; the changes and additions are also summarized in Table 2-1.

This book's recommended parking ratios aim to represent the peak accumulation of vehicles at the peak hour on a design day for that land use, as those terms have been defined in chapter 1. Unless otherwise noted in the discussion of a particular land use, the 85th percentile of observed peak-hour accumulations (ignoring seasonality) was employed in determining the parking ratios. The first edition of *Shared Parking* employed the 90th percentile of the peak-hour occupancies observed. In a 1990 article, an Institute of

Transportation Engineers (ITE) committee recommended use of the 85th percentile as an appropriate design standard. Weant and Levenson¹ and Smith² generally recommended the 85th percentile, as did the Parking Consultants Council.³ The third edition of *Parking Generation* presents 33rd and 85th percentile values as well as the average values for each land use, to frame the variation in parking ratios and for determining appropriate parking ratios from the data set.

The issue of the appropriate design day/hour for parking has become more of a controversy in recent years as smart growth principles have become more widely accepted. Some planners argue that parking supplies should be based on the average of the peak-hour occupancies observed in order to avoid underused spaces. Others believe that "more is better" and that communities should be protected from the negative impacts of parking shortages with an effective supply factor over and above expected accumulations on most if not all days.

As noted previously, designing a parking system so that every space is occupied at a regularly occurring peak hour will result in a conclusion by owners and users, if not the community at large, that the parking is inadequate. Some have argued that recommended parking ratios should be based on the 85th percentile observation plus an additional effective supply factor of 5-10 percent. Those disagreeing point out that in many cases a system may then have enough spaces to accommodate the 100th percentile accumulation, albeit inefficiently due to increased search time for available spaces.

After considerable debate, the study team for this second edition of *Shared Parking* adopted the 85th percentile of peak-hour observations in developing recommended parking ratios. However, it should be noted that relatively few land uses in *Parking Generation* have a large enough sample size that the 85th percentile value as published was deemed reliable enough to be used directly, without further consideration. In the majority of land uses, the judgment of the *Shared*

Parking team was required to finalize the ratios. Individual considerations for each land use are discussed in chapter 4.

The *Shared Parking* team believes that using the 85th percentile will provide an adequate supply cushion in most locations. But a parking supply based on this ratio will be inadequate for a certain number of locations that perform above the average. For example, some new commercial developments have a "honeymoon" period of high activity after opening, only to settle into a more typical pattern after locals have had a chance to patronize the site. Conversely, there may be a period of time as long as three years during which patronage gradually climbs to a stabilized level. Competitive factors in a local marketplace may also affect whether or not a particular destination will perform above the 85th percentile of all the comparable destinations nationwide. The first entry into a marketplace that satisfies unmet consumer demand will often perform better than average. If exceptional performance by one venue is sustained, competitors will usually enter the marketplace and performance may subsequently become more typical or average.

When a proposed new concept does not quite fit established land use categories and perhaps is being beta tested at a particular development, adjustment from parking ratios for the most closely related land use may be required. While the owners of such venues may be loathe to reveal their business plan, a special parking ratio can be developed by combining likely peak hour density of patrons and employees with assumptions for modal split and persons per car.

Customizing parking ratios for a particular tenant, however, particularly when it lowers the ratio, is usually not advisable from a longer term perspective. One of the tenets of almost any business catering to consumer demand is that what is fashionable today can be forgotten tomorrow.

Separate parking ratios should be employed for weekends and weekdays, and thus they are provided here for the land uses included in this report. Weekdays are typically defined

as the period of Monday through Friday, and weekends are typically defined as Saturday and Sunday. However, many entertainment venues are as busy on Friday nights as on Saturday nights, while few land uses generate parking needs on Sundays similar to that on Saturdays. Among the land uses that consistently do have peak activity on Sundays are places of worship and professional football stadiums. The parking for either of those uses usually overwhelms the demand from any other use at the peak hours, and thus shared parking is not generally a critical issue for Sunday conditions and there is little published data on Sunday parking needs. Therefore no recommendations are made for Sunday parking demand in this book. For the purposes of this report, "weekday" is defined to be the period from midnight Monday morning to 5 p.m. Friday afternoon. "Weekend" includes Friday evening and all day Saturday.

The adjustment of parking needs for combinations of uses is easier to understand and more reliably predicted if the parking ratios are broken into the components of visitor/customer and employee/resident demand. Other analysts have termed this long term and short term demand. Technically speaking, however, some customers (such as hotel guests) park as long or longer than employees, and part-time employees often qualify as short term parkers (by most definitions, those who stay less than three or four hours). Therefore, this report's recommended parking ratios are broken into visitor/customer and employee/resident components.

The modal splits to private auto for customers and employees are likely to be somewhat different in areas where there is good public transportation. Employees of tenants in an office complex are more likely to use public transportation or to carpool than visitors to those same tenants. There are also some differences in the time-of-day adjustments, depending on whether the user is an employee/tenant. The employees, performers, and staff at a performing arts center will arrive several hours before a scheduled performance, and

APPENDIX D

Government Center Parking Calculations

LOUDOUN COUNTY GOVERNMENT CENTER – PARKING DEMAND

The number of spaces necessary for the Loudoun County Government Center were evaluated. In the absence of actual parking data for the Loudoun County Government Center, industry standards that are applicable to the Loudoun County Government Center were reviewed:

Urban Land Institute

ULI Shared Parking, 2nd Edition recommends a rate of 3.01 spaces/1,000 SF (1 space per 332 SF) for general office use.

ITE Parking Generation

ITE Parking Generation, 4th Edition conducted studies of three suburban and one urban site of Government Office Buildings. Parking demand rates at the suburban sites were similar those at urban sites and, therefore, the data were combined and analyzed together. The studies determined that the average weekday peak parking demand rate was 4.15 spaces per 1,000 SF (1 space per 241 SF).

Loudoun County Government Center – Applicable Parking Rates

In summary, the industry (standard) parking rates for the Loudoun County Government Center reveal the following:

- Urban Land Institute – 3.01 spaces per 1,000 SF
- ITE Parking Generation – 4.15 spaces per 1,000 SF

Table 1: Government Center Applicable Parking Rates

Standard	Rate (Spaces/ 1,000 SF)	Rate (Space/SF)
1. Urban Land Institute	3.01	1 Space/332 SF
2. ITE Parking Generation	4.15	1 Space/241 SF
Average	3.58	1 Space/279 SF

As shown in Table 1, the average parking demand for the Loudoun County Government Center is 3.58 spaces/1,000 SF (1 space/279 SF).

Loudoun County Government Center – Parking Deficit

Using the average rate of 3.58 spaces/1,000 SF (1 space/279 SF), the Loudoun County Government Center (158,561 SF) currently has a parking demand of 568 spaces. The current number of parking spaces provided for the government center is 411 spaces. Therefore, the Loudoun County Government Center experiences a deficit of approximately 157 parking spaces.