

CHAPTER 4



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4.0 ENVIRONMENTAL CONSEQUENCES

This chapter discusses the potential environmental consequences, or impacts, associated with the proposed alternatives as required by DO-12. The analysis includes considerations of context, intensity, duration, and timing of each alternative, and predicts the degree of change from the baseline existing conditions to identify potential impacts on the following resource areas:

- Socio-economics, including land use and property ownership, visitor experience, planning control and policies and community facilities;
- Cultural resources, including historic and visual resources;
- Transportation systems, including vehicular traffic and parking, public and Georgetown University transit service, pedestrian and bicycle facilities, and river navigation and use;
- Physical and biological resources, including water resources, geology, soils and topography, terrestrial and aquatic vegetation and wildlife, and noise;
- Utilities and infrastructure, including stormwater drainage and management, and urban systems.

The discussion of potential impacts includes those impacts that may occur as a direct result of the proposed alternatives, or as an indirect result that could occur later in time or farther in distance than the action. In addition, this chapter also addresses cumulative impacts on each resource, which could result from, “the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency undertakes such other actions” (Council on Environmental Quality’s regulations 40 CFR Section 1508.7).

4.1 SOCIO-ECONOMIC IMPACTS

4.1.1 Land Use and Property Ownership

Land use impacts are generated by physical changes to a site area and by induced changes to the surrounding land areas. This section evaluates the potential direct and indirect impacts to the land use patterns, as well as the relationship of the proposed alternatives to the regulatory environment and applicable planning policies.

Alternatives A, B and C

Land Use

Finalization of the preliminary land exchange agreement would allow for zoning of the site and subsequent action under Alternatives A, B and C. Under Alternatives A, B and C, a boathouse would be constructed on Tract 102-114 within the C&O Canal NHP. While the land use would remain recreational, the construction of a boathouse would change the use from public open space to a private collegiate rowing use (with public access to the river).

Although the proposed boathouse is a more intensive recreational use of the site, it would not be inconsistent with surrounding recreational uses. Beginning at the Georgetown Waterfront Park and continuing up the shoreline to Jack's Boathouse, the Washington Canoe Club (WCC), and the Potomac Boat Club (PBC), recreational uses dominate the waterfront. This location as a private boathouse use would be consistent with the land immediately to the east, at WCC, which is a private facility operated on public land through a special use permit. This use is also consistent with historic recreational uses constructed along this section of the Potomac during the 19th and 20th centuries (documented in Section 3.2.1).

Because construction of the boathouse on Tract 102-114 is dependent upon the exchange of land between NPS and Georgetown University, the proposed actions under Alternatives A, B and C would result in the addition of Tract 102-109 to federally controlled open space. The long-term preservation of Tract 102-109 would result in positive impacts to land uses upstream of the site. The size of both land tracts is approximately equal and would result in no net loss of public open space. In addition, the land exchange would result in Georgetown University relinquishing a one-mile right-of-way easement that it currently retains along the CCT between the two parcels.

Since the proposed boathouse is conditional on a one-for-one land exchange resulting in no net loss of public recreational land, the land use impacts of Alternatives A, B and C are judged minimal. A precedent has already been established (at the boathouse at Fletcher's Cove and WCC, for example) for allowing a privately-run recreational use on public parkland along the Potomac River. Further, the reduction in outdoor boat storage at TBC resulting from construction of this facility would contribute to enhancing the Georgetown Waterfront Park for NPS and the public at-large.

Property Ownership

Construction of the proposed boathouse on Tract 102-114 is contingent upon an approved land exchange between NPS and Georgetown University. The construction of a new facility would require transfer of ownership of Tract 102-114 to Georgetown University and 102-109 to the NPS according to the conditions set forth in the Preliminary Land Exchange Agreement, and the corresponding Environmental Assessment, Finding of No Significant Impact, and Section 106 Memorandum of Agreement based on acceptance of all conditions by the approval authorities involved.

The exchange of lands would result in a shift from public ownership of Tract 102-114 to private ownership. This transfer would ensure that Tract 102-109 remains as open space under NPS control. This exchange of land would eliminate the potential for development of this land within the Park. It would also result in extinguishing the right-of-way over the CCT between the two parcels that Georgetown University currently owns in conjunction with its ownership of Tract 102-109.

Tract 102-114 would only be allowed to develop as a boathouse location. Thus, although the property would become private, the NPS will hold a scenic easement over it restricting its design and use in perpetuity. The NPS holds approximately 1,500 acres of scenic easements in the rest of the C&O Canal NHP.

DC WASA currently has an easement across the project site as a result of the construction of the Potomac Interceptor Sewer line in 1969. The existing easement was granted to DC WASA in 1967 by Permit No. 6:850:73. If the land exchange between NPS and Georgetown University takes place and the boathouse is constructed, DC WASA would maintain access to the interceptor sewer line through an easement agreement with Georgetown University. The agreement would allow DC WASA to maintain “continued operation, maintenance, repair, replacement, inspection and removal of the existing Upper Potomac Interceptor Relief Sewer located beneath the surface of Tract 102-114.”¹

Through the course of this study, it was determined that the sewer line easement was incorrectly recorded on maps filed by DC WASA at the District of Columbia’s Department of Public Works. Prior to executing the land exchange and as part of the construction permitting process, the error in recording the sewer line easement would be rectified through an updated survey (See Appendix for a preliminary survey).

Also, the adjacent WCC would be affected by the construction and operation of the boathouse alternatives since relocation of the fence adjacent to the CCT would be required during construction and since WCC is also using a portion of Tract 102-114 for boat and other outdoor storage. As this is a private facility on NPS property, NPS would be required to negotiate any changes with WCC as part of the subsequent boathouse approval and permitting process.

Mitigation

Because of the changes in ownership resulting from the exchange of land, multiple parties would be affected through this real estate transaction. These effects were also addressed in the previous Land Exchange EA conducted by NPS. If approved, the NPS would be required to negotiate all arrangements with DC WASA or WCC and any other parties involved to minimize disruption and to properly record the real estate documents involved in this transaction.

No Action Alternative

Under the No Action Alternative, there would be no impact to land use or property ownership (assuming there would be no land exchange). The use of the project site would continue as passive open space. The land would remain undeveloped but would not serve as a continuation of recreational uses identified in the *Georgetown Waterfront Park Plan*. The No Action Alternative would invalidate the Preliminary Land Exchange Agreement and Tract 102-114 would remain federal property. Georgetown University would retain control of Tract 102-109, along with the right-of-way along the CCT for the nearly one mile distance between the two parcels. Under private ownership, Tract 102-109 would be left open for potential development of a boathouse or other uses, in accordance with the C-M-1 zoning and other land use regulations applicable to the parcel.

¹ Preliminary Agreement to Exchange Real Property. Signatories- Georgetown University Vice President and Treasurer and Regional Director, National Capital Region, NPS. October 1998.

4.1.2 Visitor Experience

Alternatives A, B and C

Alternatives A, B and C would result in the establishment of a boathouse, as well as site improvements at the project site. Along the C&O Canal, the experience of running, hiking, biking, or boating would remain predominantly unchanged for hikers, runners, or bicyclists using the towpath or the canal for recreational activity as the towpath itself would remain unaltered. However, under all three alternatives, the boathouse would restrict views of the river from the section of the towpath adjacent to the site (described and illustrated in more detail in Section 4.2.2 below). Therefore, for recreational users of the towpath, there would be some loss of these views of the river that are currently available. Because of the site's location, their experience of pursuing recreation in an environment that includes the historic canal, intermittent views of the river, and roadway structures or buildings in Georgetown, however, would remain similar to existing conditions.

For visitors involved in cultural interpretation, there would be a change in the visual setting of the canal in the vicinity of the project area under each of the three alternatives. Under Alternative A, the setting would change more than the other two alternatives, because of its larger size. Under each alternative, the change in the visual setting of the canal due to the construction of a boathouse would be localized to the area adjacent to the structure. Since the change would be localized and visitors would continue to have similar opportunities upriver to experience the canal, the impact on a visitor's experience under each alternative is considered minor. Additional discussion regarding visual impacts is provided later in Section 4.2.2.

Along the CCT, visitors would be directly affected by construction of the boathouse because of its proximity to the trail. Once the boathouse is constructed, views from the CCT will be obstructed when biking or walking along the trail adjacent to the new building. While a similar condition exists as the CCT passes the WCC, under Alternatives A, B or C visitors would experience a two story building in an area where they currently experience a natural environment. Further, while visitor use of the trail would continue similar to existing conditions, there would be occasional periods when movement is restricted due to a trailer, or service vehicle, turning into or out of the turnaround area (see Section 4.3.1). Therefore, the proposed boathouse under each of the alternatives would result in an overall moderate impact on visitor experience along the CCT. These impacts are discussed further in Sections 4.1.4, 4.2.2 and 4.3.1, below.

Mitigation

Public access to the river and waterfront would be maintained under Alternatives A, B and C. To minimize impacts to park visitation, Georgetown University would ensure public access to the site is maintained when operating the facility. In addition, any interference or impacts to trail use would be minimized as much as possible both during the construction period and afterwards when the facility is in use. The boathouse building would be designed to maximize windows and other fenestrations aimed to reduce the effect of creating a solid wall adjacent to the CCT.

No Action Alternative

Under the No Action Alternative, a boathouse would not be constructed and there would be no improvements at the project site. Therefore, visitor experience in the area would remain unchanged. However, potential development of the upstream site for a boathouse or other uses and access to that site along the University's one-mile right-of-way concurrent with the CCT could impact the use of the trail.

4.1.3 Planning Controls and Policies

Alternatives A, B and C

Non-motorized Boating in the Potomac and Anacostia Rivers – Washington, D.C.

The Non-motorized Boating in the Potomac and Anacostia Rivers Study (1985 and subsequent updates in 1989 and 2000) identified an increased need and unmet demand for additional non-motorized boating facilities in the vicinity of Key Bridge. The study explored several sites along the waterfront for the placement of new facilities on both rivers, including the site west of WCC, described as follows:

“This site lies just west of the Washington Canoe Club at the west end of the Georgetown waterfront plan's zone 14, and encompasses almost one half acres. It could comfortably accommodate an average-sized (6,000- to 8,000- square foot) building. For the public to get to the site, a new road providing emergency access and a drop-off point must be part of the package as well as new utility connections and avoidance of construction over the Upper Potomac Interceptor Sewer.”²

The 2000 Supplemental Report identified the potential for a one-acre site at this location and for a 15,000 square foot boathouse (in accordance with the Section 106 MOA). Action under Alternatives A, B and C would result in meeting one of the main recommendations of the study (and the updates) of constructing additional boathouses, which would benefit the rowing community. The construction of a new boathouse for Georgetown University would add indoor storage space for rowing shells along the Georgetown waterfront and would make space available at TBC for other programs including high schools and individual rowers.

The proposed boathouse under Alternatives A, B and C would be larger in size than the recommended size for a boathouse at the proposed site in the 1985 and 1989 Non-Motorized Boating studies. However, neither study included the full one acre site as identified in the Land Exchange EA; they were prepared without detailed knowledge of the requirements of a collegiate rowing facility; and they did not anticipate that a boathouse could be constructed over the interceptor sewer. Alternatives A and C are larger in size than recommended in the 2000 Supplemental Report. However, both alternatives (and Alternative B) would fulfill the recommendation to provide more indoor facilities to service the unmet demand for crew and other non-motorized recreational activities along the Potomac River.

² Nonmotorized Boating in the Potomac and Anacostia Rivers, Washington D.C., NPS, 1989.

Georgetown Waterfront Park Plan

For approximately 20 years, it has been the goal of NPS to encourage water-oriented recreation through the construction of non-motorized boathouses along the Potomac, in the vicinity of Key Bridge. Under Alternatives A, B and C, a boathouse would be constructed in the area identified by both the NPS and the *Georgetown Waterfront Park Plan* as a designated boathouse zone. Under Alternatives A (Zoning Alternative) and C (Preferred Alternative), the westernmost edge of the facility would extend approximately 1,175 feet west of Key Bridge (approximately 75 feet more than the 1,100 feet identified in the plan). (This estimate is based on GIS data and may need to be verified through surveying of the site.) Under Alternative B (MOA Alternative), the westernmost edge of the building would extend approximately 1,162 feet west of Key Bridge (approximately 62 feet more than the 1,100 feet identified in the plan).

A new boathouse under Alternatives A, B and C would be consistent with the plan's goal of clustering boathouses within a non-motorized boathouse zone and extending the water-oriented recreational component of the *Georgetown Waterfront Park Plan*. In further agreement with the objectives of the Waterfront Plan, the land area upstream of the boathouse zone would remain undeveloped in order to preserve the natural appearance of the Palisades.

Finding of No Significant Impact (FONSI) and Environmental Assessment for the Proposed Exchange of Properties between the NPS and Georgetown University within the District of Columbia and within the Boundary of Potomac Palisades Park within the C&O Canal NHP

Under Alternatives A, B and C, the exchange of land between National Park Service and Georgetown University would be completed and the proposed boathouse constructed on Tract 102-114. The Land Exchange EA concluded that there would be no significant impacts as a result of this transaction. The EA determined that the project would not negatively affect the waterfront area, the *Georgetown Waterfront Park Plan*, or the C&O Canal NHP. NCPC approved the land exchange contingent upon completion of the NHPA Section 106 process.³

The Preliminary Land Exchange Agreement described the boathouse zone boundary limitation as follows:

“The boathouse may be situated more than 1,155 feet west of Key Bridge so long as no portion of the boathouse structure(s) is located beyond a point 1,250 feet west of Key Bridge. In the event the University proposes siting the boathouse or any portion thereof within the space between 1,155 feet to 1,250 feet west of Key Bridge, the United States will seek and obtain the concurrence of the National Capital Planning Commission and the Commission of Fine Arts prior to issuing a final determination as to an approved site for the boathouse.”⁴

Based on available mapping data, the proposed boathouse facility extends 1,175 feet upriver from Key Bridge under Alternative A (Zoning Alternative) and C (Preferred Alternative) and 1,162 feet upriver from the bridge under Alternative B (MOA Alternative). Since the boathouse would be located within the specified 1,155 to 1,250 distance from Key Bridge, the University will need to

³ September 5, 1995 NCPC Meeting.

⁴ Preliminary Agreement to Exchange Real Property. Signatories – Office of University Counsel and Regional Director, National Capital Region, NPS. October 1998.

obtain final approval of the proposed building from the CFA, and the NPS will consult with NCPC through this EA process.

Comprehensive Plan for the National Capital

The project site is currently under Federal ownership and not subject to District of Columbia zoning controls. Following implementation of the land exchange, the site would change from unzoned to W-O (Waterfront Open Space), as approved in Zoning Case No. 02-42. The alteration to the W-O District for the property introduces the potential for improvements to the area, allowing for construction of the boathouse. This Action would help carry out the goals of the Comprehensive Plan for the National Capital, particularly the Federal and District Elements discussed in Section 3.1.2.

The Federal Element for Parks and Open Space has identified a weakness of the area as being a lack of accessibility and the poor condition of local parks, specifically the Georgetown waterfront area. Under Alternatives A, B and C, the construction of a new recreational facility along the Georgetown waterfront would encourage greater use of the parks and open space in the area by allowing a new collegiate rowing use along the river and subsequently providing more space at TBC for high schools and other programs and individuals on the waiting list for this facility. Further, finalization of the land exchange would help “retain the palisades and gorges of rivers and streams in their natural state” through the acquisition of a private parcel (Tract 102-109) currently not under NPS ownership, as recommended by the Parks and Open Space Element.

Ward 2’s objectives specify the need for non-motorized boating facilities along the Georgetown waterfront, west of the Washington Harbour complex, to meet the increasing demand for non-motorized boating in the area. Approval and construction of the proposed boathouse under Alternatives A, B and C would meet Ward 2’s objectives, as stated in their waterfront development element of the District of Columbia Comprehensive Plan.

Washington, D.C. Zoning

Contingent upon finalization of the land exchange agreement, the project site would be regulated under the waterfront zoning district, W-O. The W-O District was created to provide a “low-density alternative to previously existing waterfront zones and to minimize negative environmental, physical, and visual impacts of development along the Potomac and Anacostia waterfronts.”⁵ Special exceptions and a variance have already been granted to allow for the construction of a boathouse on this land, to remove parking requirements, and to allow for a decreased setback distance. A boathouse would introduce a water-oriented recreational use to this area, in accordance with the intentions of the W-O District.

The W-O District applies building and lot use restrictions to the proposed boathouse. Under these restrictions, a structure on this site would be subject to a FAR of 0.75, maximum height of 40 feet as measured from finished grade to the ceiling of the uppermost story, lot occupancy of 50%, and a 12-foot side yard.

⁵ Zoning Commission for the District of Columbia, Notice of Final Rulemaking, Z.C. Order 02-30 (Georgetown University Boathouse -- Map Amendment, Special Exception, Variance).

Under Alternative A (Zoning Alternative), the boathouse facility would result in a FAR of 0.71, would have a maximum building height of 50'-8"⁶ (40 feet as measured from the finished grade to the ceiling of the exercise room, in accordance with D.C. zoning regulations), and the lot occupancy would be 39%, within the requirements of the W-O zone. All setback requirements would be met, except the distance from mean high water level would be 15 feet, which was approved as part of a requested variance for this property.

Under Alternative B (MOA Alternative), the boathouse facility would result in a FAR of 0.55, a total building height of 39'-8", and a lot occupancy of 32%, all within the requirements of the W-O zone. The distance from mean high water level would be 15 feet as for Alternative A; the sideyard setbacks would be slightly greater for this alternative and well within the zoning requirements.

Under Alternative C (Preferred Alternative), the boathouse facility would have the same FAR, lot occupancy and setbacks as Alternative A but would be 36'-6" in total height (to the ridge of the central wing) and under the D.C. building height requirements as defined by zoning.

NHPA Section 106 Memorandum of Agreement (MOA)

Action under Alternative A (Zoning Alternative) does not comply with the stipulations contained in the 1997 NHPA Section 106 MOA. The 18,862 square foot footprint would be larger than 15,000 square foot size that was identified in this document. Also, the height of the boathouse of 50'-8" (measured from the finished grade to the ridge of the central portion of the boathouse) would be taller than the agreed height of 40 feet above grade as stated in the MOA. Therefore, to construct a boathouse under Alternative A, a new or revised MOA would be required.

Action under Alternative B (MOA Alternative), where the boathouse would have a footprint of less than 15,000 square feet and a height that would be less than 40 feet above grade, would meet the stipulations contained in the MOA. A new or revised MOA would not be required for this alternative.

Action under Alternative C (Preferred Alternative) partially complies with the MOA since it meets the height requirements (36'-6" above grade) specified in this document. However, like Alternative A, a new or revised MOA would be required from the appropriate review parties that allows the proposed footprint (18,862 square feet) included in this alternative.

Mitigation

The proposed boathouse under Alternatives A, B or C would extend slightly further west of Key Bridge than the approximately 1,100 feet identified in the *Georgetown Waterfront Park Plan*, a condition that is allowed under the Preliminary Exchange Agreement. In accordance with the agreement, the University will obtain final approval of the proposed building from the CFA, and

⁶ Under Alternative A, the building would stand 50'-8" tall; however, zoning regulations restrict height based on measurement of height from finished grade to the ceiling of the uppermost story of the building. Applying D.C. zoning height measurement procedures results in a building height of 40 feet, within the W-O zoning regulations.

the NPS will consult with NCPC through this EA process, to locate a boathouse between 1,155 feet to 1,250 feet west of Key Bridge.

In accordance with the Preliminary Land Exchange Agreement, Georgetown University will be required to maintain the open space connection to the rest of the waterfront area. In an effort to preserve the continuity of recreational open space and maintain public access to the waterfront, fences or other boundary defining structures would not be permitted on the land. In addition, all boat storage would be indoors. Georgetown University would also comply with any other requirements resulting from subsequent agency review for all of the alternatives and the revised MOA for Alternatives A and C to minimize impacts as appropriate.

No Action Alternative

Under the No Action Alternative, the land use for Tract 102-114 and surrounding area would remain the same. The land would remain undeveloped and would not be subject to the Land Exchange Agreement between the National Park Service and Georgetown University. The land would remain under Federal ownership and would not be subject to Washington, D.C. zoning controls. However, since there would be no progress toward supporting the goals of the Federal or District Elements of the Comprehensive Plan for the National Capital, *the Georgetown Waterfront Park Plan*, or the Non-motorized Boating in the Potomac and Anacostia Rivers Study, there would be an adverse impact to the existing planning policies in effect for this part of the Georgetown waterfront.

Also under the No Action Alternative, Tract 102-109 would remain privately-owned land under C-M-1 zoning (Commercial and Light Manufacturing Zone) and would be available for development by the University, subject to any required public and agency review and approvals. Also, the right-of-way easement that Georgetown University currently controls along the CCT (from the beginning of the trail in Georgetown to Tract 102-109) would remain available for future use by Georgetown University. If that site is developed, it would be contrary to NPS's goals of precluding this wooded, prime wetland site from development and acquiring and extinguishing the University's right-of-way along the CCT, as identified in the FONSI for the 1995 Land Exchange EA.

4.1.4 Community Facilities

Alternatives A, B and C

Allowing Georgetown University to construct their own facility would allow the team to vacate space within the TBC, making room for other high school and college boat storage. Georgetown University is the largest crew program currently using TBC. Moving the University's training site upstream would also reduce the boat congestion on the docks at TBC, as well as in that section of the river.

The existing crew facilities (TBC and PBC) consist of approximately 45,370 square feet of indoor storage space with a total of 12 indoor boat storage bays. The construction of a new facility under Alternatives A (Zoning Alternative) and C (Preferred Alternative) would add approximately 8,700 square feet of boat storage space, while Alternative B (MOA Alternative) would add approximately 7,400 square feet of space. Georgetown University currently stores

their ergometers and other training equipment in a room on the second floor of TBC. Moving Georgetown University out of this facility would provide this space to other users at TBC. Also, as identified in Chapter 2, the proposed boathouse facility would be used for a summer rowing program for high school aged youth, providing a potential benefit to the area's rowing community.

Under Alternatives A, B and C, the CCT would be widened. The widening would provide space for emergency, trailer and service vehicles to access the boathouse and a turnaround area at the western end of the property. The trail area would be widened first and the CCT would be temporarily shifted to the north so it can be kept open for biking and other trail use during the construction period (see Section 4.3.1). After construction of the boathouse, the CCT would be re-striped at its current location. The plans for access in and out of the proposed boathouse, and any resulting effects, are further discussed in the transportation section (Section 4.3.1) below.

Mitigation

To accommodate this proposed new use north of Key Bridge and to reduce any potential river use conflicts, the Potomac River Safety Committee should meet to agree upon and update its training and river use guidelines. Georgetown University should take the lead in organizing this meeting with all parties on the Committee. This is also addressed in Section 4.3.4.

Georgetown University will take all precautions during construction and operation of the boathouse to ensure that there is minimum interference with the CCT use (described in more detail in Section 4.3.1 below). Coordination with NPS would be required to minimize any impacts to the CCT both during construction and operation of the facility.

No Action Alternative

Under the No Action Alternative, the University would not construct a boathouse and the need for additional boating facilities would continue. Thus, the current shortage of recreational boating space would continue for the foreseeable future, unless the University constructs a boathouse on the upstream site. However, if the upstream site is developed, the University's right-of-way concurrent with the CCT would be utilized to access the site, potentially resulting in impacts to trail users.

4.2 CULTURAL RESOURCES IMPACTS

4.2.1 Historic Resources

Potential impacts to historic properties are characterized as either direct or indirect impacts. The physical displacement or demolition of a resource would be a direct impact; changes in use, operation or character of the resource could be direct or indirect; and changes to the visual context or historic setting of the resource would be indirect impacts. The following criteria were used in determination of potential impacts on historic resources that would result from the proposed alternatives (40 CFR 1508.7-1508.8):

- **No Impact** occurs when the proposed action does not displace or demolish the historic resources; does not change the use, operation, or historic character of the resources; and does not affect the historic setting or visual context of the resources.
- **Minor Impact** occurs when the proposed action is visible or present within the visual context of the resources without interfering with the historic setting of the resources.
- **Moderate Impact** occurs when the proposed action results in a change in the use, operation, or historic character of the resources; results in a change in use that is incompatible with the historic use of the resources; substantially disrupts the normal operation of the resources; or substantially diminishes the historic character of the resources through physical alteration of, or visual intrusion on, the resources.
- **Major Impact** occurs when the proposed action is severely adverse and highly noticeable within the historic context of the resources, and interferes with the historic setting of the resources.
- **Positive Impact** occurs when the proposed action improves the use, operation, or historic character of the resources; and/or improves the visual context of the historic setting of the resources.

No historic structures are located on the project site. Consequently, the proposed boathouse would not result in the demolition or physical alteration of any historic structures. The project site is located within three recognized historic areas: the National Register- and National Landmark-listed Georgetown Historic District; the National Register-listed Chesapeake and Ohio Canal National Historical Park; and the D.C.-listed Potomac Gorge. All of the above-mentioned areas are potentially affected resources within the project site. Effects of the proposed boathouse on historic resources are related to the changes to the historic context and setting, resulting in indirect impacts. The assessment has been completed in two study areas: resources along the Georgetown waterfront, and resources on the Georgetown University campus.

Alternatives A, B and C

Historic Districts and Individual Landmarks Impacts- Study Area

Chesapeake & Ohio Canal National Historical Park

The project site is located within the Chesapeake and Ohio Canal National Historical Park. This area includes the land that borders the canal, and the area south of the canal to the Potomac River. The C&O Canal and towpath are located to the north of the proposed project site on an embankment. The proposed boathouse would be directly visible from the C&O Canal and towpath under all three alternatives. However, the addition of a boathouse on the proposed location would not negatively affect the historic setting of the C&O Canal since it would be consistent with the existing urban views of Georgetown already present along the canal in this area. Historically, the C&O Canal was an area of bustling activity. Georgetown was one of the many “canal towns,” or urban environments located along the canal in contrast to the otherwise natural surroundings. The banks of the canal were considered a prime location to locate a business; many sought out this location for the power source and access the canal provided. The CCT is located directly adjacent to the proposed project site. Prior to its current use as a hiking and biking trail, the land served as a rail line for the Georgetown Branch of the former B & O Railroad. Historic photographs reveal that development, including boathouses, existed along the B&O tracks in proximity to the proposed project location (see Photographs 3-3 and 3-5). The CCT alignment would remain intact in the proposed project area as discussed under Section 4.3.1 below. The overall result of the proposed construction under Alternatives A, B and C would have a minor impact on these resources. However, because action under Alternative A (Zoning Alternative) would result in a larger boathouse in its footprint and height than what is proposed in Alternatives B (MOA Alternative) and C (Preferred Alternative), action under Alternative A is judged to have the most impact, with actions under Alternatives B and C anticipated to result in lesser impacts on historic resources associated with the C&O Canal NHP.

Old Georgetown Historic District

The project site is located within the Old Georgetown Historic District. As a result of its location relative to the proposed boathouse, the majority of the historic district would be shielded from impacts resulting from the proposed action. The project site is at a lower elevation than Georgetown University and the more residential components of the Old Georgetown Historic District. Also, the Georgetown waterfront has experienced a dynamic history as an industrial center and a successful harbor. A boathouse, in particular, would be consistent with the type of development that has historically been, and currently is, present along the waterfront. Additionally, the design and materials of all three boathouses are proposed to be architecturally compatible with the Georgetown Historic District. Therefore, action under Alternatives A, B and C would have no impact on the Old Georgetown Historic District.

Potomac Gorge (Potomac Palisades)

Located upstream from Key Bridge along the Potomac River, the project site is located within a low-lying area of the Potomac Gorge, more characteristically known for its palisades.

Development in this region of the Potomac Gorge is viewed as less intrusive because it is not occurring on the character-defining line of lofty, steep cliffs that line the Potomac River's edge. Instead, the proposed boathouse would be constructed within a historically mixed-use section of Georgetown. Since the late nineteenth century, boathouses have existed along the Georgetown waterfront at various locations including north of Key Bridge in the Potomac Gorge area. Therefore, a boathouse is not an incompatible use for the project site from an historical perspective. Consequently, the proposed construction of the proposed boathouse under Alternatives A, B and C would have a minor impact on the Potomac Gorge.

Alexandria Aqueduct Bridge Abutment and Pier (at the Potomac River west of Key Bridge)

The Alexandria Aqueduct Bridge Abutment and pier are located on the Washington, D.C., shoreline of the Potomac River, just upstream from Key Bridge, southeast of the project site. Action under Alternatives A, B and C would result in a new boathouse that is highly visible from these historic resources. Historically, however, this was not an undeveloped natural setting. The construction of the Alexandria Aqueduct Bridge resulted in the linkage of the C&O Canal to the Alexandria Canal. This linkage provided a greater accessibility than ever before to far reaching markets, and resulted in the waterfront experiencing a surge in growth. Industrial and manufacturing enterprises such as ice houses, lime kilns, lumber yards, and coal piles were located along the waterfront in addition to boathouses during the late nineteenth and early twentieth centuries. As the waterfront in Georgetown has experienced different kinds of development throughout its history, new construction in itself is not inappropriate for the project site. Consequently, action under Alternatives A, B and C would not interfere with the resources' historic settings.

Washington Canoe Club (WCC), 3700 Water Street

Prior to the construction of the WCC, the character of the Georgetown waterfront was largely industrial, spurred by the construction of the Alexandria Aqueduct Bridge and the C&O Canal. By the start of the twentieth century, around the time of construction of the WCC, boathouses began to emerge on the waterfront in greater number, illustrating the popularity of the activity and the use of the river for recreational purposes. Action under Alternatives A, B and C would locate a new boathouse adjacent to the WCC. As the waterfront in Georgetown has experienced varied development patterns throughout its history, new construction in itself is not inappropriate for the project site. Tied closely with the plan for the Georgetown Waterfront Park, the creation of a boathouse "row" similar to Philadelphia is an important aspect of the project plan, as indicated within the Preliminary Land Exchange Agreement. The adjacency of the WCC and the PBC supports the creation of additional boathouse facilities along the river, and the compatibility of this proposed land use.

The integrity of location and setting would remain intact, for the addition of a boathouse along the Potomac River would reinforce the character of the waterfront where the WCC has played its historical role. The removal of the non-historic fence and other outdoor storage facilities at the site (east of the proposed boathouse) will not lessen the integrity of setting. These site features are modern additions to the property and do not contribute to the overall significance or character of the WCC. The integrity of feeling and association would also remain intact because the WCC would still be able to convey its connection with boating along the Potomac River. The materials of the proposed boathouse under each alternative would be consistent with

typical elements of boathouse architecture although the scale and massing of the proposed facility, particularly Alternative A (Zoning Alternative) is larger than the WCC. Action under any of these alternatives would have a moderate impact to the WCC, as defined above in the historic resources impact criteria used for this EA.

Potomac Boat Club (PBC), 3530 K Street

The PBC is located east of the project site on the downstream side of Key Bridge from the WCC. Boathouses have existed on the waterfront since the late nineteenth century. At the height of boating popularity, there were at least six boathouses along the Georgetown waterfront. Thus, construction of a boathouse would be appropriate for the project site. The scale of the proposed boathouse under Alternatives A, B, and C is larger than that of the PBC. Although portions of the proposed boathouse may be visible from the PBC, this would not be a negative impact because, historically, other boathouses were visible from the PBC. Considered a compatible use, the proposed boathouse would restore the historic setting of boathouses along the river, increasing the integrity of association, location, and setting. The presence of the WCC, Aqueduct Bridge Abutment and Pier in between the proposed boathouse site and the PBC however, lessen the differences in scale and massing between the two structures. For these reasons, the proposed boathouse under Alternatives A, B, and C would have a minor impact on the PBC.

Key Bridge

The project site is located northwest of Key Bridge along the waterfront in Georgetown. The proposed boathouse would be highly visible from Key Bridge because of their proximity to one another. Boathouses have existed on the waterfront since the late nineteenth century, and have been visible from the Key Bridge since 1923, when the bridge was built. New construction in itself is not inappropriate for the project site, as the waterfront in Georgetown has experienced different types of development throughout its history. Consequently, the development of a boathouse under Alternatives A, B and C would have minimal impact on Key Bridge.

Historic Districts and Individual Landmarks Impacts – Georgetown University

Old North, the Healy Building, and the Georgetown University Astronomical Observatory are buildings that are individually listed historic resources on the Georgetown University campus. The potential impacts of the proposed project on these resources would be indirect, related to alteration of their visual context or historic setting.

Old North

Located within the original quadrangle of Georgetown University, Old North is located to the north of the project site. The proposed boathouse is sited along the waterfront at a lower elevation than Old North, and would not be visible from this vantage point. Therefore, the proposed Georgetown University boathouse under Alternatives A, B and C would have no impact on Old North.

Healy Hall

Healy Hall, one of the tallest buildings on the Georgetown University campus, is located within the original quadrangle of the University, located to the north of the project site. Because of the height of Healy Hall, there is potential that the proposed boathouse would be visible from the building. Substantial grade changes, other buildings on the campus, and existing vegetation serve as buffers between Healy Hall and the project site. Although the boathouse could potentially be visible from Healy Hall, there would be no impact on Healy Hall.

Georgetown University Astronomical Observatory

The Observatory is situated on a hilltop northwest of the original Georgetown University quadrangle, and north of the project site. The proposed boathouse would be shielded from view from the Observatory by substantial grade changes, other buildings on the University campus, and by trees. Consequently, the proposed boathouse under Alternatives A, B and C would have no impact on the Observatory.

Mitigation

Overall, the proposed action under Alternatives A, B and C would have minor to moderate impacts on historic resources in the vicinity of the project site. The impact to historic resources is assessed the same for all three alternatives, except on the C&O Canal NHP and WCC as described above. It should be noted that the Old Georgetown Board approved Alternative A, and Alternative B is consistent with the existing Section 106 Memorandum of Agreement. Visual impacts are discussed in more detail in Section 4.2.2 below.

The C&O Canal NHP Towpath and Canal and the WCC are the closest historic resources immediately adjacent to the proposed boathouse. The project is also located within the C&O Canal NHP, the Georgetown Historic District and the Potomac Gorge area. In order to reduce impacts of the proposed boathouse on these historic resources, NPS will coordinate with the D.C. Historic Preservation Office and the Advisory Council on Historic Preservation to comply with Section 106 (if Alternative A – Zoning Alternative, or C – Preferred Alternative is pursued) to reduce impacts of the proposed boathouse to these historic resources. If Alternative B (MOA Alternative) is pursued, no additional action would be necessary under Section 106.

No Action Alternative

The No Action Alternative would have no effect on historic resources since the project site will not be developed and will remain in its present use as public parkland. Views from the adjacent historic districts and landmarks would not change from current conditions under the No Action Alternative. However, potential development of the upstream site, could impact cultural resources within the C&O Canal NHP, including the remnants of the incline plane.

4.2.2 Visual Resources

Methodology

The overall visual impacts that can be attributed to the proposed action would result primarily from the degree of visual change that would be generated by the three boathouse alternatives. For this analysis, the visual impacts were determined for representative viewpoints. The degree of visual change considers the existing character of the landscape in view, the relationship of the project site to the land around it, and the type of visual changes that would occur in the “viewshed” as a result of the project. As described in Section 3.2.2, viewpoints representing views from key locations were used in the analysis to identify impacts. These viewpoints were determined based on scoping input, as well as an analysis of the relationship of the proposed boathouse to the existing visual environment.

Several factors were taken into account in determining visual impacts as described below:

- The visual character of the project setting, that varies between a natural environment (that has no built elements) to an urban environment (that is dominated by built structures).
- Current relationship and visibility of the project site to the overall landscape in view (i.e., viewshed).
- Other inter-related variables concerning the viewpoint, viewer conditions, and how the landscape is being viewed. These could include the context of the specific view, the orientation and angle of the view, the presence of screening elements, the activity of the viewer during which the view is experienced, and the duration of the view.

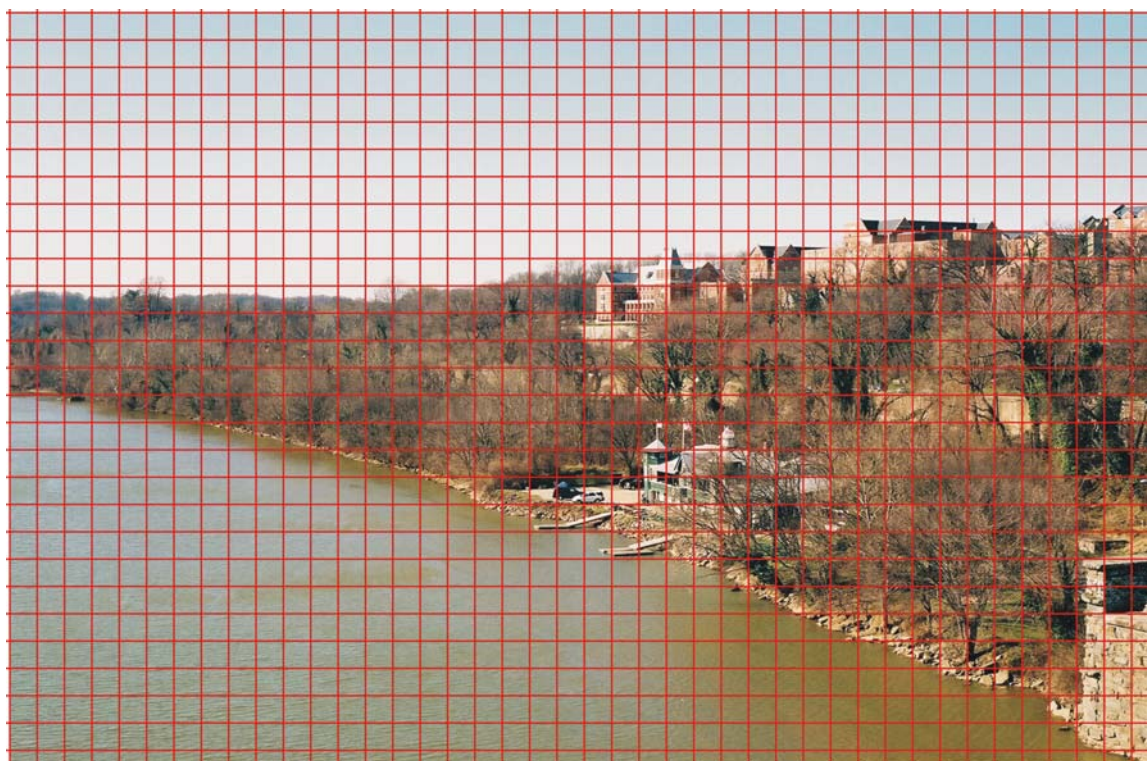
Based on these factors, the degree of visual impact is described in the following categories:

- **No Visual Impact** occurs when the proposed action would not be visible from the representative viewpoint.
- **Minor Visual Impact** occurs when the proposed project would be visible as a background element of a view that includes buildings of similar mass and scale. The project would not interfere with views from the representative viewpoint and would not change the existing viewshed character.
- **Moderate Visual Impact** occurs when the proposed project would be visible as part of a view that includes buildings of similar mass and scale and interferes with views from the representative viewpoint without changing the existing viewshed character.
- **Major Visual Impact** occurs when the proposed project would be visible as a contrasting or dominant element, interferes with views from representative viewpoint, and substantially changes the existing viewshed character.

The impact assessment included review of the plans, sections, and elevations for the proposed boathouse as prepared by MUSE Architects for Georgetown University. In addition, computer simulations of the proposed boathouse were prepared for each alternative and superimposed on

existing images (landscape, paving and other proposed features are not included). Views towards the project site were photographed using a 50 mm lens, which most closely approximates the human eye without wide angle or other distortion, on a 35 mm Single Lens Reflex (SLR) camera. The simulations were drawn to scale and rendered using computer software to as accurately as possible depict the visual appearance of the proposed boathouse. The photographs for the simulations were taken during the winter months when the proposed boathouse has the most likelihood to be visible.

The visibility of the proposed boathouse under each alternative (called “area of influence”) was quantified by measuring the area of the overall image frame that would change due to the proposed development of the project site. This was calculated by superimposing a grid on the picture frame and measuring the portion of the picture affected by the proposed building. Percentages of change at the viewpoints used in the analysis were calculated for each alternative using this methodology.



Example of a superimposed grid on existing viewpoint from Key Bridge to help quantify potential visual impacts

Alternatives A, B and C

Under the proposed build alternatives, the boathouse would be located in an area that is situated at the confluence of two predominant character areas. As identified in Section 3.2, the area to the west (inclusive of the project site) is predominantly natural, whereas the area to the north and east is predominantly urban in character. The proposed boathouse would add a structure in a location that is currently vacant and vegetated. This would change the visual condition of the project site from a natural to an urban environment, and would extend the recreational character that is currently provided by the PBC and WCC to the immediate east.

Impacts on Key Viewpoints

View from Virginia including the George Washington Memorial Parkway (GWMP)

The proposed boathouse under Alternatives A, B and C would be visible from the GWMP. Drivers or passengers in vehicles headed in the northbound direction would see the boathouse to their right for a brief duration immediately after passing Key Bridge. Similarly, drivers or passengers in vehicles headed in the southbound direction would see the boathouse from portions of the GWMP across the river. The proposed boathouse would also be visible to hikers along the Potomac Heritage Trail.

From this location, the boathouse would be visible as part of a visual environment that would include the Potomac River in the foreground, the WCC flanking the downriver side, a natural environment (C&O Canal NHP) flanking the upriver side, as well as immediately above the structure, and Georgetown University buildings along the skyline (see Photo Simulation 1). Since the proposed boathouse would be located in a visual environment that includes urban and natural features, as visible from this viewpoint, visual contrast against the existing setting would be less than if the boathouse was located in a setting that was completely natural. In addition, while the proposed boathouse is larger than the adjacent WCC in mass and scale, it is compatible with the multi-storied buildings on the Georgetown University campus that provide a backdrop.

From this viewpoint, the area of influence of the proposed boathouse was measured as 2.6 percent for Alternative A (Zoning Alternative), 2.1 percent for Alternative B (MOA Alternative), and 2 percent for Alternative C (Preferred Alternative) based on the methodology as described above. The No Action Alternative would not result in any change to the existing viewpoint.

Alternative A (Zoning Alternative)



Alternative B (MOA Alternative)



Alternative C (Preferred Alternative)



No Action Alternative



Photo Simulation 1 - Simulated View of Proposed Boathouse from the George Washington Memorial Parkway

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View from Key Bridge

The proposed boathouse under all three build alternatives would be visible from Key Bridge. While motorists headed towards Washington, D.C., would not see the proposed boathouse, motorists headed towards Virginia would see it for a brief duration if they looked towards their right.

The boathouse would be most visible to pedestrians walking on the upriver side of the bridge, especially those walking to or from D.C. on this side of the bridge. For most of the duration that a pedestrian would be on the bridge, the boathouse would appear as part of a changing visual environment. At the Virginia end of the bridge, the boathouse would appear on the periphery, below eye level, between the urban environment of Georgetown to the right, and the Potomac River and natural environment located to the left. As pedestrians move towards the center of Key Bridge, the boathouse would increase in proximity and visibility to the left (see Photo Simulation 2). Once pedestrians move towards the D.C. side of the bridge, the boathouse would become less evident among the other elements, including the Whitehurst Freeway Ramp, the C&O Canal, and Canal Road.

For pedestrians walking in the opposite direction (towards Virginia) the boathouse would be visible to the right during the duration that they would walk from the beginning of the bridge on the D.C. side to approximately the middle of the bridge. In this direction, the tall multi-storied structures in Rosslyn are the dominant elements in the viewshed, with the Potomac River providing the second dominant element to the right. Within this visual context, the boathouse would be a new structure that would be evident but would not dominate the visual environment.

From this location, the boathouse under both Alternatives B (MOA Alternative) and C (Preferred Alternative) is lower and appears closer in scale to the WCC compared to Alternative A (Zoning Alternative). Further, from this viewpoint, the area of influence of the proposed boathouse was measured as 2.3% for Alternative A, 1.7% for Alternative B, and 1.7% for Alternative C based on the methodology as described above. The No Action Alternative would not result in any change to the existing viewpoint.

Alternative A (Zoning Alternative)



Alternative B (MOA Alternative)



Alternative C (Preferred Alternative)



No Action Alternative



Photo Simulation 2 – Simulated View of Proposed Boathouse from Key Bridge

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View from Capital Crescent Trail

The proposed boathouse under all three build alternatives would be directly visible and a noticeable change to this portion of the CCT would result. To users of the trail, the boathouse would appear as a two story structure that would extend for 255 to 280 feet (depending on the alternative) as they jog, walk, bike, or rollerblade past the site.

For users headed away from Georgetown, the proposed boathouse would be a dominant structure for the duration from when they pass the WCC until they pass the proposed boathouse (see Photo Simulation 3). The visual environment would include the embankment of the C&O Canal to the right along with the CCT and the added access lane (for the boathouse) in the foreground. Once past the boathouse, the visitors would enter a more natural environment that continues for several miles.

For users headed towards Georgetown, the boathouse would appear to the right after the trail passes through a natural environment for more than three miles. For the duration that users pass the boathouse, it would be a dominant visual element. Once past the boathouse, visitors would pass by the WCC, which adds a similar visual buffer between the trail and the river, before arriving at the end of the trail in an environment that can be characterized as urban.

From this viewpoint, all three build alternatives are similar since the CCT is so close to the building that the height and size differences between the alternatives would not be overly discernable when biking or walking along the trail. However, when approaching the boathouse from either direction as illustrated in Photo Simulation 3, the visibility of the proposed boathouse in the viewpoint would vary between 37% for Alternative A (Zoning Alternative), 29.5% for Alternative B (MOA Alternative), and 28% for Alternative C (Preferred Alternative) using the methodology described earlier. Obviously, this change would be greater as one approaches the building and less the farther one moves away either walking or biking along the CCT. Under the No Action Alternative, there would be no change to the current view and existing vegetation would continue to provide intermittent views towards the river.

Alternative A (Zoning Alternative)



Alternative B (MOA Alternative)



Alternative C (Preferred Alternative)



No Action Alternative



Photo Simulation 3 – Simulated View of the Proposed Boathouse from the Capital Crescent Trail

View from C&O Canal Towpath

The proposed boathouse under all three build alternatives would be directly visible from the C&O Canal Towpath. Since differences in the alternatives could be discernable from this location and given the historic nature and proximity of this resource, several simulations were prepared (see Photo Simulations 4, 5 and 6). It should be noted that along this stretch of the towpath, the existing vegetation provides a visual screening effect with occasional openings that offer views of the river and the shoreline on the Virginia side. For the duration when a person is walking or running along the path, the boathouse would be visible through openings in the vegetation, particularly during the wintertime. During the summer, because of the existing vegetation, much of the view towards the river is blocked.

To users headed towards Georgetown, the boathouse would be to the right and part of a visual environment that would include the C&O Canal, the retaining wall adjacent to Canal Road and the Whitehurst Freeway spanning the canal as a backdrop (from this vantage point, the Alexandria Aqueduct bridge abutment or the Theodore Roosevelt Island are not visible). These users arrive at the site of the boathouse after passing through a natural environment that offers multiple opportunities to view the river. After passing the boathouse, they have intermittent views of WCC (through the existing vegetation) before arriving in an area where the vegetation opens to reveal Key Bridge as the most dominant element in the visual environment. Past that, multistoried buildings in Georgetown flank the canal and become the dominant visual elements.

To users headed away from Georgetown, the boathouse would be visible to the left during the duration that they pass the structure. Before arriving at the boathouse, they pass through the urban area of Georgetown, followed by an open area adjacent to the Aqueduct structure where the river is the dominant element in the visual environment. Past that, existing vegetation adds a buffer to the left and portions of WCC are visible prior to arriving along the proposed boathouse. Once users pass the proposed boathouse, they are in a natural environment where existing vegetation offers intermittent views of the river, particularly during the winter.

When standing directly adjacent to the boathouse on the towpath, for Alternative A (Zoning Alternative), the wings of the boathouse would be above eye-level with the central portion rising higher. The river would not be visible; however, portions of the Virginia side of the river would be visible to viewers standing on the towpath directly behind or north of the boathouse. For Alternative B (MOA Alternative), the wings of the building would be at eye-level and, although the wings would restrict the view of the river, more of the Virginia shoreline would be visible when standing in this same location. For Alternative C (Preferred Alternative), the wings of the building would be below eye-level, and with the exception of the central portion, would allow a view of both the opposing edge of the river and the Virginia shoreline. Under the No Action Alternative there would be no change to the current view and existing vegetation would continue to provide intermittent views towards the river.

Using a similar methodology as described above, calculations were made of the degree the boathouse obstructed views from the three representative viewpoints immediately adjacent to the site. These visibility calculations are summarized in Table 4-1.

Alternative A (Zoning Alternative)



Alternative B (MOA Alternative)



Alternative C (Preferred Alternative)



No Action Alternative



*Photo Simulation 4 – Simulated View from the C&O Canal Towpath towards the **Peak** (central portion) of the Proposed Boathouse under the three proposed Boathouse Alternatives and the No Action Alternative*

Alternative A (Zoning Alternative)



Alternative B (MOA Alternative)



Alternative C (Preferred Alternative)



No Action Alternative



Photo Simulation 5 – Simulated View from the C&O Canal Towpath towards the Hyphen (roof area between the central portion and side wings) of the Proposed Boathouse under the three proposed Boathouse Alternatives and the No Action Alternative

Alternative A (Zoning Alternative)



Alternative B (MOA Alternative)



Alternative C (Preferred Alternative)



No Action Alternative



*Photo Simulation 6 – Simulated View from the C&O Canal Towpath towards the **Wings** of the Proposed Boathouse under the three proposed Boathouse Alternatives and the No Action Alternative*

Visual Impact Summary

From two key viewpoints, the George Washington Memorial Parkway and the Key Bridge, a boathouse under each alternative would result in a minor visual impact due to the following reasons:

- The boathouse would be visible among buildings of somewhat similar mass and scale;
- The boathouse would not interfere with the view; and
- The boathouse would not change the overall character of the existing viewshed.

From the CCT and the C&O Canal Towpath, the degree of impact would vary depending on the location of the viewer. From the viewpoints used in the analysis above, each alternative would result in a major impact because:

- The boathouse would be a dominant visual element;
- It would interfere with existing views; and
- It would substantially change the character of the existing viewshed from these locations.

Based on scoping comments and the historic nature of the C&O Canal Towpath, views to the river from this resource were considered particularly important. The visual obstruction methodology as described above attempts to quantify impacts from viewpoints immediately adjacent to the building. As described above, this analysis shows differences among the alternatives with Alternative A, B and C having from most to least impacts, respectively, at this key location. As one moves away from the building, impacts to the towpath obviously lessen.

Overall, because the boathouse under each alternative would result in minor impacts from two of the key viewpoints, because along the CCT and the towpath, the view towards the river would be blocked for a limited duration when a viewer is walking, jogging or biking past the boathouse, and because views towards the river would continue to be available upstream and downstream from the boathouse, the visual impact of all three alternatives is considered moderate. Variations among the alternatives are most noticeable when standing directly adjacent to the building at the towpath location and are documented in Photo Simulations 4, 5 and 6 and Table 4-1 above.

Mitigation

Under all three alternatives, the following measures would reduce the visual impact of the proposed boathouse:

- To reduce impacts to views from the south (GWMP and Key Bridge), architectural materials and colors to reduce the contrast of the boathouse to the extent possible against the existing natural setting would be used. Also, landscaping would be used as

screening and to soften the visual impact of the building from viewpoints across the river and from Key Bridge.

- To reduce impacts to views from the C&O Canal towpath and the CCT, vegetation would be retained to the extent possible in key areas, such as along the towpath and at the eastern and western end of the boathouse, to reduce the period of visibility of the boathouse from these locations.
- As noted above, in Section 4.2.1, since Commission of Fine Arts and National Capital Planning Commission review is required for the proposed boathouse and a revised MOA would be required for Alternatives A and C, any other conditions and changes to the building resulting from these reviews would be implemented to reduce overall visual impacts.

No Action Alternative

Under the No Action Alternative, the site would remain vacant and undeveloped. Therefore, there would be no change to the visual environment along this part of the Georgetown waterfront. However, minor adverse affects would occur around the TBC since outdoor boat storage would remain outside and visible to viewers in and around that area. Further, if the upstream site is developed, the view of the Potomac Gorge from the GWMP could be adversely affected, and impacts to existing views along the CCT and the towpath could occur.

4.3 TRANSPORTATION SYSTEMS IMPACTS

4.3.1 Vehicular Traffic and Parking

Alternatives A, B and C

The impacts on transportation systems and routes must be assessed in several stages: construction, during daily operations, and under special circumstances such as regattas.

As a part of the zoning application process, Georgetown University prepared a parking management plan, which has been endorsed by the D.C. Department of Transportation. The parking management plan would be implemented during daily operations, as well as regattas, and consists of the following elements:

- “All students and Georgetown’s crew will either walk or bicycle to the site.
- Visitors and visiting crew will be shuttled to the end of K Street, a short walking distance to the boathouse along the CCT.
- The shuttles will run as continuously as required by the demand, leaving the campus every fifteen minutes, dropping patrons off and picking up others to return to campus.
- The team bus of visiting crews will park on campus for the duration of the regatta after dropping off team members.
- Patrons will be encouraged to park on campus and utilize the shuttle or walk to the boathouse from the campus via the C&O Canal tunnel or the stairwell located across from the Car Barn.
- Spectators and visiting teams will be shuttled by University buses, from the University campus to the K Street dead-end, from which they will walk to the Boathouse. The race course will not be altered from its current path. The finish line will remain in front of Thompson Boat Center; therefore, there will be no vehicular congestion at the boathouse due to regattas.”⁷

Construction Stage

Construction of the boathouse, under Alternatives A, B and C, would last for approximately 16 months. In order to minimize impacts during the construction stage, construction activities would have to be coordinated to avoid conflict with local trail users. The paved CCT provides the only existing access to the site. In order to avoid conflict with trail users during construction, the trail area would be widened from 10 feet to 22 feet and the trail would be temporarily shifted to the north without cutting into the embankment of the C&O Canal. A dedicated 12 foot-wide access lane during construction would accommodate construction crews and vehicles and a chain-link fence would separate the trail users from the access lane. The access lane would run parallel to the existing CCT, for the length of the boathouse site, up to the turnaround at the western end. The pavement would be widened and the CCT would be relocated first before construction of the access lane to reduce potential conflicts with trail users during the construction period. Construction activities (such as installing underground utilities)

⁷ Washington DC Department of Transportation, Zoning Commission Case No. 02-30 application for Map amendment from unzoned to W-O, Memorandum 5/03.

that could potentially impact trail users would be performed at night to ensure that the CCT remains open for public use during daytime.

Construction on the boathouse site would mostly occur during daytime hours. Construction activities would not occur on Federal holidays, or on weekends, when pedestrian and bicycle activity is at its peak. It is not anticipated that pedestrian or bicycle activity levels would change as a result of construction. However, construction activities could have a slight to moderate impact on the CCT and hikers/bikers using this trail system since vehicles may interrupt pedestrian and bicycle flow when unloading equipment or maneuvering vehicles.

Widening of the trail area would require the existing fence along the northeastern portion of WCC to be shifted to the south. Also, proposed development of the boathouse site under Alternatives A, B and C would require the existing fence along the western portion of WCC to be relocated by approximately 40 feet to the east. This area is currently used for parking and to store boats, both of which would need to be removed or relocated prior to construction at the proposed boathouse site.

Daily Operations

Daily operations of the proposed boathouse under Alternatives A, B and C would be primarily for training purposes. Georgetown University would use the facility during both morning and afternoon training sessions. The crew would arrive at the boathouse between 6:15 and 7:00 a.m. and would leave the facility between 8:00 and 8:45 a.m. during the morning session, and would arrive around 4:00 p.m. and leave around 6:00 p.m. during the afternoon session. All daily boathouse users would be expected to access the site by bicycle or on foot.

There will be no on-site parking for regular users of the boating facility; all students, coaches and visitors would be expected to comply with the parking management plan which specifies the mode of transportation as bicycling or walking. Therefore, a change in vehicular traffic and parking in the vicinity of the site would not be expected once the boathouse facility is in operation.

The only vehicular access to the site would be for emergency purposes, occasional services (e.g., trash pickup), and delivering and retrieving boats. The emergency/service access area would be striped clearly with a turnaround located just past the facility to accommodate these vehicles. In total, it is anticipated that a vehicle for deliveries such as uniforms, supplies, etc., would access the site approximately three to four times per week, between the hours of 9:30 a.m. and 3:00 p.m. This includes trash pick-up anticipated to occur once a week between the hours of 6:30 a.m. and 3:00 p.m.

This minimal traffic would have minimal impacts to the trail users, particularly because the access lane would be separate from the CCT, and most deliveries would occur during non-peak periods of trail use.

Regattas

Georgetown University currently hosts regattas during weekends in the spring season (they participate in regattas during the spring and fall but only host spring events). The regatta

schedule would not be affected by a new boathouse and would be similar to previous years. During regattas when Georgetown University is hosting the event, visiting teams would transport their boats to the proposed boathouse facility.

The method of transporting and storing the boats of the visiting team would depend on the number of teams competing in the regatta. A visiting team typically brings four boats on a trailer that would be brought to the boathouse either on the preceding day or on the morning of the event. The site can temporarily accommodate up to two trailers at one time. Depending upon the number of visiting teams, the boats would be unloaded and, either the trailer would be kept on site, or removed from the site and parked on campus.

A regatta with one or two teams visiting would typically last for approximately three hours, after which the trailer would be loaded and would depart. In the event of larger regattas, Georgetown University anticipates coordinating with either TBC or PBC to provide boat unloading space for the additional visiting teams. In this case, trailers would be stored on campus.

Similarly, Georgetown University teams go to other locations to participate in regattas. During these times, the University would remove boats on a trailer before the regatta, and would subsequently bring them back. Georgetown University participates in five to six events in the spring season and two to three in the fall season on the Potomac. The spring season regattas last from late March until late May, with two additional events occasionally occurring in June. Also, the University participates in approximately fifteen regattas away from D.C. during the spring season and approximately eight during the fall season.

In total, the University anticipates a trailer accessing the project site between 50 and 75 times in a year. During these occasions, there would be a potential impact on CCT users when trailers turn into or out of the turnaround area. Georgetown University and visiting teams would need to be attentive to trail users when using the access lane. Due to the high cost of the crew boats, a trailer is typically driven by a coach or a professional driver, with an accompanying person to assist in directing the driver while turning around and parking. This accompanying person would help to direct the trailer driver and help to minimize conflicts with CCT users when a trailer is brought or leaves the project site.

Team members would be brought to the site by bus, and dropped off at the dead end of Water Street. The number of visitors to the waterfront area during regattas would be higher than daily operations but similar to existing conditions. The racing finish line would remain near the TBC, where most of the spectators would be expected.

Parking requirements have been waived by the D.C. Zoning Commission and no parking spaces are provided on-site. An increase in parking demand along the waterfront is not anticipated as a result of the proposed boathouse under Alternative A, B or C because spectator activity is not anticipated to change. The schedule, and frequency of visiting teams coming to the Georgetown waterfront, would not be altered as a result of the new boathouse. The race course would also remain the same and it would be expected that spectator areas would remain the same.

In order to improve existing conditions, the Georgetown University bus service that is already in operation could be expanded to accommodate visiting teams. Shuttle service, as required by the

transportation management plan would offset the increase in visitors to the waterfront area during regattas, as compared to daily operations. Visitors would park their vehicles on University grounds, therefore reducing the current impact to the parking facilities along the waterfront.

Mitigation

Mitigation measures will be employed to reduce the impact of construction activities on CCT users. The construction access road will be separated from the trail by fencing. In addition, flagmen will be utilized when a construction vehicle is using the access lane or unloading equipment at the site. Also, construction activities (such as installation of utilities) that could potentially interrupt trail use will be conducted during nighttime to ensure that the CCT remains open for public use during the daytime.

There are stairs connecting the towpath and CCT at the end of Water Street, as well as a path connecting the two routes approximately one-half mile upstream. Posting detour signs would allow pedestrian trail users to pass by construction activities by use of the towpath, avoiding the construction site completely, if desired.

Following construction, the new access lane and CCT will be painted or re-striped to clearly distinguish the areas designated for vehicles versus the areas designated for bikers and trail users.

Since WCC is a private facility on NPS property by permit, impacts either from construction or operation of the proposed boathouse would require negotiation between the two parties to resolve prior to construction. Any loss of parking would be mitigated through public spaces currently available along Water Street.

No Action Alternative

Under the No Action Alternative, the proposed boathouse would not be constructed. There would be no additional users brought to the project site. The primary boating facility would remain at TBC. Visitors would continue to drive to TBC and park their vehicles there during events. There would be no change in the number of vehicles accessing the waterfront on regatta days. However, if a boathouse or another use is developed at the upstream site, there could be impacts to existing users from vehicles (both construction and operational) that would use the CCT to access the site.

4.3.2 Public/Georgetown University Transit Service

Alternatives A, B and C

Under Alternatives A, B and C, Georgetown University's new boathouse would not be expected to have an effect on the need for University operated or public bus service. Should an increase in need arise, shuttle service would be provided by Georgetown University. Visitors would be able to park on the campus, and from there take a shuttle to the waterfront area. There are several pathways the buses could take to get from the campus to the boathouse drop-off point. The buses could leave the campus from Reservoir Road, heading south toward the water on

Foxhall Road, and East on Canal Road which turns into M Street. Buses could then turn right onto Wisconsin Avenue and left onto Water Street, which runs parallel to the water. Most spectators view the races from in front of Washington Harbour and TBC, where the finish line is located. Spectators would be dropped off along the waterfront near Washington Harbour. The same route, up to Water Street, would be followed for dropping off competitors whose boats are at the proposed Georgetown University boathouse. The dead end of Water Street would serve as the drop-off point and the closest point for vehicular access (other than for emergency purposes). The roads that access the project site are the same as those currently used by vehicles traveling from the Georgetown University campus to K Street.

There are a number of public transportation systems that service the Georgetown waterfront area. These routes come from Rosslyn, Dupont Circle, and Foggy Bottom. Although they may not access the facility, they could be used by visitors and spectators to get to the Georgetown waterfront.

The University could expand their operation (the Georgetown University Transportation Shuttle) to provide bus service to and from the site during events if needed. Faculty, staff, and students with a valid Georgetown University ID card can ride on any GUTS route at no charge. Bus service to the site may be required approximately five to six times per year for regattas. Therefore, minimal impacts are anticipated on the public or Georgetown University's transit systems.

No Action Alternative

Under the No Action Alternative, there would be no change in need for transit service to the project site or the waterfront area.

4.3.3 Pedestrian/Bicycle Facilities

Alternatives A, B and C

The project site is well served by pedestrian and bicycle pathways, as discussed in Section 3.3.3. The Glover Archbold Trail runs from the University entrance, near the intersection of 44th Street and Reservoir Road, for approximately 0.6 miles to Foxhall Road. The trail continues beneath Foxhall Road and the canal via a paved tunnel, connecting to the towpath and CCT. Students would be expected to use this pathway as their primary access to the proposed boathouse. Bicycle access is also available in this area; however, the Glover Archbold Trail does not permit bicycles. Bicyclists would need to use Canal Road to access the tunnel. These pedestrian and bicycle routes are similar to the routes currently used by students.

As discussed above, existing users on the CCT would be impacted during construction and when boat trailers access the site.

No Action Alternative

Under the No Action Alternative, the pedestrian and bicycle activity in the area would be expected to remain unchanged. Students currently use the local trails to get to TBC. The trails connect to Water Street which provides direct access to TBC via bicycle or walking. As

discussed above, there could be potential impacts on CCT users if the upstream site is developed.

4.3.4 River Navigation/Use

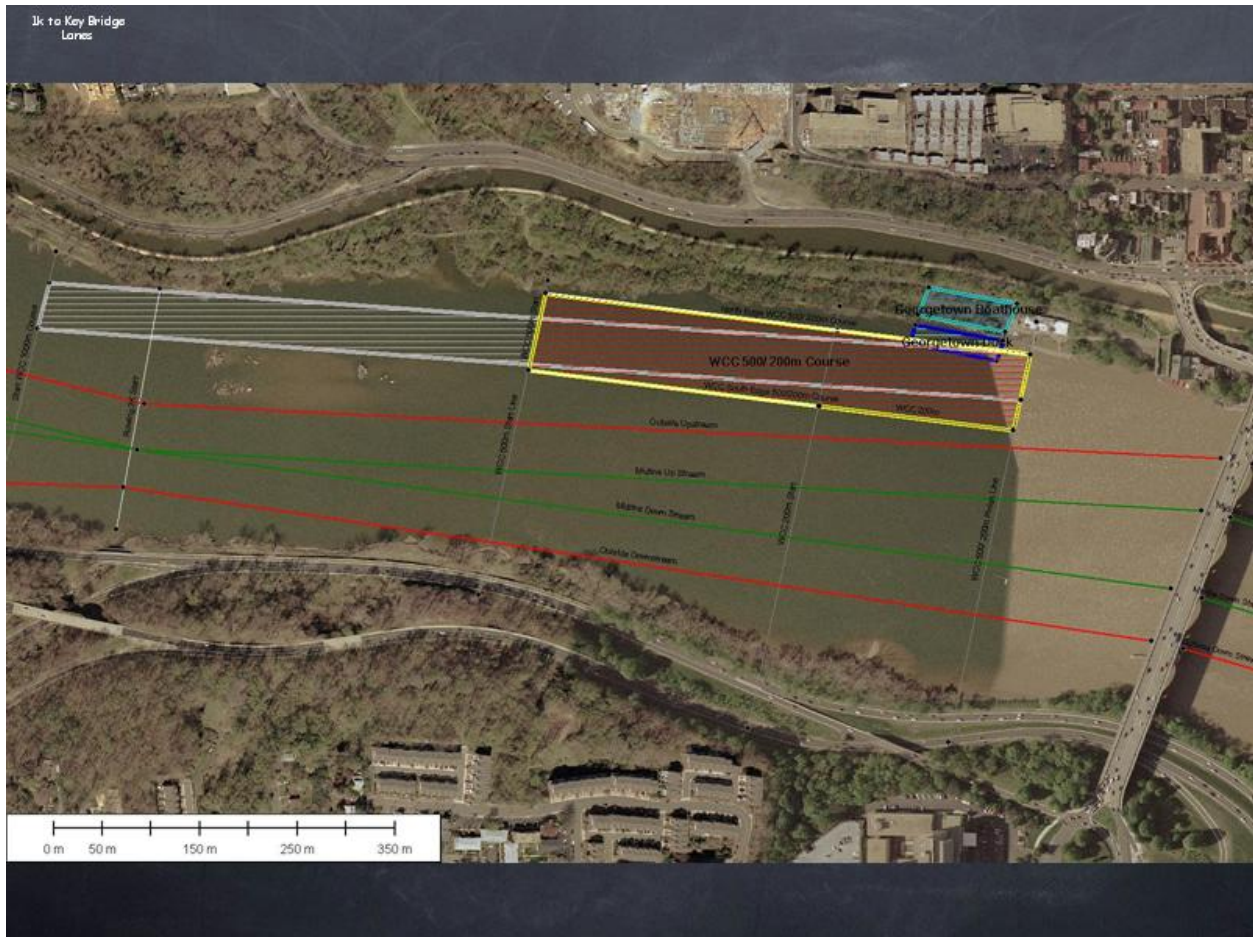
Alternatives A, B and C

The addition of a new boathouse facility on the Potomac River would have varying impacts at different points along the river. The proposed project would impact river use in areas ranging from the current crew training facility, TBC, upstream to the project site.

Action under Alternatives A, B and C would not result in a change to the rowing season, training times, or regatta schedule. Moving the Georgetown University crew out of TBC would reduce the boat congestion entering and exiting the river along this portion of the River. Currently, there are a number of teams and individual rowers and paddlers using TBC to enter, exit, and row along this segment of the river below Key Bridge. The Georgetown University crew consists of an average of 180 members, all of whom would discontinue use of TBC as a result of the new facility. Under Alternatives A, B and C, construction of a new boating facility upstream from Key Bridge would have a positive impact on the use of this section of the Potomac River. The new facility would divert some of the crowding of boats and river users in the vicinity of TBC. In addition, conflict between competitive and recreational rowers during regattas would be reduced. There would not be an impact to the practice and race routes of the rowers; however, the relocation of entry and exit points would result in a positive impact because of the reduced congestion near TBC.

Aside from the location of their facility and docks, Georgetown University's training practices would not be expected to change from their current routine. The proposed action would not affect the canoe and kayak team's training times or scheduled regattas. The placement of a new facility and associated docks, however, could interfere with the WCC practice and race courses. The Potomac River Safety Committee is responsible for guiding the use of the river for non-motorized boating uses. The Potomac River Safety Committee's guidelines direct the paddlers to travel along the D.C. shoreline and the rowers to travel along the Virginia shoreline. Moving the Georgetown University rowers' point of river access to the project site would result in the need for a revised plan. The existing conditions guiding the use of the river by the paddlers and rowers is illustrated in Figure 3-3. In its current design, the position of Georgetown University's docks would be in the path where canoers and kayakers typically practice.

Figure 4-2 illustrates the paddlers' current race course, provided by WCC, which depicts a potential impact on the WCC paddlers. The width of the river in this location is approximately 1,200 feet, compared to the 800-foot width of the river in front of TBC. The proposed dock would extend 75 feet into the water for a length of 250 feet along the shoreline. The docks at TBC extend about 50 feet into the water, running for approximately 300 feet. The size of the docks is a function of the length of the crew shells, height of the deck grade above water and maximum desired slope of the access ramp. The proposed docks are designed to accommodate easy maneuvering of the long boats into and out of the boathouse. Because the width of the river in this area is much greater than at TBC, it is not anticipated that the docks would cause congestion on the river as a result of their extending into the river.



Source: Washington Canoe Club, 2005.

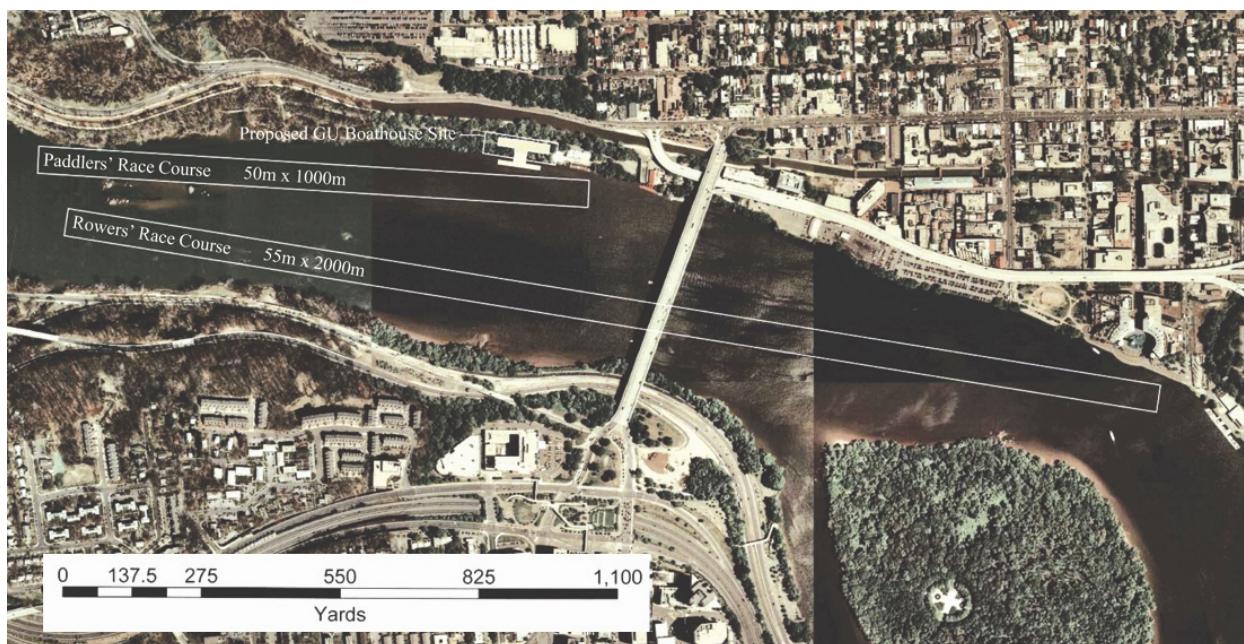
Figure 4-2: Washington Canoe Club and Proposed Georgetown University Boathouse Dock

WCC has expressed concern over the interaction between paddlers and rowers because of the difference in boat types and directions the boaters face. Canoers and kayakers face forward while rowers face backwards, using a coxswain to guide them. Because of the proximity of the two facilities, the potential for conflict between the rowers and paddlers is expected to be slightly greater than current conditions. PBC and WCC have shared and coordinated the use of the river for over 100 years. The introduction of a new facility adjacent to WCC would increase the need for coordination between rowers and paddlers. A cooperative agreement between the boating facilities in this area is recommended.

Motorized boats also pass through this area. They are restricted to a no-wake zone in the front of the boating facilities. Coaches as well as boaters must always be aware of the potential for motorized boats in the area. The proposed action should not have any effect on these boaters. Most motorized boat traffic occurs below Memorial Bridge and does not interfere with crew or paddling use above and below Key Bridge.

Mitigation

In order to accommodate all non-motorized boating activities, the Potomac River Safety Committee's river navigation guidelines should be revised and updated through a cooperative process by all members of the committee. New river patterns to guide the Georgetown crew should be included in this plan, similar to the guidelines used to coordinate river egress and ingress between WCC and PBC. During this process, practice routes as well as official race courses for rowers, canoers, and kayakers would be designated. The race lanes illustrated in Figure 4-3 have been developed by Georgetown University as a potential mitigation measure where the WCC racing lanes would be shifted slightly to accommodate the proposed dock. This illustration needs to be reviewed by WCC and other members of the River Safety Committee to determine race course locations that minimize conflict and are acceptable to both parties.



Source: MUSE Architects, 2004

Figure 4-3: Potential Realignment of WCC Race Course

No Action Alternative

River navigation and use would not change under the No Action Alternative, and, therefore, there would be no impacts or improvements as a result of this alternative.

4.4 PHYSICAL/BIOLOGICAL RESOURCES IMPACTS

4.4.1 Water Resources

Alternatives A, B and C

Surface Water and Water Quality

Construction of Alternatives A, B or C would have the potential to transport sediments and contaminants to the Potomac River, which could affect water quality. The construction process would require removal of the vegetative soil cover from the site, exposing surface soils, disturbing soils along the shoreline for bank stabilization, and excavating soil for underground utility installation and boathouse/dock pilings. These activities would create a potential for stormwater and wind erosion of exposed soils, and the subsequent potential transport of sediment and contaminants contained therein (if any) to the Potomac River. The on-site use of construction materials, equipment, and vehicle operation would potentially introduce contaminants to the soil from these sources (e.g., petroleum products), which could be transported to the river via stormwater runoff. To minimize the potential sedimentation and contaminant impacts to the river, erosion and sediment control measures would be implemented on-site.

Constructing a fixed dock, approximately 24 feet by 80 feet, would require approximately four pilings of 12-inch diameter. In addition, several concrete blocks will be placed on the river bed to provide anchors to the floating portions of the dock. Dock construction would create a minor potential for the contamination of the river from the use of construction materials and equipment over the water, and potential turbidity issues from constructing dock support pilings in the river. Boathouse and dock pilings would not be driven into the river sediments due to the risk of vibration impacts to the on-site concrete sewer interceptor. Instead, holes for the pilings would be augered utilizing piling casings, thereby minimizing vibration and noise impacts.

The constructed facilities would cover approximately 42 percent of the site under Alternatives A (Zoning Alternative) and C (Preferred Alternative) and 34 percent of the site under Alternative B (MOA Alternative) with impervious surfaces, and approximately 2,500 square feet of river surface and subsurface area with the fixed dock. The increase in impervious surfaces would result in a reduction in assimilation and absorption of stormwater with a subsequent increase in stormwater run-off. The proposed facility under each alternative would include a stormwater management system with a subsurface drainage system, stormwater catchment, and a biofiltration sand filter prior to controlled discharge to the river. Therefore, the quality and quantity of stormwater discharged to the river would be controlled. The dock would cover the river area, blocking sunlight to the water column and river bottom sediments, potentially affecting growth of submerged aquatic vegetation. However, no SAV was observed in the proposed location of the docks and therefore, there would be no impacts.

Physical impacts to the river bottom including minor scour and deposition of sediment, and turbidity would potentially occur from the proposed dock pilings in the river. The added water depth of scoured areas would be advantageous for boat launching; the deposition areas would be advantageous for the introduction of aquatic plant species and the desired restoration of aquatic habitat. Due to a sufficient water depth at the end of the dock, where boats would be

launched, the need for periodic dredging due to fluctuating river levels and sediment accretion would be unlikely. There would be no change to the number or type of boats used at the new facility, thereby potentially affecting water quality from what currently exists where the Georgetown crew functions out of the TBC.

Motorized boat fueling would occur on-site; however, these boats would have outboard motors with removable gas tanks, which would be filled off-site and transported to the boats for use. If gasoline storage is proposed on-site, appropriate spill containment would be implemented.

Therefore, as discussed above, potential impacts to water quality under Alternatives A, B and C that would be based on the construction, maintenance, and operation of the boathouse, including soil erosion, installation of docks, the presence of boats, and runoff from impervious surfaces, would be minimal. Further, since sewage material from the proposed boathouse will be sent to a treatment facility, there are no water quality impacts associated with waste water disposal.

Mitigation

Construction impacts to the river would be short-term and minor due to the use of appropriate Best Management Practices (BMPs) for soil erosion and stormwater runoff. A soil erosion and sedimentation control plan, and a stormwater management plan would be prepared to minimize impacts to the river during construction and operation. Stabilization of the site shoreline with a combination of man-made materials (e.g., stone riprap) and vegetation would reduce the soil erosion of the exposed shoreline and the subsequent sedimentation to the river.

Potential water quality impacts from boat cleaning will be controlled to reduce the release of contaminants into the river. Phosphate-free and biodegradable detergents and cleaning compounds will be used. A spill response plan will be prepared for spill accidents and tank leakage. To minimize the discharge of incomplete fuel combustion and motor leaks, boat motors will be appropriately maintained and stored.

Flooding and Floodplains

The proposed development of a boathouse under either Alternatives A, B or C would be located in a FEMA-designated flood zone. The proposed boathouse is to be constructed at the soil surface level supported by underground pilings; therefore, the ground floor of the facility would be subject to flooding since the river's high water mark at the project site is 19 feet above msl. The lowest floor elevation (at approximately 11' above msl) would be approximately eight feet below the base (100-year) flood elevation (BFE), and the second floor elevation (at approximately 26'-6" above msl for Alternatives A and B, and approximately 25' above msl for Alternative C) would be approximately seven to six feet above the BFE, respectively.

Based on a 2002 geotechnical study by Schnabel Engineers, there are potential physical impacts with the flooding of the Potomac River on the project site. The study indicated that hydrostatic pressure should not be allowed to build up on future site structure during flood conditions to reduce the potential for uplift forces on the proposed structure. Therefore, the proposed boathouse would be flood-proofed where the first floor would include automatic openings to allow surging floodwater to move freely through the lower floor of the boathouse, eliminating

the pressure differential on the outside of the building. The second floor would be at least six feet above the 100-year flood elevation for all alternatives.

Design of the facility under either Alternative A, B or C, therefore, would include building flood-proofing that would allow flood water to enter and exit the ground floor. These flooding allowances would allow the energy of the floodwater to be reduced around the facility, thereby, reducing scouring of surface soils around the structure. The lowest floor area would utilize flood resistant materials as identified by FEMA, and all mechanical and electrical equipment would be built above the BFE. In addition, the District requires that the proposed development not increase the BFE more than one foot at any point within the community.

A hydraulic impact analysis was performed for the project site in 2004 by Patton Harris Rust & Associates to assess the impacts of a boathouse on the floodplain, flow velocities, and other flow characteristics of the east bank of the Potomac River (see the Appendix for a summary of this study). According to the study, a boathouse structure on the project site would result in no change downstream from the boathouse site and a 0.02 feet increase in water surface elevation immediately upstream from the proposed structure during a 100-year flood (PHRA 2004). The study also concluded that water surface elevations, velocities, and shear stresses of the river in flood conditions would vary only slightly at the proposed boathouse building, and there would be no change in these factors at the WCC, located downstream (PHR&A 2004).

Since the proposed boathouse is in the floodplain, action under Alternatives A, B and C are subject to Executive Order No. 11988, *Floodplain Management*; the National Flood Insurance Program; District floodplain regulations including the District's Flood Hazard Rules; and FEMA standards for building within a floodplain. Flood-proofing measures as described above are included since the boathouse is water-dependent and no alternatives exist to locate it outside the floodplain.

Mitigation

Implementation of proposed building flood-proofing and shoreline stabilization measures would minimize floodwater damage to the boathouse structure and its contents, and to soil erosion around the boathouse and along the shoreline. In addition, Georgetown University has proposed measures to mitigate the effects of a flood event that include the following:

Before a flood event:

- Removing shells and equipment from storage bays & relocating to main campus (major flood) or moving some to upper racks (minor flood);
- Moving docks to safe location (major flood);
- Removing launches from dock area and relocating to main campus;
- Removing equipment in first floor work room and storage room;
- Removing items from entrance hallway & relocating to second floor;
- Moving elevator cab to second floor level and locking in place;
- Closing valve on sand filter inlet side (designed to keep mud out of sand filter vault during floods);
- Shutting off electric power at main disconnect;

- Shutting off main gas valve;
- Draining the rowing tank (into the sanitary sewer system and not directly into the river); and
- Opening doors and windows as necessary and vacating the structure.

After a flood event:

- Cleaning up and making repairs as required; and
- Reversing procedures for all “before flood” items.

For each flooding event, advance notice of the time and severity of the expected flooding is critical to determine the appropriate flood-proofing measures to be taken. Everything in the first floor must be moved above or out of the expected high water mark. Depending on the severity of the flood, this could mean raising items above the expected water level in a minor flood or completely vacating the storage bays in a major flood.

Georgetown University, in coordination with NPS, will be required to implement all Federal and local review and reporting measures for construction of the proposed boathouse in the floodplain, including review and approval of the proposed facility by FEMA, prior to implementation of the land exchange and proposed construction.

C&O Canal

Implementation of Alternative A, B or C would not impact the C&O Canal structure. Project construction would not occur in the toe (base edge) of the canal. In addition, no subsurface work would occur under the canal structure, and construction on-site adjacent to the canal toe would include: installation of utilities; expansion of the paved area adjacent to the CCT for emergency and delivery/service vehicles; and construction of the boathouse on pilings, which would be installed by drilling/augering soil and lining piling holes with casons. Prior to construction, the Upper Potomac Interceptor Sewer pipeline on-site will be structurally enhanced by excavating around it and encasing the pipeline. The proposed construction and excavation on-site would not impact the canal.

The project site would continue to be impacted by water seepage from the C&O Canal. The groundwater and soils on the project site would continue to receive the seepage of canal water migrating through the subsurface soils towards the river, and being confined by interceptor pipe, saturating surface soils on the site.

Mitigation

Canal water seepage on-site will be mitigated by installing a subsurface perforated pipe along the perimeter of the site to collect the seepage by gravity flow (not under a vacuum) and transporting the water to the river’s edge for discharge.

Wetlands

Implementation of Alternatives A, B and C would include construction on-site above and below the soil surface, and result in surface and subsurface structures on-site including the boathouse, dock system, access roadway, and realignment of the bikepath. Therefore, the construction and structures would be subject to the saturated soils of the artificial wetland created on-site by the subsurface seepage of canal water and the confining of groundwater flow by the Upper Potomac Interceptor sewer. Since the USACOE determined that the source of ponding water was artificial, and therefore that the wetlands are artificial, the area does not fall under USACOE jurisdiction. (This letter is included in the Appendix.) Therefore, the Corps will not exert its regulatory permitting authority under Section 404 of the Clean Water Act. Additionally, there are no naturally occurring wetlands on-site. Therefore, no wetland impacts are anticipated with the implementation of Alternatives A, B or C.

Chesapeake Bay Watershed

The Potomac River is a major part of the Chesapeake Bay Watershed. Implementation of Alternatives A, B and C would potentially contribute sediment, contaminants, and turbidity, which would potentially contribute to water quality impacts to the Potomac River. However, due to the relatively small surface area of soil disturbance, and the implementation of appropriate stormwater and erosion control BMPs, the water quality impacts to the river would be minor, short-term, and localized, and would not contribute to water quality impacts of the Chesapeake Bay.

Groundwater

Groundwater on-site, identified at a depth of one to seven feet below ground surface, would likely be encountered during construction of the interceptor encasement and piling caisson installation under Alternatives A, B and C. In addition, groundwater could be at the surface level due to high rainfall events. Therefore, soil dewatering techniques would be required during construction, but would not be necessary for project operation since the boathouse would be supported at the soil surface by pilings.

Construction and operation of the facility would potentially indirectly introduce minor amount of hazardous materials to the soil surface from petroleum-based materials from vehicle traffic, and any chemicals (paints, solvents, lubricants, etc) associated with the boathouse construction and operation, which may be transported through the soil to the groundwater. Excavation during construction would potentially disturb the identified contaminated soils on-site, and result in leaching of contaminants into the groundwater.

With the addition of the impervious surfaces of the proposed facility, there would be a minor decrease in localized groundwater recharge potential from stormwater percolation into the soil. Also, since groundwater is not to be used as water supply for the project, this would have a negligible affect on groundwater levels.

Mitigation

Due to the shallow groundwater table and proximity to the Potomac River, groundwater flows would provide an immediate conduit for the transport of contaminants to the river. Special precautions including appropriate BMPs for groundwater protection will be required during the construction and operation of the facility to protect groundwater quality, thereby indirectly protecting river water quality. Stormwater runoff from the site's impervious surfaces will be collected and treated on-site prior to discharge to the Potomac River.

No Action Alternative

Under the No Action Alternative, the project site would not be developed and the condition of water resources would remain unchanged. The site's surface soils and groundwater would continue to be affected by the migration and deposition of canal seepage water on-site. If the upstream site is developed for a boathouse or another use, there could be potential impact to the existing high-grade wetland at that site (as identified in the 1995 Land Exchange EA).

4.4.2 Geology, Topography, and Soils

Alternatives A, B and C

Implementation of Alternative A, B or C would not impact site geology due to the depth of bedrock exceeding the depth of project construction (e.g. piling installation).

Site topography would not be greatly affected by the construction and operation of the proposed facilities. Alternatives A, B and C would include some fill and grading of the site so that the first floor of the structure would be at the highest location on the site and the land would slope away from the structure in every direction. This would allow for appropriate drainage of precipitation and snow melt away from the building and toward a common drainage collection location on the site.

Because the fill soils on the site are slightly contaminated and are continually in contact with site surface and subsurface drainage waters, the proposed drainage scenarios for Alternatives A, B and C would provide a reduced potential for impacts to water quality. Stormwater in contact with slightly contaminated soils now continually leach and "flush" any present contaminants directly and indirectly into the Potomac River. Under Alternatives A, B and C, stormwater would be redirected into a filter providing some isolation from site soils minimizing contact with and carrying of contaminants into the river. Therefore, the proposed boathouse would reduce potential chemical contamination of the Potomac River compared to existing conditions.

Site soils would be impacted due to being covered by a building (boathouse) and sidewalk and other impervious materials, as well as by grading activities during construction. Construction generally results in compaction of site soils and elimination of the natural permeability of those soils. Lacking permeability, site drainage through the soils no longer takes place and surface/sheet flow would be encouraged. However, these soils are not native to the site, and have been subject to grading and movement when they were placed. In addition, the site soils are contaminated by elevated (but low) levels of heavy metals. Therefore, there could be a

positive impact from covering the soils since the soils would no longer be exposed to the environment and accessible to organisms or mobilization by wind and water.

Under Alternatives A, B and C, topsoil would be brought for use around the building. Use of topsoil would help to enrich the soils currently located at the site. Pedestrian areas around the proposed boathouse structure would consist of both gravel and concrete, with one area of concrete block covered with sod at the western side of the boathouse. Use of gravel on surfaces would increase permeability of the soils; however, concrete surfaces would decrease permeability of the soils and encourage increased runoff and concentrated flow during precipitation events.

Mitigation

Impacts caused by covering soils include increased stormwater runoff and its increased potential for transport of contaminants to the Potomac River. Treatment of “first flush” stormwater by subsurface sandfilters and storage for a limited period would improve water quality by filtering out sediments and those chemicals that adhere to sediment particles. Increasing ground permeability in more locations on-site would also improve groundwater recharge and the subsequent “natural” filtering performed by subsurface sediments. The use of pervious geoblock in the turnaround area and gravel for the access lane would also minimize the addition of impervious surfaces to the site. In addition, mixing of natural topsoil would increase the organic content of the soils and improve soil fertility by introducing organic content, which does not exist in many areas of the site.

No Action Alternative

The No Action Alternative would not alter topography, soils, or geology. Similar to existing conditions, the river would continue to be subject to the direct runoff of stormwater without the removal of potential contaminants of surface soils.

4.4.3 Terrestrial/Aquatic Vegetation and Wildlife

Terrestrial Vegetation

Alternatives A, B or C would have an adverse impact on site vegetation due to the unavoidable removal of a number of trees and shrubs on-site. Alternative B (MOA Alternative) would result in a slightly smaller number of trees being removed compared to either Alternative A (Zoning Alternative) or C (Preferred Alternative). The initial impact of the tree loss would be the increased visibility of the construction and operation of the boathouse, as well as reduced habitat and canopy for wildlife. There is a small area of natural woody vegetation that would be preserved in the southwestern corner of the site under all three alternatives. Maintaining mature woody vegetation on the shoreline as much as possible would continue the benefits that all the woody vegetation now provides, which includes strengthening of site soils with subsurface roots, increased perching locations for birds, increased food source for birds, mammals and insects, shading of the site, and increased permeability of soils. Maintaining or introducing woody vegetation elsewhere on the site would also provide similar positive impacts.

All three alternatives include the introduction of native shrub and tree species and the removal of a large number of highly invasive and competitive plant species that tend to lower the quality of the habitat. This site is largely dominated by a very aggressive invasive plant, Amur honeysuckle (*Lonicera maackii*) and to a lesser, but still significant extent by Japanese honeysuckle (*Lonicera japonica*). Removal of the seed source for these plants could have minor positive effects on the surrounding areas. Both plants produce large numbers of apparently flavorful berries, attractive to many birds. The consumption and later elimination of the seeds by birds results in spreading the plant to surrounding areas.

All alternatives also include removal of the two American Elms on site, which meet the District's minimum criteria for Special Trees requiring mitigation in accordance with DC regulations.

Submerged Aquatic Vegetation

Alternatives A, B or C would not impact SAV due to the lack of SAV in the vicinity of proposed dock along the shoreline directly offshore. Based on the potential for SAV to return to the area, the establishment of the dock over the water would block sunlight, reducing a component of the favorable conditions for the return of SAV at the site. However, there is no guarantee that plants may thrive as their absence indicates that conditions for their existence are currently unfavorable. Unfavorable conditions may have more to do with the ambient water quality within the Potomac than the suitability/unsuitability for the site to support SAV. Therefore, removal of the space from potential SAV growth due to construction of docks of any size should not have a substantive impact.

Aquatic Wildlife and Habitat

Impacts to aquatic organisms could take place due to the construction of the dock and gangways, shoreline stabilization, and discharge of water to the Potomac River. Although there appeared to be some aquatic habitat on the site (artificial wetland area), the vegetation observed indicates that the site is not wet for long enough periods of time to develop aquatic habitat. It is possible that a more seasonal habitat may exist (ephemeral wetlands, or vernal pools). The water that appears in this wetland is presumed to originate from the C&O Canal system as determined by the USACE. Construction of Alternatives A, B or C would result in removing this ephemeral system.

Impacts to benthic invertebrates would not occur with the construction of a boathouse under Alternatives A, B or C, but would occur with the construction of the dock. The area covered by the dock would be removed from the potential area for inhabitation by benthic invertebrates due to shading and lack of water currents. Because these areas are currently not highly valuable, and the dock would occupy a very small portion of the available habitat area along the river's edge, the losses to the general ecosystem are considered potentially small.

There would be limited negative impacts to fish and fish habitat due to construction of any of the boathouse alternatives. The existence of the dock could contribute a positive impact providing a cool, shaded, and protected area for fish fry and young or prey fish. Negative impacts would be the loss of invertebrate (presumably food sources) available to fish. It appeared during the SAV study that there were no soft-bodied invertebrates or insect larvae

within the top few inches of the river bottom at the proposed dock location, and the overall effect of the dock coverage on available food sources in the Potomac is considered negligible.

Terrestrial Wildlife and Habitat

Impacts to animal habitat would be similar under Alternatives A, B and C. Although the proposed boathouse is smaller under Alternative B (MOA Alternative), the smaller footprint would be offset by larger areas for lawn and common areas.

Birds

Impacts to bird populations would occur with the removal of mature tree and shrub cover. These areas are used for nesting, resting, and food sources (insects and fruit). In addition, removal or blocking of shoreline shallows limits the use of the area for shoreline wading birds. The existing condition of the banks, consisting of hard fill, limits their use by bank nesting species. Increasing the amount of hard fill on the shoreline would further eliminate this type of habitat.

Mammals

Removal of the trees and shrubs on the site would impact the mammal community here. Although much of the plant community is invasive, the components are likely used by mammals for browse, supply of small fruits and seeds, and cover. Construction of the boathouse and construction and maintenance of the surrounding common areas and lawn under all three alternatives would remove the potential for the habitat to re-establish itself here. However, similar additional habitat exists upstream and adjacent to the site. Maintaining the native, mature trees where possible, and planting native trees and shrubs on the site (incorporating native and food bearing plants into the landscaping) would contribute to mitigating the losses. Maintaining access to the river would also help to maintain raccoon and deer use at the shoreline.

Reptiles and Amphibians

It is unlikely that the site currently possesses suitable habitat for herptile species, with the exception of the shoreline area. Impacts to herptile habitat may take place at the shoreline of the proposed development after construction of the dock. Once the docks are constructed, rocks or logs at the shoreline edge would not be available for resting and sunning spots for turtles. Also, construction of the proposed boathouse under either of the alternatives would result in the loss of habitat for invertebrate species, a food source for herptiles. Therefore, there would be a localized impact on reptiles and amphibians due to the proposed project.

Protected Plant and Animal Species

The U.S. Fish and Wildlife Service reported that there were no known protected plant or animal species in or around the proposed boathouse site (see correspondence in the Appendix). Investigation into state-listed species identified the closest site for location of protected plant species two miles upstream of the proposed site. The nearest state-listed animal species was located almost one mile upstream in the C&O Canal. Therefore, it is assumed that none of the

proposed alternatives would impact protected species on the site or in the area of the dock and gangway.

Mitigation

Creation of shallows in the vicinity between the dock and the shoreline, or inconspicuous areas could improve the chances for occurrence of SAVs and, therefore, the organisms that are attracted to them, like fish and invertebrates. Grading the shoreline in the vicinity of the site from the abrupt vertical to a more gradual slope could also improve habitat here.

Any trees to be retained on-site will require protection measures during construction. New trees and landscaping would be planted on-site which would partially offset the tree loss and effects on existing vegetation. Replacement fees for the two Special Trees lost under the District's Urban Forest Preservation Act will also be required, reduced by credits for any new trees replanted on-site.

By maintaining as much of the native, large tree cover as possible, impacts to habitat and wildlife would be reduced. In addition, the planting of shoreline areas with native shrubs/trees (on the river bank slope) and emergent or submerged aquatic plants within the shallow areas would result in attracting birds and waterfowl to the area. Much of the vegetation on the site is not native. If some of the existing tree cover is maintained and non-native vegetation is replaced with native vegetation, the loss of habitat for bird species could be reduced. A greater opportunity exists for this type of planting under Alternative B (MOA Alternative), which has a smaller footprint, than either Alternatives A (Zoning Alternative) or C (Preferred Alternative).

Maintenance of shoreline shallows and strategically locating partially submerged rocks and large pieces of driftwood in and around the docking area would also mitigate wildlife and habitat impacts resulting from dock construction.

No Action Alternative

Under the No Action Alternative, there would be no impact to terrestrial or aquatic plant and animal species. Without site development, vegetation would remain on-site at current levels, providing habitat for wildlife. The No Action Alternative would allow the continued co-existence of native trees and aggressive, non-native shrub species on-site. The proximity of this site, which supports a dominant community of invasive species, to areas vulnerable to introduction of invasives, would continue the potential for adverse impact on these contiguous natural areas. If the University constructs a boathouse at the upstream site, removal of vegetation from an established woodland site (as identified in the 1995 Land Exchange EA) would potentially impact terrestrial plant and animal species at this location.

4.4.4 Noise

Alternatives A, B and C

The District of Columbia limits weekday construction and demolition noise to 80 dBA (hourly average) from 7:00 a.m. to 7:00 p.m., and 55 dB(A) from 7:00 p.m. and 7:00 a.m. unless granted a variance. The construction equipment expected to be used on-site is not expected to achieve this noise limit. There are no identified noise-sensitive receptors on-site or adjacent to the site that would be affected by the project grading and construction. However, if noise levels exceed the District's construction noise limits, measures to reduce noise and/or a variance to the construction noise limit would be required.

The movement of heavy trucks transporting construction materials could cause an adverse noise impact to residences if they are adjacent to the designated travel route. However, material hauling is anticipated to operate within the daytime construction hours specified above, and hauling routes would be selected to minimize travel along residential areas.

The site would be visited by large groups associated with the University and visiting schools during scheduled regatta events. This increase in visitation would increase ambient noise levels at the site during visitation to the site. In association with these visits, there would be an increase in vehicle traffic to transport visitors to the end of Water Street which is the closest vehicular connection to the site. Therefore, there would potentially be operational noise from Alternatives A, B and C during these events, but these noise levels should not exceed ambient noise levels typical of the urban area surrounding the site and will not disrupt or affect any noise sensitive sites in the vicinity.

Mitigation

Short-term construction-related noise would be minimized by controlling noise at the sources through implementation of best management practices, as necessary, to meet the District noise standards. It is recommended that construction specifications require the selection of truck routes that would minimize the potential for noise impacts to residences from trucks during construction, particularly during truck delivery of construction materials.

No Action Alternative

Under the No Action Alternative, the proposed boathouse would not be constructed. Therefore, construction and operational noise would not be generated, and there would be no impacts to noise.

4.5 UTILITIES/INFRASTRUCTURE IMPACTS

4.5.1 Stormwater Management System

The proposed boathouse would include an underground sand filter in a pre-cast concrete vault for the purpose of stormwater drainage and management. This type of system involves flushing water through a sand filter for treatment and contaminant removal. As required by the District of Columbia and the U.S. Environmental Protection Agency, the first flush of storm drainage is forced to flow by gravity through a sand filter media to reduce the concentration of pollutant elements. The sizing of the sand filter would be reviewed for approval by the District of Columbia Watershed Protection Division of the Department of Health.

The storm drainage system would intercept the stormwater runoff for on-site runoff resulting from the proposed boathouse's roof and paved pedestrian areas. Currently, off-site runoff drains from the towpath and across the CCT as surface runoff. The existing runoff flows from the CCT would be directed by inlets and storm drainage pipes to the east of the boathouse and out to the river. This storm drainage pipe would bypass the sand filter. The storm drainage within the site would be conveyed and eventually discharged into the stormwater management quality control structure located on the site. The underground pre-cast concrete structure with a sand filter media chamber would treat the first 0.3 inches of runoff from the buildings and pedestrian areas. Only after the runoff has been detained for the appropriate amount of time for treatment to reduce the pollutant levels, the water would exit the structure, draining into the Potomac River.

Stormwater management for quantity control has been preliminarily waived by the District of Columbia, Watershed Protection Division based on verbal discussion during a meeting that presented design documentation, and the "Storm Water Management Guidebook" (Watershed Protection Division Bureau of Environmental Health Administration Department of Health, DC) Section 2.2. No impacts on the tidal levels of the Potomac River are anticipated due to the development of the site. Detaining stormwater runoff in the downstream reaches of the watershed fluvial flow regime during low tide events is counterproductive to controlling storm river peak flow rates. The detention of runoff at the site could increase the flow rate of the river if there were a simultaneous occurrence of the flow events from the site and the river. This could cause flooding at the point of discharge from the site as it is in the downstream reach of the river.

Alternatives A, B and C

Under Alternatives A, B and C, the proposed project would include stormwater management facilities to provide stormwater quality treatment. Stormwater quantity control, to reduce the increases in peak discharge to predevelopment levels, is not required by the District of Columbia for this project. The site adjoins the Potomac River which is tidal at the location of project and does not have an effect on the river's tidal flows. Under Alternatives A and B, the boathouse project would use a D.C. Standard underground pre-cast concrete sand filter structure for stormwater quality control. The sand filter structure will filter the first flush of storm drainage runoff as required by District of Columbia and the EPA.

Action under Alternative B (MOA Alternative) would require the same stormwater management quality treatment as described above except the sand filter media surface area in Alternative B would be slightly less than Alternatives A (Zoning Alternative) and C (Preferred Alternative), as there would be less impervious surface under this alternative.

No Action Alternative

Under the No Action Alternative, the current storm drainage conveyance system would remain unchanged. The existing park land to the north would continue to drain to the south across the site and the undeveloped area of the site would continue to drain into the river. The existing area has no stormwater management facilities and none are required by the District of Columbia. The No Action Alternative would not affect the conditions of the Potomac River.

4.5.2 Urban Systems

Sanitary Sewer System

The project site is not served by an existing sanitary sewer system by the District of Columbia. An existing 84-inch sanitary interceptor sewer traverses the site. An inactive 48-inch sanitary relief sewer is located north of the site along the bike path. The sanitary sewers are owned and operated by DC WASA. Sanitary sewer service, based on a review and the direction of DC WASA, would be provided by a sanitary sewer grinder and pump station and 1 1/2-inch force main to the existing active gravity sanitary sewer east of the Alexandria Aqueduct abutment. The projected average daily wastewater flow to the sanitary sewer from the boathouse is approximately 3,600 gallons per day. DC WASA will not allow the site to be connected to the existing inactive relief sewer or the interceptor sewer.

Alternatives A, B and C

Action under Alternatives A, B and C would include the provision of sanitary sewer service for the facility. Service would be provided by a pump station and force main. DC WASA has determined that there is adequate capacity in the sanitary sewer system and wastewater treatment facilities to accommodate the new boathouse and has approved the connection to the sanitary sewer system from the boathouse site. The pump station would be located on the site and owned/operated by Georgetown University. Routing of the 380 feet of force main would be within Georgetown University's 15 foot right-of-way from the site to D.C.'s Water Street, NW right-of-way at the east side of the Alexandria Aqueduct abutment. The force main would terminate in a manhole that would discharge by a new four-inch gravity sewer to an existing manhole. The pump station, force main, manhole, and gravity sewer would be built to DC WASA and EPA standards.

The existing 84-inch DC WASA sanitary interceptor sewer will be retained at the boathouse site under Alternatives A, B and C. The boathouse structure would be constructed over top of the of the interceptor sewer. DC WASA has agreed to allow for the construction if Georgetown University encases the sewer pipe in reinforced concrete to protect it during construction and afterwards. The encasement would extend beyond the outside walls of the boathouse structure under each alternative. Support columns for the boathouse would be based on piles located outside the edge and supported below the concrete encased interceptor sewer. Beams

supported by the columns would span over the sewer and support the boathouse structure. Since the interceptor sewer pipe is 84-inches in diameter, any repairs that may be required at the boathouse site in the future would be performed from the interior of the pipe. DC WASA will also be reviewing this EA and has approval authority of the final construction plans over the sewer line.

No Action Alternative

Under the No Action Alternative the project site would remain undeveloped. Thus, there would be no impacts to sewer service.

Potable Water

The project site is not served by an existing District of Columbia water main. An existing 12-inch water main is located on the east side of the Alexandria Aqueduct abutment. The existing water main is owned and operated by DC WASA. Potable water service for the new boathouse would require the extension of the water service area for fire protection and domestic usage. Installation of a six-inch water main would be required to provide fire protection and domestic use service to the site.

Alternatives A, B and C

Potable water service for the boathouse under Alternatives A, B and C would be provided by the extension of a new six-inch water main to the facility. DC WASA has determined that there is adequate capacity and pressure in the existing water mains to accommodate water service for the proposed boathouse. Routing of the approximately 380 feet of new water main would be within Georgetown University's right-of-way from the site to a DDOT right-of-way at the Alexandria Aqueduct abutment in Water Street, NW.

No Action Alternative

Under the No Action Alternative the project site would remain undeveloped. Thus, there would be no impacts to potable water.

Natural Gas

The project site is currently not served by a natural gas main. The nearest natural gas service is an existing two-inch gas main, located east of the Alexandria Aqueduct, owned and operated by the Washington Gas Company. Natural gas service for the proposed boathouse would require the extension of the gas service area for the heating system and a clothing dryer (2,020,000 BTUH Input Rating). Installation of a two- to four-inch gas main would be required to serve the project site.

Alternatives A, B and C

Under Alternatives A, B and C, natural gas service for the proposed facility would be provided by the extension of a new two- to four-inch gas main to the boathouse. Washington Gas has received an application for service and has preliminarily determined that there is adequate

capacity and will process the application to provide service. The extension of the gas main would run for approximately 380 feet, located within Georgetown University's 15 foot right-of-way. A recorded easement to Washington Gas Company from Georgetown University would be needed in order to install the new gas main.

No Action Alternative

Under the No Action Alternative the project site would remain undeveloped and not served with natural gas.

Solid Waste Disposal

Currently, NPS provides solid waste disposal service (removal of dead vegetation and litter deposited along the CCT) to the project site. Open flat bed trucks and pick-up trucks are used to haul solid waste from the site. These vehicles access the site by way of the existing paved trail.

Alternatives A, B and C

Under Alternatives A, B and C, Georgetown University would be responsible for solid waste removal from the project site. Flat-bed and pick-up trucks would access the site along the widened portion of the CCT. Plastic containers (approximately 55 gallon drums) with trash bags would be used to contain the segregated recyclable waste streams. The paper products would be segregated from the glass and plastic. Any large solid waste items would be picked up on an as-needed basis by the University. A solid waste enclosure area to the west of the building would be used to store solid waste containers for pick-up by the University staff. Ultimate disposal of the solid waste would be through a recycling system and standard landfill disposal contracted through Georgetown University.

No Action Alternative

Under the No Action Alternative the project site would remain undeveloped. Thus, there would be no impacts to solid waste disposal.

4.6 CUMULATIVE IMPACTS

The CEQA regulations require that NEPA environmental analyses address connected, cumulative, and similar actions in the same document (40 CFR 1508.25). Three potential projects have been identified as potentially having cumulative impacts in conjunction with the proposed boathouse (see Section 1.6): the proposed Arlington County Boathouse; the proposed George Washington University (GWU) boathouse, and the proposed Georgetown Waterfront Park.

Socio-Economic Impacts

Land Use

As discussed in Section 3.1 and 4.1, the proposed Georgetown University boathouse under Alternatives A, B or C would provide for the continuation of defined recreational uses along the waterfront to the west of Key Bridge. The construction of the proposed GWU boathouse to the east of Key Bridge, and the construction of the Georgetown Waterfront Park (in two phases) to the east of 34th Street, NW, would extend defined recreational uses from the Georgetown University boathouse to the TBC. As part of these proposed projects, public access to the waterfront is included and anticipated to increase from the existing conditions. In addition, the additional boathouses would result in increasing water-oriented recreational opportunities along the Georgetown waterfront.

Property Ownership

The Georgetown Waterfront Park would retain the land under NPS ownership and no impacts to land ownership would occur. The proposed George Washington University and Arlington County boathouses will require a land exchange or a transfer of property ownership, which has yet to be determined or negotiated. Separate project documentation will be required by NPS for each of these projects to identify potential land ownership impacts prior to implementation of either project.

Visitor Experience

The proposed Georgetown Waterfront Park would substantially increase public access to the waterfront. Although they are private rowing facilities, public access is required in front of the proposed GWU and GU boathouse along the riverfront. Therefore, visitor experience overall would benefit from additional waterfront access opportunities as compared to the existing conditions.

During regatta events, while the Georgetown Waterfront Park would expand the area for viewing the races, it is anticipated that most spectators would remain near the finish line at TBC. Increased use of the two boathouse sites would occur, particularly after events when collegiate rowers and visitors congregate at these facilities. Parking and other facilities are available in Georgetown to accommodate this increased visitation to these sites.

The Arlington County boathouse site is within the George Washington Memorial Parkway (GWMP) across the river and separate from public parkland on the D.C. side of the river.

Cumulative impacts to visitor experience are not expected from construction or operation of this facility; NPS will analyze the environmental impacts of this boathouse to the GWMP and site surroundings in separate NEPA documentation.

Planning Controls and Policies

The proposed GWU boathouse and the Georgetown Waterfront Park would be consistent with the planning policies discussed including the *Comprehensive Plan for the National Capital*, the *Non-Motorized Boating in the Potomac and Anacostia Rivers*, and the *Georgetown Waterfront Park Plan*. The Land Exchange EA and the *Section 106 MOA* are not applicable to these two projects, while the applicability of Washington, D.C. Zoning would be dependent on the design that is prepared for the GWU boathouse. The proposed Arlington County boathouse would not be subject to the planning policies discussed, although it would contribute to the Non-Motorized Boating study's recommendation of constructing additional boathouses along the Potomac River.

Community Facilities

Cumulative impacts related to community facilities include the potential for additional boathouses to be proposed along the shores of Washington, D.C. Both the George Washington University and Arlington high schools' crew teams currently use facilities at TBC to store their equipment, for training and for regattas. Construction of new facilities for these crew programs would result in removal of outside storage compounds at the TBC. The conversion of an existing parking lot to public park space at the Georgetown Waterfront Park site would have an overall positive impact to community facilities in this area. Since the site for the Arlington boathouse has not been selected, the effect on public park uses and community facilities on the Virginia side of the river is unknown.

Cultural Resources Impacts

Historic Resources

Historic resources that are affected by the proposed Georgetown University boathouse under Alternatives A, B or C are the C&O Canal NHP, Alexandria Aqueduct Bridge Abutment, WCC and Key Bridge. Of these, only Key Bridge would be affected by the proposed GWU boathouse or the Georgetown Waterfront Park. As discussed under Section 4.2 the waterfront area has experienced a variety of development throughout its history. Also, proposed projects would be required to coordinate their efforts with NPS, the D.C. Historic Preservation Office, and the Old Georgetown Board prior to implementation.

No cumulative impacts are anticipated due to the development of the proposed Arlington County boathouse on historic resources near the proposed Georgetown University boathouse site.

Visual Resources

The proposed GWU boathouse and the Georgetown Waterfront Park are separated from the proposed Georgetown University boathouse by the Key Bridge. Also, these are located in an urban environment where the visual setting differs from the proposed Georgetown University site. Similarly, the Arlington County boathouse site is separated from the project site by Key Bridge and the Potomac River. None of the key viewpoints considered for the Georgetown University boathouse would be affected by changes at any of these other locations, although the two proposed boathouses would result in increased built development along the riverfront as seen from other viewpoints. The degree of impact is dependent on the size, architecture, landscaping and riverfront treatment of the proposed facilities.

Transportation Systems Impacts

Vehicular Traffic and Parking

The GWU boathouse is anticipated to commence construction after the Georgetown University boathouse is constructed, and the Georgetown Waterfront Park would begin construction on Phase I (between 34th Street and Wisconsin Avenue) in 2006 and could overlap with the construction period for the Georgetown University Boathouse. Therefore, there could be a simultaneous addition of construction-related traffic on area roadways. The NPS and Georgetown University should coordinate construction phasing and schedules to ensure that construction traffic does not burden area roadways.

In the long-term, the proposed GWU boathouse is anticipated to have similar requirements of users accessing the site by walking and bicycling since limited parking will be provided on-site. During regatta events along the Potomac River, there would be trailers accessing the GWU boathouse site and increased visitation to this site before and after these events. However, since similar traffic levels already occur for GWU and Georgetown University-related regatta events at TBC, overall cumulative traffic levels are not expected to increase significantly. Shuttle systems similar to those proposed by Georgetown University should be considered for GWU-related spectators or visitors from their campus to reduce vehicular traffic in Georgetown. The Georgetown Waterfront Park will be a passive waterfront park that would displace public parking facilities currently at the site. However, other public parking is available in Georgetown to accommodate this use particularly on weekends when parking is available in the numerous office buildings in the area.

If the Whitehurst Freeway is deconstructed, as currently being evaluated by the District of Columbia Department of Transportation (DDOT), the traffic patterns in the Georgetown area, including access to the Georgetown University boathouse, would change substantially. Due to the scale of that project, compared to the minimal traffic-related impacts from the construction of the proposed boathouse, no cumulative impacts are anticipated. Further, since there are several existing uses present along Water Street, DDOT will have to ensure that if the freeway is removed, these uses would continue to have access from public roadways.

Since transportation systems and access are separate from the other proposed park and boathouse facilities on the D.C. side of the river, there would not be cumulative traffic or parking impacts expected from the proposed Arlington County boathouse. However, separate

traffic analyses and NEPA documentation will be required to address localized impacts to traffic and parking facilities on the Virginia side of the river resulting from the proposed facility.

Public Transit Service

No cumulative impacts are anticipated from the development of the identified projects on public transit services.

Pedestrian/Bicycle Facilities

The Georgetown Waterfront Park will improve pedestrian and bicycle access along the waterfront. Also, the GWU boathouse is anticipated to provide pedestrian and bicycle access on the waterfront side of the facility which would improve pedestrian and bicycle movement from existing conditions.

The proposed Arlington County boathouse could impact trail systems along the GWMP depending on the site chosen for this facility. These impacts will be considered in separate documentation for this project.

River Navigation/Use Impacts

In terms of river use, GWU which currently rows out of TBC would move to the new facility upriver once their boathouse is constructed. Use of the river for GWU's practices or regatta events will not change from present conditions.

Once the Arlington County boathouse is constructed, the three schools that currently row out of PBC, Capital Rowing Club, and TBC would move to their new facility. Additional users will be allowed at TBC replacing these high schools, although NPS also expects to bring boats stored outside into the facility to eliminate outdoor boat storage at this site. Wakefield High School that currently rows on the Anacostia River will be included in the Arlington facility and would add to the number of rowers on the Potomac River. The addition of this school is not anticipated to result in a substantial increase in the number of rowers on the Potomac River, but the Potomac River Safety Committee should review its river navigation and safety guidelines to minimize potential conflicts among river users, as each proposed facility comes on-line.

Physical/Biological Resources Impacts

Water Resources

The development of the Georgetown Waterfront Park is anticipated to be beneficial on water resources as more than 10 acres of impervious parking surfaces along the Potomac River would be converted to pervious open space. The construction of the GWU boathouse is also not anticipated to result in an adverse impact on water resources as the site is currently a paved parking area. The Arlington boathouse would add impervious surfaces due to new building and parking construction that could potentially impact water quality. These impacts will be addressed in separate NEPA documentation for this facility.

Geology, Topography and Soils

No cumulative impacts are anticipated from the development of the identified projects on the geologic, topographic or soil resources.

Terrestrial/Aquatic Vegetation and Wildlife

The development of the Georgetown Waterfront Park is also anticipated to be beneficial on vegetation and terrestrial wildlife as existing parking lots will be converted to vegetative open space. The construction of the GWU boathouse is also not anticipated to result in an adverse impact on vegetation and terrestrial wildlife as the site is currently a paved parking area. The Arlington Boathouse could result in loss of existing vegetation and habitat depending on the site chosen. Also, there could be minor impacts on benthic invertebrates due to the construction of a dock for both the GWU and the Arlington County boathouse. However, these impacts would be localized and would have to be dealt with at a project level.

Noise

Due to the distance between the various project sites, no noise-related cumulative impacts are anticipated due to the identified projects.

Utilities/Infrastructure Impacts

Infrastructure related impacts are anticipated to be minimal due to the proposed projects since all three boathouses and the proposed park facilities are in an urban area with access to nearby utilities systems. The proposed boathouses replace current users operating out of Thompsons and along the Anacostia so overall system capacities would not be significantly affected. Each boathouse facility and comfort stations or other park facilities included in the Georgetown Waterfront Park need to be analyzed in terms of specific connections to local utilities systems serving these sites

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