

WASHINGTON
UNION STATION
STATION EXPANSION

Draft Environmental Impact Statement for Washington
Union Station Expansion Project

Appendix A5 – Action Alternatives Refinement Report



U.S. Department of Transportation
Federal Railroad Administration

January 2020

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WASHINGTON
UNION STATION
STATION EXPANSION

Washington Union Station Expansion Project

FINAL

Action Alternatives Refinement Report

JANUARY 2020

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1: Introduction



1: Introduction

1.1 EXECUTIVE SUMMARY

The Federal Railroad Administration (FRA), in coordination with the Project Proponents, the Union Station Redevelopment Corporation (USRC) and the National Railroad Passenger Corporation (Amtrak), followed a multi-step process to develop concepts and identify alternatives for the Washington Union Station Expansion Project (SEP). The Washington Union Station *Concept Development Report* (CDR) summarizes the process undertaken to identify Project Elements and presents the nine retained concepts for further evaluation. The Washington Union Station *Concept Screening Report* (CSR) describes the process by which the nine retained concepts were screened and evaluated. Following the screening process, five of the retained concepts were revised based on public and agency comments received throughout the process and resulted in four Preliminary Alternatives, which were the starting point of the Alternatives Refinement process.

This *Action Alternatives Refinement Report* (AARR) documents the process by which FRA and Project Proponents advanced and refined the Project Elements and Preliminary Alternatives. The process included coordination with a multiplicity of stakeholders including affected and interested agencies, organizations, and members of the public. The Alternatives Refinement also included a series of technical meetings and workshops with FRA and the Project Proponents that focused on issues including constructability, cost, concourse planning, multimodal transportation analysis, and track and platform planning. See Figure 1.1. Based on the outcomes of the meetings and workshops from August 2017 to June 2018, as well as consideration of comments and feedback received throughout the process, the Proponents further modified the Preliminary Alternatives with support from FRA. In the Spring of 2018, based on results from the preliminary impact analysis, agency and stakeholder feedback, and continued coordination with cooperating agencies, the FRA and the Proponents combined key features of the Action Alternatives to develop another Action Alternative. The Alternatives Refinement process and outcomes enabled FRA to select six Action Alternatives to advance into the Draft Environmental Impact Statement (DEIS) for more detailed study.

1.2 OVERVIEW OF ALTERNATIVES IDENTIFICATION AND SCREENING

FRA, in coordination with the Project Proponents, USRC and Amtrak, followed a multi-step, iterative evaluation process to develop concepts and identify alternatives. See Figure 1.1.

The CDR describes the process undertaken to identify Project Elements, develop a range of 18 preliminary concepts, and select nine retained concepts for further evaluation.

The CSR from July 31, 2017 describes the process by which FRA screened and evaluated the nine retained concepts. See Figure 1.2. As a result of this process, in August 2017, FRA retained five of those concepts. The Proponents, with support from FRA, further modified the five retained concepts based on public and agency comments received throughout the process. This revision resulted in four Preliminary Alternatives: 1A, 1B, 4B, and 5, plus the No-Action Alternative. These five Preliminary Alternatives were the starting point of the Alternatives Refinement process.

1.3 ALTERNATIVES REFINEMENT

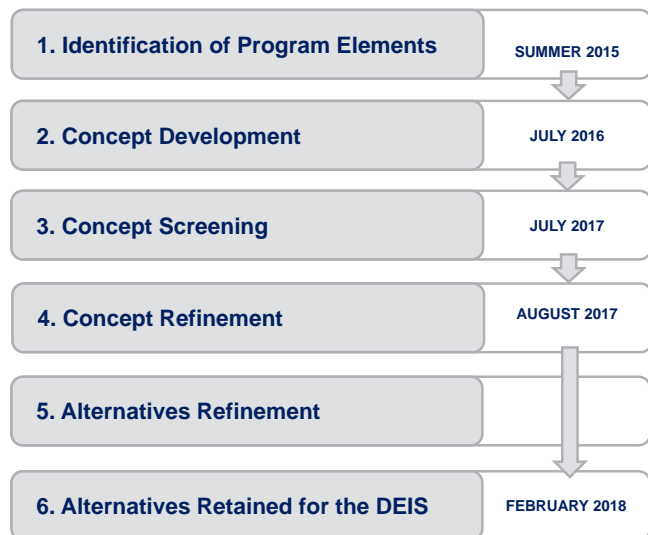


FIGURE 1.1. PROCESS TO DEVELOP CONCEPTS AND IDENTIFY ALTERNATIVES

During the Alternatives Refinement step, the Project Proponents, with support from FRA, further developed the Preliminary Alternatives to better address issues raised by agency and public comments and to advance the quality of the design of the Action Alternatives. Initially, five Action Alternatives were developed. However, a sixth Action Alternative was added by FRA and the Proponents in response to the preliminary impact analysis, agency and stakeholder feedback, and continued coordination with cooperating agencies. See Figure 1.2. The No Action Alternative is also being advanced in the DEIS.

The Preliminary Alternatives were modified and refined based on several factors:

- Updated programming assumptions (Section 1.3.1)
- Advanced technical coordination with the Project Proponents and FRA (Section 1.3.2)
- Stakeholder and Agency engagement (Section 1.3.3)
- Public comment (Section 1.3.4)

Milestones

Roles and Responsibilities

July 2016

Retained Preliminary Concepts



Proponents developed preliminary concepts



FRA conducted concept screening

July 2017

Retained Concepts



FRA identified concepts to retain



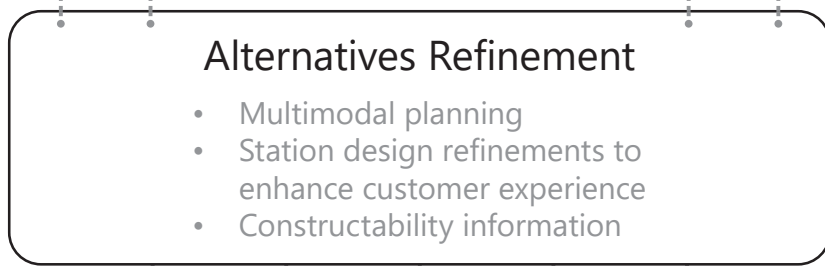
Proponents refined concepts with support from FRA

August 2017

Preliminary Action Alternatives



FRA identified Preliminary Alternatives



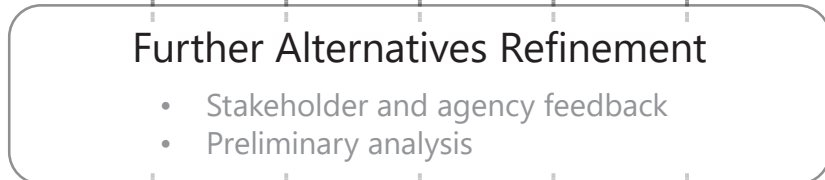
Proponents refined Alternatives with support from FRA

February 2018

DEIS Action Alternatives A through E



FRA identified five Action Alternatives



FRA and Proponents further refined the five Action Alternatives and developed an additional one, Alternative A-C, a combination of Alternative A and Alternative C

July 2019

DEIS Action Alternatives



FRA identified six Action Alternatives

FIGURE 1.2. THE ALTERNATIVES REFINEMENT PROCESS

1.3.1 Updated Programming Assumptions

OVERVIEW

As described and documented in the CDR, the Project Elements are the different components of a multimodal station. At Washington Union Station (WUS), these Project Elements fulfill the Purpose and Need and programmatic requirements of the project. The SEP, also referred to in this document as "the Project," considers:

1. SEP Project Elements
2. Other programmatic considerations
3. Adjacent elements (not within the scope or control of the SEP)

The Project Proponents identified the Project Elements through feedback received during stakeholder engagement activities conducted between Fall 2015 and Spring 2016 and from a review of the statutory requirements stated in the Union Station Redevelopment Act of 1981 (USRA). On March 30, 2016, FRA hosted a public informational forum to present and receive public feedback on the Project Elements.

Over the course of meetings and workshops during concept development, a range of preliminary concepts was derived from different combinations and arrangements of SEP Project Elements. The combinations of Project Elements were based on the presumption that certain elements would remain common to all concepts, while other Project Elements would vary in size and placement within the Project site.

The Project Elements that remained common in size and placement to all concepts include the tracks and platforms, concourse and retail, for-hire vehicles, the historic station, and bicycle and pedestrian access. Conversely, the variation between three Project Elements engendered the range of concepts: bus facility, train hall, and parking. More information about these Project Elements is included in the following section.

The Project Action Alternatives must address all eight Elements. Together, the Elements form a cohesive whole that accommodates the full range of multimodal functions at WUS. The Project does not require the prior or simultaneous construction of any other project.

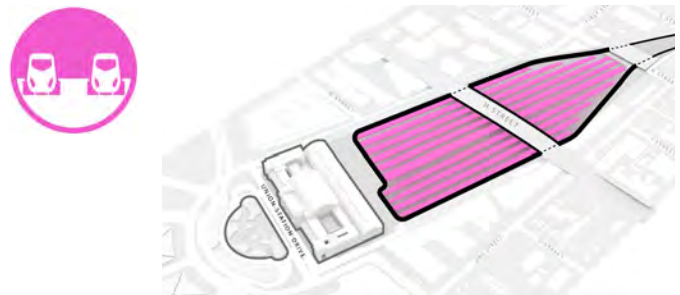
During the Alternatives Refinement process, as FRA and the Proponents further clarified and refined project needs, the SEP programming assumptions evolved. This chapter of the AARR summarizes the SEP Project Elements and describes the nature and degree to which modified programming assumptions affected the Project Elements during the Alternatives Refinement process. This chapter also describes the other programmatic considerations and adjacent elements to the SEP that contributed to the advancement of the Preliminary Alternatives. The Project

Elements are concisely summarized in this section; Refer to DEIS Chapter 3 (Elements Common to All Alternatives or Elements that Vary) for more detail on the Project Elements.

SEP PROJECT ELEMENTS

The Project Elements are the eight core constituent parts of the SEP that fulfill the major programmatic requirements, consisting of the following:

TRACK AND PLATFORM

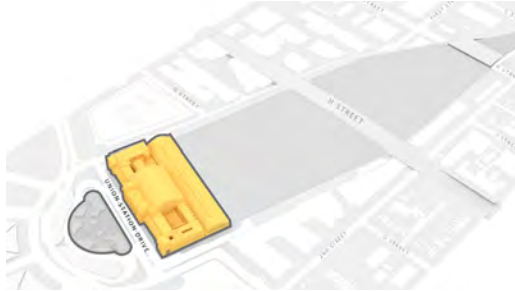


The Track and Platform Project Element consists of the reconstructed tracks, platforms, and associated infrastructure in the area of the existing rail terminal. The tracks and platforms, which provide space for trains and their passengers, serve a core function of WUS. The existing rail terminal would be upgraded to meet future intercity and commuter ridership requirements, operational criteria, and modern design standards (Americans with Disabilities Act and Life Safety requirements). The track and platform planning effort is led by Amtrak and requires close coordination with the other elements of the Project. Amtrak analyzed two track and platform plans during Alternatives Refinement: Terminal Infrastructure (TI) Option 14 and TI Option 16. Both options:

- Provide 19 revenue tracks (12 stub-end tracks on the upper level and 7 run-through tracks on the lower level) and 30' wide platforms;
- Meet the requirements of the 2040 operating plan; and
- Accommodate the same level of future rail demands and need for increased operational reliability.

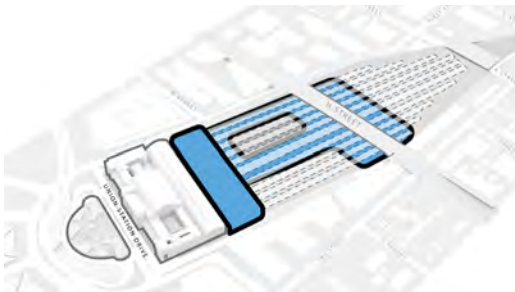
FRA chose to analyze TI Option 14 through the DEIS analysis because of perceived operational benefits. TI Option 16 remains available as a potential refinement at a later stage of Project design since it would accommodate the same number of tracks and platforms and entail similar impacts.

HISTORIC UNION STATION



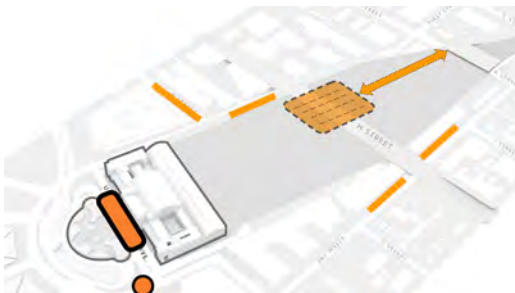
The historic station building, listed in the National Register of Historic Places, is an important part of the urban fabric of Washington, DC. All alternatives preserve the historic station and would sensitively integrate it with the Project.

CONCOURSES AND RETAIL



Concourses provide circulation space for passengers as well as room for retail, which could contribute revenue for WUS maintenance and operations. Concourses consist of multiple areas that allow for access to and transfers between the transportation modes at or adjacent to WUS, such as rail, bus, Washington Metropolitan Area Transit Authority (WMATA) Metrorail, streetcar, bike, and vehicles, including for-hire. Circulation space and retail opportunities in concourses enhance passenger experience.

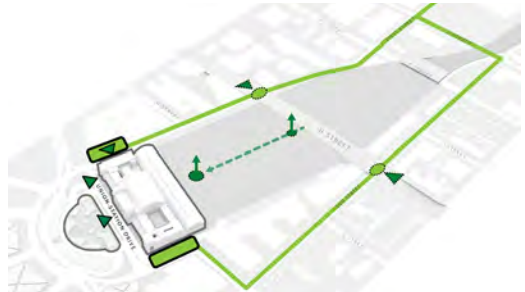
FOR-HIRE VEHICLES



For-hire vehicle facilities provide WUS users and visitors with a range of transportation options. The Action Alternatives provide a range of for-hire vehicle management options, including:

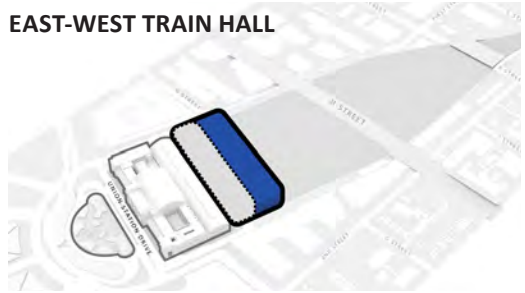
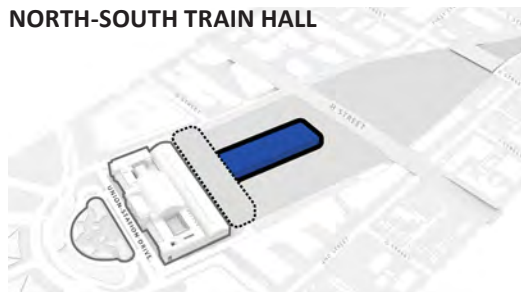
- Pick-up and drop-off areas at the front of the historic station
- In an on-site facility
- On the same level as H Street NE
- On First and 2nd Streets NE

PEDESTRIAN AND BICYCLE ACCESS



Ensuring quality bicycle and pedestrian access is essential for a multimodal facility in an urban environment. All concepts and alternatives envisioned enhancements to bicycle and pedestrian access to, and circulation within, WUS as well as new opportunities for bicycle parking. The Proponents identified and evaluated six new entrances to WUS that would allow pedestrians and cyclists to access the station comfortably and efficiently: at First Street, 2nd Street, and the existing historic station, with additional entrances from the H Street Bridge level at First Street, the center of the H Street Bridge, 2nd Street, and access via the west ramp to the H Street Bridge. The Proponents studied the opportunity for improved connectivity through H Street access in greater depth during the Alternatives Refinement phase. For more information on H Street pedestrian access, see DEIS Chapter 3. The Proponents also envision improvements to sidewalks, crosswalks, bike lanes, bike parking, and bikeshare stations.

TRAIN HALL



NORTH-SOUTH TRAIN HALL

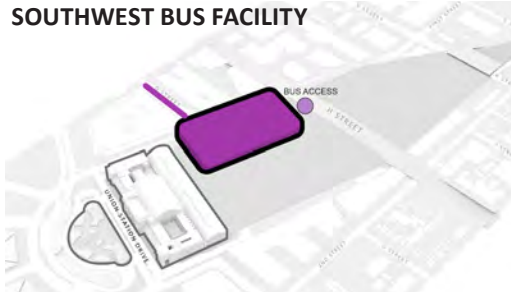
EAST-WEST TRAIN HALL

The train hall is a public space of monumental scale that would enhance the passenger experience at WUS by providing portions of the track, platform, and concourse areas with daylight and air. The train hall configuration varies per Action Alternative, with some Action Alternatives having a north-south train hall, and others having variations on an east-west train hall.

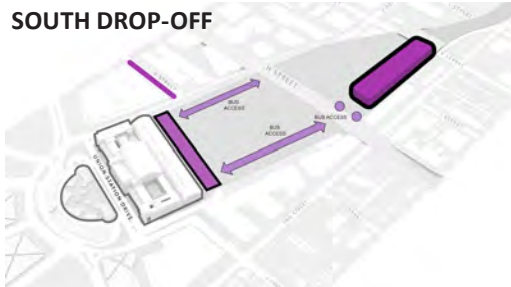
BUS FACILITY



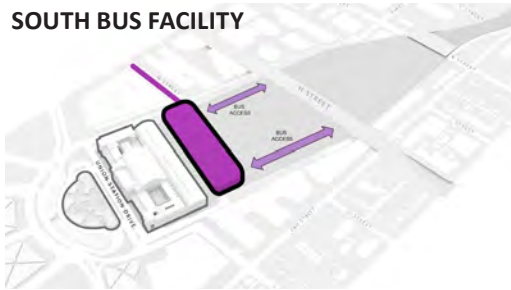
SOUTHWEST BUS FACILITY



NORTHEAST BUS FACILITY AND SOUTH DROP-OFF



SOUTH BUS FACILITY



The Bus Facility Project Element accommodates loading bays and platforms for intercity and tour/charter bus services, replacing the existing facilities at the Union Station Parking Garage. The location and configuration of the bus facility varies per alternative; South, Southwest, South/Northeast, and South/Northwest configurations are all being considered. The *Alternative Bus Program Memorandum* (February 22, 2017; VHB) outlines the process by which FRA determined that active management would allow a program of approximately 25 slips to meet 2040 bus demand at WUS. All of the Action Alternatives meet or exceed this program. For more information on the exact capacity of each alternative, see DEIS Chapter 3. Additionally, USRC's *Bus Facility Design Considerations Memorandum* (April 17, 2018; USRC) establishes a need to provide redundant bus access and follow bus slip design standards that promote safe and efficient bus and passenger movements to accommodate future volumes at the station.

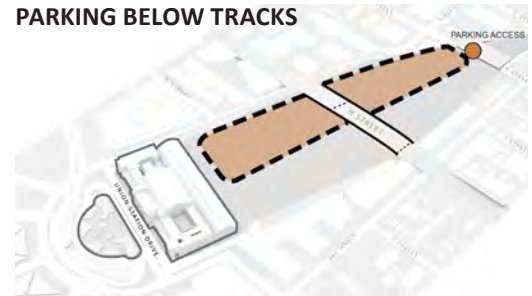
PARKING



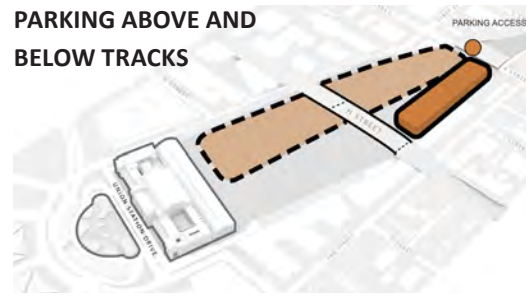
PARKING ABOVE TRACKS



PARKING BELOW TRACKS



PARKING ABOVE AND BELOW TRACKS



The Parking Project Element provides parking capacity to meet the future demand for vehicular access to the different transportation modes at WUS. Parking at WUS serves Amtrak and retail users, car rental companies, and the surrounding business area. The existing parking garage can accommodate approximately 2,450 vehicles, which includes the area occupied by rental cars and associated equipment. FRA worked with the Project Proponents to reduce the minimum parking program within the limit of the existing lease requirements. As a result, the program was reduced to 1,575 spaces. All of the Action Alternatives meet or exceed this program but substantially reduce parking capacity below both existing levels and projected requirements for 2040. For more information on the parking program and the exact capacity of each alternative, see the DEIS Chapter 3.

OTHER SEP PROGRAMMATIC CONSIDERATIONS

Other programmatic considerations include the supporting functions that allow for operational viability to the SEP Project Elements.

RAIL SUPPORT FUNCTION



The Rail Support Function comprises the expansion of the existing Amtrak support spaces, which is necessary for improvement in rail function and operation.

During Concept Development, Amtrak had identified a specific planning program size for its operational space (referred to as "back of house" space in the CDR) of 335,400 gross square feet. This space was primarily below the tracks. Because of the constructability challenges associated with below-ground construction, Amtrak re-evaluated the operational space it needs to achieve its goals at WUS. Based on that re-analysis, Amtrak relocated some functions to nearby off-site locations and revised the required square footage at WUS to 290,700 gross square feet. Amtrak's requirements are summarized in the *Space Program Memorandum* provided by the WUS Terminal Infrastructure team (December 8, 2017), which projects an assumed architectural program, including functions and space allocations, for the ultimate 2040 time frame. These allocations are based on projected ridership and train volume and fall into the following departments:

- Assistant Station Superintendent
- Baggage Operations
- Commissary
- Amtrak Police
- Communications and Signals
- Electric Traction
- Track
- Buildings and Bridges
- Amtrak Communications
- Station Mechanical
- MARC Mechanical
- Train and Engine/On Board Services

These requirements are used as the basis for planning support functions within the SEP.

PASSENGER AMENITIES



Passenger amenities are categorized into their own element to reflect the distinct purpose they serve within the SEP. Improving passenger amenities is crucial to the enhancement and modernization of the overall passenger experience at WUS. In addition to improving passenger experience, amenities and retail would generate future revenue for the station. This element also includes any other public-facing Rail Support Function elements, such as ticketing and information services, Red Cap, and baggage claim areas which are necessary for rail operation. The total area for rail-related passenger amenities, not including retail, is 35,551 SF. This element includes assumed bus-related public-facing

elements such as passenger ticketing and waiting spaces. The amount of retail area in the alternatives remains fundamentally unchanged since Concept Development; refer to the CDR for areas. See Appendix A-1 for more information on the configuration of passenger amenities and retail. Also see Amtrak "WUS TI Space Program" document (May 5, 2018) for more detail.

The program requirements fall into the following departments:

- Baggage Claim and Circulation
- Satellite (South) Baggage Make up
- Office Lost and Found Clerk
- Existing ticketing area
- Additional ticket counters
- Club Acela
- Information Desk
- MARC Information
- Red Cap
- Reception/Customer Service Counter
- Travelers' Aid
- Bus Passenger Ticketing
- Bus Passenger Waiting
- Retail
- Restrooms

SERVICE ACCESS & LOADING



The Service Access and Loading element allows for partial relocation and expansion of the truck access and loading area to account for the expanded WUS.

The existing station service access and loading area is located at the food court, lower level on the east and west sides of the existing WUS; the former coming from First Street and the latter from the H Street Bridge through a service road by Station Place.

The two existing loading docks for the historic station building would continue to support the unloading and distribution of goods at WUS. Additionally, a new loading dock would be provided on 2nd Street NE, adjacent to the REA building. The new loading dock would have approximately 12 loading slips.

SUPPORT SYSTEMS



The Support Systems are the SEP building's engineering systems, such as adequate mechanical, electrical, plumbing, and fire protection, as well as utilities and other infrastructure. The Support Systems element is further described in Appendix B, *Supporting Station Infrastructure Information*.

ADJACENT ELEMENTS



Adjacent elements are areas, infrastructure, or buildings immediately outside of the Project boundary that require close coordination with the SEP. It is important to note that the Adjacent Elements are not within the scope or control of the SEP. However, due to the proximity and immediate relationship that these Adjacent Elements share with SEP, their programmatic requirements need to be considered within the planning process. Adjacent Elements are described in the CDR and include the H Street Bridge, WMATA Metrorail, and Columbus Circle. Another significant adjacent element is the private air-rights development over the rail terminal.

1.3.2 Advanced Technical Coordination

The Alternatives Refinement process involved close coordination over a series of meetings and workshops with the Project Proponents and FRA to integrate Project components from Amtrak's consultant teams for track and platform planning (Terminal Infrastructure) and the Cost and Constructability analysis.

The meetings and workshops facilitated the exchange of technical information that allowed fine tuning to certain aspects of the Preliminary Alternatives. The advancement of discrete topics and the comprehensive effect on the range of Preliminary Alternatives was shared with FRA and Project Proponents over the course of a series of meetings and workshops. See Table 1.1.

TERMINAL INFRASTRUCTURE (TI)

To coordinate the rail infrastructure, including the tracks and platforms, the SEP team engaged in numerous meetings and workshops from May 2017 to October 2017. See Table 1.1. The goal of the coordination was to advance the planning and design of the track and platforms and other Amtrak areas within the Project in a manner consistent with Amtrak clearances and requirements. Specific topics included:

- Platform planning to identify the layouts and locations of structural and vertical circulation elements (VCEs) in a manner that complies with Amtrak requirements and life safety, accessibility, and fire codes.
- Back of House (BOH) coordination to ensure adequate provisions for Amtrak requirements were allowed in the lower levels of the SEP.
- Systems coordination to identify utility loads and exhaust requirements, and plan for adequate provisions for fresh air intake, fume exhaust, and spatial compartmentalization for interior public areas.
- Circulation planning and pedestrian flow analysis to ensure that the patterns of movement within the station and resultant effects outside the station are accommodated.

- Coordination of the 2040 Operating Plan (*TI Operating Plan, 2017*; Amtrak) with the multimodal transportation analysis.

The Amtrak *Terminal Infrastructure Report* includes more detail and specific findings.

Cost and Constructability

From July 2017 to December 2018, Amtrak led the preparation of a detailed cost and constructability analysis in cooperation with USRC and FRA to analyze and evaluate the constructability of the Preliminary Alternatives. Specific topics included, but were not limited to:

- Overall duration and timeframe for construction
- Construction methods
- Construction phasing and discussion of implications for outages for all modes of transportation
- Construction staging and access points
- Depth and volume of soil removal for below grade construction
- Construction vehicle volumes and routes
- Support of Excavation (SOE) strategies and foundation types
- Costs per alternative

The findings of their analysis indicated that, while the preliminary alternatives could be built, there were several considerable challenges with regard to duration and cost. Specifically:

- Complexity of performing extensive construction in a dense urban environment while maintaining operations of the active rail terminal, bus facility, and parking facility
- The extent of below-ground construction, and associated costs
- Some elements of the preliminary alternatives could reach below the water table, adding further complexity and cost to the Project
- Construction around the east-side run-through tracks

Although the duration of construction and cost associated with the alternatives are based in large part upon the need to work concurrently with the potential air-rights overbuild, ultimately the Proponents and FRA found that three key Project components drive the Project cost and duration of construction:

- The extent of excavation such as the depth and footprint of excavation.
- The type of SOE and foundation that is appropriate for the depth of excavation based on the groundwater level.
- Limitations of work zones restrict what can be taken out of service at one time and are complicated by setbacks to enable construction vehicle maneuvering and movements.

The *Terminal Infrastructure Project Constructability Report* provides more detail on rail infrastructure.

Table 1.1 – Preliminary Alternatives Coordination Meetings and Workshops

MEETING AND DATE	AGENDA
Terminal Infrastructure SEP Coordination (TI/SEP) #01 May 24, 2017	<ul style="list-style-type: none"> • Back of house (BOH) • Updates on TI14 • Existing parking garage • Ticketing and fare control
TI/SEP Coordination #02 June 14, 2017	<ul style="list-style-type: none"> • 2025, 2030+, and 2040 Operating Plans • BOH clarifications
Proponents Workshop #01 June 20, 2017	<ul style="list-style-type: none"> • Updated concourse and lower level plans • Platform planning- vertical circulation elements (VCE), ped flow, and egress strategy • Concourse and BOH planning • Ticketing, loading, screening, baggage diagrams
The District Department of Transportation (DDOT) Coordination June 20, 2017	<ul style="list-style-type: none"> • Traffic and transportation • H Street
TI/SEP Coordination Workshop June 22, 2017	<ul style="list-style-type: none"> • VCE coordination
TI/SEP Coordination #03 June 28, 2017	<ul style="list-style-type: none"> • Track constructability work • Discuss required inputs and timing to support EIS impact analysis • Phasing and construction methods • Foundations
Cost & Constructability #01 July 7, 2017	<ul style="list-style-type: none"> • FRA kick off
TI/SEP Coordination #04 July 11, 2017	<ul style="list-style-type: none"> • VCE coordination • National Fire Protection Association (NFPA) code • Ventilation • Utility loads
The National Capital Planning Commission (NCPC) Information Presentation July 13, 2017	<ul style="list-style-type: none"> • Background and context • Project purpose and need • Identified Preliminary Alternatives • Next steps
DDOT Coordination July 18, 2017	<ul style="list-style-type: none"> • Traffic and transportation • H Street
TI/SEP Coordination #05 July 19, 2017	<ul style="list-style-type: none"> • VCE coordination • Structural grid • Ventilation • Existing zoning and overbuild SEP assumptions: existing zoning diagrams • Structural deck assumptions • Mechanical equipment locations on deck • Overbuild development assumptions

MEETING AND DATE	AGENDA
Cost & Constructability #02 July 26, 2017	<ul style="list-style-type: none"> • Amtrak kick off
DDOT Coordination July 26, 2017	<ul style="list-style-type: none"> • Review traffic and circulation concepts
Proponents Workshop #02 August 2, 2017	<ul style="list-style-type: none"> • Multimodal design in WUS vicinity • Train Hall (ventilation, compartmentalization)
Cost & Constructability #03 August 15, 2017	<ul style="list-style-type: none"> • Review assumptions for track outages • Construction work zones • Material type and delivery • H Street circulation • Access to overbuild
DDOT Coordination August 15, 2017	<ul style="list-style-type: none"> • Traffic impact methodology
TI/SEP Coordination #06 August 22, 2017	<ul style="list-style-type: none"> • Work Session • Cost & Constructability • Phasing • Platform and concourse planning • Station planning
S106 Consulting Parties Meeting September 7, 2017	<ul style="list-style-type: none"> • Section 106 / NEPA EIS schedule • Preliminary Alternatives • APE and Identification of Historic Properties • Next steps
Cost & Constructability #04 September 13, 2017	<ul style="list-style-type: none"> • Review site access report • Construction means and method
Proponents Workshop #03 September 19, 2017	<ul style="list-style-type: none"> • Platform and concourse planning • Station planning • Deck level development
Cost & Constructability #05 October 11, 2017	<ul style="list-style-type: none"> • Review site access report • Construction means and methods
Proponents Workshop #04 October 25, 2017	<ul style="list-style-type: none"> • SEP and private development integration opportunity • The connectivity between SEP and H Street • The relationship between SEP elements (Train Hall, H Street headhouse, skylights on the deck, and open space) and private development • Extents of excavation - impacts on Alternatives • Range of modified Alternatives
DDOT Coordination October 26, 2017	<ul style="list-style-type: none"> • Traffic generation
Cost & Constructability #07 November 8, 2017	<ul style="list-style-type: none"> • Review assumptions for cost and comparison of Alternatives with regards to below grade construction
Federal Protective Services (FPS) November 8, 2017	<ul style="list-style-type: none"> • Screening and loading scenarios • Delivery volumes

MEETING AND DATE	AGENDA
Cost & Constructability #08 November 20, 2017	<ul style="list-style-type: none"> • Cost and comparison of Alternatives; difference between parking levels B1 and B2
DDOT Coordination November 28, 2017	<ul style="list-style-type: none"> • H Street Bridge and Streetcar coordination
Cost & Constructability #09 December 13, 2017	<ul style="list-style-type: none"> • Means and methods follow-up with schedule detail • Updated groundwater information (if available)
DDOT Coordination December 18, 2017	<ul style="list-style-type: none"> • H Street Bridge kick off meeting
DC Agency Meeting February 13, 2018	<ul style="list-style-type: none"> • FRA and Proponents provide an update on the EIS Alternatives and project progress • Discuss needed items of coordination with the DC agencies: DDOT, DC Office of Planning (DCOP), and DC Historic Preservation Office (HPO)
DC Agency Meeting February 26, 2018	<ul style="list-style-type: none"> • DC Government Agencies to provide feedback (DDOT, DCOP, HPO)
Interested Agency & Cooperating Agency Meeting March 12, 2018	<ul style="list-style-type: none"> • Review public meeting materials
CCC Meeting March 11, 2018	<ul style="list-style-type: none"> • Review public meeting materials
Public Meeting March 22, 2018	<ul style="list-style-type: none"> • Project Purpose and Need • Project update • Preliminary Alternatives & Alternatives Refinement • Alternatives identified for the DEIS • Next steps & open house
DC HPO and U.S. Commission of Fine Arts (CFA) Meeting April 18, 2018	<ul style="list-style-type: none"> • History and context • Existing conditions • Alternatives - Train Hall alignment • Track and platform planning
S106 Consulting Parties Meeting April 24, 2018	<ul style="list-style-type: none"> • Review methodology for Assessment of Effects
DDOT Coordination April 26, 2018	<ul style="list-style-type: none"> • Comprehensive Transportation Review (CTR) scoping form • EIS Analysis next steps after 4/20 meeting
DDOT Coordination May 16, 2018	<ul style="list-style-type: none"> • Structural workshop
DDOT Coordination May 18, 2018	<ul style="list-style-type: none"> • Utility coordination

1.3.3 Stakeholder Engagement

Throughout the Alternatives Refinement process, the Proponents and FRA engaged key Project stakeholders. The goal of the coordination was threefold: The first goal was to share information about the complexity of the Project and timeframe for implementation. The second goal was to coordinate SEP Project needs with the respective agency or organization purview to ensure Project feasibility and support. The final goal was to assess short term and long-range impacts to the agency or organization's resource area(s) for consideration in the EIS process.

The list of stakeholders is considerable, given the breadth of the Project scope. To support the EIS and the National Historic Preservation Act (Section 106) process, four groups were developed: Cooperating Agencies, Consulting Parties, interested Agencies, and the Community Communications Committee.

Individual stakeholder coordination was undertaken with entities who possess approval authority and/or are directly affected by the proposed action.

- DC Department of Transportation (DDOT) - FRA and the Project Proponents engaged in coordination with DDOT in a continuous manner throughout the Project, beginning in Spring 2015, to ensure SEP's goals were represented and integrated into the H Street Bridge Replacement Project, Benning Road and Georgetown extensions of the DC Streetcar, and the advancement of multimodal traffic and transportation analysis. DDOT coordination affected the development of the structural systems to support the deck and H Street Bridge, roadway planning on the deck level, and the multimodal transportation analysis. Please refer to the Appendix Compendium of Relevant Studies for more detail.
- DC Office of Planning (DCOP) – The Proponents and FRA met with DCOP twice in February 2018. DCOP provided comments related to the SEP's long-term sensitivity to the local context, the responsibility to provide adequate opportunities for connectivity at the Project edges, and the importance of placemaking to strengthen surrounding neighborhoods. In addition, DCOP noted concerns related to the reduction in the parking and bus programs and encouraged the minimization of time between modes to make travel as streamlined and pleasant as possible.
- Akridge – As an adjacent property owner, the Proponents and FRA met with Akridge several times over the course of the Project wherein Akridge was able to share their goals and objectives for the private air-rights development.
- Federal Protective Services (FPS) – The Proponents and FRA met with FPS several times throughout Concept Design and

Alternatives Refinement. In November 2017 and February 2018, the team shared the findings of the SEP Threat and Vulnerability Risk Assessment (TVRA) and discussed operational mitigations to incorporate into the Project. As a result of this coordination, the SEP confirmed that offsite freight screening could be accommodated by FPS.

- DC Office of Historic Preservation (DC SHPO) – Given the historic nature of the Washington Union Station complex, the DC SHPO has been continuously involved in the future planning of the station, including the development of the Washington Union Station Historic Preservation Plan (HPP) from 2015. The Proponents and FRA met with DC SHPO several times throughout the process, both as a consulting party to the Section 106 process, but also as an interested Agency. Following the Alternatives Refinement process, the DC SHPO articulated concerns regarding the potential visual effects from the development behind the station. In response, the Proponents and FRA designated an access zone within the Private Air-Rights in some Action Alternatives to allow access and daylighting to the SEP, thus preserving the opportunity for symmetrical development north of the historic station.
- US Commission of Fine Arts (CFA) and National Capital Planning Commission (NCPC) – Early in the Alternatives Refinement process in July 2017, the Project was presented to the NCPC commissioners. The goal of the presentation was to familiarize the commissioners with the scope, scale, and transformational nature of the Project, one of the largest planning efforts ongoing in the city. The Project was presented to the CFA in November 2019 and to NCPC in January 2020.

1.3.4 Public Comment

The retained preliminary concepts and preliminary screening results were presented to the public in October 2016. Based on the preliminary findings of the Alternatives Refinement process and continued coordination with Project stakeholders such as the Cooperating Agencies, Consulting Parties, and Akridge, FRA selected the DEIS alternatives in February 2018 and presented them to the public on March 22, 2018. Comments from the public and agencies in the March 2018 meeting informed the evaluation of the alternatives in the DEIS.

After the March 2018 presentation, the preliminary impact analysis, agency and stakeholder feedback, and continued coordination with cooperating agencies revealed several issues of and concerns with the Action Alternatives. To address these issues, FRA, working with the Proponents, refined the Action Alternatives and combined key features of two Action Alternatives to develop a sixth Action Alternative.

LIST OF STAKEHOLDERS

COOPERATING AGENCIES for the EIS include:

- Federal Transit Administration (FTA)
- National Park Service (NPS)
- DDOT
- NCPC

INTERESTED AGENCIES for the EIS include:

- Architect of the Capitol (AOC)
- CFA
- Deputy Mayor for Planning & Economic Development (DMPED)
- DCOP
- District Department of Energy and Environment (DOEE)
- DC HPO
- Federal Highway Administration (FHWA)
- Government Publishing Office (GPO)
- General Service Administration (GSA)
- Maryland Department of Transportation (MDOT)
- Maryland Transit Administration (MTA)
- Metropolitan Washington Council of Governments (MWCOG)
- Transportation Security Administration (TSA)
- Virginia Railway Express (VRE)
- Virginia Department of Rail and Transportation (VA DRPT)
- Washington Metropolitan Area Transit Authority (WMATA)

CONSULTING PARTIES to the Section 106 Process include:

- Advisory Council on Historic Preservation (ACHP)
- Akridge
- Amtrak
- Advisory Neighborhood Commission (ANC) 6C
- Architect of the Capitol
- Capitol Hill BID
- Capitol Hill Restoration Society (CHRS)
- CFA
- Committee of 100 on the Federal City (C100)
- DCHPO
- DC Preservation League (DCPL)
- DDOT
- Federal Highway Administration (FHWA)
- FTA
- Government Printing Office
- Greyhound
- GSA
- MARC/MTA
- MWCOG
- NCPC
- NPS
- National Railway Historical Society DC Chapter
- National Trust for Historic Preservation (NTHP)
- USRC
- VRE
- WMATA
- Megabus

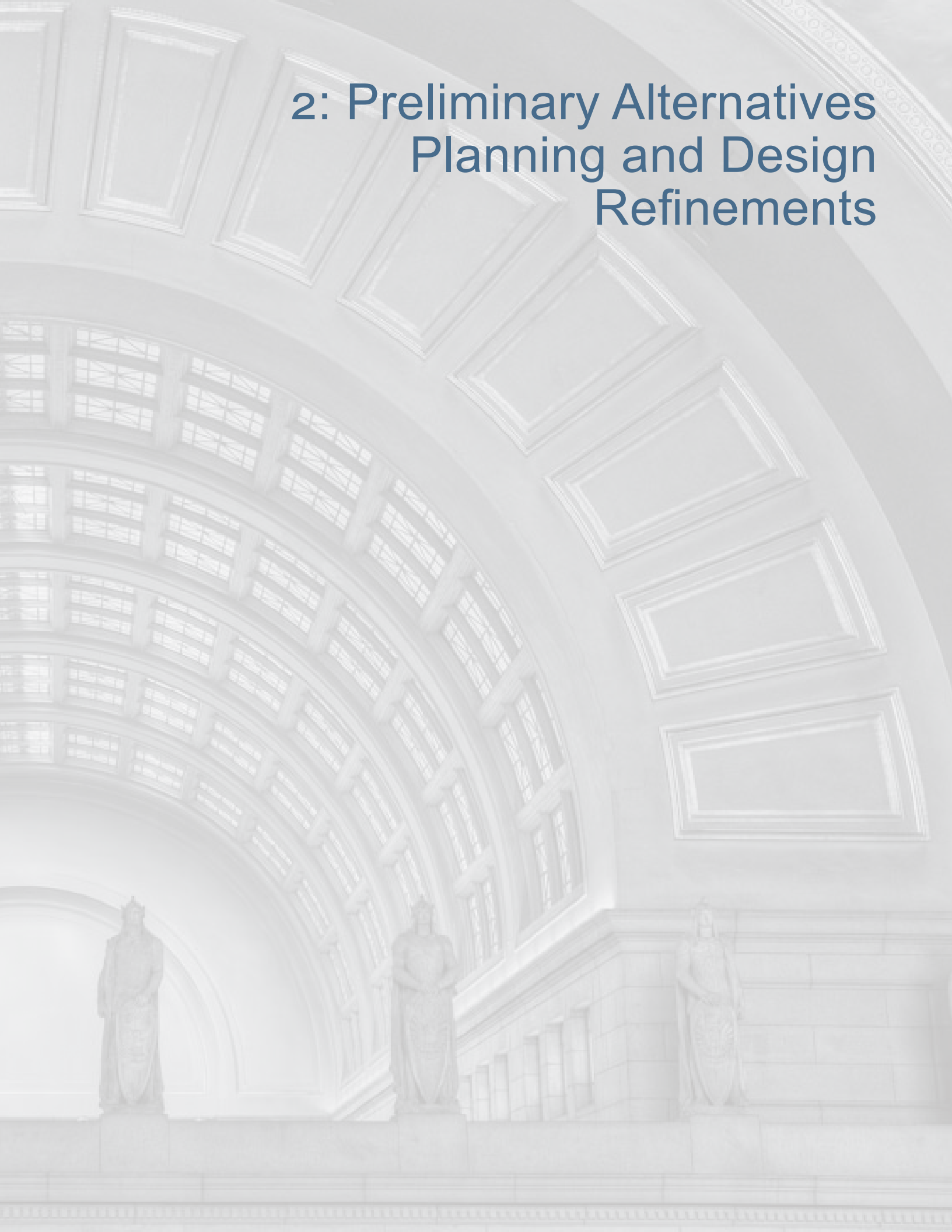
COMMUNITY COMMUNICATIONS COMMITTEE (CCC)

comprises residents of nearby neighborhoods, transit and rail users, and user groups and affected businesses and business groups. The CCC includes:

- American Bus Association
- ANC 6C
- Capitol Hill BID
- Capitol Hill Restoration Society
- Consortium for Citizens with Disabilities
- DCOP
- DDOT
- Destination DC
- Downtown BID
- MARC & VRE
- Mt. Vernon CID
- NoMA BID
- National Association of Railroad Passengers
- Transportation for America
- WMATA

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2: Preliminary Alternatives Planning and Design Refinements



2: Preliminary Alternatives Planning and Design Refinements

The Proponents, in coordination with FRA, modified and refined the Preliminary Alternatives based on updated programming assumptions, advanced technical coordination, stakeholder and agency engagement, and public comment. Below is a summary of the resultant changes.

2.1 REFINEMENTS TO DESIGN TO ENHANCE PASSENGER EXPERIENCE

During the Alternatives Refinement phase of work, FRA and the Project Proponents investigated three aspects related to passenger experience and advanced the level of design of the train hall and concourses related to:

- The air conditioning strategy in the concourses and train hall;
- Analysis of pedestrian flow within the station; and
- Passenger boarding and ticketing control strategies.

COMPARTMENTALIZATION

There are various approaches to regulating thermal comfort and air movement in the public areas of a major station like WUS. Different areas of the future station serve varying functions and have distinct circulation patterns that call for specific conditioning approaches.

Ultimately, strategies for compartmentalization must achieve a reasonable balance between cost, passenger comfort, safety, and passenger experience. With diesel trains operating at the station and attendant fumes, heat, and noise, it is important to comprehensively consider the environment of the enclosed areas (concourses, waiting areas, and train hall). In planning different areas of the station, compliance with requirements for life safety, ventilation, and health/safety must be satisfied while also optimizing passenger comfort. Therefore, the Proponents, in coordination with FRA, defined three distinct thermal zones for WUS:

- Unconditioned but Ventilated – Exterior or semi-enclosed areas, such as platforms, would have ventilation but there would be no conditioning and the temperature would reflect outside conditions.
- Conditioned – Interior areas, such as ticketing and lounges, retail (non-platform), and the concourses would be fully conditioned to optimize thermal comfort.
- Tempered – In other spaces, there would be a mix of conditioned and unconditioned air. A tempered environment can reduce overall energy costs and the visual impacts associated with the compartmentalization of space needed to support full conditioning. Examples of tempered areas include concourse spaces opening into unconditioned but ventilated areas such as the platforms.

After considering the balance of cost, passenger comfort, safety, and passenger experience, the Project Proponents and FRA developed a conditioning strategy combining these three thermal zones within WUS. To maintain this mixed conditioning approach, provide separation from diesel exhaust, and comply with building code requirements, a number of architectural strategies are employed:

- Full-height glazed walls separate fully-conditioned Concourse A from the unconditioned-but-ventilated platforms at platform level. These walls would provide full environmental separation while allowing shared access to views and natural light throughout the train hall.
- Full-height glazed walls separate fully-conditioned Concourse A from the partially-conditioned north-south concourse spaces at the lower level.
- Fully-conditioned H Street Concourse waiting areas would be separated from the partially-conditioned lower concourse level and from the unconditioned-but-ventilated platform level. Enclosure would be provided for waiting area VCEs at either platform or concourse level.
- Partially-conditioned concourse spaces would have some openings to unconditioned-but-ventilated platform areas. Approaches to reduce impacts from train exhaust, noise, and dust include partial-height walls at the top of concourse level and/or glazed floor areas at platform level.

STRUCTURAL REFINEMENTS

During the Alternatives Refinement process, the Proponents, in coordination with FRA, refined the proposed structural system to meet constructability goals while also facilitating the best possible passenger experience. There were several items that were modified as a result of this review, including:

- Local alternate concourse grids – The design goal of the preliminary alternatives was to improve passenger experience in the H Street and First Street Concourses and associated waiting areas by reducing the number of columns landing within them. Fewer visual obstacles would improve intuitive wayfinding and circulation, in addition to providing adequate openings in the structure for required elevators and escalators. Several local alternate grid configurations were studied, but ultimately the design team determined that an approximately 55FT x 45FT column grid would provide the best balance between the desired quality of service and structural demands in the primary passenger circulation areas.
- To accommodate the local alternate concourse grids noted above, overbuild-supporting column loads would be transferred at platform level to the track-supporting columns at concourse level. This system would result in increased column sizes, especially at the end columns in each line of transfers. These end columns would have to be elongated in order to accommodate the large lateral loads created by the transfers, and were carefully located to minimize impacts to the concourse levels.
- The Proponents, in coordination with FRA, modified train hall column locations for each Action Alternative to ensure

reasonable spans and coordinated with TI-14 to eliminate conflicts with run-through tracks.

- The Proponents, in coordination with FRA, analyzed impacts of column placements and foundations on all levels to ensure that space program requirements and other requirements were met such as parking counts.

PEDESTRIAN FLOW

The Project Proponents studied pedestrian flows to analyze the effectiveness of the preliminary alternatives in meeting projected 2040 pedestrian demand at WUS. The Proponents derived pedestrian flow volumes from Amtrak's proposed 2040 TI Operating Plan. Due to the similarity of all Preliminary Alternatives at the platform and lower concourse levels, the design team determined that the alternative with the most demanding train hall condition would be the subject of the analysis. Alternative E met this criterion because the mix of uses in the integrated train hall would likely create the highest level of pedestrian demand. Based on the analysis, there are several problem areas with implications for all alternatives:

- The level of service at the run-through platforms was not meeting Amtrak Station Program and Planning Guidelines (2013) due to issues with VCEs connecting them to the main level.
- The VCEs leading to WMATA Metrorail from Concourse A and the Lower Level Concourse were not meeting demand caused by connections to Metrorail, especially during the AM peak period. Refer to Appendix C for more information.

Based on the pedestrian flow analysis, the Proponents added additional vertical connections to the platforms for the run-through tracks to better accommodate the increased volumes associated with enhanced VRE service and potential MARC through-running service. The Proponents also added vertical connections between the platform level and the lower level concourse in Concourse A to enhance pedestrian movements to and from the WMATA Metrorail station.

Following architectural refinements, the design team developed a digital simulation model for additional analysis and confirmed that the Action Alternatives provide adequate circulation space. Please see the Pedestrian Flow Report (Appendix C) for additional detail.

PASSENGER BOARDING AND CONTROL

Current passenger boarding operations at WUS often cause queues to form into the passageways of the Claytor Concourse, compromising pedestrian circulation. No formal security screening of passengers occurs, apart from random searches, including canine searches, by Amtrak Police Department personnel. During the Alternatives Refinement step, FRA and the Proponents considered different approaches to improve future screening and boarding procedures. These approaches included individual-platform screening, screening for multiple platforms, or screening for all platforms through a few central screening areas.

Regardless of screening procedures, a range of alternative boarding procedures are also possible. These may include ticket scanners that give travelers access to waiting areas in advance of train boarding or more open boarding procedures that allow ticketed passengers greater access to platforms in advance of their train's departure.

MODIFICATIONS TO EAST-WEST TRAIN HALL

FRA received comments requesting the agency to consider solutions that would improve the connection between the east-west train hall and H Street NE and provide light to the Central Concourse (the subsurface Central Concourse provides the pedestrian connection between H Street and the east-west train hall). To address these comments, FRA and the Proponents refined the east-west train hall. A new H Street headhouse would compensate for the distance between H Street NE and the east-west train hall. The headhouse would provide an attractive entrance to WUS near the DC Streetcar stop. It would afford access to the tracks and platforms and to the east-west train hall via the Central Concourse. It would incorporate pedestrian access features at H Street above the Central Concourse.

MODIFICATIONS TO NORTH-SOUTH TRAIN HALL

Commenters also requested modifications to the north-south train hall so it would: cover more tracks; reduce barriers between the east and west sides of the train hall; and foster pedestrian activity rather than more vehicular activity than strictly necessary to serve the train hall. To address these comments, FRA and the Project Proponents sought to enhance customer experience and improve pedestrian accommodations by refining the north end of the train hall to create an opportunity for the construction of a plaza that would provide a quality public space and entrance to WUS from H Street NE. They also refined the concept for the roadway next to the train hall to provide adequate accommodations for pick-up and drop-off activities. In the process, FRA and the Proponents revised the width of the north-south train hall to accommodate structural requirements. The refined north-south train hall would cover three tracks instead of five.

MODIFICATIONS TO PARKING/BUS FACILITY NORTH OF H STREET

Based on the comments received and constructability information, FRA and the Project Proponents investigated potential alterations to the bus facility north of H Street NE. Concerns about the cost and complexity of constructing below-ground parking led FRA and the Proponents to explore reductions in the amount of below-ground parking for all alternatives. Therefore, FRA and the Proponents modified Preliminary Alternative 4B to accommodate a partial parking program above the bus facility, thus allowing for a reduction in the amount of below-ground parking.

In addition, FRA and the Project Proponents investigated limiting bus circulation from the north entrance of the bus facility to an intersection on the west side of the H Street Bridge for Alternative

4B. The facility should have two entrances to allow it to remain fully operational during maintenance activities or in case of incidents. To minimize the need for a second entrance, FRA and the Proponents initially considered a design with perpendicular, rather than angled, slips, which would have allowed buses to travel in and out of the same H Street Bridge access point. However, bus companies expressed safety concerns about perpendicular slips. Therefore, FRA and the Proponents reverted to the original angled slip configuration from Preliminary Alternative 4B but added a bus turning loop to allow the bulk of bus traffic to both enter and exit through the H Street access point. As a result of this refinement, FRA and the Proponents reduced the capacity of the bus facility to 25 slips.

2.2 MULTIMODAL TRAFFIC AND TRANSPORTATION MODIFICATIONS

TRAFFIC OPERATIONS ON H STREET

Public and agency comments revealed concerns about future traffic operations on H Street NE. The street would provide additional access points to WUS, the potential developments on both public and private air-rights, and the H Street Streetcar, while remaining a major east-west thoroughfare. Therefore, FRA and the Project Proponents worked with the District Department of Transportation (DDOT) to develop approaches to the traffic operations on H Street. FRA and the Project Proponents worked with various teams at DDOT, including the Planning & Sustainability, Transit Delivery, and Traffic Engineering & Safety Divisions of the Project Delivery Administration, as well as teams working on the H Street Bridge Replacement Project and the Benning Road and Georgetown extensions of the DC Streetcar.

As part of this work, FRA and the Proponents investigated how the different vehicular modes serving WUS would circulate on the deck-level roads connecting to H Street NE. To improve operations on the bridge, DDOT recommended that WUS adopt a one-way circulation pattern on the deck and minimize left-turn opportunities in and out of H Street. Based on this recommendation, FRA and the Proponents modified Alternatives A through E to establish an east-west, one-way deck circulation pattern for WUS-related traffic. The pattern would vary slightly depending on the alternative and the location of the various above-ground project element. Please refer to the DEIS for specific deck circulation assumptions patterns under each Action Alternative. Please refer to the DEIS for specific deck circulation patterns under each Action Alternative.

K STREET ACCESS AND OPERATIONS

Three of six preliminary alternatives would provide parking below the rail terminal. FRA and the Proponents assessed multiple potential locations for below-ground parking access in coordination with DDOT, taking into account Project needs and DDOT's vision for pedestrian and bicycle infrastructure at this

location as part of the K Street NE Corridor Safety Assessment. Following this effort, they found that the only feasible location for a parking ramp would be on K Street NE, between First and 2nd Streets NE.

Because this location still posed several challenges, FRA and the Proponents continued to evaluate K Street parking access during the Alternatives Refinement step. Between First and 2nd Streets NE, K Street NE runs under the railroad tracks, which cross the street on two bridges. Bridge-supporting columns are located between the street's two through lanes in each direction. In addition, the north and south masonry walls of the K Street NE underpass are contributing features to WUS as a historic property.

FRA and the Proponents considered four options for parking access in the K Street underpass: two single-entrance options and two double-entrance options. One single-entrance option was a right-in, right-out intersection on the south side of K Street NE. The other was a full-movement intersection, also on the south side. One double-entrance option provided two separate entrances on the south side of K Street NE. The other featured an entrance on each side of the street.

Analysis showed that the single-entrance, right-in, right-out option would not adequately accommodate the anticipated volumes of exiting vehicles. Among the double-entrance options, the south-side one would create unnecessary conflicts and require making two openings in the historic wall. The other double-entrance option would do the same, and additionally face substantial structural challenges. Therefore, FRA and the Proponents selected the single-entrance, full-movement intersection to move forward. The access road to the parking facility would consist of two lanes out and one lane in on the southern side of K Street NE. Constructing the new intersection would require removal of two bridge supporting columns and the addition of a transfer beam to allow for left turns into or from the parking facility entrance.

BICYCLE AND PEDESTRIAN ACCESS

To promote enhanced access to WUS, FRA and the Proponents further advanced pedestrian and bicycle access approaches during the Alternatives Refinement. Refinements included new entrances on First, 2nd, and H Streets NE that would provide adequate infrastructure for cyclists and pedestrians to access WUS comfortably and efficiently. They also included upgrades to sidewalks, crosswalks, bike lanes, bike parking, and Capital Bikeshare stations. Specifically:

- Bicycle parking, bikeshare, and bike storage facilities would be included adjacent to the First and 2nd Street entrances, and an interior bike parking facility would be considered for the H Street Concourse. The Proponents need to consider the fact that bicycles would likely be rolled through the concourses.
- The public identified needs for additional bike parking and bikeshare locations on both the East and West sides of the historic station.

- Safe bicycle access to, and across the front of the historic station has been identified as a problem. This problem could be addressed by making the front of the historic station a "walk your bike" zone.

FRA and the Proponents shared the proposed improvements with DDOT and refined them based on DDOT's comments. As design progresses, refinement of pedestrian and bicycle infrastructure options would continue in coordination with DDOT.

BUS AND OTHER MULTIMODAL USES ON FIRST AND G STREETS

FRA and the Proponents examined opportunities on First and G Streets NE, in coordination with DDOT, to accommodate a variety of multimodal uses. In response to DDOT's request, FRA and the Proponents:

- Removed pullout areas for pick-up and drop-off along First Street (so that pick-up and drop-off would occur at a traditional curbside)
- Focused bus operations on G Street NE and removed bus activity from First Street NE
- Worked to accommodate sidewalks along First Street NE that would be at least 12 feet wide

Refer to Section 3.4.4 for more information.

COLUMBUS CIRCLE ROADWAY MODIFICATIONS

Columbus Circle currently provides the main access to the station for pick-up/drop-off activity. There are currently two approach lanes that turn into a two-lane pick-up/drop-off area and two bus lanes for tour and charter buses. To the right of the bus lanes are two more lanes dedicated to for-hire pick-up activity. These vehicles access the station using the east ramp from H Street NE. The pick-up/drop-off lanes and the for-hire lanes are currently 9 feet wide each, and the bus lanes are 12 feet wide with 8-foot medians.

FRA received comments requesting traffic engineering changes to Columbus Circle and the pick-up and drop-off lanes in front of the historic station building. In response, during the Alternatives Refinement step, FRA and the Proponents developed proposed improvements to circulation on Columbus Circle that would provide greater capacity and reduce congestion. These improvements would reconfigure and simplify the multiple vehicular lanes now in front of the historic station building as well as the adjacent roadways. This would allow for more drop-off and pick-up activities and minimize queuing. FRA and the Proponents incorporated the improvements into the Action Alternatives.

FRA and the Proponents shared the improvements with DDOT in July 2017 and February 2018 as part of their ongoing coordination effort with this agency. The improvements were refined based on DDOT's feedback.

See DEIS Chapter 3: Pedestrian and Bicycle Access and Pick-Up and Drop-Off Areas for more detailed information.

UNION STATION WMATA METRORAIL STATION

Public and agency comments asked that FRA further evaluate the connection between WUS and the Union Station WMATA Metrorail station. The lower level concourse plan is common to all the preliminary alternatives. The plan envisions improved circulation to and from the Metrorail station. It also allows for the future construction, as a separate and independent project, of a central mezzanine at the Metrorail station that would tie into WUS concourses. To better accommodate the volume of passengers, FRA and the Proponents modified the design of SEP Concourse A to add VCEs for train passengers transferring to and from the Metrorail station.

2.3 OTHER CONSIDERATIONS

PUBLIC SAFETY AND SECURITY

As part of the Concept Development phase, the Proponents completed a SEP Threat and Vulnerability Risk Assessment (TVRA) in July 2016. The purpose of the SEP TVRA was to identify threats to WUS, develop mitigations, assess the impacts of the mitigations on the spatial configuration and programming of the concepts, and ensure that the concepts conformed to the TVRA recommendations.

During the Alternatives Refinement process, the Proponents and FRA continued coordination with the Federal Protective Service (FPS) and the Department of Homeland Security (DHS) to advance the planning of the concourses, loading dock, and bus facility. The current range of alternatives incorporates recommended safety and security principles such as clear sightlines, adequate and intuitive access for emergency responders, and spatial flexibility for future security measures. However, in subsequent stages of design, the Architect and Engineer of Record would develop specific design responses to the identified threats including more precise physical, electronic, and operational security measures.

OVERBUILD AND ZONING ASSUMPTIONS

The Project site is currently within the Production, Distribution & Repair Zone 3 (PDR-3) and Union Station North (USN) zoning designations and is directly adjacent to the private air-rights of a 14-acre area to the northeast of the historic station. A private developer acquired these air-rights in 2006 and subsequently applied for specific zoning for the property. In response to the request, the DCOP developed the USN Zoning District in 2011. A letter from DCOP dated March 6, 2018 confirmed that a change to USN zoning in the Federal air-rights parcel was reasonably foreseeable based on establishment of the USN. The nature of the potential air-rights development is undetermined but could be

symmetrical, pending the ultimate design by the private developer. In addition, NCPC is the zoning entity responsible for Federal property in DC, so continued coordination with both DCOP and NCPC would be required to inform the final parameters of the overbuild.

All alternatives utilize various portions of the private air-rights development and Federal air-rights areas for Project Elements, such as the train hall, parking, and bus facilities. However, the allocation of SEP and the private air-rights reflect different assumptions and vary between alternatives.

The bus facility in Alternatives A, B, and Alternative A-C would be built within the Federal air-rights volume. Alternatives C and D would use a portion of the private air-rights development area north of H Street for parking and/or for the bus facility. There is an opportunity to integrate private development with the parking structures in Alternatives A, B, C, and D. Alternative E would not utilize any private air-rights north of H Street. Note that private air-rights development is not part of this project, and that Federal air-rights are made available by this project but are not being transferred or developed as part of it.

Please refer to Appendix A for more detail.

CONSTRUCTABILITY INPUTS

From July 2017 to December 2018, Amtrak, in cooperation with USRC and FRA, led the preparation of a detailed cost and constructability analysis to analyze and evaluate the constructability of the Preliminary Action Alternatives.

A key requirement that influenced the phasing of all Action Alternatives was that construction must not significantly adversely impact the daily rail operations for Amtrak, MARC, and VRE.

Ultimately, the Amtrak analysis found that while it was possible to build the preliminary alternatives, the construction process raised challenges with regard to duration and cost. Several project aspects drive the project cost and duration of construction:

- The complexity of performing extensive construction in a dense urban environment, while maintaining traffic operations of the active rail terminal, bus facility, and parking facility.
- The extent of below-ground construction, such as the depth and footprint of excavation.
- The type of foundation that is appropriate for the depth of excavation.
- Limitations of work zones restrict what can be taken out of service at one time and are complicated by setbacks to enable construction vehicle maneuvering and movements.

As a result of the Cost and Constructability coordination, FRA and the Proponents decided to modify the alternatives while retaining a range of below-ground elements for consideration.

To achieve this, FRA and the Proponents reduced below-ground parking and took advantage of the reduced Amtrak operational space, or "back of house" programs, to minimize excavation under the run-through tracks on the east side of the rail terminal. This reduction in below-ground space would lower the cost and duration of construction and minimize track outages.

However, the removal of parking underneath the run-through tracks required two levels of below-ground parking to meet the full parking program. To evaluate options that would limit below-ground parking to one level, FRA and the Proponents identified additional alternatives that moved some of the below-ground parking to above-ground locations. This split parking program options are Alternatives C and D.

The *Terminal Infrastructure Project Constructability Report* provides additional information on constructability.

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3: Action Alternatives



3: Action Alternatives

3.1 OVERVIEW

As a result of the concept screening, concept refinement, alternatives refinement, and construction analysis, six Action Alternatives were identified, renamed for simplicity, and carried forward in the EIS process:

- Preliminary Alternative 1A was renamed Action Alternative A
- Preliminary Alternative 1B was renamed Action Alternative B
- Preliminary Alternative 4AB was renamed Action Alternative C
- Preliminary Alternative 5AB was renamed Action Alternative D
- Preliminary Alternative 5B was renamed Action Alternative E
- Action Alternative A-C

Alternative C includes two options for the placement of the bus facility and parking facility.

This Chapter provides detailed information and diagrams for each Action Alternative, as well as elements common to all alternatives and the elements that vary.

3.2 NO-ACTION ALTERNATIVE

While the purpose of the *Action Alternatives Refinement Report* is to document the Action Alternatives, it is necessary to include the No-Action Alternative within the DEIS alternatives.

The No-Action Alternative reflects the state of the environment in the absence of the Project in the horizon year of 2040. The future state of the environment includes the effects of projects that would result in changes to existing conditions in the Project Area and have independent utility relative to the Project.

Where no changes are anticipated to occur, the No-Action Alternative consists of the continuation of existing conditions at WUS and in the Project Area. For more detailed information on the No-Action Alternative, please see DEIS Chapter 3 Section 3.4.1.

3.3 DESCRIPTION OF ACTION ALTERNATIVES

ELEMENTS COMMON TO ALL ALTERNATIVES



TRACK & PLATFORMS



CONCOURSES



PED & BICYCLE ACCESS



FOR-HIRE



RAIL SUPPORT FUNCTION



SERVICE ACCESS & LOADING



SUPPORT SYSTEMS



PASSENGER AMENITIES

ELEMENTS THAT VARY BY ALTERNATIVE



TRAIN HALL



BUS FACILITY



PARKING

3.3.1 Action Alternatives A and B

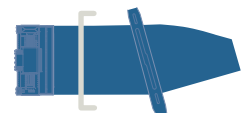
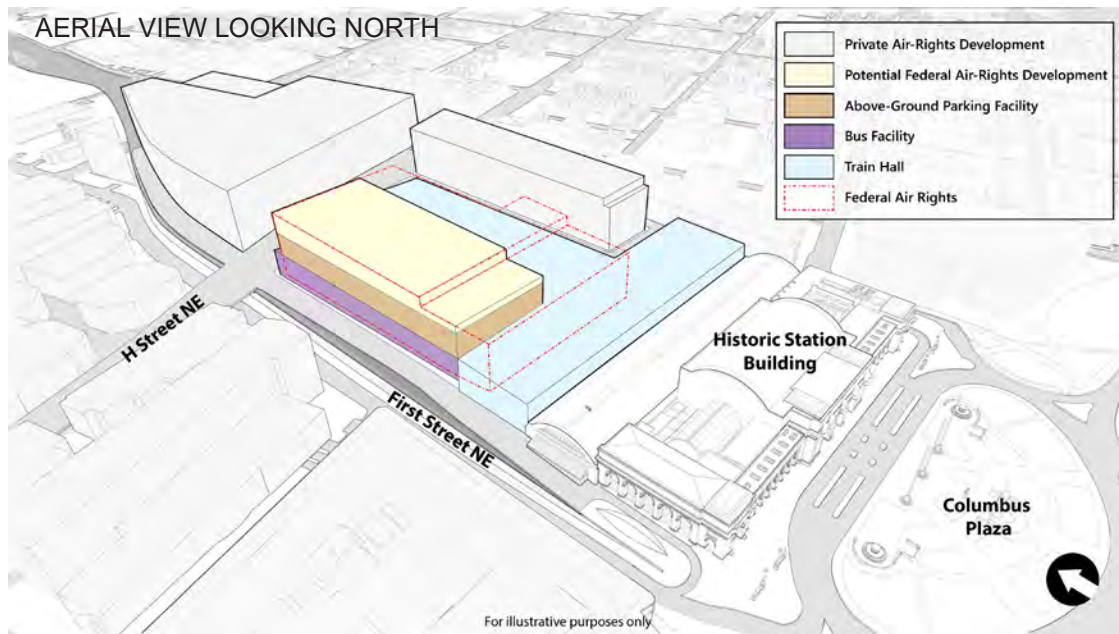
Alternatives A and B have a north-south train hall configuration with a southwest bus facility that can be accessed from H Street and through Concourse A. A new entry point from H Street would bring people down to the H Street Concourse, while two entry points would bring people down to the Central Concourse from the street level.

In Alternative A, parking is located above the bus facility while in Alternative B, parking is below the train station on two levels. In

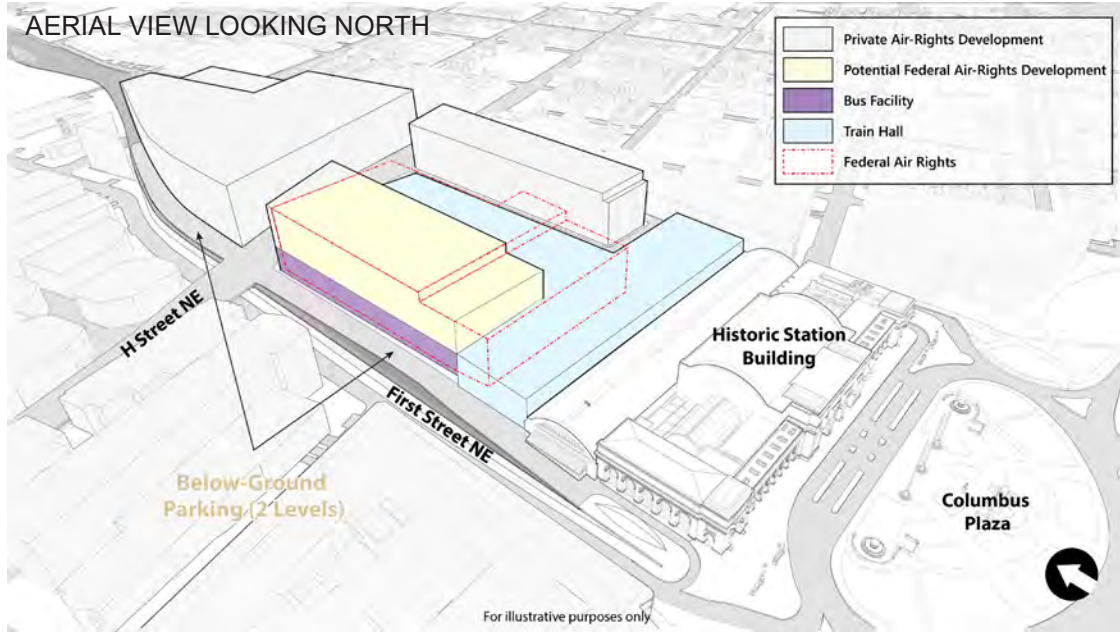
Alternative A, the parking program is 1,659 cars. In Alternative B, the parking program is 2,017 cars with 917 cars on parking level B1 and 1,100 cars on parking level B2.

In Alternative A, the maximum development envelope for the Federal air-rights lot is 323,720 GSF. In Alternative B, the maximum development envelope for the Federal air-rights lot is 917,420 GSF.

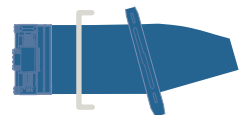
ALTERNATIVE A



ALTERNATIVE B



SECTION PERSPECTIVE LOOKING NORTH



3.3.2 Action Alternative C, East and West Options

Alternative C has an east-west train hall. The main bus facility and parking would be north of H Street NE on the eastern or western land parcel. In Alternative C, parking is split between the B1 level of the SEP and above the bus facility. The parking program is 1,709 cars with 792 cars on parking levels above grade and 917 below grade.

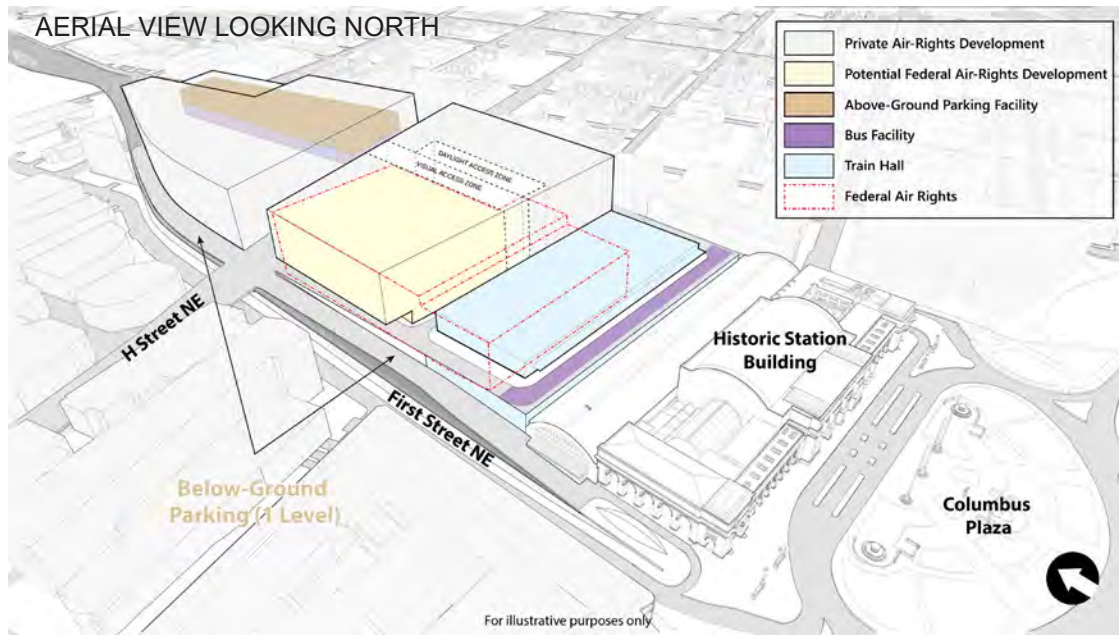
Between the historic station and train hall, buses would be able to pick up and drop off passengers. Passengers would have direct

access to the streets from Concourse A via VCEs. A secondary entrance on H Street brings streetcar passengers and deck level users to both the Central and H Street Concourses.

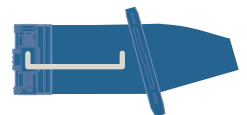
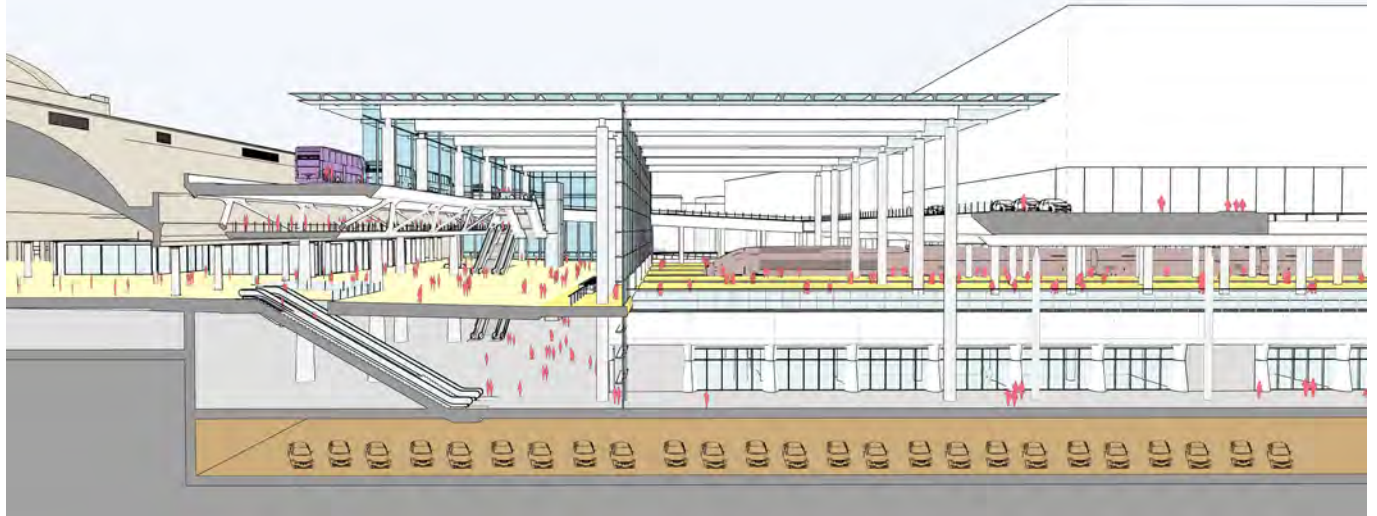
In Alternative C, East Option, the bus facility and parking is on the east side of the site. In Alternative C, West Option, the bus facility and parking is on the west side of the site.

For Alternative C, East and West Options, the maximum development envelope for the Federal air-rights is 952,600 GSF.

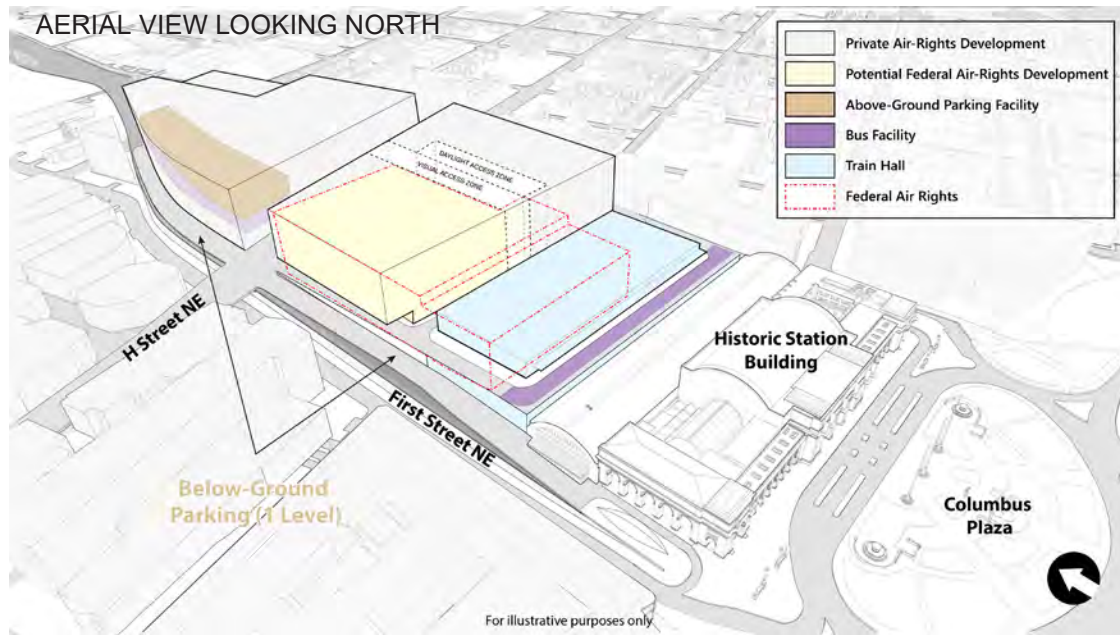
ALTERNATIVE C, EAST OPTION



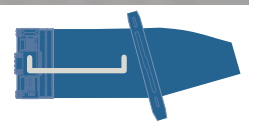
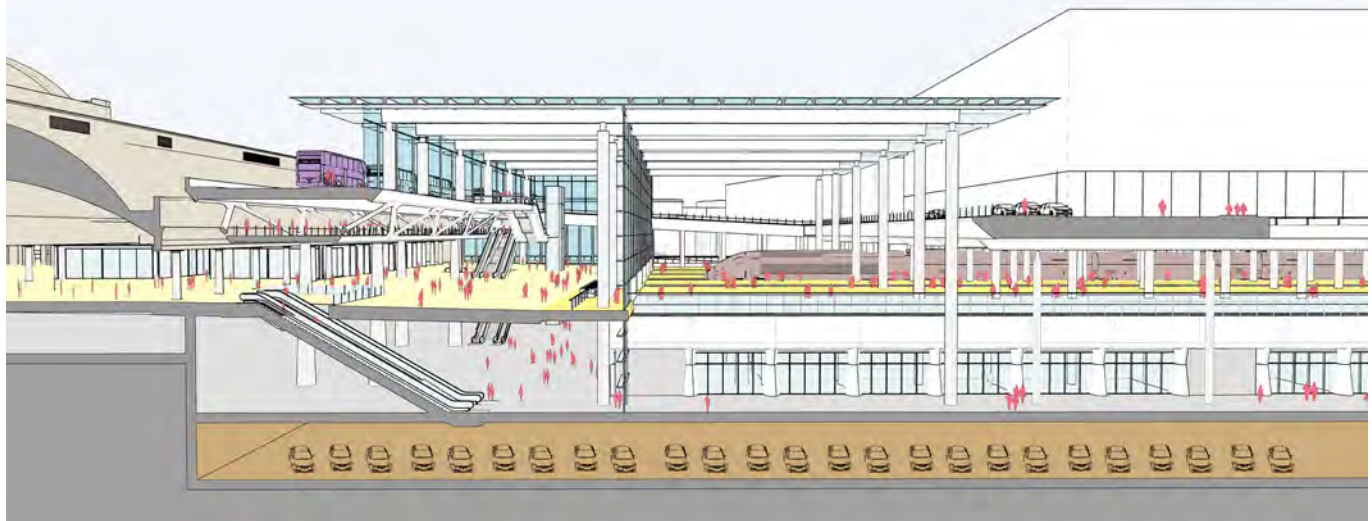
SECTION PERSPECTIVE LOOKING WEST



ALTERNATIVE C, WEST OPTION



SECTION PERSPECTIVE LOOKING WEST



3.3.3 Action Alternatives D and E

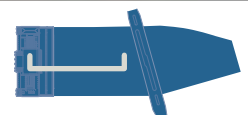
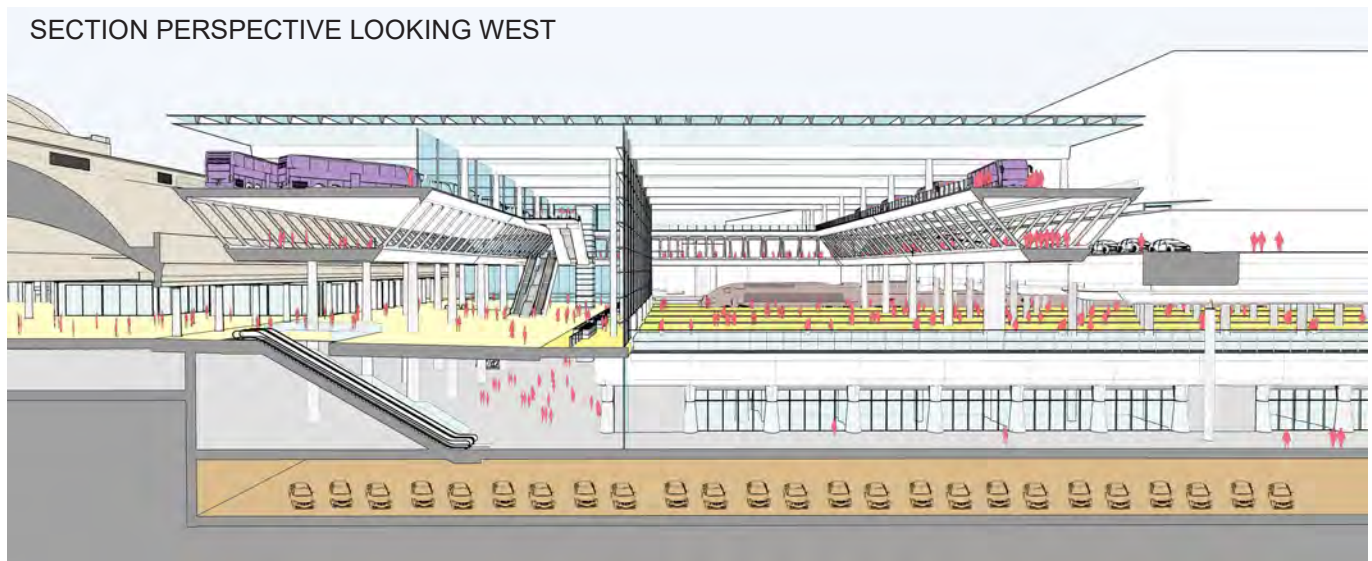
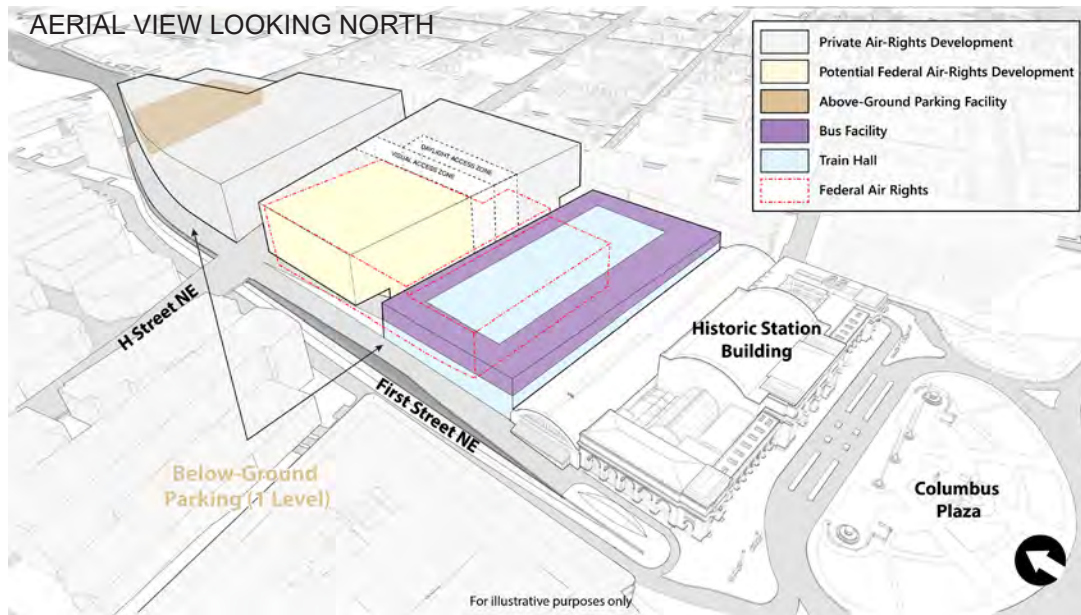
Alternatives D and E have an east-west train hall. The bus facility is integrated with the train hall.

In Alternative D, parking is split between one level (B1) beneath the stub-end tracks and Central Concourse areas and a parking structure north of H Street above the tracks. The parking program is 1,709 cars with 756 cars on parking levels above grade and 917 below grade.

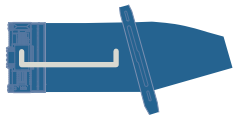
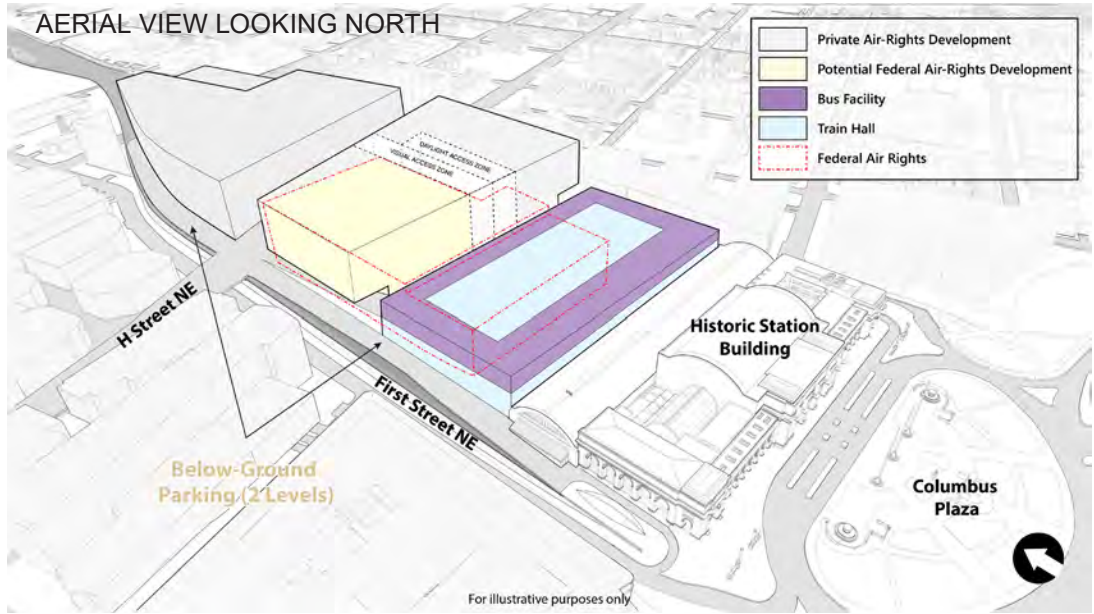
In Alternative E, the entire parking is under the stub-end tracks with the same footprint as Alternative D, but on two levels (B1 & B2). The parking program is 2,107 cars with 917 cars on parking level B1 and 1,100 cars on parking level B2.

For Alternative D and E, the maximum development envelope for the Federal air-rights lot is 688,050 GSF.

ALTERNATIVE D



ALTERNATIVE E



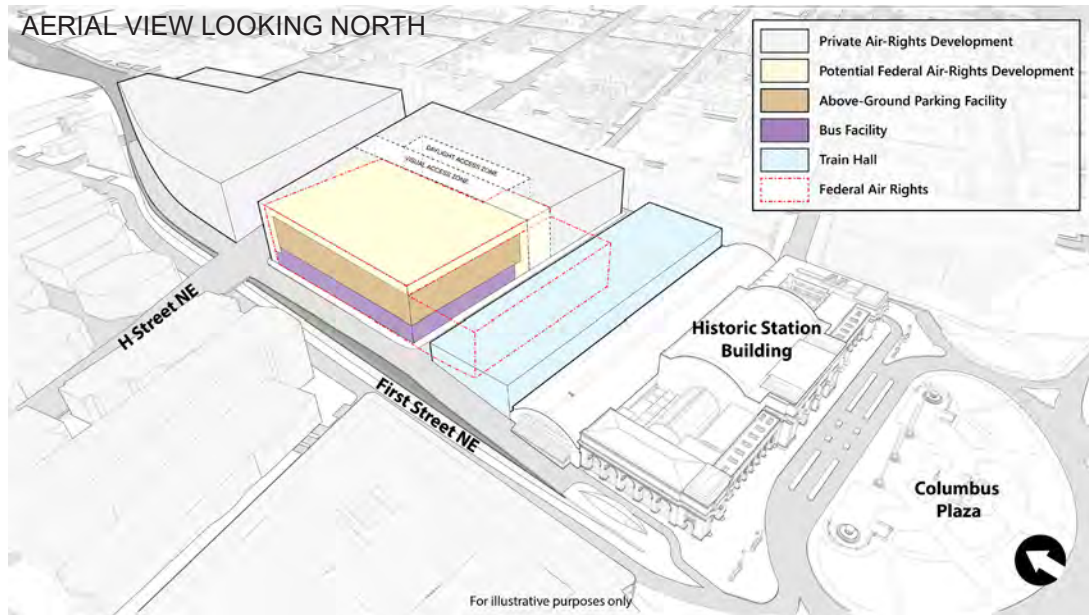
3.3.4 Action Alternative A-C

Alternative A-C features an east-west train hall similar to Alternative C. The bus facility would be located in the southwest corner of the Project Area similar to Alternative A with the new parking facility above it, in the approximate area where the existing parking garage now stands. The parking program is 1,626 cars with 280 cars on each of six levels.

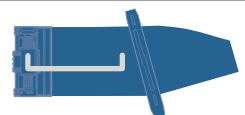
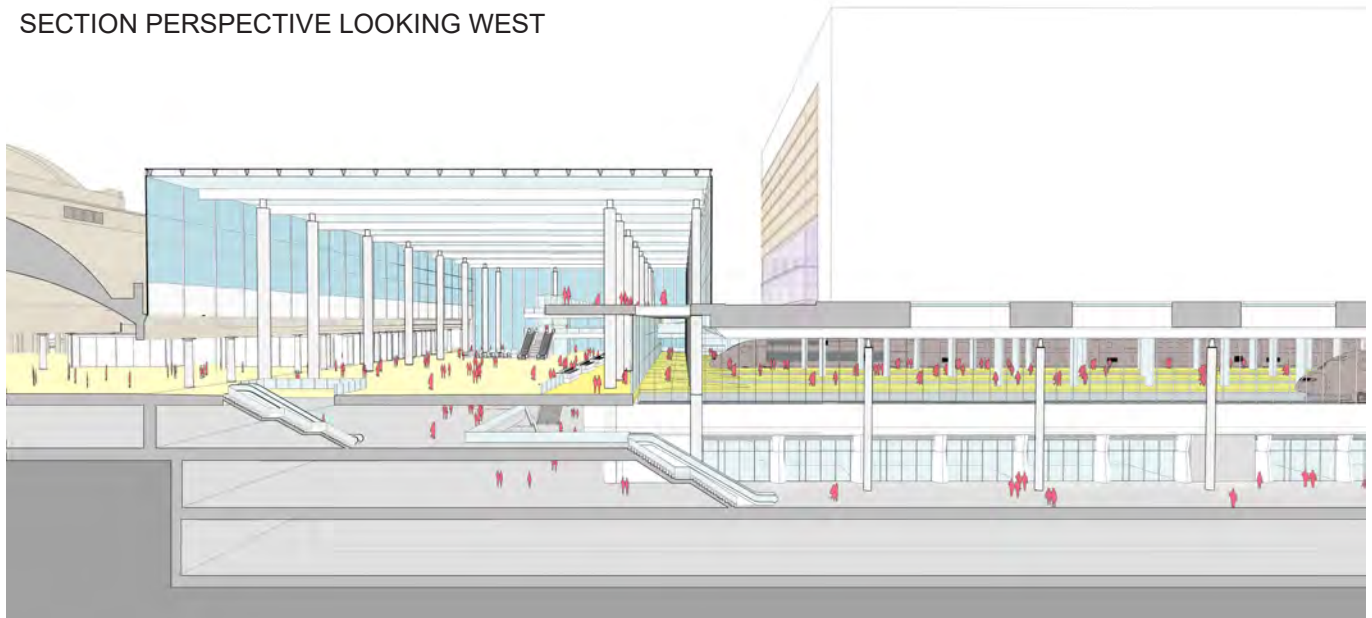
The remaining Federally-owned air rights within the footprint of the existing bus facility and parking garage could be available for future development (such development is not part of the Project). In Alternative A-C, the maximum development envelope for the Federal air-rights lot is approximately 380,000 GSF.

The detailed process by which the FRA and Project Proponents identified this alternative is documented in Chapter 3 of the DEIS.

ALTERNATIVE A-C



SECTION PERSPECTIVE LOOKING WEST



3.4 ELEMENTS COMMON TO ALL ACTION ALTERNATIVES



3.4.1 Tracks and Platforms

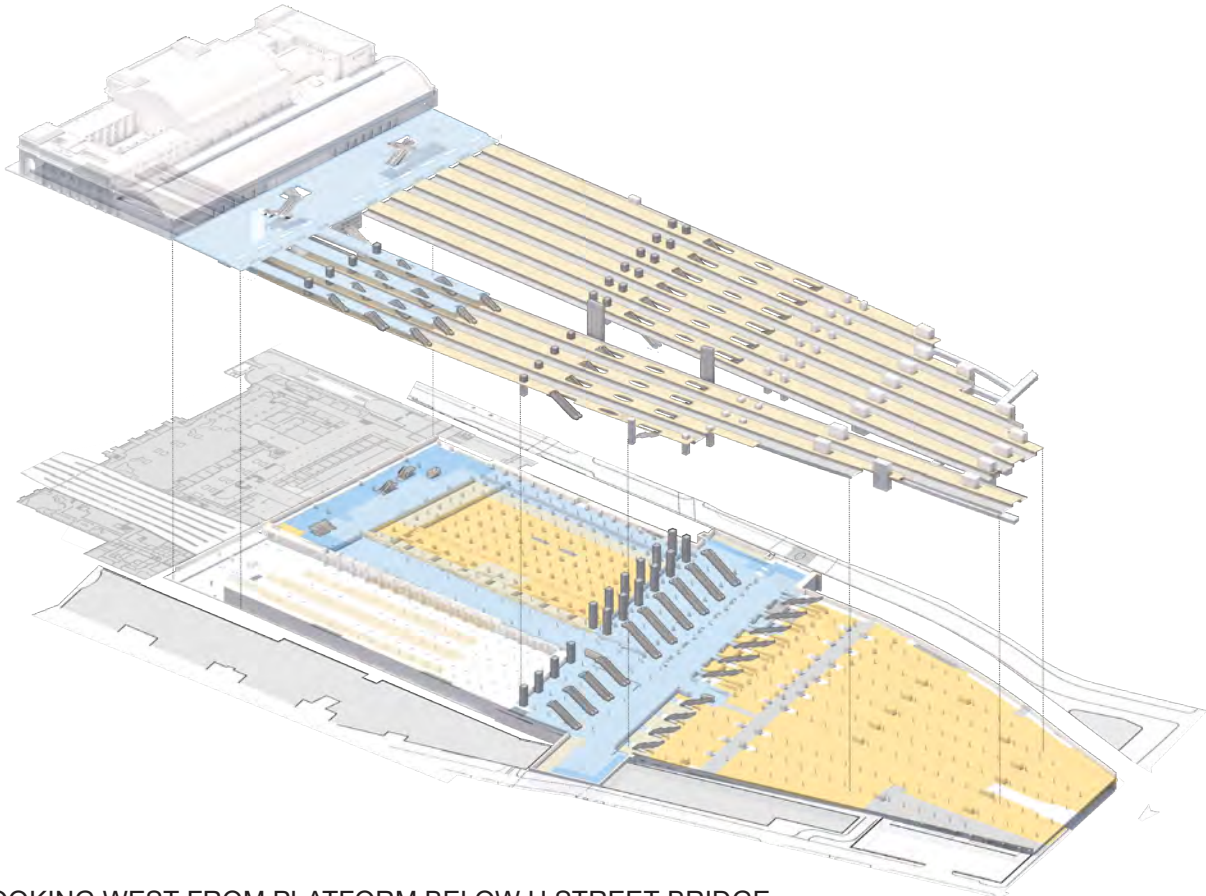
There are two final options for the track and platform layout: Option 14 and Option 16. Both options are similar in that they support rail operations for the planning horizon year of 2040. The planning of the expanded WUS is largely defined by the track and platform layout.

Each option provides 19 new tracks: 12 stub-end tracks on the west side and seven run-through tracks on the east side. The stub-end platforms would be at the same elevation as Concourse A, allowing direct access for passengers coming in through the southern end of the station. The run-through platforms would be at a lower elevation. Passengers would reach these platforms via VCEs at the northern edge of Concourse A. VCEs in the middle of all platforms would bring passengers down to the H Street

Concourse. The track and platforms would be open on both the east and west sides of the rail terminal to let in light and air. Rail support would have access to the tracks and platforms via dedicated service elevators at the north end without having to cross any tracks and with minimal disruption to passengers.

Each platform would have egress points consistent with NFPA130 5.3.3.5. A summary of the conceptual approach to egress is provided in Appendix A. Also see the *Concept Development Report*.

The two TI options would create different conditions for the Central Concourse on the level below (see Appendix A).



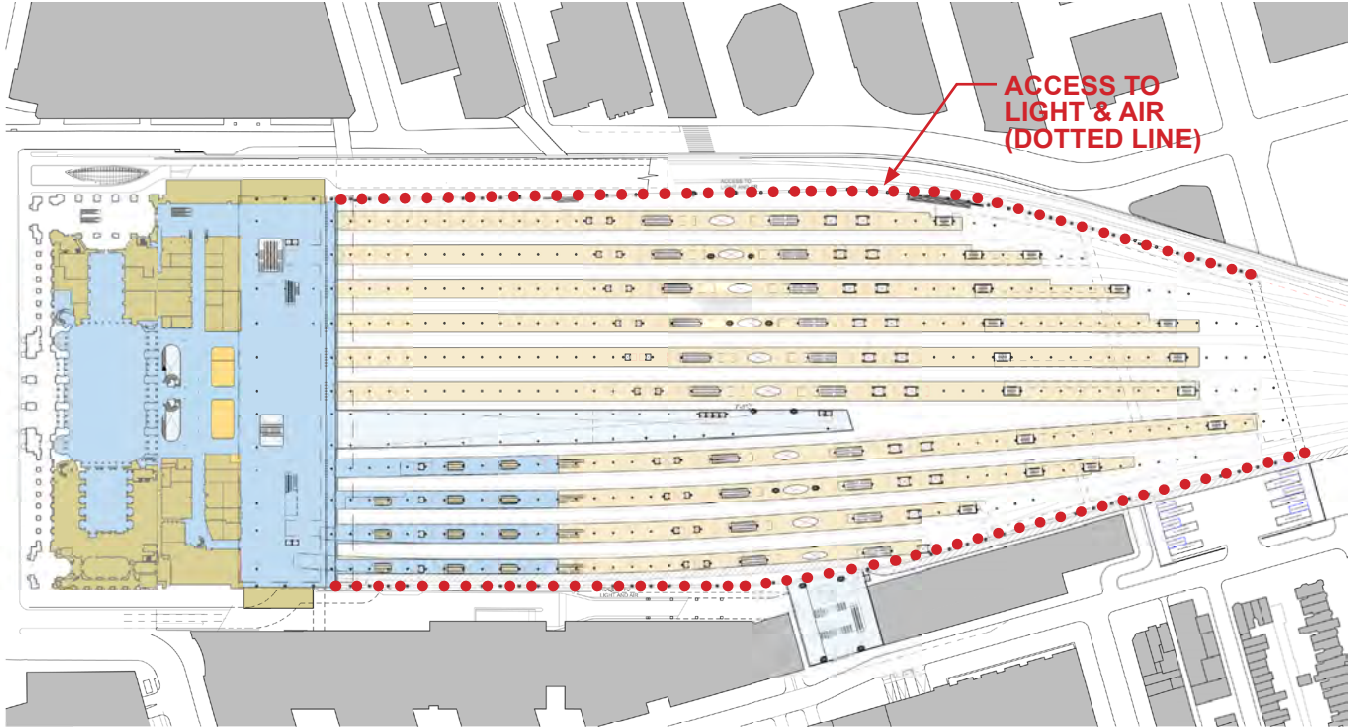
VIEW LOOKING WEST FROM PLATFORM BELOW H STREET BRIDGE

TI OPTION 14

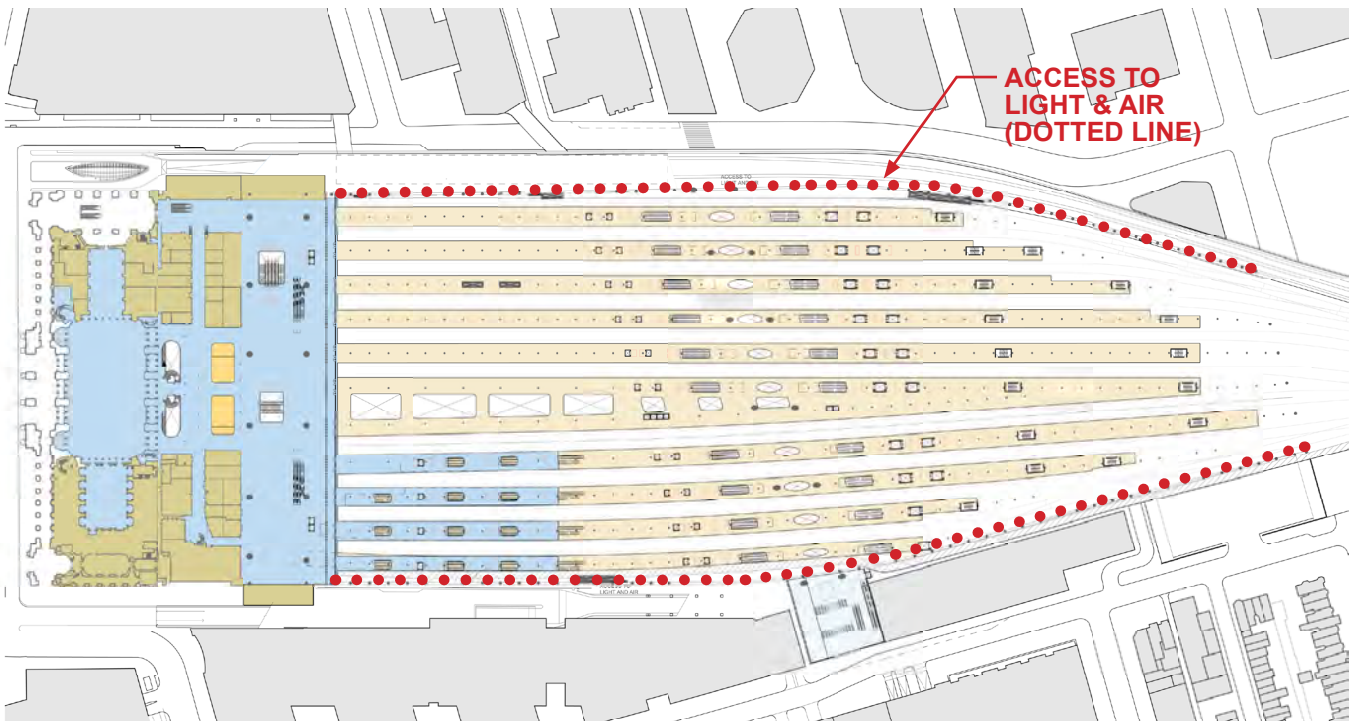
In TI Option 14, the Central Concourse divides the stub-end tracks and platforms from the run-through tracks and platforms. This option allows the Central Concourse to have a higher ceiling height that would be capped by the overhead deck level buildings.

TI OPTION 16

This option is largely identical to Option 14, except the easternmost stub-end track splays eastward. As a result, the easternmost stub-end platform would be extra wide, and would incorporate skylights along the center to bring light down to the Central Concourse.



TI OPTION 14



TI OPTION 16



3.4.2 Concourses and Retail

Several new concourses would facilitate public access to and circulation through WUS. The concourses would connect the various transportation modes serving the station, including the train platforms, the bus facility, the WMATA Metrorail station, and the H Street Streetcar. Additionally, they would offer various services and amenities. These may include information, ticketing, and baggage services. Waiting areas would provide secure and organized access to the platforms. Retail would be available for passengers and visitors circulating through the station.

A secondary function of the concourses is for emergency egress. Egress stairs connect from the below-grade parking levels in Action Alternatives B, C, D, and E through the First Street or Central Concourses and out to First and 2nd Street via the H Street Concourse.

CONCOURSE A

A new east-west concourse, Concourse A, would replace the Claytor Concourse and would connect directly to the existing Retail and Ticketing Concourse in the historic station building. Concourse A would also connect directly to the stub-end platforms, providing more room for passenger amenities, including retail, and the WMATA Metrorail station. Concourse A would contain or maintain adjacency to passenger amenities and services including retail, information, police station, ticketing, and baggage services.

Concourse A would provide an organized and secure means to access the platform and would be the primary circulation providing

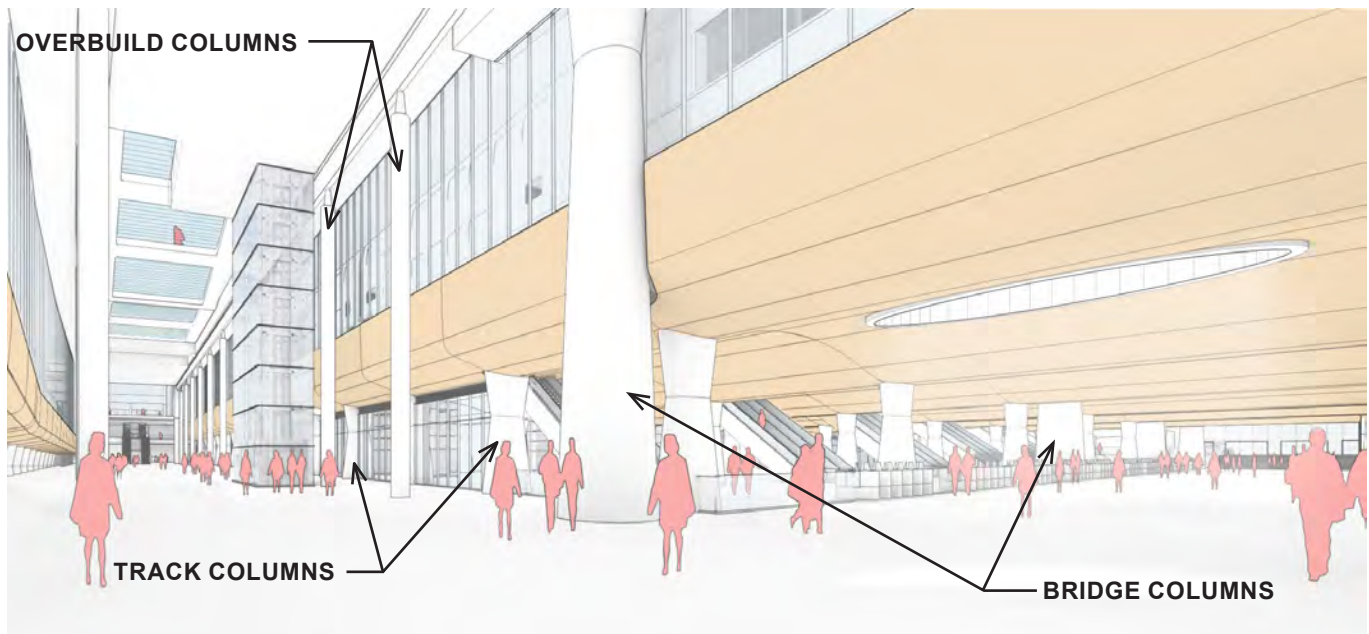
direct access to WMATA Metrorail and the bus facility in Action Alternatives A, B, D, E, and A-C.

CENTRAL CONCOURSE

The Central Concourse would connect Concourse A to the H Street Concourse and would have new retail uses for passengers and visitors. Depending on the rail configuration, the retail would either be along one side of the concourse or along both (see Appendix A).

H STREET CONCOURSE

The H Street Concourse provides additional circulation to and from the center of the train platforms to 1st and 2nd Streets NE. This concourse would be important in accommodating the required capacity for the increased passengers in the future, easing the demand capacity on Concourse A, and being a convenience for passengers whose destinations and points of origin are closer to H Street, 1st, and 2nd Streets NE than Columbus Circle. Passenger amenities and services would include information, police station, ticketing, baggage services, and retail. New waiting areas would facilitate movement up the escalators or elevators connecting to the platforms. The H Street Concourse would connect the neighborhoods east and west of WUS with entrances at First Street and 2nd Street. VCEs would bring people up to H Street NE, providing a transfer point to the H Street streetcar in all Action Alternatives and to the bus facility in Alternative C.



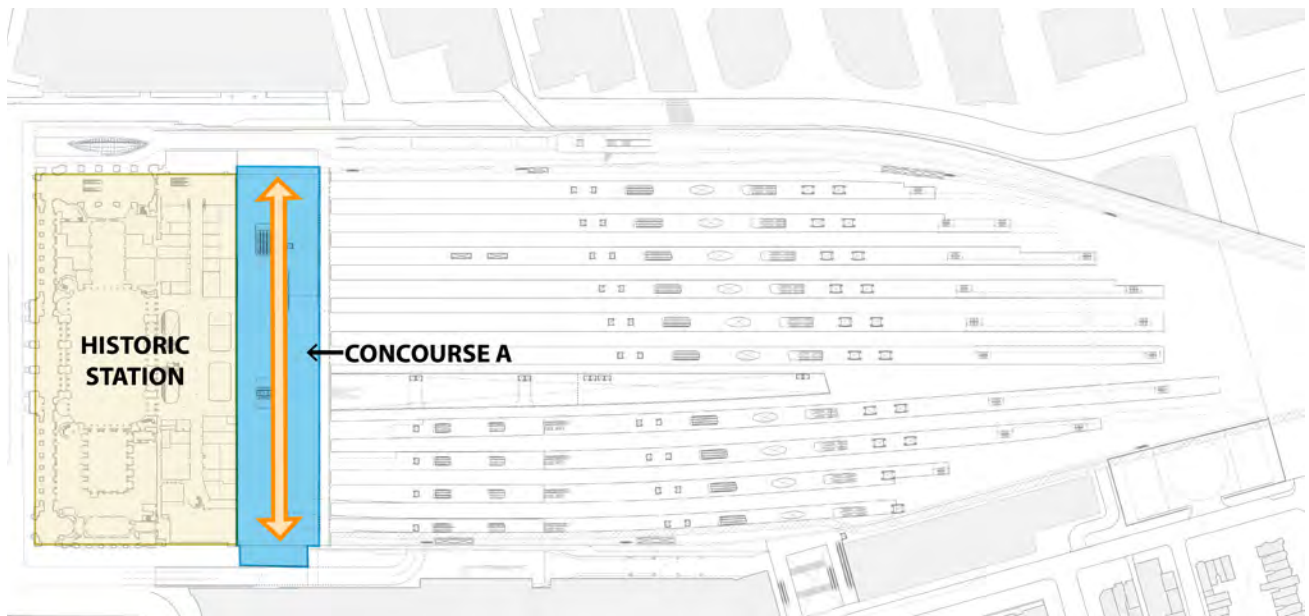
VIEW LOOKING WEST TOWARD FIRST STREET ENTRANCE FROM H STREET CONCOURSE

3.4.3 Passenger Amenities

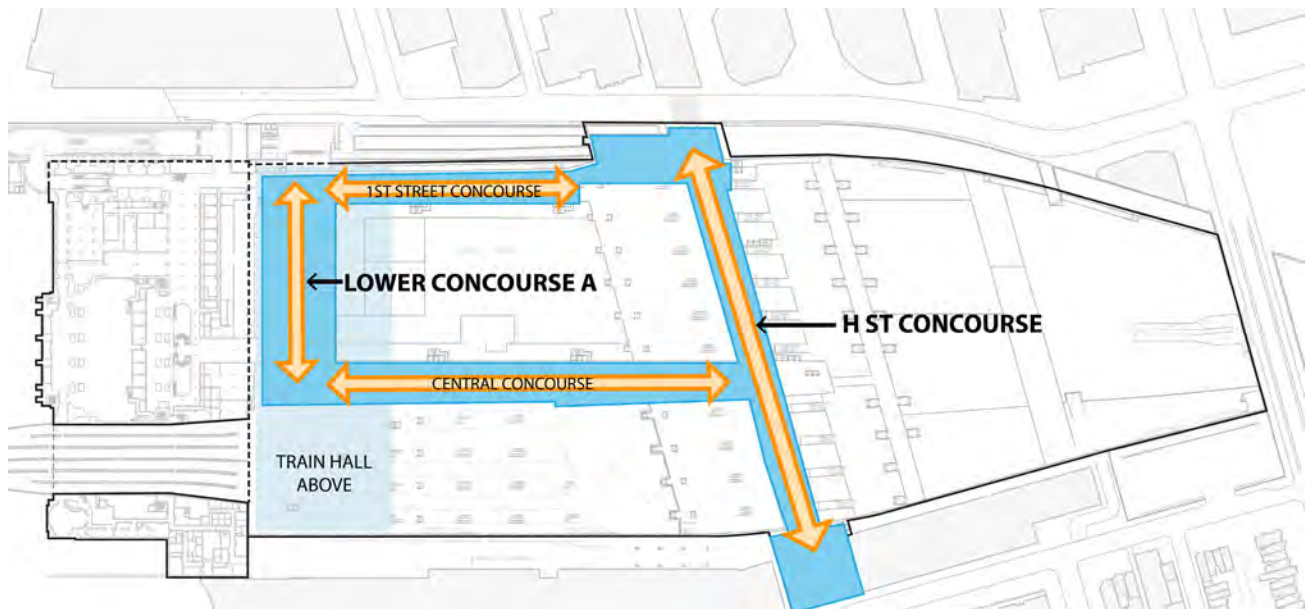
FIRST STREET CONCOURSE

This north-south concourse would run parallel to First Street NE and connect the H Street Concourse to Concourse A and the WMATA Metrorail station. Retail would be available along the concourse.

In addition to the existing passenger amenities located within the Retail and Ticketing Concourse, additional passenger amenities would be located within the concourses of WUS. Concourse A and the H Street Concourse are currently proposed to serve ticketing, information, waiting, and other rail related amenities as they connect passengers directly to the platforms. However, existing and future agreements could change these assumptions. Club Acela would likely be located above Concourse A, within its volume, or immediately adjacent depending on the alternative. While retail would be found throughout all the concourses, the Retail and Ticketing Concourse, Central Concourse, H Street Concourse, and First Street Concourse are currently proposed to contain the bulk of the new retail.



MAIN LEVEL CONCOURSE PLAN DIAGRAM



LOWER LEVEL CONCOURSE PLAN DIAGRAM

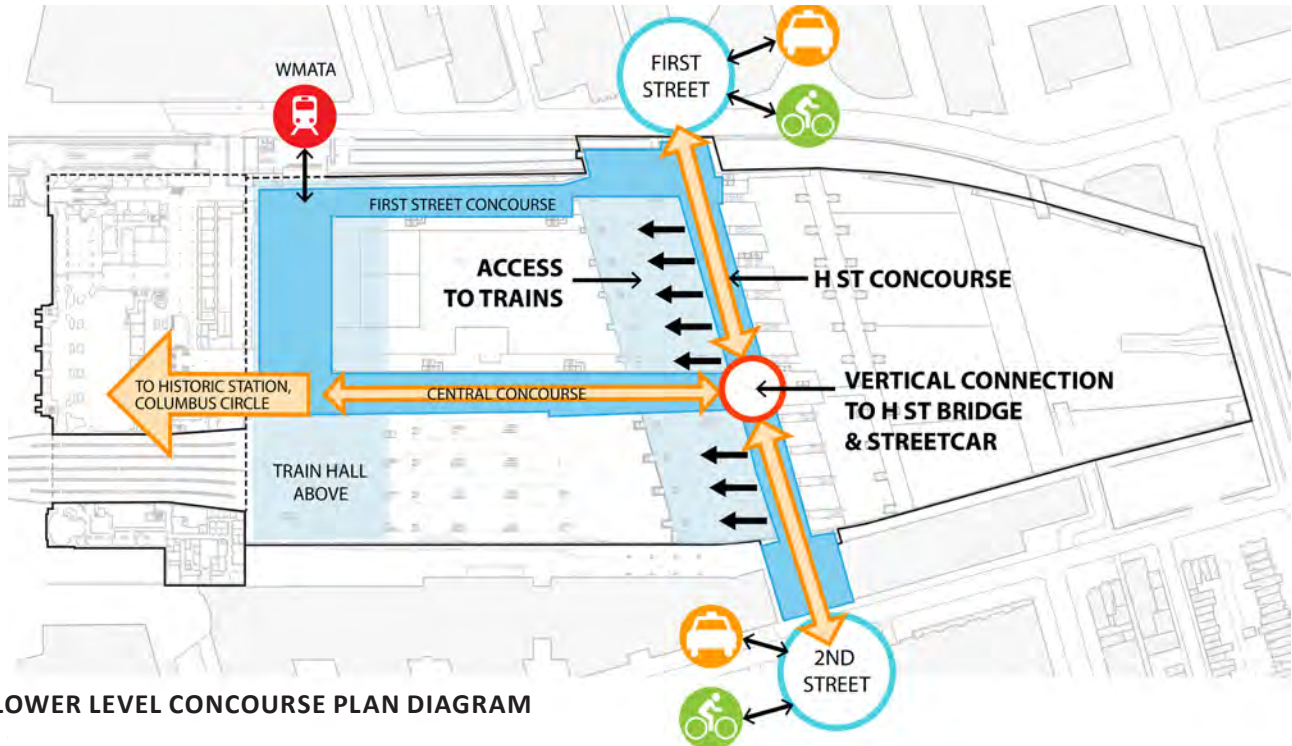
3.4.4 Pedestrian, Bicycle, and For-Hire Access

In addition to the existing entry through Columbus Circle into the historic station, each alternative has entrances at First Street and 2nd Street under the H Street Bridge. These new entries would link passengers to the H Street Concourse. Furthermore, there would be a link from the First Street entrance to the WMATA Metrorail entry via the First Street Concourse. Car and taxi drop-offs and bicycle facilities along the new entrances would allow for the efficient movement of passengers into the station.

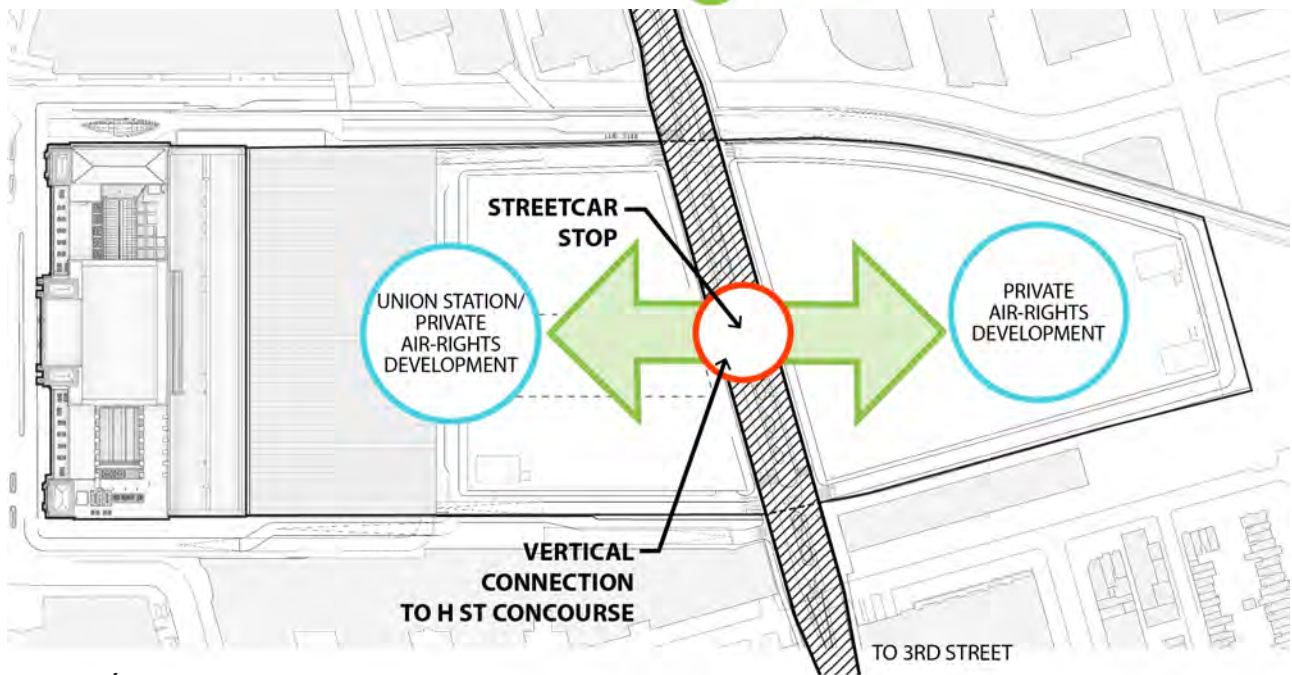
At the center of the H Street Concourse, there would be a direct connection via VCEs to the H Street level in all alternatives. From there, passengers would be able to transfer to the Streetcar, or in Alternative C, to the bus facility.

BICYCLE FACILITY, TAXI, AND FOR-HIRE

The Action Alternatives would all include pick-up and drop-off taxi locations near all major concourses. The Project concepts



LOWER LEVEL CONCOURSE PLAN DIAGRAM

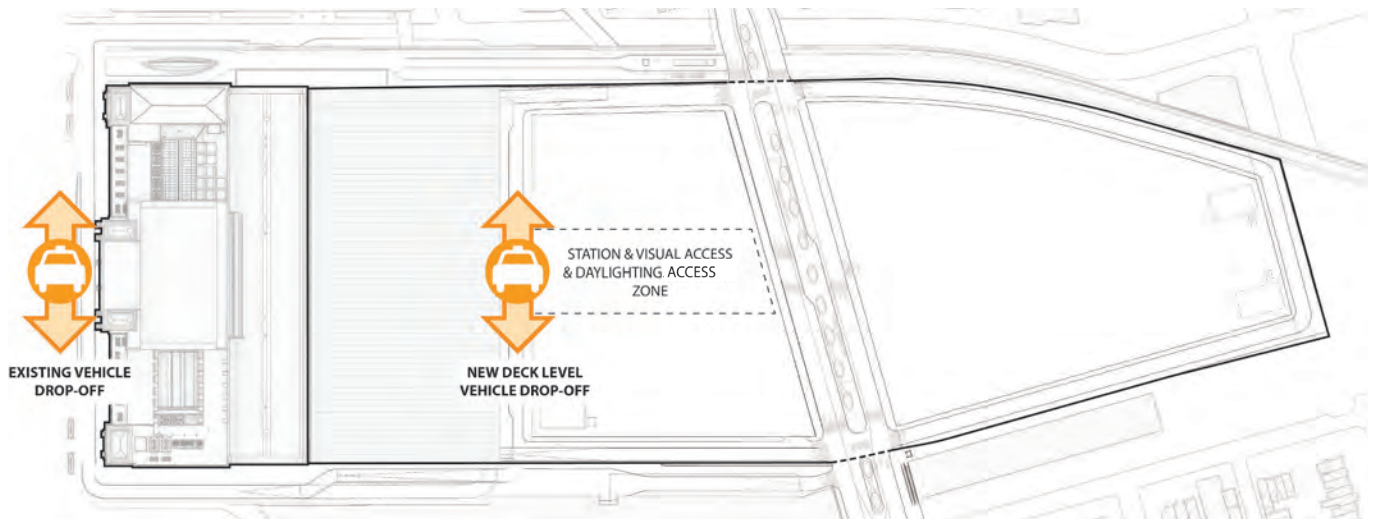


H STREET/DECK LEVEL PLAN DIAGRAM

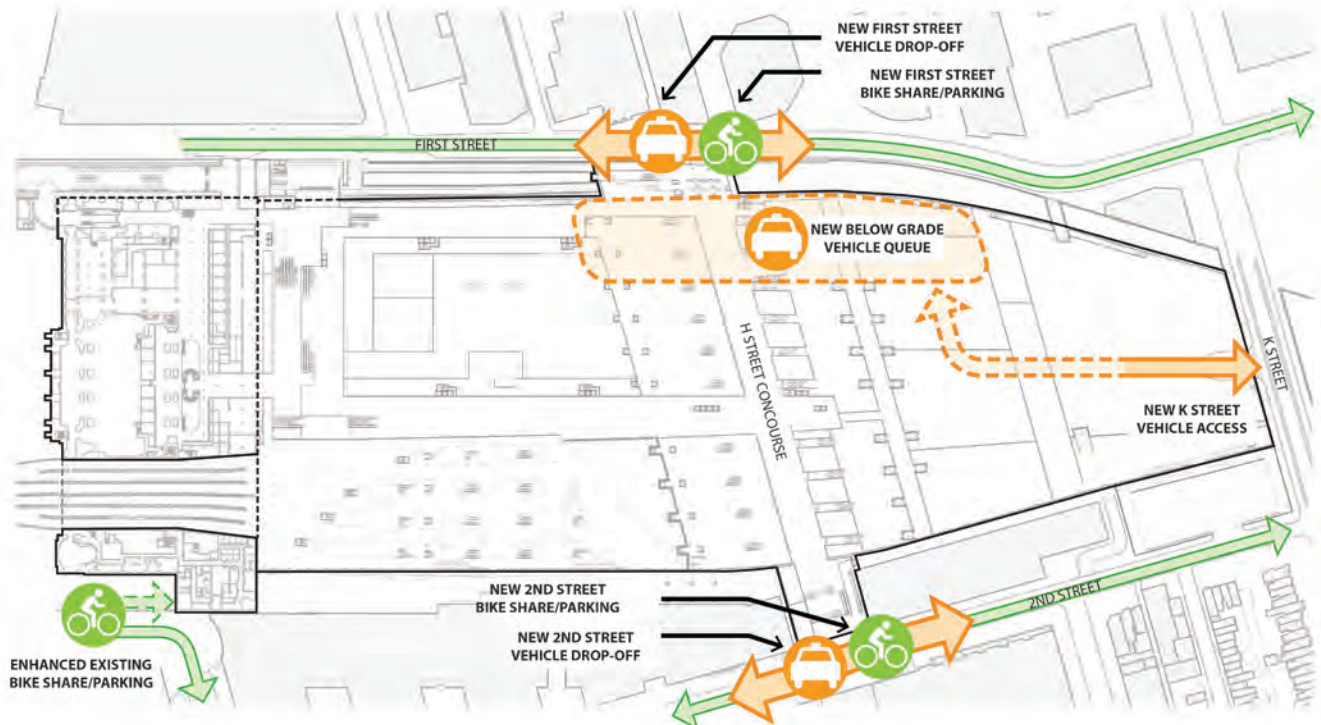
to incorporate for-hire vehicles included pick-up and drop-off areas at the front of the historic station; in an on-site facility; on the same level as H Street NE; and on First and 2nd Street NE. Providing new locations would increase the throughput capacity of for-hire services to pick up and drop off passengers.

In addition to street level pick-up/drop-off, there is an option for below-ground for-hire pick-up on the B1 level for pertinent Action Alternatives. Vehicles would have access to the below-ground loop via a ramp on K Street.

All concepts and alternatives envisioned enhancements to bicycle and pedestrian access to, and circulation within, WUS as well as new opportunities for bicycle parking. At the First and 2nd Street entrances, there is an opportunity to include a facility for bicycle storage. Potential bicycle access to private air-rights development and H Street level station elements via the east ramp and west edge of the station is not precluded.

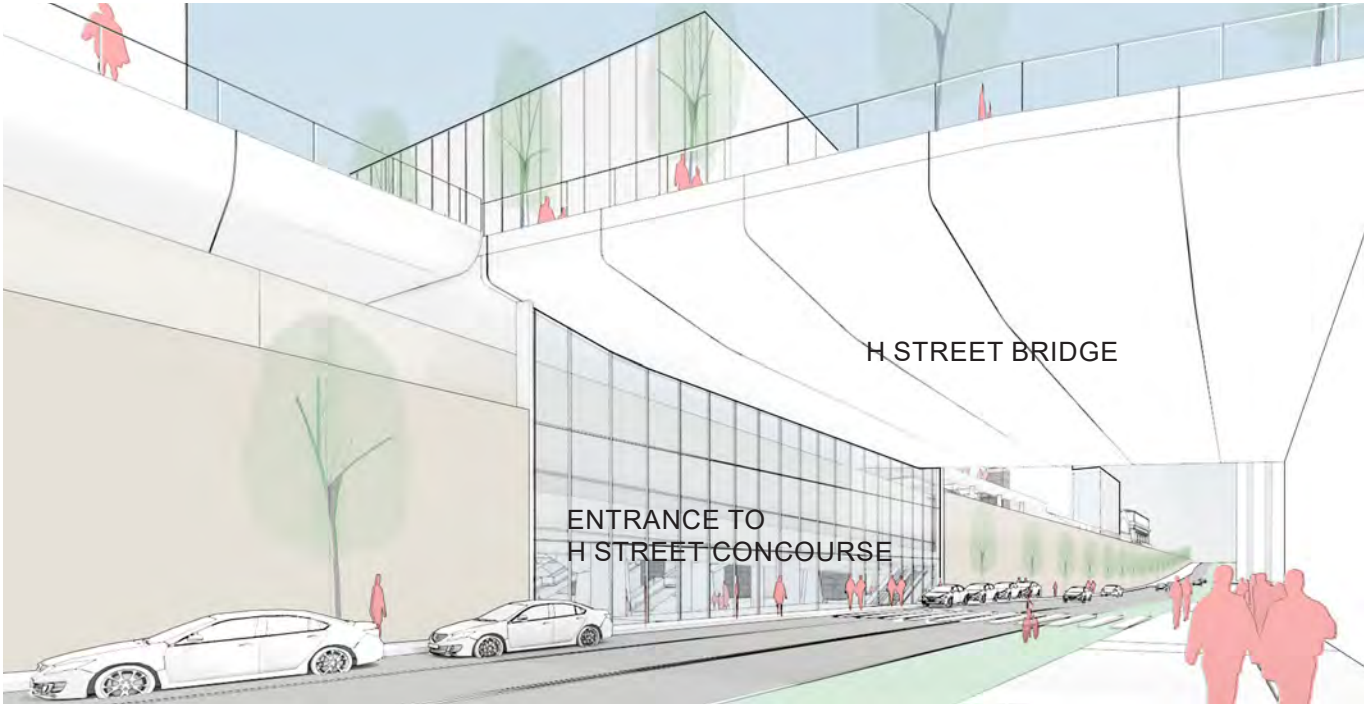


COLUMBUS CIRCLE/DECK LEVEL PLAN DIAGRAM



LOWER LEVEL CONCOURSE PLAN DIAGRAM

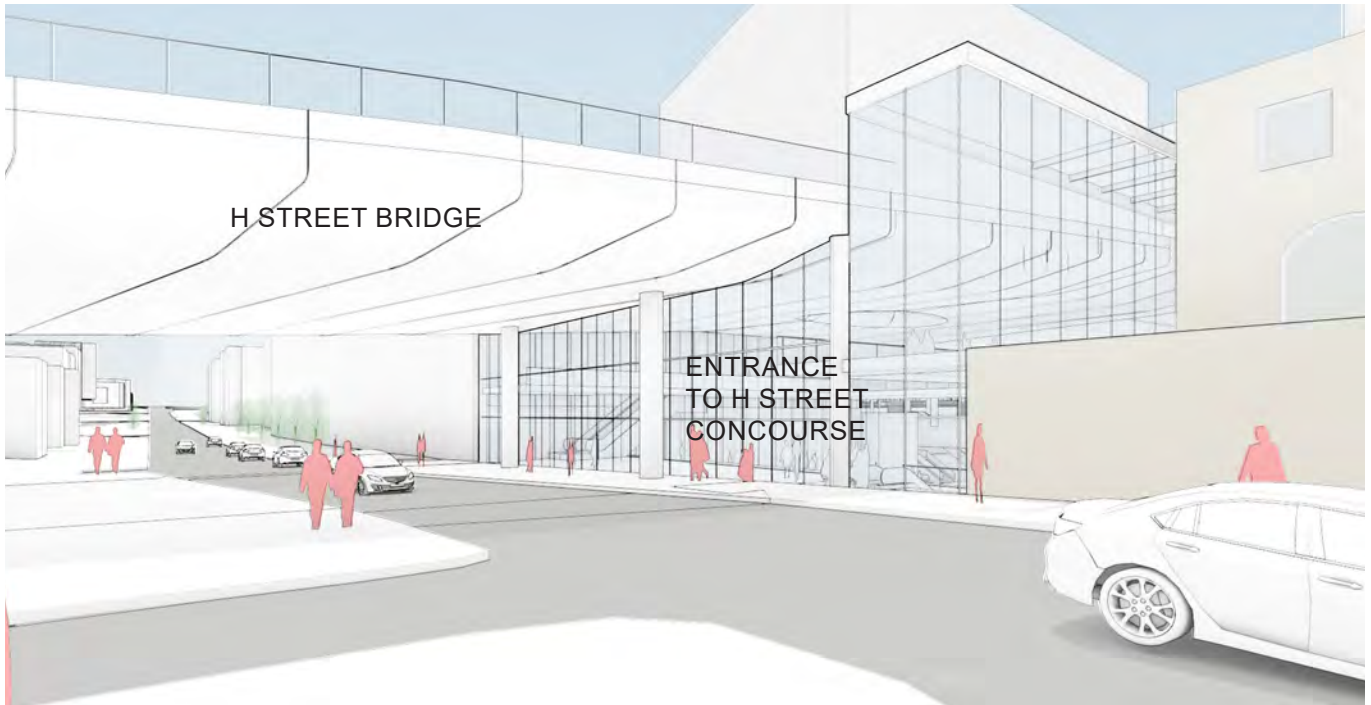
VIEW LOOKING SOUTHEAST TOWARD STATION ENTRANCE FROM FIRST STREET



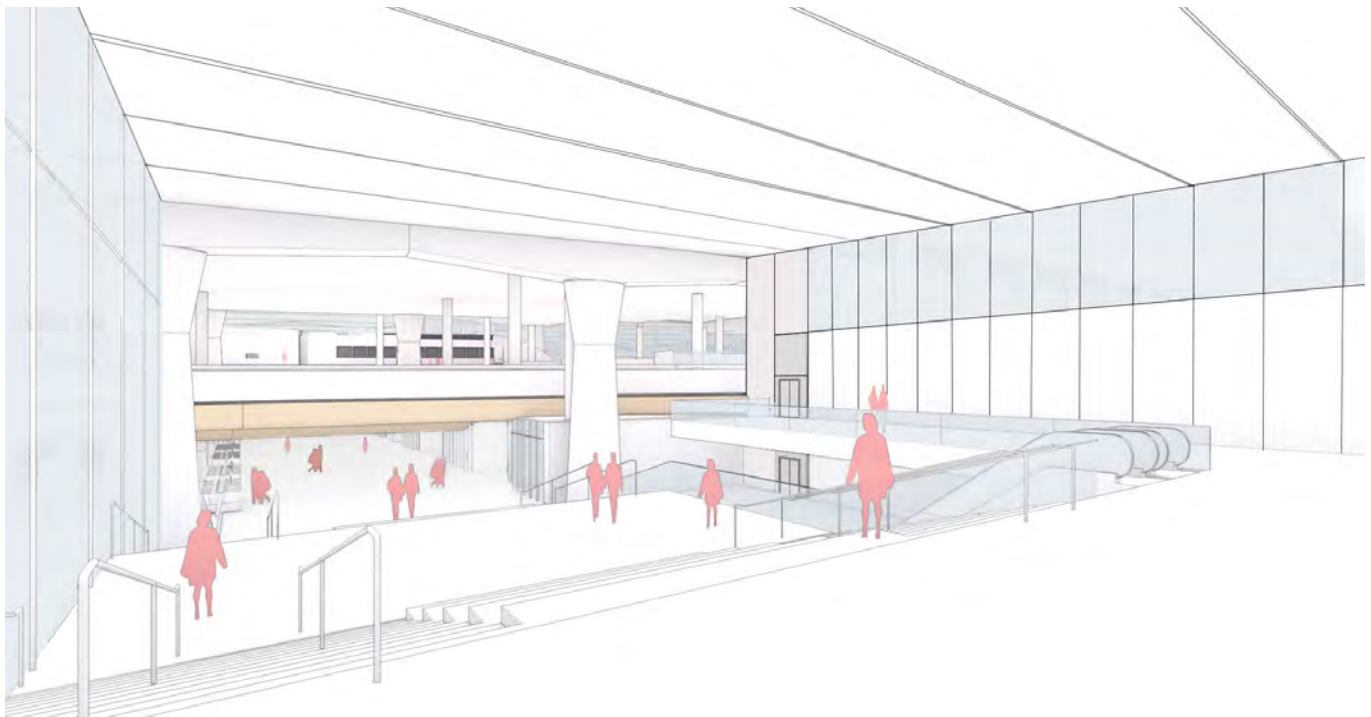
VIEW LOOKING SOUTH TOWARD FIRST STREET CONCOURSE FROM WEST OF H STREET CONCOURSE



VIEW LOOKING SOUTHWEST TOWARD STATION ENTRANCE FROM 2ND STREET



VIEW LOOKING WEST TOWARD H STREET CONCOURSE FROM STATION ENTRANCE



3.4.5 Rail Support Function

All of the alternatives would locate rail support spaces primarily north of the H Street Concourse on the lower concourse level, just below existing street grade. Rail support would have access to the tracks and platforms via dedicated service elevators. These service elevators would be used only by Amtrak for any track work, baggage movement to trains, and commissary support. Refer to Appendix A for more information regarding internal distribution of the Rail Support Function.

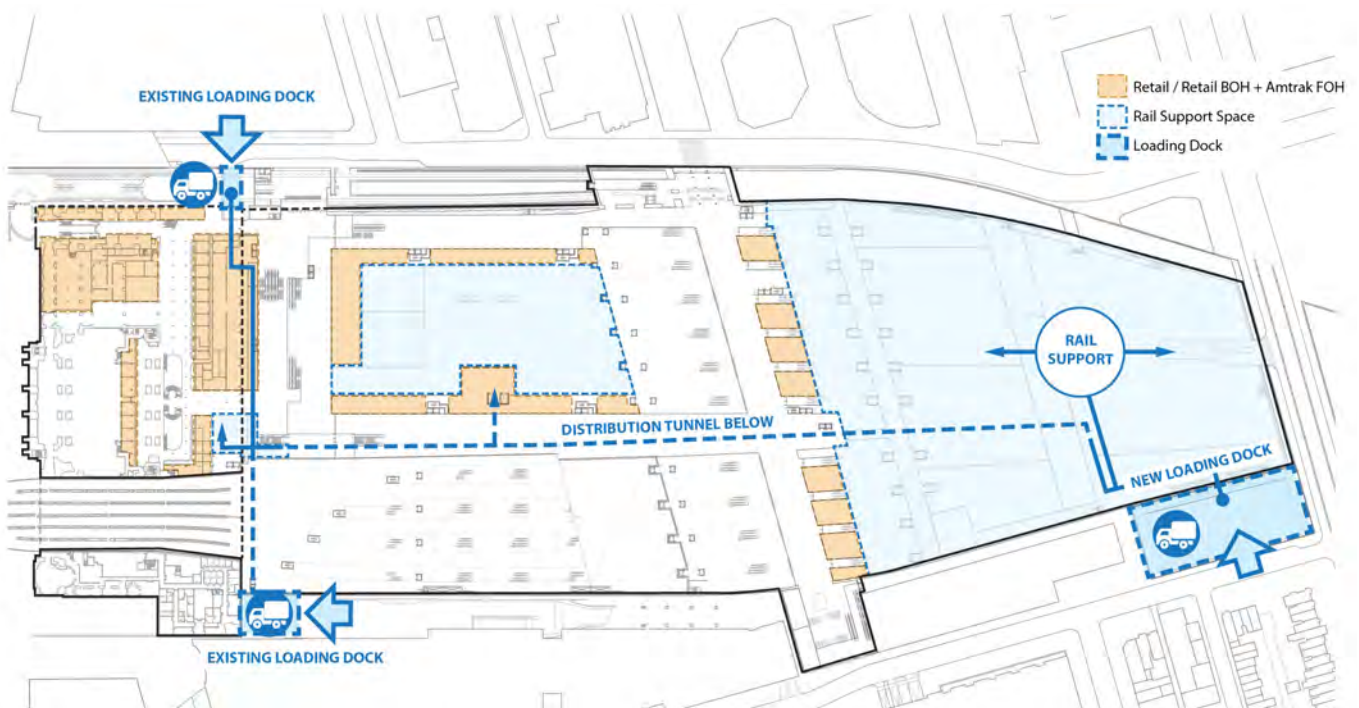
3.4.6 Loading

The two existing loading docks for the historic station building would continue to support the unloading and distribution of goods at WUS. The realignment of First Street NE would include a layby lane to service the First Street loading dock and U.S. Post Office Building across the street. Additionally, a new loading dock would be provided on 2nd Street NE, adjacent to the REA building. Users of the new loading dock, which would have approximately 12 slips, may include new retail and Amtrak back of house services.

3.4.7 Support Systems

Refer to Appendix B for detailed information regarding Support Systems.

LOWER LEVEL LOADING ACCESS DIAGRAM



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3.5 ELEMENTS THAT VARY BY ACTION ALTERNATIVE



3.5.1 Train Hall

To address both existing WUS deficiencies and the Design Goals and Objectives as stated in the CDR, a series of key drivers promote highly compatible combinations of Project Elements and eliminate those that are non-compatible. These drivers include wayfinding, spatial quality, daylighting, passenger and visitor amenity, and were all used as criteria to evaluate the legitimacy of each concept element. In addition, one design goal should be to reflect the inclusion of a high quality, architecturally compelling feature reflecting the prominence and stature of Washington Union Station and its place within the nation's capital. The resulting train hall configurations represented in the Action Alternatives are described below.

In all of the alternatives, the train hall would be a volume to the north of the existing historic WUS that encompasses various concourses, train tracks, and platforms, though the amount of each contained within the train hall varies by alternative. The intent of the train hall is to provide passengers entering WUS a sense of grandeur to complement that of the historic station. The lofted height of the train hall would maximize daylighting into the station.

During the Design Refinement process, there was continuing coordination to further study and understand structure, constructability, and ventilation of the train hall. All of the Action Alternatives align the structure to promote better pedestrian circulation from Concourse A to the Central Concourse and coordinate with upper levels of the train hall. The train hall is also refined to contain and safely expel fumes from trains and buses without compromising the quality of space for passengers. A vertical glazed wall separates the platforms, tracks, and bus loop (in pertinent alternatives) from zones that provide passenger services, retail, and waiting areas. Zones that provide these passenger amenities would be conditioned, while those areas with trains and buses would either be semi-conditioned or naturally ventilated. More information about compartmentalization is in Appendix A.

ACTION ALTERNATIVES A & B

Alternatives A and B would feature a north-south train hall between H Street NE and Concourse A. It would rise approximately 42 feet above the elevation of the H Street Bridge and would create an opportunity for placemaking on H Street. The

north-south train hall would encompass the Central Concourse, providing it with a lofty ceiling and allowing daylight to reach the center stub-end tracks and platforms. At its southern end, the train hall would form a unified space with Concourse A. On its west side, the train hall would be contiguous to the bus facility. The design of the train hall would support ventilation requirements and compartmentalized conditioning without compromising passenger experience.

ACTION ALTERNATIVE C

Alternative C would feature an east-west oriented train hall. The train hall would encompass Concourse A and a portion of the southern end of the tracks and platforms. A vertical glazed wall would separate the platforms from Concourse A, which would be sealed and ventilated. The tracks and platforms, though protected from the sun and rain by the roof of the train hall, could be open to the exterior environment with mechanically assisted natural ventilation.

ACTION ALTERNATIVES D & E

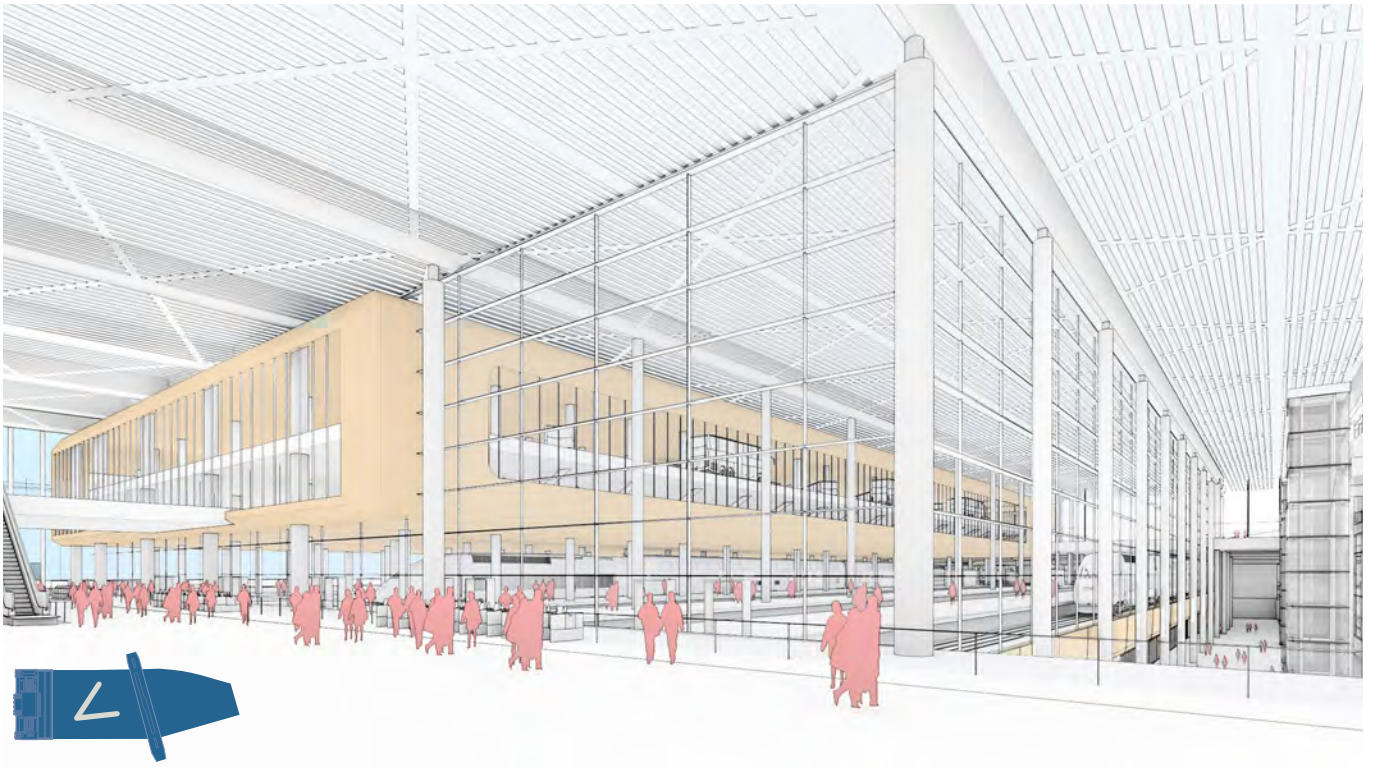
Alternatives D and E would feature an east-west oriented train hall with an integrated bus facility that would encircle the upper, outer edge of the train hall. Below the bus facility, Concourse A and a portion of the tracks and platforms would be within the train hall. A vertical glazed wall would allow for a fully-conditioned indoor environment within Concourse A and the passenger waiting area for the bus facility. The bus loop, platforms, and tracks, while protected from rain and sun by the roof of the train hall, could be open to the exterior environment with mechanically assisted natural ventilation.

ACTION ALTERNATIVE A-C

Alternative A-C would feature an east-west oriented train hall encompassing Concourse A and a portion of the southern end of the tracks and platforms. A vertical glazed wall under the mezzanine level would separate the platforms from Concourse A. Concourse A would be sealed and ventilated. The tracks and platforms, though protected from the sun and rain by the roof of the train hall, could be partially open to the exterior environment with mechanically assisted natural ventilation.

ALTERNATIVES A/B

VIEW OF TRAIN HALL LOOKING NORTH



ALTERNATIVE C

VIEW OF TRAIN HALL LOOKING NORTH



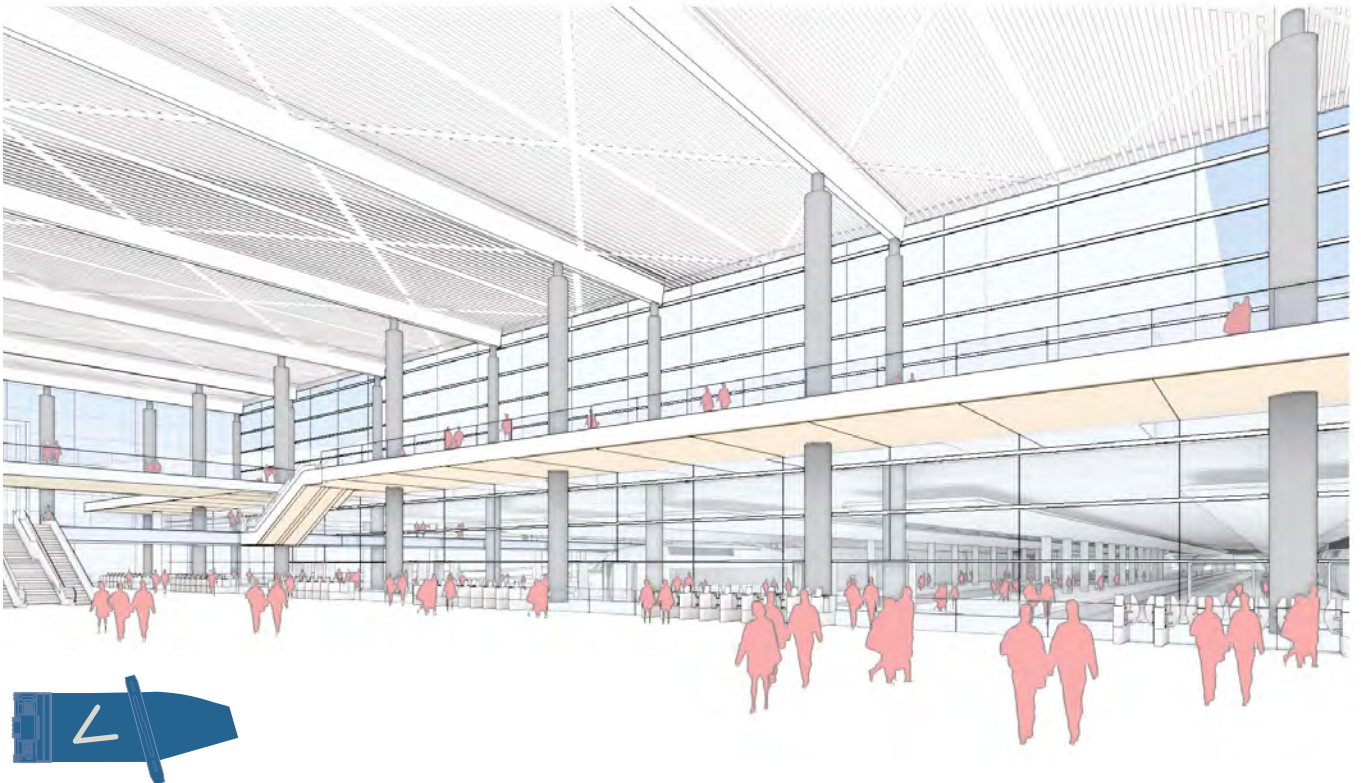
ALTERNATIVES D/E

VIEW OF TRAIN HALL LOOKING NORTH



ALTERNATIVE A-C

VIEW OF TRAIN HALL LOOKING NORTH



3.5.2 New H Street Access

As part of the expansion of WUS, an additional primary entrance to the station would be created off of H Street to transition visitors from the H Street Bridge and Streetcar down into the station's lower level concourses. In all alternatives, there would be opportunities for a public plaza to be developed as an amenity for the surrounding development and broader community.

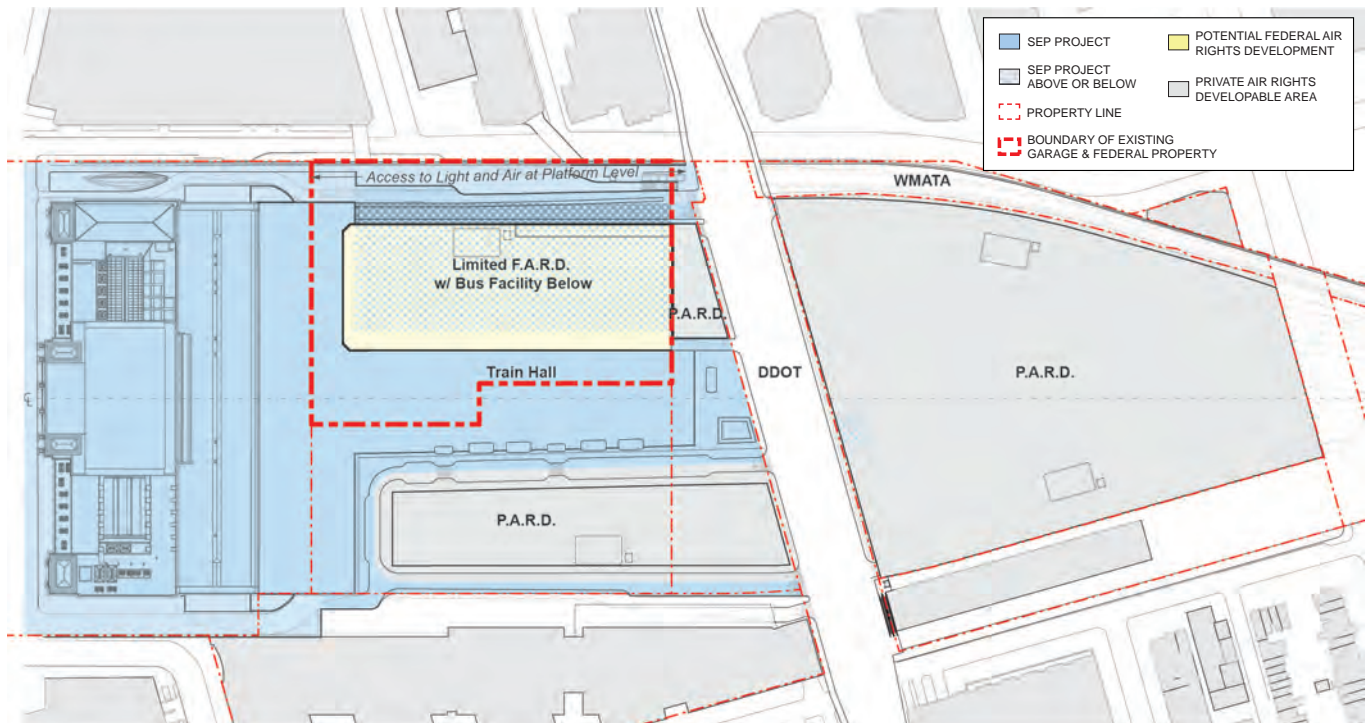
The alternatives have different relationships with the surrounding Federal and private parcels. The area, currently Federally-owned, is designated "Federal Air-Rights Lot." The area above the rail terminal that is not Federally-owned is designated "Private Air-Rights Development."

Two additional entrances to the bus facility would be located to the west, directly off of H Street.

The area directly off of H Street facing the bus facility is private air-rights. In Alternative A, the area would be acquired to accommodate access to the bus facility and the parking facility. In Alternative B, access to the bus facility and potential Federal air-rights above would be via the Federal easement. Ownership of the area would be retained by the private development.

ACTION ALTERNATIVES A & B

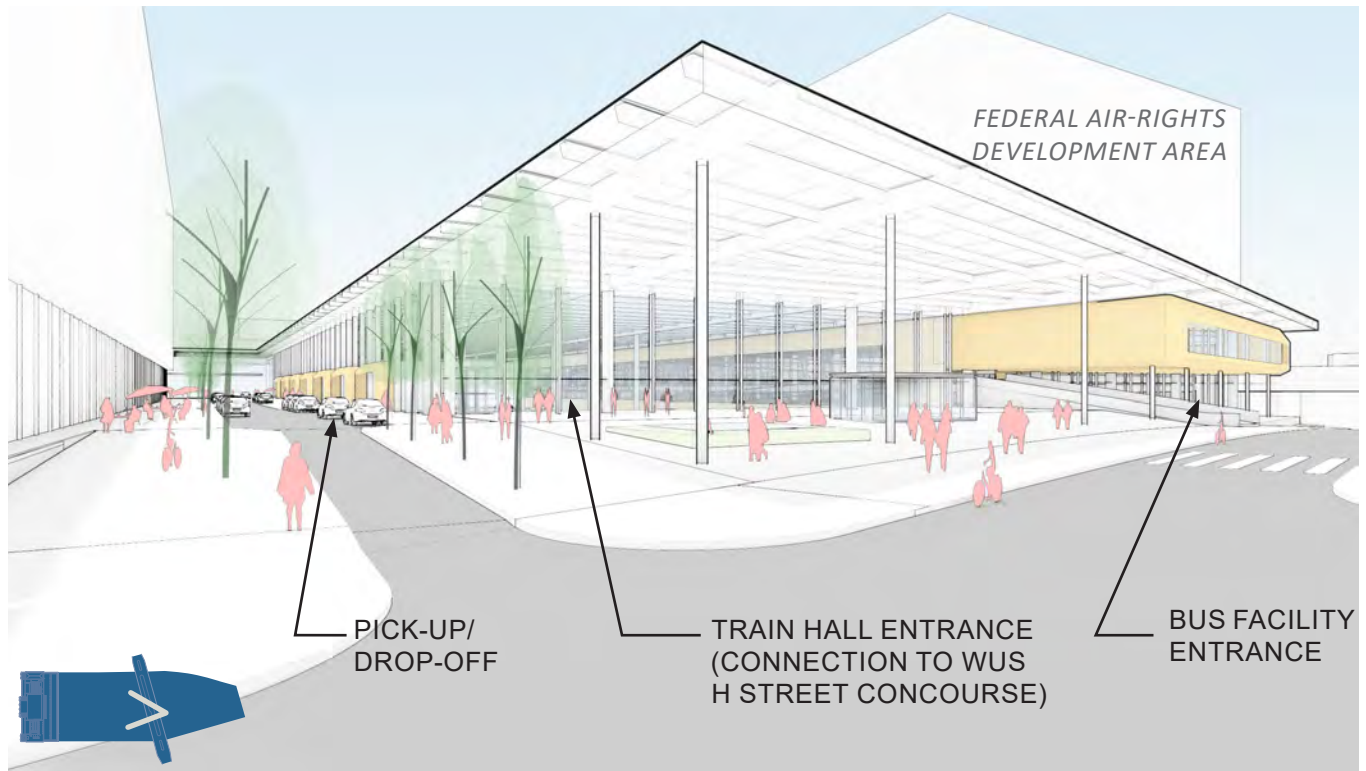
This linear north-south oriented train hall would extend toward H Street, the proposed facade stopping with a setback from H Street. The proposed entrance would allow passengers to access the train hall and the bus facility proximal to H Street. There is an opportunity to create a public plaza at the front of the H Street entrance and storefront retail lining the entry to the train station.



TYPICAL DECK LEVEL AREA ALLOCATION (ALTERNATIVE B SHOWN) SEE APPENDIX FOR MORE INFORMATION

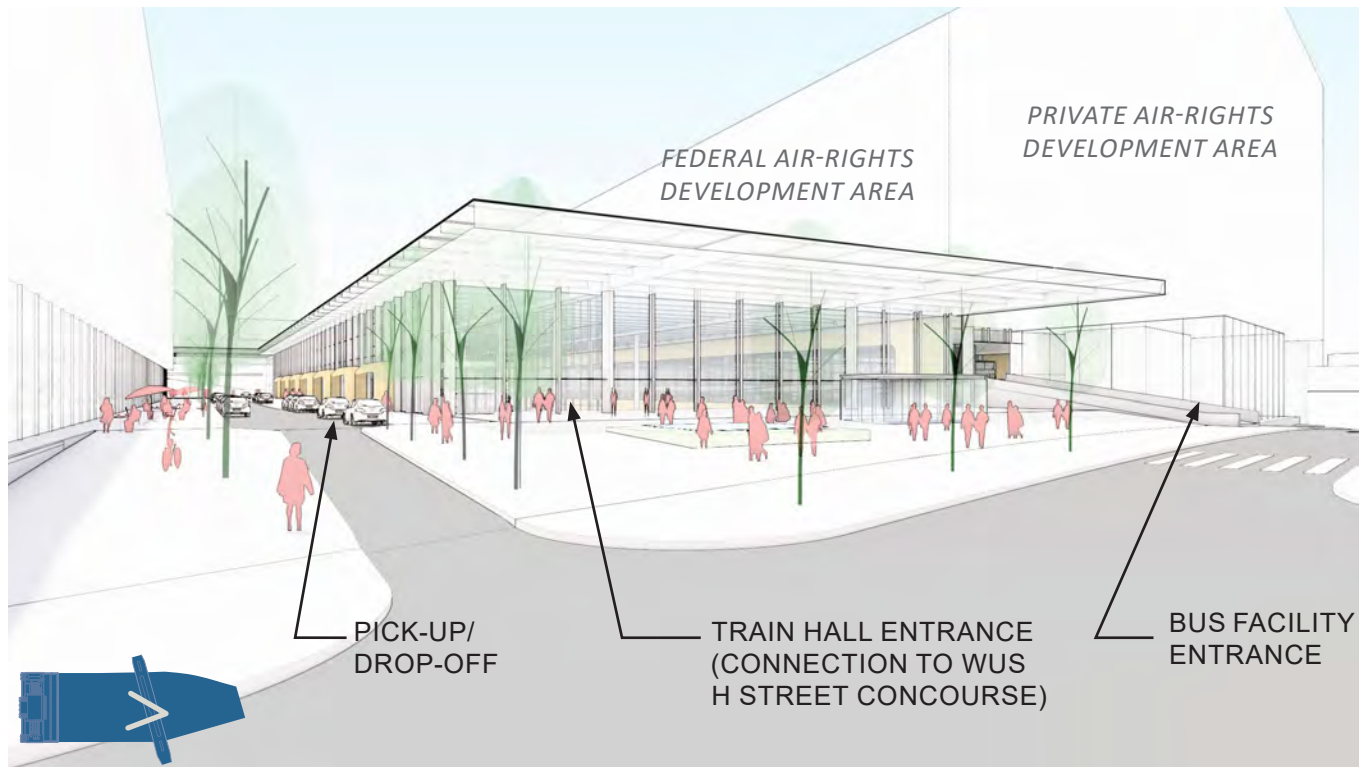
ALTERNATIVE A

VIEW LOOKING SOUTH TOWARD THE PROPOSED HEADHOUSE FROM H STREET



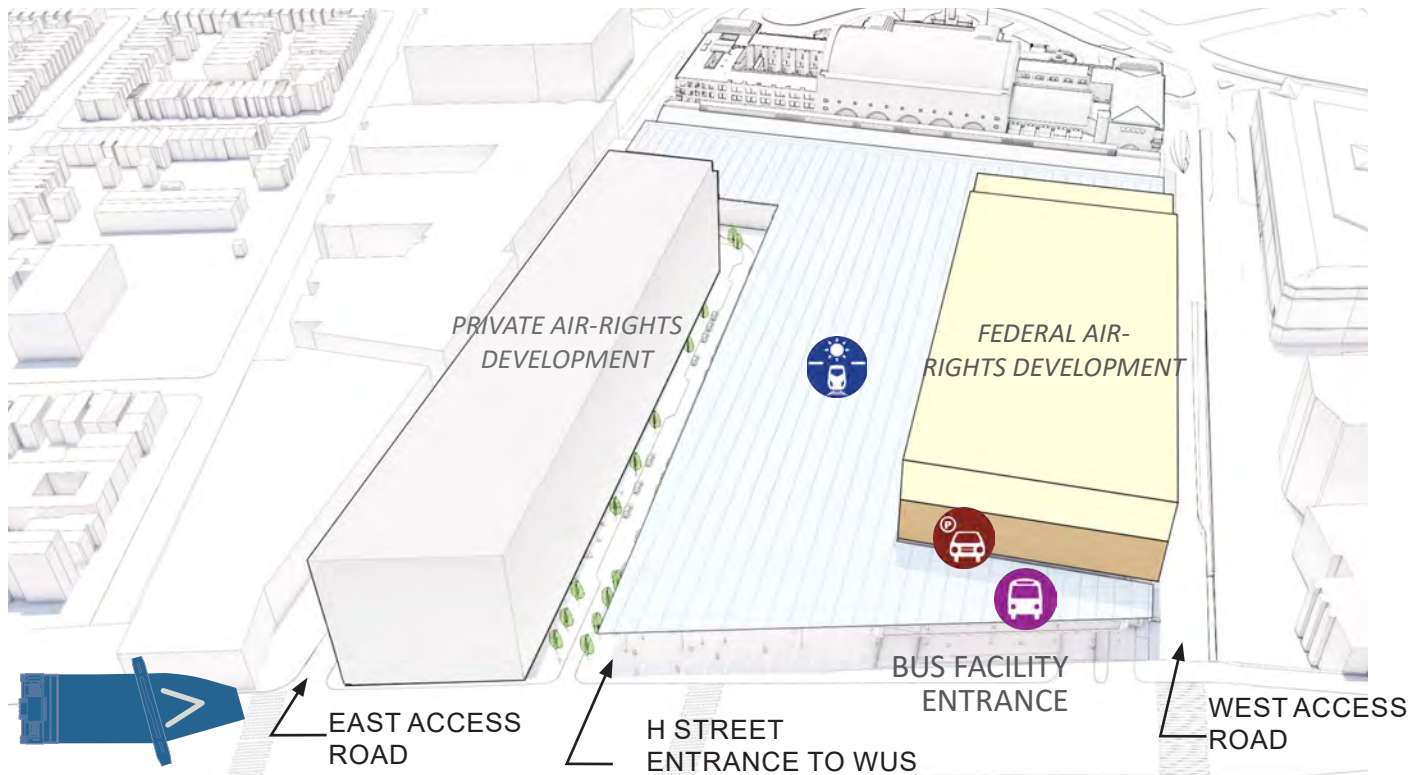
ALTERNATIVE B

VIEW LOOKING SOUTH TOWARD THE PROPOSED HEADHOUSE FROM H STREET



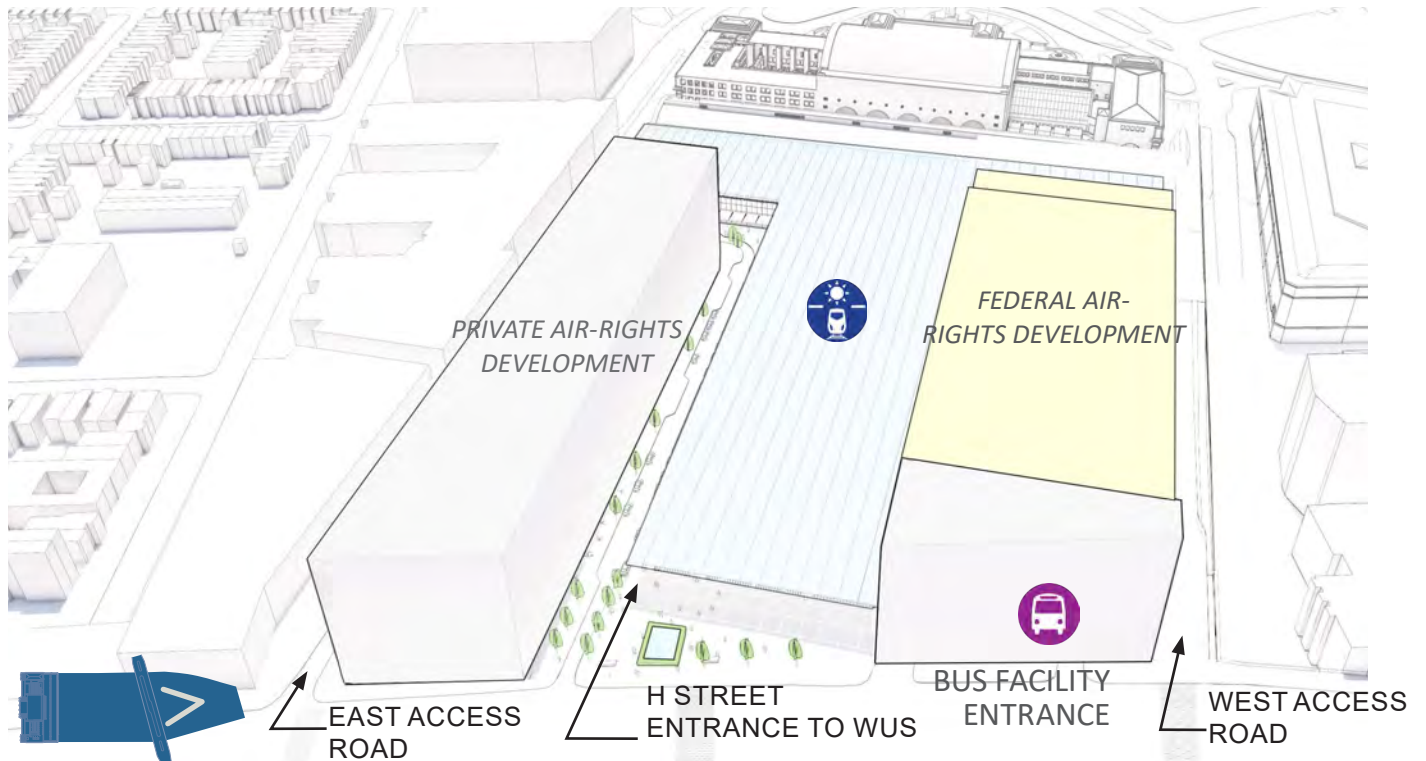
ALTERNATIVE A

AERIAL VIEW LOOKING SOUTH TOWARD HISTORIC STATION



ALTERNATIVE B

AERIAL VIEW LOOKING SOUTH TOWARD HISTORIC STATION



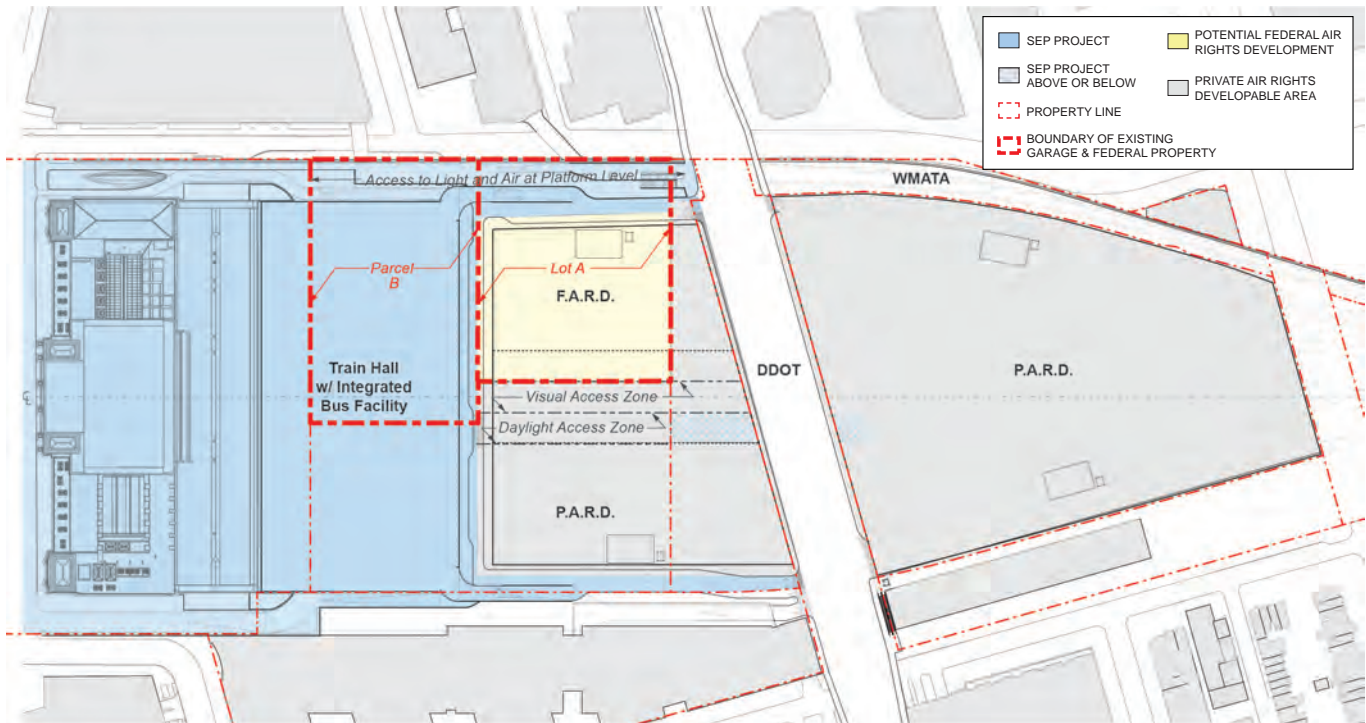
ACTION ALTERNATIVES A-C, C, D, & E

These alternatives would provide an additional station connection to the bus facility and parking structure, which are located north of H Street, via elevators serving the north end of the Central Concourse. South of H Street, an enclosed headhouse with elevators would bring passengers down to the H Street Concourse. The proposed headhouses would serve the station, but could potentially be incorporated into the larger network of placemaking and private development on the deck. A visual access zone between H Street NE and the new train hall would be centered on the historic station building and could include station access and a visual connection. A daylight access zone would be reserved south of the proposed H Street headhouse to allow daylight into the lower level platforms and concourses of the SEP. See "Station & Visual Access & Daylighting Access Zone" identified in the figures below.

The daylighting features would only use a portion of the daylight access zone. An agreement with the private air-rights developer would be needed for the access zone.

A portion of the deck adjacent to the H Street Bridge must be occupied by the Action Alternatives A-C, C, D, and E to accommodate ingress and egress to the station. The proposed headhouses would be approximately 60 feet wide and their approximate location is delineated in the figures below.

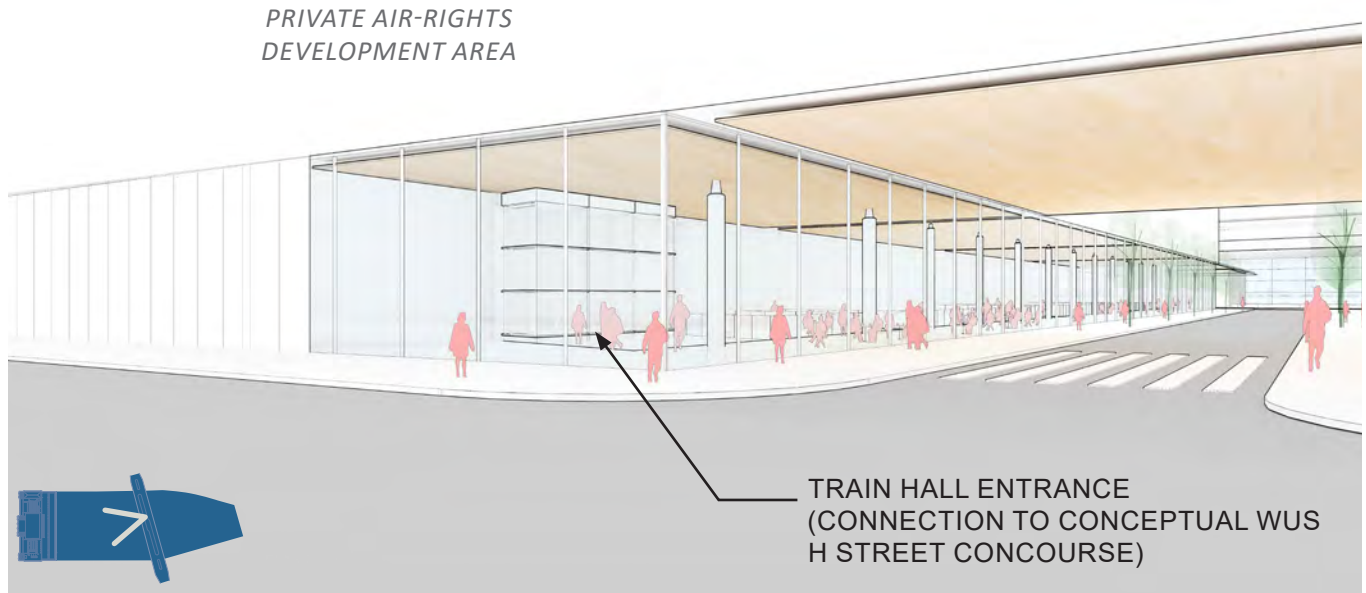
The daylight access zone would allow for private development, as only a portion of its area would be required for openings to below for natural light, not including setbacks required for that area to receive direct daylight. This zone may be concentrated generally over the proposed SEP Central Concourse. The following illustrations provide examples of how the access zones' spaces may be developed in the future, in coordination with others to allow for the integration of SEP elements. These illustrations are neither intended to represent specific design intent for the private development area, nor are they intended to prescribe a specific design direction for non-SEP areas. An agreement with the private air-rights developer would be needed for the placement of the access zones.



TYPICAL DECK LEVEL AREA ALLOCATION (ALTERNATIVE E SHOWN). SEE APPENDIX FOR MORE INFORMATION

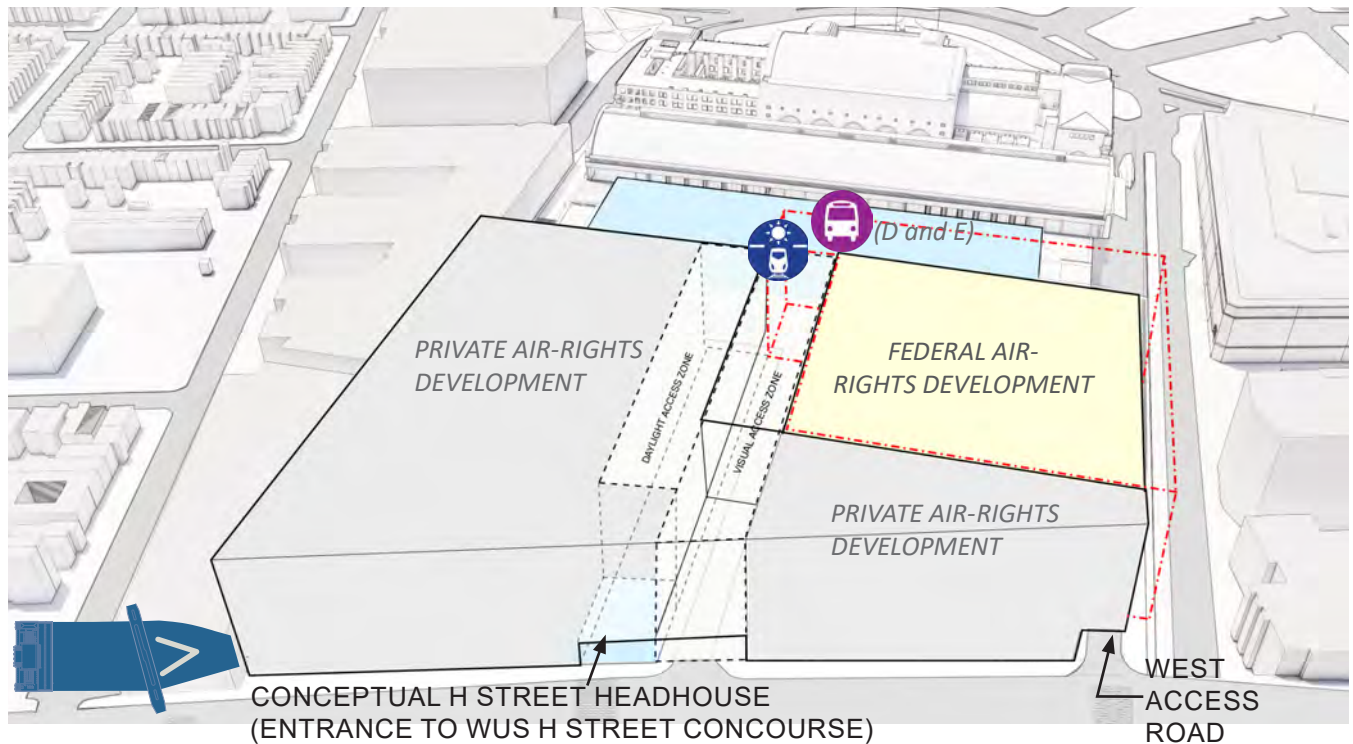
ALTERNATIVE C/D/E

VIEW LOOKING SOUTH TOWARD THE CONCEPTUAL HEADHOUSE FROM H STREET



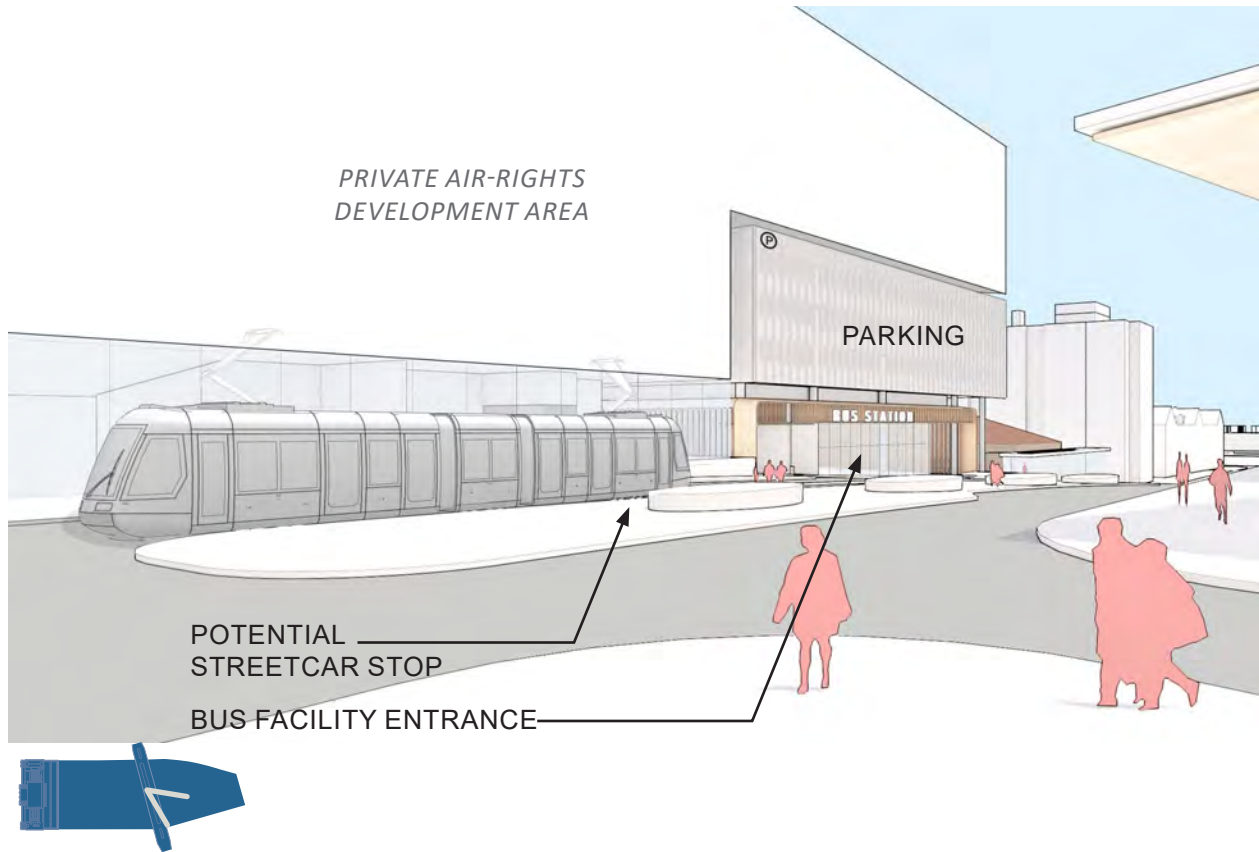
ALTERNATIVE C/D/E

AERIAL VIEW LOOKING SOUTH TOWARD HISTORIC STATION

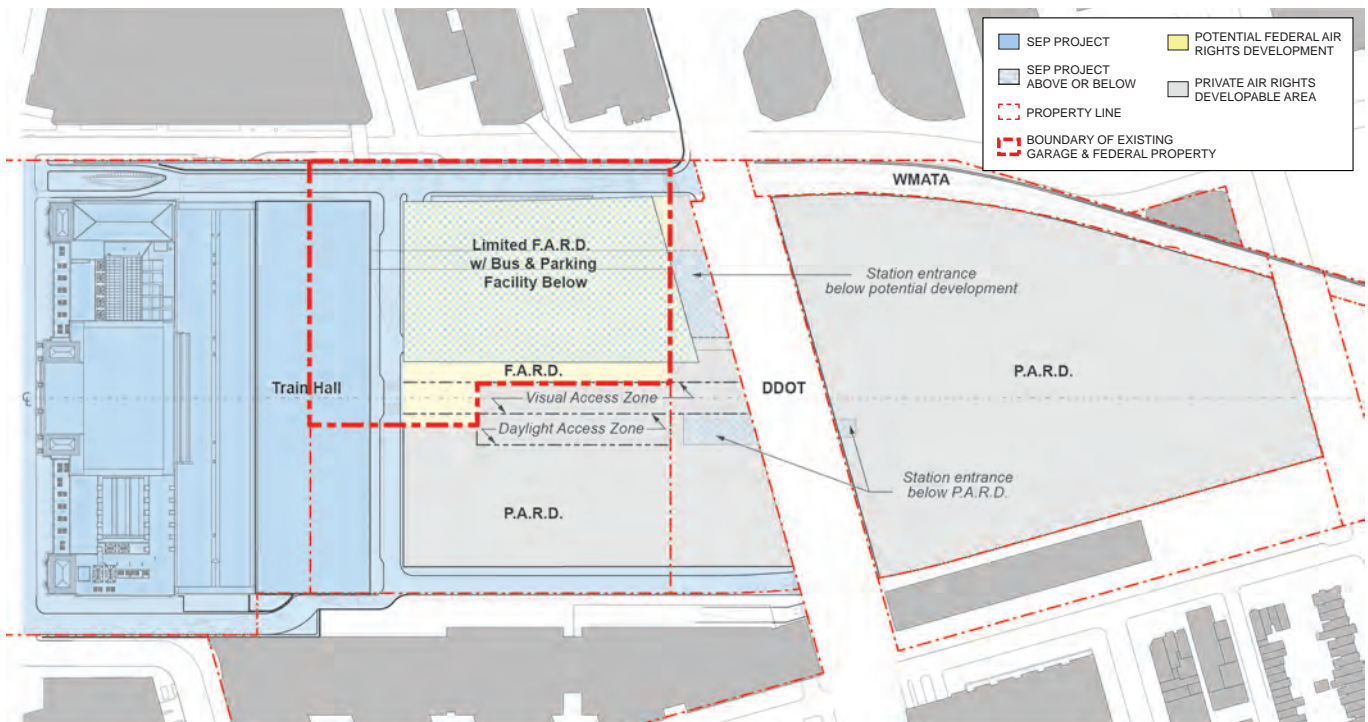


ALTERNATIVE C, EAST OPTION

VIEW LOOKING NORTHEAST TOWARD BUS FACILITY FROM H STREET

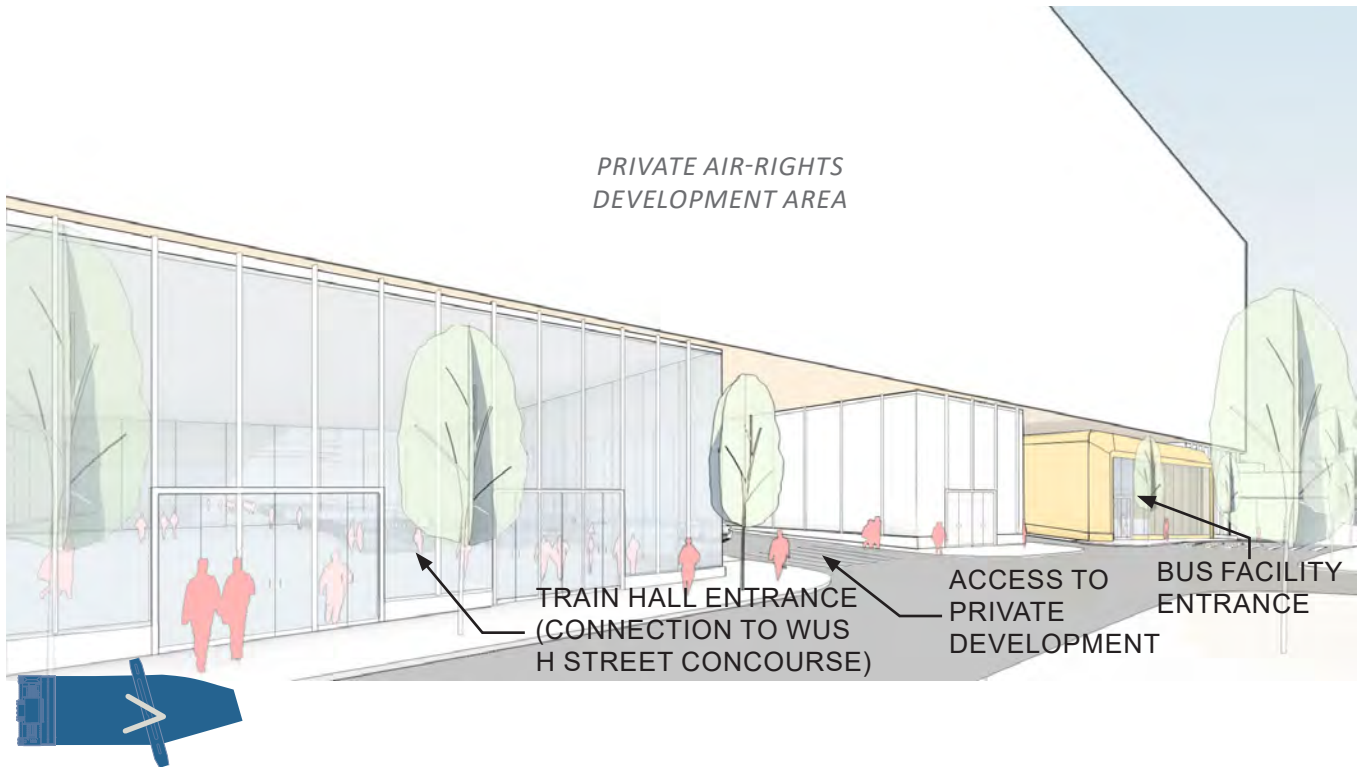


TYPICAL DECK LEVEL AREA ALLOCATION (ALTERNATIVE A-C SHOWN). SEE APPENDIX FOR MORE INFORMATION



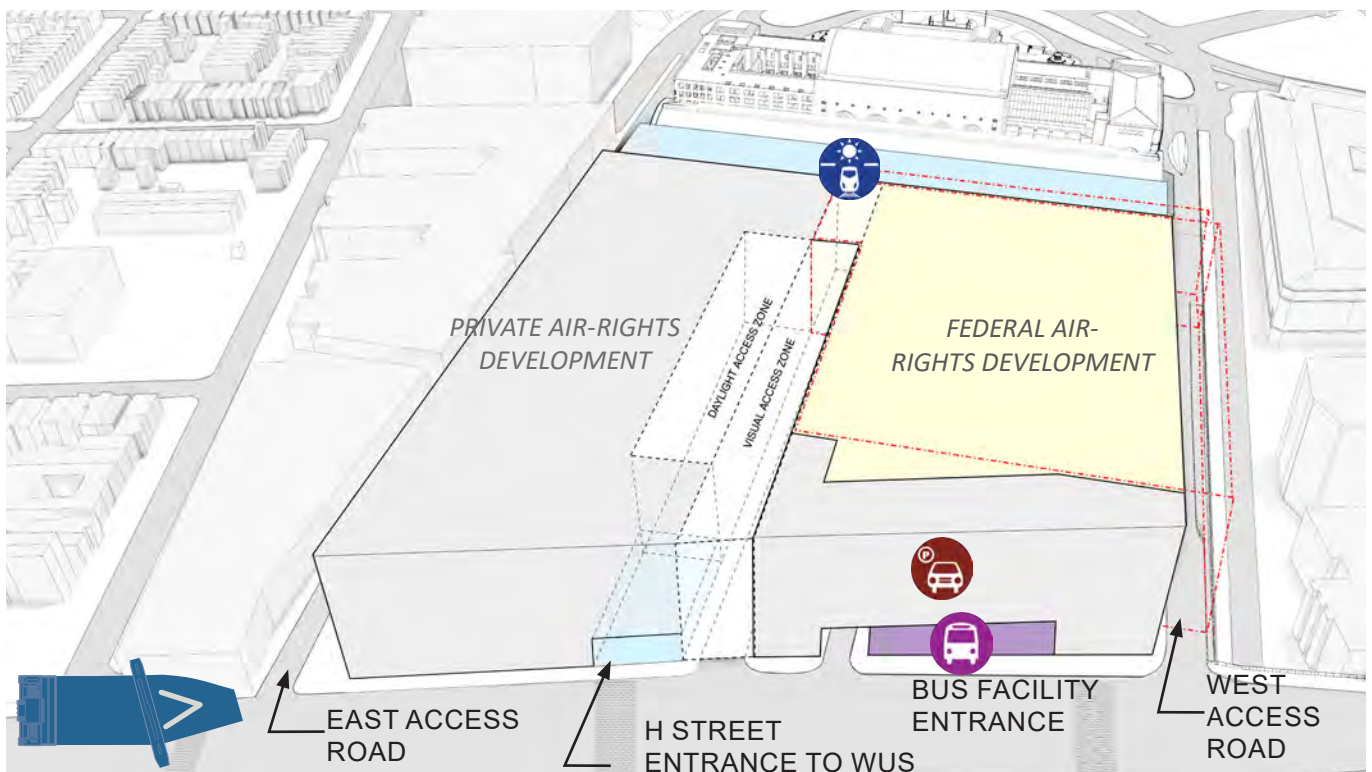
ALTERNATIVE A-C

VIEW LOOKING SOUTH TOWARD THE CONCEPTUAL HEADHOUSE FROM H STREET



ALTERNATIVE A-C

AERIAL VIEW LOOKING SOUTH TOWARD HISTORIC STATION





3.5.3 Bus Facility

The bus facility is currently anticipated to provide for a range of bus pick-up and drop-off slips. The minimum program for the bus facility is 25 slips. In total, the number of bus spaces is anticipated to be less than the current bus facility based on the approach that the future operations would incorporate a more active management to limit underutilized spaces throughout the day.

The curbside on G Street NE could also act as a staging area for buses, as the number of bus slips that the alternatives currently provide do not accommodate staging buses for the required amount of time that drivers are on break. The area would allow for buses to stage without disrupting the operations of the bus loop.

The *Alternative Bus Program Memorandum* (February 22, 2017; VHB) outlines the process by which the estimated number of active bus slips was adjusted down to approximately 25. All of the alternatives meet or exceed this target. For more information on the exact capacity of each alternative, see Appendix D.

ACTION ALTERNATIVES A & B

In Alternatives A & B, the bus facility would be adjacent to Concourse A and would be integrated within the contiguous train hall. This option combines a concourse space, a train hall and a bus facility. This closely integrated approach facilitates intermodal transfers via Concourse A, as well as potential access to H Street.

The bus facility would have two levels: a lower mezzanine level for passenger circulation and an upper level with 26 active bus slips in an angled configuration.

BUS CIRCULATION

Buses would access the facility from H Street NE through the new west intersection. Inbound buses could turn right or left from H Street NE onto the ramp. Buses would exit via a dedicated ramp onto H Street NE. Exiting buses could only make a right turn onto H Street NE.

The bus loop would have an angled parking configuration, which provides an appropriate parking angle for safe and efficient bus and passenger movements, accommodates the future volumes at the station, and reduces the facility's footprint to allow more light onto the tracks and platforms.

PASSENGER CIRCULATION

A waiting mezzanine area would extend north-south adjacent to the train hall and above Concourse A. Within the waiting area, there would be passenger services and amenities including ticketing, information, a seating area, and potentially, retail. VCEs would carry passengers from the waiting area up to an island where passengers would disperse to the respective bus slips.

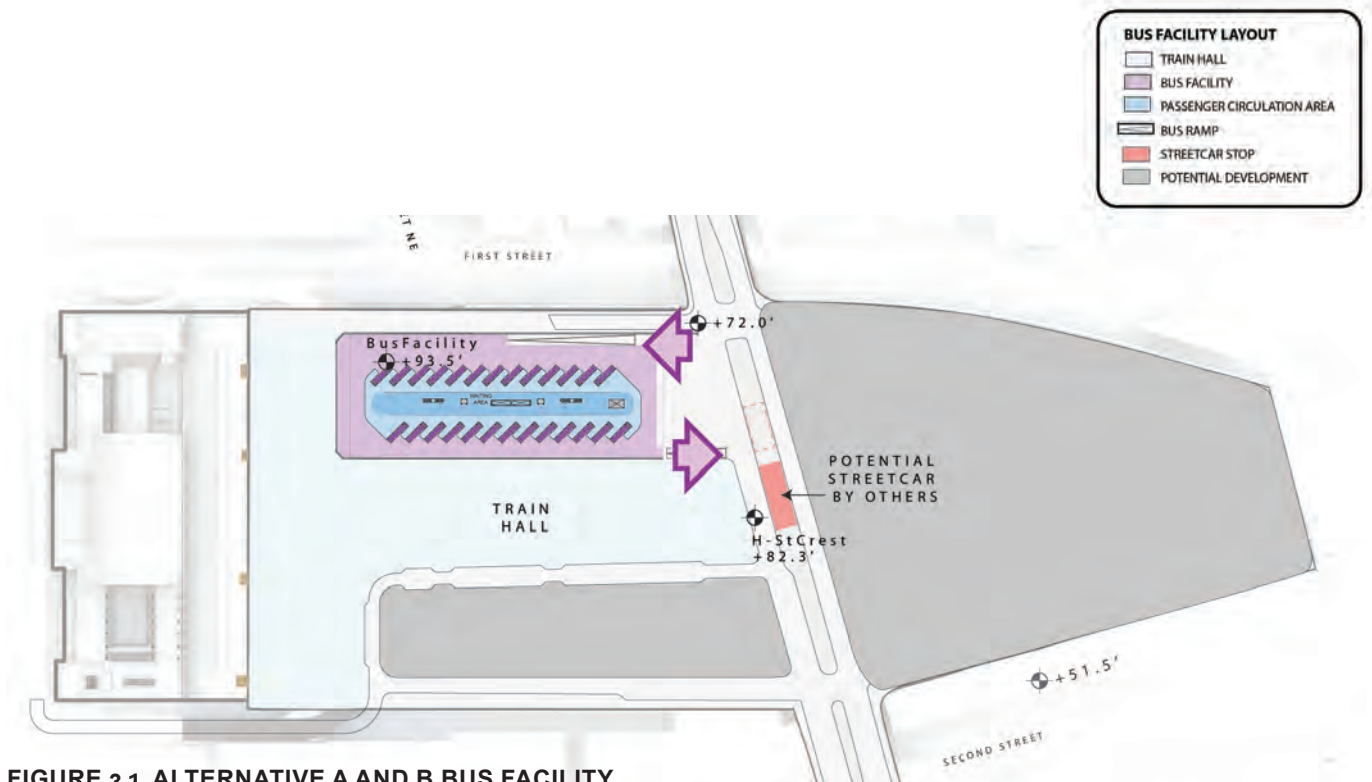


FIGURE 3.1. ALTERNATIVE A AND B BUS FACILITY

The waiting mezzanine area would have a direct pedestrian connection to Concourse A, by way of an intermediate level within the concourse volume. Passengers would have access to rail transfers at the main level, or to VCEs that facilitate intermodal transfers to WMATA Metrorail on the level below. A potential pedestrian entrance on H Street could also allow for direct transferring between bus and streetcar.

PHASING

Depending on the manner that construction phasing is implemented, a temporary bus facility would be required during the demolition and construction of the final bus facility.

ACTION ALTERNATIVE C WITH NORTHWEST AND NORTHEAST BUS FACILITY OPTIONS

In these alternatives, the bus facility is split across two sites on the south and north sides of H Street at the deck level. The main bus facility would be located in a standalone structure north of H Street on either the east or west portion of the site. Parking would be integrated above the main bus facility with a separate access ramp. To the south of H Street would be a separate bus drop-off and pick-up area.

The main bus facility would have a conditioned area for passenger services and amenities towards the front of the building at H Street. The bus loop for the East Option would have 17 active bus slips while the bus loop for the West Option would have 19 active slips. The bus loop would be semi-open and naturally ventilated in both options.

Passengers would have direct access to the streetcar upon exiting the main bus facility. The H Street entrance into the train hall would be across the street from the main bus facility. Furthermore, VCEs on the northern side of H Street would bring passengers down to the H Street Concourse.

In both options, the bus facility would include a separate bus drop-off and pick-up area located between the train hall and historic station, where up to 9 buses would be accommodated simultaneously. Buses would reach this drop-off/pick-up area via service roads that connect to H Street. Passengers would be able to enter the train hall through the mezzanine level and access VCEs that would bring them to Concourse A and the Retail and Ticketing Concourse.

Bus Circulation

Buses would enter the main facility from the east side of H Street bridge in the East Option. Optimally, this location would be adjacent to a full intersection. The bus loop would move in a counterclockwise fashion and would have an angled parking configuration that requires an internal turnaround. Buses would exit at the same location as the entrance via a turnaround. A redundant access point would be situated at the northeast of the facility. See Figure 3.2.

In the West Option, Buses would enter the facility from the west side of the H Street bridge. The bus loop would also have a counterclockwise circulation and an angled parking configuration with a turnaround. Buses would exit and enter via the same entrance with a redundant access point. See Figure 3.3.

Passenger Circulation

Within the main bus facility, there would be passenger amenities and services including retail, information and ticketing. A conditioned waiting area would provide seating and queuing space. The bus slips would be to the north of the waiting area.

In order to make a transfer to rail or WMATA Metrorail, passengers at the main bus facility would use a bank of VCEs located adjacent to the bus facility. Depending on the ultimate design, passengers may or may not have to exit the bus facility to access the VCEs. These VCEs would connect to the Central Concourse where passengers could transfer to trains, or proceed southward and transfer to WMATA Metrorail under Concourse A. Passengers in the Alternative C East Option would need to travel south and east through the H Street Concourse to the First Street Concourse to reach WMATA Metrorail, while in Alternative C West Option, passengers would just travel south through the First Street Concourse to reach Metrorail.

PHASING

The current phasing strategy is to construct the Project from east to west. Therefore, a northeastern main bus facility could be implemented within the early sub-phases. This strategy would bypass the need for a temporary bus structure as service would transition from the existing to the new permanent bus facility. The same would be the case for a northwestern bus facility, should an alternative phasing strategy be adopted in which construction moves from west to east.

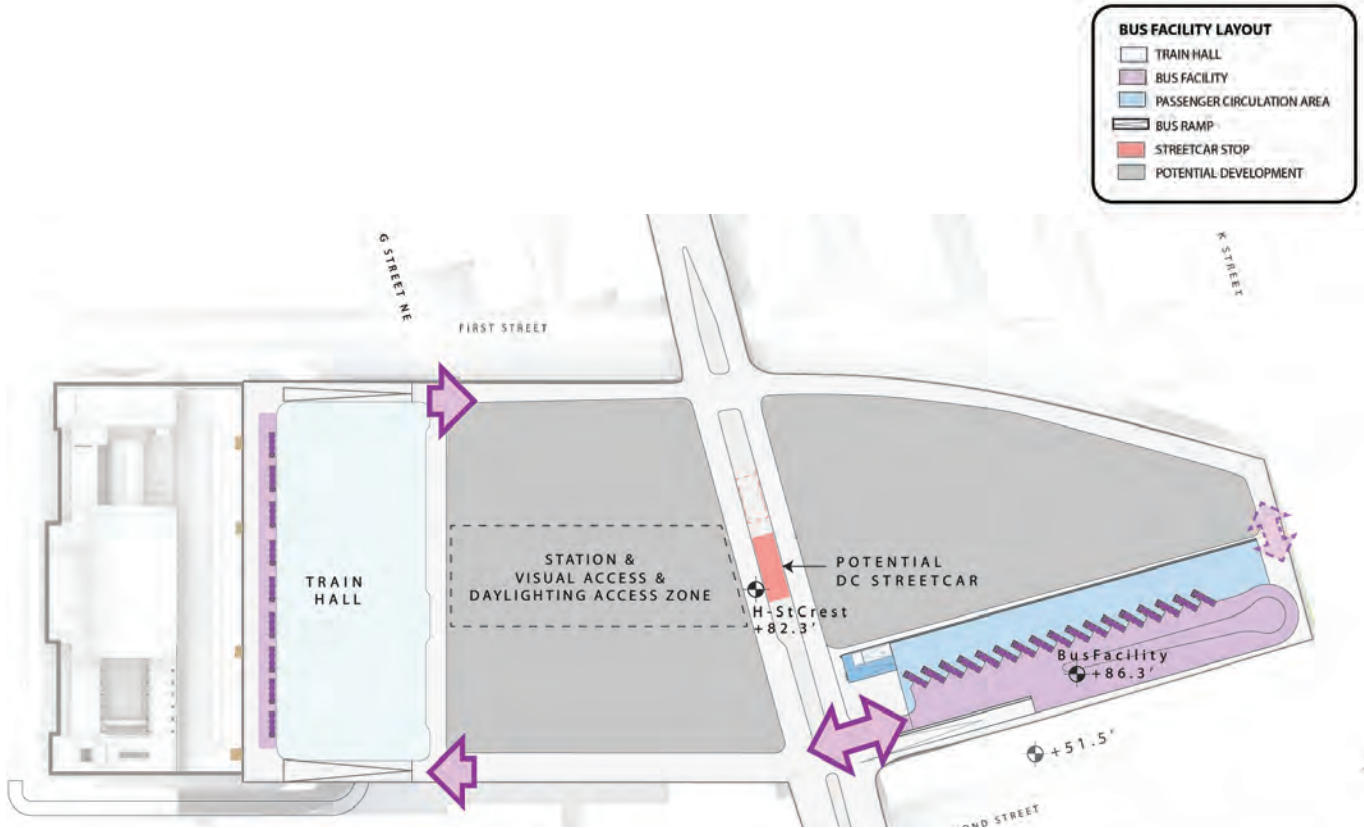


FIGURE 3.2. ALTERNATIVE C NORTHEAST BUS FACILITY

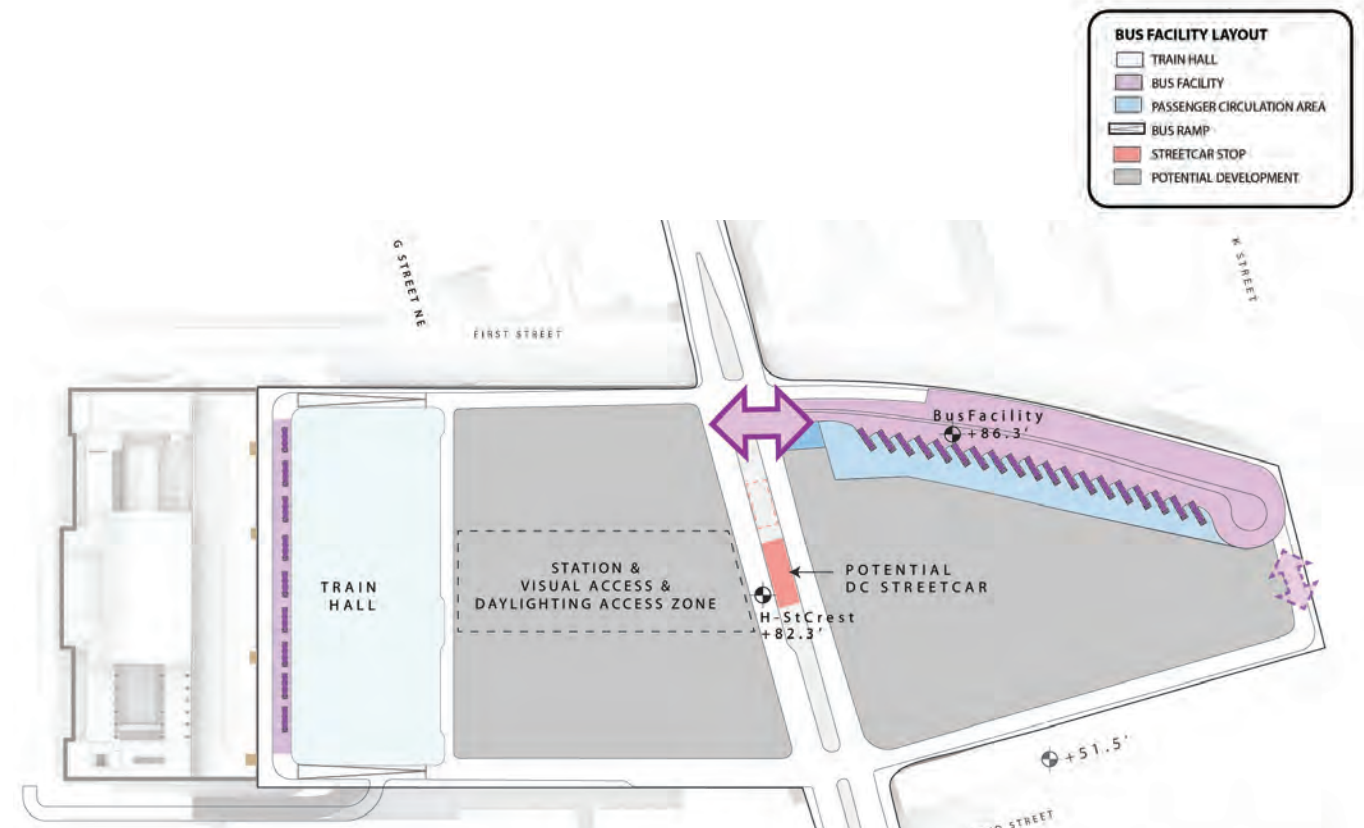


FIGURE 3.3. ALTERNATIVE C NORTHWEST BUS FACILITY

ACTION ALTERNATIVE D AND E

In these alternatives, the bus facility would be integrated into the train hall above Concourse A. It would be accessible from Concourse A via VCEs and from the adjacent deck level.

The bus facility would have two levels: a mezzanine passenger level and an upper bus loop level. The mezzanine level would provide passenger amenities and services. Furthermore, conditioned waiting areas with VCEs would bring passengers up to the upper bus loop. The upper bus loop would have 16 angled slips and 11 sawtooth slips. This expanded loop configuration would allow for a wider opening in the middle to give Concourse A and the train hall more access to natural light, and to create more loft.

BUS CIRCULATION

Buses would access the facility via a service road on the western edge of the site, where a ramp brings them up to the 102' elevation. From there, buses would enter and exit the loop where they circulate in a clockwise direction. A second ramp on the eastern edge of the site would allow for redundant access during emergencies and maintenance disruptions.

The southern side of the bus loop would have an angled slip configuration. As with other bus facility configurations, the benefit of angled parking is that it provides an appropriate parking angle for safe and efficient bus and passenger movements to accommodate the future volumes at the station. The configuration also requires the least amount of floor space per bus parking space.

There would be 2 sawtooth slips on the eastern side of the loop, 2 sawtooth slips on the western side of the loop, and 7 on the northern side. Buses would pull forward from these slips to exit the station without having to make a reverse movement. See Figure 3.4.

PASSENGER CIRCULATION

Passengers would have access to the mezzanine directly from Concourse A. The mezzanine level would have ticketing, information, seating, and retail. Furthermore, passengers could also enter the mezzanine level directly from the street north of the train hall.

This bus facility option would allow for a direct transfer between WMATA Metrorail, the rail, and the bus passengers utilizing the western vertical circulation element in the train hall.

PHASING

Depending on the ultimate phasing strategy adopted, there is a possibility that a temporary bus facility would need to be established in the early construction stages with bus program fully available at the completion of construction.

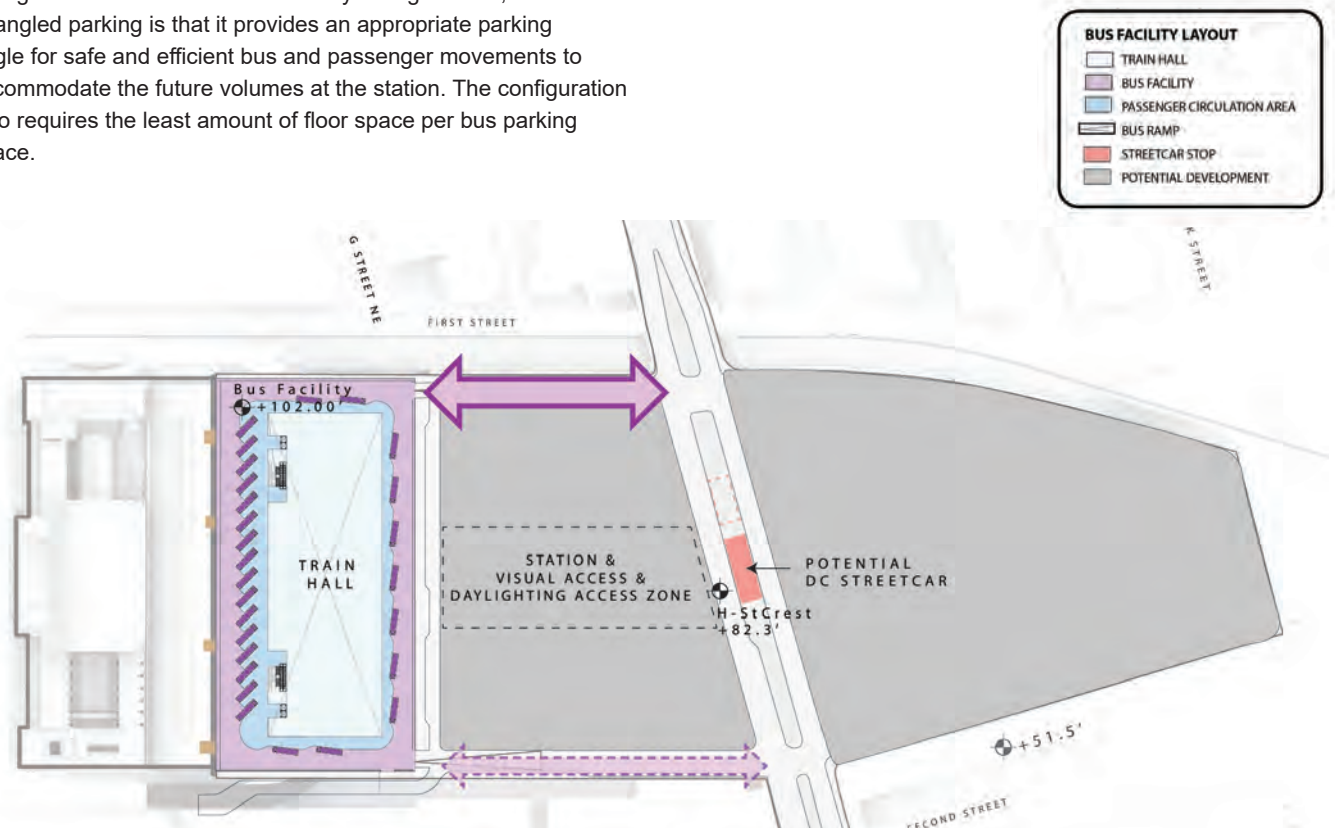


FIGURE 3.4. ALTERNATIVE D AND E BUS FACILITY

ACTION ALTERNATIVE A-C

In Alternative A-C, the bus facility would be separated from Concourse A and the new east-west oriented train hall by a new east-west service road. This close proximity would facilitate intermodal transfers via Concourse A, as well as potential access to H Street and to rail and WMATA Metrorail. A two-level bus facility capable of accommodating up to 40 bus slips (20 per level) would be located southwest of H Street, below the new parking facility. The second level would be operationally flexible. If not needed for buses, it could potentially be used for other activities such as for-hire and private pick-up and drop-off.

BUS CIRCULATION

Vehicle entry into the bus facility would be provided along the west service road. Buses would then circulate around the bus loop in a counterclockwise direction. Buses would exit the facility via a dedicated ramp directly onto H Street NE where only right turns would be possible. The bus loop would have an angled parking configuration and would be semi-open and naturally ventilated.

PASSENGER CIRCULATION

Waiting areas for the bus facility would be located in several locations. The first location would be in the train hall above Concourse A on a mezzanine level which would connect directly with the drop-off/pick-up area located between the train hall and bus facility. From the mezzanine, passengers would use VCEs for

access to rail transfers at the main level or transfers to WMATA Metrorail on the level below. Within this waiting area, there would be passenger services and amenities including ticketing, information, a seating area, and potentially, retail. Passengers would travel between the waiting area and the bus facility via a passageway located on an intermediate level below the bus facility main deck level but above the platform level of the station. Vertical circulation elements would transition passengers to and from this intermediate level where they would reach an island in the center of the bus slips from which they can disperse to reach their bus. The second location would be at the bus deck level(s) where smaller enclosures would be located in the islands in the center of the bus slips. Finally, at the north end of the bus facility, there would be two pedestrian entrances off H Street (one to the west and one near the streetcar) to allow for direct transferring between bus and streetcar. Both entrances would lead to a lobby off of H Street wherein a small waiting area could be located.

PHASING

Depending on the ultimate phasing strategy adopted, there is a possibility that a temporary bus facility would need to be established in the early construction stages with bus program fully available at the completion of construction.

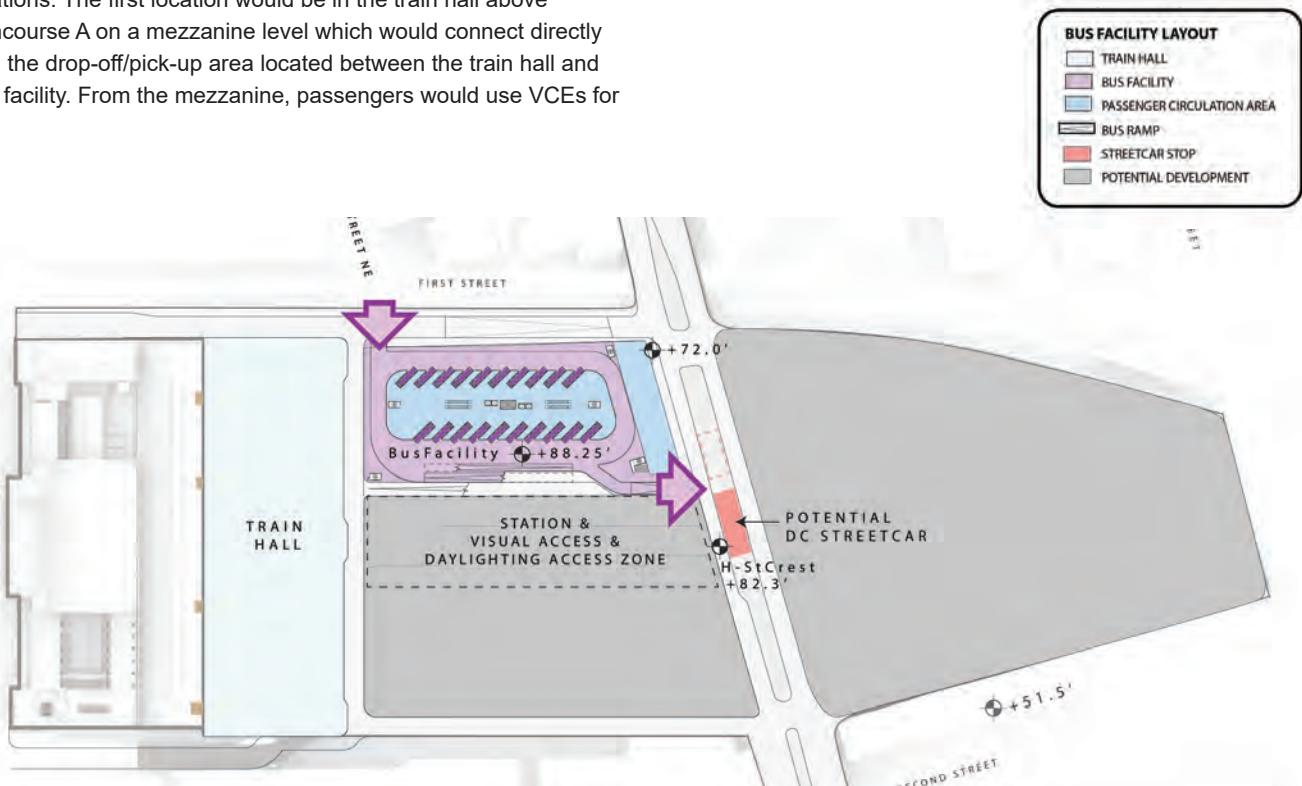


FIGURE 3.5. ALTERNATIVE A-C BUS FACILITY



3.5.4 Parking

With the demolition of the existing Union Station parking garage, public station parking would relocate to a new facility, either above or below-ground. The existing parking garage can accommodate approximately 2,450 vehicles, which includes the area occupied by rental cars and associated equipment.

Over the course of Concept Development, the Proponents projected a demand of 2,730 spaces in 2040 for Amtrak, retail, and rental car uses. FRA worked with the Project Proponents to reduce the minimum parking program within the limit of the lease requirements. As a result, the program was reduced to 1,600 spaces, including 600 retail-serving spaces, 75 rental car spaces, and 900 additional spaces to benefit rail passengers and other station users, with some additional spaces added for flexibility. This program would be consistent with USRC's lease agreements with Union Station Investco (USI), which manages WUS retail. Providing less parking capacity than the forecast need for Amtrak, retail, and rental car uses will increase private pick-up and drop-off, ride-for-hire, or transit usage. FRA and the Project Proponents incorporated the revised parking program into the alternatives.

In the proposed alternatives, the parking would be located above the tracks and platforms, below the tracks and platforms, or a combination of both. The above-tracks options would be either south or north of H Street. In alternatives where parking is located above the bus facility, such as in Alternatives A, C, and A-C, it would be structured on a nominally 60'x60' grid.

Below-ground parking would be located below the concourse level, either on a nominally 30'x30' or 30'x60' grid, depending on the presence of overbuild structure. Access to below-grade parking is proposed to be located at K Street, beneath the bridge between First and 2nd Streets NE. Vehicles would then proceed to ramps leading down to levels B1 and potentially B2. Parking would be under the stub-end tracks and Central Concourse areas of the site on both levels.

For more information on the parking program, see the DEIS Chapter 3.

ABOVE-GROUND PARKING:

ACTION ALTERNATIVE A

A new structure above the bus facility would provide vehicular parking. This structure would consist of six levels (99,900 GSF per level) and offer a total of approximately 1,750 spaces (599,000 GSF). The resulting height required to achieve parking count would be in excess of the existing parking garage.

The parking facility would also include space for pick-up and drop-off activities. Vehicular access would be from H Street NE via the new west intersection and southwest road. Vehicles would exit to the south toward First Street NE via the repurposed west ramp.

PEDESTRIAN CIRCULATION

Pedestrians would access the parking facility via the VCEs from the bus facility mezzanine level. Those coming from WMATA Metrorail or the SEP would need to access Concourse A before moving up via the VCEs and walking through the mezzanine level. Passengers going to the parking facility would share an elevator with passengers going up to the bus loop.

ACTION ALTERNATIVE A-C

A new structure above the bus facility would provide vehicular parking. This structure would consist of six levels (115,000 GSF per level) and offer a total of approximately 1,600 spaces (690,000 GSF).

Vehicular access would be via a ramp off the east-west road, on the east side of the structure. Cars would reach this ramp from H Street NE, traveling southbound along the southwest road and turning right into the east-west road or from First Street traveling northbound along the west ramp. Vehicles leaving the parking facility would turn left onto the east-west road and go to either H Street NE via the southeast road or F Street via the east ramp.

PEDESTRIAN CIRCULATION

Pedestrians would access the parking facility via the VCEs from the bus facility mezzanine level. Those coming from WMATA Metrorail would need to access Concourse A before moving up via the VCEs and walking through the mezzanine level. Passengers going to the parking facility would share an elevator with passengers going up to the bus deck and would enter the station or exit to H Street through the same mezzanine.

ABOVE- AND BELOW-GROUND PARKING:

ACTION ALTERNATIVE C, WEST AND EAST OPTIONS

In this alternative, parking would be located on three levels above either the northeast or northwest bus facility. Private air-rights development could be situated above the parking levels. Each floor would accommodate 264 cars at 128,964 GSF for a total of 386,952 GSF for three levels. Cars would access either parking facility from H Street, where a ramp brings them up to the parking levels.

In addition, Alternative C would have parking on the B1 level, below the stub-end tracks and Central Concourse areas of the site. There will be 917 cars over an area of 128,984 GSF. Cars would access the below-ground parking facility from K Street, where a ramp would bring them down to the B1 level.

PEDESTRIAN CIRCULATION

In Alternative C, pedestrians would access the above-ground parking facility via VCEs in the H Street Concourse. Pedestrians would be brought up to the street level where they would be able to access a second vertical circulation element to bring them from the street level up to the parking facility. Passengers would access below-ground parking via VCEs in the H Street Concourse, Central Concourse, and First Street Concourse. From the WMATA Metrorail station, passengers would need to access respective VCEs in the H Street Concourse, Central Concourse, and First Street Concourse.

ACTION ALTERNATIVE D

Three levels of parking would be located on the northernmost parcel by K Street in this alternative. Each floor would accommodate 252 cars over an area of 95,953 GSF for a total of 287,859 GSF on three levels.

Cars would access the facility from H Street via a service road that will lead drivers to the entrance. Parking would start on the street level and go up two more levels above.

In addition, Alternative D would have parking on the B1 level, below the stub-end tracks and Central Concourse areas of the site. There will be 917 cars over an area of 128,984 GSF. Cars would access the below-ground parking facility from K Street, where a ramp would bring them down to the B1 level.

PEDESTRIAN CIRCULATION

In Alternative D, pedestrians would access the above-ground parking facility via VCEs in the H Street Concourse. Once on the street level, pedestrians would walk north to enter the parking structure. Passengers would access below-ground parking via VCEs in the H Street Concourse, Central Concourse, and First Street Concourse.

BELOW-GROUND PARKING:

ACTION ALTERNATIVES B AND E

Vehicular parking would be entirely below ground, on two levels beneath the lowest concourse level: Level B1 (approximately 900 cars) and Level B2 (approximately 1,100 cars). The below-ground facility would extend between K Street NE and Concourse A, underneath the stub-end tracks and the Central Concourse. Vehicular access would be from K Street NE, via a new signalized intersection in the underpass between First Street and 2nd Street NE. The facility entrance would have one inbound lane, one outbound lane for left turns only, and one outbound lane for right turns only.

PEDESTRIAN CIRCULATION

Below-ground parking would be accessed via VCEs from the lower concourse level through the H Street Concourse, Central Concourse, and First Street Concourse. From the lower concourse level, pedestrians would access VCEs that would bring them to the WMATA Metrorail station.

Above-ground Parking - ALT A

Full Parking Level L2-L6 (5 lvls):

Total : 1450 cars

409 sf/parking
60' x 60' grid

290 cars/level

118,740 sf

Partial Parking Level L1 (1 lvl):

Total : 209 cars

481 sf/parking
60' x 60' grid
pick-up/drop-off area : 18,000 GSF

GRAND TOTAL : 1659 cars

Above-ground Parking - ALT A-C

Full Parking Level L3-L8 (6 lvls):

Total : 1626 cars

409 sf/parking
30' x 55' grid

280 cars/level

114,641 sf

GRAND TOTAL : 1626 cars

Above- and Below-ground Parking - ALT C Northwest Parking Option

Full Parking Level L2-L3 (2 lvls):

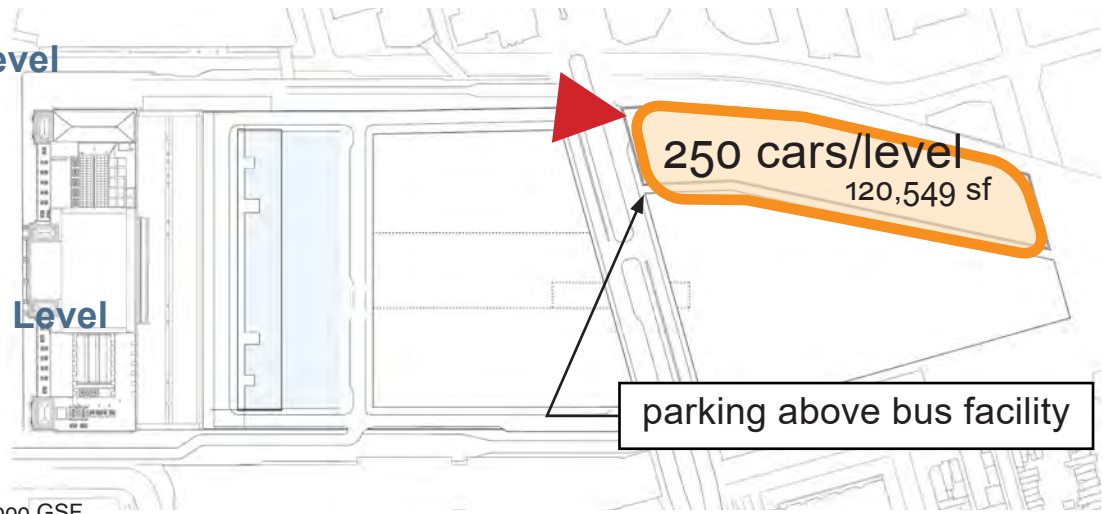
Total : 500 cars

480 sf/parking
60' x 60' grid

Partial Parking Level L1 (1 lvl):

Total : 213 cars

480 sf/parking
60' x 60' grid
pick-up/drop-off area : 18,000 GSF



Lower Concourse Level:

Access to Below-ground
Parking from K Street



B1 Level:

Total : 917 cars

484 sf/parking
30' x 60' grid &
30' x 30' grid



GRAND TOTAL : 1630 cars

*For-hire Pick-Up/Drop-Off utilizes roughly 18000 SF on that level

Above- and Below-ground Parking - ALT C Northeast Parking Option

Full Parking Level L2-L3 (2 lvls):

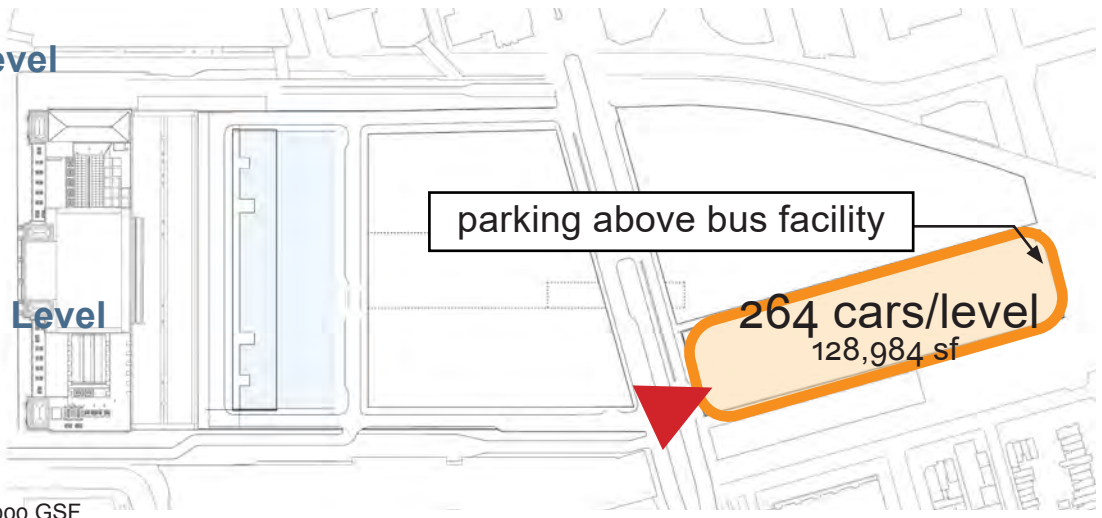
Total : 528 cars

480 sf/parking
60' x 60' grid

Partial Parking Level L1 (1 lvl):

Total : 227 cars

480 sf/parking
60' x 60' grid
pick-up/drop-off area : 18,000 GSF



Lower Concourse Level:

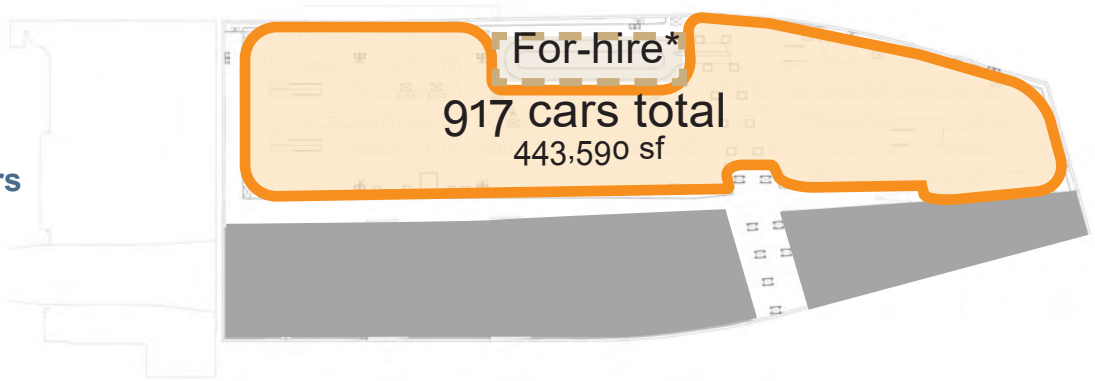
Access to Below-ground
Parking from K Street



B1 Level:

Total : 917 cars

484 sf/parking
30' x 60' grid &
30' x 30' grid



GRAND TOTAL : 1672 cars

*For-hire Pick-Up/Drop-Off utilizes roughly 18000 SF on that level

Above- and Below-ground Parking - ALT D

Full Parking Level L2-L3 (2 lvls):

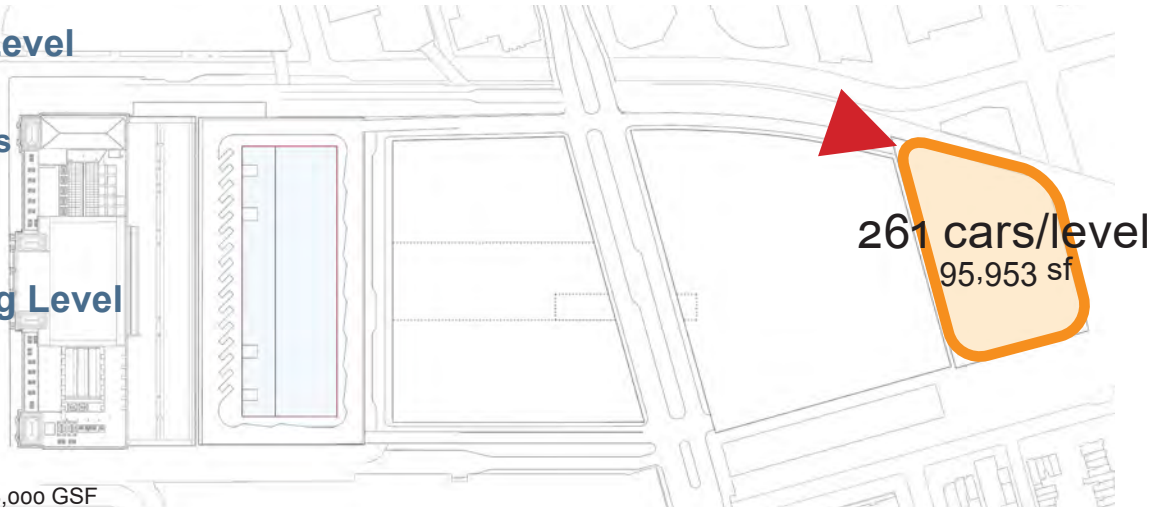
Total : 522 cars

367 sf/parking
60' x 60' grid

Partial Parking Level L1 (1 lvl):

Total : 213 cars

367 sf/parking
60' x 60' grid
pick-up/drop-off area : 18,000 GSF



Lower Concourse Level:

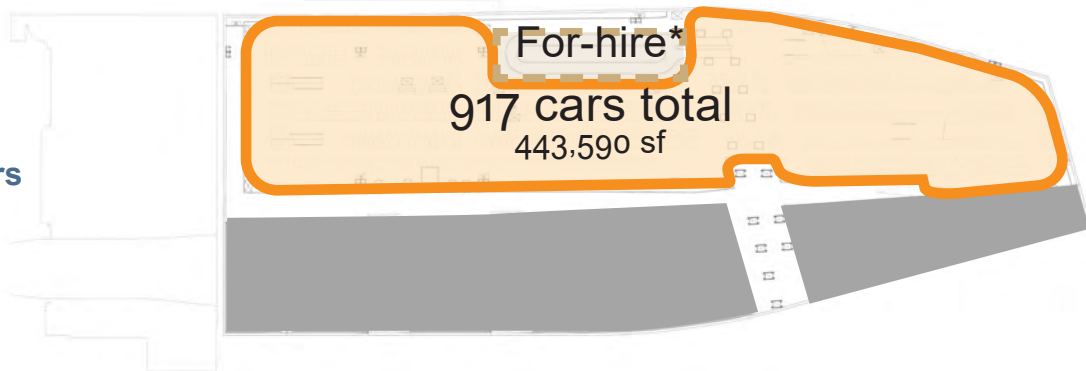
Access to Below-ground
Parking from K Street



B1 Level:

Total : 917 cars

484 sf/parking
30' x 60' grid &
30' x 30' grid



GRAND TOTAL : 1652 cars

*For-hire Pick-Up/Drop-Off utilizes roughly 18000 SF on that level

Below-ground Parking - ALT B and ALT E

Lower Concourse Level:

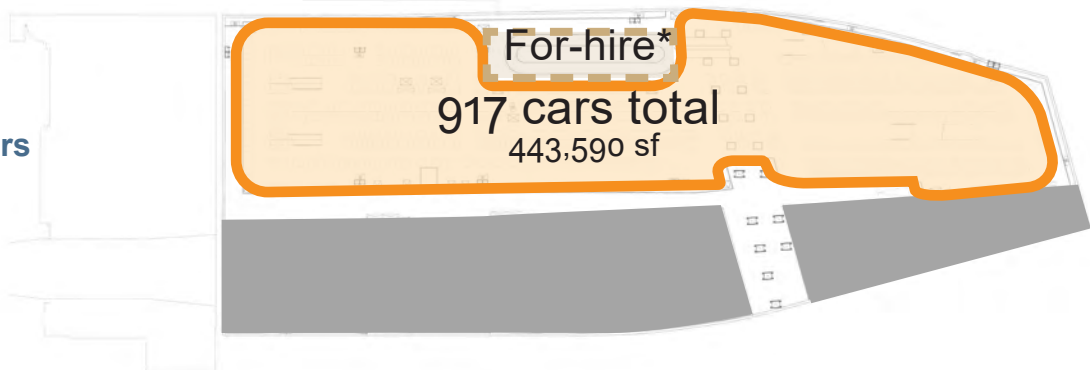
Access to Below-ground Parking from K Street



B1 Level:

Total : 917 cars

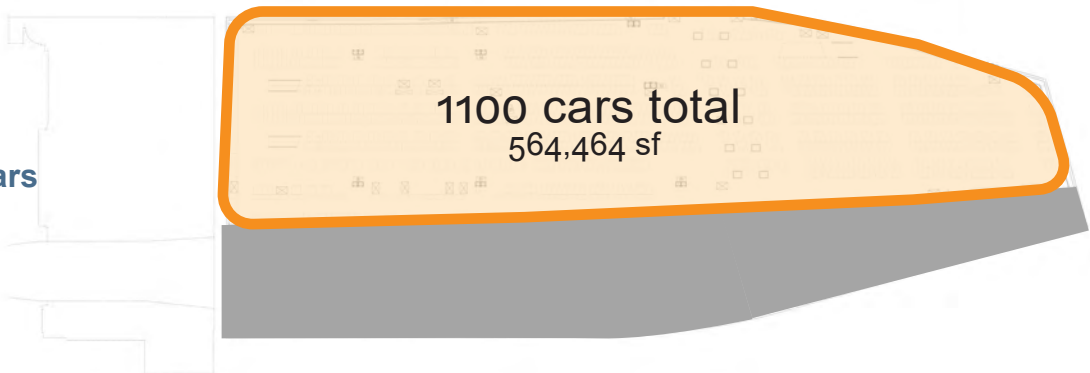
484 sf/parking
30' x 60' grid &
30' x 30' grid



B2 Level:

Total : 1100 cars

513 sf/parking
30' x 60' grid &
30' x 30' grid



GRAND TOTAL : 2017 cars

*For-hire Pick-Up/Drop-Off utilizes roughly 18000 SF on that level

