Potomac Yard Metrorail Station Concept Development Study

February 3, 2010

a joint venture of:
• Parsons Transportation Group Inc.
• PB Americas, Inc.
• Delon Hampton & Associates, Chartered

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Preface

The Potomac Yard Metrorail Station Concept Development Study was conducted in two primary phases, and accordingly this report has two major sections documenting the progress of the study.

The first phase of the study identified several potential locations for a Potomac Yard Metrorail station and examined the general characteristics of a station at each location, including the relationship to nearby planned and approved development. This phase identified eight potential station locations, but two of them were eliminated from further consideration because of obvious drawbacks. The analysis reflected the amount and location of land development planned at that time. This first study phase was completed by May 2009, and it is documented in Section I of this report.

The second phase of the study was a screening analysis that examined in more detail the characteristics of a station at each potential location, although this analysis was still at a conceptual level of planning. The analysis narrowed the number of potential locations to a smaller number that would be carried forward into an environmental review process. Station characteristics analyzed included property ownership, station design, relationship to National Park Service lands, estimated cost, ridership, financing, and implementation considerations. The second study phase used additional and updated land development information that reflected the progress made on the North Potomac Yard Small Area Plan. The second study phase is documented in Section II of this report.

Together the two sections of this report describe the analysis performed in the planning for a Potomac Yard Metrorail station and document the decisions made about station development.

Section I

Analysis of Station Location Alternatives

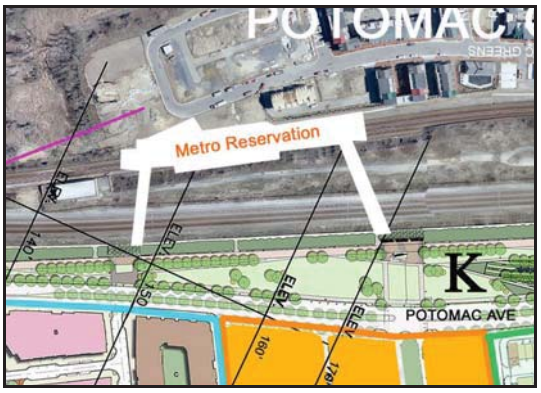
Completed May 15, 2009

Purpose of This Analysis

This analysis examined potential locations for a new infill Metrorail station at Potomac Yard. The analysis considered eight alternatives and addressed the station sites' relationship to planned and approved development in Potomac Yard and Potomac Greens, necessary modifications to Metrorail track and systems to accommodate a station at each site, and the estimated Metrorail construction costs. The resulting information was intended to assist the current planning efforts to select a site for a potential new Metrorail station.

Station Background

The construction of an infill station in Potomac Yard was anticipated when WMATA planned the Metrorail Adopted Regional System. At the time the Blue and Yellow Line tracks were built through the RF&P Railroad Potomac Yard, a station was not justified, but Metrorail planners recognized the potential for the yard's future development. They identified the site for a station to be added later, and the tracks there were designed to accommodate a station that would meet WMATA's design criteria. The *Final Environmental Impact Statement, Metropolitan Washington Regional Rapid Rail Transit System*, August 1975, cites the provision for this future station. The City of Alexandria subsequently required the developers of Potomac Greens and Potomac Yard to set aside land, which will transfer to the City when a Metrorail station is to be built. This land is now called the reserved site, shown in Figures 1 and 2.[1]



Figures 1 and 2: Reserved Station Site

Since then, several planning and development efforts have discussed a Potomac Yard Metrorail station. In the mid-1980s, the Alexandria 2020 plan included the addition of a station and proposed approximately 16 million square feet of mixed-use development for Potomac Yard. The plan was not formally submitted to the City of Alexandria for approval. A 1997 station study by the then-owner of the yard developed conceptual

[1] Corrected since May 2009 to state that the City has not yet acquired the reserved site.

designs for three alternative station sites at and slightly east and west of the reserved site. While the current zoning approvals for Potomac Yard do not require the construction of a Metrorail station, the approvals did require the reservation of land for a potential station. In addition, the existing zoning approvals require the property owners to participate in a special tax district to assist in financing station construction.

In 2008, the City of Alexandria created a 20-member Potomac Yard Planning Advisory Group (PYPAG) to evaluate land use density and zoning for Landbays F and L. A basic principle of the group is that any redevelopment for Landbay F should be transit-oriented, mixed-use, and urban development. In addition, the City created a five-member Metrorail Station Feasibility Work Group comprising the mayor and one member each from the City Council, the Planning Commission, the Transportation Commission, and the Potomac Yard Planning Advisory Group. The work group was established to evaluate the technical elements related to a potential Metrorail station.

Transit-Land Use Relationship

A general smart growth and transit-oriented development principle is that higher density and a balanced mix of uses should be located within close walking and commuting distance of a transit station. Therefore, this analysis of alternative station sites considered possible density and uses within the commonly accepted walking distances of a quarter mile and a half mile from a Metrorail station. Transit ridership is also greatly influenced by factors such as an appropriate mix of uses (office, residential, and retail), density, parking policies, pricing and rider subsidies, connectivity, and the quality of the pedestrian realm. The planning currently being conducted through the PYPAG addresses these factors.

There are challenges to locating a Metrorail station close to development in Potomac Yard. Approximately half the land within a quarter mile of most of the alternative station sites cannot be developed due to such constraints as environmental characteristics and the presence of railroad tracks and National Park Service property, shown in Figure 3. A Federal Aviation Administration (FAA) flight path restriction on much of the central portion of the yard, shown in Figure 4, limits building heights to approximately 100 feet. The CSX railroad line separates the Metrorail tracks from the western portion of Potomac Yard, requiring a pedestrian bridge to the station and adding 200 feet to the station access distance.

Figure 5 shows the Potomac Yard Coordinated Development District (CDD) Concept Plan. Table 1 lists the development maximums permitted by the current CDD zoning for Potomac Yard and Potomac Greens, including the existing retail center.[2]

[2] Corrected since May 2009 to clarify that the concept plan is based on the Potomac Yard Coordinated Development District.

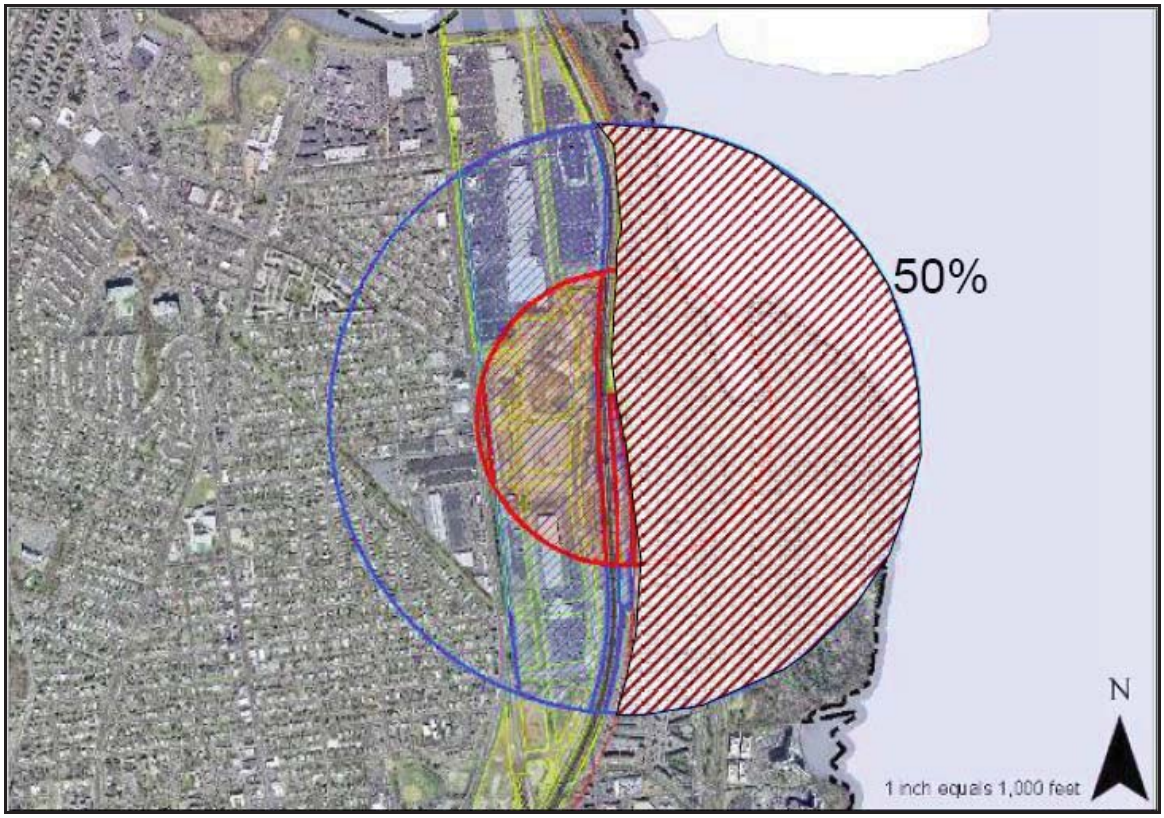


Figure 3: Development Limitations in Station Vicinity

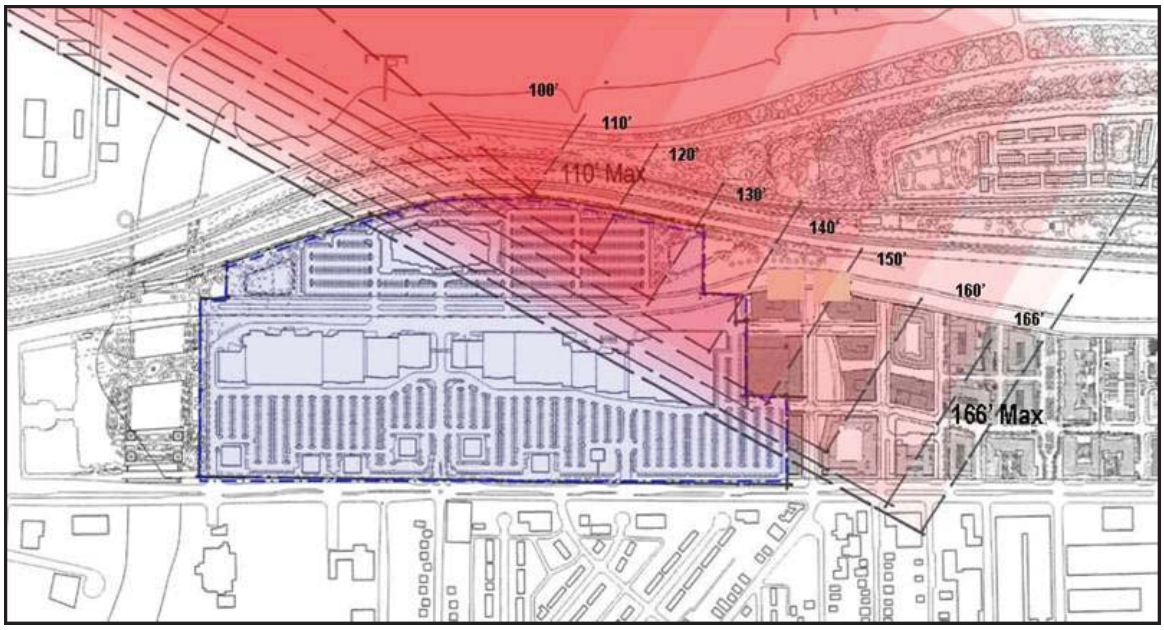


Figure 4: FAA Height Restrictions

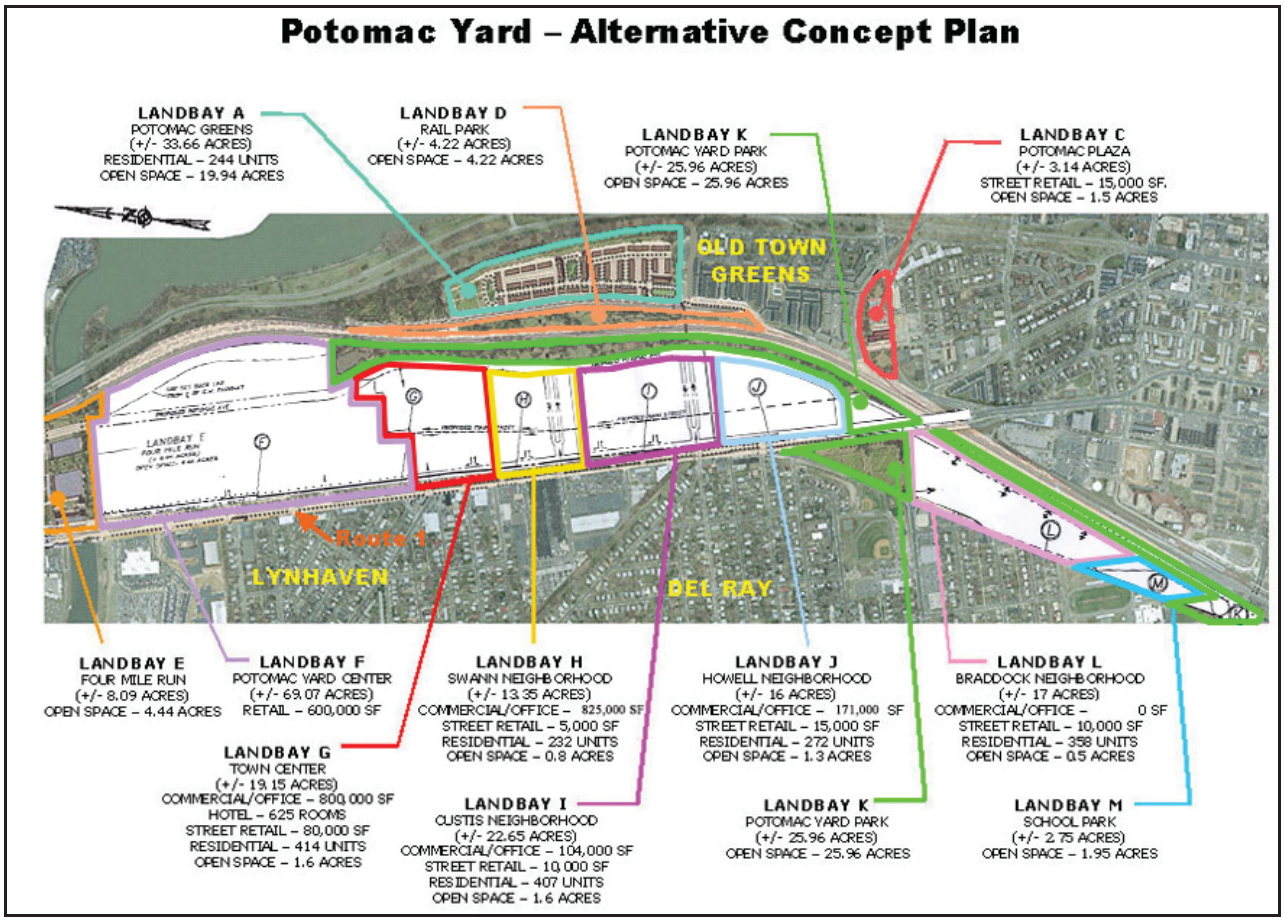


Figure 5: Potomac Yard Coordinated Development District Concept Plan[3]

Table 1: Development Maximums

Use Maximums per Current CDD:

Landbay	Residential (Units)	Office * (sf)	Retail (sf)	Hotel (rooms)
F	0	0	600,000	0
G	414	800,000	80,000	625
H	232	825,000	5,000	0
I	407	104,000	10,000	0
J	272	171,000	15,000	0
L	358	0	10,000	0
TOTAL	**1,683**	**1,900,000**	**720,000**	**625**

* Office use can be converted to retail use with City Council approval through the DSUP process

The existing retail center in Landbay F contains approximately 600,000 square feet of retail, which is the maximum amount of development permitted with the existing zoning.

[3] Corrected since May 2009 to cite the Coordinated Development District.

Therefore, any additional density will require a rezoning of the site and associated approvals. The PYPAG has discussed a potential floor-area ratio of approximately 2.5.

Metrorail Design Requirements

A new station at any location must comply with WMATA's adopted Metrorail design criteria. If a station is built at a site other than the reserved site, the Metrorail tracks and systems would have to be modified to comply with the design criteria as well. Complying with the design criteria would require more construction at some sites than at others, and the extent of construction would affect the cost of each alternative. The design criteria define the Metrorail system characteristics in great detail; criteria that most directly affect decisions about station location are described below.

Station

The design criteria address a variety of station characteristics, including safety, capacity, ADA-compliant accessibility, architectural and aesthetic qualities, operating economy, maintainability, and commonality among system components. The station platform must be 600 feet long, the same as all Metrorail stations, to accommodate an eight-car train.

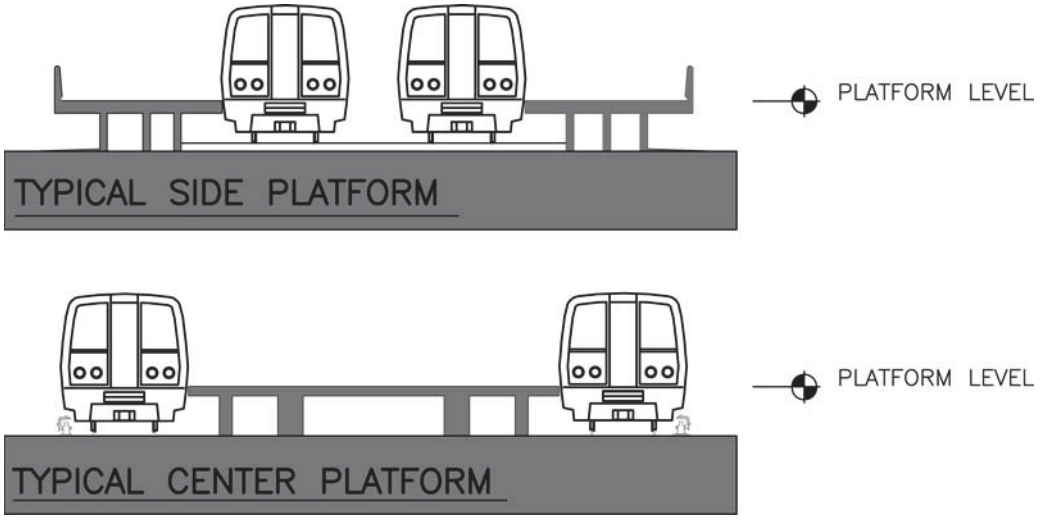


Figure 6: Metrorail Station Types

Depending upon the characteristics of the station site, a station can have a single center platform between the tracks or a pair of side platforms on the outside of the tracks; Figure 6 illustrates both types. Elevators, escalators, and stairs must meet capacity and safety requirements for vertical circulation, and redundant elevators are required to ensure accessibility when one elevator is out of service. A center-platform station requires fewer elevators, escalators, and stairs than a side-platform station, imposing lower costs for both construction and operation, but a center-platform station requires more space for the tracks to spread apart to pass on either side of the platform. Space in the station must provide not only for passenger circulation but also for Metrorail operating system

equipment and station maintenance functions. A station in a tunnel would require air-conditioning, ventilation, and fire-protection systems to meet standards and codes.

Tracks

The tracks through a station must be straight, a condition called tangent track. Tracks cannot be curved at a station because the platform edges would need to be set back to clear the rail cars, creating safety concerns because of the resulting wide gap between the platform edges and rail car doors. The tangent track must be 730 feet long at a station; 600 feet for the platform plus 65 feet at each end to provide proper alignment of trains entering and leaving the station.

Any new Metrorail tracks or existing-track modifications to accommodate a station must comply with design criteria for track grade and curvature. The maximum acceptable grade is 4 percent, a rise or fall of 4 feet for every 100 feet of track. The minimum desirable curve radius is 1,000 feet, which allows a train speed limit of 40 miles per hour though the curve, the lowest speed limit allowed in the Metrorail system.[4] Every connection between a tangent and a curve is a spiral, a gradual track transition from straight to curved track. These design criteria are based upon safety and rider comfort.

A double crossover, an X-shaped track connection between the two running tracks that would allow trains to move from one track to the other, would need to be added north of a new station. This crossover would be needed to maintain Metrorail operations during station construction and would provide operational flexibility.

Metrorail Operating Systems

The addition of a station would require modifications to the systems that support Metrorail train operations. Trains accelerating from a stop at the station would increase the required traction power for the electric motors that propel the trains. Upgrades to the DC traction power system would include the addition of a supplemental rectifier-transformer unit to the existing traction power substation to serve a station at a nearby site; a new traction power substation would be needed to serve a station farther away. New composite contact rail (the third rail) would be installed, replacing steel contact rail where necessary.

The automatic train control system (ATC) would require changes and additions to accommodate any necessary track realignment and to implement programmed stops at the station. Ductbanks will be required for cabling to integrate the new equipment circuits into the existing system. Wayside signals, switch machines, speed command loops, and interlocking control equipment will be required to operate trains through the new double crossover.

[4] Corrected since May 2009 to reflect the applicable Metrorail design criteria.

A new station would need several communications systems for operations and customer safety, including modifications to the carrier transmission system, a public address system, a fire and intrusion-detection system, and closed-circuit television systems for surveillance.

Construction Sequence

The steps in station construction are extremely important for an infill station. Because construction of the new station and any connecting tracks would be near operating trains, the potential would exist for this construction to affect Metrorail operations. Safety must be ensured, and major service disruptions are not acceptable, so the station and tracks must be designed to be built without interfering with regular Metrorail operations.

Building a station directly on operating Metrorail tracks would impose specific construction requirements. Construction activities immediately adjacent to an operating Metrorail line are typically limited to nonrevenue hours to eliminate the possibility of construction activities damaging trains and causing injuries to riders. Enforcing this limitation on Potomac Yard station construction would raise costs considerably because construction could occur for only a short time each night. To avoid this constraint if the station is built directly on the operating tracks, trains would single-track through the station site during construction. Trains in one direction would cross to the opposite track, trains in both directions would use the same track, and construction activities could then proceed relatively uninhibited adjacent to the now-unused track. Single-tracking would begin at 8:00 p.m. and continue until closing for five nights a week for the duration of construction. The period of time prior to closing plus the nonrevenue period after closing would provide a standard eight-hour work window.

Night-time construction is more expensive because it typically requires payment of a shift differential, and it would create noise, lighting, and other impacts on nearby residences and businesses. During the periods when trains would be single-tracking, train frequency would be reduced. Some steps in the construction sequence would require shutting down Metrorail operations through this rail segment, but each closure would be limited in duration to a weekend and would not be permitted on consecutive weekends.

Building a station on a new parallel track segment would be less disruptive. Because construction activity would not be directly adjacent to trains, operations would be less affected. The station could be built during daytime hours, allowing lower construction costs and avoiding night-time construction impacts. Some Metrorail operations changes and closures would still be necessary at the point when the new track segment would be connected to the existing tracks; their type and extent would depend upon the construction necessary to accomplish the connection in a specific design.

Potomac Yard Station Context

The Potomac Yard station would have specific requirements created by the immediate physical setting. The ability to expand the station site or realign the Metrorail tracks is constrained by the CSX freight railroad tracks on the west and National Park Service land and the Potomac Greens neighborhood on the east.

An alternative in which the station or tracks would extend beyond the present Metrorail right-of-way and City-owned land could require the acquisition of additional property. Property ownership is shown in Figure 7. Some properties will require a full title search to determine the ownership. In the area where the National Park Service easement applies, no improvements may be constructed and no clearing, grading, or tree removal may be done without National Park Service approval. The easement allows for limited uses including passive recreational activities and some active recreational facilities, also subject to National Park Service approval. The easement would not allow the construction of a Metrorail station unless the easement is amended by the National Park Service in conjunction with the City of Alexandria.

Using land for a station or tracks where development is approved could require compensating the land-owner for foregone development opportunities. In Landbay F, where planning and a potential rezoning are underway, dedication for a future Metrorail station and associated rail lines could be required as part of the planning process. Using parkland would be problematic, especially if federal funds are used, as parkland may be used for a federally funded transportation project only if no prudent and feasible alternative exists. A new station would affect open space and program uses in the previously approved plans for Potomac Yard landbays; the effects would depend upon the station location and design.

Access from the west to a station built on the existing tracks must be by a pedestrian bridge that would have to be high enough to provide at least 23 feet of clearance over the CSX tracks. Any new Metrorail tracks that crossed above the CSX tracks would have to provide the same clearance.

The existing traction power substation between the Metrorail tracks and the CSX tracks is a necessary Metrorail system facility to provide electric power to the trains. If realigning the Metrorail tracks required removing the substation, a replacement substation would need to be built nearby.

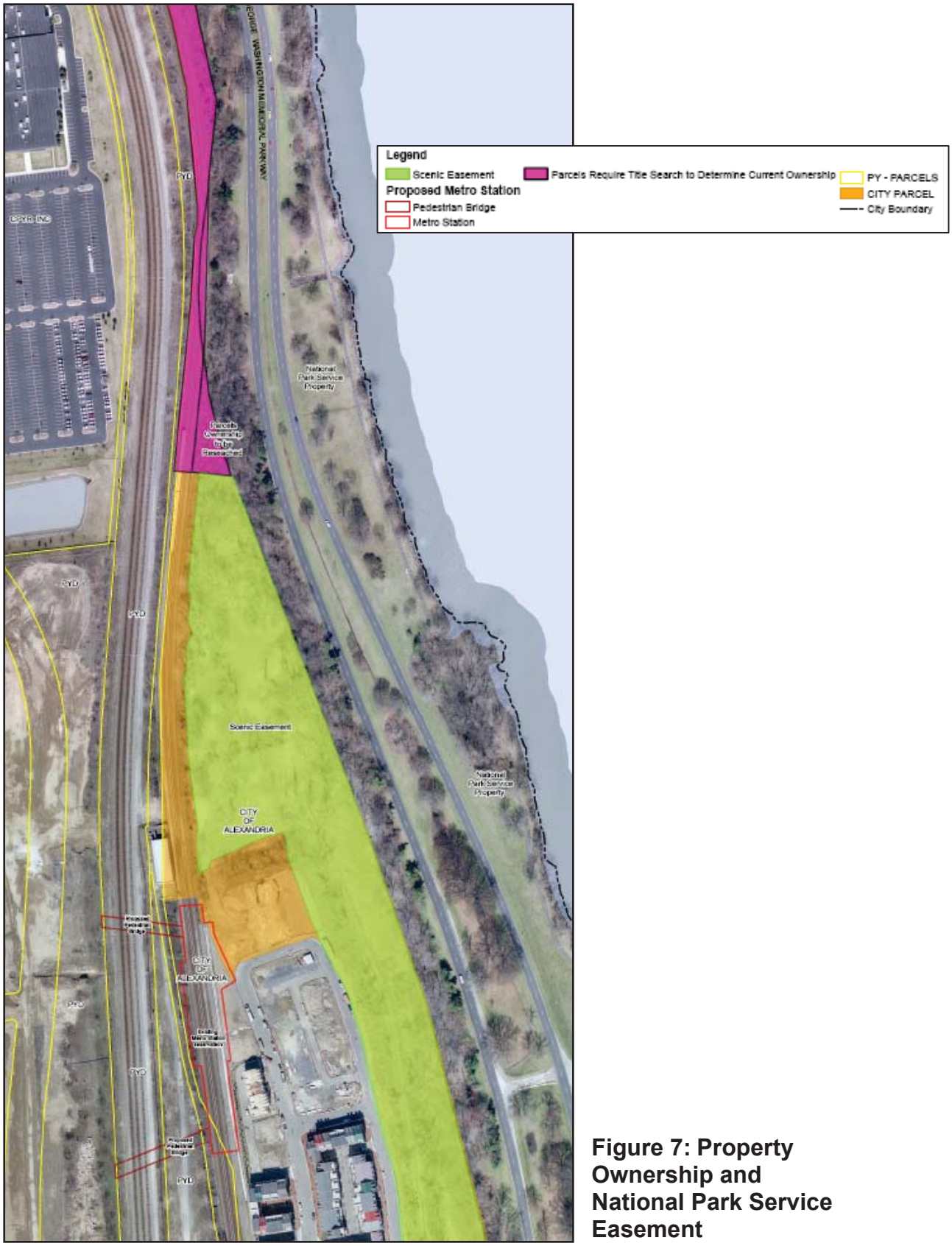


Figure 7: Property Ownership and National Park Service Easement

Capital Cost Estimates

The alternatives' capital costs were estimated in 2012 dollars, assuming that 2012 would be the midpoint of construction. Capital costs will be a function of the type and extent of construction necessary, not only for the station but also for necessary track modifications and changes and additions to Metrorail systems. Capital cost estimates developed in this analysis are order-of-magnitude and concept-level because detailed designs have not yet been prepared. Cost estimates are expressed here as ranges and include contingency factors because they are conceptual and based upon general concepts.

These cost estimates are based upon recent rail transit system construction costs nationally as well as construction costs in the Washington, DC metropolitan area. The cost estimates include all construction-related costs from project inception through completion, including planning, design, engineering, construction management, and station commissioning. The costs estimates do not include land acquisition, major utility relocation, permits, fees, financing, or costs imposed by unforeseen conditions, such as geotechnical conditions or hazmat remediation.

Alternative Station Sites

Figure 8 shows the eight alternatives considered for the station and track alignment. Several alternatives would be on or near the present Metrorail track. Others would be in Landbay F, requiring new tracks that would diverge from the existing tracks.

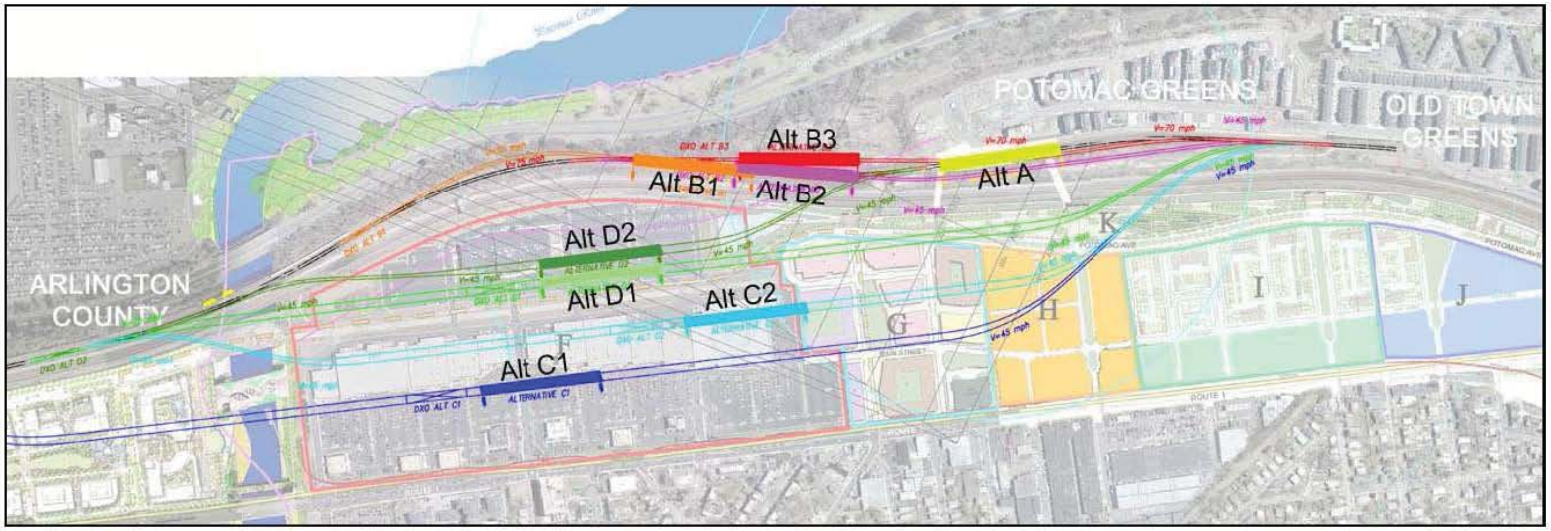


Figure 8: Alternative Station Sites

Existing Reserved Station Site—Alternative A

In Alternative A, shown in Figure 9, the station would be located at the reserved site. This site is on the existing Metrorail tracks east of the boundary between Landbays G and H.

The nearly complete 227-unit Potomac Greens townhouse development is located east of the site.[5] To the south and west of the reservation is the approximately four-acre Rail Park, Landbay D. Landbays G, H, and K are located to the west of the existing reservation. Figure 10 shows the land use within the station site's walkshed and Table 2 lists its characteristics.

The reservation was designed to be accessed primarily from the west but can also be accessed from the east. City-wide bus service and kiss-and-ride access would be on the west side of the station, and local bus service would use Potomac Greens Drive on the east.

The station would be a side-platform station, and an overhead walkway would provide access across the CSX tracks. Figure 11 shows a potential station concept. A station entrance pavilion would be on each side of the station with elevators and escalators providing access to the overhead walkway. The west station entrance and the associated circulation, including ramps, elevators, and escalators, would be built within Landbay K, the nearly 24-acre linear park along the eastern edge of Potomac Yard. The station entrance and possibly a bus loading area and Kiss & Ride would need to be incorporated into the Landbay K park plan. To reach the station from the west, a Metrorail rider would have the challenge of walking across the four-lane Potomac Avenue, Landbay K, and a pedestrian bridge over the CSX railroad, a distance of almost 400 feet.

Alternative A would require the least modification of the existing Metrorail facilities because some provisions were made for a station at this site. Additional traction power equipment would be needed in the existing traction-power substation, and additional train-control equipment would need to be installed.

Because the station would be built on the operating Metrorail line, trains on the Blue and Yellow Lines would single-track through the station site from 8:00 p.m. to closing five nights a week for the duration of construction. To allow single-tracking, the first step in the project would be the installation of a new double crossover north of the station site. The installation of the double crossover, the only necessary track modification in Alternative A, could be done by closing the Metrorail line over a weekend.

The Alternative A capital cost is estimated to be **$140 million to $180 million** in 2012 dollars.

[5] Corrected since May 2009 to state the number of units in the development.

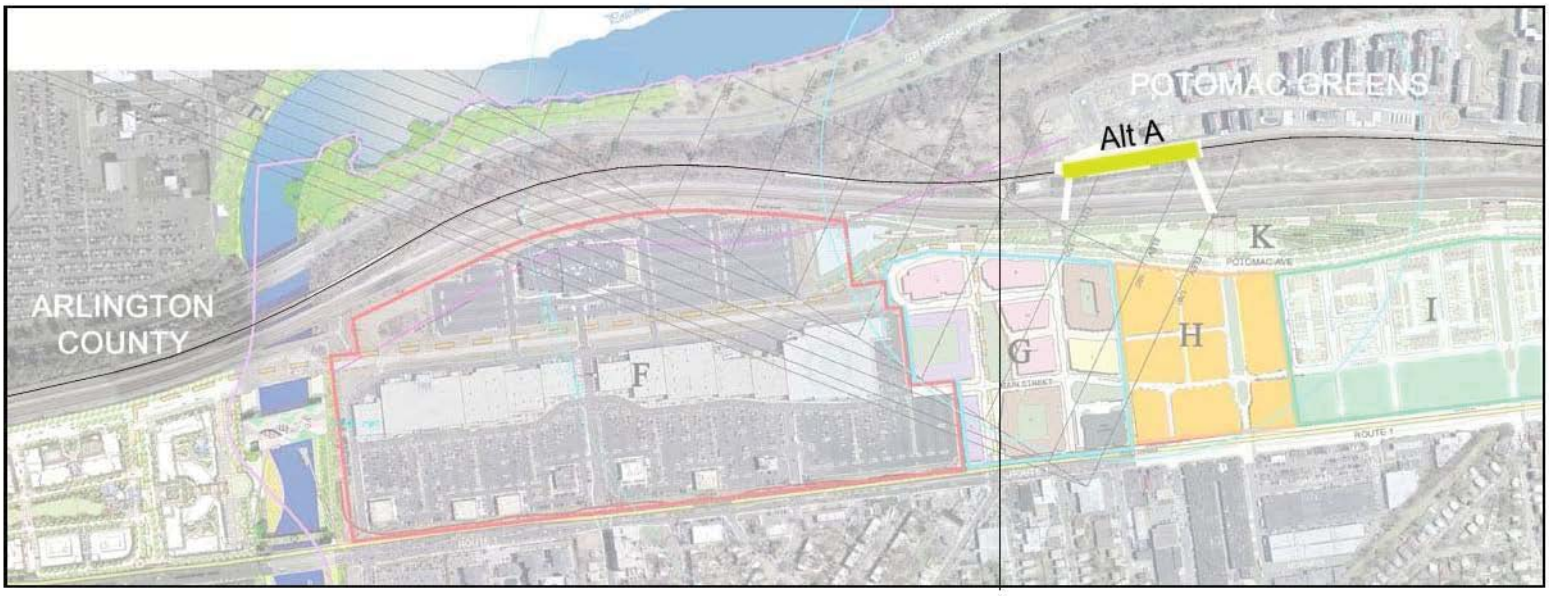


Figure 9: Existing Reserved Station Site—Alternative A

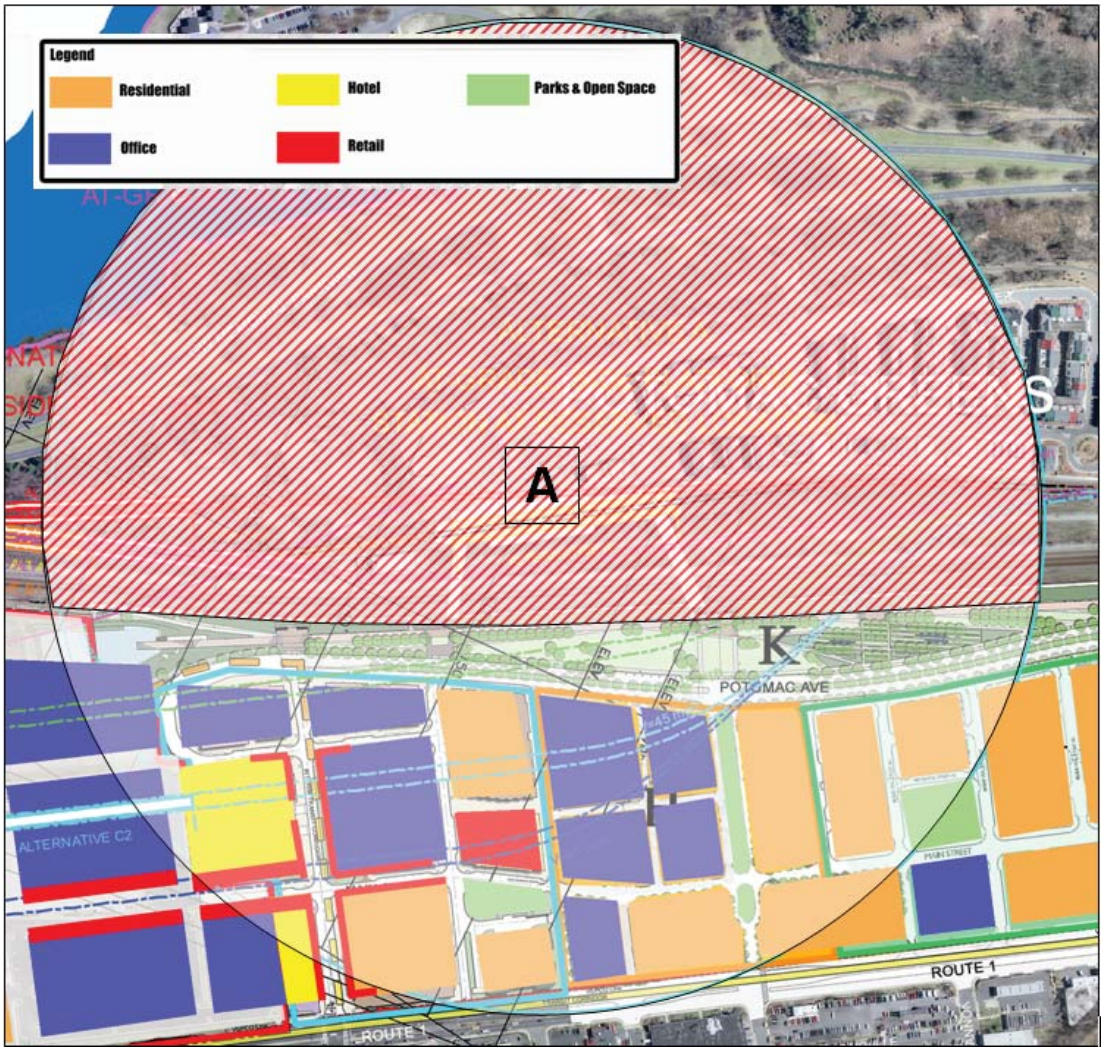


Figure 10: Alternative A Land Use Analysis

Table 2: Alternative A Land Use Analysis

Analysis	Office (%)	Residential (%)	Residential Units	Other (%)	Total sf (millions)
Quarter mile	49.0	34.0	775	17.0	3.5
Half mile*	23.0	66.0	2,953	11.0	6.6
Total	32.0	55.0	3,728	13.0	10.1

* Excludes quarter mile

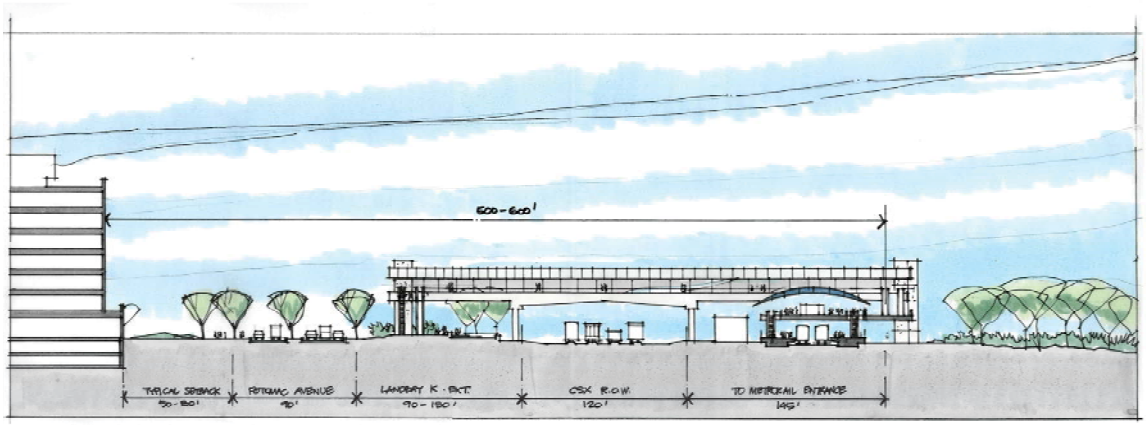


Figure 11: Station Concept

Northern Station Sites—Alternatives B1, B2, and B3

To enable additional density within the quarter-mile and half-mile walking distances of the station, three alternatives farther north along the Metrorail tracks, shown in Figure 12, were considered. A station site farther north would capture more density approved for Landbays G and H and planned in Landbay F as compared to the existing reservation site.

The northern alternatives would also serve a larger land area that is outside the flight path with its associated height restrictions. However, the northern alternatives would be less accessible to the residential area to the east. Figure 13 shows the land use within the Alternative B station site's walkshed and Table 3 lists its characteristics.

These alternatives would present an opportunity to reduce the distance between the station and the density in Potomac Yard. As illustrated in Figure 14, a westward inflection could be created in Potomac Avenue, allowing new mixed-use development between the avenue and the CSX right-of-way. This development would incorporate a station entrance and anchor the western end of the pedestrian bridge over the CSX tracks, providing a direct and convenient linkage. The open space of Landbay K (extended) could wrap around both the east and west sides of the station development site, offering a greenway to the east and an active urban experience to the west.

The configuration of a station at the northern locations would be similar to the Alternative A station—a side-platform station with an overhead walkway to the west over the CSX tracks. A station entrance pavilion would be on each side of the station with elevators and escalators providing access to the overhead walkway. As in the Alternative A station, the west station entrance and the associated circulation would be built within Landbay K. The station entrance and possibly a bus loading area and Kiss & Ride would need to be incorporated into the Landbay K park plan. A new double crossover would be installed farther north, and additional traction power and train control equipment would be needed.

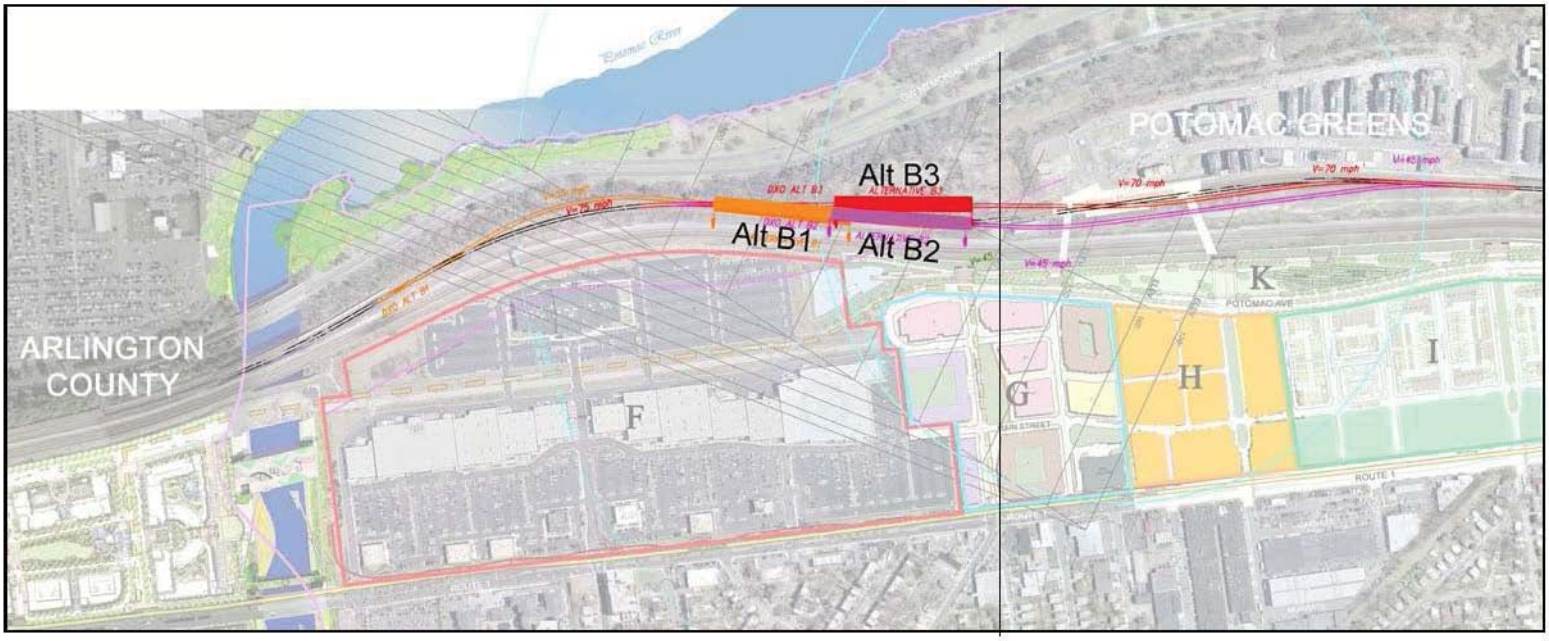


Figure 12: Alternative B Station Sites

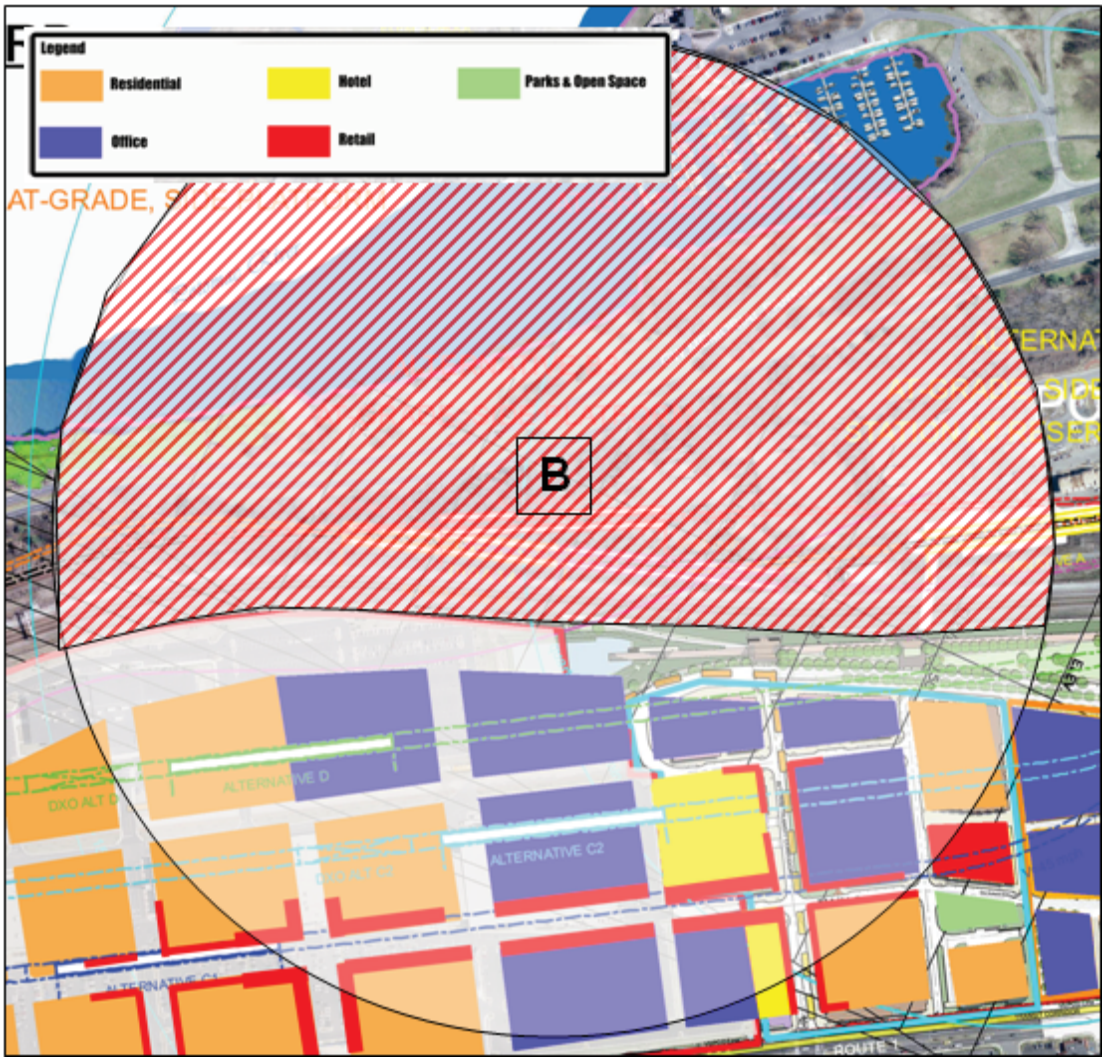


Figure 13: Alternative B Land Use Analysis

Table 3: Alternative B Land Use Analysis

Analysis	Office (%)	Residential (%)	Residential Units	Other (%)	Total sf (millions)
Quarter mile	43.0	37.0	1,376	20.0	5.6
Half mile*	9.8	85.0	4,416	9.8	8.2
Total	23.0	63.0	5,792	14.0	13.8

* Excludes quarter mile

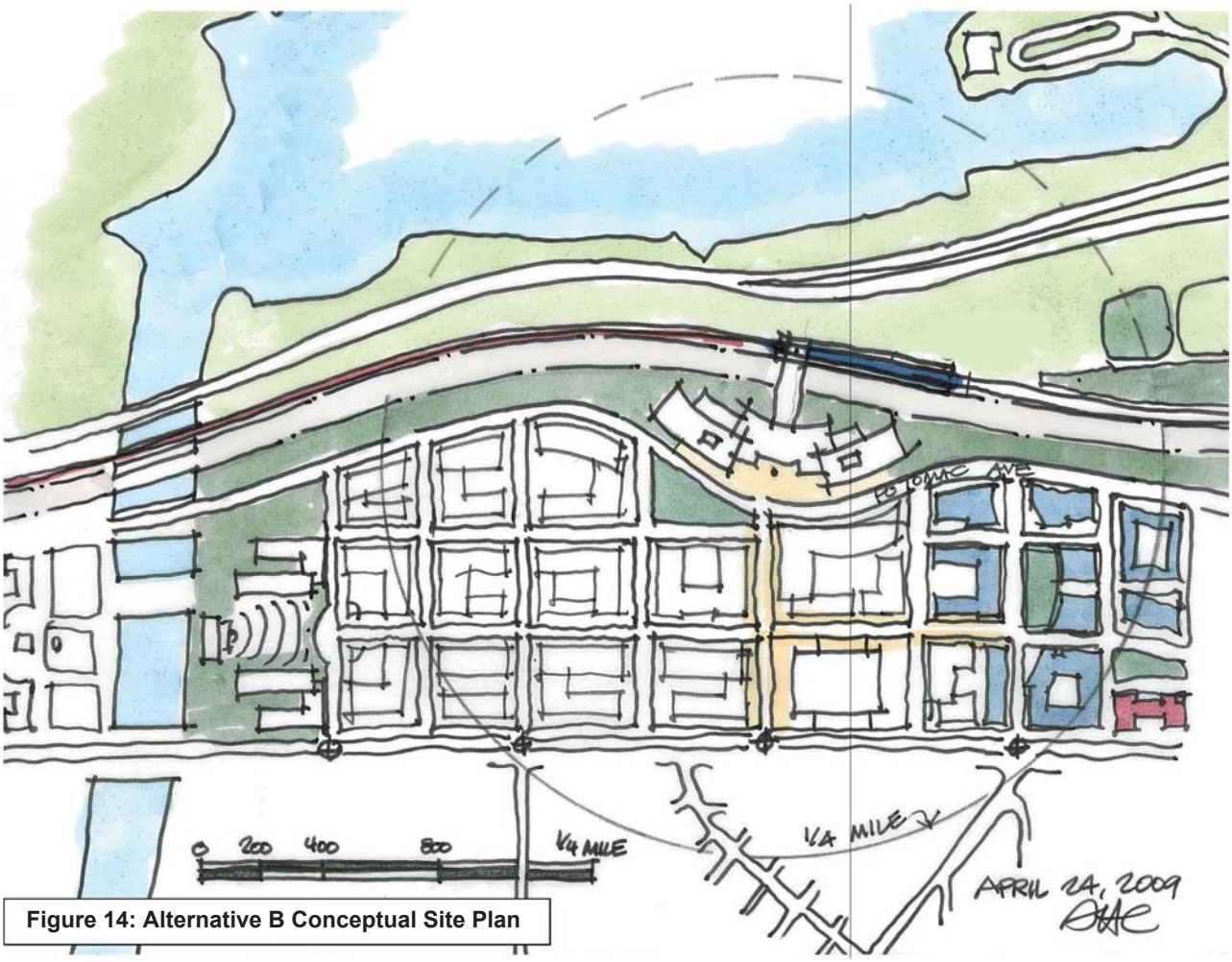


Figure 14: Alternative B Conceptual Site Plan

Because the northern sites were not designed to accommodate a station, the existing Metrorail tracks would require modification. Depending upon the exact track alignment, additional right-of-way and the construction of new retaining walls could be needed. Longer walkways would be required between the station and Potomac Greens Drive.

Alternative B1

The station in Alternative B1 would be 1,600 feet north of the Alternative A site. The existing tracks curve where the station would be located, so the tracks would need to be realigned to create a 730-foot tangent. A tighter track curve would have to extend eastward north of the station to meet the track design criteria, and new right-of-way would need to be acquired from the National Park Service where the new curved track would be built. Because of the impacts on the National Park Service property, this is not a viable alternative.

Alternative B2

Alternative B2 was developed to avoid impacts to National Park Service land identified in Alternative B1. Avoiding the impacts would locate the station about 950 feet north of the Alternative A site.

The Metrorail tracks would be shifted westward closer to the CSX tracks. Three or more acres of land that is now inaccessible because it is between the Metrorail and CSX rights-of-way would become easily accessible from Potomac Greens and the wetlands walkway to the north.

The tracks existing tracks would need to be realigned to create a 730-foot tangent. This alternative would require the construction of about 3,000 feet of new track west of the existing Metrorail tracks. The realigned tracks would pass through the location of the existing traction power substation, requiring the construction of a new substation before any other construction could occur and adding to the construction cost. A new double crossover would then be installed north of the station site to allow creation of the same work window as for Alternative A.

The Alternative B2 capital cost is estimated to be **$150 million to $200 million** in 2012 dollars.

Alternative B3

Alternative B3 would be a new track segment built to straighten curves on the existing tracks. The new track would allow the station to be about 1,250 feet north of the Alternative A site.

This alternative would require the construction of about 3,000 feet of new track, but it would have a distinct construction advantage—the station would be built on tracks that

were not carrying trains during the station construction. Potential Metrorail operations disruptions would be less than in Alternative A or Alternative B2, and construction would be more or less unimpeded, improving construction efficiency and reducing costs. After the station was built, the new tracks would be connected to the existing ones. To accommodate the new tracks, additional right-of-way would be needed on the east side of the existing right-of-way.

The Alternative B3 capital cost is estimated to be **$140 million to $180 million** in 2012 dollars.

Landbay F Tunnel Station Sites—Alternatives C1 and C2

A station in the middle of Landbay F would be closest to the highest amount of development. Two underground station sites in a new Metrorail tunnel in Landbay F, shown in Figure 15, were analyzed.

New buildings could be directly adjacent to the station. Much of Landbay F is not subject to the FAA flight path restriction and could be planned for higher densities; the amount of additional density above the 2.5 floor-area ratio discussed by the PYPAG will require additional analysis. Landbay G would still be within the quarter-mile walkshed, and Landbay H would still be within the half-mile walkshed. Although access from the east would be challenging, the station would be more accessible to properties and neighborhoods west of Route 1.

Figure 16 shows the land use within the Alternative C station site's walkshed and Table 4 lists its characteristics. The development on Landbay F was assumed to be the same in both amount and distribution for all alternatives and does not account for likely density increases for alternatives located in the main body of Potomac Yard.

Locating a station in Landbay F would allow a segment of the existing Metrorail tracks to be removed and the existing right-of-way used to substantially increase the buffer between new development and the George Washington Parkway. The new development would also be farther from the parkway, reducing its perceived impact to the parkway. Virtually all of Landbay F would be within a quarter-mile walkshed, and Landbays G and H would be within a half-mile walkshed.

In each alternative, the Metrorail tunnel would run across part of Landbay F beneath one of the north-south streets to be built there, similar to the Metrorail tunnels beneath streets in other urban centers in the region. The station would be a below-grade, center-platform station, and station entrances could be incorporated into nearby buildings. There would be flexibility in station design because it would not be constrained by the existing Metrorail track configuration. The station could be farther north or south along the tunnel beneath Landbay F to create the best connections to new development.

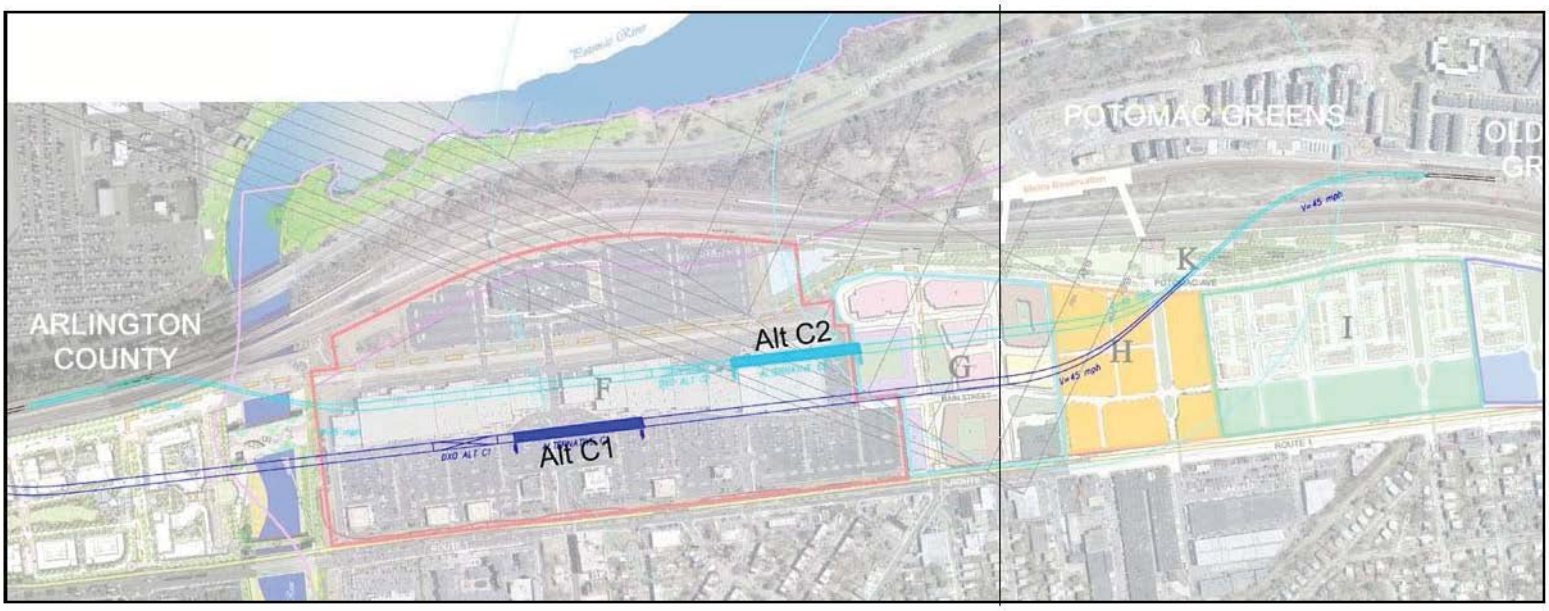


Figure 15: Alternative C Station Sites

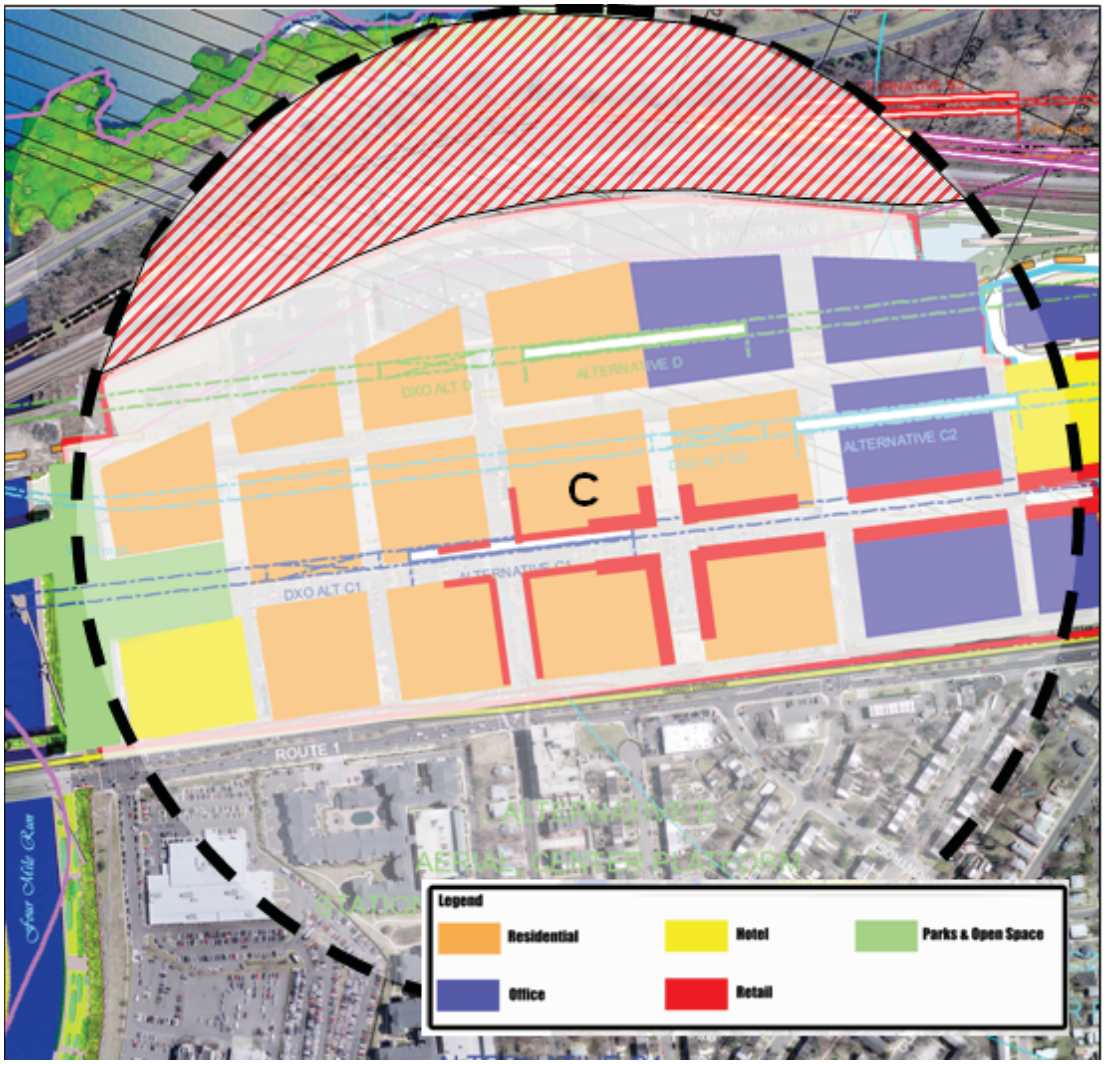


Figure 16: Alternative C Land Use Analysis

Table 4: Alternative C Land Use Analysis

Analysis	Office (%)	Residential (%)	Residential Units	Other (%)	Total sf (millions)
Quarter mile	15.0	70.0	4,750	15.0	10.1
Half mile*	44.0	40.0	1,393	16.0	4.3
Total	24.0	61.0	6,143	15.0	14.4

* Excludes quarter mile

The tunnel alternatives would require extensive construction. New Metrorail tracks would have to be built from north of Four Mile Run to the existing tunnel section near the south end of Potomac Yard, a distance of approximately 1.65 miles. The new tracks would have to cross above the CSX railroad tracks twice on aerial structures. North of Four Mile Run, the existing aerial Metrorail track structure would have to be modified and a new structure would be built to carry the Metrorail tracks over the CSX tracks, Four Mile Run, and Landbay E. Modifying the existing structure would require taking the Blue and Yellow Lines out of service for an extended period of time. A tunnel portal would be built in Landbay F where the tracks would come down to grade and enter the new tunnel. At the south end of Landbay F, another portal would be built in Landbay G where the tracks would come up to grade and rise onto a new structure over Landbay K and the CSX tracks. This structure would displace planned recreational facilities such as the regional playground, create approximately a thousand feet of shadow over Landbay K, and reduce future opportunities for Landbay D, Rail Park. Since the existing traction power substation is too far from the station site to provide the required power, a new traction power substation would be required in this alternative. The new substation could be located in one of the new buildings near the station.

To avoid disruption to the development in Landbay F, the tunnel and station should be built before the new streets and buildings, which could complicate the development schedule. The southern tunnel portal and aerial tracks in Landbays G, H, and K would require modifications to the planned and approved development there.

Alternative C1

Although the central segment of Alternative C1 would be in a tunnel, the northern segment would be an aerial Metrorail track structure through the recently built buildings north of Four Mile Run. This would create unacceptable impacts, and Alternative C1 is not a viable alternative.

Alternative C2

To avoid Alternative C1's negative impacts, the Alternative C2 tunnel and station would be farther east in Landbay F, allowing the new structure carrying the Metrorail tracks over the CSX tracks and Four Mile Run to diverge from the existing structure farther south and avoid existing buildings. However, as currently defined, this option would still significantly impact planned and approved development in Landbays G, H, and K.

The Alternative C2 capital cost is estimated to be **$410 million to $520 million** in 2012 dollars. This estimate includes the tunnel, the station, connecting tracks and supporting structures to the north and south, the traction power substation, and the necessary Metrorail operating system modifications. This estimate does not include any costs to modify the development in Landbays G, H, and K to accommodate the tunnel portal and aerial Metrorail tracks.

Landbay F Aerial Station Sites—Alternatives D1 and D2

Two alternatives that would include an aerial Metrorail line and station in Landbay F were also analyzed. These alternatives, shown in Figure 17, would also be close to the highest amount of development but would not have the high cost of tunnel construction.

An aerial Metrorail line would be built farther east in Landbay F than the line in Alternative C. Figure 18 shows the land use within the Alternative D station sites' walkshed and Table 5 lists its characteristics.

Locating a station in Landbay F would allow a segment of the existing Metrorail tracks to be removed and the existing right-of-way used to substantially increase the buffer between new development and the George Washington Parkway. The new development would also be farther from the parkway, reducing its perceived impact to the parkway. Virtually all of Landbay F would be within a quarter-mile walkshed, and Landbays G and H would be within a half-mile walkshed.

Alternative D would have the same advantages as the Alternative C tunnel stations resulting from location within Landbay F—a segment of the existing Metrorail tracks would be removed and the existing right-of-way would be used to increase the buffer between new development and the George Washington Parkway. Virtually all of Landbay F would be would be within a quarter-mile walkshed, and Landbays G and H would be within a half-mile walkshed. Like the Alternative C station, there would be flexibility in station design, and the station could be located farther north or south. Access to a new aerial station could be through adjacent buildings, potentially creating opportunities for integrating new interior public spaces with retail related to the station entrances. Access from Potomac Greens would be by the previously planned pedestrian bridge located adjacent to Landbay G.

This alternative would also require extensive construction. As in the tunnel alternatives, new Metrorail tracks would have to cross above the CSX railroad tracks twice. At the north end, new structure would carry the Metrorail tracks over the CSX tracks, over Four Mile Run and Landbay E, and into Landbay F. At the south end, the aerial structure would have to connect to the existing tunnel segment. As in Alternative C, this aerial structure at the south end of the new tracks would displace planned recreational facilities such as the regional playground, create approximately a thousand feet of shadow over Landbay K, and reduce future opportunities for Landbay D, Rail Park. Since the existing traction power substation is too far from the station site to provide the required power, a new traction power substation would be required, possibly in one of the new buildings near the station.

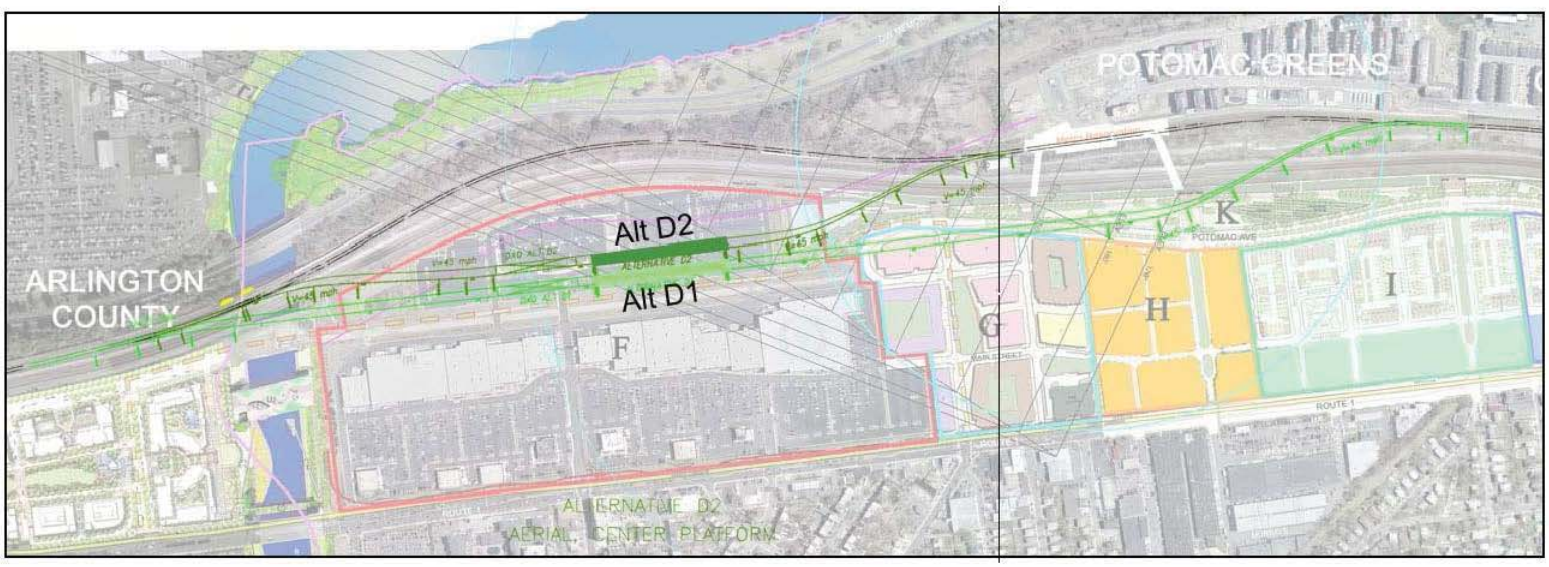


Figure 17: Alternative D Station Sites

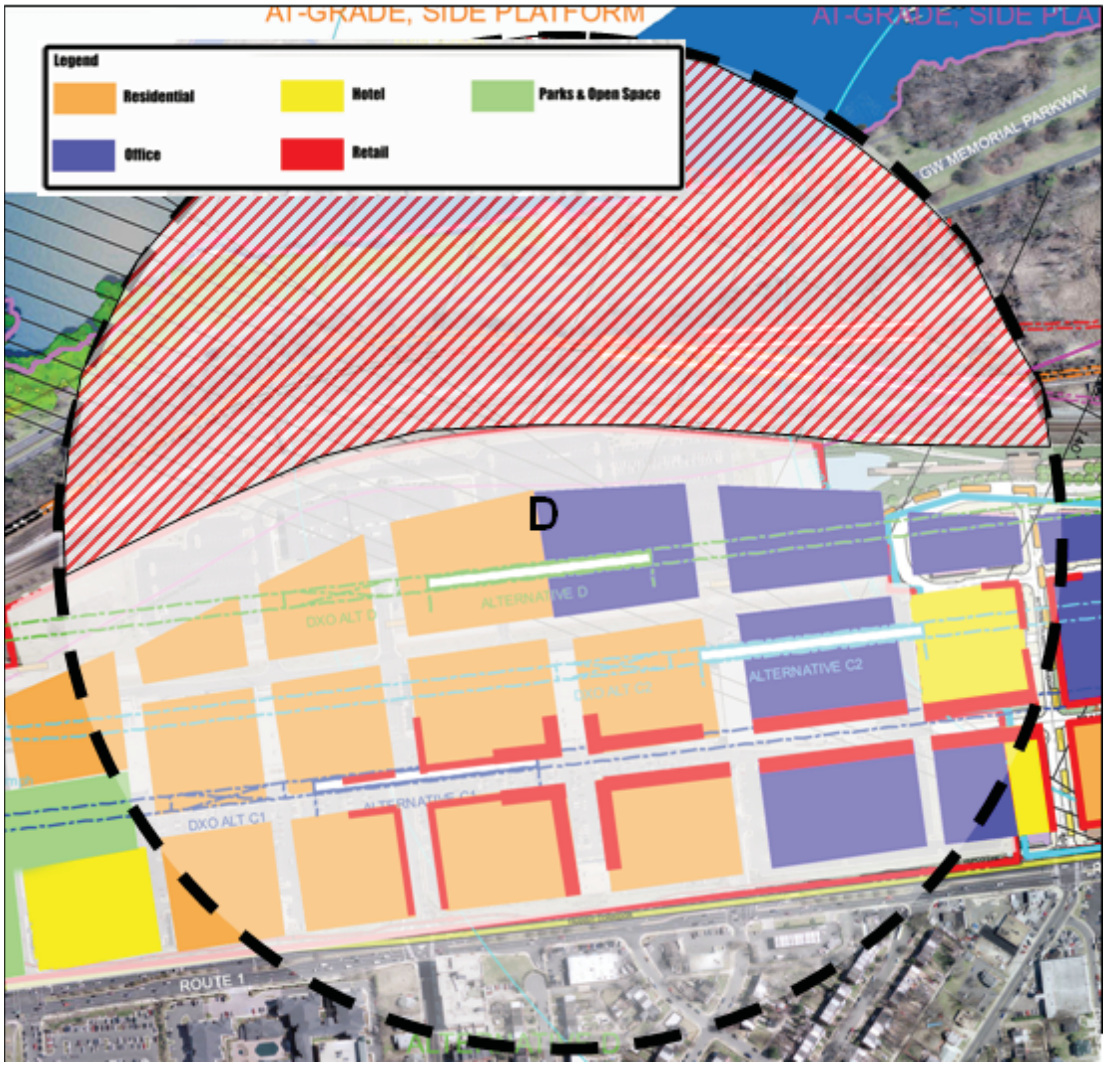


Figure 18: Alternative D Land Use Analysis

Table 5: Alternative D Land Use Analysis

Analysis	Office (%)	Residential (%)	Residential Units	Other (%)	Total sf (millions)
Quarter mile	15.0	74.0	4,750	11.0	9.6
Half mile*	43.0	34.0	1,185	23.0	4.4
Total	24.0	61.0	5,935	15.0	14.0

* Excludes quarter mile

To achieve the required clearance above the CSX tracks, the Metrorail line would probably be at the second- or third-floor level of the adjacent buildings, but more-detailed design analysis of both the Metrorail track structure and the buildings would be necessary to determine this relationship. To avoid disruption to the development in Landbay F, the station and aerial track structure should be built before the new buildings, but their design would have to be carefully coordinated to ensure physical and functional compatibility.

Alternative D1

To limit the visual intrusion of the aerial structure, the Metrorail line could run north-south in an alley between new buildings. The minimum width of an aerial Metrorail station is 60 feet. The Metrorail tracks would be visible where they would cross above Potomac Avenue and east-west streets. Aerial Metrorail tracks through Landbays G, H, and K would require modifications to the planned and approved development there.

The Alternative D1 capital cost is estimated to be **$230 million to $300 million** in 2012 dollars. This estimate includes about 6,500 feet of aerial structure, the station, connecting tracks to the north and south, the traction power substation, and the necessary Metrorail operating system modifications. This estimate does not include any costs to modify the development in Landbays G, H, and K to accommodate the aerial Metrorail tracks.

Alternative D2

Alternative D2 was designed to reduce the length of new track construction from about 7,300 to about 5,400 and limiting impacts to development in Landbays G and H while still locating the station within area of the highest amount of development. Consequently, the station would be relatively far to the east in Landbay F, as shown in Figure 19.

As in Alternative B, Potomac Avenue could be curved westward around the station, creating space for new mixed-use development between the avenue and the CSX right-of-way. The station could be directly connected to this development, and the open space in Landbay K (extended) could wrap around both the east and west sides of the station. The Metrorail tracks would not cross over any streets.

The Alternative D2 capital cost is estimated to be **$200 million to $260 million** in 2012 dollars.

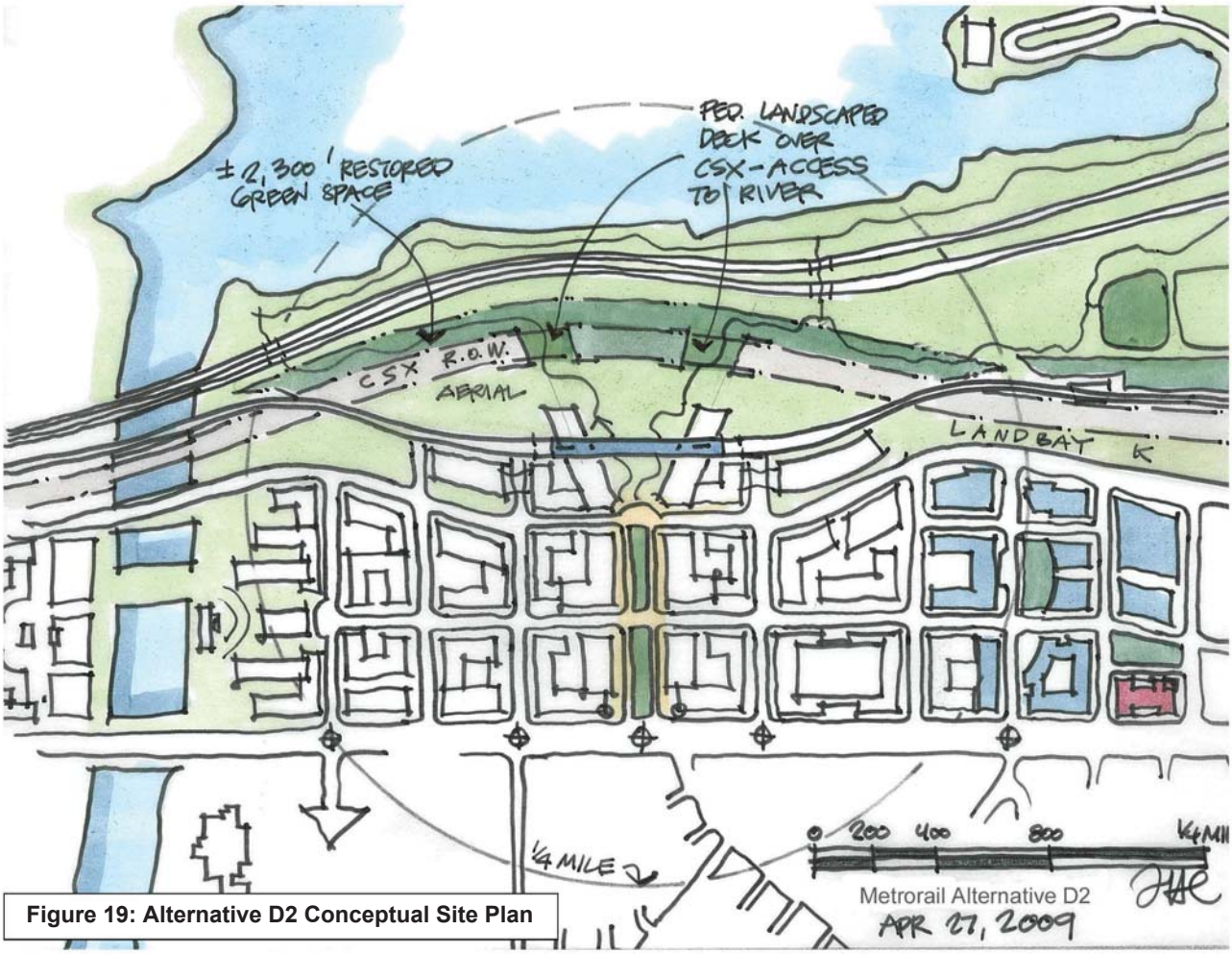
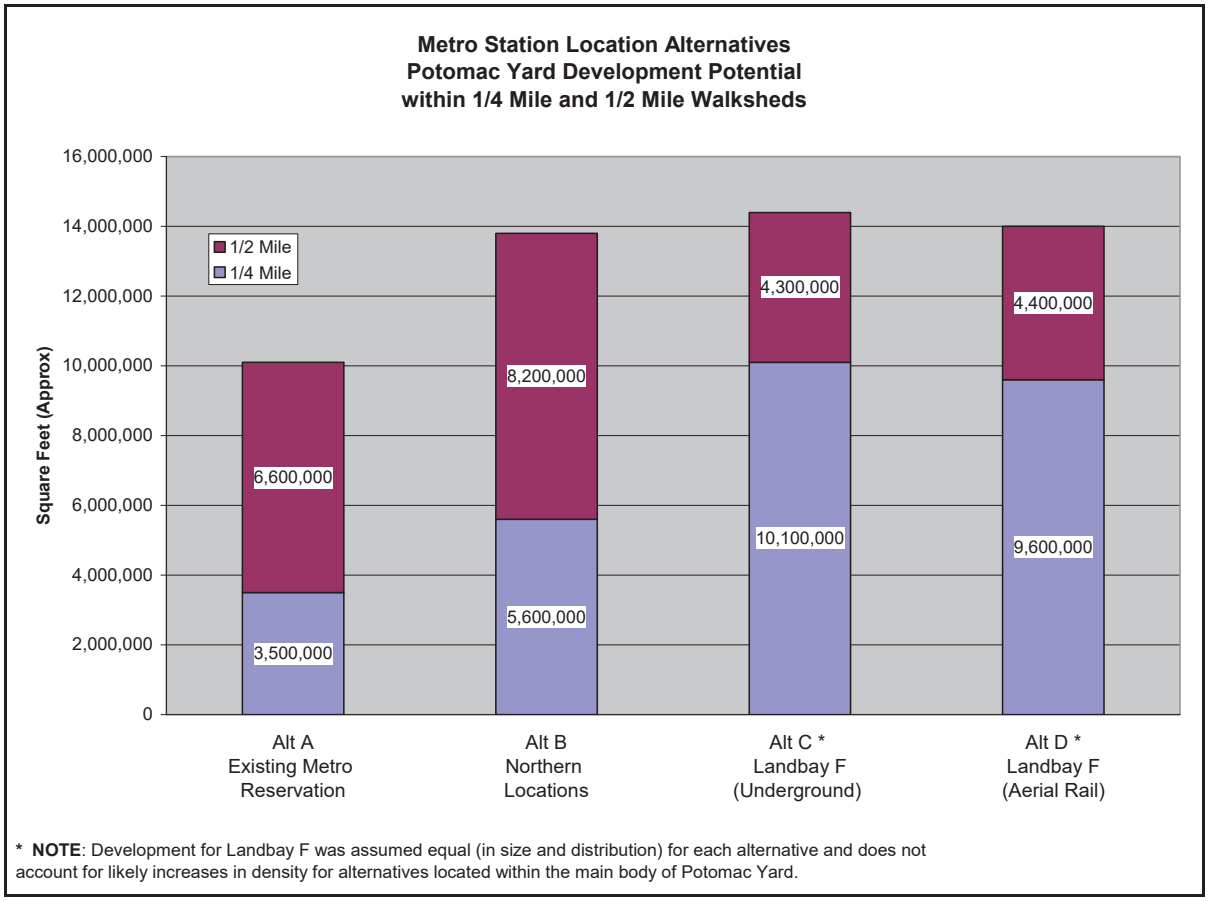


Figure 19: Alternative D2 Conceptual Site Plan

Summary of Alternative Station Site Characteristics

Figure 20 compares the development within the walksheds at the alternative station sites, and Table 6 summarizes selected characteristics of the alternatives.



* **NOTE**: Development for Landbay F was assumed equal (in size and distribution) for each alternative and does not account for likely increases in density for alternatives located within the main body of Potomac Yard.

Figure 20: Development Potential

Table 6: Summary of Alternatives

Characteristic	Alternatives							
	A	B1	B2	B3	C1	C2	D1	D2
Station Type	At-grade, side platform	Not Viable	At-grade, side platform	At-grade, side platform	Not Viable	In tunnel, center platform	Aerial, center platform	Aerial, center platform
Approximate development within ¼ mile, million square feet	3.5		5.5	5.5		10.0	9.5	9.5
Approximate development within ½ mile, million square feet	10.0		14.0	14.0		14.5	14.0	14.0
Construction impacts on Metrorail operations	High		High	Medium		Medium	Medium	Medium
Preliminary estimated capital cost, million 2012 dollars	$140-180		$150-200	$140-180		$410-520	$230-300	$200-260

Note: Some station characteristics will require more detailed analysis in future planning phases. They include environmental impacts, detailed architectural and design characteristics, and operating and maintenance costs.

Section II

Preliminary Screening of Station Location Alternatives

Completed February 3, 2010

Preliminary Screening of Alternatives

A preliminary screening was performed of the six alternatives remaining from the initial eight identified in the station location analysis described in Section I. The screening was intended to identify station characteristics that would make an alternative clearly undesirable and not appropriate for further consideration. The following characteristics were the basis for the preliminary screening:

Station constructability. The station must be able to be built without extraordinarily complex construction steps and major disruptions to existing activities. Constructability is an especially important aspect of a new in-fill station because it would be built where other activities already exist. Station construction must minimize disruptions of Metrorail operations, so the design of the station and modifications to the tracks must accommodate operations during the construction period. Station construction also should minimize impacts on the existing and planned development around the station.

Phasing. Construction of a station and modifications to the Metrorail tracks must allow land development in Potomac Yard to proceed on an acceptable schedule. Any Metrorail construction directly in the Potomac Yard landbays would have to be coordinated with the construction of streets, buildings, and other elements of the planned urban, mixed-use center. Phasing is critical to the orderly development of Potomac Yard. Land development must be guided by market conditions and financing considerations, as well as the efficient construction phasing of related buildings. Station construction must not impose undue delays or create complex development phasing conditions.

Cost. Funding sources to support station construction are limited. Federal transit funding is less than that required to meet the demand for transit investments across the country; projects must compete for federal funding approvals. Commonwealth of Virginia funds for all types of transportation improvements are especially constrained. WMATA does not have an independent source of funding for capital improvements but must instead rely on federal, state, and local sources. The remaining potential funding sources are local, including City resources and the incremental property value caused by the presence of a station that can be captured and applied to station costs. Because of these funding source limitations, cost is a critical factor.

Taking into account these characteristics, the following decisions were made:

Alternative C2—Tunnel Station

Alternative C2 was eliminated from further consideration. Alternative C2 would be extremely difficult to build because of the physical relationship of new Metrorail tracks to the CSX tracks, the necessary disruption of Metrorail operations during construction, and potential conflicts with the construction of new buildings in Landbay F. The other tunnel alternative, Alternative C1, shown in Figure 8, was eliminated in the analysis described in Section I.

Building the two new aerial crossings of the Metrorail tracks above the CSX tracks would require extensive coordination with CSX. Permission to build the crossings would have to be obtained from CSX, who would impose conditions on the construction to protect the safety and integrity of freight and VRE commuter train operations. This coordination would likely add additional time to the construction schedule and increase costs beyond those estimated. Because the Metrorail right-of-way at the northern point where the new tracks would connect to the existing ones is too narrow to accommodate a temporary bypass, building the connection of the new aerial Metrorail tracks to the existing tracks would require shutting down the Blue and Yellow Lines while new track structures were built and new grades established.

Tunnel construction in Landbay F could proceed without affecting Metrorail operations because it would not be on the presently operating tracks, but it would need to be coordinated with the development of new streets and buildings in Landbay F and could create development phasing problems. Tunnel construction would interfere with the present retail uses in Landbay F and might not be able to begin until the existing Landbay F buildings had been demolished. Much of the tunnel construction would have to be completed before other construction could occur, imposing development delays. The tunnel construction and aerial crossings would also affect approved planned development in Landbays G and H. This alternative would negatively impact the parkland in Landbay K and in Rail Park.

Alternative C2 would have the highest cost of the six alternatives under consideration—two to three times the cost of the least expensive alternatives. Developing a sound financing plan to cover this cost would be more difficult because of the limited sources of funds for station construction.

Alternatives D1 and D2—Aerial Station

Alternatives D1 and D2 were also dropped from further consideration. Either of these alternatives would create many of the same construction challenges as Alternative C2. The same two aerial Metrorail crossings of the CSX tracks made necessary by Alternative C2 would also be necessary with these alternatives, resulting in the same construction issues.

Construction of the aerial Metrorail station and the track structure in Landbay F could proceed without affecting Metrorail operations. However, building the station, which would be located in a new building, would require close coordination between the Metrorail contractor and the building developers, which would have significant implications for phasing and cost of both the station and the buildings adjoining the proposed Metrorail station.

Although the cost of either Alternative D1 or D2 would be lower than the cost of Alternative C2, it would still be substantially higher than the less expensive A and B alternatives. Given the difficulty of financing even the least expensive alternatives, this higher cost is a significant obstacle. While more of the planned development in Landbay

F would be within a quarter mile of a station in Alternatives D1 and D2, these station locations would be farther away from the approved office density in Landbays G and H.

Screening Results

Because of constructability problems and total cost, Alternatives C2, D1, and D2, the tunnel and aerial alternatives, were eliminated from further consideration. These alternatives would create complex construction and phasing challenges with considerable cost implications without providing access to significantly more density. Further planning will examine Alternatives A, B2, and B3. The Metrorail Station Feasibility Work Group discussed these decisions and concurred.

Additional Characteristics of Remaining Alternatives

For alternatives A, B2, and B3, basic station characteristics were defined, and the relationship of the station and tracks to the adjacent properties was examined in greater detail.

Variations on Alternatives B2 and B3 are possible, all within the general northern station location. These variations could improve station characteristics or reduce negative station impacts; they would be defined in more-detailed station planning. Rather than develop a large number of variations at this conceptual level, the broader variety of northern station alternatives were considered collectively and are referred to here simply as the B Alternatives. Where the differences among variations would be important, the analysis identified the range of the potential characteristics. To determine the maximum impact upon parkland, the envelope of the area that could be occupied by the B Alternatives was defined, shown in Figure 21. This envelope includes the areas needed for either Alternative B2 or Alternative B3, in recognition of the potential for variations on these two sites.

Property ownership

The site for a new station and right-of-way for any modified tracks must be controlled by WMATA, either by direct ownership or through easements. The Alternative A station site is owned by the City of Alexandria. However, the land ownership at the B Alternatives station site is more complex, as displayed in Figure 22.

The existing Metrorail right-of-way is a permanent surface easement through most of this area. The right-of-way in the northern part of the area is owned by WMATA in fee simple. Both can accommodate Metrorail tracks, a station, and other Metrorail facilities.

Part of the area east of the Metrorail right-of-way, cross-hatched in green in Figure 22, is owned by the City of Alexandria but subject to a National Park Service scenic easement. The terms of the easement require that, with a few exceptions, no improvements are to be built, no clearing or grading is to occur, and the easement is not to be otherwise disturbed

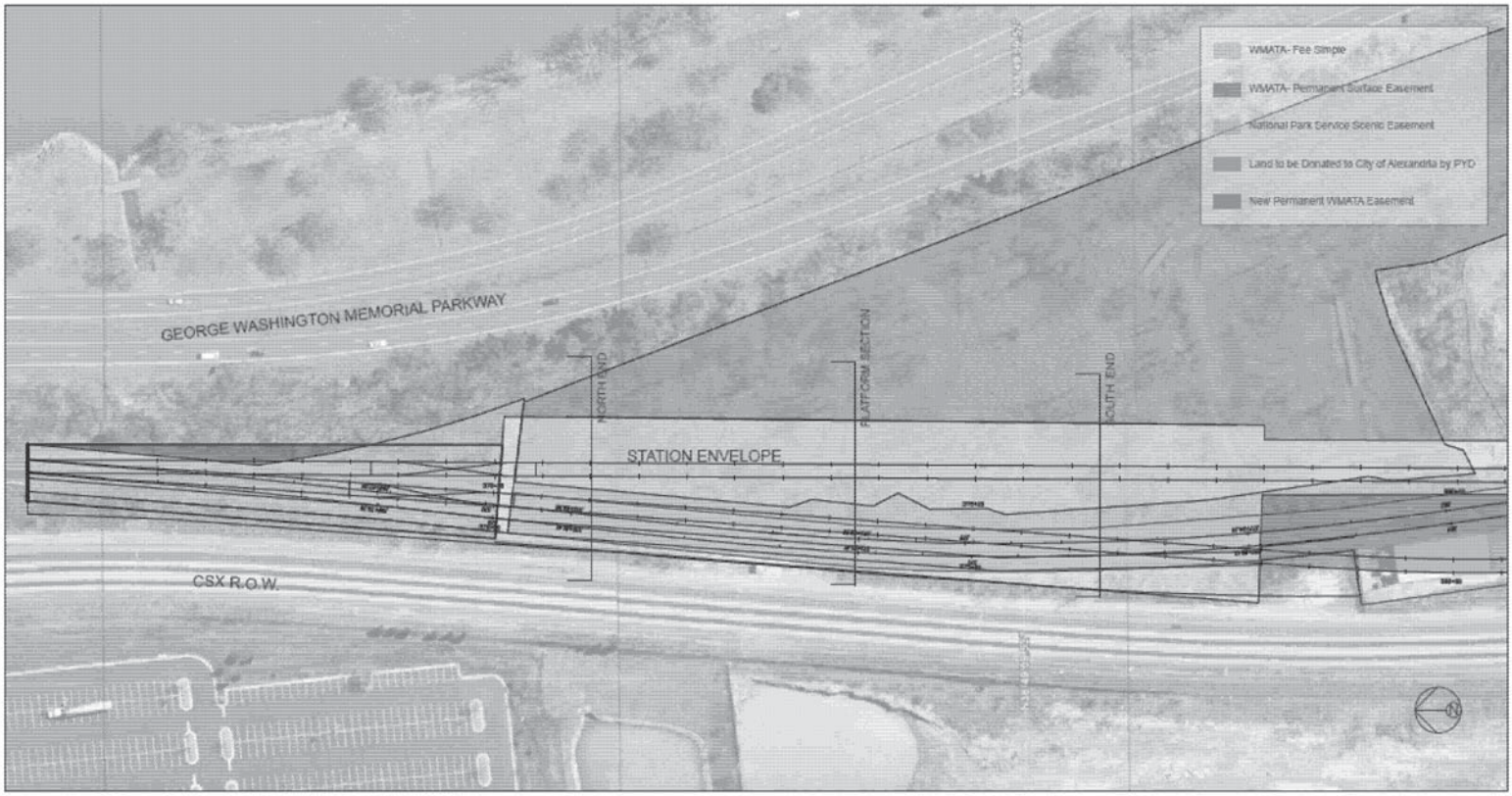


Figure 21: Station Envelope for the B Alternatives

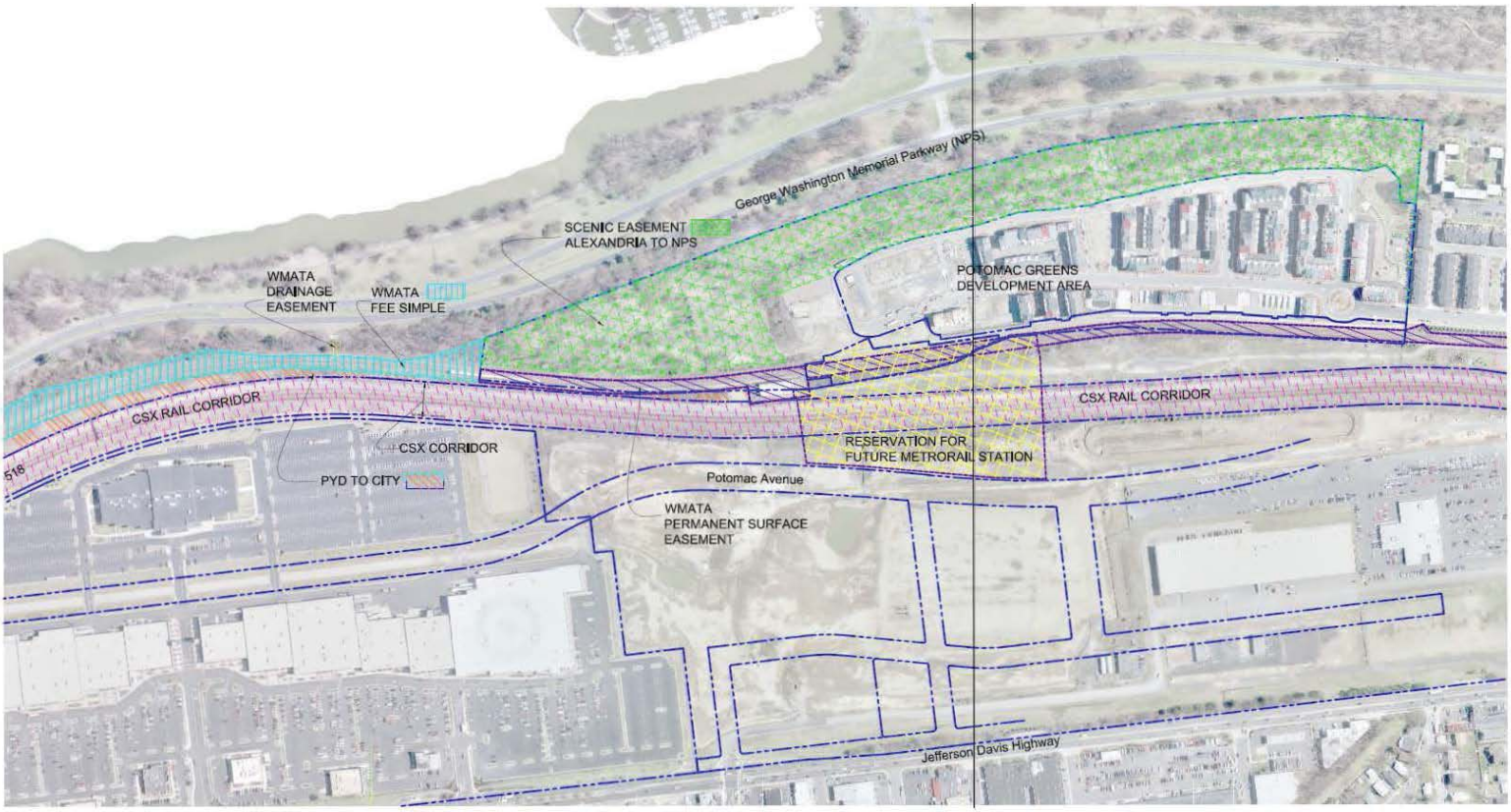


Figure 22: Property Ownership and Easements

without the approval of the National Park Service. The exceptions generally allow certain types of recreational facilities, lighting, some underground utility lines, and a stormwater management pond. The irregularly shaped area between the Metrorail right-of-way and the scenic easement, unshaded in Figure 22, is a slope easement to accommodate side slopes to the tracks. There is also a small drainage easement. WMATA controls both easements. The area between the Metrorail right-of-way and the CSX right-of-way is to be conveyed to the City of Alexandria.

The B Alternatives would require the acquisition of additional land by WMATA. The land now controlled by WMATA is not large enough to accommodate a station. Track modifications that would realign the tracks probably also would require land acquisition.

Alternative A would also require land acquisition. Although the track geometry would accommodate the Alternative A station, no provisions were made for the station infrastructure. Property would need to be acquired for the station structure and entrances.

Station design concepts

Both WMATA and the National Park Service have design criteria, which would both be considered as the station design process proceeds to create a unique aesthetic for this station. The WMATA criteria state, "Consideration shall be given to creative uses of materials, massing, scale, form, texture, and detailing. Buildings shall be visually attractive, innovative, as well as functional and durable." The National Park Service criteria state, "Materials should be selected based on their appropriateness for building type, durability, impact on the environment, climatic conditions, and the prevailing architectural design and character of the installation."

The City has expressed a desire that the proposed Metrorail station be a high-quality, unique, and innovative design coordinated with the National Park Service and in compliance with applicable WMATA standards. The station must be aesthetically appropriate for its location adjacent to the George Washington Memorial Parkway. To accommodate these requirements, the station canopy, supports, railings, lighting, and materials may be altered from the WMATA design standards.

Conceptual plans for the architectural design of the station were developed. The station concepts that have been developed are for a side-platform station. For all the station alternatives the platforms would be 600 feet long and 15 feet wide. A canopy roof would extend over the station platform to keep patrons out of the weather.

Fare machines, fare gates, and a kiosk would be located on a mezzanine level above the platforms. A mezzanine area would be approximately 100 feet long and 60 feet wide, and would be connected to each platform by elevators, escalators, and stairs. Public and staff toilet facilities as well as a cleaners' room would be located at this level. Mezzanines can generally be located anywhere along the platform, and a station can have more than one mezzanine.

Building multiple entrances and mezzanines for the station would increase the cost, but it would increase the station's value and effectiveness. Multiple entrances would expand the area that would be within walking distance of the station and increase the number of people who could conveniently use it. Because of this increased effectiveness, the concepts developed for the Potomac Yard station include two mezzanines located at the ends of the platforms to provide multiple entrances.

Figure 23 illustrates a station concept, in this case for the B Alternatives. At the top of the figure is a plan view of the platform level, in the center is a plan view of the mezzanine level, and at the bottom is a cross section through the station showing the relationship of the platform and two mezzanines at the ends.

A station entrance bridge would connect each mezzanine to Potomac Yard. The height of the two station entrance bridges would be determined by the required clearance over the CSX tracks and would establish the height of the mezzanines. A pavilion at the west end of each bridge would include elevators, escalators, stairs, or ramps to provide vertical circulation.

Access should also be provided to the station from the east. One station entrance bridge would extend to the vicinity of Potomac Greens, where another pavilion would house elevators, escalators, and ramps for vertical circulation. The station entrance bridge would be designed so that people could pass between Potomac Yard and Potomac Greens by way of the station without paying a fare.

Metrorail service rooms would be located at both ends of the station to balance the services. Train control, AC switchboard room, and a tie breaker would be located at the north end of the station because of the crossover required north of the station. The service rooms would extend approximately 100 feet beyond each end of the station platforms, although they could be combined at the station's north end if necessary.

The final design and station materials have not yet been chosen. The general structure would be concrete and the platform and mezzanine would have traditional Metrorail station flooring and platform edges. Since the station would be above the surrounding grade level and out of the flood plain, a retaining wall would be used to support the station.

Relationship to National Park Service land

Special attention was paid to analyzing potential impacts of the alternatives on adjacent parkland, including the George Washington Memorial Parkway and the scenic easement. In addition to the planning goal of minimizing impacts on parkland, federal law includes special protection for parkland with respect to transportation projects. Section 4(f) of the Department of Transportation Act requires that the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or from any significant historic site, is permissible only if no prudent or feasible alternative exists. If land subject to Section 4(f) must be used, it must be documented that all possible planning has been

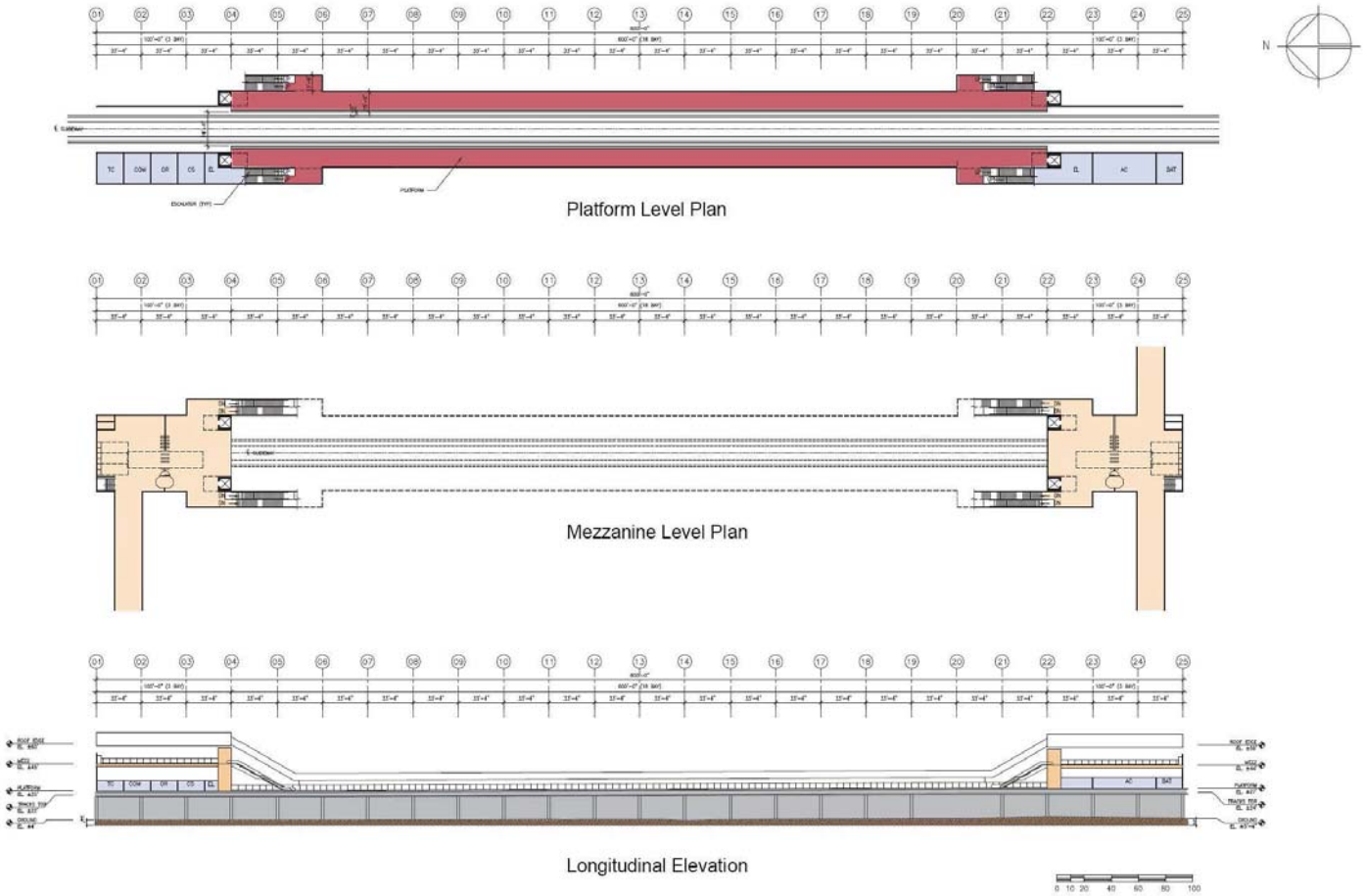


Figure 23: Station Concept for the B Alternatives

done to minimize harm to the property resulting from such use. Section 4(f) would apply to a Potomac Yard Metrorail station only if federal transportation funds were used for the station. Although decisions have not yet been made about funding sources, the station development efforts respected the Section 4(f) objectives.

Alternative A would not require the use of parkland. The B Alternatives would require the use of parkland for a temporary easement during construction and, depending upon the station's specific location, possibly for a permanent easement for the station structure.

Figure 24 is a cross section of a station, in this case the Alternative B3 station, showing its relationship to the George Washington Memorial Parkway. At the top of the figure is a cross section through the northern mezzanine, in the center is a cross section in the middle of the station showing the platforms and canopies, and at the bottom is a cross section through the southern mezzanine. The station's northern end would be closer to the parkway than its southern end.

The City of Alexandria has initiated discussions with the National Park Service regarding the proposed station. The City has expressed a commitment to work with the National Park Service to minimize the visibility of the station and ensure a high-quality design for the station.

Compatibility with the North Potomac Yard Small Area Plan

The North Potomac Yard Small Area Plan identifies the B Alternatives as the most desirable from a land use perspective. The B Alternatives would be directly accessible to the potential 7.5 million square feet of development in Landbay F and to the 1.8 million square feet of development planned in Landbay G while still being located within a quarter mile of the 1 million square feet of development zoned for in Landbay H. To maximize ridership potential, the Landbay F plan recommends office use close to the Metrorail station. To maximize access to the station, the station should have two entrances, one to serve Landbay F and the other to serve Landbay G and the more southen portions of Potomac Yard. Figures 25 and 26 show the draft proposed land uses and quarter- and half-mile walking distances for the A and B Alternatives, respectively. Table 7 lists the updated assumptions regarding land use in the Potomac Yard landbays, both within a quarter-mile of the station and outside of a quarter-mile.

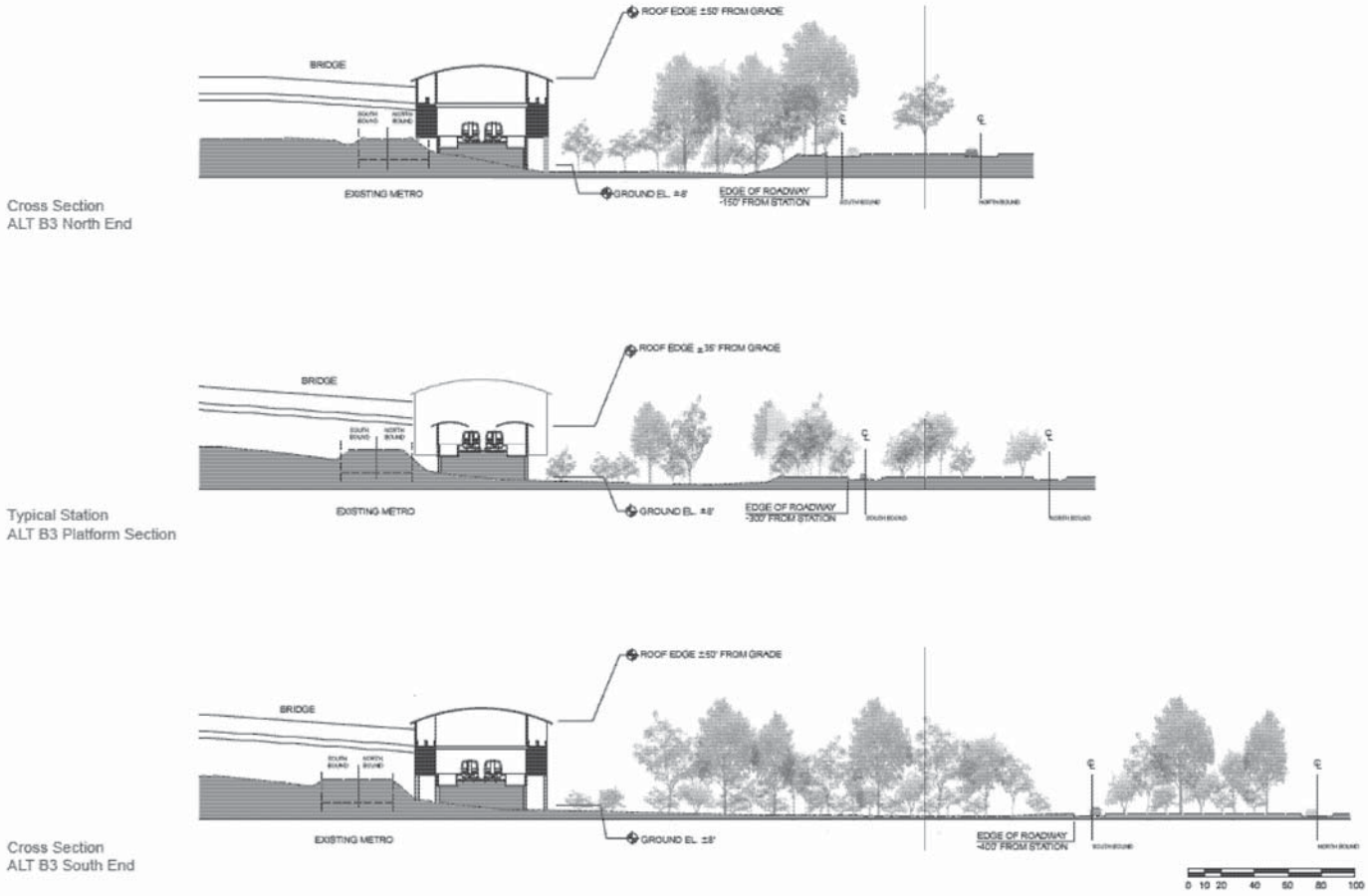


Figure 24: Cross Sections of Potential Station at the B3 Location

Figure 25: Planned Land Use for Potomac Yard within One-Quarter and One-Half Mile of Alternative A

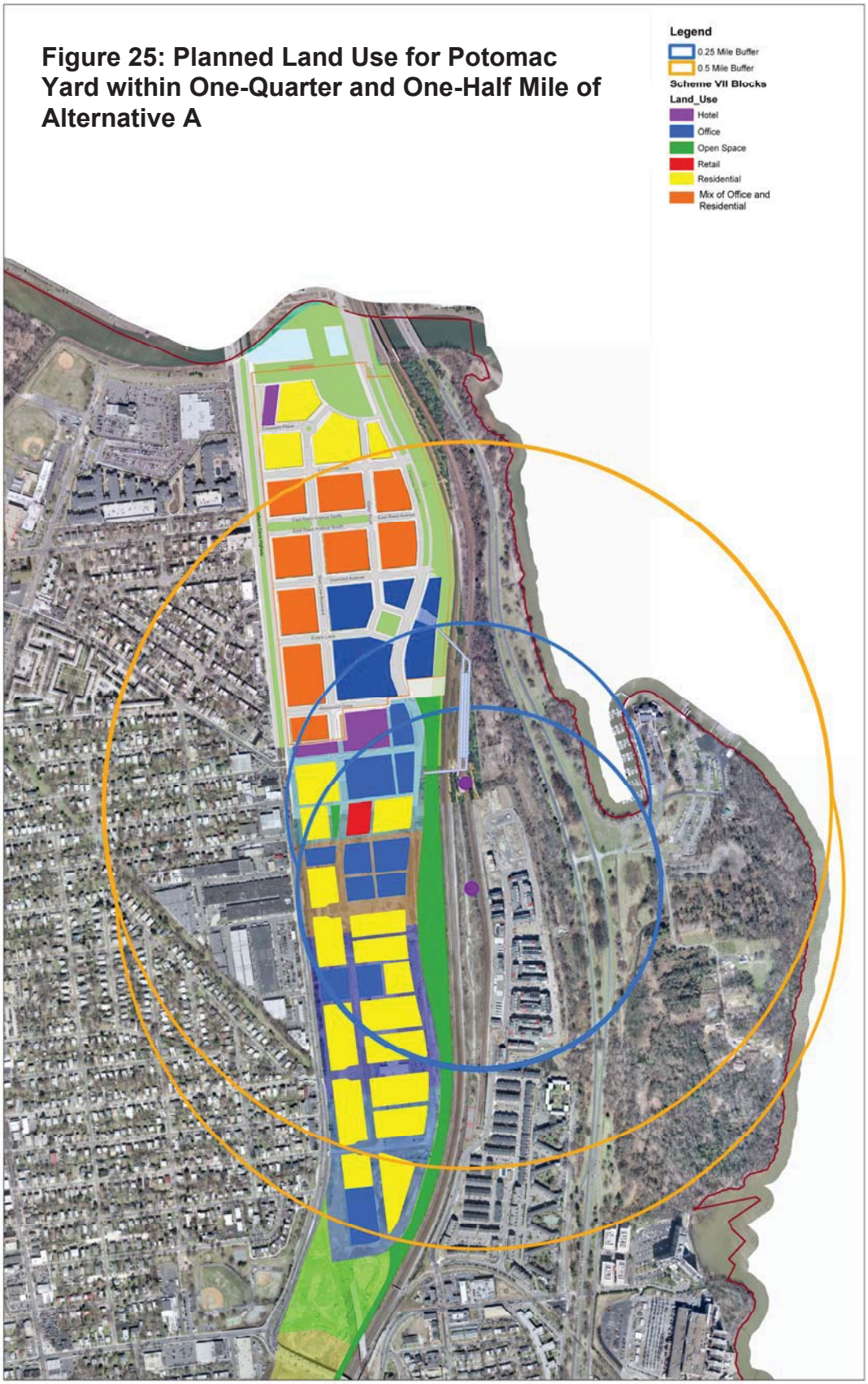


Figure 26: Planned Land Use for Potomac Yard within One-Quarter and One-Half Mile of the B Alternatives

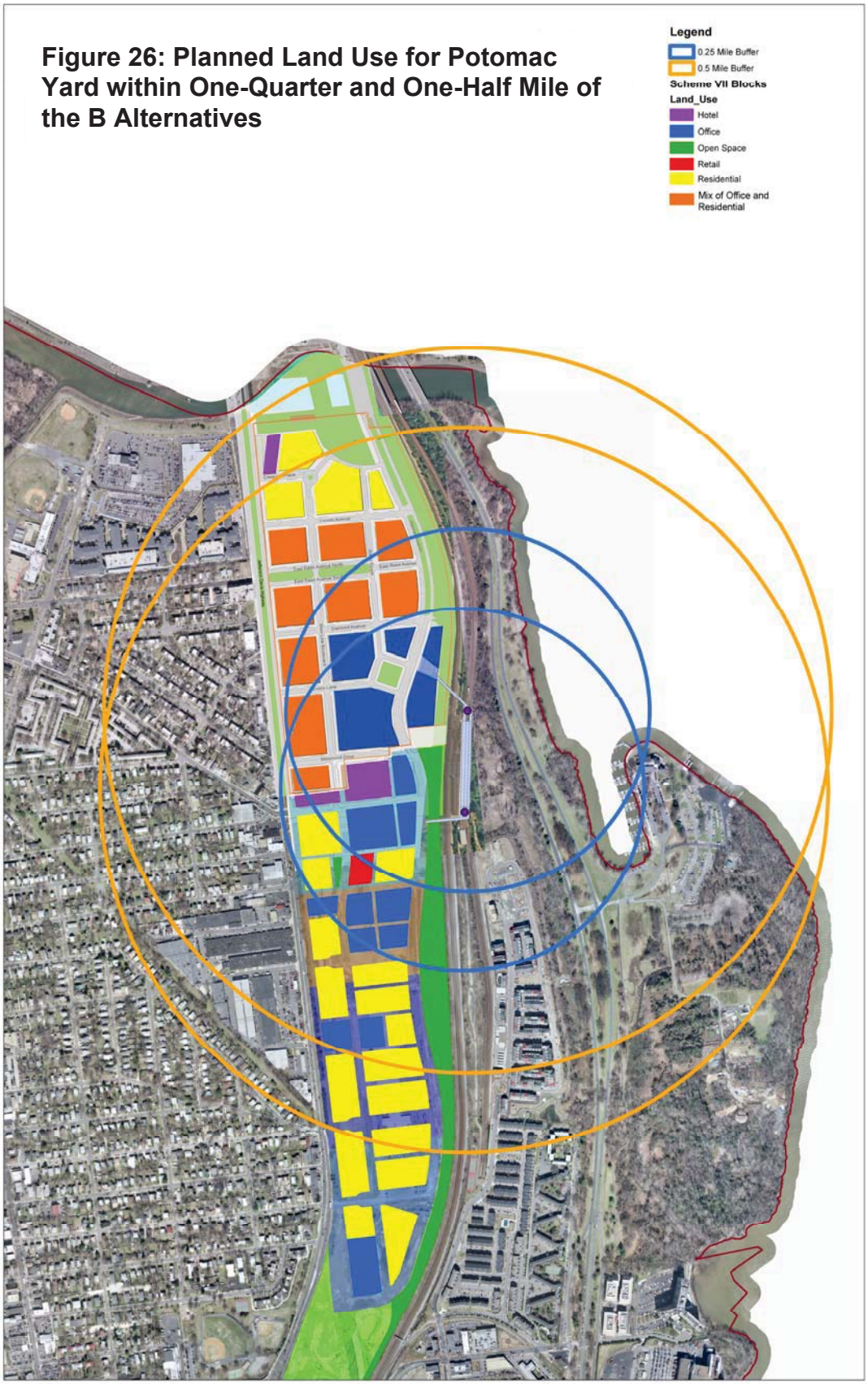


Table 7: Land Use Assumptions for Landbays F, G, H, I, and J within a Quarter-Mile of the Station Alternatives

		Alternative A		B Alternatives	
Land Use	Total	Within ¼ Mile	Outside ¼ Mile	Within ¼ Mile	Outside ¼ Mile
Residential	5,714,000	918,151	4,795,849	1,892,899	3,821,101
Office	3,897,000	2,396,423	1,500,577	3,310,632	586,368
Retail	1,144,500	363,587	780,913	794,344	350,156
Hotel	624,700	449,097	175,603	454,700	170,000
Total	11,380,200	4,127,258	7,252,942	6,452,574	4,927,626

Notes: All amounts are expressed as net square footage
The existing 600,000 sq. ft. retail center has not been subtracted from Landbay F
Landbay F density projections are subject to final approval of planning commission and City Council
Landbay G, H, I, and J amounts reflect CDD approved densities, with 1,000 sq. ft./residential unit

Revised cost estimates

The conceptual cost estimates reported in Section I were refined to reflect several changes. The revised costs estimates for Alternative A and the B Alternatives are shown in Table 8.

One revision was to the station construction schedule. Given the steps in station planning and design yet to be completed before construction could begin, a later construction period is more probable. Cost estimates were revised to reflect an assumed midpoint of construction in 2015. Because the cost estimates apply a 3.5 percent-per-year escalation factor, the later construction period would increase the estimated costs from those in Section I. A second change is the inclusion of the second station mezzanine and the pedestrian walkway to the east side of the station in the cost estimates for the B Alternatives.

Table 8: Revised Preliminary Capital Cost Estimates with 2015 as Midpoint of Construction

	Cost in millions		
	Low	Mid-point	High
Alternative A	$190	$220	$250
B Alternatives	$200	$235	$270

Estimated ridership

Ridership estimates were developed for the station alternatives in 2030. These estimates were based upon an existing forecast developed using the regional travel-demand-forecasting model, adjusted to account for differences in development within one-quarter and one-half mile of each alternative station site.

These ridership estimates are preliminary, developed primarily to allow comparisons between alternatives. More-refined forecasts would be developed in further station planning.

WMATA maintains a set of future ridership forecasts for all stations, existing and planned, in the Metrorail system. The Potomac Yard station is included in these estimates, as are the stations that are planned as part of the extension of Metrorail to Dulles Airport. WMATA's most recent forecast for the Potomac Yard station is 9,800 weekday boardings in 2030.

The density and intensity of development around the Potomac Yard station will have a substantial impact on that portion of riders who arrive at the station on foot, but a very limited impact on those who arrive by other means (private automobile, bus, taxi, or bicycle). Therefore, adjustments to the existing forecast were made only to the share of trips that would use walking as the mode of access to the station. Since no estimate of mode of access for the future Potomac Yard station exists, an estimate was created by compiling known mode-of-access data from the 2007 Metrorail ridership survey for existing stations that have substantial recent development with a highly urban character and no park-and-ride facilities.

WMATA's estimates are prepared using MWCOG's regional travel-demand model and land use forecasts, and the current set of estimates are based upon Version 2.1D of the model and Round 7.0 land use projections. The density now planned in Potomac Yard would allow significantly greater office and residential development at full build-out than is included in Round 7.0. For this analysis, future Potomac Yard development was assumed to be 90 percent of that allowable under the anticipated zoning.

Applying this adjustment factor, full build-out of the assumed land use shown in Table 7 would create approximately 53 percent more office development and 33 percent more residential development than was anticipated in Round 7.0. These higher development amounts were assumed to produce similar percentage changes in ridership; the office-generated, pedestrian-access-mode portion of ridership would be 53 percent higher than the WMATA forecast, and the residential-generated, pedestrian-access-mode portion of ridership would be 33 percent higher. Applying these factors to the office and residential portions of the WMATA ridership forecast of 9,800 daily boardings in 2030 produces an adjusted estimate of approximately 12,600 weekday boardings. This estimate reflects development levels in the North Potomac Yard Small Area Plan; variations in the amount of development would produce different numbers of riders.

Ridership estimates for different alternatives were developed by adjusting to account for the different amounts of development within one-quarter and one-half mile of the station site in each alternative. The adjusted estimate of 12,600 weekday boardings was assumed to apply to Alternative A, since the WMATA forecast would have reflected a station at the reserved site.

Estimates were developed for the B Alternatives based upon the estimate for Alternative A. Using GIS, the City calculated the percentage of each of the 55 blocks that comprise Potomac Yard that would fall within one-quarter and one-half mile of the station site in each alternative. The differences in the amounts of development located in proximity to the B Alternatives station site compared to the Alternative A station site provided the basis for the B Alternatives estimate.

Table 9 shows revised estimates of weekday boardings in 2030 for the locations under consideration, as well as the actual weekday boardings in September 2009 and the WMATA forecast weekday boardings for 2030 for the existing Metrorail stations in Alexandria and other stations with comparable urban character to that planned for Potomac Yard.

Table 9: Ridership for Potomac Yard Alternatives and Comparison Stations—Weekday Boardings

Station	2009 Actual	2030 Estimated
Alternative A	--	12,600
B Alternatives	--	15,900
Pentagon City	15,674	21,400
Ballston	12,314	20,600
Bethesda	10,255	14,500
Friendship Heights	9,090	13,100
King Street	8,976	13,000
Virginia Square	4,253	7,600
Clarendon	4,254	7,300
Eisenhower Avenue	2,359	5,400
Braddock Road	4,481	5,300

Financial Planning

Financing a project that would cost $200 million or more is a difficult challenge. WMATA does not spend its limited capital dollars on adding stations to the Metrorail system. In Virginia, where state transportation capital funding assistance to localities has collapsed as the state's transportation tax revenues have fallen sharply, there also is no current significant new funding for transit capital projects such as a new Metrorail station. The absence of state and federal funding opportunities leads to the conclusion that any Metrorail station to serve Potomac Yard must be planned to be locally funded and financed.

In order to determine the financial feasibility of funding a Metrorail station, tax revenues potentially generated by the development of Potomac Yard were calculated, and the ability of City-issued general obligation bonds to raise the funds necessary to fund the construction of the station was modeled. This analysis is described in the North Potomac Yard Master Plan.

Potomac Yard Metrorail Station Feasibility Work Group

The Potomac Yard Metrorail Station Feasibility Work Group was charged with (a) analyzing the financial tools, fiscal impact and risks of funding the Metrorail station; (b) examining concept refinement, costs, and constructability of a new Metrorail station; and (c) evaluating ridership estimates.

The Work Group met on an ad hoc basis for approximately a year and reviewed the information presented in this report. While the group was not charged with making recommendations to any of the City's appointed or elected bodies, in their review and analysis of the materials they developed guidance that reflects the work done and the consensus points reached by the Work Group.

The guidance that was developed by the Work Group relates to station location, relationship between station construction and proposed development, and funding and financial risk to the City.

Consensus was reached by the Work Group on the following:

1. For the purpose of future NEPA environmental studies, continue studying options within the envelope of the northern station locations and the existing station reservation site (A). The C and D options should be removed from further consideration.

   The northern station envelope encompasses the maximum footprint, including permanent maintenance easements, which would be required for the construction of a station along the Metrorail alignment north of the existing station reservation.

2. The existing transportation infrastructure cannot support the Landbay F proposed development. Construction of the Metrorail station is required to support the level of development proposed in Landbay F.

3. Amendments to the Master Plan and the rezoning of Landbay F cannot go forward until the City is satisfied that an acceptable financing plan has been developed and agreed to.

4. The financial risk to the City must be carefully structured and managed.

   Terms and conditions in contracts and land use approval actions need to be carefully and clearly detailed so all parties understand expectations and obligations, and therefore the financial risks to the City are mitigated.

5. No negative cash impact on the City's General Fund in any given year.

   The projected "gap" between the anticipated tax revenues from the special tax district, per square foot developer contributions, plus additional incremental net new revenues generated by the project, will need to be "bridged" in the early years of the bond financing by firm and sufficient upfront Landbay F payments, so there will be no negative cash impact on the City's General Fund in any given year.

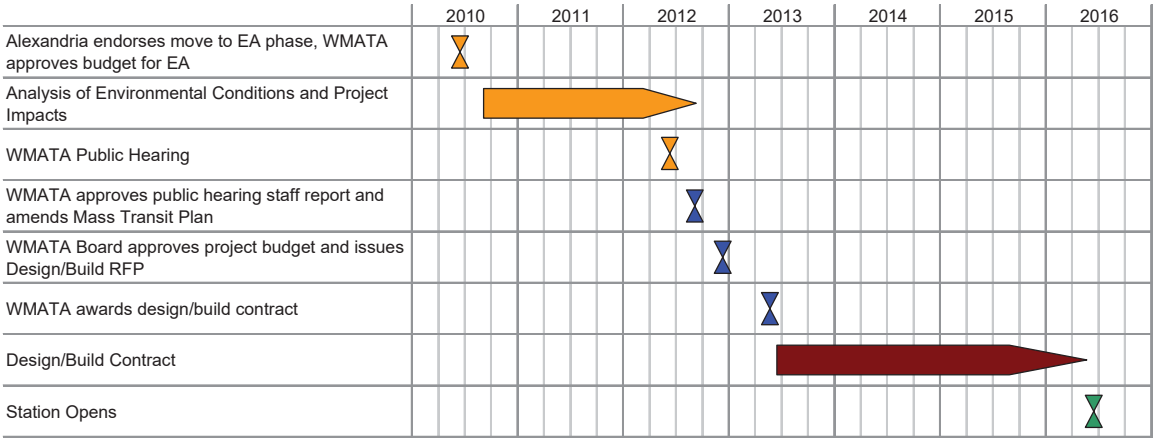
6. Any proposed financing must be conservative with a sound financing structure and shared risk.

   The proposed financing must not put at risk the City's AAA/Aaa bond ratings, as well as projections used for the Metrorail station construction costs, as well as the project build-out timetable and resultant projected tax revenues need to utilize conservative assumptions, so that the downside risks can be minimized. Some of the downside risks also need to be shared by the participating parties.

Station Implementation

Station implementation would be a multiyear process. An example schedule is shown in Figure 29. This schedule is illustrative only, as it reflects assumptions about the timeliness of many decisions and actions, some of which are beyond the control of the City of Alexandria and WMATA.

Figure 27: Potomac Yard Station Project Timeline



The City of Alexandria would begin station implementation by requesting that WMATA undertake a formal project development process. WMATA's process includes technical and environmental analyses as well as public involvement. If project development involves a federal action, such as the provision of federal funds or other federal approvals, the project would be subject to the requirements of the National Environmental Policy Act and Section 4(f) of the Department of Transportation Act. The WMATA process is consistent with and includes many of the same steps as the federal requirements.

The schedule in Figure 27 shows completion of the environmental analysis near the end of 2011, followed by a public hearing. WMATA would issue a design-build request for proposals in 2012, and final design would begin about a year later. Construction would last from 2014 to 2016, when the station would open near the end of 2016.