



## Nonmotorized Boathouse Zone Feasibility Study



Georgetown Waterfront Park, Rock Creek Park  
Chesapeake & Ohio Canal National Historical Park  
Washington, DC

Final  
August 2013

The Louis Berger Group, Inc.  
Washington, DC

Contract No. C300090032  
Task Order No. 17  
NPS PMIS No. 16717



## EXECUTIVE SUMMARY

In 1987, the National Park Service (NPS) developed the Georgetown Waterfront Park Master Plan, which designated a portion of the Potomac River shoreline as a suitable location for boathouses to support nonmotorized boating on the Upper Potomac River. This nonmotorized boathouse zone (NMBZ) extends from 34th Street, NW at the western edge of Georgetown Waterfront Park to approximately a quarter mile upriver from Key Bridge in the District of Columbia. The zone encompasses both public and private lands, including portions of the Chesapeake and Ohio Canal National Historical Park (C&O Canal NHP) and Rock Creek Park, and several private parcels (the Potomac Boat Club, several private residences, and a small parcel accessible from the shoreline only).

Since 1987, the development of facilities for nonmotorized boating along the Potomac River in Georgetown has been the subject of several studies. The NPS prepared this feasibility study to comprehensively examine the entire nonmotorized boathouse zone to consider what uses can be accommodated in this area, given a broader range of user demand, the size limitations of the area, and other site constraints. The feasibility study addresses the “what” and “where” but does not address the “how” questions, which include property ownership, management, construction funding, and the ultimate users of any particular site.

## FINDINGS

The study was developed through extensive research and a substantial public involvement process. Current demand for recreational facilities was documented through a public comment period and stakeholder interview process in which users identified the extent of current use, issues and problems associated with existing facilities, modifications or renovation of existing facilities and new facilities that could be constructed to better accommodate current and projected demand. While outside the study area, crowding of Thompson Boat Center, including boat storage and dock space, is considered a hindrance to excellent rowing programs and fair and equitable access to the river.

This study confirms an unabated demand for boathouses to serve rowers and paddlers as well as a demand for use of the Capital Crescent Trail located adjacent to the nonmotorized boathouse zone. The size and other functional requirements for facilities to accommodate this demand were assessed during the stakeholder interview and research process.

Several themes and ideas became clear through the public involvement process. Although there was no true consensus on the preferred number or type of facilities, there was general agreement that access to the river should be enhanced with some level of additional boathouse development and other types of access. There is clearly a large demand for more storage for both rowing shells and other paddlecraft. Dock space is needed to distribute the traffic along the waterfront. There is also demand for many types of public access, including free and safe access points for those using car-top launching and other land-based activities. Parking is an important issue that should be considered carefully. Furthermore, many users are interested in locating private activities outside C&O Canal NHP and in keeping with the mission and purpose of the park. The Washington Canoe Club structure should remain. People recognize a need to address circulation and transitions between Capital Crescent Trail and Water Street, NW and to consider how the many users in the nonmotorized boathouse zone would interact.

## DEVELOPMENT POTENTIAL

To facilitate the analysis of feasible building locations, the zone was divided into separate development sites based on the current zoning designations, physical features, and other site considerations (figure ES-1.) The potential for each site and the nonmotorized boathouse zone as a whole to accommodate additional facilities has been evaluated based on a site-by-site analysis of the parameters and potential for development at each of the sites.

Three scenarios for the development of new facilities, such as boathouses, launch sites of various types, parking and trails were developed. The scenarios are not intended to be exhaustive, but rather to represent generalized approaches to siting facilities within the zone, ranging from high density to low

density. This approach revealed that the zone is sufficient to provide a substantial amount of boat storage and to accommodate other uses, although there is likely not sufficient developable land within the nonmotorized boathouse zone designated in the Georgetown Waterfront Park Master Plan to accommodate all user demand. The ultimate number, size, and location of new facilities in the zone will require further study to ensure that development balances the needs of users and protects the historic, cultural, and environmental resources of C&O Canal NHP and Rock Creek Park. The following scenarios present the high, medium and low density approaches to siting facilities within the nonmotorized boathouse zone:

**Development Scenario 1, High Density**—The high-density development scenario assumes that the largest reasonable building would be developed on Sites A, C, D and E. Site B, occupied by the Washington Canoe Club, would undergo site restoration and rehabilitation of the structure. Site A, which has a maximum allowable footprint of 18,186 square feet, cannot be developed to its maximum capacity without adversely impacting adjacent historic and cultural resources, including the Washington Canoe Club, the C&O Canal levee and towpath, and the view from multiple vantage points of the forested shoreline west of the Alexandria Aqueduct. A building on Site A that is in scale with the Washington Canoe Club could be a reasonable structure in this setting, but because of access issues, the site would best accommodate storage and launch facilities for only canoes, kayaks and single rowing sculls for individual use. A structure on Site C could be designed to address site constraints by developing two separate storage bays at ground level that flank a shared apron. This configuration would permit existing sewer access structures to be integrated into the design of the apron to maintain access. Upper levels of the structure could bridge the shared apron to permit the maximum allowable floor area for other program elements. Large boathouses could be developed on Sites D and E and could accommodate two collegiate programs and most high school programs and provide sufficient space for other activities such as rowing tanks, ergometer rooms, meeting and locker rooms, and caretaker quarters on upper levels. In the context of the urban and industrial character of the nonmotorized boathouse zone east of the Alexandria Aqueduct, multistory buildings would have limited visual impact on the historic and cultural resources within the nonmotorized boathouse zone. In this scenario, Site D includes adjacent private lots. Site access restrictions and space constraints preclude on-site parking in this scenario; it would be necessary to provide off-site parking.

**Development Scenario 2, Medium Density**—The medium-density development scenario assumes that the largest reasonable building would be developed on Sites A, D, and E. Sites B and C, which are occupied by the Washington Canoe Club and the Capital Crescent Trail, would undergo site restoration and rehabilitation of the structure. A building on Site A that is in scale with the Washington Canoe Club could be a reasonable structure in this setting, but because of access issues, the site would best accommodate storage and launch facilities for only canoes, kayaks and single rowing sculls for individual use. Site A could be developed as an expansion of the operation of the Washington Canoe Club structure with parking and drop-off provided on Site C for both sites. Large boathouses could be developed on Site D and Site E to provide ground floor boat storage and more program options such as rowing tanks, ergometer rooms, meeting and locker rooms, and caretaker quarters on upper floors. In the context of the urban and industrial character of the nonmotorized boathouse zone east of the Alexandria Aqueduct, multistory buildings would have limited visual impact on the historic and cultural resources within the nonmotorized boathouse zone. Parking for structures on Sites D and E would need to be provided off site.

**Development Scenario 3, Low Density**—The low-density development scenario assumes that a new facility would be built on Site E. Sites A, B and C would retain existing facilities and forest cover, and could be enhanced with amenities that are compatible to the greatest extent with the sensitive natural, historic, and cultural resources within the C&O Canal NHP. Existing operations, property ownership, and tree cover would be retained on Site D, and additional storage for canoes, kayaks and single rowing sculls would be integrated into the existing site in place of parking. A structure consistent in height with nearby buildings could be developed on Site E and could accommodate a collegiate program and several high school teams or both universities. The maximum building on this site would have limited visual impact in the context of the urban and industrial character of the nonmotorized boathouse zone east of the Alexandria Aqueduct.

## CONCLUSION

While this feasibility study does not offer conclusions about how the zone will be developed, the findings establish an approach to programming the NMBZ to allow a variety of uses consistent with physical site limitations and deemed necessary and appropriate for the site. Future planning efforts will be needed to establish a program for the zone that better accommodates the demand and is appropriate to the constraints of the site. While the public involvement effort of the feasibility study did not produce a groundswell of support for a single development vision, stakeholders were in agreement that a better-defined development program for the entire zone was desirable (in contrast to site-by-site development). Next steps in planning for the NMBZ would likely include preparation of an EIS that would further analyze the development scenarios, a revision of the Georgetown Waterfront Park Master Plan, and proposals for one or more land exchanges for boathouses.



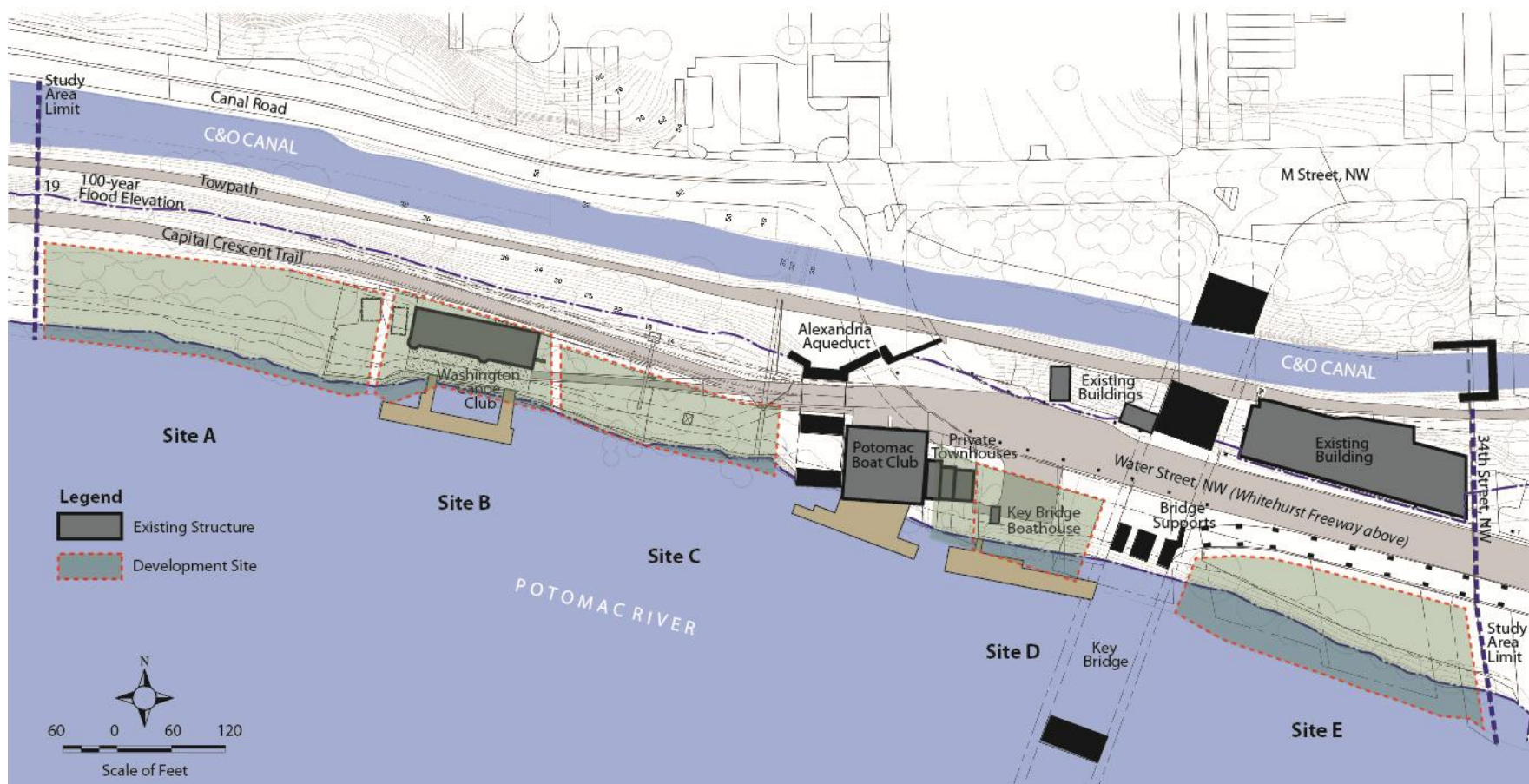


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## ACRONYMS

ANC	Advisory Neighborhood Committee
C&O	Chesapeake & Ohio
CFA	U.S. Commission of Fine Arts
CSO	Combined Sewer Outfall
DC Water	District of Columbia Water and Sewer Authority
DDOT	District Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
GIS	Geographic Information System
NMBZ	Nonmotorized Boathouse Zone
NEPA	National Environmental Policy Act
NCPC	National Capital Planning Commission
NHP	National Historical Park
NPS	National Park Service
NRHP	National Register of Historic Places
SF	Square Foot/Feet
USACE	U.S. Army Corps of Engineers

## GLOSSARY

Apron	The area between the boathouse and the dock in which boats can be turned as they are put into the water or stored in the boathouse
Eight	An eight-person rowing shell used for team rowing
Ergometer	A stationary rowing machine with a flywheel used for training on land
Four/quad	A four-person rowing shell with “four” referring to a sweep boat (one oar per rower) and “quad” referring to a sculling boat (two oars per rower)
Paddlecraft	Any boat, such as a canoe or kayak, that is propelled with paddles rather than rowing oars; the person paddling faces forward
Pair/double	A two-person rowing shell with a “pair” referring to a sweep boat (one oar per rower) and a double referring to a sculling boat (two oars per rower)
Sculling	A type of rowing vessel (shell) in which two oars per rower are used to propel the boat as compared to sweep rowing, in which a rower uses a single oar
Shell	A rowing vessel or boat
Single	A single person sculling shell
Standup paddleboard	A vessel similar to, but larger than, a surf board on which the user stands or kneels on the board and uses paddles to propel the board

# INTRODUCTION

## PURPOSE OF FEASIBILITY STUDY

Since 1987, the development of facilities for nonmotorized boating along the Potomac River in Georgetown has been the subject of several studies. The purpose of this feasibility study is to identify the range and quantity of uses and users that should be accommodated in the zone, consistent with physical site limitations, and deemed necessary and appropriate uses for the site. The study establishes an approach to programming to allow access to the river for a variety of uses, not just nonmotorized boat uses. The feasibility study addresses the “what” and “where” but does not address the “how” questions, which include property ownership, management, construction funding, use and the ultimate users of any particular site.

Georgetown Waterfront Park consists of 10 acres of passive park located along the Potomac River shoreline between Washington Harbor and 34th Street, NW. In addition to the passive park, completed in 2011, the 1987 Master Plan for the park (figure 1) also established a zone for rowers and paddlers, which is the focus of this feasibility study. The plan designated a portion of the Potomac River shoreline as a suitable location for boathouses to support nonmotorized boating on the Upper Potomac River. The area identified in the plan extends from 34th Street, NW at the western edge of the Georgetown Waterfront Park to approximately a quarter mile upriver from Key Bridge in the District of Columbia. The zone encompasses both public and private lands, including two National Parks (C&O Canal NHP and Rock Creek Park) and several private parcels (including a private club, the Potomac Boat Club, several private residences and a small parcel accessible from the shoreline only.)

Current uses of the river adjacent to the NMBZ include two race courses. Rowers and canoeists use the area, and their racecourses are parallel. The canoe course is immediately offshore and the rowing course is farther out in the river. Cycling is prevalent along the Capital Crescent Trail through Water Street, NW and includes a large number of commuters. Conflicts between cyclists and nonmotorized boat use are most prevalent during boating events when the area along Water Street, NW is used as a staging area for regattas.

Following approval of the Georgetown Waterfront Park Master Plan, the National Park Service and other interested parties released a number of studies focused on the development of the nonmotorized boathouse zone. Studies have included specific boathouses for the Georgetown University and George Washington University rowing programs. The previous compliance efforts are separate from the current study. This feasibility study is intended to lay the groundwork for future decision-making for development and improvements and guide future planning and compliance activities.



FIGURE 1. GEORGETOWN WATERFRONT PARK MASTER PLAN DESIGNATED NONMOTORIZED BOATHOUSE ZONE

## PREVIOUS STUDIES AND REPORTS

**Studies of Nonmotorized Boating Activities along the Georgetown Waterfront, 1985, 1989, 2000.** These NPS studies examined demand for nonmotorized boating facilities on the Potomac River along the Georgetown Waterfront, using data on boat clubs, teams, and storage facilities along the Potomac River to determine how the organizations use the river and waterfront. The studies also addressed the existing and potential demand for growth of these groups and their activities and identified user conflicts that may arise on the river. All these studies confirmed a high and growing demand for both rowing and paddling sports on the Potomac River. The studies also documented real and perceived conflicts between users, including between paddlers and rowers, and right of way conflicts between motorboats and nonmotorized craft of all types. In addition to the basic evaluation of demand characterized in the 1985 study, the 1989 and 2000 studies also looked at how the NMBZ might be developed, as summarized below:

- **Survey of Non-motorized Boating Activities along the Georgetown Waterfront, 1985.** In this 1985 study, the NPS provided the first comprehensive look at demand for nonmotorized boating uses on the Potomac, analyzed trends, identified conflicts between user groups, and discussed each nonmotorized boating activity and associated boat rental and storage in more detail. The purpose of this study was to gather data on area boat clubs, teams, and storage facilities to determine: 1) how these organizations use the river and waterfront, 2) the existing and potential demand for growth of these groups and their activities, and 3) what user conflicts occur on the river and what new problems may arise as the result of changes to the waterfront. The study noted that in 1985, competitive rowing dominated the river activity in the spring and fall, but it also documented the other rowing and paddle sports on the river. The study concluded there was a high and growing interest in nonmotorized boating on the Potomac River and that there was generally a need for more storage space in the area for both organized competitive teams and individual recreational boaters. At the time, it was estimated that up to 25 to 30 additional spaces were needed for large rowing shells and an additional 150 to 200 spaces were needed for individually owned boats to keep up with demand.
- **Special Study: Nonmotorized Boating in the Potomac and Anacostia Rivers, Washington, DC, 1989.** This 1989 NPS study examined nonmotorized boating on both the Potomac and Anacostia rivers with a focus on rowing. The study documented a doubling in interest in rowing since the 1985 study, particularly, for the scholastic and university rowing community.

The 1989 study also established several goals for development of nonmotorized boating facilities, including maintenance of public access to all publicly owned shoreline and boating facilities, reduction of visitor conflicts by separating incompatible functions and services, enhancing the historical appearance and setting of Georgetown, and encouraging use of the Anacostia River as an alternative site for rowing. This study identified locations for new facilities on the Potomac River that roughly correspond to the sites under consideration in this feasibility study, although it assumed that a floating restaurant would eventually be built. It identified Site A, west and upstream of the Washington Canoe Club, as a potential site for a small boathouse (with an approximate 4,000-square-foot footprint) with site constraints related to access and utilities, and Dempsey's Boathouse site as a possibility for a larger boathouse with a 7,000-square-foot footprint with site constraints related to sewer leaks and adjacency to the Alexandria Aqueduct. It identified the current location of the Key Bridge Boathouse as a potential site for a much larger floating boathouse with a 10,000-square-foot footprint, assuming that the three townhouses at this location would be demolished and that the Key Bridge Boathouse would be accommodated. The final site allowed for docks west of the floating restaurant and placed the boathouse facilities in the "Icehouse," the large warehouse facility on the north side of Water Street, NW.

- **Draft Supplemental Report: Non-motorized Boating on the Potomac River in Georgetown 2000.** This 2000 NPS study confirmed earlier findings that demand for rowing and other nonmotorized facilities on the Potomac River continued to increase since the 1989 report. The study concluded that three sites should be further evaluated, including a site for Georgetown University, an additional institutional rowing facility, and an NPS concession-operated nonmotorized boating facility. The study included some new assumptions that the 1989 study had not included and also amended

some of the 1989 assumptions. The first new assumption was that there needed to be a 50-foot buffer to the abutment to the Alexandria Aqueduct as well as similar access setbacks of 25 feet from Key Bridge and 10 feet from Whitehurst Freeway.

The 2000 study identified the site west and upstream of the Washington Canoe Club as a potential site for an average-size (6,000- to 8,000-square-foot) boathouse, which would be somewhat larger than the 1989 study but would have similar access and utility challenges as the 1989 study. It also acknowledged plans by Georgetown University to develop the site with a 15,000-square-foot boathouse with five bays. Site B, Dempsey's Boathouse, was no longer considered appropriate for a university site, but it could accommodate a smaller new facility for rowing shells and paddlecraft. Site D, where a canoe and kayak livery (Key Bridge Boathouse) is currently located, was identified as a possible location for a scholastic boathouse with three bays. The study assumed a floating restaurant would still be built. The study recommended dropping the redevelopment of buildings on the north side of Water Street, NW into a boathouse from further consideration due to safety concerns for the rowers, who would need to cross Water Street, NW with the boats and carry them through the proposed parking lot of the floating restaurant.

**Plan for the Georgetown Waterfront Park and the C&O Canal NHP, 1987.** Georgetown Waterfront Park, which was dedicated in 1984, includes 10 acres between Washington Harbor and 34th Street, NW and an area upstream within the C&O Canal NHP. The 1987 Master Plan was approved by the NPS National Capital Regional Director on January 29, 1987, after the draft plan had been reviewed and approved by the National Capital Planning Commission (NCPC), the District of Columbia Office of Planning, the U.S. Commission of Fine Arts (CFA), the District of Columbia Historic Preservation Review Board, and the C&O Canal National Historic Advisory Board. The plan set forth 30 goals for the park, including establishment of the Georgetown Waterfront Park, which was completed in 2011, and an NMBZ for rowers and others, which is the focus of this feasibility study. The plan stated that the NMBZ should be located west of 34th Street, NW to approximately 1,100 feet west of Key Bridge to allow for continued protection of the scenic and natural values of the Palisades. The plan also called for a maintaining river views and a floating restaurant and associated parking at the 34th Street, NW site, but it stipulated that it should be used for a rowing or paddling facility if the floating restaurant was determined to be infeasible. As of 2012, plans for the floating restaurant are not active.

**Environmental Assessment for the Proposed Exchange of Properties between the National Park Service and Georgetown University within the District of Columbia and within the Boundary of Potomac Palisades Park within the Chesapeake & Ohio Canal National Historical Park, 1995.** This environmental assessment (EA) looked at a proposed land exchange between Georgetown University and the NPS. Georgetown owns an approximately two-acre parcel upstream of the NMBZ. As part of the proposed exchange, Georgetown would receive the parcel west of the Washington Canoe Club and would relinquish its right-of-way along the Capital Crescent Trail. NPS would receive the undeveloped Georgetown University-owned parcel. The result of this EA was a Finding of No Significant Impact, and a preliminary Exchange Agreement between the NPS and Georgetown was signed in 1998. Under the agreement, an expansion of the NMBZ boundaries beyond the boundaries discussed in earlier documents was proposed.

**Memorandum of Agreement between the National Park Service, the District of Columbia Historic Preservation Officer, and the Advisory Council on Historic Preservation, 1997.** This memorandum of agreement, signed by the NPS, the District of Columbia Historic Preservation Officer, and the Advisory Council on Historic Preservation, was the outcome of the 1995 EA, and was put in place to address the potential effects of a land exchange between the NPS and Georgetown University, providing Georgetown with a property on which the university could build a rowing facility. The memorandum of agreement required that the building design would be consistent with the late nineteenth century architecture of Boathouse Row in Philadelphia and that the structure would not exceed 15,000 SF nor rise more than 40 feet above grade. It also required approval from several authorities, including the CFA, the NCPC, the Zoning Commission, and the Historic Preservation Review Board of the District of Columbia. The agreement stipulated that zoning would need to be revised to allow use of the site for a boathouse facility, and the university must obtain all necessary zoning and other approvals and permits for the specific use of the site. The memorandum of agreement also set forth the requirement that the



NPS approve the design prior to submitting it to the authorities listed above for approval and that the NPS would work cooperatively and in good faith to adopt a boathouse design and landscaping that is agreeable to both the NPS and Georgetown University.

#### **Facility and Site Analysis for a Boathouse on the Potomac River in Arlington County, 2002.**

There has been interest in developing a rowing or other nonmotorized boating facility on the Virginia side of the Potomac River in partnership with Arlington County, somewhere along the George Washington Memorial Parkway. The NPS sponsored a feasibility study to look at sites for such a facility in 2006, and the study examined four sites, including two configurations of the same site in Rosslyn, Virginia, a site at the 14th Street, NW Railroad Bridge, and a site on Daingerfield Island. The feasibility study looked at several case studies, identified environmental concerns, and examined demand for training and rowing facilities in the Arlington school system and other users. The NPS is now carrying this study forward as an environmental impact statement (EIS).

**Georgetown University Boathouse Environmental Assessment, 2006.** This EA continued the analysis of impacts from a land exchange and construction of a boathouse on the site west and upstream of the Washington Canoe Club that had been the topic of the 1995 EA and the memorandum of agreement in 1997. The EA looked more carefully at the impacts of constructing a boathouse for Georgetown University on the site and characterized the potential direct, indirect, and cumulative environmental impacts of the proposed boathouse alternatives and of the No Action Alternative. The EA also provided information to be used in fulfilling Section 106 of the National Historic Preservation Act. The EA examined three alternatives on the same site with focus on rooftops and massing of the boathouse facility. The NPS received several thousand negative comments on the EA and determined that an EIS should be prepared.

**Draft Environmental Impact Statement—Proposed Land Exchange and Georgetown University Boathouse (not published), 2008.** Following the comments on the 2006 Georgetown University Boathouse EA, the NPS determined that it was appropriate to continue the study of a proposed land exchange between Georgetown University and the NPS. A Notice of Intent was published in 2007 announcing that the NPS intended to prepare an EIS. Scoping and focus group meetings were held, but the draft EIS was not released. The NPS recognized that a study of a broader range of facilities and uses within the non-motorized boathouse zone was needed.

## **METHODOLOGY OF FEASIBILITY STUDY**

The feasibility study was developed after extensive research and a substantial public involvement process. The team preparing the feasibility study considered the history of the site and the NMBZ, examined past studies, and engaged the public in a meeting, a series of stakeholder interviews/focus groups, and a public workshop/charette. The stakeholder focus groups brought together several stakeholders at a time and helped determine the need for additional nonmotorized boating capacity and documented how stakeholders currently use the river, what new facilities they felt were needed, and how they envisioned the NMBZ should look and function in the future. During the workshop, attendees were given an opportunity to help determine where new facilities might be located and how they might accommodate the needs identified during the stakeholder interviews. The participants divided into teams and worked together to identify where new facilities would be located and what principles should guide the plan for the NMBZ.

The potential for each site and the nonmotorized boathouse zone as a whole to accommodate additional facilities has been evaluated based on a site-by-site analysis of the parameters and potential for development at each of the sites. Three scenarios for the development of new facilities, such as boathouses, launch sites of various types, parking and trails were developed. The scenarios are not intended to be exhaustive, but rather to represent generalized approaches to siting facilities within the zone, ranging from high density to low density. The ultimate number, size, and location of new facilities in the zone will require further study to ensure that development balances the needs of users and protects the historic, cultural, and environmental resources of C&O Canal NHP and Rock Creek Park.

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## EXISTING CONDITIONS

### DESCRIPTION OF THE GEORGETOWN WATERFRONT PARK NONMOTORIZED BOATHOUSE ZONE

The NMBZ was established as part of the Master Plan for Georgetown Waterfront Park and C&O Canal NHP (Georgetown Sector) approved and adopted in 1987. The plan designates a general area of land within which new boathouses and river access can be built along the Potomac River in Georgetown. The NMBZ (figure 2) is bounded on the south by the Potomac River shoreline and includes a segment of Rock Creek Park between the Alexandria Aqueduct and Georgetown Waterfront Park and a segment of the C&O Canal NHP upstream of the Alexandria Aqueduct. The eastern, or downriver, boundary of the NMBZ is at 34th Street, NW. The western, or upriver, boundary of the NMBZ is approximately 1,100 feet upstream of Key Bridge. The northern boundary of the NMBZ is Water Street, NW, east of the Alexandria Aqueduct, and the Capital Crescent Trail right-of-way, west of the Alexandria Aqueduct. The western limit reflects an NPS policy to preserve the natural appearance of the Potomac Palisades. Several privately owned parcels are located within these boundaries: Potomac Boat Club, three townhouses, and a small parcel without street access that is located inside the NPS-managed parcel currently leased to the Key Bridge Boathouse.

The NMBZ extends 80 to 100 feet from the shoreline and includes approximately 1,500 feet of river frontage; it has a total area of 126,753 square feet. The NMBZ was assembled from several parcels during a series of transfers over a period of many years. As a result, the property records are complex (appendix A). Property tax records, the District of Columbia geographic information system (GIS) database, land transfer property descriptions, and partial boundary surveys of several areas of the NMBZ were used to develop the site plan for this analysis and these records and documents reveal several easements. A complete boundary survey for the NMBZ has not been conducted. However, prior to the development of design drawings for any proposed facilities, a boundary survey would need to be completed to ensure easements are comprehensively and accurately located. Easements identified from available records include access, maintenance, and utility line easements (figure 3). The Capital Crescent Trail follows a 40-foot easement on the northern boundary of the NMBZ that narrows to 30 feet near the Washington Canoe Club. Georgetown University owns a 15-foot easement that aligns with the Capital Crescent Trail and provides access to a property owned by the university upstream from the NMBZ. Both Key Bridge and the Whitehurst Freeway are elevated facilities that cross over the NMBZ, and the DDOT requires maintenance setbacks from these facilities. The Alexandria Aqueduct and C&O Canal each require a setback of 25 feet according to recommendations from the NPS.

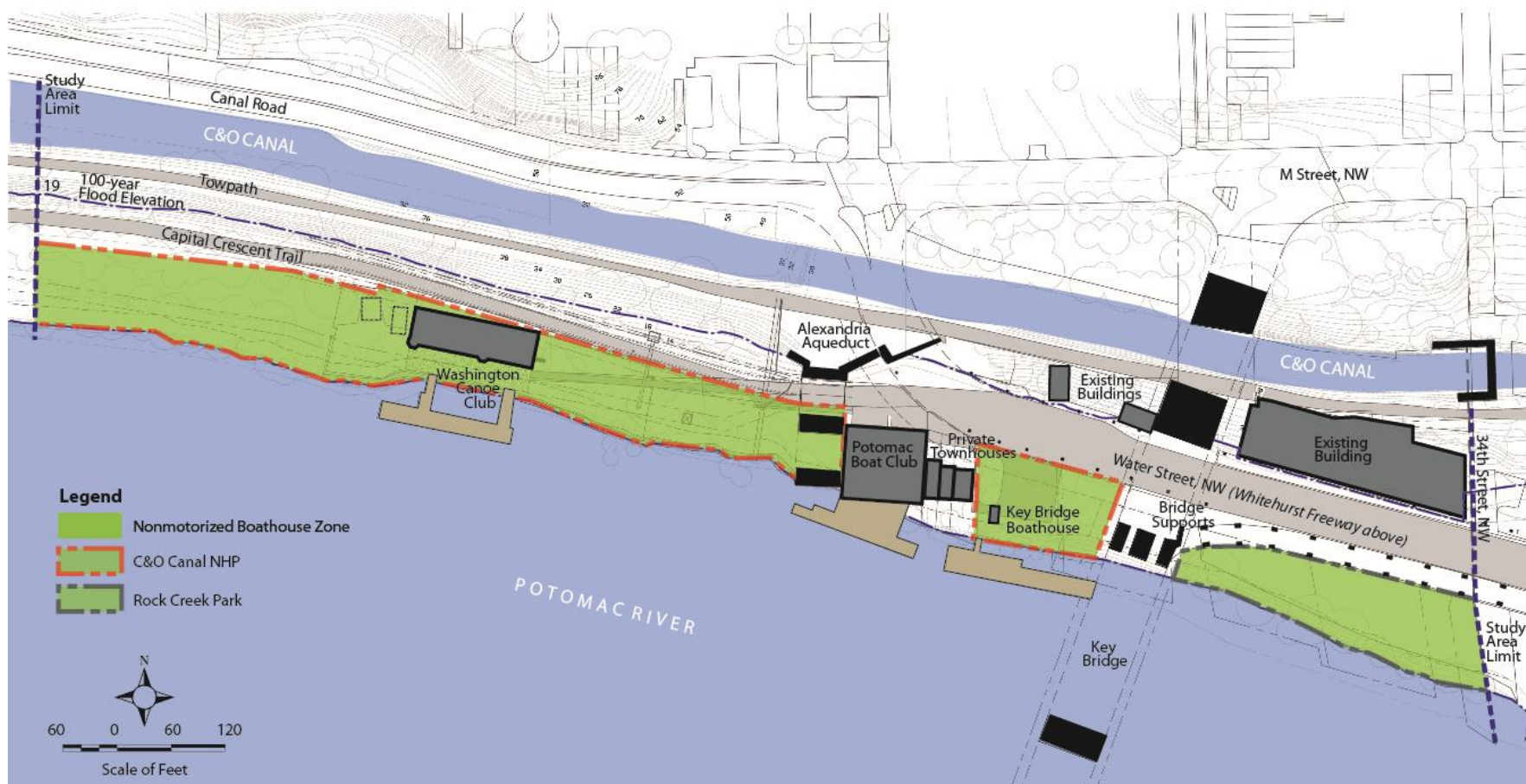


FIGURE 2. NONMOTORIZED BOATHOUSE ZONE

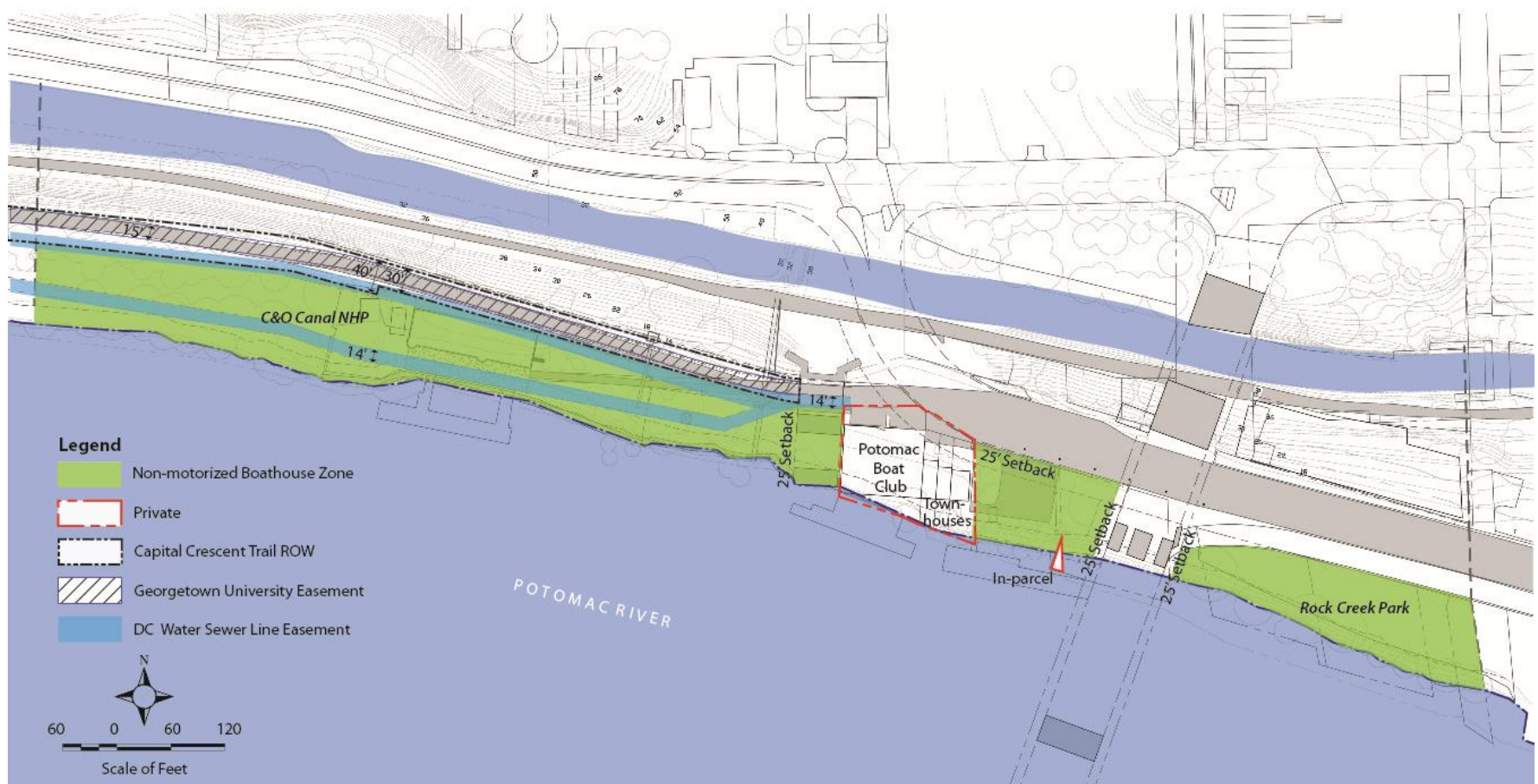


FIGURE 3. LAND OWNERSHIP AND EASEMENTS

## EXISTING FACILITIES AND USES

Existing facilities within or adjacent to the NMBZ (figure 4) include a boat rental facility; two private boating clubs, the Potomac Boat Club and the Washington Canoe Club (the building and land are owned by the NPS); and the Capital Crescent Trail, a regional multiuse trail. Several other regional trails pass near the NMBZ. Three Sisters Islands, a cluster of three rocky islands immediately upstream from the NMBZ, is a popular motorboat mooring location.

The primary recreational uses in the NMBZ are trail-related activities and a launching point for nonmotorized boating. Motorized boating is limited within the NMBZ by a no-wake zone on the Potomac River north of Memorial Bridge. Dangerous currents, rocks, and shallows require motorized and nonmotorized boaters to have detailed knowledge of local conditions. There is significant cross-town commuter bicycle traffic along the Capital Crescent Trail, accounting for the majority of recreational use within or near the NMBZ, while rowing and paddling also account for a significant volume of recreational uses. Walking and hiking on the C & O Canal towpath is a popular activity adjacent to the NMBZ. Other activities include bird watching, photography, and passive nature appreciation. Stakeholder interviews and public meetings were conducted in January and February 2012 to establish the level of use for these recreational activities.

Key stakeholder groups were asked to estimate the number of users and their average number of uses to allow the study team to estimate the intensity of use within the NMBZ for each type of activity. Uses per year estimates for some activities (trail use and Thompson Boat Center class participation and rentals), were measured directly. Other activity was estimated in terms of uses per year obtained by multiplying the estimated number of users by their typical number of uses per year. The current level of use is summarized in table 1 for each type of recreational activity based on these interview findings.



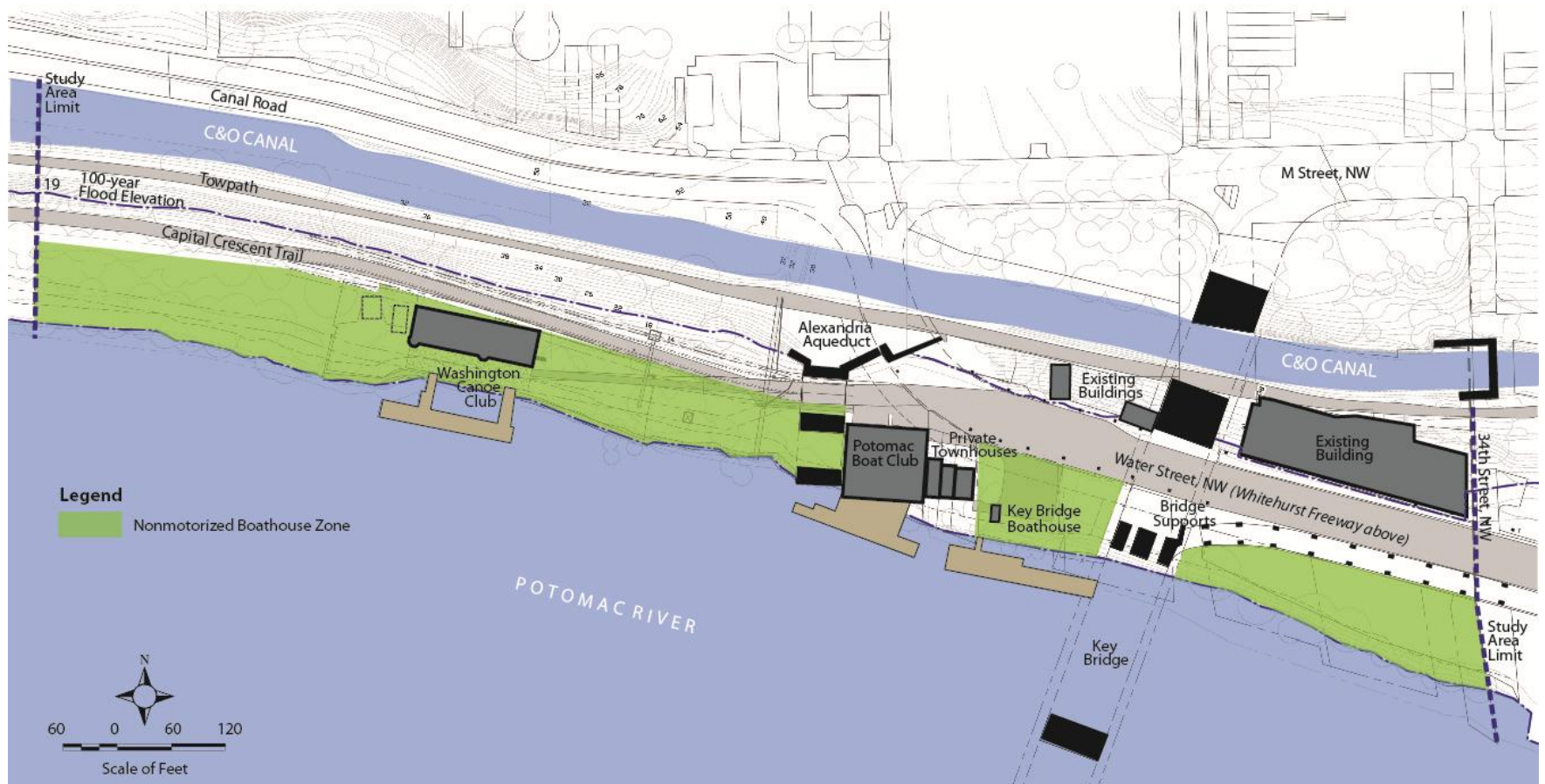


FIGURE 4. EXISTING FACILITIES

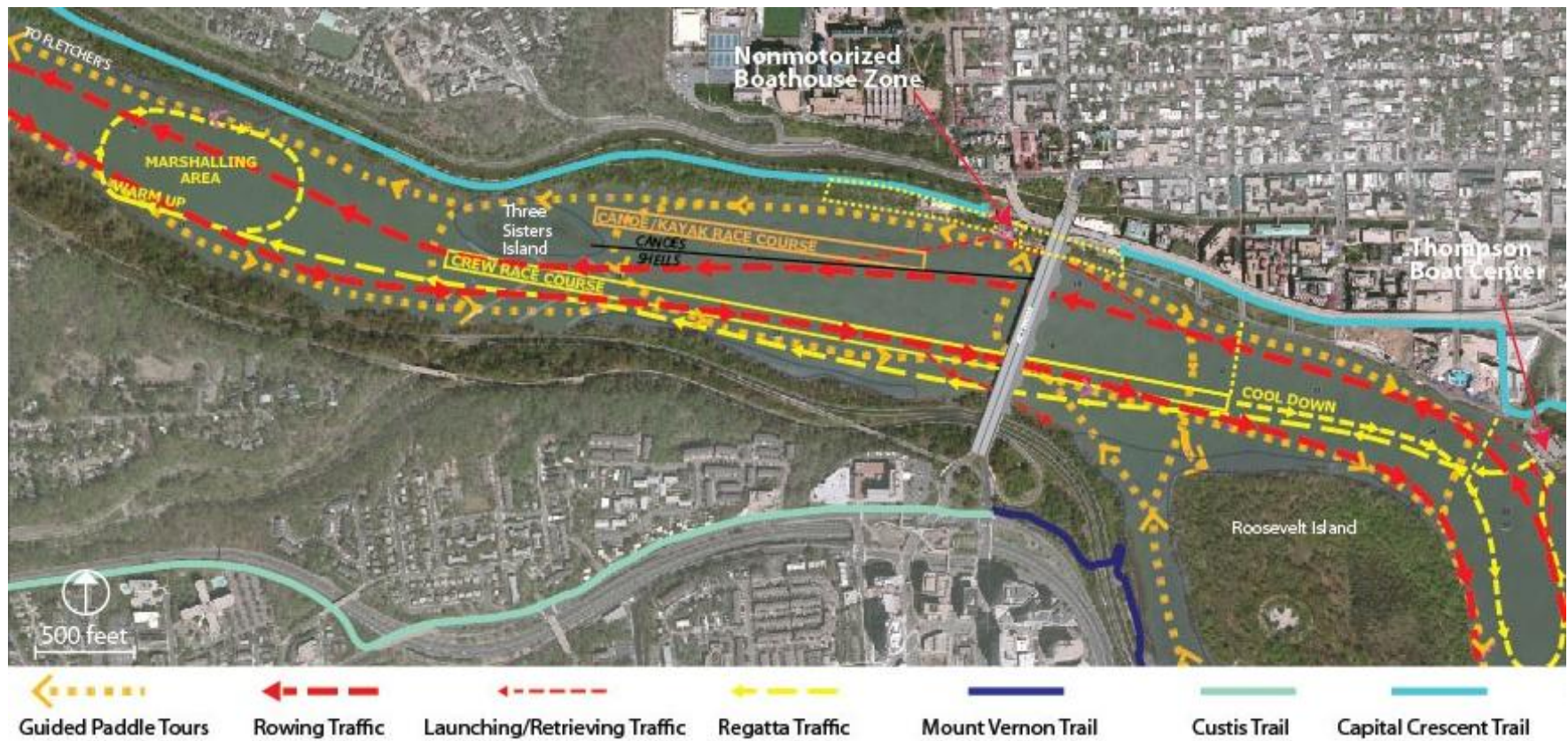


FIGURE 5. BOAT TRAFFIC PATTERNS





*Key Bridge Boathouse (Source: The Louis Berger Group, Inc.)*



*Potomac Boat Club (Source: The Louis Berger Group, Inc.)*



*Washington Canoe Club (Source: The Louis Berger Group, Inc.)*



*Capital Crescent Trail (Source: The Louis Berger Group, Inc.)*



*Dock at Key Bridge Boathouse below Key Bridge (Source: The Louis Berger Group, Inc.)*



*Dock at Potomac Boat Club (Source: The Louis Berger Group, Inc.)*



*Dock at the Washington Canoe Club (Source: The Louis Berger Group, Inc.)*



*Dock at Thompson Boat Center (Source: M.V. Jantzen, Flickr)*

**Table 1. Current Level of Use for Primary Recreational Activities**

Type of Use	Number of Uses/Year	Source
Hiking, walking, or biking on the Capital Crescent Trail or C&O Canal towpath	<b>1,591,717</b> Capital Crescent Trail (23,015 / week x 52 weeks = 1,196,780)  (Use for 2012 is estimated to be 1,306,344, assuming a rate of increase similar to the 9% increase between 2000–2006) C&O Canal towpath (7,595 / week x 52 weeks = 394,937)	Coalition for the Capital Crescent Trail 2006 Trail Use Survey
Paddling in a canoe, kayak, or other paddlecraft on the Potomac River near the nonmotorized boathouse zone	<b>137,180</b> Washington Canoe Club (322 members/guests x 90 times/season = 29,300) Washington Canoe Club (regatta participants = 1,500) Thompson Boat Center (50 slip holders x 90 times/season = 4,500) Thompson Boat Center (7,735 rentals per month for 8 months = 61,880) Key Bridge Boathouse (escorted tours = 4,000) Key Bridge Boathouse (individual paddlers rentals + 125 slipholders = 36,000)	Jack's Boathouse (now Key Bridge Boathouse), Washington Canoe Club, Thompson Boat Center
Sculling as an independent rower in a racing shell on the Potomac River near the nonmotorized boathouse zone	<b>108,480</b> Potomac Boat Club (300 members/guests x 90 times/season = 27,000) Potomac Boat Club (300 "Learn to Row"/month for 8 months = 2,400) Thompson Boat Center (100 slip holders x 90 times/season = 9,000) Thompson Boat Center (8,760 "Learn to Row"/month for 8 months = 70,080)	Thompson Boat Center, Potomac Boat Club
Rowing in a racing shell on the Potomac River near the nonmotorized boathouse zone as part of a high school team	<b>126,750</b> Scholastic teams (975 athletes x 5 days/week for 26 weeks = 120,900) Scholastic teams launching from Thompson Boat Center (850) Washington and Lee High School team launching from Potomac Boat Club (125)	Thompson Boat Center, scholastic rowing teams
Rowing in a racing shell on the Potomac River near the nonmotorized boathouse zone as part of a collegiate team	<b>43,680</b> Collegiate teams (280 athletes x 6 days/week for 26 weeks = 43,680)	Thompson Boat Center, Georgetown University, George Washington University
Regattas	<b>7 regattas (4,200 users)</b> 600 athletes x 7 times/year = 4,200 users per year	Scholastic rowing teams

Substantial boating activity occurs on the Potomac River offshore from the NMBZ, where favorable currents and winds combine to create ideal flat water conditions. The flat water upstream of Key Bridge and the natural shoreline that provides a safe exit from the water attract large numbers of both paddlers and rowers who make heavy use of the Potomac River in this area. Multiple crew teams practice in the area daily during the rowing season. In addition, several rowing regattas are conducted each year, involving both high school and collegiate racing teams. The Washington Canoe Club organizes canoe races and the Key Bridge Boathouse conducts guided tours in the area. Motorboats also use the NMBZ, primarily on weekends when the Three Sisters Islands attract moored yachts. While there are established race courses and guided tour routes, and customary "rules of the river" (figure 5) to guide where paddlers, rowers, motorboats, racers, practicing athletes and individual rowers or paddlers are expected to be, inexperienced boat paddlers, rowers, and motorboat operators sometimes come into conflict. Boat launching within the NMBZ primarily occurs from the docks at the Washington Canoe Club, Potomac Boat Club, and Key Bridge Boathouse. It is also possible to launch from Thompson Boat Center, located



outside the NMBZ downstream. Washington Canoe Club and Potomac Boat Club are private clubs while Key Bridge Boathouse and Thompson Boat Center are open to the public. The Washington Canoe Club and Key Bridge Boathouse provide launching primarily for paddlecraft, such as canoes and kayaks. The Potomac Boat Club provides launching for racing shells, primarily singles and doubles. Thompson Boat Center provides launching for both paddlers and rowers.

Within the region, recreational facilities (figure 6) that support nonmotorized boating are limited. While numerous marinas exist, some of which accommodate canoe and kayak launching, only six locations within the Washington, DC area are suitable for launching a racing shell. These locations include the Potomac Boat Club, Thompson Boat Center, Alexandria Schools Rowing Facility, Anacostia Community Rowing, Bladensburg Community Rowing on the Anacostia River in Bladensburg, Maryland, and Sandy Run Rowing Facility at Sandy Run Regional Park in Occoquan, Virginia. Currently, two universities and twelve high schools conduct their crew team practices from Thompson Boat Center. In addition, one high school team (Washington and Lee High School) launches from the Potomac Boat Club. Independent rowers launch their private racing shells from Thompson Boat Center or the private dock at Potomac Boat Club.

The number of boaters on the river at any given time is difficult to estimate but the user estimates reported during the stakeholder involvement process reveal that during the spring busy season approximately 1,500 boaters use the river each day. Most boating activity within the NMBZ launches from Thompson Boat Center, which estimates that the following use the facility regularly:

- 800-850 high school students
- 250-300 university students
- 60-75 private slip holders
- 100-150 renters
- 40-60 students in Thompson Boat Center programs

The Potomac Boat Club estimates that approximately 75 people on three teams and 25 individual rowers launch from the club each morning. Approximately 100-125 Washington and Lee team members launch during the afternoon. One private team launches during the evening. Individual club members launch at various times during the day.

Launching of boats and use of the river is orchestrated according an informal schedule that minimizes but does not eliminate conflict.

The early morning hours are typically used by university rowing teams and a few high school teams that launch from Thompson Boat Center and the Potomac Boat Club. Private rowing and paddling clubs for adults also launch from both Thompson Boat Center and the Potomac Boat Club in the morning. A few individual rowers use the river at this time as well. Typically the morning rush abates by approximately 9:00 am when Thompson Boat Center conducts several classes.

Stakeholders estimate that approximately 600 high school students launch from Thompson Boat Center beginning at approximately 3:00 pm. An additional 100-125 Washington and Lee High School students launch from the Potomac Boat Club. Practice ends around 5:30-6:00 pm. Most of the high school students are either bussed or drive individual vehicles to Thompson Boat Center at around the same time, leading to crowded parking and a crush of boats in line to launch by 4:00 pm. A typical practice day involves getting the students out of class on time, over to Thompson Boat Center via bus or personal car, finding a parking spot, unloading, and getting the boats on the dock and launched. Once students actually arrive, it takes approximately 45 minutes to get the boats out and actually launched on the water. In March, launching works smoothly. Varsity boats will get out on the water first to start rowing. Novice teams launch afterwards and typically stay closer to the boathouse, occasionally causing bottlenecks as they are slower to move away from the dock. Coaches make efforts to get their students to the boathouse 10-15 minutes early to avoid this rush and get out on the river. The same scenario recurs when bringing the boats in.



Late afternoon rowing includes some university rowing, which typically starts around 4:30-5:00pm and ends at sunset. The WeCanRow breast cancer survivor team of about 20 women goes out from 6:00-8:00 pm from Potomac Boat Club.

There are times, particularly in the spring, when rowers cannot safely travel downstream from Thompson Boat Center, given wind direction, current, and chop. On these occasions crowding on the river can occur. Conflicts arise with power boaters when the weather first becomes warmer in the spring, particularly at around 3:00-3:30 pm on a Friday and continuing through the weekend. River conflicts typically stem from the inexperienced users such as novice teams that crowd the area immediately upstream of Thompson Boat Center. This can become especially problematic for power boaters tied up at Washington Harbor in Georgetown. If a Novice boat gets stuck and needs assistance from the coach's launch, there can be wake issues and Harbor Patrol may be called.

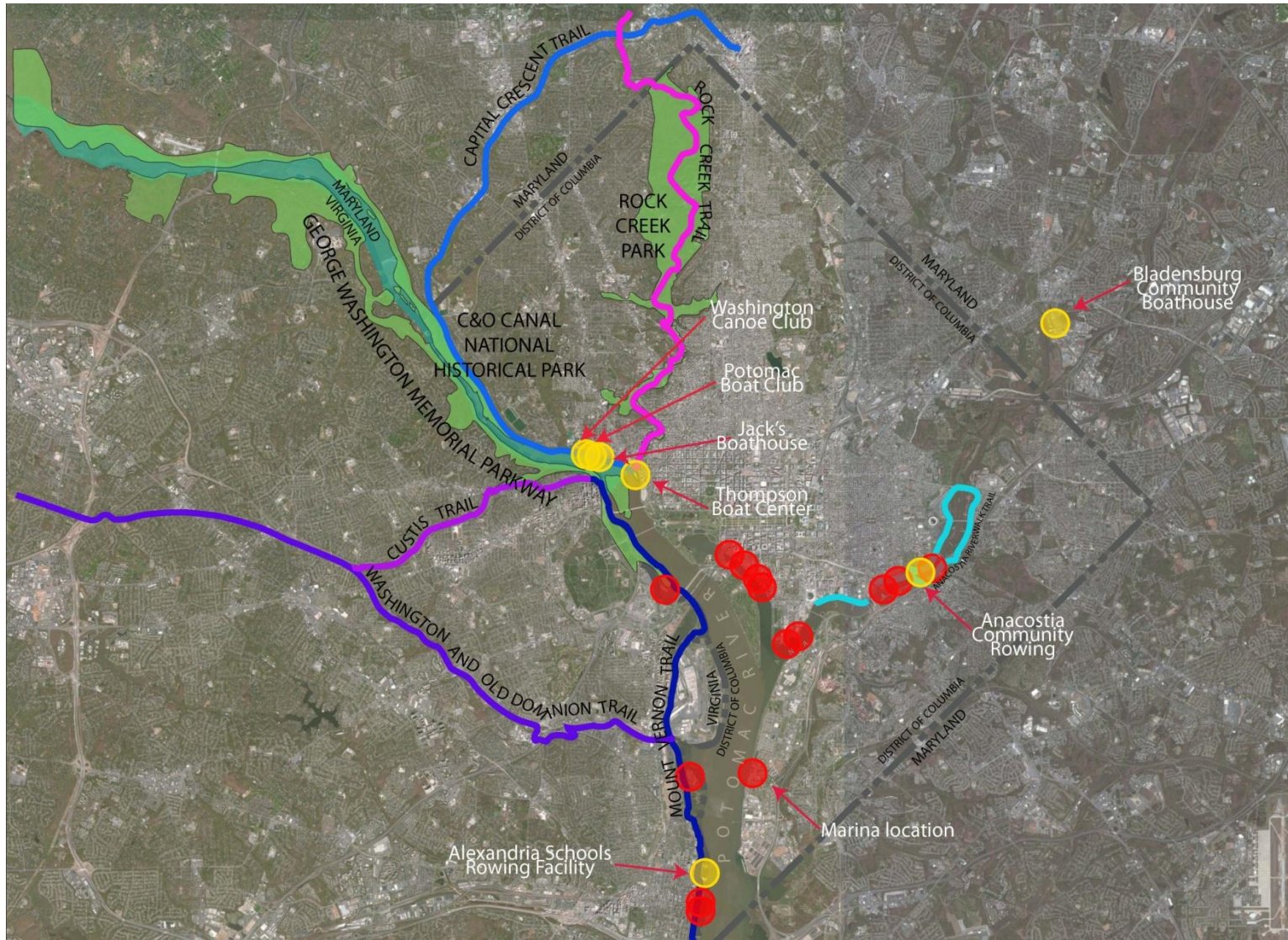


FIGURE 6. REGIONAL FACILITIES

## ADJACENT FACILITIES

Water Street, NW begins at the Alexandria Aqueduct and runs beneath Whitehurst Freeway. Traffic patterns at the terminus of the street are confusing, and it is not clear to drivers who are unfamiliar with the area that the road ends at the aqueduct. Capital Crescent Trail empties into the street, and bicycle commuters and recreational riders often continue from the trail down Water Street, NW and either join the trail in the Georgetown Waterfront Park or continue on the street. Whitehurst Freeway is elevated over the length of Water Street, NW, and the support piers are spaced at intervals along the street. These support piers present challenges to drivers pulling boat trailers and operating other large vehicles, causing traffic circulation problems, although tour buses often turn around near the aqueduct, as noted below.

Metered on-street parking is available along most of the length of Water Street, NW and parking garages are located farther east on K Street, NW. There is a less formal parking pattern between 34th Street, NW and the Alexandria Aqueduct. The Potomac Boat Club has several private pull-in parking spaces. Tour buses dropping off people in Georgetown, often specifically at Key Bridge Boathouse, frequently use the end of the street to turn around or park while waiting for passengers to reload.

The north side of Water Street, NW is home to an old warehouse known as the “Icehouse,” other warehouses, offices, and businesses. The C&O Canal towpath can be accessed using the stairs alongside Key Bridge. The Potomac Boat Club (immediately adjacent to the Alexandria Aqueduct), three residential townhouses, Key Bridge Boathouse, Key Bridge, and fenced-off storage areas are located on the south side of Water Street, NW before Georgetown Waterfront Park begins at 34th Street, NW.

Key Bridge connects M Street, NW in Georgetown with Arlington, Virginia. Its arching supports cross through the NMBZ approximately a block west of 34th Street, NW. The space below the supports is currently used as a DDOT staging area. The docks for Key Bridge Boathouse currently extend east under the bridge. The bridge requires a 25-foot maintenance access setback for any structures on adjacent properties.

Whitehurst Freeway is another elevated roadway directly above Water Street, NW. This freeway connects Key Bridge with roads to the east. Its support posts must be considered in any plans to develop new facilities east of Key Bridge because these posts would affect parking and turnaround configurations for boat trailers. Similar to Key Bridge, any development located adjacent to Whitehurst Freeway must be set back 25 feet to facilitate maintenance, creating a more narrow developable area immediately adjacent to the water. At one point, there were plans to remove Whitehurst Freeway, but these plans have been delayed indefinitely.

The Alexandria Aqueduct connected Georgetown, Washington, D.C, and Rosslyn, Virginia. It was designed to transport cargo boats across the river from the C&O Canal to Alexandria Canal. The bridge was closed in 1923 after the construction of Key Bridge, and the remains of the bridge abutment have been placed on the National Register of Historic Places (NRHP). Today, the Alexandria Aqueduct is the terminus of Capital Crescent Trail and a transition from the C&O Canal NHP to Water Street, NW. Potomac Boat Club is located immediately to the east of the abutment, and the arch closest to the water is used to shelter rowing shells. According to land records, any new facility constructed adjacent to the Alexandria Aqueduct must be set back 25 feet from the aqueduct.





*Water Street, NW, west of Key Bridge (Source: The Louis Berger Group, Inc.)*



*Water Street, NW, east of Key Bridge (Source: The Louis Berger Group, Inc.)*



*Key Bridge (Source: The Louis Berger Group, Inc.)*



*Alexandria Aqueduct (Source: The Louis Berger Group, Inc.)*

## DEMAND FOR ADDITIONAL FACILITIES

During stakeholder interviews conducted in January and February 2012, recreational users were asked to identify additional facilities needed to support nonmotorized boating activities and other major uses within the NMBZ. Results of the interviews indicate that demand for additional facilities is high. Specific measures and considerations for desirable elements of any plans for potential future development are listed below:

### Desired Features of Trail Facilities

- clear wayfinding in the “no man’s land” between the trailhead of Capital Crescent Trail and 34th Street, NW
- distinct paths for various user groups
  - meandering pedestrians
  - bike commuters
  - shell trailers
  - cars
- connections between trails that are parallel but are at different elevations: the Capital Crescent Trail and C&O Canal towpath, which provides access to Virginia trails crossing Key Bridge

- adequate clearance on both sides of Capital Crescent Trail (from the C&O Canal embankment or any building) to allow for safe use of the trail
- unobstructed views and undiminished enjoyment of the natural shoreline
- preservation of natural and historic resources and the cultural landscape
- protection of the “threshold” between urban and wilderness area

### **Desired Features of Paddling Facilities**

- additional river access points for paddlecraft
- separation from rowers (upriver preferred by the paddlers)
- free public launch points as an alternative to rental facilities
- additional indoor storage for privately owned paddlecraft
- clear wayfinding signage and maps about the “rules of the river” for novice paddlers
- public access to all facilities, including launch points, docks, storage, and viewing stands

### **Desired Features of Rowing Facilities**

- additional dock space (room to launch six racing eights at once)
- storage for team boats (Needs are summarized in table 2)
- additional rack space for private boats (mostly single-person boats)
- wakeless pontoon launches
- access for boat trailers (e.g., trailers carrying shells for regattas require a 90-foot-diameter turning area)
- opportunities to have a collegiate identity for any new boathouse to recognize existing donors
- dock space distributed along the river to disperse launch and recovery traffic from a single boathouse location to multiple locations to lessen safety issues and congestion at Thompson Boat Center without dramatically increasing traffic flow on the river
- parking
- infrastructure to allow colleges to host more races (including at Georgetown Waterfront Park) and high schools to share college racing lanes
- a permanent marker at race finish line
- storage for regatta equipment (including buoys, safety gear, radios, public address systems, blankets, finish line stand, and small portable grandstands) and race course equipment (including \$25,000 to \$45,000 worth of wire to mark race lanes and other course features that are anchored in the river on buoys during the racing season but are stored during the winter)
- a landing point for regatta officials near the finish line

Stakeholder interviews disclosed that people using the river now consider the level of traffic comparable to levels considered manageable on the Charles River in Boston, Massachusetts, and the Schuylkill River in Philadelphia, Pennsylvania. Crowding of facilities, including boat storage and dock space, however, is considered a hindrance to excellent rowing programs and fair and equitable access to the river.

The amount of boat storage available at Thompson Boat Center was regarded by all stakeholders as inadequate for the demand. Because of the increasing popularity of rowing and the ideal river conditions of the Upper Potomac River, stakeholders estimated that demand for boat storage and launching facilities would grow to fill any additional facilities provided. Crowding on the docks at Thompson Boat Center

causes safety concerns and concerns about the quality of the rowing program. Additional launching points are required to alleviate problems related to the inadequate capacity of Thompson Boat Center to meet current demand or to accommodate any growth in demand. Crowded conditions have caused teams to devise a carefully timed sequence of launching and landing of boats that allows all current teams to coexist at the crowded facility. All scholastic teams share the same schedule, and orchestration of the launching process during the brief window of time available to high school students leads to a frantic start to daily practice. While launching occurs in rapid succession, novice rowers frequently create back-ups immediately upriver from the dock despite the carefully orchestrated launching process. Retrieving (or landing) of boats creates similar “controlled chaos” conditions.

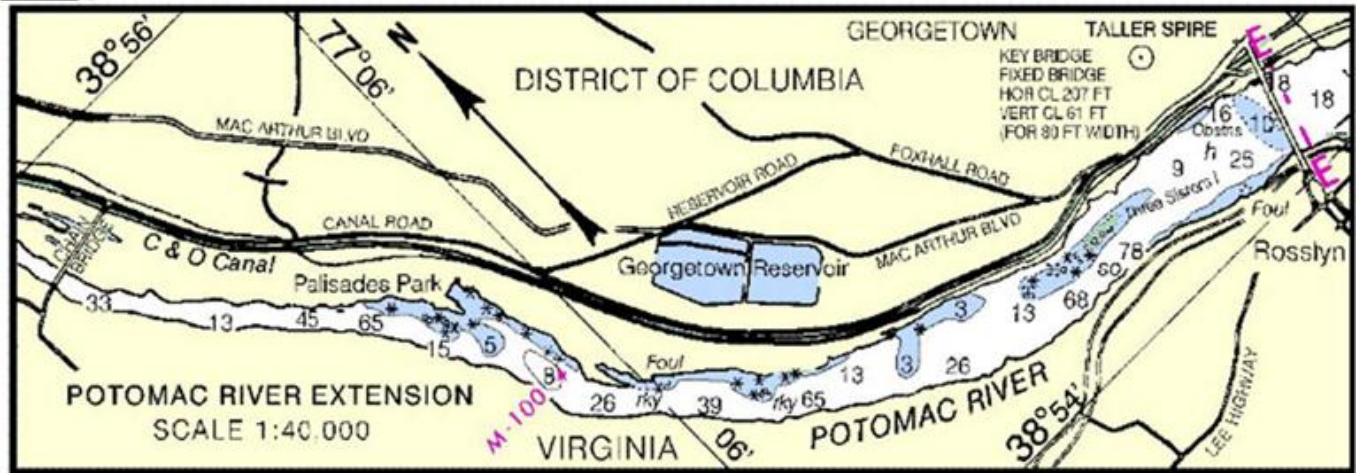
The intense use of the docks by rowing teams effectively precludes independent rowers or paddlers from using the docks during morning and afternoon practice times. River users have established an informal division of time to manage this condition, but independent rowers and paddlers are limited by overcrowding and have stated that overcrowding is a barrier to equitable access to the river. Motorized coach launches (which range in length between 20 and 26 feet) are also a high priority for the scholastic teams. It is preferable to have two coach launches per program on the river during practice. Docking space for launches of this type is limited to the back of the dock. The dock length at Thompson Boat Center is not sufficient to provide docking space for the number of launches required. Coaches at both the high school and university levels noted that the longer wakeless pontoon launches are preferable to the smaller motor launches currently in use. Other issues cited include the lack of alternative activities for high school teams at Thompson Boat Center (ergometers, exercise machines, and team meeting space) that pressure teams to focus only on getting out onto the river to practice. In marginal weather conditions, coaches would prefer to have alternatives to launching. The less numerous and more highly skilled rowers at the university level experience similar but less intense pressure as the high school rowers.

Independent access to the river is limited by the adequacy of the storage and launching options along the Potomac River. Private clubs provide access for their members and for limited numbers of community outreach groups, but demand for access (as measured by the waiting list at Thompson Boat Center for private slips) is an indication that team rowing prevents other types of users from access. Free launching points are not available anywhere along the river. Car-top launching of private vessels that are stored elsewhere is possible from public parking along Water Street, NW or the limited parking spaces at Key Bridge Boathouse. Actual access to the river, however, requires payment of a dock use fee at Thompson Boat Center and Key Bridge Boathouse, which are the only options available. Beach-type kayak or canoe launch is not possible anywhere along the river. Georgetown Waterfront Park provides a regatta viewing facility but no launch points.

The rack capacity requirements of the rowing teams were estimated by the stakeholder group. The tabulated findings provide an estimate of the demand for additional boathouses within the NMBZ. Meeting total storage demand would require rack capacity sufficient to accommodate the storage needs of multiple rowing programs (table 2). Additional space would be required to store paddlecraft.

Motorboat traffic offshore from the NMBZ is limited by the existence of a “no wake” zone upstream from Memorial Bridge. In addition, hazardous conditions that require expert knowledge of conditions limit amateur yachting. Navigational charts of the river in this area (figure 7) indicate the presence of shallow water, rocks, and swift currents and the absence of designated deep draft vessel channels, in which motorboats would have the right of way. These conditions and the prevalence of smaller nonmotorized boats that are not able to evade faster moving vessels make the area unsuitable for facilities that would increase motorboat traffic.





12285 40th Ed., Apr. /10 ; Corrected through NM Apr. 24/10, LNM Apr. 13/10

**FIGURE 7. NAVIGATIONAL CHART OF THE UPPER POTOMAC RIVER**

(Source: National Oceanic and Atmospheric Administration 2011)

**Table 2. Summary of Rowing Facility Requirements**

Requirement	Athletes	Launches	Eights	Fours	Pairs	Singles
Georgetown University	180	8	55	25	20	
George Washington University	100	4	40	10	10	
Bishop O'Connell	80	2	8	4	2	
Bethesda Chevy Chase	100	2	12	4		
Georgetown Day School	50	2	8	4	2	
Holton Arms	50	2	8	4	2	
McLean High School	100	2	12	4		
St. Johns High School	50	2	8	4	2	
Visitation High School	50	2	8	4	2	
Walt Whitman High School	100	2	12	4		
Wilson High School	80	2	12	4	2	
Yorktown High School	120	2	12	4		
St. Albans/ National Cathedral School	100	2	12	4		
Sidwell Friends School	50	2	12	4	2	
Individuals	150+					150+
Total	1,210	36	211	83	44	150

Note: Washington and Lee High School is accommodated now and for the foreseeable future at the Potomac Boat Club and is therefore not included in this summary of requirements.

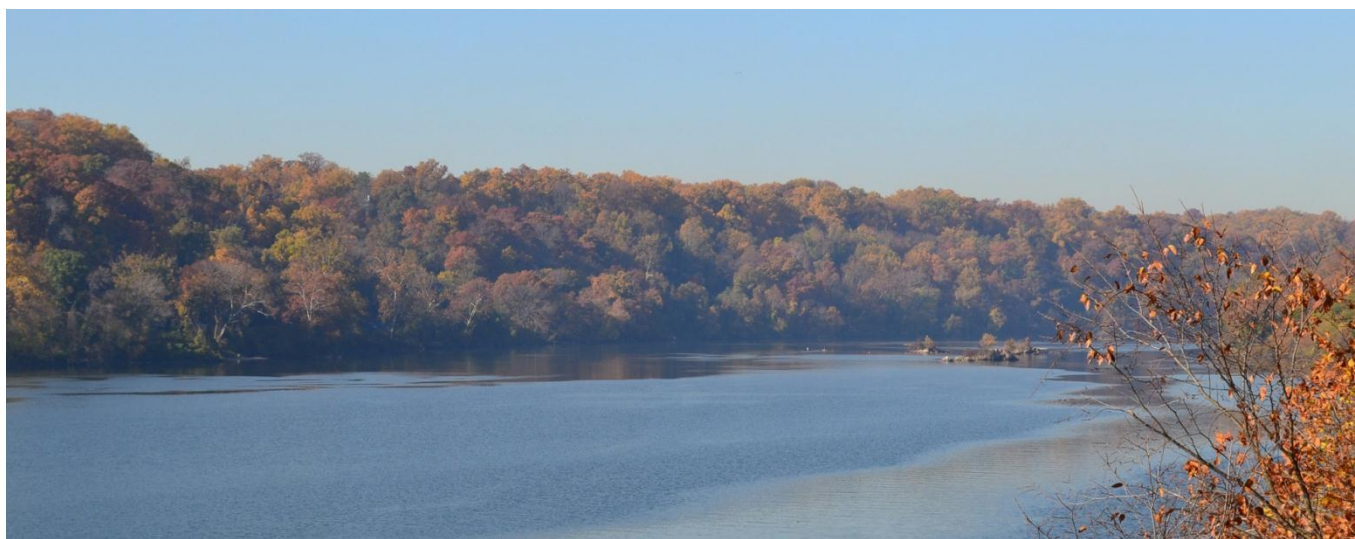
## ENVIRONMENTAL SETTING

### Geography

The Potomac River offshore from the NMBZ is the last navigable stretch of river before Great Falls, the dramatic geologic formation that characterizes the emergence of the Potomac River from the Piedmont plateau. The Piedmont plateau extends along the entire eastern seaboard of the United States and was a critical factor in the establishment of many of the nation's major east coast cities. Rivers flowing out of the Piedmont plateau into the coastal plain are only navigable downstream from the Piedmont plateau's rocky geology, and many cities, including Georgetown, were established at the "fall line" that marks the threshold between the lowlands of the tidal coastal plain and the rocky uplands of the Piedmont plateau (U.S. Geological Survey 1980.)

The Potomac River is unique along the fall line in that it has never been dammed and the primordial geology of the river and of the Piedmont region is readily visible. The Potomac Gorge (figure 8) is a significant feature of the C&O Canal NHP, described as follows on the NPS website:

The Potomac Gorge (the Gorge)...is one of the most significant natural areas in the eastern United States. It extends for 15 miles along the Potomac River from Great Falls to Theodore Roosevelt Island, encompassing about 9,700 acres in Virginia, Maryland and the District of Columbia and incorporating sections of C&O Canal NHP and George Washington Memorial Parkway. Because of its unusual hydrogeology, the Gorge is one of the most biologically diverse areas for plant species in particular, serving as a meeting place for northern and southern species, midwestern and eastern species, and mountain and coastal species. The site harbors more than 400 occurrences of over 200 rare species and communities, a major river system with numerous tributaries, noteworthy stands of upland forest, many seeps and springs harboring rare groundwater fauna, and abundant wetlands. The National Park Service is the principle landowner in the Gorge, however, The Nature Conservancy co-owns Bear Island in the heart of the Gorge and has had long been interested in the extraordinary biological diversity of the site. The site is also renowned for its aesthetic, cultural and recreational values. Numerous vantage points of the river from both C&O Canal NHP and George Washington Memorial Parkway afford spectacular views of features like the Great Falls of the Potomac and the Potomac Palisades. The lush vegetation along the river screens out much of the sights and sounds of civilization, providing welcome tranquility in the midst of a densely populated urban area (NPS 2012).



*Potomac River offshore of the NMBZ (Source: The Louis Berger Group, Inc.)*



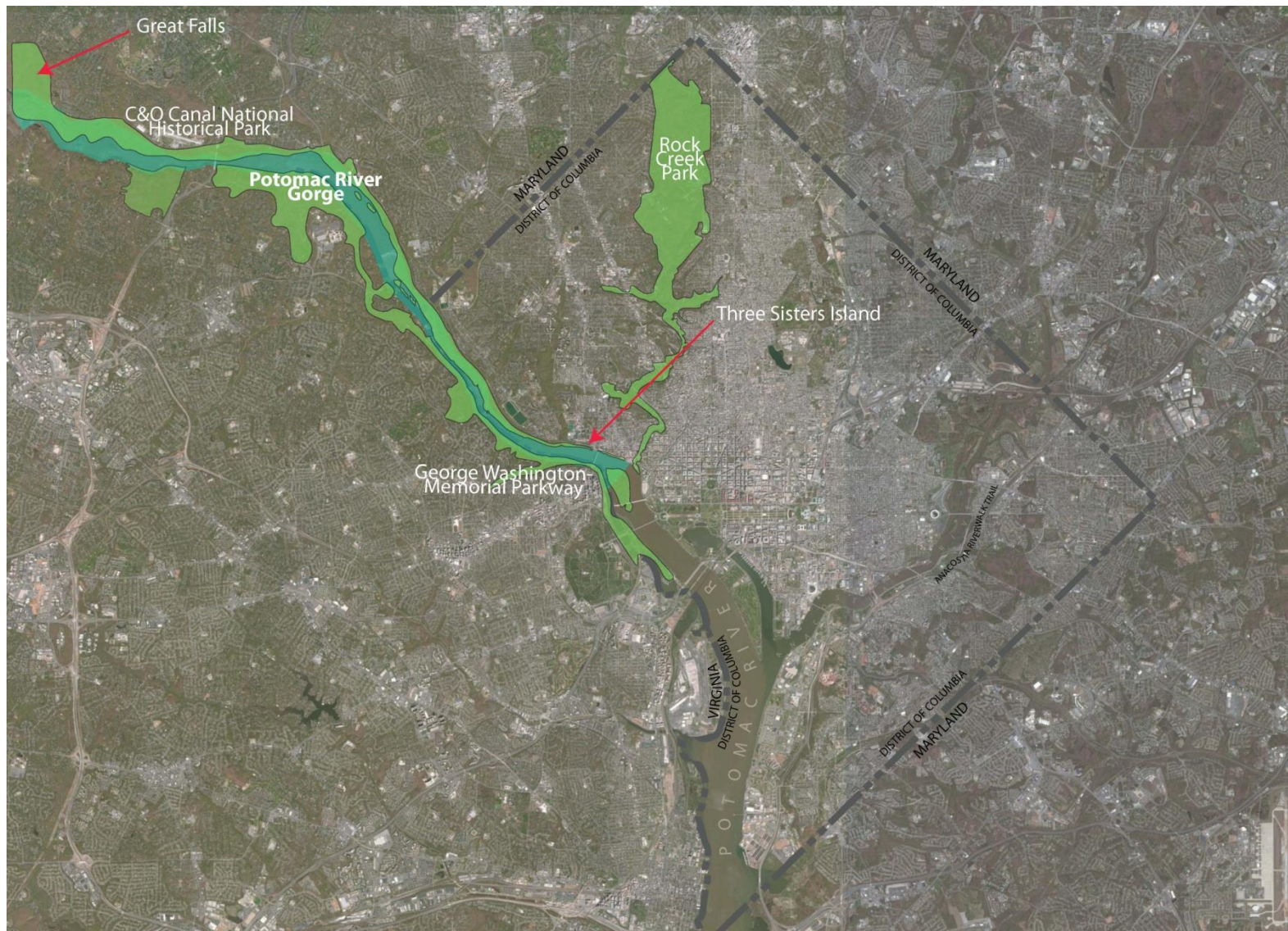


FIGURE 8. POTOMAC RIVER GORGE

## Topography and Soils

Both topography and soils of the site have been altered from the natural condition of the river terrace through the placement of fill in a series of civil works. The creation of the C&O Canal levee was the first of these operations. Construction began in 1828, and the Georgetown portion of the canal was completed in 1839. The canal levee was located parallel to the Potomac River and fell steeply to the shoreline (figure 9). A photograph from the 1870s or 1880s shows an area of fill immediately west of the Alexandria Aqueduct, giving access to small establishments built along the shoreline. To the east of the aqueduct, a wider expanse of fill extended the shoreline into the Potomac River, and industrial and waterfront uses were built along the shoreline. Soon after its construction was complete, the C&O Canal was rendered obsolete by the Baltimore and Ohio Railroad, which purchased the canal in 1890 and constructed a railroad parallel to the canal levee on a narrow shoulder of fill placed along the shoreline. The Washington Canoe Club, built in 1896, extended from this embankment over the water. Sometime after the turn of the century fill was extended from the rail embankment beneath the Washington Canoe Club. Consistent with its construction fill origins, the site is generally flat with a few low areas on the western end and a relatively steep embankment with riprap shoreline stabilization west of the Alexandria Aqueduct. Soils in the NMBZ reflect the fact that much of the land has been disturbed; they are a mix of urban land and urban land-Manor Complex. The urban land soil classification confirms the history of substantial fill and disturbance (Natural Resources Conservation Service 2012).

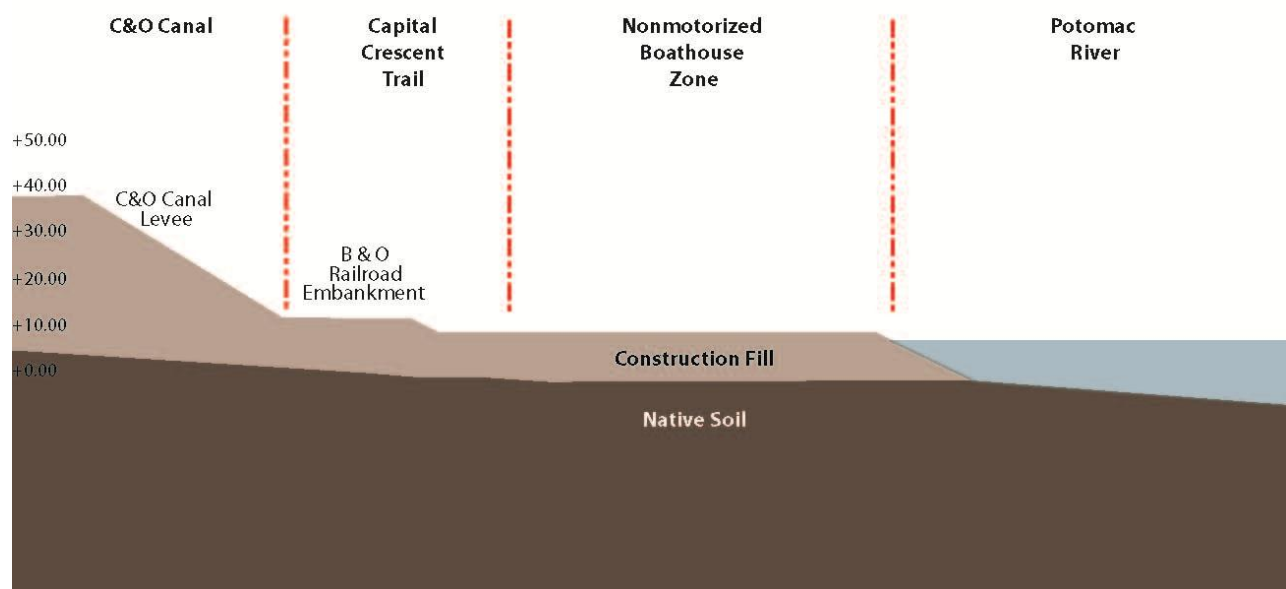
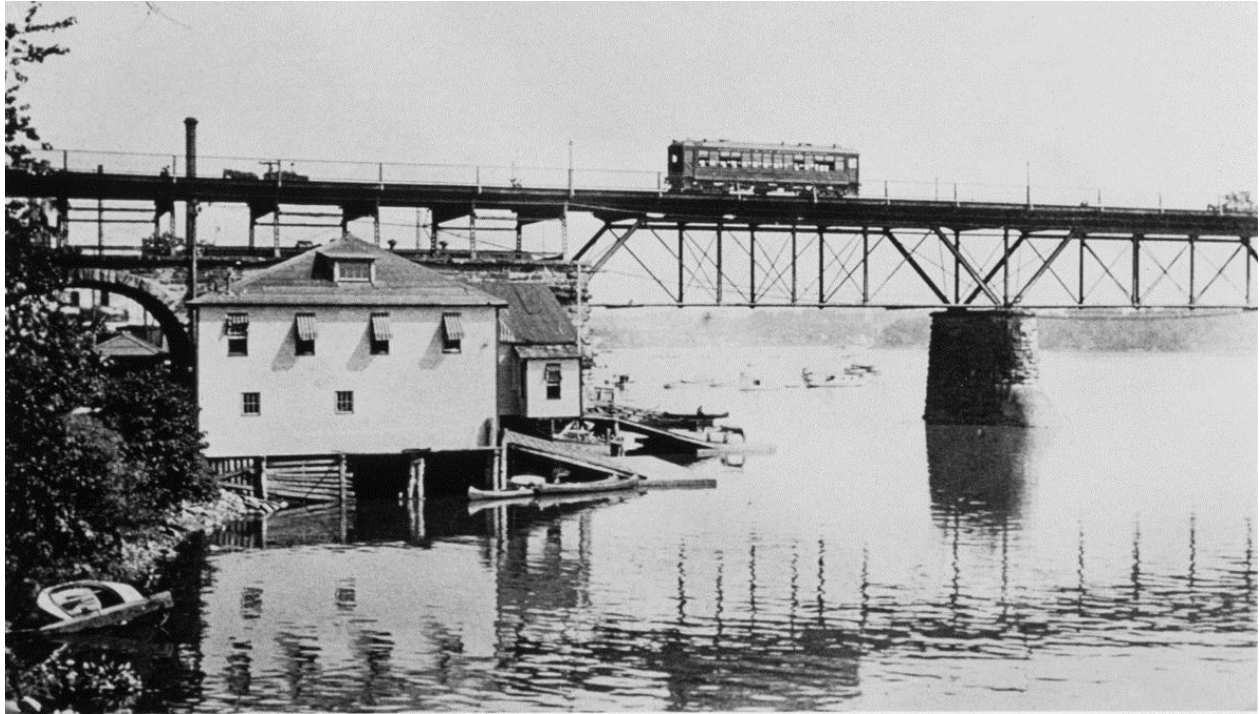


FIGURE 9. CONCEPTUAL SITE CROSS SECTION



*Boathouse built directly over the Potomac River, c. 1890s  
(Source: National Park Service)*

## **Floodplain**

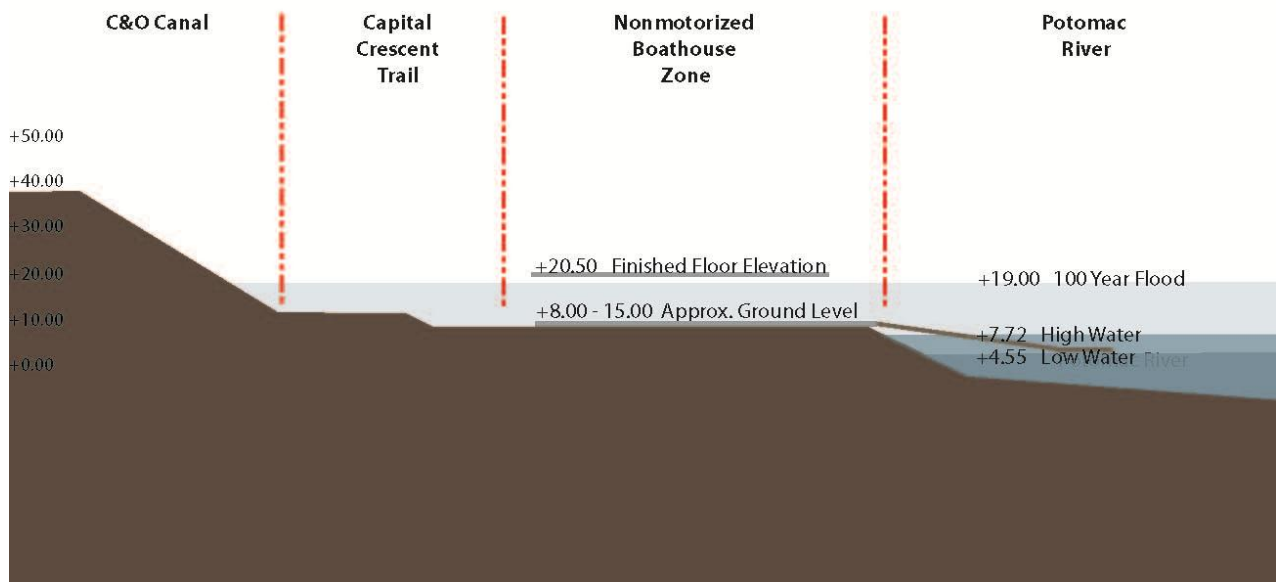
Flooding of the Potomac River has been a ravaging influence on the C&O Canal since construction began in 1828 and was a major factor in the closure of the canal. Several boathouses built in the NMBZ have been destroyed by flood waters. The most recent devastating floods occurred in 1996; minor floods occurred in 2003 and 2008. The NMBZ is in the Federal Emergency Management Agency's Flood Hazard Zone AE with a 100-year flood elevation of +19.00. This flood hazard zone requires that the first habitable floor of a structure be constructed 1.5 feet above the 100-year flood elevation. The shoreline elevation (figure 10) varies from +8.00 at the western end to +15.00 on the eastern end of the NMBZ. The highest tide of the year (the spring tide) is approximately +8.00 and lower areas at the western end of the NMBZ are prone to periodic inundation.

A 2004 study examined the effect of a structure proposed at the western end of the NMBZ on the C&O Canal and the floodplain. The study concluded that the proposed structure would have no impact on the floodplain and would not increase the water surface level, velocity, or shear stress appreciably during floods (Patton, Harris Rust and Associates 2004).





*Aerial view of ice dams at Washington Canoe Club and Dempsey's Boathouse within the NMBZ  
(Source: National Park Service)*



**FIGURE 10. FLOODPLAIN**

## Wetlands

The EA prepared in 2006 noted that Site A contains approximately one third of an acre of artificial vegetated wetlands. Water leaking from the C&O Canal, located adjacent and upgradient from the site, is believed by the US Army Corps of Engineers to be the source of ponding water onsite. Due to the artificial source of water, the Corps determined that the wetlands are artificial and do not come under Corps jurisdiction. Therefore, the Corps will not exert its regulatory authority under Section 404 of the Clean Water Act. In addition, according to the District's Wetland Conservation Plan (1997), there are no mapped wetlands within or in proximity to the site. The U.S. Fish and Wildlife "Wetland Mapper" shows no aerially-detected wetlands at or in the vicinity of the project site.

## Wildlife and Vegetation

Existing vegetation was assessed in a previous study and is reported to consist of species typical of disturbed sites, including both herbaceous plants and trees (see Appendix B). Flooding and ice dams occur periodically and destroy forest cover in this landscape; therefore, new colonizing species and young trees are typical. Much of the vegetation documented in the previous study is non-native invasive species. Species typical of wetlands are also reported on the site. Jurisdictional wetlands have not been confirmed on the site (EA 2006) and wetland delineation would be required prior to development. The embankment of the C&O Canal is heavily forested with hardwood species and is a major component of the scenic fabric of the Upper Potomac River. Trees within the NMBZ, primarily white ash (*Fraxinus americana*), are also significant character-defining features of the landscape. Trees occur primarily along the shoreline edge with herbaceous plants and grasses occupying the area between the shore and Capital Crescent Trail. These shoreline trees are visually prominent from multiple vantage points within and beyond the NMBZ.

Wildlife identified on the site includes migratory birds and other urban wildlife (See Appendix B). Further consultation with review agencies would be necessary to ensure that no protected species are present, such as the shortnose sturgeon, which has been reported in the Potomac River.



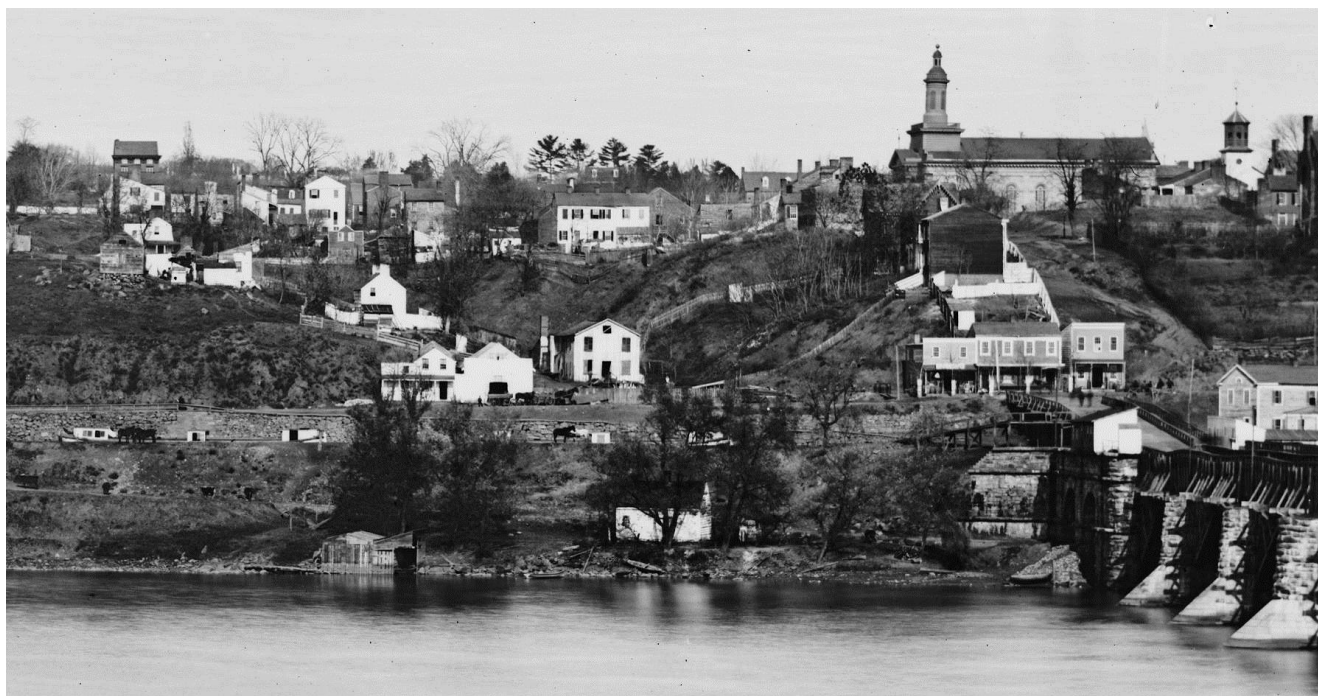
*Shoreline vegetation viewed from the Capital Crescent Trail (Source: The Louis Berger Group, Inc.)*



*Shoreline vegetation viewed from the docks (Source: The Louis Berger Group, Inc.)*



## CULTURAL AND HISTORICAL CONTEXT



*C&O Canal levee in the vicinity of the boathouse zone, c. 1880s (Source: National Park Service)*

### Chesapeake & Ohio Canal National Historical Park

The upstream end of the NMBZ, from the Alexandria Aqueduct west, is part of the C&O Canal NHP. The canal and its levee run parallel to the river rising about 35 feet in elevation above the river. The C&O Canal is one of the most intact and impressive remnants of the American canal-building era, and its historical significance is the basis for creating the C&O Canal NHP. C&O Canal is historically significant primarily because it embodies nineteenth century engineering and architectural technology. The canal operated from the late 1820s to 1924 as a route for transporting coal, lumber, and agricultural products from western Maryland to the port of Georgetown and to the navigable lower reaches of the Potomac River.

The entire length of the canal is listed on the NRHP because of its historical significance for architecture, engineering, commerce, transportation, military history, and conservation. As a modern-day transportation resource, the canal's towpath still provides a nearly level, continuous trail through the spectacular scenery of the Potomac River valley. Millions of visitors recreate annually by hiking and biking the C&O Canal towpath and enjoying the natural, cultural, and recreational opportunities it provides (NPS 2008).

The purpose of the C&O Canal NHP is to provide, in perpetuity, the opportunity to:

- understand the canal's reason for being, its construction, its role in transportation, economic development and westward expansion, the way of life which evolved upon it, and the history of the region through which it passes and from which to gain an insight into the era of canal building in the country
- appreciate the setting in which it lies and the natural and human history that can be studied along its way
- enjoy the recreational use of the canal, the parklands, and the adjacent Potomac River (NPS 1976)

The Washington Canoe Club building sits within the C&O Canal NHP. George P. Hales designed the building in 1904 (Washington Canoe Club 2012; NPS 1990), and it is listed in the NRHP. The structure

has fallen into disrepair in recent years, however, and there is concern about its structural soundness. The NPS has reinforced it structurally, but it is currently not habitable by the club or others. Currently, the club is storing its boats on outside racks. Howard University students in partnership with the Historic American Building Survey are conducting surveys to develop measured drawings for the Washington Canoe Club expected to be completed by spring of 2013. The building will be evaluated for treatment in the future.

## **Georgetown Waterfront Park**

The NPS-managed property on the downstream end of the NMBZ is part of Georgetown Waterfront Park, a unit of Rock Creek Park. The Capper-Crampton Act of 1930 established a federal goal of protecting the shorelines of the Potomac River from Fort Washington, Maryland, to Great Falls, Maryland, and identified the Georgetown waterfront as an important element of that shoreline warranting federal protection. The District of Columbia transferred 10 acres of Georgetown waterfront property to the NPS for park purposes, and Georgetown Waterfront Park boundary was formally established in 1984. The plan for the park includes 30 goals, of which the following are relevant to the NMBZ:

- create a passive public park
- create a shoreline promenade with separate bike path
- create variety of bulkhead treatments including fishing places
- create a special place/Wisconsin Avenue, NW focal point
- maintain river views
- stabilize and interpret the historic aqueduct
- retain Thompson Boat Center and enhance the appearance of and redesign Thompson Boat Center parking
- provide for a floating restaurant (between 34th Street, NW and Key Bridge) and related parking under the freeway
- establish a nonmotorized boating area (extending 1,100 feet west of Key Bridge and east to 34th Street, NW if the floating restaurant is not realized)
- acquire waterfront offices, Icehouse, hydroelectric plant, canal bank, and parking lot
- preserve the natural scenic values of the Palisades (prescribing the 1,100-foot upstream limit for the NMBZ)

In 2011, a 10-acre passive park was constructed between Washington Harbor and 34th Street, NW. The park includes a promenade and bike path along the river; a fountain at the terminus of Wisconsin Avenue, NW; river stairs; and viewing areas for regattas.

## **Character Defining Features of the Landscape**

Features of the NMBZ fall into categories delineated by the *Guidelines for the Treatment of Cultural Landscapes* (NPS 1994) as contributing to the historic fabric of the landscape. These features include spatial organization, topography, vegetation, circulation, buildings and structures, water features, views and vantage points, and small-scale features. Care would be required to avoid adverse impacts to these features when developing new facilities within the NMBZ. These features are discussed below and elsewhere in the report.

The Potomac River and the C&O Canal are the primary organizing features of the landscape of the NMBZ. The river terrace and C&O Canal levee provide spatial organization oriented toward the river. In addition, the presence of the Alexandria Aqueduct establishes a portal that divides the NMBZ into distinct character areas similar to parallel stretch of the C&O Canal towpath, which crosses below Whitehurst Freeway to establish a “threshold” between city and nature. East of the Alexandria Aqueduct along Water Street, NW, the urban character is marked by the presence of buildings adjacent to the river that block

views of the river and minimize access. Several open lots are exceptions that are more consistent with the open character of Georgetown Waterfront Park located to the east. Whitehurst Freeway and Key Bridge provide a strong spatial definition of the site by providing a “ceiling.” West of the Alexandria Aqueduct, the site character is more rural with the Washington Canoe Club being the only structure and the area having significantly more vegetation. Views to the river are open and a strong boundary is created by the C&O Canal levee. As discussed previously, the topography of the site is dominated by the C&O Canal levee and flat riverside terraces formed by construction fill. The topography is a significant component of the site’s spatial organization.

Vegetation at the site is a strong contributor to its present character. Historic photographs indicate that the forested condition is relatively recent. The forest cover obscures the relationship of the C&O Canal to the Potomac River. The vegetation distinguishes the areas east and west of the Alexandria Aqueduct and reinforces the spatial organization of the NMBZ.

The circulation patterns in the NMBZ are predominantly water-based. The Washington Canoe Club, the Potomac Boat Club and Key Bridge Boathouse provide access to the Potomac River from within the NMBZ. In addition, Thompson Boat Center, located downstream from the zone, is a significant launching point for nonmotorized boats using the river offshore from the NMBZ. Washington Canoe Club and Potomac Boat Club are private clubs that offer access only to their members. Key Bridge Boathouse and Thompson Boat Center offer access to the public. The other significant circulation feature is the Capital Crescent Trail, which is a major regional trail and provides access for commuters and recreationists. Capital Crescent Trail is 12 feet wide but occupies a 30- to 40-foot-wide easement that encompasses the railroad embankment on which it is built. The trail is linked to Water Street, NW, which is the main circulation spine east of the Alexandria Aqueduct. Water Street, NW lacks delineated lanes and conveys the impression of a parking lot as much as a street.

The C&O Canal, Washington Canoe Club, Potomac Boat Club and Alexandria Aqueduct are listed in the NRHP.

The Potomac River is the primary feature of the NMBZ. Within the NMBZ, views and vantage points (figure 11) that are significant as character defining features of the region as a whole are those that establish the relationship of the various cultural features to the natural setting, to the history of the C&O Canal, and to one another. These views and vantage points include the forested slope of the C&O Canal levee and to a lesser extent the forested edge of the NMBZ, which establishes the natural character of the Potomac River above Georgetown. The view through the Alexandria Aqueduct from both directions is significant in that it marks a symbolic transition from city to nature in the form of a literal threshold marked by the arch of the aqueduct.

No small-scale features of significance are located in the NMBZ.



*Rural character west of the Alexandria Aqueduct (Source: The Louis Berger Group, Inc.)*



*Urban character east of the Alexandria Aqueduct (Source: The Louis Berger Group, Inc.)*



*View of the western end of the NMBZ from the Virginia shore of the Potomac River (Source: National Park Service)*





FIGURE 11. SIGNIFICANT VANTAGE POINTS

## **CODES, REGULATIONS, AND STANDARDS**

Coordination with the District of Columbia government, specifically the Department of Transportation (DDOT), Department of Consumer and Regulatory Affairs, which regulates the building permitting process, and the District of Columbia Water and Sewer Authority (DC Water), will be required for any development within the NMBZ. A facility built in this area would likely require further consultation with several other review boards including the National Capital Planning Commission (NCPC), the Commission of Fine Arts Old Georgetown Board and the Georgetown Advisory Neighborhood Committee.

### **Review Agencies**

The NCPC was established by the National Capital Planning Act. The NCPC is the planning agency for the federal government in the District of Columbia and the National Capital Region. The NCPC reviews all proposed federal actions that impact the nation's capital and surrounding areas. The agency's principal responsibility is to protect and enhance the historic, cultural, and natural resources of the national capital by creating and updating a comprehensive plan for the region, crafting long-range plans and policies, reviewing a variety of federal and district development projects, and producing the federal Capital Improvements Program. Any planning documents related to the NMBZ, and any resulting projects, including land exchanges, development projects, and landscape design, are subject to review and approval by the NCPC.

Congress established the Commission of Fine Arts (CFA) to provide expert advice to the president, Congress, and heads of departments and agencies of the federal and District of Columbia governments on matters of aesthetics and design as they "affect the Federal interest and preserve the dignity of the nation's capital" (CFA 2012). Under the Old Georgetown Act, the CFA Old Georgetown Board advises on design matters affecting the historic district of Georgetown. Proposed projects in the NMBZ would be subject to Old Georgetown Board review.

Advisory Neighborhood Committees (ANCs) are residential advisory boards for the neighborhoods in the District of Columbia. ANCs consider policies and programs affecting neighborhoods, including traffic, parking, recreation, zoning, economic development, and related issues. The NMBZ is in Georgetown and therefore the Georgetown ANC would review any actions taken with the NMBZ. Once it has reviewed a proposed action, the ANC would present its positions and make recommendations to appropriate District of Columbia government agencies, the District of Columbia executive branch, and the city council. ANCs may also present their positions to federal agencies, such as the Old Georgetown Board and NPS.

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation, state historic preservation officers, and other consulting parties a reasonable opportunity to comment on such undertakings. Through this process, concerns associated with historic preservation are addressed at the early stages of project planning. Overall, the objective of consultation is to identify historic properties potentially affected by the undertaking; assess its effects; and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties. Any action taken within the NMBZ would require Section 106 review.

### **Zoning**

Any structure constructed by NPS within the NMBZ would be exempt from zoning regulations. A private facility, however, would be required to comply with zoning controls. There are three separate zoning districts within the NMBZ (figure 13). The site of the Washington Canoe Club retains the waterfront's original light industrial zoning designation (CM-1). As land use along the river changed, new Waterfront Districts were established by the District of Columbia and portions of the NMBZ were rezoned. The majority of the site area of the NMBZ is zoned W-1. A parcel at the western end (Site A) was rezoned to W-0 in 2006 as part of the Georgetown University boathouse proposal. Zoning controls for each district are summarized in table 4.

The purpose of the Waterfront Districts is to encourage a diversity of compatible land uses at various densities, including combinations of residential, offices, retail, recreational, arts and cultural, and other miscellaneous uses. The W-0 District permits open space, park, and low-density and low-height waterfront-oriented retail and arts uses; the W-1 District permits a moderate height and density. The W-1, W-2, and W-3 Districts are also intended to be relatively self-contained by supplying a variety of housing, service, employment, and recreational opportunities in one location. This characteristic allows one area to serve many different needs of a single population and to thereby reduce the amount of vehicular traffic generated by the uses in the Waterfront Districts. The W-0 District is intended to provide waterfront recreation areas with related waterfront-oriented or waterfront-enhancing uses to serve local and regional open space recreation needs. Zoning regulations for the Waterfront Districts include a 100-foot setback from the shoreline except for structures associated with publicly accessible wharfs, docks, or piers. No shoreline setback would be required for boathouses that provide public access to the dock. Private boathouses would be subject to the setback requirement. The 100-foot setback can be reduced to 20 feet with a variance.

A boathouse can be permitted as a special exception in the W-0 District, if it:

- meets the criteria for special exceptions
- is designed to enhance the visual and recreational opportunities offered along the waterfront
- will not result in the filling of normally submerged areas and will minimize excavation to that reasonably required for a facility that is principally above-grade
- will be located so as not likely to become objectionable to surrounding and nearby property because of noise, traffic, or parking

One or more motorized safety launches for coaches are allowed for supervision of rowing practice and water safety. A boathouse may include rest rooms, showers, locker rooms, kitchen, exercise area, boat storage and maintenance, coaches' office, one caretaker's residence, rowing tank, dock, and related functions. Off-street parking spaces are required but may be provided offsite as a special exception, if an applicant proves that compliance with this parking requirement would be unsafe or economically impractical and if the parking spaces are reasonably convenient parking for patrons of the principal building; are unlikely to become objectionable to adjoining or nearby property, park space, or the waterfront because of noise, traffic, or other objectionable conditions; are adequately screened from adjacent park space and from the waterfront, and are designed to prevent storm water run-off directly into the river. All or a portion of required parking spaces for a boathouse may be reduced or eliminated by special exception if an applicant proves that provision of parking would result in significant adverse impacts on adjacent park land and reasonable and conveniently located alternatives to the required parking exist and are available to the boathouse users with minimal impact on adjacent land or development.



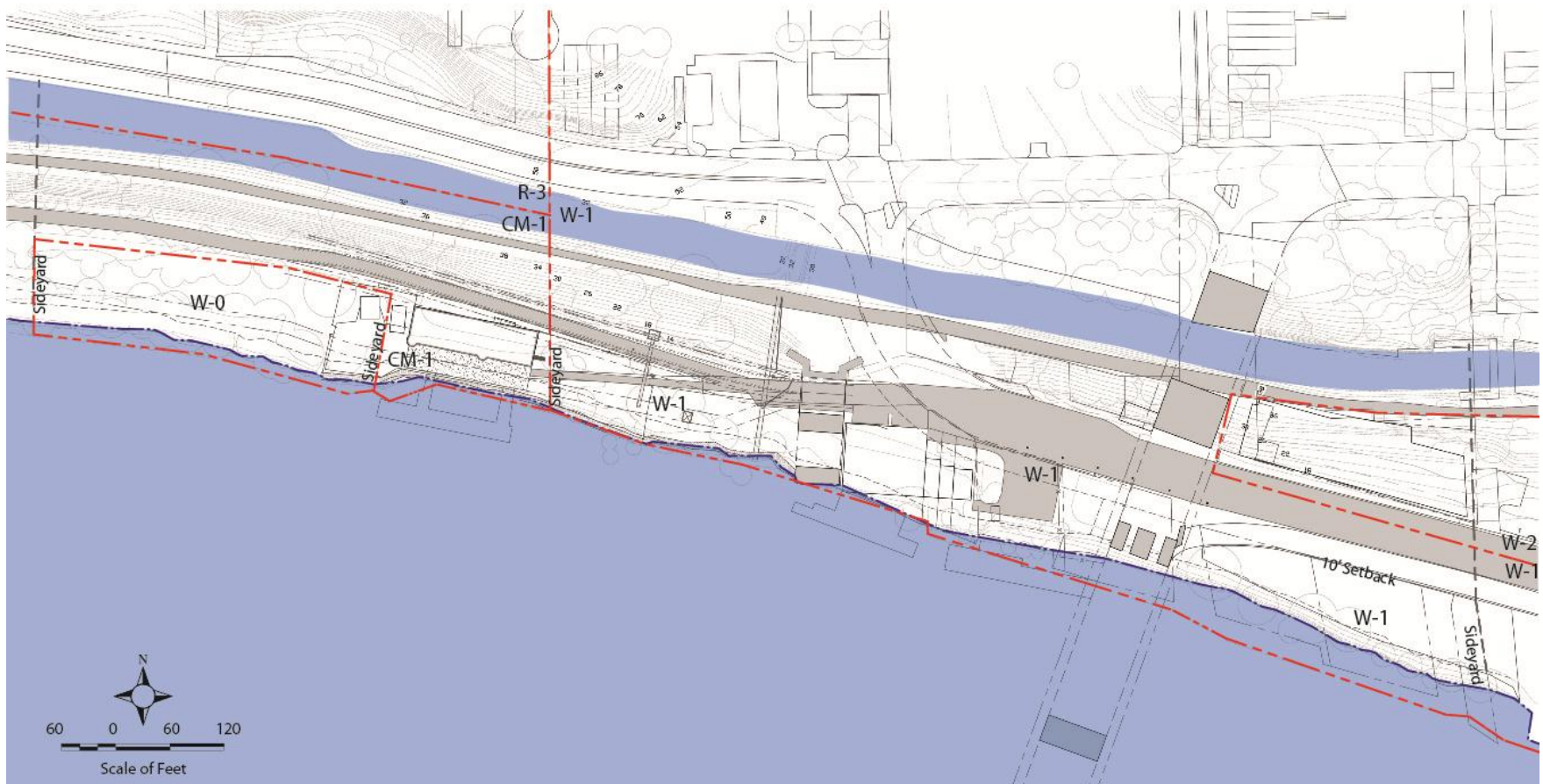


FIGURE 12. ZONING

## Environmental Preservation

The U.S. Army Corps of Engineers (USACE), Baltimore District, issues permits for proposed marinas, docks, piers, and commercial and institutional facilities located partially or wholly in a water body in the Chesapeake watershed. A Section 10 permit (for work in, over, or under a Navigable Water of the United States) is required. NPS permits any action affecting the river bottom and would review plans potentially impacting the river bottom. The USACE initiates coordination and consultation with the U.S. Department of the Interior, the U.S. Environmental Protection Agency, and the National Oceanic and Atmospheric Administration. If portions of a building must be located within a waterway, it is important to determine the level of impact associated with the proposed action. If the impact is minor, it is more likely that a permit for construction will be approved. On the other hand, if there is a significant effect as determined by the USACE, the permitting process may prove more problematic. The USACE nationwide permit system (USACE 2002) considers impacts related to residential, commercial, and institutional developments, including the construction of building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures. In this case, it is important to determine if any part of the foundation or building pad, including the parking lot, would be located partially or wholly in a water body. Although further analysis would be required to determine the exact nature and placement of a proposed building's foundation the design options appear to accommodate a structural system, such as pilings, that could be located within the property line and not in submerged portions of the site. Any portions of a proposed building overhanging the submerged portion of the site would be more likely to be permitted if they are less than 20 feet deep and represent less than 10 percent of the building's total gross area. Similarly, options exist that allow the dock that would be attached to the structure to be designed as a temporary dock and moored to the main structure, making it significantly easier to obtain permit approval. A building overhang is considered problematic in projects where the length of the overhang over the water would be a significant proportion of the width of the entire facility or intrudes on the water body in a way that impedes daylighting issues relative to submerged aquatic vegetation. Design options exist that would not require significant overhangs. It is not anticipated that there would be significant effects to the submerged aquatic vegetation.

Executive Order 11988, Floodplain Management (May 24, 1977), requires federal agencies to take action to reduce the risk of flood loss; to minimize the impacts of floods on human safety, health, and welfare; and to restore and preserve the national and beneficial values served by floodplains in carrying out their responsibilities for managing and disposing of federal lands. Before taking an action, an agency must determine whether a proposed action would occur in a floodplain; if so, consideration must be made of alternatives to avoid adverse effects and incompatible development in floodplains.

If, after compliance with the requirements of this executive order, new construction of structures or facilities are to be located in a floodplain, accepted flood-proofing and other flood protection measures must be applied to new construction. To achieve flood protection, agencies will, wherever practicable, elevate structures above the base flood level rather than filling in land. District of Columbia Municipal Regulation 21 stipulates that habitable spaces in buildings that are located in a floodplain must be located at least 1.5 feet above the minimum elevation of the 100-year floodplain. For this project, the lower level boat storage is not considered habitable.

The development of any facility within the NMBZ, public or private, is subject to local and federal laws, federal mandates and NPS policies regarding stewardship of natural resources. These include:

- PL 110-140, Energy Independence and Security Act of 2007 (EISA)
- Section 303 of the Clean Water Act Chesapeake Bay Total Maximum Daily Load
- 2009 EO 13508 Chesapeake Bay Protection and Restoration
- 2009 EO13514, Federal Leadership in Environmental, Energy and Economic Performance
- 2006 Federal Leadership in High-Performance and Sustainable Buildings Memorandum of Understanding including United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) requirements.

These requirements include strict controls on stormwater management geared to protecting the Chesapeake Bay watershed, of which the Potomac River is a major component. Section 438 of EISA outlines stormwater runoff requirements for federal development projects (more than 5,000 square feet), specifying the use of strategies to maintain or restore predevelopment hydrology conditions. Both EISA Section 438 and Clean Water Act Section 303 Total Maximum Daily Load requirements are reviewed as part of the National Pollution Discharge Elimination System (NPDES) permitting process, which is required for sites with more than one acre of disturbance. Stormwater management within the NMBZ is also regulated by the District of Columbia Department of Environment. New regulations are expected at the time of writing of this study that will closely follow Maryland's stormwater management regulations. Maryland's "Stormwater Management Act of 2007" regulations require environmental site design (ESD) through the use of non-structural best management practices (BMP) and other better site design techniques. In general, stormwater will be required to be retained and treated on site, necessitating that some portion of any development site be dedicated to stormwater control features. Given size limitations, the height of the water table and the presence of underground utility lines, stormwater management will likely require compact building footprints to reduce impervious cover and runoff and other space-efficient options such as pervious pavements and roof drainage linked to subsurface storage. The cost of stormwater management will be a significant development constraint.

## **SITE ACCESS**

Circulation and access to the site are considerations under all development scenarios. Several multipurpose trails converge with vehicular traffic in the area, earning it the informal moniker "The Mixing Bowl." Cyclists, pedestrians, and automobiles currently share the same space between the Capital Crescent Trail trailhead west of the Alexandria Aqueduct and the two paths in Georgetown Waterfront Park that end at 34th Street, NW. The transition between these trails is a safety concern that any site plan for the NMBZ must address. In addition, access into the site beyond Water Street, NW is problematic. To reach the site beyond Site C with a vehicle, it would be necessary to travel on a roadway constructed adjacent to the Capital Crescent Trail. The Washington Canoe Club and C&O Canal levee are immediately adjacent to the trail, making road construction infeasible without impact to these protected historical features. Use of the Capital Crescent Trail itself as an access way beyond Site C is problematic. While the existing trail is 12 feet wide, safe use by vehicles, pedestrians, and fast-moving bicycle commuters sharing Capital Crescent Trail would require expansion to two lanes as well as the employment of traffic calming and other safety measures. A minimum width of 20 feet is required for fire equipment access. Improvement of the trail for fire equipment access beyond the Washington Canoe Club must extend to within 150 feet of the farthest door of any structure and ensure a 13-foot vertical clearance. Fire equipment would be able to back out of the site, removing the need for a turning space for vehicles. Improving the area west of Site C for vehicular access would be a significant construction operation because the trail is built on an existing railroad embankment immediately adjacent to the C&O Canal levee and would require significant grading to establish a road bed of sufficient size and stability. The NPS recommends that construction not occur within 25 feet of the levee.

Parking was cited by stakeholders during interviews as an important issue, and car-top launching was of particular importance to independent paddlers. The majority of paddlers do not store their craft on the waterfront, making alternative access points with or without parking critical for meeting demand for recreational access to the Potomac River.

Curbside parking is available along much of Water Street, NW, and the Key Bridge Boathouse offers several parking spaces for customers. It is possible to drive through the Alexandria Aqueduct to the Capital Crescent Trail trailhead and Washington Canoe Club, where an informal gravel turnaround and informal parking for launching and drop-off exist. It is customary for users of the Washington Canoe Club to park off site.

Trailer access for racing shells requires a substantial amount of space that is not available within the NMBZ. The current practice of members of the Potomac Boat Club is to use the existing Water Street, NW width to maneuver trailers delivering shells and to unhitch trailers and rotate them, a process that requires less space. Large regatta events in which trailers are arriving from multiple locations may cause traffic disruptions. Parking, trailer access, and drop-off would be design challenges for any facility

constructed within the NMBZ but may be provided with special exception at offsite locations. It is customary for university rowing teams to carry their racing shells from remote locations.

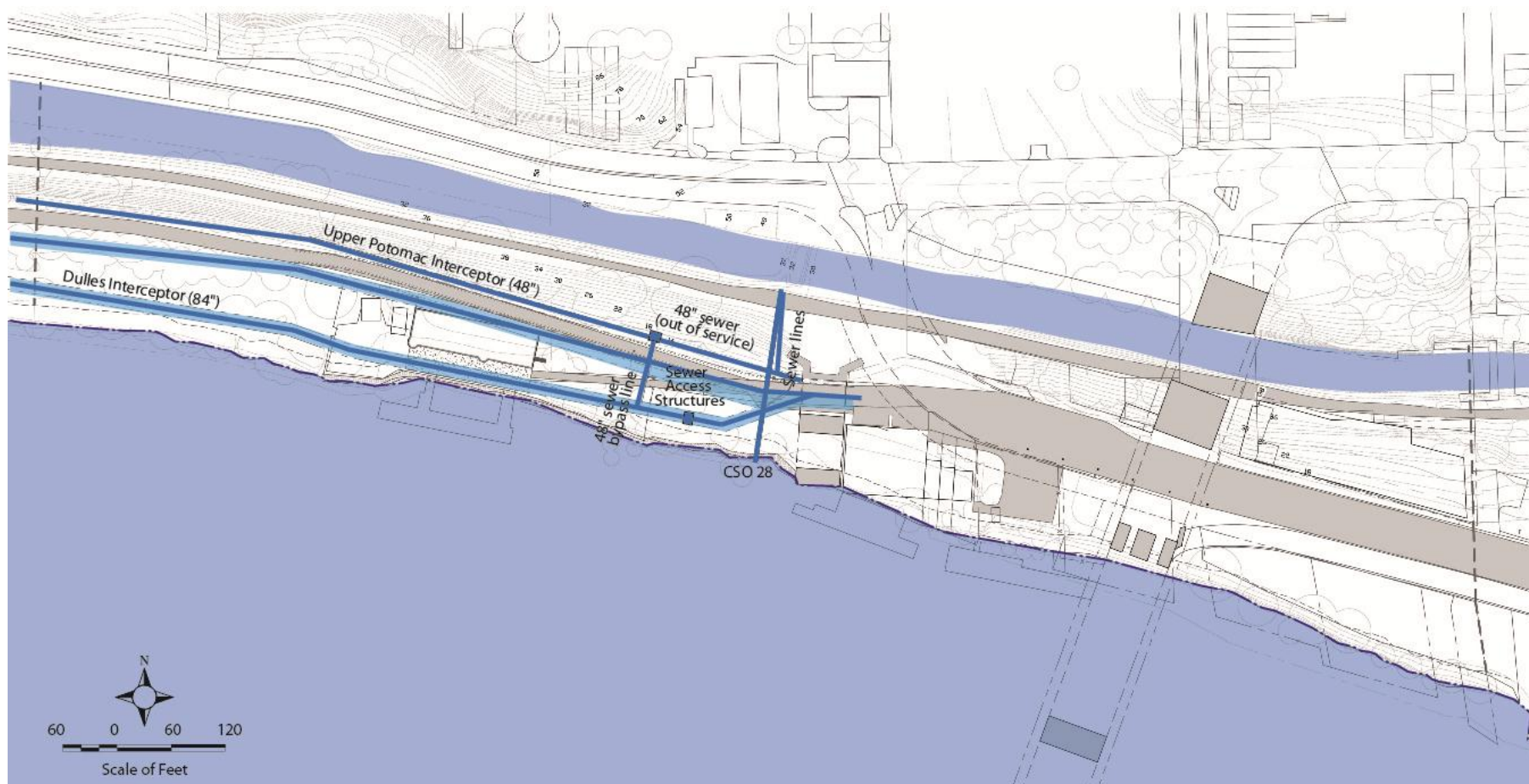
## UTILITIES

DC Water stormwater lines traverse the site, and DC Water retains several easements through the site for regional facilities that parallel the Potomac River. These easements include an easement for the Dulles Interceptor that runs beneath the Washington Canoe Club and easements on both sides of the Capital Crescent Trail for the Upper Potomac Interceptor and another 48-inch pipe (figure 13). The Upper Potomac Interceptor is a fragile structure and any construction within the area would need input from DC Water engineers to ensure that no damage from construction would occur. Also, the Upper Potomac Interceptor may carry a weight restriction that would need to be considered should the Capital Crescent Trail be widened to accommodate any service/authorized vehicles.

In addition to easements for its regional facilities, DC Water's pipes and surface structures occupy the area east of the Alexandria Aqueduct (Site C) and run perpendicular to the river. These pipes include a combined sewer outfall (CSO 28) and a bypass line that diverts the Potomac Interceptor line to the Dulles Interceptor. DC Water plans for its Clean Rivers Initiative (appendix C) include a storage tunnel (the Potomac Tunnel) to be located approximately 100 feet below the surface and extending from the Potomac Pumping Station at the Roosevelt Bridge approximately 9,500 feet upriver. Plans also identify a preliminary location for a replacement for CSO 28 (figure 14) and four other CSOs along the river. The plan identifies the area of CSO 28 as a possible location for a drop shaft and access point. NPS has not agreed with DC Water and has informed DC Water of the need for an EIS for this action.

DC Water does not ordinarily permit building above water and sewer lines. However, for special cases, such as the existing 84-inch sewer pipe, DC Water has accepted the construction of a building above the sewer line if constructed with a concrete encasement that would allow DC Water to access the pipe for future repairs.

Utility lines for any proposed buildings would have relatively small diameters and could be run across the site and around proposed buildings without limiting the buildable area or having to provide expensive concrete encasements/utility corridors. Utilities can be designed based on the topography, building locations, location of tie-in utilities, and invert elevations.



**FIGURE 13. EXISTING UTILITIES**



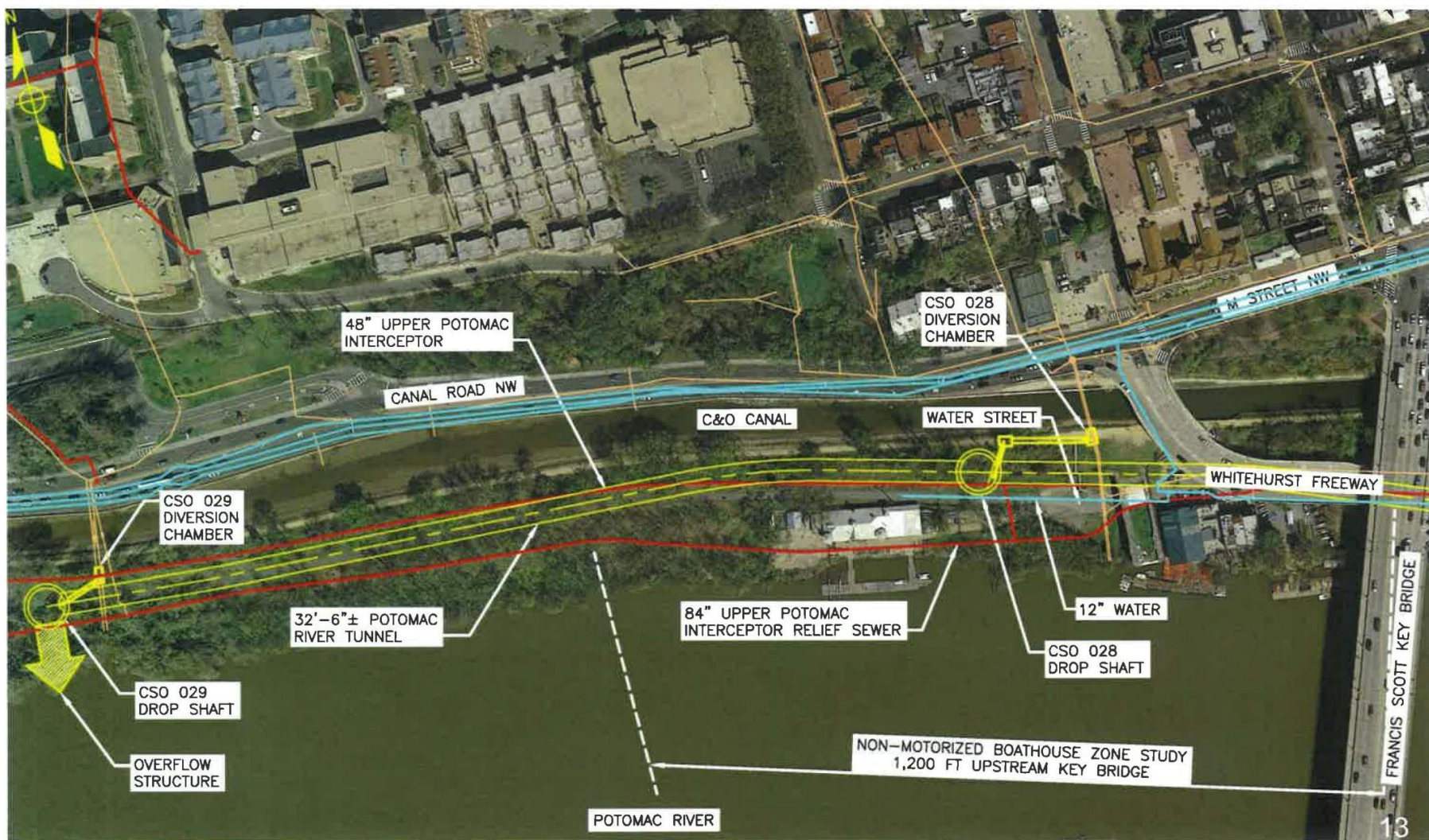


FIGURE 14. DC WATER PROPOSED FACILITIES

## **PUBLIC INVOLVEMENT**

As previously noted, public involvement was a large component of this feasibility study because it was critical to understand the current need for nonmotorized boating facilities within the NMBZ and how current and future users and neighbors of the NMBZ might want to see it developed in the future. The process included hosting a public open house meeting in December 2011 at which the feasibility study was introduced, a series of interviews and focus group sessions with known stakeholders was held in January and February 2012, and a public workshop and charette on March 3, 2012 allowed attendees to work together in small teams to develop and present their visions for the NMBZ and the concepts and principles important to a successful NMBZ. In addition, comments we accepted via the NPS Planning, Environment and Public Comment website. The notes from each meeting and comments received are included in appendix D.

### **STAKEHOLDER INPUT**

Stakeholder interviews were conducted in early 2012 using a focus group format. The objective was to learn how these stakeholders and those they represent use the NMBZ and to identify their visions and concerns. Participants were asked about how they currently use the river and shoreline, how they would use the NMBZ in the future, what programmatic requirements they have for their rowing or paddling programs, what they would like to see in the NMBZ, and what, if any, conflicts or issues they perceive. The discussions were allowed to follow a natural course so that participants could speak and focus on issues that were important to them.

The results of the interviews and information from focus group sessions were used to prepare for the public workshop. Ten meetings were held, and 22 groups were represented, although the scholastic rowing associations represented several high school teams in the area, many of which currently use or would use facilities on the Potomac River. A total of 46 individuals participated in the stakeholder interviews.

### **PUBLIC WORKSHOP**

A public workshop was held on Saturday, March 3, 2012. Eighty-five members of the public attended. Workshop leaders presented the findings of the 10 focus group meetings held in January and early February. Findings included information on different uses and amount of use in the NMBZ, documentation of user needs and desires, and concerns and challenges discussed during the focus group meetings. Attendees were tasked with determining a vision for the NMBZ that was reasonable, addressed the needs of as many users as possible, and encompassed the priorities related to the preservation, development, and use of land within the NMBZ.

Attendees were asked to divide into smaller groups to discuss their vision for the future of the NMBZ. During the breakout sessions, attendees were allowed to group themselves as they wished, although they were encouraged to join groups with similar opinions and then consider needs of others outside their group as they worked. Groups were instructed to consider all uses discussed during the presentation: nonmotorized boating uses, such as competitive and recreational rowers, kayakers and canoeists, and stand-up paddle boarders, and land-based uses, such as the users of the Capital Crescent Trail. Participants also were instructed to consider the natural and historic issues of the C&O Canal NHP.

Each group worked for an hour with a map of the NMBZ and tracing paper to develop their ideas. At the end of the work sessions, maps were posted for everyone to examine, and each group presented the highlights of their group's work. Attendees were then given an opportunity to ask questions about the presentations. The workshop concluded with a discussion of elements common to many of the plans and the identification of consensus items, suggested modifications, and paramount objectives. The workshop report is included in appendix D.

After the breakout sessions, the groups discussed possible consensus points and principal objections. Although there were no true consensus points, the following four main ideas emerged:

- The Washington Canoe Club structure should remain (there was not agreement on whether it was appropriate to move the structure, which was discussed in some of the groups, and an objection to moving the structure was noted).
- Additional boating facilities should be constructed (there was no consensus on the number or the type of facilities).
- Enhanced access to the river should be provided; at least one access point should be multipurpose.
- The parking issue is important and should be considered carefully.

Several objections to plan feasibility also were noted as follows:

- There was an objection to moving the Washington Canoe Club to the west (to or toward Site A) and to moving historic structures in general.
- There was an objection to placing any new facilities east of 34th Street, NW (into the open space of the recently completed portion of Georgetown Waterfront Park), while others objected to limiting the NMBZ to the 34th Street, NW boundary.
- There was an objection to placing any new buildings west of the trailhead for the Capital Crescent Trail, while others objected to new private facilities in this area.
- Although one group developed guiding principles for the process, the rest proposed either general uses for the five sites, or proposed specific uses (or avoidance of uses).

The following plans or considerations were discussed:

- The need to improve the transition between the end of the Capital Crescent Trail and 34th Street, NW along Water Street, NW was mentioned several times.
- The Alexandria Aqueduct was mentioned as an important feature by several teams for various reasons. It represented a gateway of some type to several of the teams, a constraint or bottleneck, or a line of demarcation when considering where to place different types of facilities (rowers in one direction, paddlers in another).
- There was the least agreement on what should go on Site A, if anything, with several teams presenting multiple options ranging from nothing at all to a university boathouse, and a variety of low intensity public uses in the middle. There was the most agreement that a facility of some sort should be placed on Site E.

The public was invited to submit comments on this project throughout the stakeholder focus group session and workshop processes, and the information was used to prepare this feasibility study. Comments were received from many of the same organizations and individuals who participated in both the interviews and workshop. Overall, a total of 107 correspondences were submitted, with most of them coming from the District of Columbia (33%), Maryland (30%), and Virginia (18%). These are proved in appendix D.

## SUMMARY OF FINDINGS

Several themes and ideas became clear through the public involvement process. Although there was no true consensus on the number or the type of facilities, there was general agreement that access to the river should be enhanced with some level of additional boathouse development and other types of access. There is clearly a large demand for more storage for both rowing shells and paddlecraft. Dock space is needed to distribute the traffic along the waterfront. There is also demand for many types of public access, including free and safe access points for those using car-top launching and other land-based activities. Parking is an important issue that should be considered carefully. Furthermore, many users are interested in locating private activities outside the C & O Canal NHP and in keeping with the mission and purpose of the park. The Washington Canoe Club structure should remain. People recognize a need to address circulation and transitions between Capital Crescent Trail and Water Street, NW and to consider how the many users in the nonmotorized boathouse zone would interact.



## SITE USE POTENTIAL

### SUMMARY OF DEVELOPMENT CONSIDERATIONS

To facilitate analysis of the type of recreational facilities that could be reasonably developed within the NMBZ to meet current and future demand, the site was divided into separate development sites based on current zoning designations and physical features (figure 15) with each development site having a set of parameters. The potential for each site and the NMBZ as a whole to accommodate additional facilities has been evaluated based on a site-by-site analysis of the development parameters and potential of each of the sites. These conditions and constraints are based on findings from previous studies, the study team's evaluation of existing site conditions, and stakeholder input collected during the public involvement process. To permit future planning efforts to readily use the findings of this analysis, site conditions and constraints for the development of the NMBZ are summarized in tables 3 through 7.



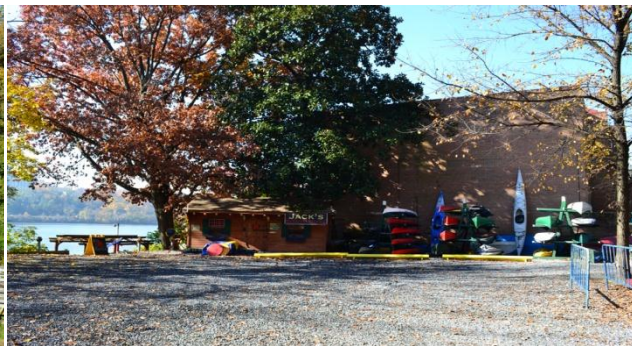
Site A (Source: The Louis Berger Group, Inc.)



Site B (Source: The Louis Berger Group, Inc.)



Site C (Source: The Louis Berger Group, Inc.)



Site D (Source: The Louis Berger Group, Inc.)



Site E (Source: The Louis Berger Group, Inc.)

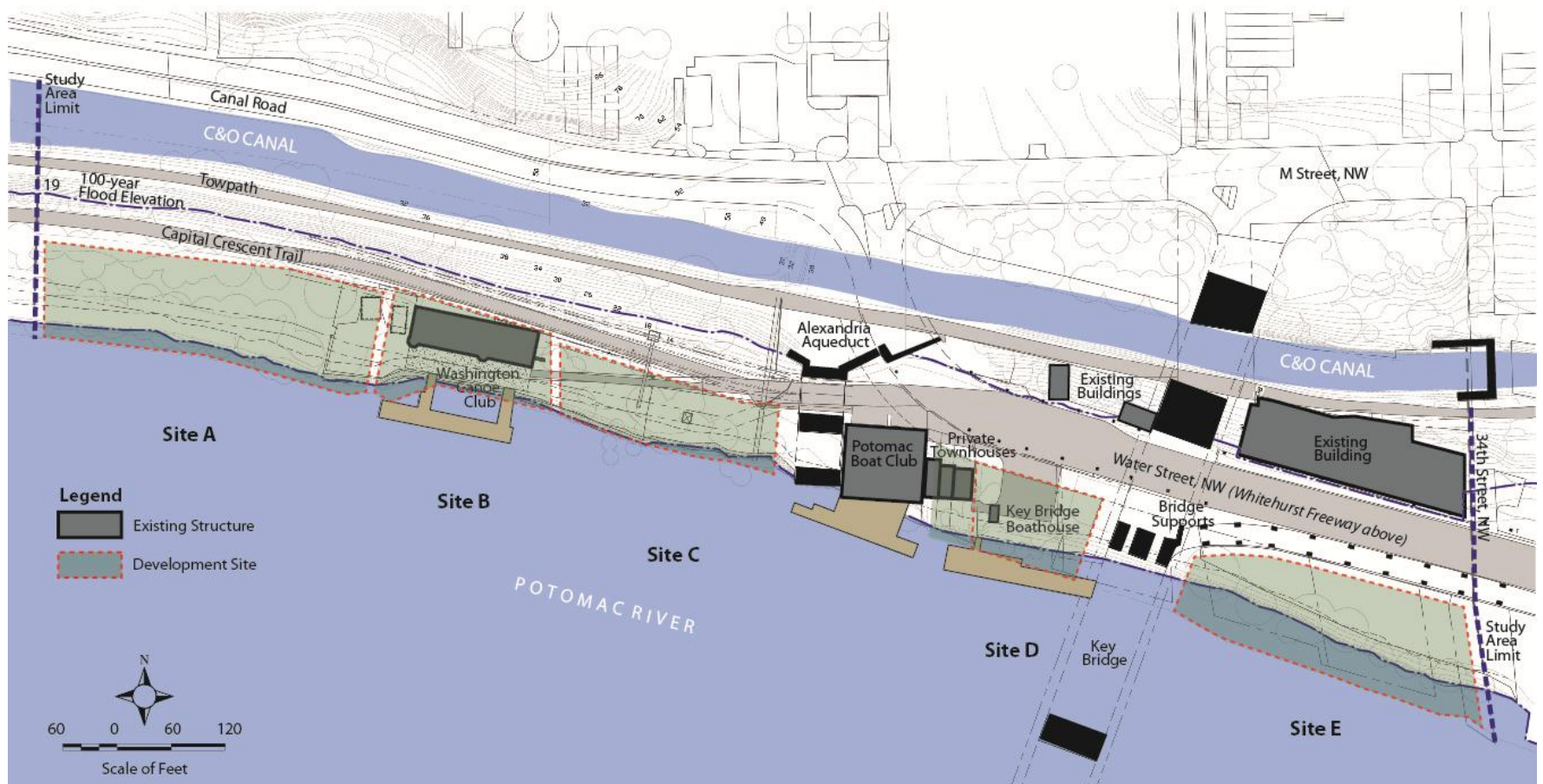


FIGURE 15. DEVELOPMENT SITES



**Table 3. Site Area and Property Ownership**

	Site A	Site B	Site C	Site D	Site E
Site Area Total– 126,753 SF Area is approximate; it was calculated using NPS property records (appendix A) and GIS site data compiled from public sources	36,372 SF	15,750 SF	18,217 SF	20,321 SF NPS: 15,296 SF Private: 5,025 SF	33,342 SF
	70,339 SF Site area for individual sites is only relevant to zoning requirements for private lease or land transfer.				
Easements/Private Property	Easements: Capital Crescent Trail, DC Water, and Georgetown University	Easements: Capital Crescent Trail, DC Water, and Georgetown University	Easements: Capital Crescent Trail, DC Water (includes access to surface features), and Georgetown University	Total private property – 5,025 SF Lot 806 – 278 SF Lot 808 – 3,063 SF Lot 809 – 1,684 SF	Easements: DC Water (sewer line easements assumed but location not recorded)

Notes: GIS – Geographic Information System

SF – square feet

Site area is based on the existing land area. Figure 10 illustrates the limit of zoning district boundaries, which include submerged areas. Accurate survey and property records are required to establish the bulkhead line and buildable limit of each site.

Table 4. Site Development Potential

	Site A	Site B	Site C	Site D	Site E
Zoning District	W-O Boathouse	CM-1	W-1 Boat club use permitted by right	W-1 Boat club use permitted by right	W-1 Boat club use permitted by right
Setbacks	Side yard – 12 feet Shoreline – 100 feet (not required for structures directly associated with public accessible dock and pier)	Side yard – 12 feet Shoreline – 100 feet (not required for structures directly associated with publicly accessible dock and pier)	Side yard – 12 feet Shoreline – 100 feet (not required for structures directly associated with publicly accessible dock and pier) Aqueduct – 25 feet	Side yard – 8 feet Shoreline – 0 feet Key Bridge – 25 feet Whitehurst Freeway – 10 feet	Side yard – 8 feet Shoreline – 0 feet Key Bridge – 25 feet Whitehurst Freeway – 10 feet
Lot Area	36,372 SF	15,750 SF	18,217 SF	20,321 SF	33,342 SF
Lot Occupancy % allowed Allowable first floor maximum Possible (subtracting setbacks) Compatible with nearby structures	50% 18,186 SF 18,186 SF 9,093 SF	50% 7,875 SF 7,875 SF n/a	80% 14,574 SF 14,574 SF 14,574 SF	80% 16,257 SF 10,725 SF 10,725 SF	80% 26,674 SF 16,120 SF 16,120 SF
Floor Area Ratio	0.75	1	1.8	1.8	1.8
Gross Floor Area First floor Second floor Third floor Fourth floor	27,279 SF 9,093 SF 9,093 SF 9,093 SF --	15,750 SF 7,875 SF 7,875 SF -- --	32,791 SF 14,574 SF 14,574 SF 3,643 SF --	36,578 SF 10,725 SF 10,725 SF 10,725 SF 4,403 SF	60,016 SF 15,004 SF 15,004 SF 15,004 SF 15,004 SF
Building Height Limit (excludes architectural embellishments)	40 feet from the finished grade level at the middle of the front of the building to the ceiling of the top story	40 feet from the finished grade level at the middle of the front of the building to the ceiling of the top story	45 feet from the level of the curb opposite the middle of the front of the building to the highest point of the roof or parapet	45 feet from the level of the curb opposite the middle of the front of the building to the highest point of the roof or parapet	45 feet from the level of the curb opposite the middle of the front of the building to the highest point of the roof or parapet
Floor Elevation Floor 1 (uninhabited/storage) Floor 2 (1.5 feet above flood elevation*) Floor 3 Floor 4 Ceiling of top story Top of roof	+10.00 +21.50 -- -- +50.00 NA	+10.00 +21.50 -- -- +50.00 NA	+10.00 +21.50 +31.50 -- NA +55.00	+12.00 +22.00 +32.00 +42.00 NA +57.00	+15.00 +25.00 +35.00 +45.00 NA +60.00

Notes: Zoning restrictions apply to private development only. NPS-managed federal facilities are exempt.

Flood elevation = +19.00

**Table 5. Boathouse Functionality**

	Site A	Site B	Site C	Site D	Site E
<b>Apron</b> 60-foot minimum required to maneuver racing eights from storage to ramp. 25-foot minimum required to maneuver paddlecraft. All sites have insufficient space for apron to accommodate storage of racing shells perpendicular to river without cantilever over water or shoreline fill.	Sufficient space for apron/loading perpendicular to river for paddlecraft only.	Existing suitable for canoe/kayak maneuvering	Sufficient space for apron/loading area at building end with boat storage parallel to river	Sufficient space for apron/loading area at building end with boat storage parallel to river. Whitehurst Freeway columns complicate loading.	Sufficient space for apron/loading area at building end with boat storage parallel to river. Whitehurst Freeway columns complicate loading.
<b>Ramp Length</b> Maximum slope of 1:10 recommended for maneuvering from apron to dock floating at the mean lower water elevation of ~+5.00.	First floor elevation at +10.00 50-foot ramp	Existing	First floor elevation at +10.00 50-foot ramp	First floor elevation at +12.00 70-foot ramp (existing ramp starts from embankment elevation at +6.00)	First floor elevation at +15.00 100-foot ramp Site excavation could lower building elevation, shorten ramp requirement
<b>Launching</b> Dispersed launch sites, segregation of paddlers and rowers required for optimum safety.	150 feet of potential dock space	Existing	250 feet of potential dock space (restricted by Potomac Boat Club dock)	150 feet of potential dock space	300 feet of potential dock space

**Table 6. Site Access**

	Site A	Site B	Site C	Site D	Site E
<b>Loading Area</b> 40-foot minimum required to maneuver racing eights from trailer to storage. Boat storage can be oriented parallel to river and boats can be unloaded through bay doors at the end of the building or perpendicular to the river and unloaded through bay doors facing the river	Loading creates safety conflicts with trail users Apron/loading area combo possible with parallel storage, end loading. 25-foot apron with perpendicular loading only adequate for paddlecraft	Loading creates safety conflicts with trail users Apron/loading area combo possible with parallel storage, end loading	Loading creates safety conflicts with trail users Apron/loading area combo possible with parallel storage, end loading	Loading from street Apron/loading area combo possible on site with parallel storage, end loading	Loading from street Apron/loading area combo possible on site with parallel storage, end loading
<b>Vehicular Access</b> Fire access requires minimum 20-foot fire lane with a maximum 150 feet from farthest door	Access affects C&O Canal levee and/or Washington Canoe Club	Access affects C&O Canal levee and/or Washington Canoe Club	Access affects C&O Canal levee and/or Washington Canoe Club	Water Street, NW	Water Street, NW
<b>Trailer Turnaround</b> 90 feet in diameter	Fits on site with boathouse Requires use of Capital Crescent Trail right-of-way	Does not fit on site with boathouse requiring location on Site A	Does not fit on site with boathouse requiring location on Site A	Does not fit on site with boathouse requiring location on Site C or Site A or use of Water Street, NW with multiple-point turn	Does not fit on site with boathouse requiring location on Site C or Site A or use of Water Street, NW with multiple-point turn
<b>Trailhead</b> Safe transition between traffic patterns on Water Street, NW and Capital Crescent Trail	Undesirable location too far inside park	Existing trailhead lacks designed transition to Water Street, NW	Potential for development of a roundabout to safely integrate pedestrians, bicycles, and vehicles	Streetscape improvements on Water Street, NW to separate pedestrians, bicycles, and vehicles	Streetscape improvements on Water Street, NW to separate pedestrians, bicycles, and vehicles
<b>Parking</b> Requirement waived if no street frontage or appropriate access through existing or proposed streets. District Department of Transportation prohibits new roads within floodplain	No access	No access	Access from Water Street, NW	Required; may be allowed on Water Street, NW with waiver and streetscaping	Required; may be allowed on Water Street, NW with waiver and streetscaping



**Table 7. Physical and Biological Conditions**

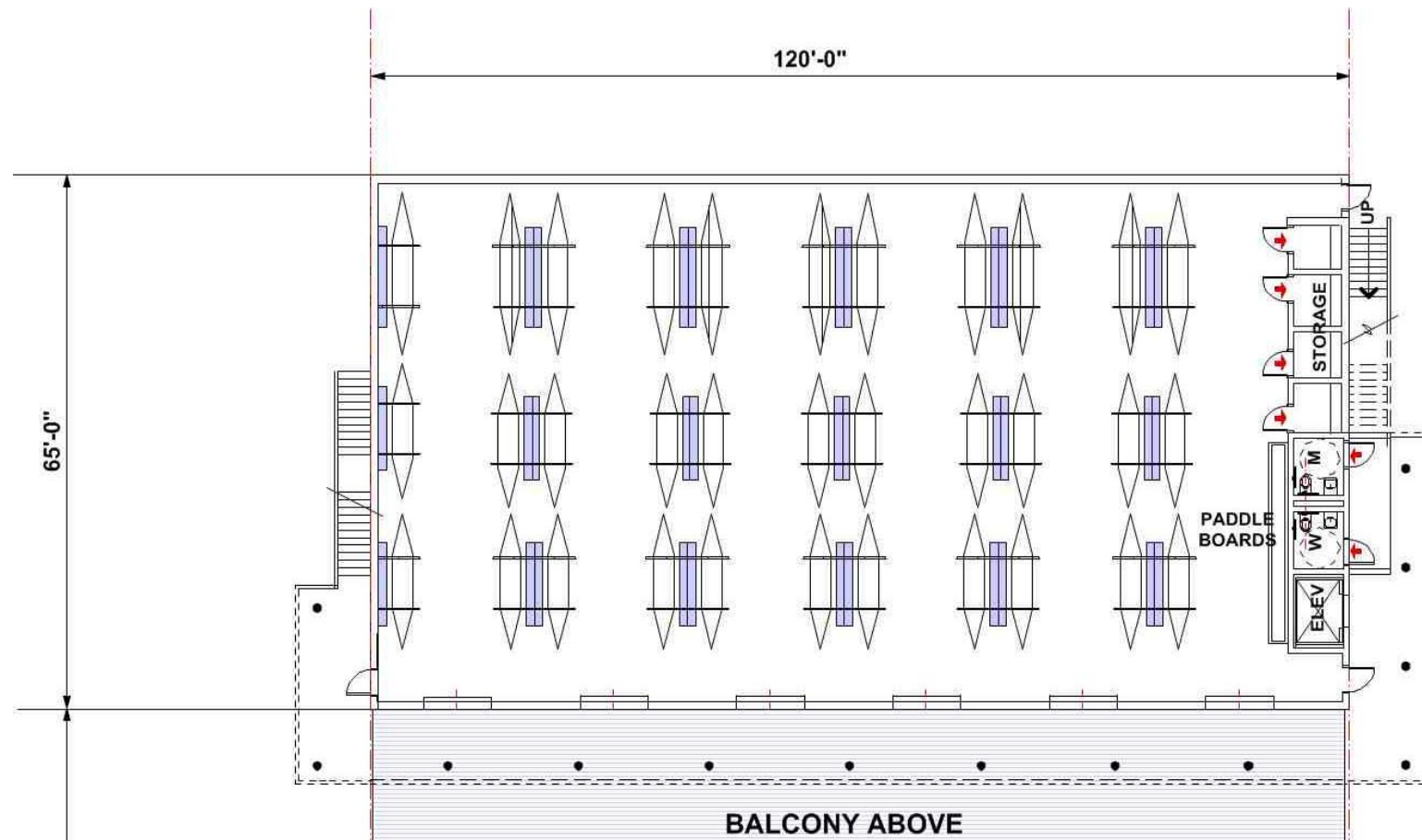
	Site A	Site B	Site C	Site D	Site E
Embankment Elevation	10 feet	10 feet	10 feet	12 feet	15 feet
<b>Shoreline Fill</b> U.S. Army Corps of Engineers Section 404 permit required beyond mean low water and may only extend to the pierhead or bulkhead line	Filling of normally submerged lands not permitted in this zoning district	--	Minor shoreline fill or cantilevered construction required to reach lot occupancy and maximum dimensions	Minor shoreline fill or cantilevered construction; excavation required to establish lowest first floor elevation of 10 feet and reduce ramp length	Minor shoreline fill or cantilevered construction; excavation required to establish lowest first floor elevation of 10 feet and reduce ramp length
Floodplains	+19.0 Federal Emergency Management Agency flood hazard elevation				
<b>Wetlands</b> No jurisdictional wetlands have been noted in previous studies; a formal wetland delineation would be necessary in the future to confirm	No jurisdictional wetlands; spring tide inundates the eastern end of the site	No jurisdictional wetlands	No jurisdictional wetlands	No jurisdictional wetlands	No jurisdictional wetlands
Flora	Small to medium trees along the shoreline and higher western end	Sparse vegetation, including a few large (24-inch diameter at breast height or greater) trees and minor ruderal herbs and shrubs	Sparse vegetation, including a few large (24-inch diameter at breast height or greater) trees and minor ruderal herbs and shrubs	Sparse vegetation includes a few large (24-inch diameter at breast height or greater) trees and minor ruderal herbs and shrubs	Sparse vegetation includes a few large (24-inch diameter at breast height or greater) trees and minor ruderal herbs and shrubs
Fauna	Habitat area for a variety of urban species. No threatened or endangered species are present on the site, and no significant habitat is present for these species.				

## DEVELOPMENT POTENTIAL

To conclusively establish the development potential of the NMBZ, accurate site survey and land ownership information will be required, including establishment of the bulkhead line. Based on available information, each of the development sites was studied to establish the storage capacity for boats, the most space intensive type of facility requirement. Schematic boathouses have been developed for each site to establish a realistic estimate of the number of boats that can be stored on each site (figures 16-19). The cumulative storage capacity of all four available sites represents a substantial portion of the demand identified during the public input process (table 2).

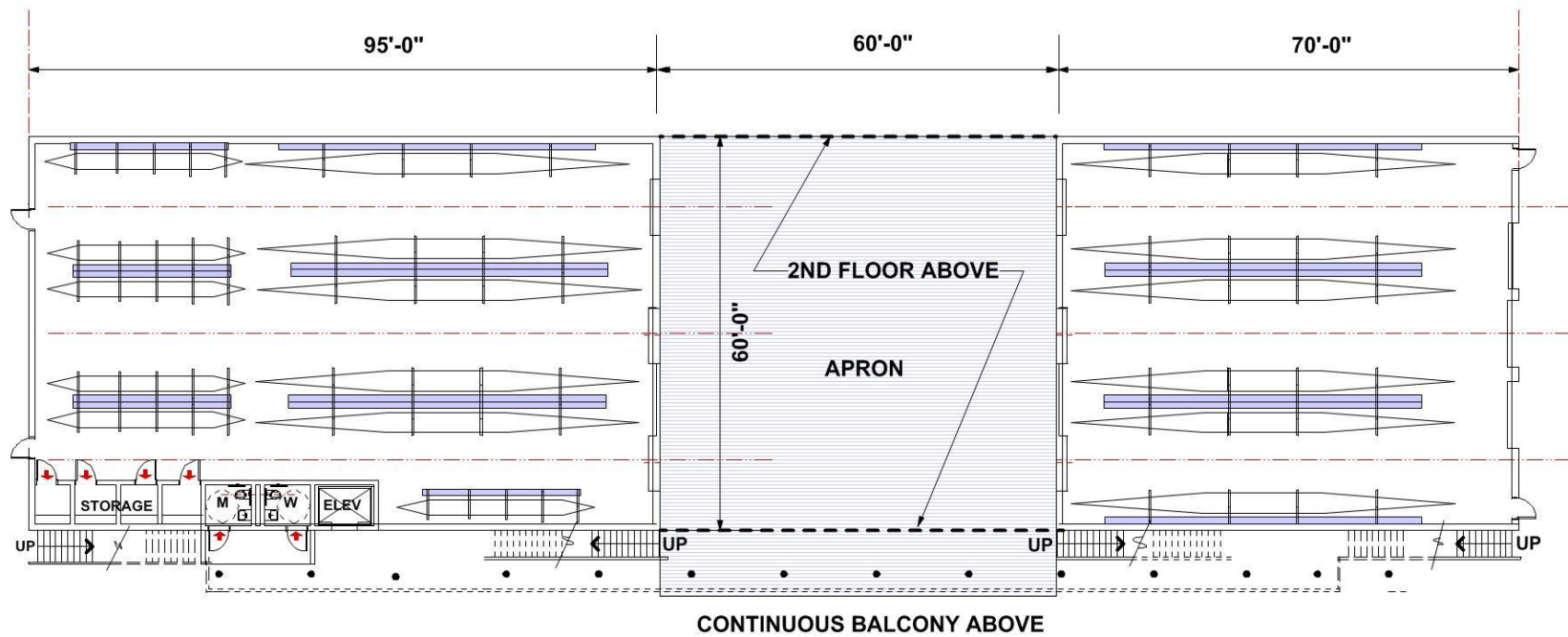
To facilitate the analysis of feasible building locations, the zone was divided into separate development sites based on the current zoning designations, physical features, and other site considerations (figure 12.) The potential for each site and the nonmotorized boathouse zone as a whole to accommodate additional facilities has been evaluated based on a site-by-site analysis of the parameters and potential for development at each of the sites.

Three scenarios for the development of new facilities, such as boathouses, launch sites of various types, parking, and trails, were developed. The scenarios are not intended to be exhaustive, but rather to represent generalized approaches to siting facilities within the zone, ranging from high density to low density. This approach revealed that the zone is sufficient to provide a substantial amount of boat storage and to accommodate other uses, although there is likely not sufficient developable land within the nonmotorized boathouse zone designated in the Georgetown Waterfront Park Master Plan to accommodate all user demand. The ultimate number, size, and location of new facilities in the zone will require further study to ensure that development balances the needs of users and protects the historic, cultural, and environmental resources of C&O Canal NHP and Rock Creek Park. The following scenarios present the high, medium and low density approaches to siting facilities within the nonmotorized boathouse zone.



Note: Storage capacity at ground level with 5 boats/rack = 165 kayaks; habitable space for additional program on upper levels.

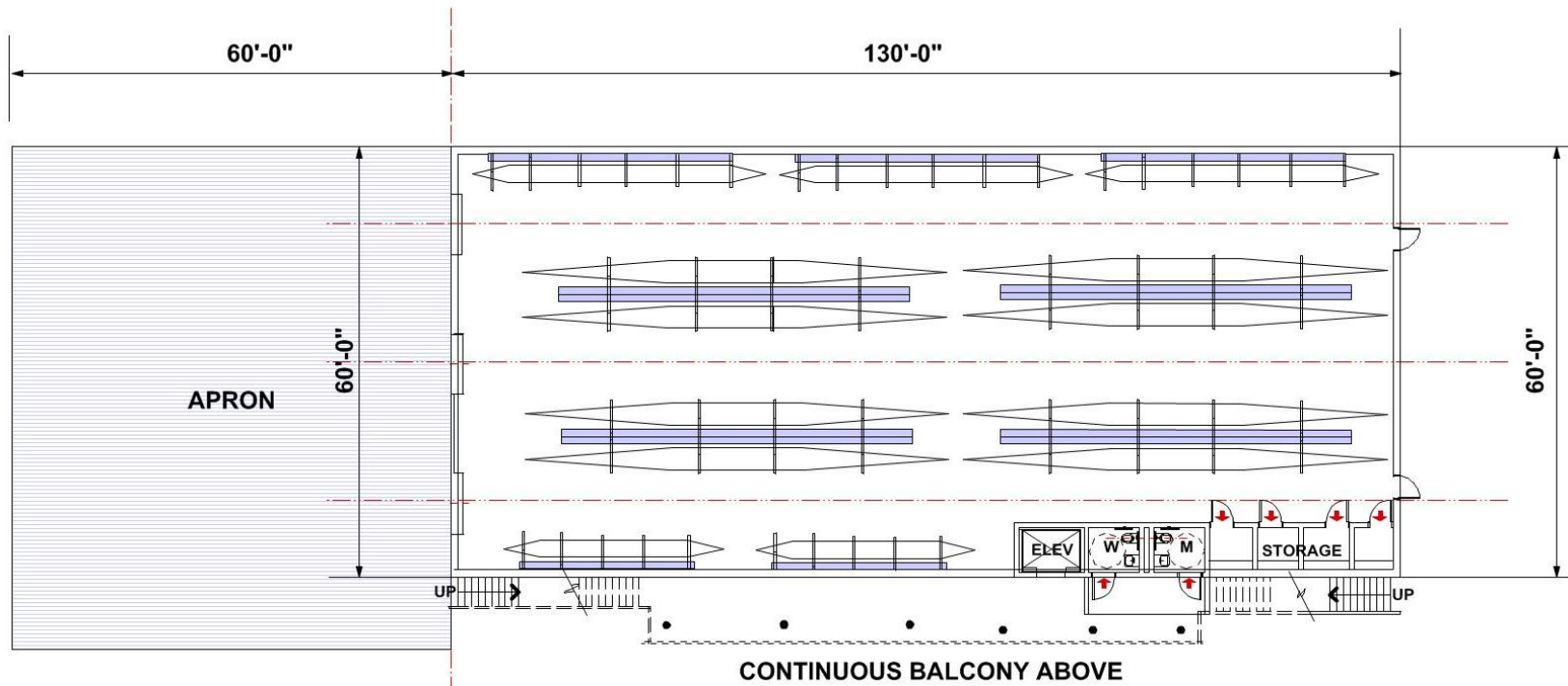
**FIGURE 16. SITE A DEVELOPMENT POTENTIAL**



Note: Storage capacity at ground level with 5 boats/rack = 55 eights, 30 fours; habitable space for additional programs on upper levels.

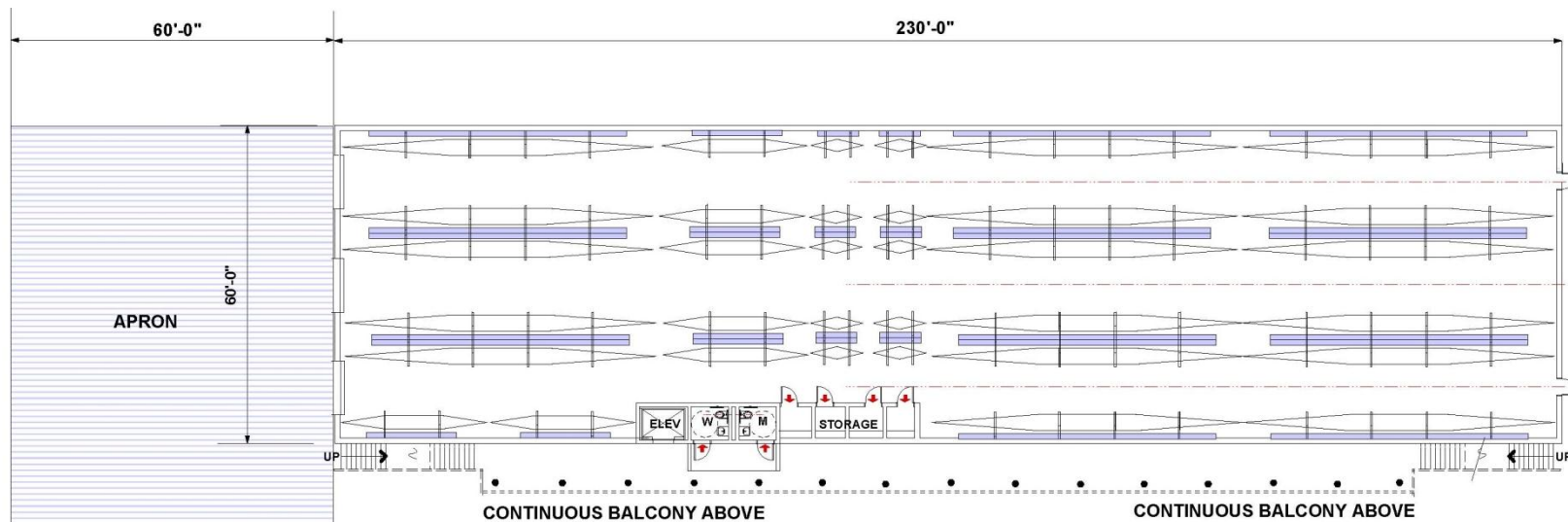
**FIGURE 17. SITE C DEVELOPMENT POTENTIAL**





Note: Storage capacity at ground level with 5 boats/rack = 40 eights, 15 fours, 10 pairs; habitable space for additional programs on upper levels.

**FIGURE 18. SITE D DEVELOPMENT POTENTIAL**



Note: Storage capacity at ground level with 5 boats/rack = 85 eights, 36 fours, 50 doubles; habitable space for additional programs on upper levels.

**FIGURE 19. SITE E DEVELOPMENT POTENTIAL**

## Development Scenarios

### Development Scenario 1—High Density

The high-density development scenario (figure 20) assumes that the largest reasonable building would be developed on Sites A, C, D and E. Site B, occupied by the Washington Canoe Club, would undergo site restoration and rehabilitation of the structure. Site A, which has a maximum allowable footprint of 18,186 square feet, cannot be developed to its maximum capacity without adversely impacting adjacent historic and cultural resources, including the Washington Canoe Club, the Chesapeake & Ohio Canal levee and towpath, and the view from multiple vantage points of the forested shoreline west of the Alexandria Aqueduct. A building on Site A that is in scale with the Washington Canoe Club could be a reasonable structure in this setting, but because of access issues, the site would best accommodate storage and launch facilities for only canoes, kayaks and single rowing sculls for individual use. A structure on Site C could be designed to address site constraints by developing two separate storage bays at ground level that flank a shared apron. This configuration would permit existing sewer access structures to be integrated into the design of the apron to maintain access. Upper levels of the structure could bridge the shared apron to permit the maximum allowable floor area for other program elements. Large boathouses could be developed on Sites D and E and could accommodate two university programs and most high school programs and provide sufficient space for other activities such as rowing tanks, erg rooms, meeting and locker rooms, and caretaker quarters on upper levels. In the context of the urban and industrial character of the nonmotorized boathouse zone east of the Alexandria Aqueduct, multistory buildings would have limited visual impact on the historic and cultural resources within the nonmotorized boathouse zone. In this scenario, Site D includes adjacent private lots. Site access restrictions and space constraints preclude on-site parking in this scenario; it would be necessary to provide off-site parking

**Table 8. Development Scenario 1—High Density**

Site A	Site B	Site C	Site D	Site E
<p>Two stories at 7,800 square feet each (figure 16)</p> <p>Perpendicular storage and loading with 25-foot apron parallel to river</p> <p>Paddlecraft facility only</p> <p>Maximum height 40' excluding architectural embellishments</p>	<p>Rehabilitation of the Washington Canoe Club structure</p>	<p>Three stories with 9,900 square feet at ground level in two buildings with a shared apron and 13,200 square feet on the second and third levels (figure 17)</p>	<p>Three stories at 7,800 square feet each with partial fourth floor (figure 18)</p> <p>Parallel storage and loading with apron at west end of building at elevation +12.00, ramp 70 feet</p> <p>Top of roof at elevation +57.00, plus embellishments (level with Whitehurst Freeway)</p> <p>Assumes development of private lots.</p>	<p>Three stories at 13,800 square feet</p> <p>Parallel storage and loading with apron between two buildings at elevation +12.00, ramp 70 feet</p> <p>Top of roof at elevation +60.00, plus embellishments (level with Whitehurst Freeway) (figure 19, modified)</p>

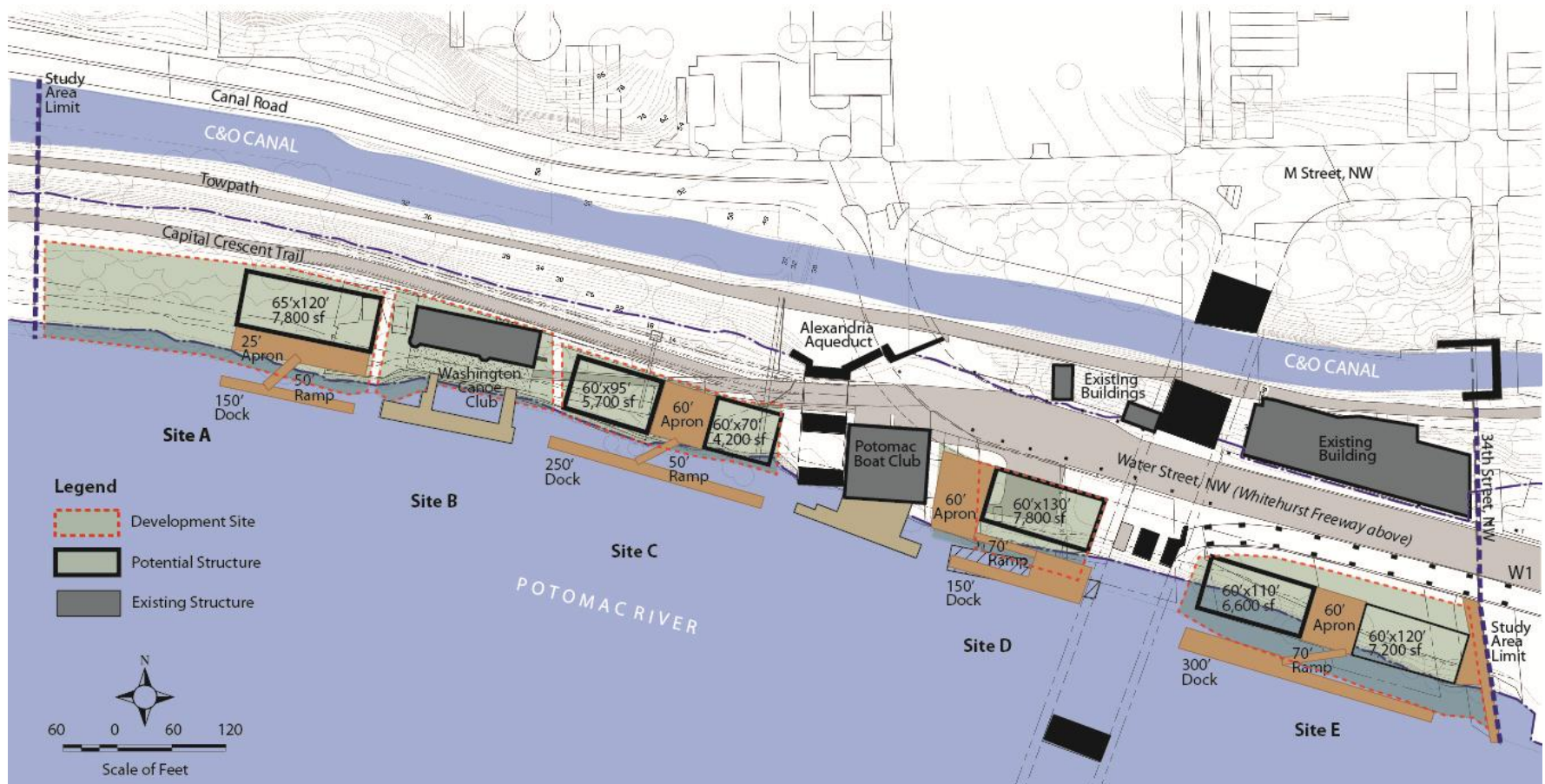


FIGURE 20. SCENARIO 1—HIGH DENSITY



## Development Scenario 2—Medium Density

The medium-density development scenario (figure 21) assumes that the largest reasonable building would be developed on Sites A, D, and E. Sites B and C, which are occupied by the Washington Canoe Club and its informal vehicular access, would undergo site restoration and rehabilitation of the structure. A building on Site A that is in scale with the Washington Canoe Club could be a reasonable structure in this setting, but because of access issues, the site would best accommodate storage and launch facilities for only canoes, kayaks and single rowing sculls for individual use. Site A could be developed as an expansion of the operation of the Washington Canoe Club structure with parking and drop-off provided on Site C for both sites. Large boathouses could be developed on Site D and Site E to provide ground floor boat storage and more program options such as rowing tanks, erg rooms, meeting and locker rooms, and caretaker quarters on upper floors. In the context of the urban and industrial character of the nonmotorized boathouse zone east of the Alexandria Aqueduct, multistory buildings would have limited visual impact on the historic and cultural resources within the nonmotorized boathouse zone. Parking for structures on Sites D and E would need to be provided off site

**Table 9. Development Scenario 2—Medium Density**

Site A	Site B	Site C	Site D	Site E
<p>Two stories at 7,800 square feet each (figure 16)</p> <p>Perpendicular storage and loading with a 25-foot apron parallel to river</p> <p>Paddlecraft facility only</p> <p>Maximum height 40' excluding architectural embellishments</p>	<p>Rehabilitation of the Washington Canoe Club structure</p>	<p>Car-top launch</p>	<p>Three stories at 7,800 square feet each with partial fourth floor; parallel storage and loading with apron at west end of building at elevation +12.00, ramp 70 feet (figure 18)</p> <p>Top of roof +57.00 plus embellishments (level with Whitehurst Freeway)</p>	<p>Three stories at 13,800 square feet; parallel storage and loading with apron at west end of building at elevation +12.00, ramp 70 feet (figure 19)</p> <p>Public launch plaza with rental storage racks at east end of site adjacent to Georgetown Waterfront Park</p>

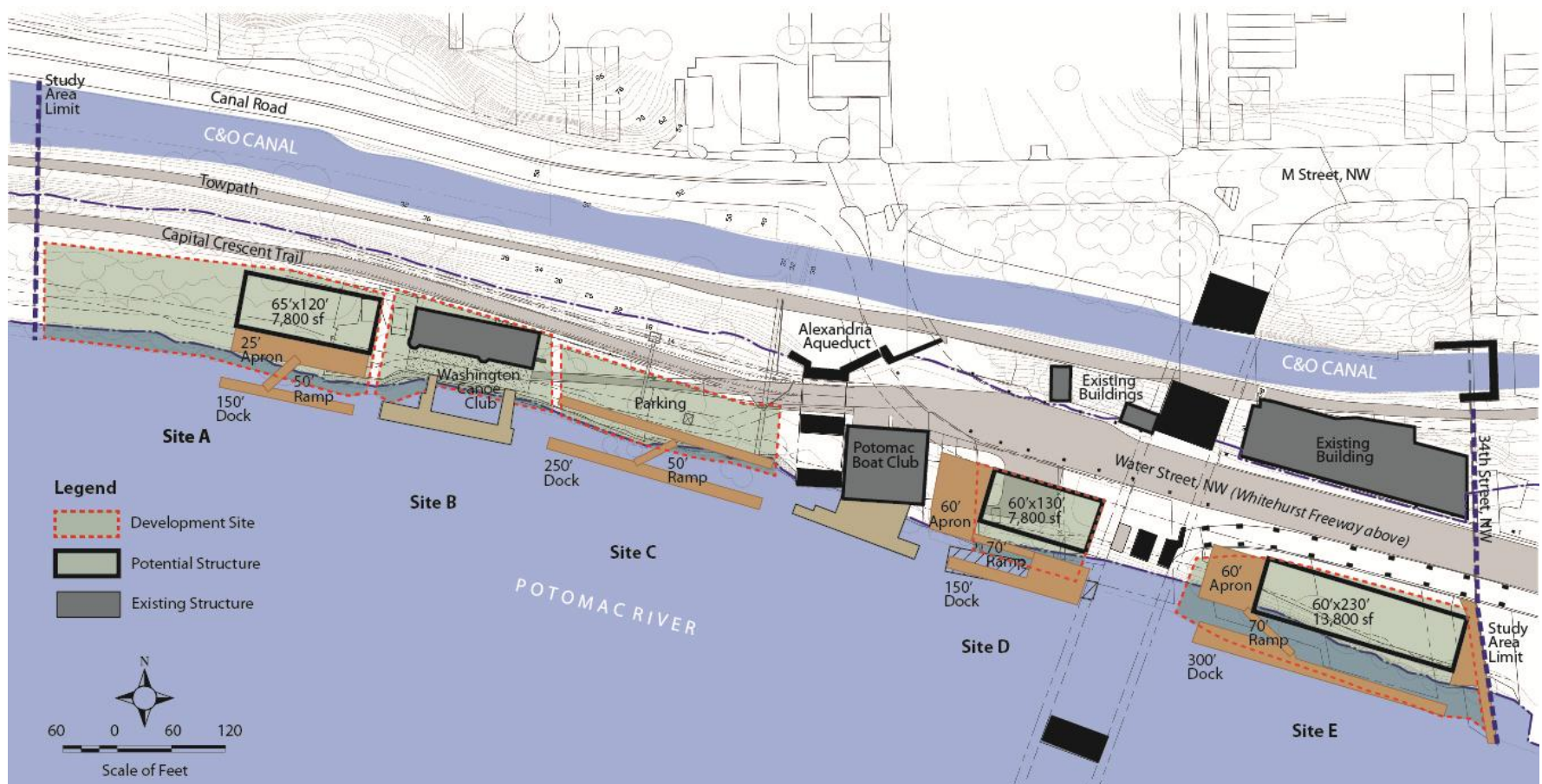


FIGURE 21. SCENARIO 2—MEDIUM DENSITY

### Development Scenario 3—Low Density

The low-density development scenario (figure 22) assumes that a new facility would be built on Site E. Sites A, B and C would retain existing facilities and forest cover, and could be enhanced with amenities that are compatible to the greatest extent with the sensitive natural, historic, and cultural resources within the Chesapeake & Ohio Canal NHP. Existing operations, property ownership, and tree cover would be retained on Site D, and additional storage for paddlecraft would be integrated into the existing site in place of parking, which would need to be replaced off-site. A structure consistent in height with nearby buildings could be developed on Site E and could accommodate a university program and several high school teams or both universities. The maximum building on this site would have limited visual impact in the context of the urban and industrial character of the nonmotorized boathouse zone east of the Alexandria Aqueduct.

**Table 10. Development Scenario 3 —Low Density**

Site A	Site B	Site C	Site D	Site E
Trailhead enhancements, and pier and beach launch No parking Access via Washington Canoe Club Maximum height 40' excluding architectural embellishments	Rehabilitation of the Washington Canoe Club structure	Car-top launch	One story at 5,000 square feet Additional boat storage at rental operation No acquisition of private lots Paddlecraft facility only	Three stories at 13,800 square feet each; parallel storage and loading with apron at west end of building at elevation +12.00, ramp 70 feet (figure 19) Public launch plaza with rental storage racks at east end of site adjacent to Georgetown Waterfront Park

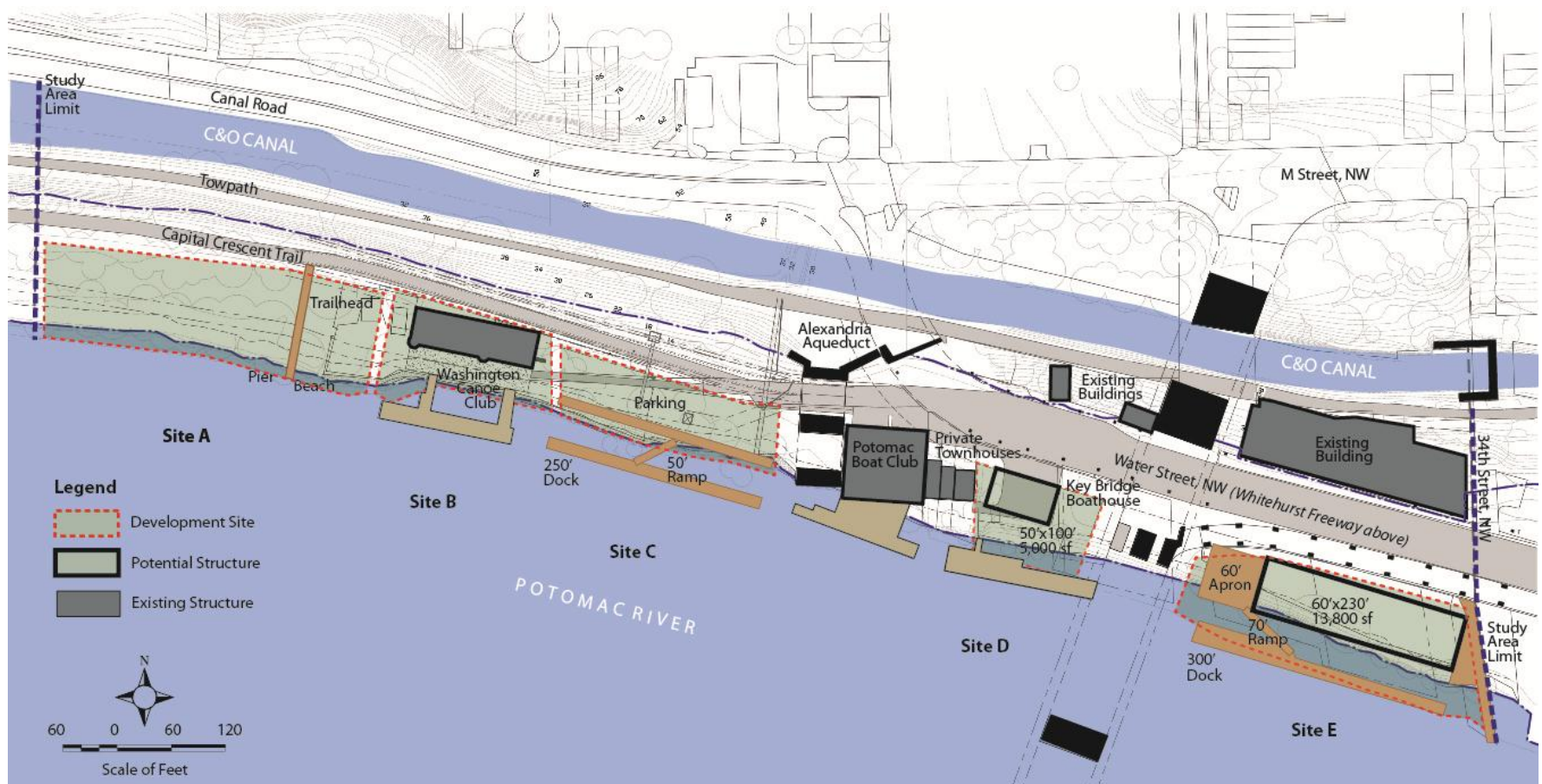


FIGURE 22. SCENARIO 3—LOW DENSITY



## CONCLUSION

The development of facilities for nonmotorized boating along the Potomac River in Georgetown has been the subject of several previous studies. The current feasibility study has taken a fresh look at an old issue in order to lay the groundwork for future decision making. While this feasibility study does not offer conclusions about how the zone will be developed, the findings establish an approach to programming the NMBZ to allow a variety of uses consistent with physical site limitations, and deemed necessary and appropriate uses for the site. A public involvement component has been included in the study and together with a summary of constraints will help guide future planning and compliance activities. Next steps in planning for the NMBZ would likely include preparation of an EIS that would further analyze the development scenarios, a revision of the Georgetown Waterfront Park Master Plan, and proposals for one or more land exchanges for boathouses.

The public has demonstrated a keen interest in proceeding with the development of additional facilities for nonmotorized boating along the Potomac River. Demand for additional facilities for team rowing remains strong while demand for other types of access has increased since the initial studies of nonmotorized boating activity on the Potomac were conducted. The need for free public access points for a variety of activities has increased in the last several years and new modes of nonmotorized boating such as paddleboarding have emerged. Concern about the need to balance boathouse development against these other needs and interests remains strong. No true consensus emerged from the public involvement component of the study about the number and type of facilities that are desirable within the zone, although there appeared to be general agreement on the need to proceed with some level of boathouse development to alleviate crowding at existing facilities and to keep pace with growing demand.

Various configurations of new facilities consistent with site constraints were developed as part of the analysis. These include boathouses, launch sites of various types, parking, and trails. This approach was taken in order to develop a range of feasible options for further study. Not all possibilities were examined but an effort was made to reflect public input identifying space needs for a variety of desirable uses. A key objective of the study is to examine whether boathouses sufficient to address growing demand will fit within the zone without precluding or impairing other uses and site features. The scenarios represent generalized approaches to siting facilities within the zone from high density to low density; smaller facilities could also be developed where the largest boathouse feasible for a site is shown. This approach revealed that the zone is sufficient to provide a substantial amount of boat storage and to accommodate other uses, although there is likely not sufficient developable land within the nonmotorized boathouse zone designated in the Georgetown Waterfront Park Master Plan to accommodate all user demand. The ultimate number, size, and location of new structures in the zone will require further study to ensure that development balances the needs of all users and protects the historic, cultural, and environmental resources of C&O Canal NHP and Rock Creek Park. Additional study is needed to establish a program for the zone that is adequate to the demand and appropriate to the constraints of the site. Consensus was not achieved on the desired course of action although stakeholders were in agreement that a development program for the entire zone was desirable (in contrast to site by site development) in order to ensure public oversight of the ultimate plan. The next step in implementation of the nonmotorized boathouse zone is to identify the best method for finalizing a development program. Several options are available to NPS including revision of the Georgetown Waterfront Park Master Plan to reexamine the extent of the zone, further development of one or all of the development scenarios explored in the feasibility study or exploration of options for improved access to the Potomac River outside the designated zone. Whichever course of action is chosen, progress will require several specific planning activities mandated for all federal actions.

Both the National Environmental Policy Act (NEPA) and Section 106 of the NHPA would apply to future actions. NEPA requires that all federal actions be evaluated for their impacts on the human and natural environment, so any proposed future actions in the NMBZ would require NEPA scoping and analysis. Section 106 of the NHPA requires federal agencies to take into account the effects of their actions on historic properties. Adverse impacts of proposed development of facilities in the NMBZ on historic and cultural resources must be evaluated in consultation with the Advisory Council on Historic Preservation and the historic preservation officer for the District of Columbia, and measures to avoid or mitigate adverse effects must be identified. The next step for any proposed improvements in the NMBZ would therefore include NEPA and NHPA compliance studies.

Additional studies recommended to move forward include a complete boundary survey, title search and wetland delineation to establish the accurate size of the available development sites. As part of this study, a determination by the USACE regarding the location of the bulkhead line should be made to confirm the size of Site E, which includes lot lines and zoning district boundaries that suggest the submerged land is available for development.

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