



Final Report



Town of Occoquan, Virginia
PARKING STUDY



November, 2017



Overview

Introduction and Background

The Town of Occoquan, Virginia has partnered with Johnson, Mirmiran and Thompson, Inc. (JMT) to conduct a town-wide parking study to address the Town's concerns with parking availability and safety.

The Town is looking for ways to maintain its vibrant Downtown Historic Business District as a regional destination. They plan to achieve this by, among other things, developing appropriate parking plans and policies that will meet the current needs while maintaining the historic downtown character, as well as sustaining economic growth and high quality of life for residents and visitors.

Parking has been identified by both business owners and residents as a very important challenge facing their community. Many business owners and residents feel that there is not an adequate amount of parking available in the Historic Business District. There is also concern regarding effective wayfinding signage linking visitors and potential

customers to businesses and parking spaces.

The purpose of this study is to analyze the parking challenges and causes facing the Town of Occoquan and identify implementable solutions for the Town to pursue to alleviate its parking challenges.

Study Area

The study area has been identified as roughly the same boundary line as the Historic District of Occoquan (Yellow outlined areas in **Figure 1**). The parking areas identified by the Town for analysis include:

- On-Street Public Parking
- Off-Street Town-Owned Parking
- Private Lots, Mostly Residential
- Private Lots, Mostly Commercial

Figure 1: Study Area



Study Methodology

Data Collection

Using spreadsheets and maps created by JMT, Town staff collected an existing inventory and occupancy count for the following parking areas defined in the project area (**Appendix A**):

- On-Street Public Parking (A Lots)
- Off-Street Town-Owned Parking (B Lots)
- Private, Mostly Residential (C Lots)
- Private, Mostly Commercial (D Lots)

The data was collected on an hourly basis from 7AM-8PM, on a Wednesday (weekday data) and Saturday (weekend data) during sunny August days in 2017. Additional inventory and occupancy counts were also collected during a special event Saturday from 2PM—8PM for the public on-street parking and Town-owned off-street parking areas.

The Town provided the raw data to JMT for analysis.



Parking Demand Analysis

The parking inventory and occupancy data was broken into three overall initial categories for analysis:

- Weekday
- Weekend
- Special Event Weekend (Saturday)

The data was then further compiled into the following four hourly timeframes for each category:

- **7:00 AM—11:00 AM**

Businesses are beginning to open and employees have mostly arrived to work

- **11:00 AM—2:00 PM**

Peak lunch activity at restaurants

- **2:00 PM—5:00 PM**

Lunch peak is over and people have returned to their homes, place of work, or are enjoying other activities

- **5:00 PM—8:00 PM**

Many retail businesses have closed and restaurant/entertainment uses are active.

Occupancy Maps

GIS software was used to understand and analyze the relationships of the spatial locations of parking areas and the results of the inventory and occupancy count data. Overlaying this information illustrates parking occupancy and identifies areas that are near or over capacity as well as highlights parking areas that are underutilized. Analyzing this information based on day of the week and time of day is vital to understanding how the Town's parking patterns change and shift throughout the day and week. Using GIS, a total of 10 parking occupancy maps were generated for analysis purposes. These maps illustrate the various parking challenges and opportunities as they occur throughout the Historic District. The full index of occupancy maps is located in **Appendix B**.



Public Input

Public input was identified as a crucial component to the study method for this project. Not only is public input vital to understanding the Town's parking challenges, it is also key to include the public in the decision making process so that when solutions are implemented they are supported by the public. The Town hosted a Community Input Meeting on September 27th, 2017, which was attended by approximately 26 residents and members of the business community. During this meeting, representatives from the Town and JMT provided an overview of the study process, and attendees were encouraged to ask questions and provide insight on their experiences or issues with parking in the Town .

As part of the public input process, the Town and JMT prepared two online surveys (one which was community focused and one which was business focused) which were distributed electronically to the public as a way to provide input outside of the public meeting. Additional hard copies of the survey were made available at the Community Input Meeting.

The information gathered from the public meeting and the two online surveys was used to supplement the parking data and to help inform and guide the analysis process.

Recommendations From Town Council

The Town Council Work Session on October 17th focused on the results of the Parking Study. Recommendations were presented to the Town Council for input and concurrence as presented within this Study. As with all Town Council Work Sessions, this meeting was recorded for public record.

Review of Data & Existing Town Plans

How Did We Get Here?

Occoquan is a small town, with a population of approximately 1,049 people according to the 2015 American Community Survey (ACS) Census data. The streets of Occoquan were first laid out in 1804 before the boom of the automobile. This is evident in the narrow, often one-way streets, and close building setback lines throughout the Town. The Town also enjoys the scenic and recreational benefits of having its Historic Business District located along the Occoquan River, with many establishments capitalizing on this riverfront property. This type of layout can be very conducive to attracting commercial activity, however along with that commercial activity parking concerns can become a persistent nuisance to residents and a challenge for Town Staff.

The Town is considered a suburb of Washington, D.C. and is located in Prince William County, Virginia. The location of the Town in relation to these more populated areas provides an opportunity for visitors from the DC metro-region to visit Occoquan and enjoy the small town pleasures. These visitors create a positive economic impact that can be capitalized on by local commercial establishments.

The Town has been facing parking challenges for many years. A Charrette was held in 1998 to focus on the issue of parking as well as other important issues that were facing the Town at the time. From this effort a range of potential actions was suggested such as; a parking management program, on-street parking restrictions, parking permits, and formation of a Business Improvement District (BID). To date, none of these recommendations has been put into place due to a variety of reasons, leading to increased parking concerns.

Structured Parking Feasibility Report (2007)

In October 2007, the Town of Occoquan hired a consultant to perform a feasibility study for installing structured parking on four specific parcels within Occoquan. From this study, two

sites were identified as feasible for structured parking: 1) the West Garage (2 parcels owned by Fairfax County Water Authority located at the northwestern-most corner of the border of Town), and; 2) the East Garage (existing Town-Owned parking lot and portion of private parcel owned by Maude Williams, located at the corner of Mill Street & Poplar Alley). The West Garage (est. cost = \$3.2 million) would provide 211 new parking spaces. The East Garage (est. cost = \$2.1 million) would provide a total of 137 new parking spaces. These 2007 cost estimates equate to slightly over \$15,000/space for each garage.

The previously proposed West Garage location is now the River Mill Park. The previously proposed East Garage location has since been further developed.

Comprehensive Plan Vision 2026

The Town of Occoquan adopted its “*Comprehensive Plan Vision 2026*” in 2016. The purpose of this plan is to provide a vision for how Occoquan should grow into the future, maintain public facilities and programs in response to growth, and successfully manage new development and redevelopment actions.

This plan touches on a range of topics and actions with parking identified as an ongoing challenge facing the Downtown and surrounding residential areas. A Town parking study was identified as a recommended action item to address the parking challenges facing the town and begin to chart a plan for how to address the Town’s current and future parking needs.

Town of Occoquan Parking Study (2017)

This current parking study was built upon this previous work as well as extended to include recent data and input from the public.



Public Surveys

The Town published two public surveys to gather and document public input regarding Town parking conditions. The two surveys consisted of a general public survey which could be filled out by any member of the general public, and a business survey for business owners within the study area. The public survey yielded 90 responses and the business survey yielded 44 responses.

The community survey was taken by a mix of residents (51%), visitors (40%), and other members of the public. Both surveys indicated that there is a general consensus that solving parking issues is a high priority facing the Town. Both surveys included support for addressing the parking issues associated with the post office and suggested time-limited parking at this location. Improved parking wayfinding and signage as well as dedicated employee parking areas were common recommendations received through both surveys.

The Community Survey responses included recommendations for parking limits/meters, permits for residents, and increased parking enforcement. The Business Survey responses included recommendations for pedestrian safety improvements, highlighting the lot under the Route 123 Bridge. There were also recommendations to consider shared parking in private lots, and general recommendation to increase parking availability.

Complete survey results are located in **Appendix C**.



Existing Conditions Assessment

JMT staff conducted a field assessment of the existing parking conditions. They advised that improved signage directing people to available parking upon entering town, and continuing consistent signage through town to available parking could be a potential solution to spreading out the parking usage across existing public parking areas. Sidewalk conditions, overall walkability, and ADA accessibility were also identified as needing improvement, which may alleviate some of the parking issues the town is experiencing. Improving the walkability of the town could be a catalyst to improved parking as people are more willing to walk further to their destination.

Cut-Through Traffic Study

As part of this study, JMT conducted a weekday peak period cut-through traffic survey between the Route 123/Commerce Street intersection at the east edge of the Town and the Old Bridge Road/Tanyard Hill Road intersection to the southwest of Town. Specifically, the survey assessed AM peak period cut through volumes traveling from the Old Bridge Road/Tanyard Hill Road intersection to the Route 123/Commerce Street intersection from 6:00 AM – 9:00 AM and in the reverse direction (by way of Mill Street) from 4:30 PM – 6:30 PM. The survey was conducted in late September 2017 using a combination of manual and automated license plate reader (ALPR) technology. The results of the survey indicated the following:

- 871 vehicles cut-through from Old Bridge Road to Route 123 (by way of Commerce Street) during the 3-hour AM period, which equates to 86% of the directional traffic on Tanyard Hill Road and 69% of the directional traffic on Commerce Street
- 596 vehicles cut through from Route 123 to Old Bridge Road (by way of Mill Street and Tanyard Hill Road) during the 2-hour PM period, which equates to 50% of the directional traffic on Commerce Street and 71% of the directional traffic on Tanyard Hill Road
- Each cut-through route experienced between 250-300 cut-through vehicles/hour on average



The cut through percentages and volumes on these routes exceeds the minimum thresholds required for consideration of a formal cut-through study under VDOT's Residential Cut-Through Traffic Policy. JMT was asked by the Town and citizens to assess the potential parking impacts of converting 1-way streets to 2-way streets in the Town (specifically Mill Street, Union Street, Commerce Street, and Washington Street), with a primary goal of reducing the level of PM cut-through traffic along westbound Mill Street. Based on an initial review of traffic volumes, cut-through patterns, and overall traffic circulation patterns in the Historic Business District, JMT offers the following preliminary findings with respect to the 1-way to 2-way conversion:

- Mill Street – the existing 45 on-street parking spaces along the 1-way section of Mill Street (Lots A6, 7 and 8) should be able to be recaptured entirely by restriping both sides of Mill Street for parallel on-street parking (similar to the existing westernmost 2-way segment of Mill Street)
- Union Street – the 36' pavement width could allow for two (2) 11' travel lanes and parallel parking (7' wide) on both sides of the road, which should result in 100% recovery of the 22 existing on-street public spaces in Lot A14
- Ellicott Street – 7 public on-street parking spaces (Lot A4) would be lost with 2-way conversion
- Commerce Street
 - Washington Street to Union Street – 8 of the public on-street parking spaces in Lot 13 would be lost with 2-way conversion
 - Union Street to Ellicott Street – approximately half of the 31 public on-street parking spaces in Lot A3 would be lost, while the remaining could be recovered by converting to parallel parking (1 side only) with 2-way conversion, resulting in a loss of 15-16 public on-street spaces
- Total Net Loss of Public On-Street Parking with 1-way to 2-way conversion of all street segments listed above = approximately 30 spaces, which represents approximately 3% of the Town's total public parking inventory and over 5% of Town's public on-street parking inventory.

From a practical standpoint, the roadway link that appears to offer the greatest positive impact for traffic operations and safety through 1-way to 2-way conversion is Commerce Street between Washington and Union Streets. Converting this link to 2-way operation would eliminate the need for PM cut-through traffic to divert along Mill Street, which has high parking turnover and pedestrian activity. This would likely remove

between 600 to 1,000 cut-through vehicles from Mill Street in the busy weekday afternoon/evening hours, greatly improving parking operations and pedestrian mobility in this section of the HBD. However, this conversion would result in the loss of 8 spaces from Lot A13 along Commerce Street. These spaces were observed to be used frequently by residents as de facto residential parking.

Recommendations – Near Term

The Town should present the cut-through data to VDOT and petition VDOT to conduct a formal cut-through study for the routes between the Old Bridge Road/Tanyard Hill Road intersection and the Route 123/Commerce Street intersection.

Recommendations – Medium/Long Term

The Town should consider converting the segment of Commerce Street between Washington and Union Streets to 2-way operations in the future. This recommendation assumes that the eight (8) lost public on-street parking spaces along Commerce Street that would result from the 2-way conversion could be replaced or otherwise accounted for nearby, for the benefit of the Commerce Street residents who rely upon those spaces as de facto residential parking.



Review & Summary of Parking Demand Analysis

Parking Supply

The parking areas were categorized into the following lot types:

- On-Street Public Parking (A Lots)
- Off-Street Town-Owned Parking (B Lots)
- Private, Mostly Residential (C Lots)
- Private, Mostly Commercial (D Lots)

See **Appendix A** for study area parking location maps.

The parking data collection revealed a total parking inventory of 880 spaces located within the project study area. As a general rule, public parking supply should account for at least 50 percent of the total parking supply in a business district. In Occoquan, public parking (435 spaces) accounts for 49 percent, while private parking (445 spaces) accounts for 51 percent. As illustrated in **Figure 2**, the largest portions of parking fall within the On-Street Public A Lots (264 spaces) and Private, Mostly Commercial D Lots (272 spaces). The supply of spaces in each of these parking lot groups is relatively evenly distributed throughout the Town’s Historic District. Private, Mostly Residential C Lot parking is also distributed relatively evenly across the study area, while Off-Street Town-Owned B Lot parking is located at/beyond the Historic District perimeter, with nearly 70% of the spaces located near or under the Route 123 Bridge (completely outside the Historic District).

Parking Occupancy & Peak Demand

As illustrated in **Figure 3**, parking occupancy is highest on weekends beginning at 11:00 AM and lasting through 8:00 PM. The peak time occurs during the midday on the weekend, with the peak beginning around 11:00 AM and lasting until 5:00 PM, with ultimate peak occupancy from 2:00 PM—5:00 PM (1,613 parked vehicles). The 5:00 PM—8:00 PM timeframe, although not considered the peak of the

weekend, still shows significant numbers of vehicles parking in the Historic Business District, much higher than weekday occupancy rates .

During weekdays the peak parking occupancy occurs from 11:00 AM—2:00 PM, then again from 5:00 PM—8:00 PM.

Figures 4—7 on page 8 illustrate the parking occupancy by lot type. The public parking lots are more utilized during peak demand, whereas the private lots show less of a change in occupancy throughout the day. Overall, none of the lot types *as a whole* reach total capacity, with the greatest availability of spaces in the C and D Lots.

Figure 2: Total Parking Inventory By Lot Type



Figure 3: Peak Parking Occupancy (All Lots)

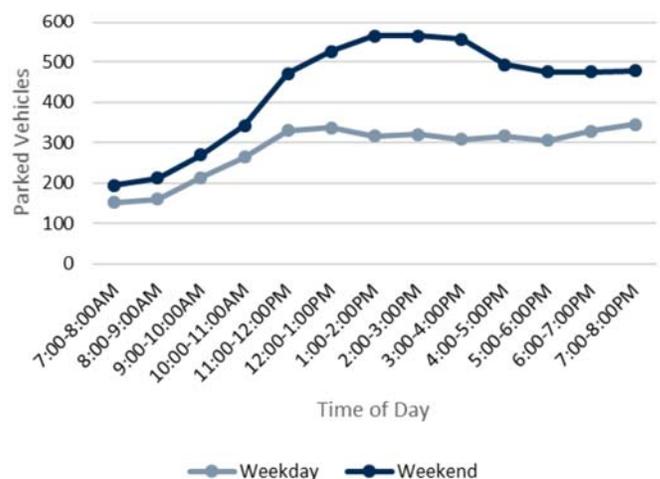




Figure 4: All On-Street Public Parking (A Lots) - Parking Occupancy Count

All A Lots:
 Total Capacity = 264
 Total Max Capacity = 86%

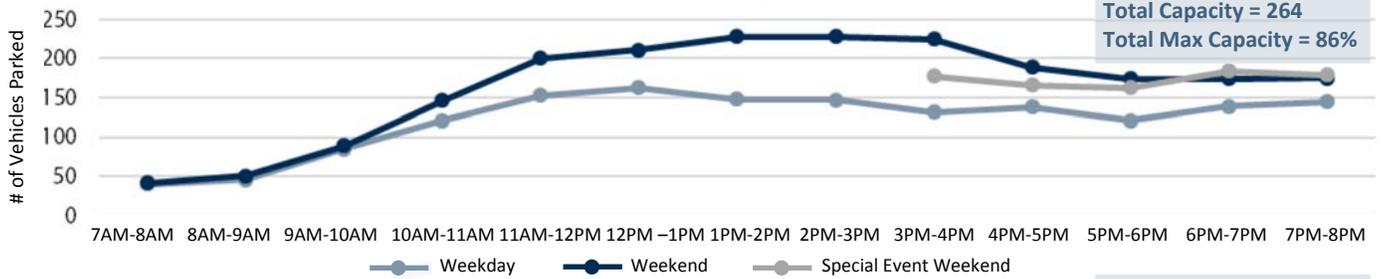


Figure 5: All Off-Street Town-Owned Parking (B Lots) - Parking Occupancy Count

All B Lots:
 Total Capacity = 171
 Total Max Capacity = 96%

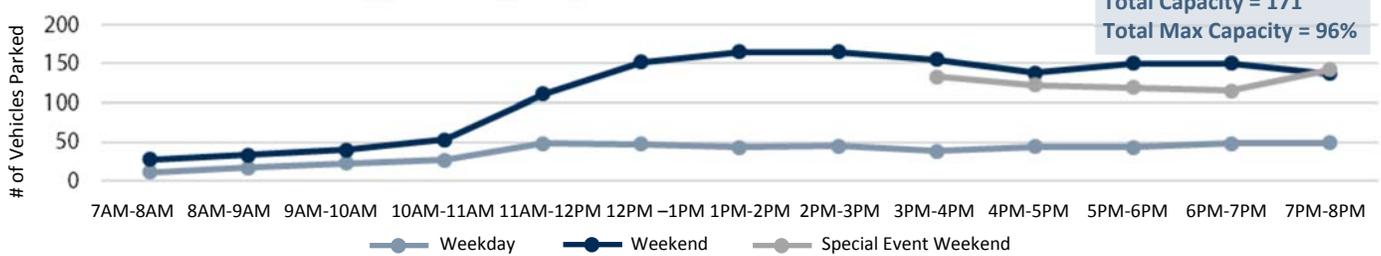


Figure 6: All Private, Mostly Residential (C Lots) - Parking Occupancy Count

All C Lots:
 Total Capacity = 173
 Total Max Capacity = 50%

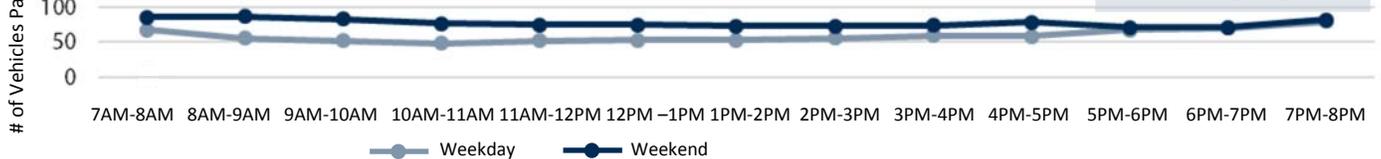
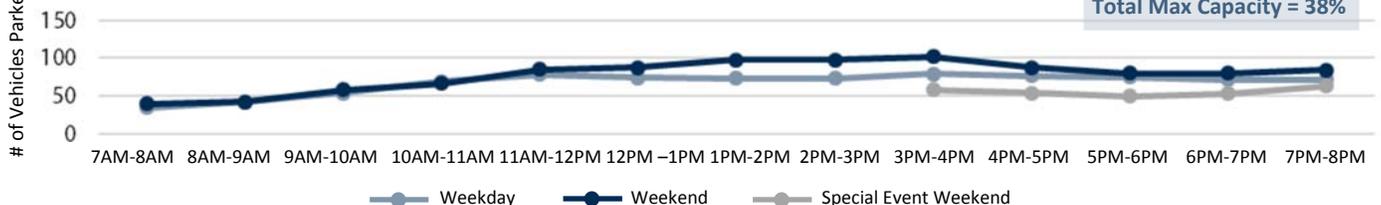


Figure 7: All Private, Mostly Commercial (D Lots) - Parking Occupancy Count

All D Lots:
 Total Capacity = 272
 Total Max Capacity = 38%



Parking Duration and Turnover

Parking duration and turnover rate was studied for the following parking areas:

- A Lots – On-Street Public Parking
- B Lots – Off-Street Town-Owned Parking
- D Lots – Private, Mostly Commercial (select lots*)

*Includes lots closest to the busy Mill Street area (D5, D8, D9, and D18)

These lots were chosen for study because they represent locations where visitors park. It is important to understand the current operation and utilization of these spaces to develop implementable solutions that will best serve the interests of both visitors and business owners in the area. Shorter parking durations allow for a higher turnover rate, which is preferable for on-street parking near businesses. This translates to a higher volume of unique customers per day, which promotes economic vitality in a downtown area. Longer parking durations and lower turnover rates are best served by off-street parking lots.

Parking Duration

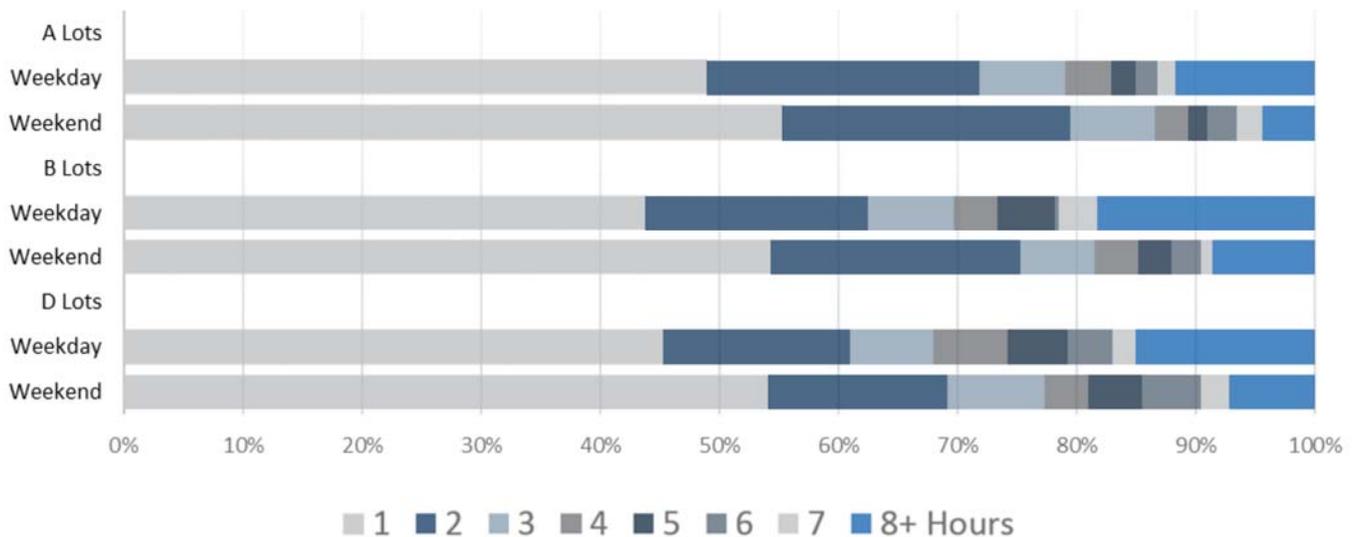
Parking duration is the length of time a vehicle is parked in a given space. For this study, each parking lot in the study area was observed on an hourly basis for a typical weekday and typical weekend day (Saturday) between the hours of

7AM – 8PM. Additional hourly data was collected during a special weekend event (Saturday) from 2PM – 8PM. Parking duration was measured by recording the last three characters of license plates for vehicles parked in each parking space in the study area to determine the length of their stay.

Figure 8 is the result of this evaluation: it depicts the percentage of vehicles that parked for a total of 1 hour, 2 hours, etc. throughout the day for each type of lot. On average, of the total vehicles accounted for, 53 percent stay for 1 hour or less, and 22 percent stay between 1 – 2 hours. Cumulatively, this accounts for 75 percent of all vehicles parking in the Town of Occoquan. On average, vehicle parking duration is 2.2 hours.



Figure 8: Parking Duration by Lot





Parking Turnover

Parking turnover represents the number of different vehicles that park in the same space over a period of time. This parking turnover rate is calculated based on the following relationship:

$$\text{Turnover Rate} = \frac{\text{\# of unique vehicles}}{\text{\# of available spaces}}$$

The results of the turnover analysis are shown in **Figure 9** for all lots in the study area. All public lot types have an average turnover rate of greater than 1.0, which indicates that vehicles are, in fact, turning over throughout the day. These parking turnover rates, in combination with the high percentage of vehicles found to be parking for a duration of 2 hours or less, indicate a good overall turnover condition in the Town.

As illustrated in **Figure 8**, a number of vehicles in each parking area were observed to occupy a parking space for an extended period of time (8+ hours). **Figure 10** summarizes the number of these vehicles per lot type. The on-street parking in the Town (A Lots) showed the overall highest prevalence of vehicles parking for an extended period of time.

Figure 9: Parking Turnover Rate

Lot	Weekday	Weekend
A	2.4	3.2
B	1.5	3.1
D	1.0	1.4
Total	1.8	2.7

Figure 10: Vehicles Parked 8+ Hours

	Lots	Weekday	Weekend
A	All	48	23
	Mill Street	15	9
	Commerce Street	18	8
	B	29	26
	D	13	9

Results and Recommendations

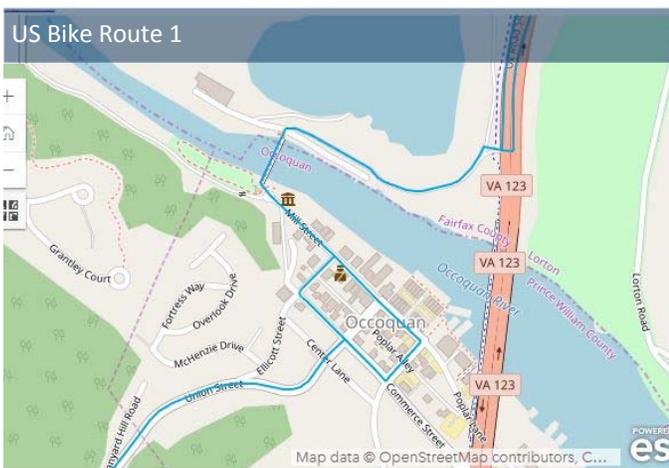
Creating a walkable Town is fundamental to the future plans and vision of the Town Of Occoquan.

Walk Occoquan

(Medium Term Improvement, 1-5 Years / Long Term Improvement 5–10 Years)

A walkable environment will allow residents to commute to the Downtown by foot, likewise visitors can park their vehicle one time and stroll to several destinations comfortably on foot before returning to their vehicle. Increasing walkability means not only updating sidewalk facilities to current ADA standards but also means adequate pedestrian lighting, well maintained sidewalks, and inviting streetscapes and pedestrian amenities. Also crucial to walkability is safe pedestrian street crossings. The Town should consider striping two additional crosswalks across Mill Street, one at Ellicott Street and another at Washington Street. The use of high visibility crosswalks or raised crosswalks should be considered to increase pedestrian visibility and safety at crossings. Strategic pedestrian connections and upgrades should also be prioritized, such as new sidewalks along the west side of Mill Street from the Town-Owned parking lot to Downtown, and safety lighting in the parking area under the Route 123 Bridge.

The following recommendations are also offered to make better use of the available parking supply and to strategically plan how and where new parking areas will be developed.



Bike Occoquan

(Medium Term Improvement, 1-5 Years)

- Capitalize on the location of the various existing and proposed regional bike trails intersecting Occoquan (US Bike Route 1, East Coast Greenway, and the proposed Occoquan Greenway Trail) by marketing Occoquan as a bicycle tourism destination and providing additional, strategically-located bicycle amenities for day trip and overnight riders.
- Incorporate additional public bicycle parking into existing parking inventory to encourage residents to make more trips by bicycle. Further analysis is needed to identify ideal on-street parking spots for conversion to bicycle parking. The bike parking should be branded to match the identity of the entire parking system and Downton Occoquan.



Wayfinding & Signage

(Medium Term Improvement, 1-5 Years)

- The parking system should be branded and incorporate the Downtown identity
- Install consistent directional wayfinding signage to direct those unfamiliar with the system to public parking
- Private parking lots for businesses, particularly along Mill Street, should be consistently and clearly

marked with wayfinding that is compatible with the branding of the public parking wayfinding

- Signage should clearly define the uses of each public parking lot
- Develop online parking resources, such as a parking map, with prominent links on the Town's website

Shared Parking

(Medium Term Improvement, 1-5 Years)

- Discourage new private parking lots, excluding residential uses which do not typically share parking for public use
- Establish and maintain at least 50 percent of parking supply for public use
- Explore opportunities for agreements to share public parking with under-utilized private commercial lots
- Incentivize property owners to share unused parking areas

Encourage Turnover of On-Street Parking

(Medium Term Improvement, 1-5 Years)

- Investigate partnering with under-utilized private lot owners to provide additional long-term parking in off-street lots, preserving the high-demand on-street spaces for shorter trips
- Work with business owners to ensure that employees are parking in appropriate long-term parking lots in lieu of on-street spaces in front of businesses.

Residential Parking Permits

(Medium Term Improvement, 1-5 Years)

- Consider implementing residential parking permits
- Sign specific on-street parking areas that have limited off-street residential parking as permit parking only

On-Street Parking Modifications

(Long Term Improvement, 5-10 Years)

- Remove the horizontal white pavement striping lines between parallel parking spaces on the west end of Mill Street to encourage vehicles to park closer together increasing overall capacity

- Modify pull-in angle parking spaces on Mill Street to be back-in angle parking spaces. This configuration eliminates the difficulty that drivers, particularly older drivers, have when backing into moving traffic. Also increases the ease of loading and unloading cargo and helping children in and out of car seats, and protection as the open car door now directs passengers unloading from vehicles back to the sidewalk rather than out into the street.



Work with Developers

(Short Term Improvement, 1 Year)

- As development plans are finalized, the Town should coordinate with developers to ensure that adequate parking and pedestrian accommodations are included in any new development or redevelopment plans in or near the Downtown.

Parking Enforcement

(Ongoing)

- As these recommendations are implemented, considerations need to be given to how police staff will be able to effectively manage parking enforcement.

Implementation Plan

The implementation plan is illustrated on the following page and provides general timeframes for the study, planning, design, and construction for each of the proposed recommendations. The Program Cost provided includes the total cost, in current dollars, for all of the components of each recommendation.

Wayfinding & Signage

It is recommended that the Branding / Marketing campaign, as associated with the wayfinding recommendation, be completed as an initial activity. This will determine any branding for the Town of Occoquan to be used for additional elements of any improvements proposed for the Town, whether through these projects, or through any developer improvements to be provided.

Walk Occoquan

The Walk Occoquan recommendation has been broken into two components, one for the initial crosswalks at either end of Mill Street to provide immediate pedestrian connectivity. The remaining component of Walk Occoquan requires a full pedestrian study to be completed to determine sidewalk feasibility and full ADA compliancy. These studies will review not only the pedestrian path, but also obstacles and potential solutions such as identifying utility location and right-of-way requirements.

Additional improvements can be programmed as funds and grants are available.

Recommendations	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Feasibility Level Program Cost	Stakeholder Involvement
Walk Occoquan													
Crosswalks / ADA Ramps at ends of Mill Street			■	■								\$40,000	Town Council, VDOT
Walkable, Compliant Network			■	■	■	■						\$2,800,000	Town Council, VDOT
Bike Occoquan													
Website Updates for Bike Occoquan	■											N/A	Town Manager
Bicycle Parking							■	■				\$50,000	Town Council, VDOT
Wayfinding and Signage													
Website Updates for Parking Resources	■					■						N/A	Town Manager
Branding / Marketing Campaign		■	■									\$25,000 - \$50,000	Town Council, Community
Wayfinding Signage			■	■	■							\$25,000 - \$75,000	Town Council, Community, VDOT
Shared Parking													
Consider Zoning Plan Updates	■											N/A	Town Council
Encourage Turn-over of On-Street Parking													
MOU with Private Lots	■	■	■									N/A	Town Council, Businesses
Residential Parking Permits													
Consider Parking Permits and Signage									■			N/A	Town Council, Residents
On-Street Parking Modifications													
Change the Existing Parking Configuration (Mill Street)							■	■	■			\$160,000	Town Council, VDOT
Work with Developers													
Coordinate with Developers	■	■	■	■	■	■	■	■	■	■	■	N/A	Town Council
Parking Enforcement													
Continued Parking Enforcement	■	■	■	■	■	■	■	■	■	■	■	N/A	Police

Study ■ Planning / Design ■ Construction ■ Ongoing Coordination ■

Other Considerations

Several additional recommendations were evaluated for consideration and informational purposes for the Town of Occoquan Parking Study. These recommendations are not included in this plan for implementation based on their conflict with other recommendations that highlight greater potential improvement, or based on not being feasible at this time. These are:

Structured Parking

Providing public (Town-owned) structured parking is not recommended. A planning level cost estimate for building a new structured parking facility is \$25,000 per space, and can increase from there based on incorporated technologies and architectural features for the garage. This cost does not account for the ongoing maintenance and operation for the facility. In addition, with the current development patterns, there is no open space remaining to accommodate the size needed for the structure, access, and other considerations necessary for the implementation of a parking garage as a town-owned facility.

Parking Space Width

Angled parking space widths were evaluated along Mill Street, specifically lots A6, A7, and A8, to understand the impact of widening the existing stall space from 8.5' to 9'. By restriping these three areas evaluated, there would be a total loss of three spaces along Mill Street. In consideration of the length of Mill Street, this would represent a 3% reduction of parking spaces, which is not consistent with the goal to maintain at least 50% public parking spaces for the Historic Business District. Properly restriping parking spaces to ensure the aesthetic for the area would require milling and overlay of the pavement as well as the actual restriping. With the proposed improvement of reverse angled parking to promote safety and efficiency, this improvement is not recommended now.

Time-Limited Parking

Time-limited parking is not recommended at this time. However, it could be a consideration in the future based on customer / employee behaviors, particularly along dense commercial streets or near the Post Office to enhance turnover for customers.

One-Way to Two-Way Conversion: Commerce Street

JMT evaluated the impact from the number of parking spaces, for the conversion of Commerce Street from one-way to two-way. This recommendation was proposed as one potential solution for minimizing the current cut-thru traffic. Commerce Street from Ellicott Street to Union Street is approximately 36' wide. This section of roadway currently provides 31 parking spaces within the Historic Business District. Commerce Street from Union Street to Washington Street is approximately 24' wide. This section of roadway currently provides 11 parking spaces, for a total parking space count along Commerce Street of 42.

Converting the existing one-way street to a two-way street would result in returning Commerce Street to a similar configuration as in the early 2000's with one lane in either direction and limited parallel parking for the block of Commerce Street between Ellicott Street to Union Street. Angled parking would not be able to be provided along Commerce Street, even at 30 degrees, based on the constrained width. The angled parking requires at least 16'-8" from the curb, leaving less than 20' remaining for both travel lanes, which is not permissible for this roadway. This conversion would result in a parking loss of approximately 26 parking spaces which is not consistent with the goal to maintain at least 50% public parking spaces for the Historic Business District.



One-Way to Two-Way Conversion: All Streets in Downtown Historic Business District

JMT evaluated the impact on the number of parking spaces if all the one-way streets in the Downtown Historic Business District were converted to two-way streets. The purposes of this evaluation was to understand an order of magnitude impact to public parking for each street conversion. The results of this evaluation is located in **Figure 11**.

Figure 11: One-Way to Two-Way Street Conversion (All Streets)

Street Name	Width	Existing Spaces	Spaces Remaining After One-Way Conversion*	Difference
Mill St from Washington St to Ellicott St	38'	45	25	-20
Commerce St from Ellicott St to Union St	38'	31	14	-17
Commerce St from Union St to Washington St	31' 22'	11	3	-8
Washington St from Commerce St to Mill St	40'	21	15	-6
Union St from Mill St to Commerce St	36'	22	10	-12
Ellicott St from Mill St to Commerce St	25'	7	0	-7
TOTAL SPACES		137	67	-70

*Assumes 11' minimum lane width.



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