APPENDIX B3

BELOW-GRADE ACCESS RAMPS

WASHINGTON UNION STATION EXPANSION PROJECT

BELOW-GRADE ACCESS OPPORTUNITIES

AKRIDGE Invested.

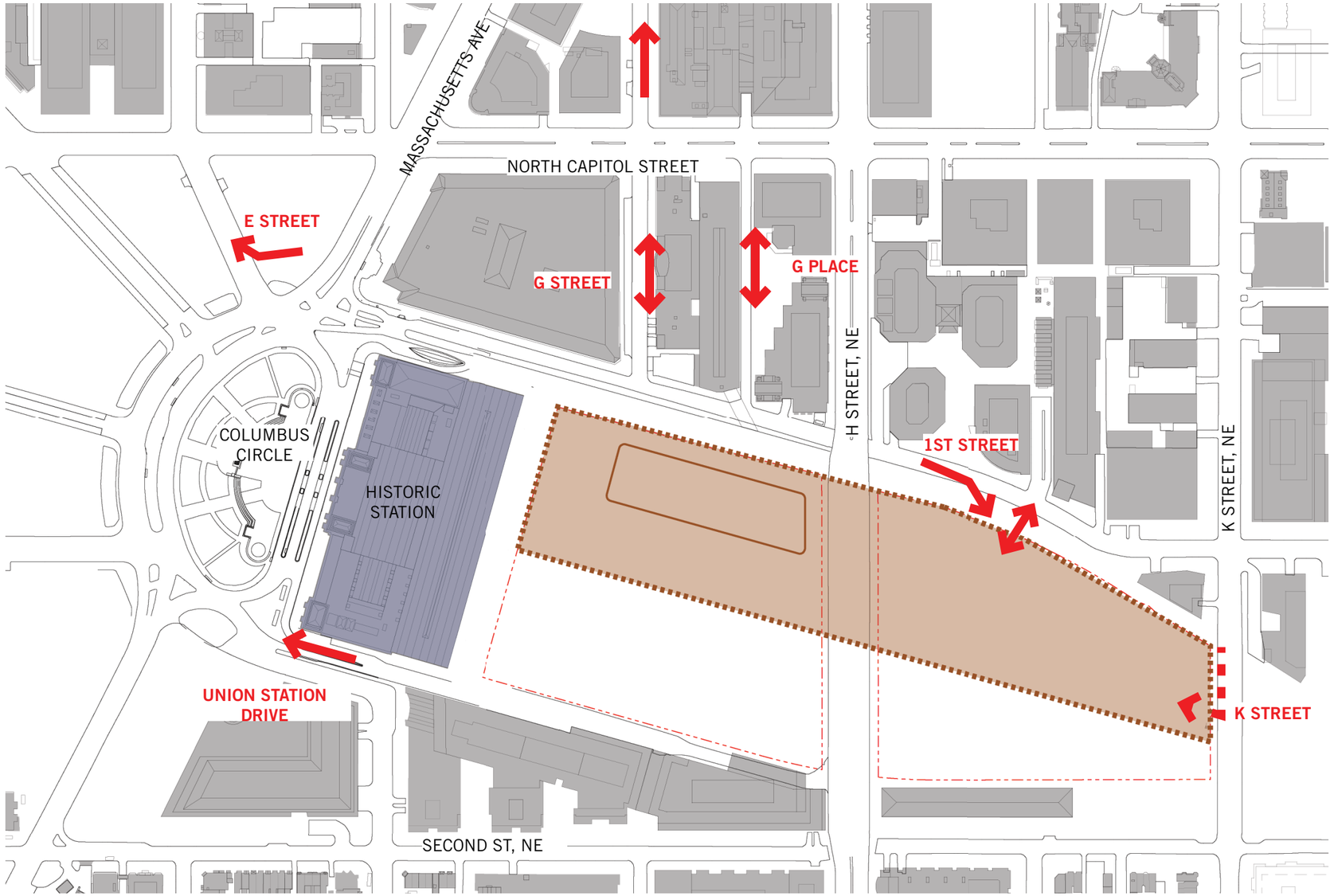
IAB Laboratory for Architecture + Building

Sam Schwartz

WELLS + ASSOCIATES

shalom baranes associates | architects

Below-Grade Access Opportunities



Ramp Design Criteria

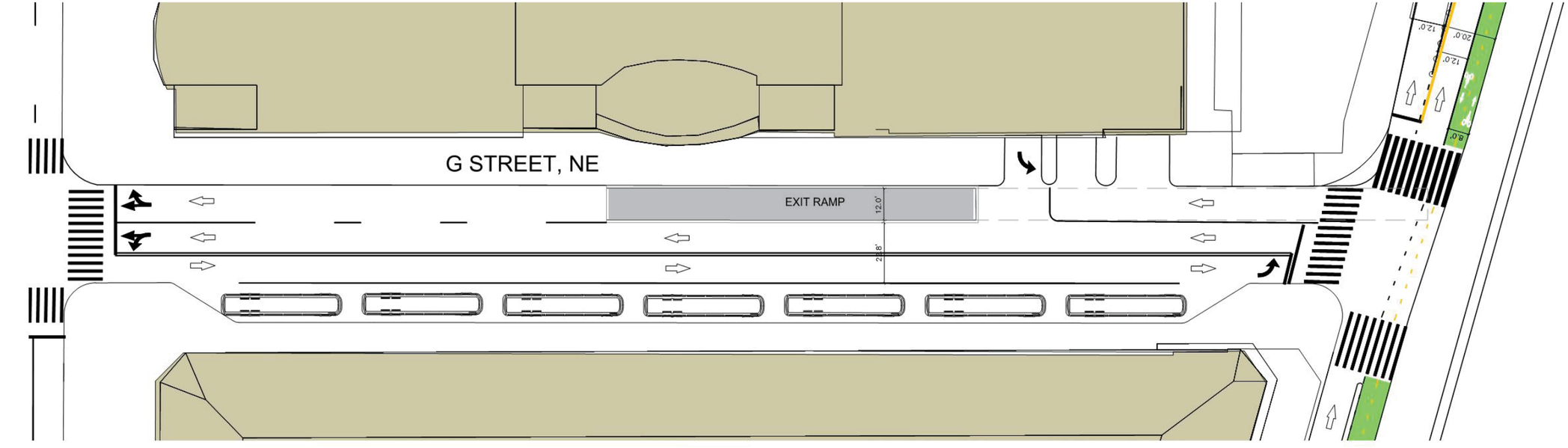
Background code research:

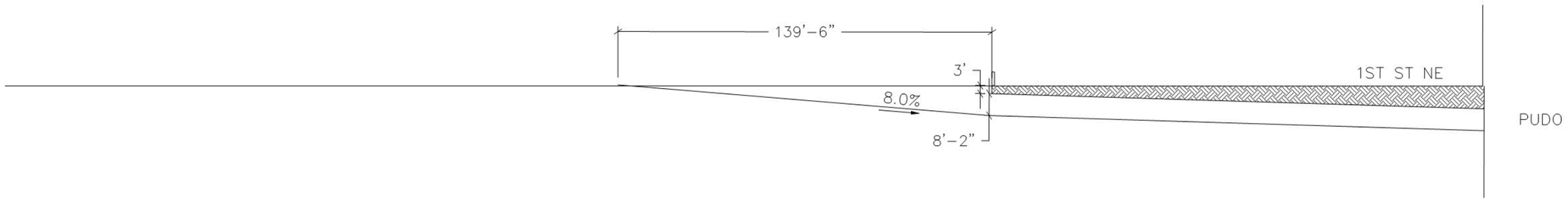
- DDOT Design & Engineering Manual (DEM), 2019
- AASHTO: A Policy on Geometric Design of Highways & Streets (Green Book), 2011
- International Building Code (IBC), 2015
- DC Construction Code, 2017
- DC Fire Code, 2013
- Americans with Disabilities Act Accessibility Guidelines (ADAAG), 2010
- DC Office of Zoning Regulations, 2016

Ramp attributes:

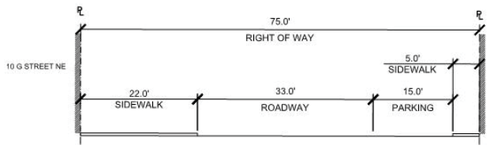
- 8’-2” minimum vertical clearance, with 3’-0” minimum roof slab where ramp goes underground
- 12% maximum slope on ramps, with additional considerations for visibility of vehicles on exit ramps to use more gradual slopes
- 12’-0” minimum horizontal clearance on the ramps
- 20’-0” minimum roadway width for fire apparatus access roads at-grade

G Street, NE

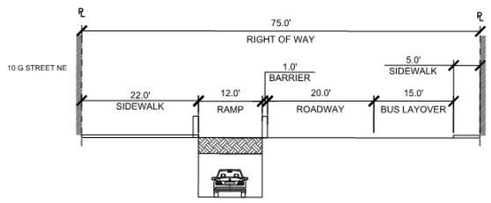




G STREET NE
LOOKING EAST
EXISTING

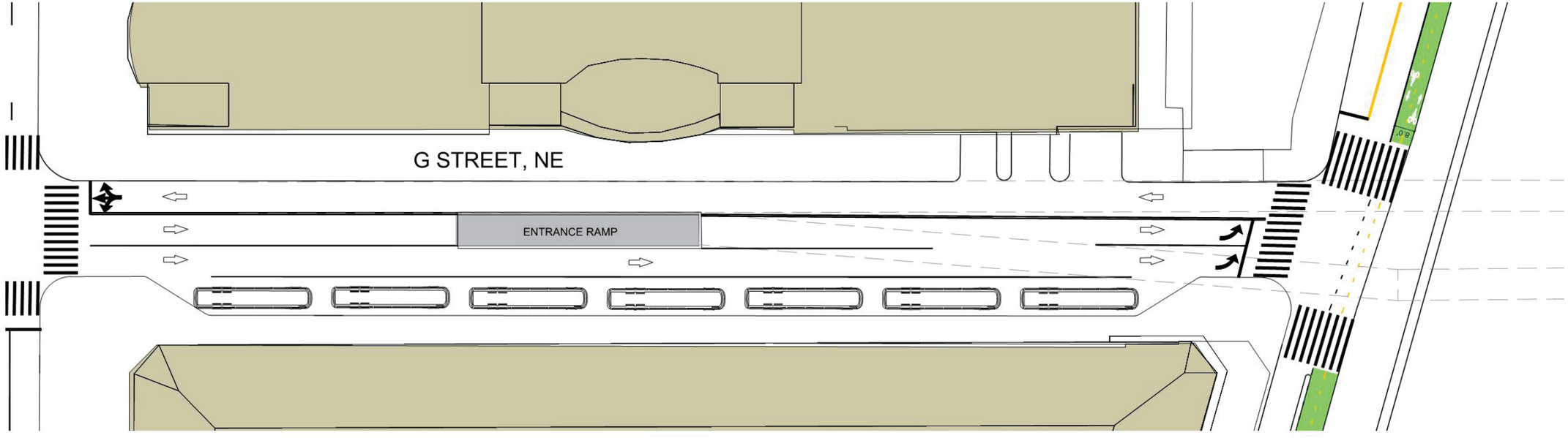


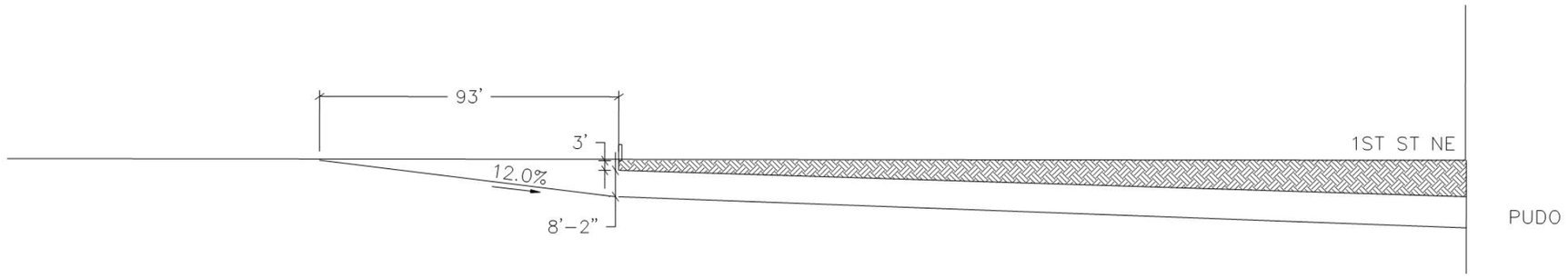
G STREET NE
LOOKING EAST
PROPOSED



BURNHAM PLACE

G Street, NE





G STREET NE
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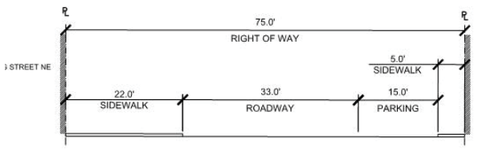
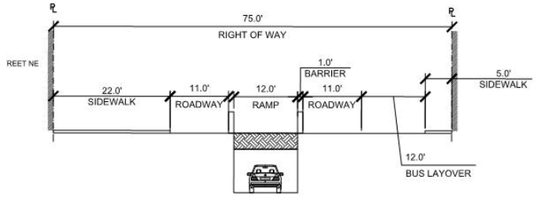


G STREET NE
LOOKING EAST
PROPOSED

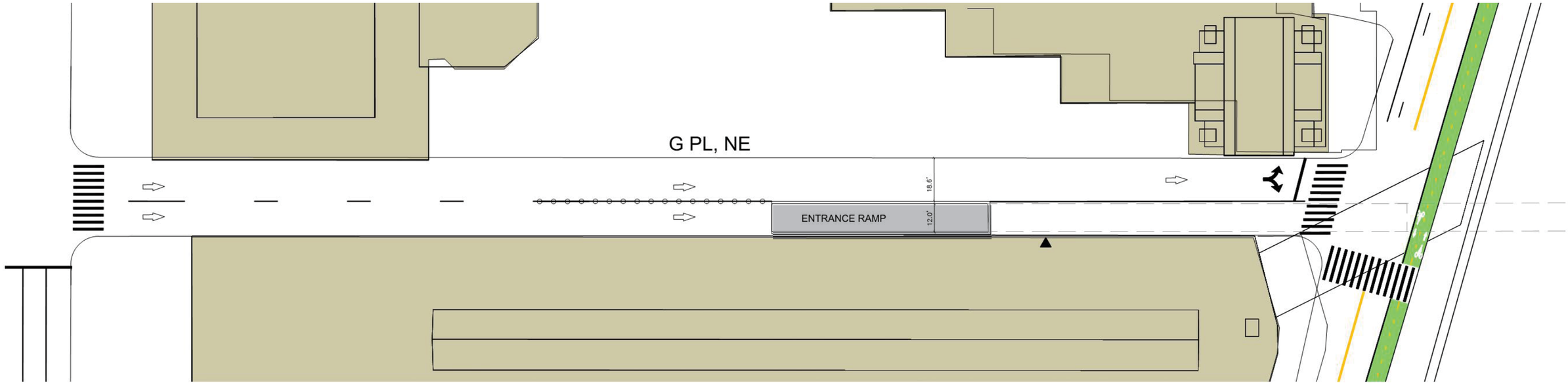


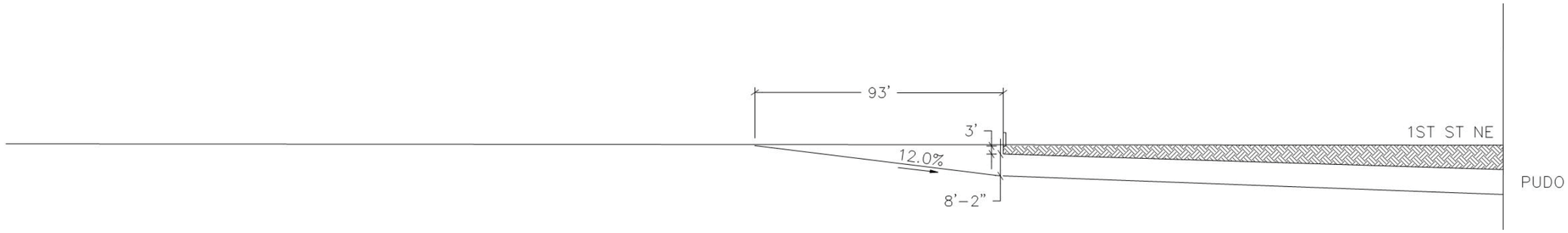
G Street Entrance Ramp looking east

Existing Conditions

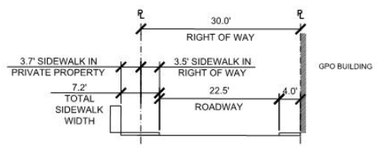
Entrance Ramp Concept

G Place, NE

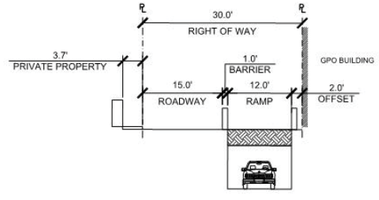




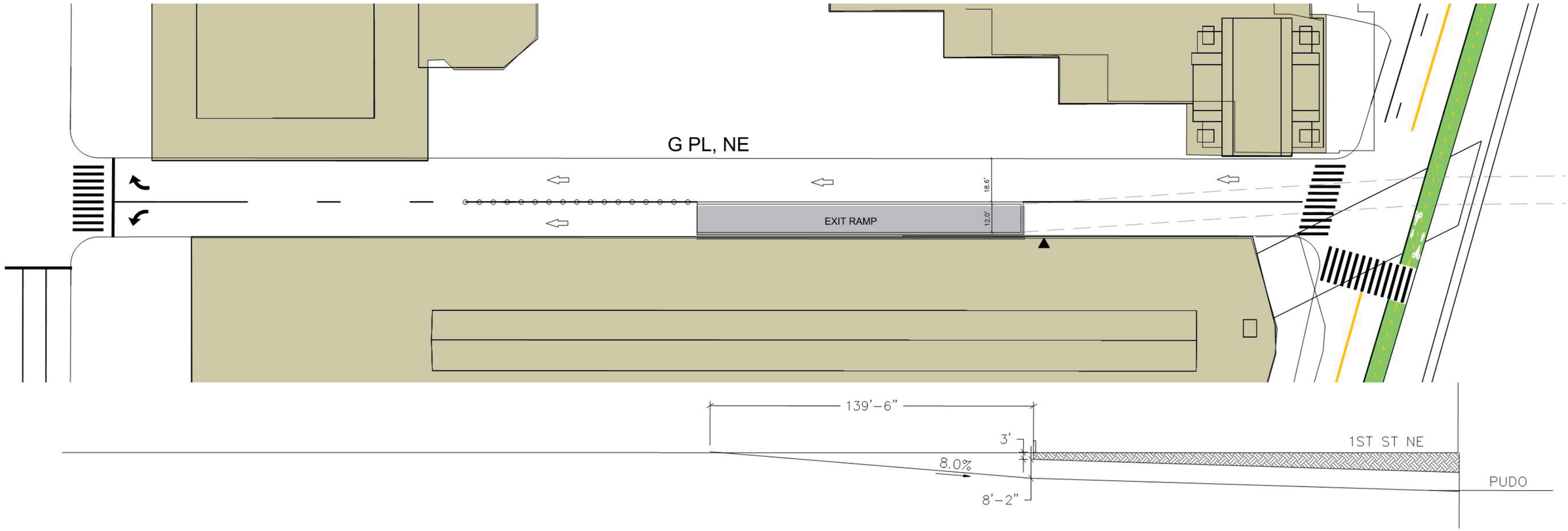
G PLACE NE
LOOKING EAST
EXISTING



G PLACE NE
LOOKING EAST
PROPOSED



G Place, NE



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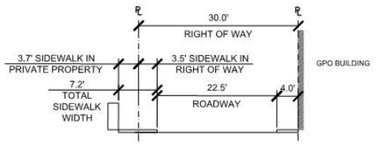
EXISTING



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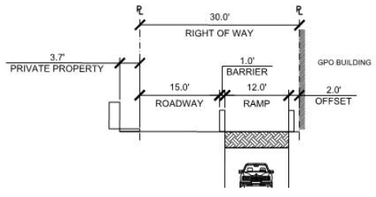
LOOKING EAST
PROPOSED

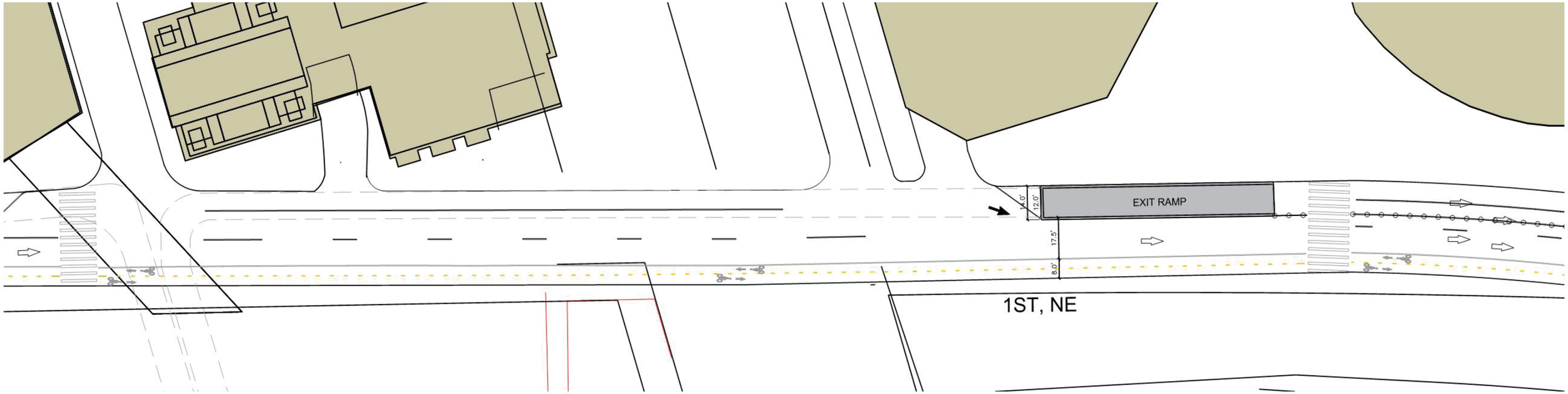


G Place Exit Ramp looking east

Existing Conditions

Exit Ramp Concept - Pedestrian Priority Street

First Street, NE



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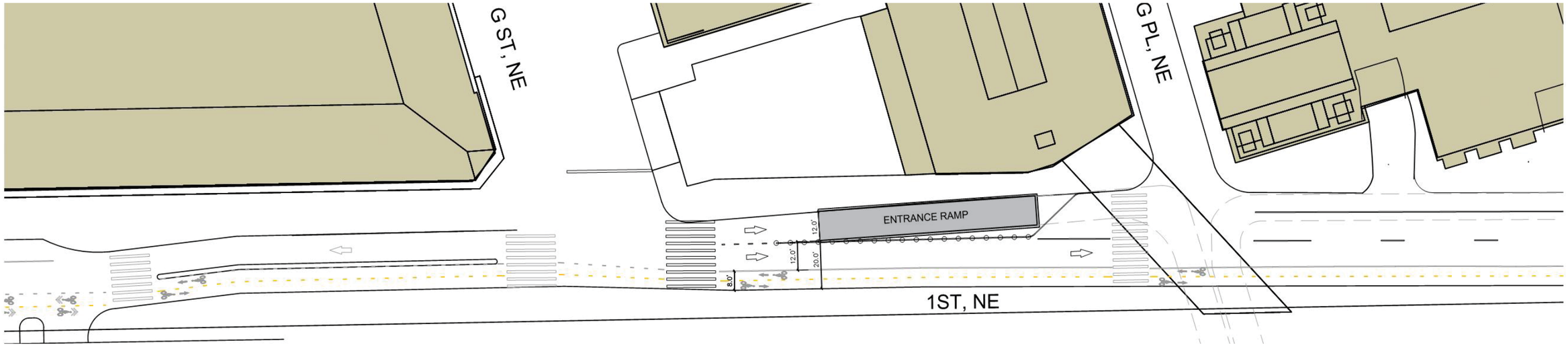
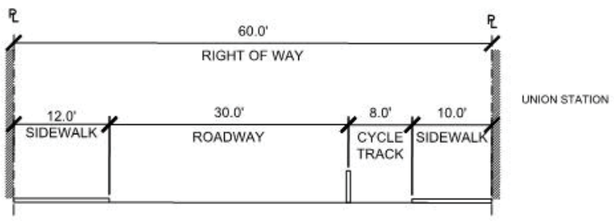


1ST STREET NE
LOOKING NORTH
EXISTING



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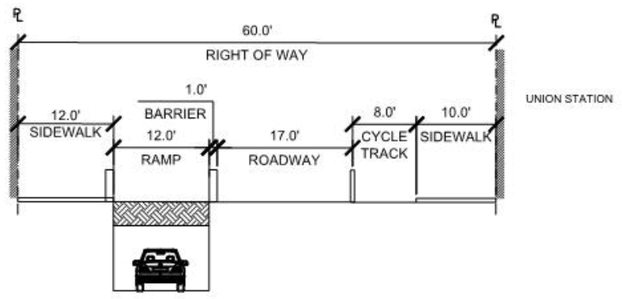
LOOKING NORTH
PROPOSED



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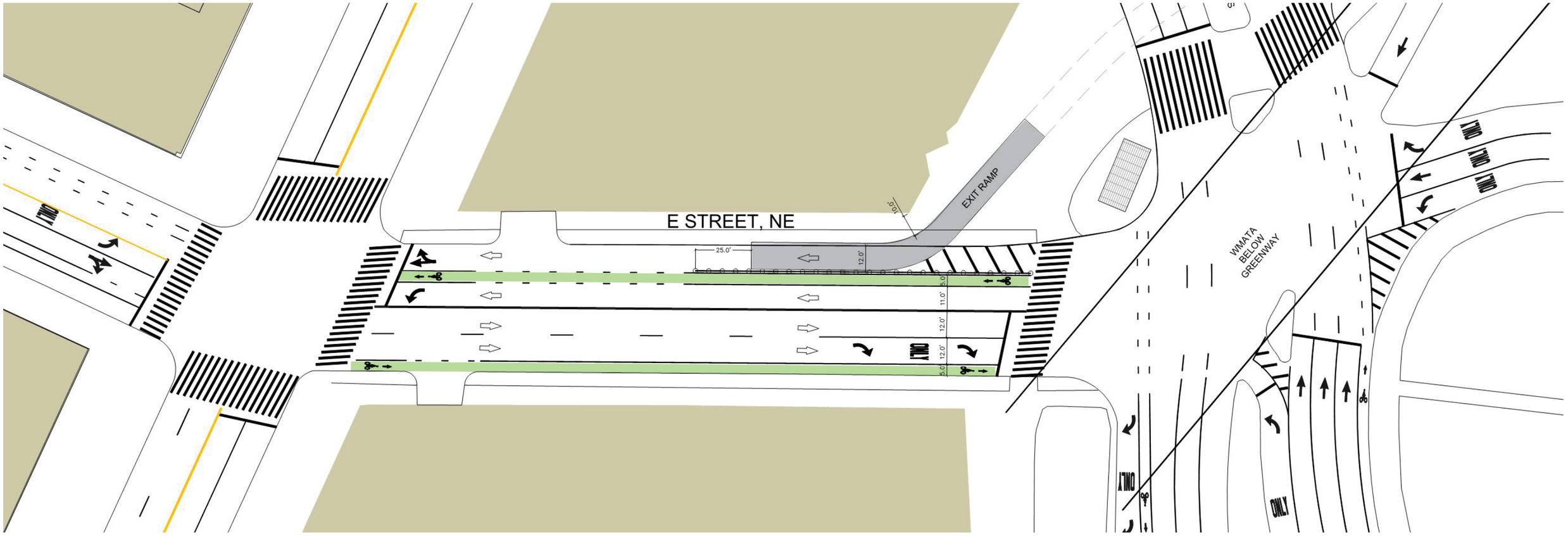

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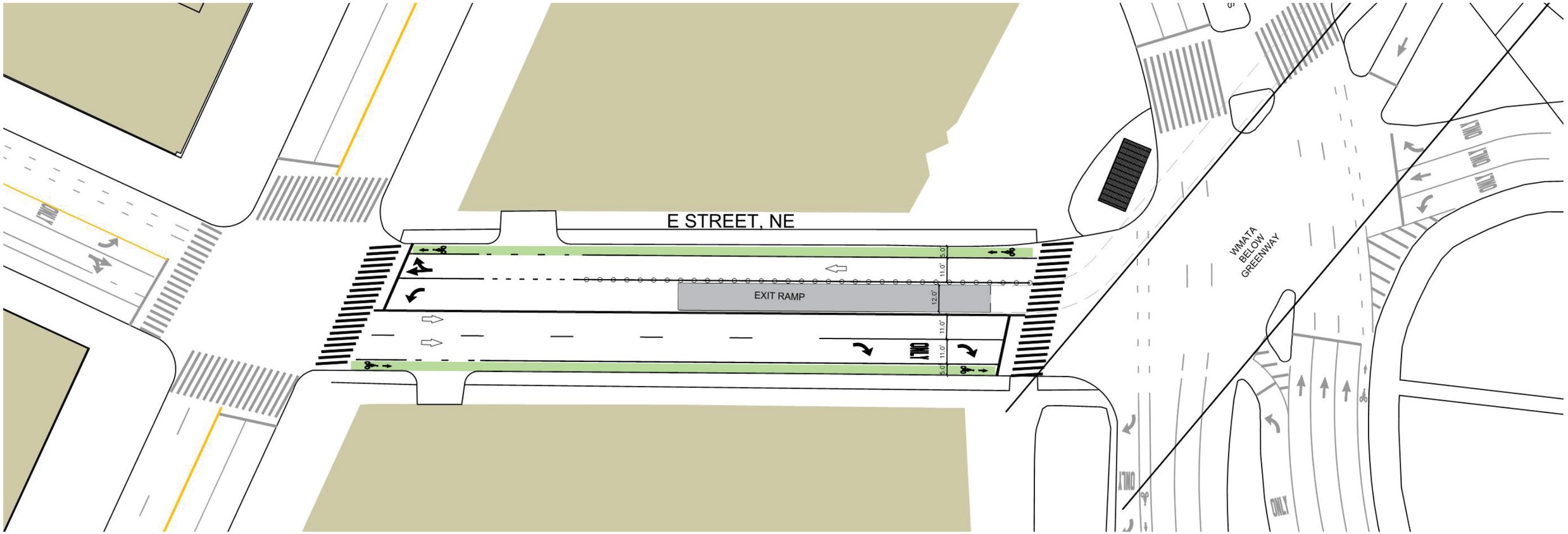

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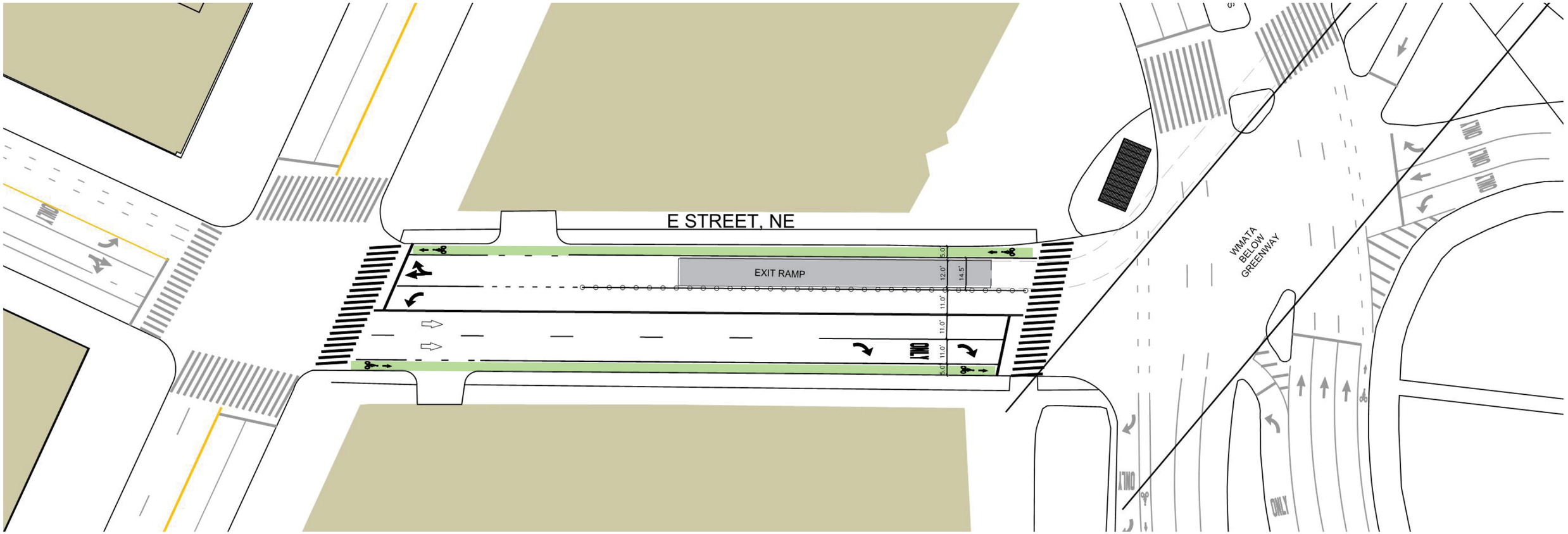
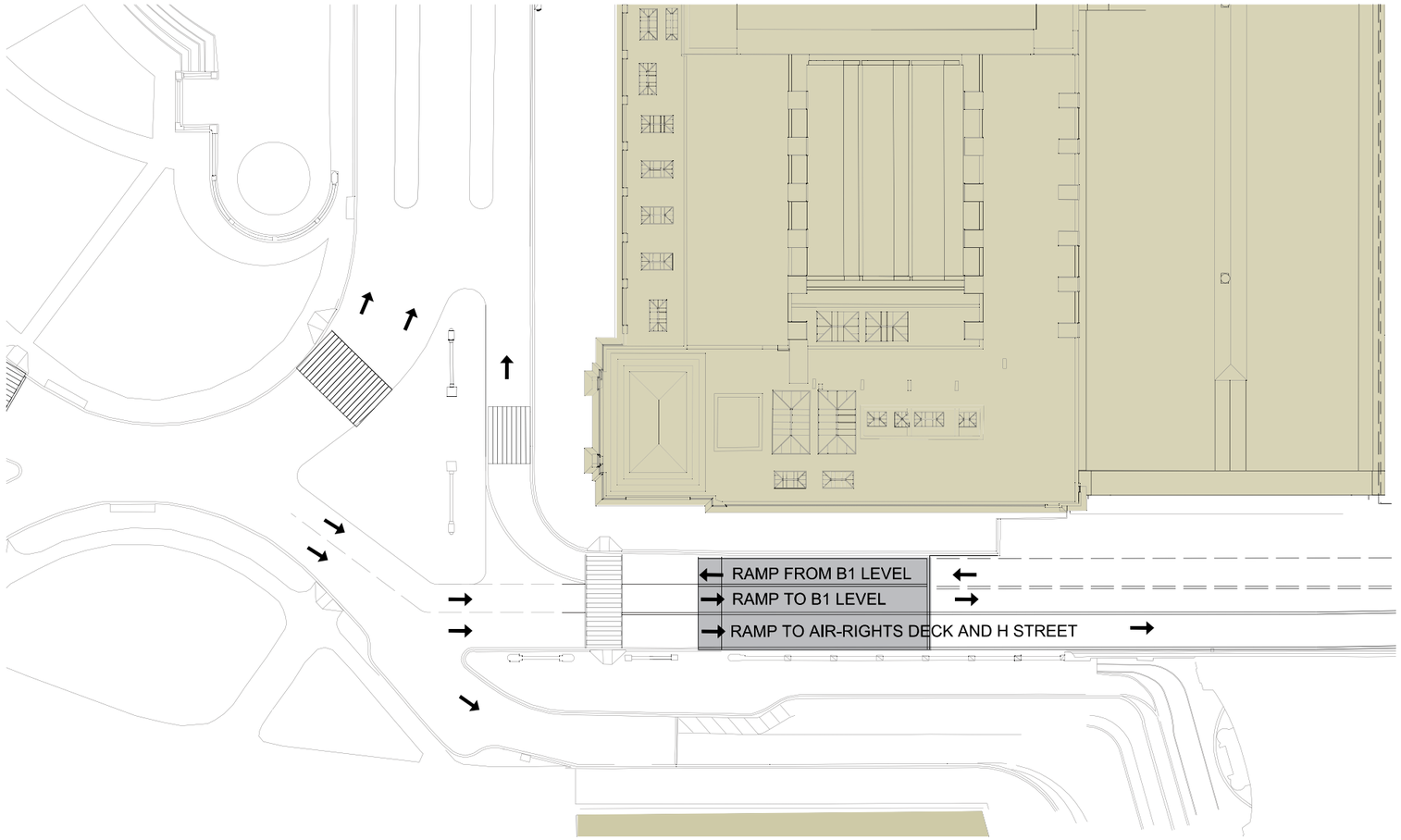


Union Station Drive, NE



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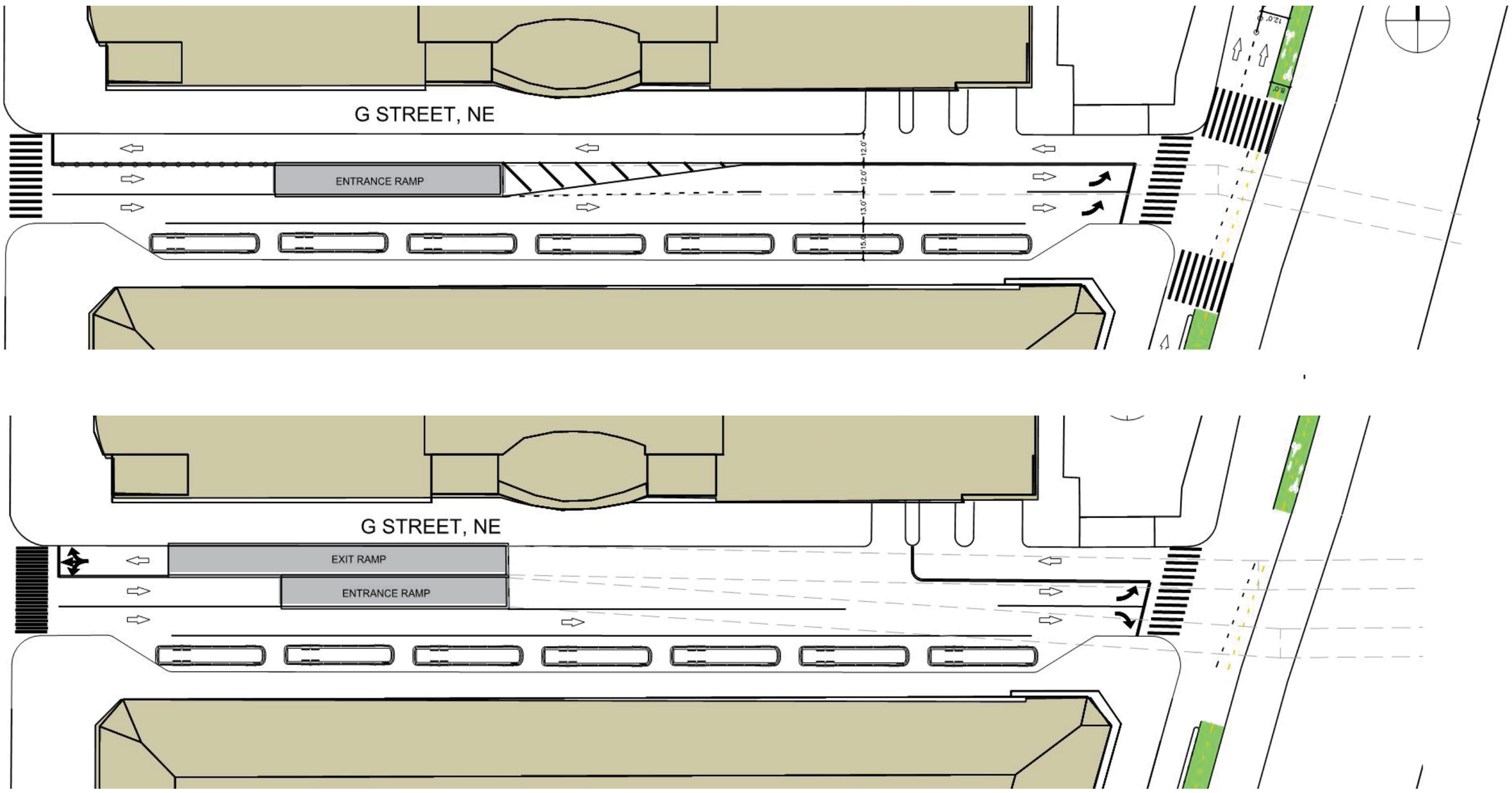
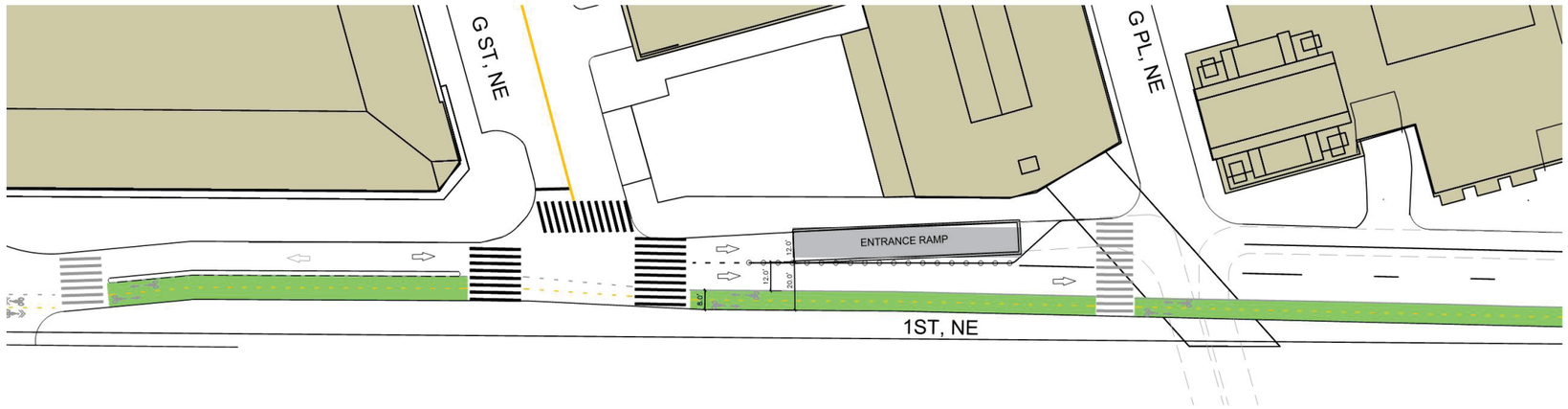
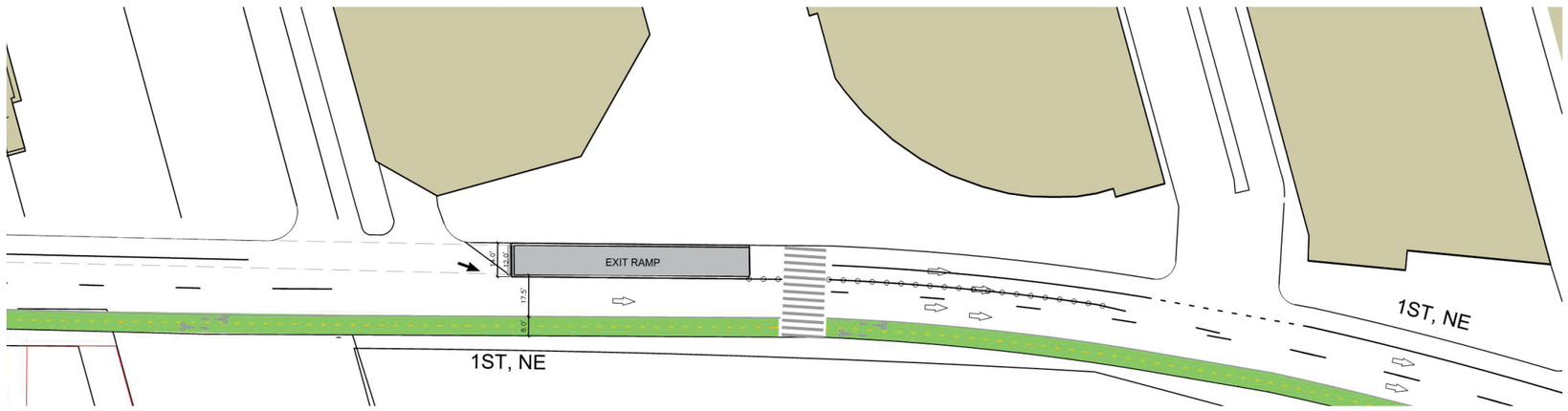


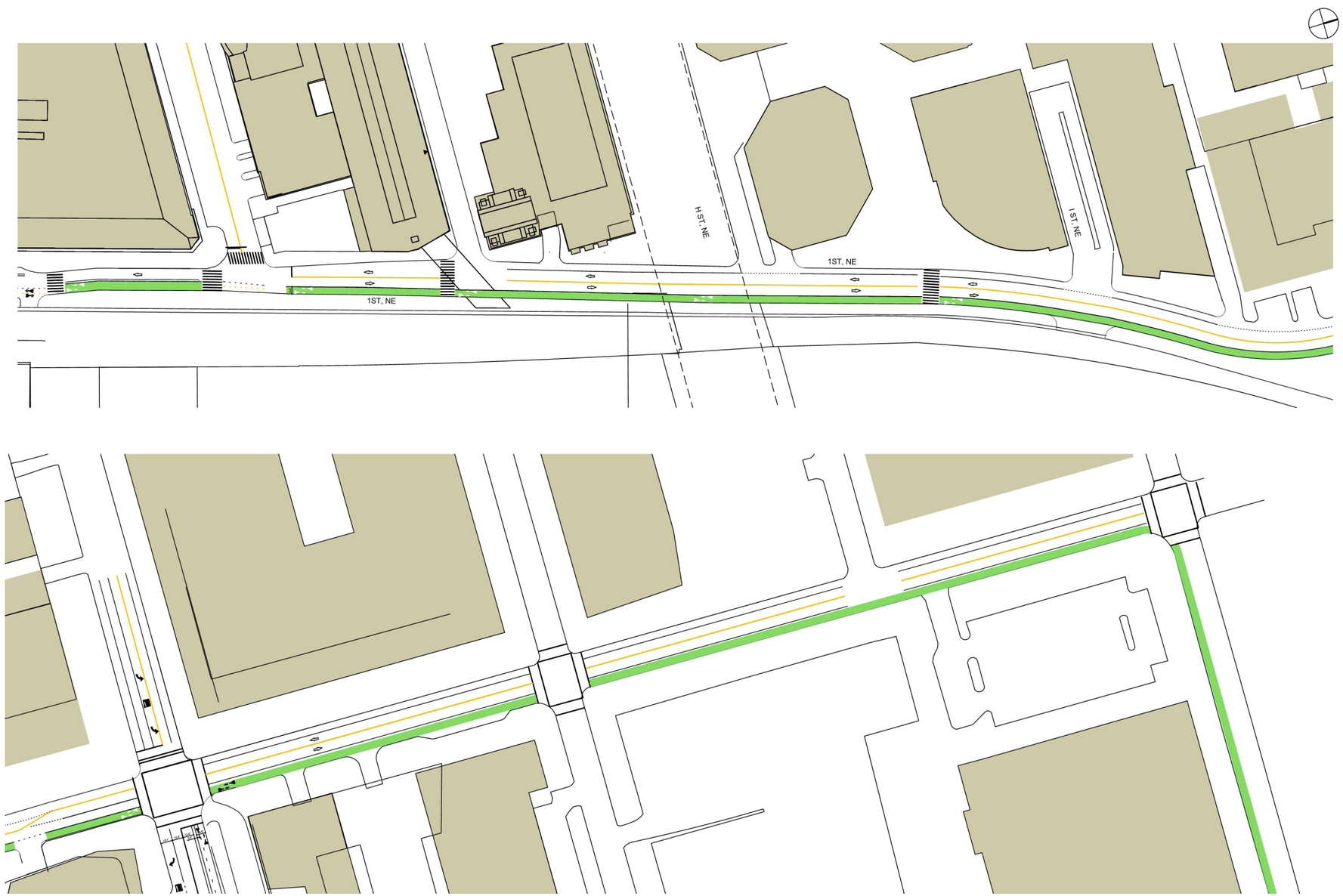
First Street, NE

First Street, NE

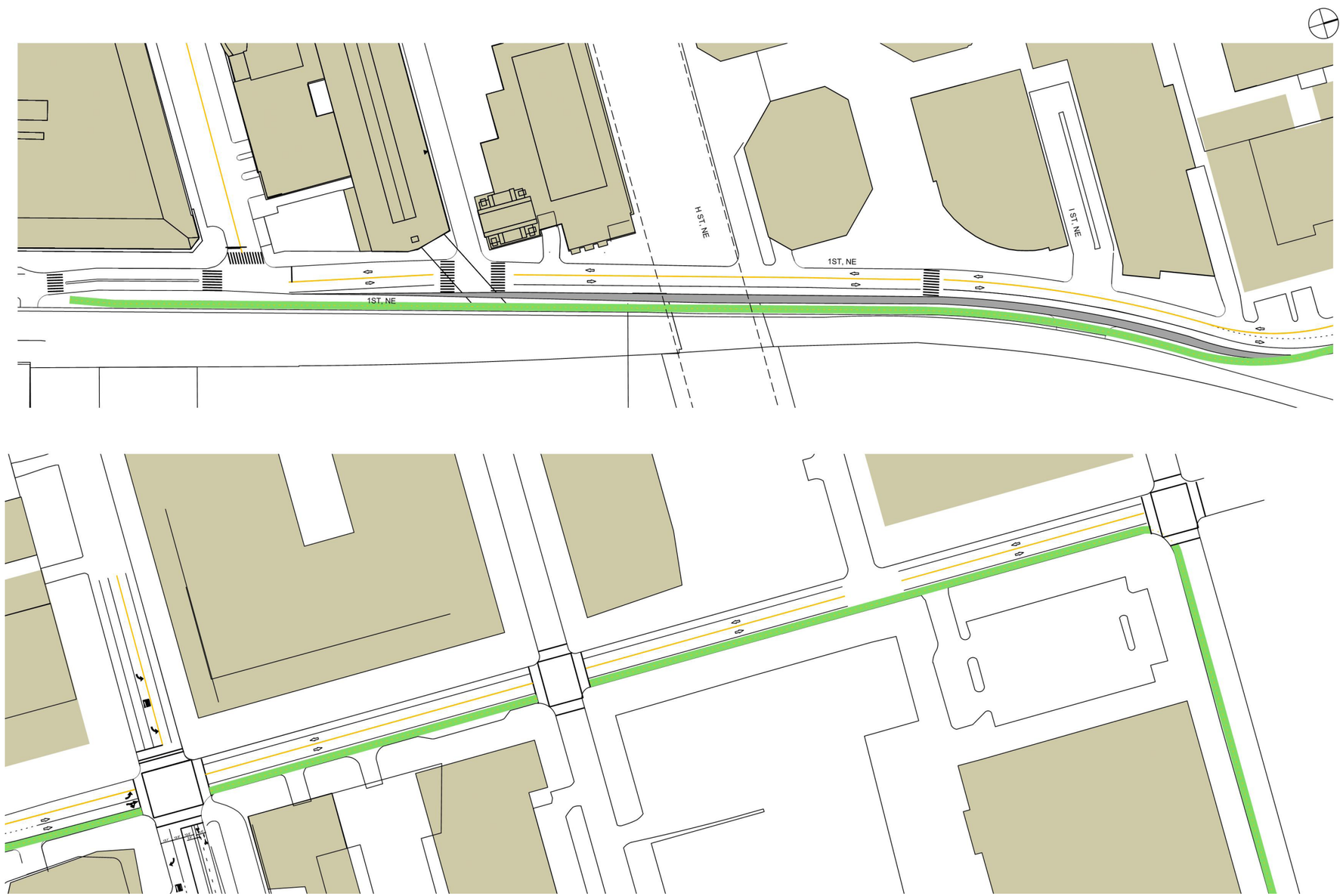




First Street, NE - Existing



First Street, NE - Option 1



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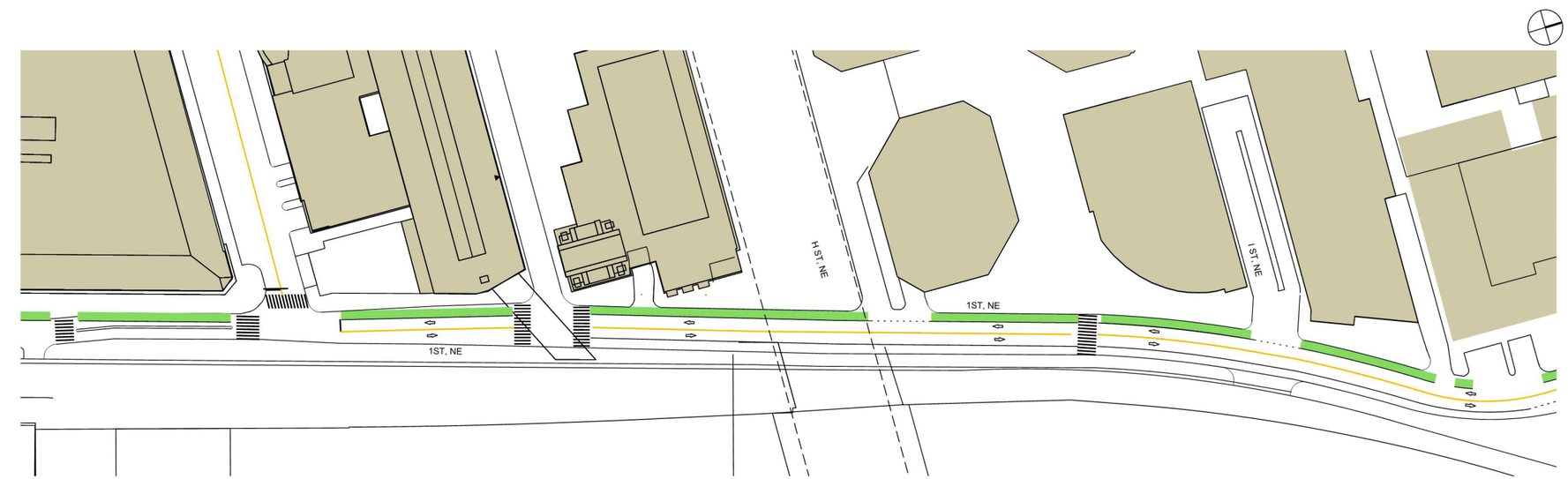

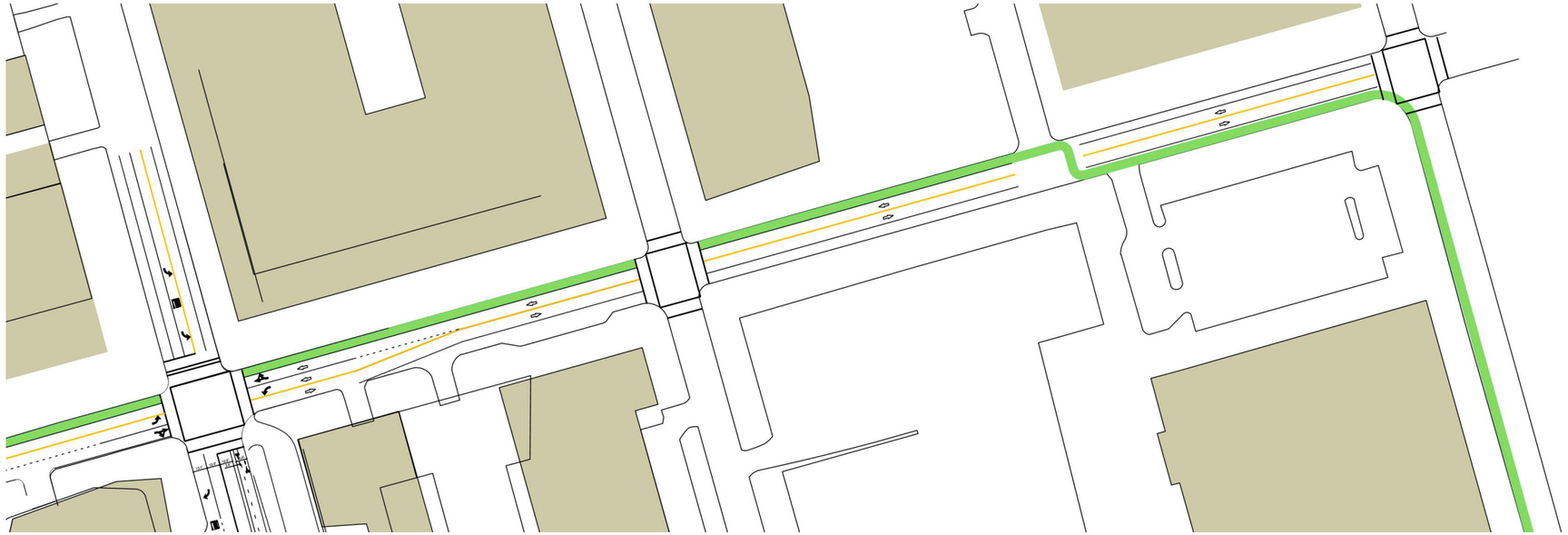

APPENDIX C

BUS TERMINAL OPERATIONS

APPENDIX C1

BUS TERMINAL OPERATIONS

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Sam Schwartz

Union Station Bus Terminal Operations

Research Findings and Independent Analysis of the Draft Environmental Impact Statement (DEIS) and Draft Section 4(f) Evaluation for the Washington Union Station (WUS) Expansion Project
September 2020

Introduction

Washington Union Station (WUS) is Amtrak's second busiest station and a major intermodal hub, where long-distance rail and intercity bus operations meet local, commuter, and charter bus services, as well as the Metrorail system. Planning for a major expansion of WUS includes the design and construction of a new bus terminal that will serve the intercity and charter bus services that are currently part of the bus terminal operation. With a fixed footprint that must also accommodate a greatly enlarged Amtrak station, the new bus terminal design is challenged to meet growing demand for intercity and charter bus service in limited space. This will require maximized efficiency through the application of modern techniques of operation and dispatching.

The Federal Railroad Administration (FRA) released the Draft Environmental Impact Statement (DEIS) for the Washington Union Station Expansion Project (SEP) on June 4, 2020. The DEIS is the result of a multi-step concept development, concept screening, concept refinement, and alternatives refinement process. The DEIS identifies a No-Action Alternative and six Action Alternatives: A, B, C, D, E, and A-C. Alternative A-C is the Preferred Alternative. After the public comment period, which ends on September 28, 2020, FRA will complete the Final Environmental Impact Statement (FEIS) and the Record of Decision (ROD), identifying the alternative selected for implementation, the rationale for the selection, and the associated mitigation measures and environmental commitments.

During the public comment period, Akridge asked Sam Schwartz to analyze and provide recommendations related to the DEIS and the proposed WUS bus terminal, to better understand best practices for facility operations and sizing, and the potential impacts of the bus facility on Burnham Place and adjacent uses. The DEIS proposes 26 to 40 bus berths (depending on the Alternative), with 40 being the number identified for the Preferred Alternative. In contrast, the analysis described in this paper argues that a bus terminal with twelve to sixteen active berths can more than meet the 2040 intercity and charter combined demand, by applying a centrally controlled dynamic scheduling system. A twelve-berth terminal is identified as a best practice value; a more conservative operation could increase the number of active berths to sixteen. Either design could be supplemented with additional staging berths, also dynamically managed, for increased efficiency. Both this analysis and the DEIS assume the same passenger growth; the discrepancy in the number of proposed berths results from projecting bus movements and time slot limitations (this analysis), rather than by applying a growth rate to existing number of berths (DEIS methodology). This analysis uses 35-minute (Best Practice) and 45-minute (Conservative) turnaround times for two sequential intercity bus movements (arrival and departure plus buffer time), whereas the DEIS assumes a 60-minute turnaround time.

A Best Practice, twelve-berth scenario involves employing a centrally controlled dynamic scheduling system (a practice seen around the world in transportation hubs). During peak hours, all layover activities, staging, storage, and maintenance work are located off-site. This dynamic management approach is the same operations method proposed in the DEIS.[1] Utilizing this operational approach, the facility as proposed in this analysis still allows for growth and flexibility. The need for twelve berths only occurs during the peak of the peak (approximately two hours per week, and only during peak charter season). Additional capacity would be available during off-peak hours, days, and seasons. The redistribution of peak hour bus movements and/or application of reduced 2040 charter growth assumptions could also allow for longer turnarounds or fewer berths.

The analysis outlines the similarities and differences in methodology compared to those in the DEIS, as well as identifies outstanding questions and gaps in DEIS documentation. Importantly, the DEIS acknowledges that the "size and operation of the bus facility may continue to be refined by FRA and the project proponents during the preparation of the FEIS and during the design phase of the Project."[2] The considerations raised in this analysis can influence the size and operation of the facility as the design progresses, leading to a bus terminal that reduces construction and operation costs while best meeting the needs of customers and supporting the economic vitality of WUS.

Per the Union Station Redevelopment Corporation (USRC), the WUS bus terminal currently serves approximately 2.6 million intercity bus passengers annually.[3] As a basis for its planning processes, the DEIS estimated that the bus terminal serves 2.5 million passengers annually, and projected 19% total growth in intercity passenger volume through 2040, up to an annual ridership of 2.975 million.[4] To align with the DEIS, the analysis described in this paper uses the same baseline and projected growth. However, the results of this analysis define a smaller facility size than what is proposed in the DEIS; one that can reliably accommodate more than 3 million annual passengers.

The planned bus terminal's 2040 passenger capacity requirements can be met and optimized within the WUS site by improving space utilization and applying an efficient operations model. A centrally-controlled dynamic scheduling system is proven and successfully applied by many of the largest US airports and in the central bus stations of Berlin, Frankfurt, and Hamburg in Germany, as well as in bus stations in the Netherlands and Denmark. This analysis demonstrates that such an operations model can meet current demands and accommodate an increase of more than 27% in bus movements by 2040 by increasing berth utilization, thereby reducing the overall space required for the new WUS bus terminal.

Similar to the DEIS, the analysis described in this paper applies the concepts of Active Terminal Management and Dynamic Scheduling Systems. However, in contrast to the operation model described by the DEIS, this analysis distinguishes the different time allowances needed for bus arrivals and departures, resulting in the need for fewer berths even during peak hours. It does so while accounting for the overall maximum hourly activity for intercity buses and for the spring peak travel period for charter buses. It assumes the same 19% increase in intercity bus movements and 51% increase in charter bus

[1] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix A5e, p. 1, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

[2] Ibid, p. 6

[3] Union Station Redevelopment Corporation. (Retrieved March 06, 2020). Transportation Introduction. https://www.usrcdc.com/transportation/.

[4] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix C3, p. 1-14, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

movements as the DEIS (even though it is unclear whether the latter figure has been sufficiently substantiated). It more accurately calculates future berth requirements based on projected bus movements and time slot limitations, rather than by applying a growth rate to the existing number of berths as done in the DEIS.

Additionally, to benchmark and support the recommendations, this analysis provides a comparison of intercity bus terminal operation models in analogous cities across the US, including berth leasing and utilization within these terminals. American examples are supplemented with international precedent. Unlike their international counterparts, intercity providers in the US have historically been rarely required to operate as efficiently as possible. This inefficiency is partly because many bus terminals have been located in areas where real estate values are relatively low. There is consequently little pressure to maximize space efficiency. This will not be the case for the future WUS, which is located at the heart of a vibrant urban center where space is at a premium.

Table of Contents

Chapter 1: Existing Bus Operations at Washington Union Station

Development of the Existing WUS Bus Facility

In 2010, the Union Station Redevelopment Corporation (USRC) began modifications of the space on the first level of the Union Station Parking Garage to improve its function as a charter bus operation and add intercity buses to the facility. Prior to 2010, this space was generally underutilized, serving a variety of transportation functions including parking, charter bus daytime storage, car rental, local bus service, and taxis. The 2010 modifications included paint markings, signage and unique safety systems to separate various functions and protect pedestrians. The facility design included no layover, storage, maintenance, fueling or crew facilities. The WUS bus terminal began operation in 2012, and within two years, Greyhound (which had operated from, and then sold the terminal it had owned about a quarter mile away from WUS) relocated to WUS and opened an 1,100 square foot ticketing and operations facility. With some updates and added passenger amenities, this is the operation in use today. The current facility has made intercity bus operations more convenient to Metro and the amenities offered by Union Station, and has successfully accommodated increasing intercity bus growth. For the purpose of this paper, intercity buses are defined as privately operated, scheduled bus services between major cities or destinations, primarily for non-commuting purposes. Charter buses are defined as buses hired by affiliated persons for a one-time use of transportation to a certain destination, in this case Washington, DC.

Existing WUS Bus Facility Size and Berth Assignment

The WUS Bus Terminal is a single-level facility with 52 bus berths that serve both intercity and charter buses, as well as private shuttle buses, sightseeing tours, and the Georgetown-Union Station Route of the DC Circulator.

Table 1 lists the number of bus berths currently assigned to each activity at the terminal, based on site observations and berth location information available on the websites of the various intercity bus operators.[5] Based on field observations conducted on February 26, 2020, 27 of 52 total berths are assigned to intercity bus operators; 20 berths are unassigned and may be used by charter buses; and five berths are utilized by local shuttles, sightseeing buses, and the DC Circulator. Nine berths that were established in the original 61-berth facility are not currently used for bus operations, and accommodate storage and miscellaneous vehicle parking.

Table 1: Existing Berth Assignment by Activity, WUS Bus Terminal

Berth Assignment	Berth Count	Main Users
Intercity	27	Greyhound, Peter Pan, Megabus, BoltBus, BestBus, Washington Deluxe, OurBus, Virginia Breeze
Unassigned	20	Charter buses
Other bus services	5	DC Circulator, Gallaudet University Shuttle, sightseeing bus tours
TOTAL	**52**	

[5] Berth observations at WUS were conducted at 2-3 PM on February 26, 2020.

As of February 2020, the intercity bus operators serve destinations that include New York City, Richmond, Durham, Philadelphia, Boston, Charlottesville, Pittsburgh, Baltimore and Newark, DE (see **Figure 3**).[6] Greyhound and Megabus are the two carriers with the greatest number of arrivals and departures. Over-the-road coaches 45 feet in length are standard except for Megabus, which uses double decker buses as shown in **Figure 1**.

Figure 1: Megabus double-decker buses shown staging at WUS

The requirement to incorporate a bus terminal in the WUS redesign is defined by the 2017 Washington Union Station Expansion Project Concept Screening Report, which stated that "Intercity and tour/charter buses are important parts of the programming at Union Station as identified in the Union Station Redevelopment Act of 1981."[7] Additionally, the report states that "the FRA will not further investigate bringing Metrobus/commuter bus into the bus facility."[8] In addition, the DEIS program for the bus facility does not include university and other shuttle services, and sightseeing buses, relocating these services outside of the intercity and charter facility. Therefore, the analysis of existing bus operations at WUS and the planning for future capacity of the facility in this paper is based on accommodating intercity and charter services only. Consideration of space for the DC Circulator is also discussed below.

A Brief History of Intercity Bus Operations in the US

Intercity buses have provided service across the United States since the 1920s.[9] However, the popularity and utilization of intercity bus terminals declined in the mid-20th century, following a cultural shift away from cities and towards the suburbs. In 1982 the intercity bus industry was deregulated through the Bus Regulatory Reform Act after decades of strict requirements.[10] Deregulation allowed for new types of services to arise, some based on decentralization of services and stations. While service to rural areas

[6] Publicly available bus schedules for intercity bus service carriers that operate at WUS, using Tuesday October 15, 2019 and Friday December 6, 2019.

[7] USDOT-FRA. (2017). Washington Union Station Expansion Project – Concept Screening Report, p. 6, Retrieved April 23, 2020. https://www.usrcdc.com/wp-content/uploads/2017/02/fra_wus_concept_screening_report_july2017.pdf.

[8] Ibid, p. 25

[9] Marshall, Aarian. (February 3, 2015). *The Bus Terminal Is Dead. Long Live the Bus Terminal*. City Lab. https://www.citylab.com/transportation/2015/02/the-bus-terminal-is-dead-long-live-the-bus-terminal/384352/. Retrieved January 31, 2020.

[10] Klein, Nicholas J. (2009). *Emergent Curbside Intercity Bus Industry: Chinatown and Beyond*. Transportation Research Record: Journal of the Transportation Research Board, No. 2111. Transportation Research Board of the National Academies. Washington, D.C. pp. 83–89.

declined following the Act, its passage set the stage for reinvigorating intercity services through a new, low-cost breed of decentralized companies: curbside operators.[11]

Intercity bus curbside operations began to surge at the beginning of the 21st century, initially centered about Washington and New York's respective Chinatowns. Curbside operations offer a high degree of flexibility in routes and schedules, and many curbside terminals are also convenient to transit. Other curbside operators deliberately locate far from center city to offer faster service, reduce costs, and to attract non-transit-oriented customers. But many bus riders and operators still recognize the usefulness of the bus terminal. Internal research conducted by the intercity bus operator BoltBus in 2015, found that 70% of its riders relied on public transit for first or last mile travel to and from bus terminals.[12] The connections to different modes of transportation, along with other amenities characteristic of well-functioning terminals, are attracting riders to strategically located terminals for intercity bus service.[13]
In recent years, growth in the intercity bus industry overall has stabilized into a more modest trajectory, coming largely from regional trips with distances ranging between 150 and 300 miles.[14] At the same time, a push came from city officials in the Northeast to move intercity bus operations off the street and into terminals.[15]

Intercity Bus Service at WUS

Union Station is the largest intercity bus facility among all stations and curbside locations in Maryland, Virginia, and DC. In 2016, the Metropolitan Washington Council of Governments (COG) surveyed regional intercity bus activity using schedules available on-line, as well as field visits, for typical Wednesday, Thursday and Friday travel days. The survey found that Union Station was the dominant intercity bus hub of the region, with 180 of the 400 (45%) scheduled intercity bus movements that were counted across the region.[16]

To analyze the intercity bus operation at WUS, Sam Schwartz reviewed the published schedules for all the intercity operators currently serving the station (see **Figure 2** and **Figure 3**; the full weekly schedule of arrivals and departures at WUS is in the **Appendix**)[17]. The greatest amount of scheduled service operates between DC and New York City, with some providers offering hourly service. Less-frequently served destinations include Pittsburgh, PA and Wilmington, NC. Virginia Breeze, a Commonwealth of Virginia-sponsored bus service, serves smaller destinations including Front Royal and Charlottesville. For many intercity trips, WUS is a terminal (trips originate or terminate there) while others stop at WUS mid-route. For instance, service to Richmond, Virginia shown in Table 3 also includes multiple routes further south to North Carolina and east of Richmond to the Hampton Roads area. All of these routes either have a stop or connecting bus route at Richmond.

[11] Ibid, ibid

[12] Marshall, Aarian. (February 3, 2015). *The Bus Terminal Is Dead. Long Live the Bus Terminal*. City Lab. https://www.citylab.com/transportation/2015/02/the-bus-terminal-is-dead-long-live-the-bus-terminal/384352/. Retrieved January 31, 2020.

[13] It should be noted that this survey queried passengers who used a terminal-based service and may have gravitated to it for that reason. It was also conducted before the explosion in use and availability of TNC services such as Uber and Lyft, which function equally well with central or decentralized bus terminals.

[14] Ibid, ibid

[15] Schwieterman, Joseph, School of Public Service, DePaul University. Phone interview on January 27, 2020.

[16] National Capital Region Transportation Planning Board. (Retrieved April 23, 2020). 2016 Counts of Intercity Bus Traffic. https://www.mwcog.org/assets/1/28/04072017_-_Item_12_-_Intercity_Bus_and_Tourism.pdf.

[17] Schedules for March 22-28, 2020; recorded in February 2020, before COVID-19 had an impact on scheduled services.

As described in the 2020 DEIS, the WUS bus terminal serves approximately 2.5 million passengers per year.[18] While the objective of the terminal is to serve this passenger demand, that number also drives the amount of space needed for passenger queuing and movement. However, the number of berths required is a function of the number of bus movements, not passengers. As used in this paper, the term "bus movement" describes a single arrival or departure. For instance, a bus carrying passengers from New York and arriving at WUS to allow passengers to alight constitutes a single movement. If the same bus then takes on new passengers, and departs for a new destination, that activity is an additional movement. Thus, a single bus that arrives with passengers that alight, and then departs with new passengers, constitutes two movements. This paper uses the term "turnaround time" to describe these two sequential movements, inclusive of schedule buffer time. A bus that arrives empty to pick up passengers, or that arrives with passengers that do not disembark at Union Station but takes on new passengers, constitutes a single movement.

Weekly WUS Intercity Operations Patterns

During 2019 and 2020, there was an average of 250 daily intercity bus movements within the terminal. Annualizing that number yields an average load per bus of approximately 30, well below the capacity of 55 (a typical maximum for an intercity bus) or 81 passengers (a typical maximum for a double decker Megabus) per bus. This number is explained by lower loads on off-hour trips, some trips that offload passengers at intermediate stops before D.C. and the highly competitive DC-NYC market, where some operators need to schedule extra trips to remain competitive. But it is not the 250 bus movements that define the number of berths needed. Determining berth requirements is not a function of simple division. Rather, peak seasons, peak days, and peak hours define how many berths are needed. For example, on Wednesday March 25, 2020, 191 cumulative intercity bus movements were scheduled. However, on Sunday that week (March 22, 2020), there were 322 bus movements, a 70% difference. Based on the schedule data, the greatest number of daily intercity bus movements occurs on Friday through Sunday, averaging 297 movements per day, while the mid-week period of Monday through Thursday shows an average of only 214 per day, as shown in **Figure 2.** This observed demand is consistent with expectations for travel patterns into the future and provides a reasonable basis for planning. In other words, demand for intercity bus travel is highest on weekends, and lowest mid-week.

[18] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix C3, p. 1-14, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

Figure 2: WUS Intercity Bus Movements by Operators, by Day of the Week
Public schedules for March 22-28, 2020; recorded in February 2020, before COVID-19 had an impact on scheduled services

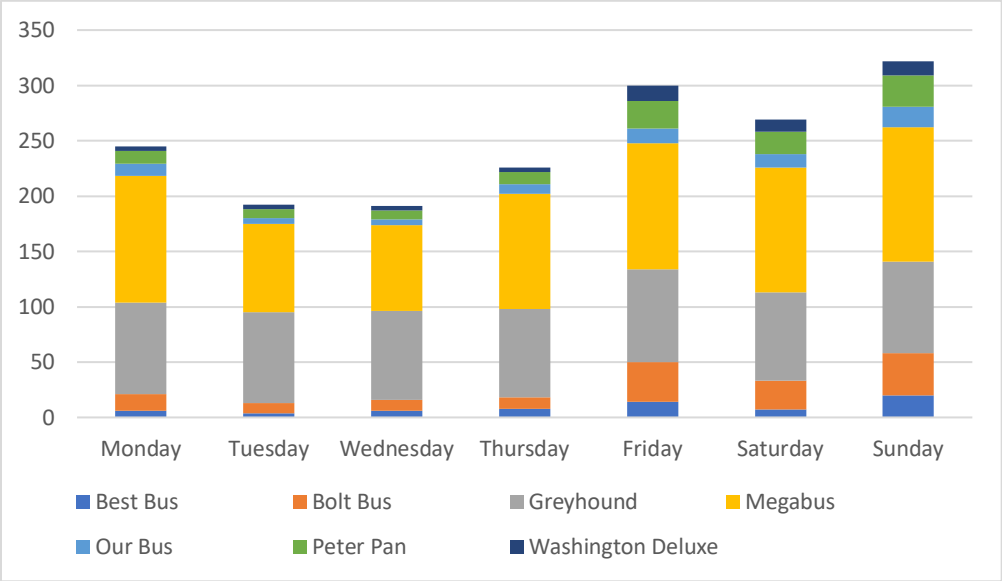
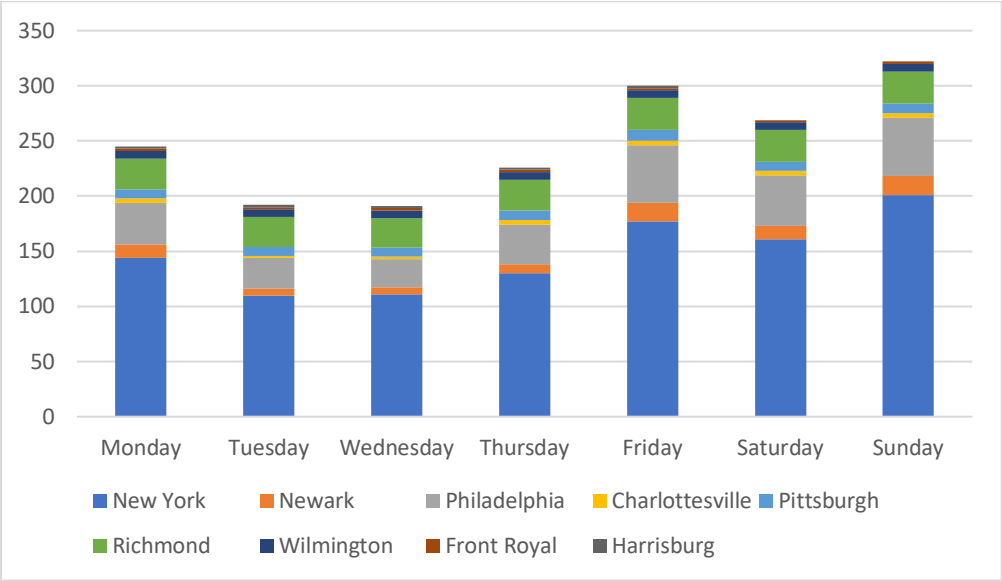


Figure 3: WUS Intercity Bus Movements by Trip Origin/Destination, by Day of the Week
Public schedules for March 22-28, 2020; recorded in February 2020, before COVID-19 had an impact on scheduled services

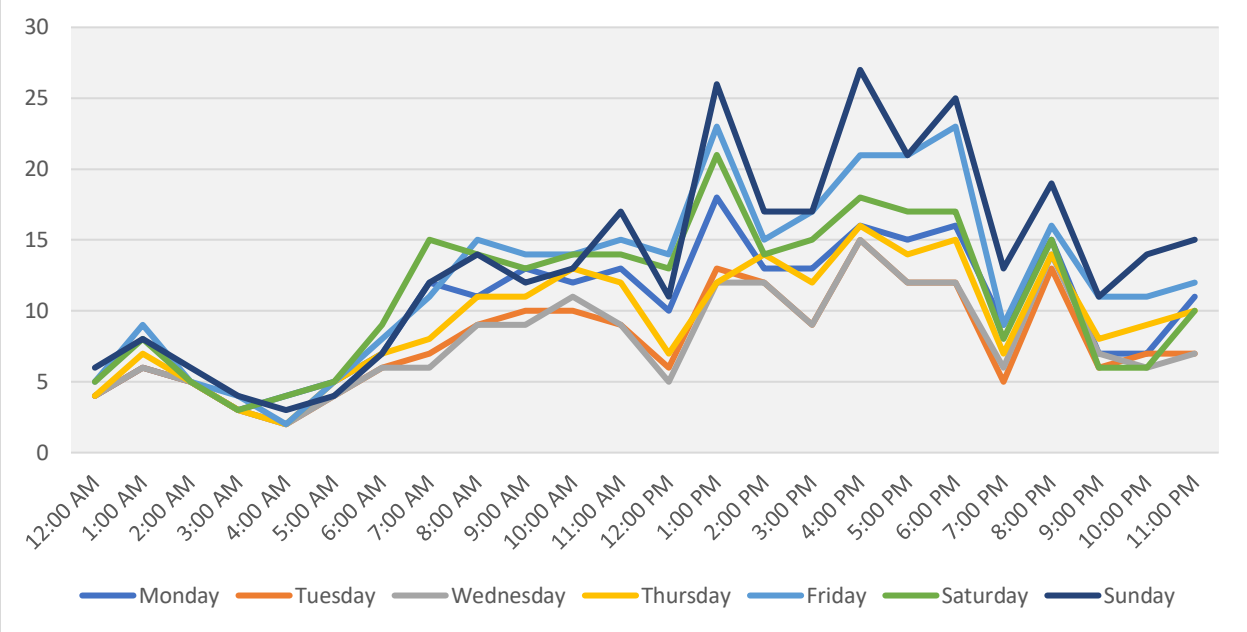


Hourly WUS Intercity Operations Patterns

Focusing on peak days, it is next necessary to identify which hours in those days have the highest number of bus movements, and sometimes, if there is a shorter peak within that peak hour. On a typical Sunday, the 1-2 PM peak hour serves 26 bus movements; but in the hours before and after the peak, there are only 11 and 17 bus movements, respectively. Accommodating today's peak hour volume is not difficult, because the existing bus terminal, with 27 intercity assigned berths, has a surfeit of berths. This was the result of USRC allocating available space not purpose-built for a bus terminal that happened to be larger than needed. Coupled with a typical bus terminal lease arrangement, whereby operators have exclusive use of their berths, operators can develop schedules in a vacuum. With excess space at their disposal, operators have not had to concern themselves with terminal efficiency. For example, Greyhound has a peak of eight departures per hour, and seven berths over which to spread them out, and an average of only 31 additional daily departures spread out over the remaining 23 hours. OurBus leases two berths to handle a range of five arrivals/departures per day mid-week to 19 arrivals/departures on a Sunday. Based on the scheduled services for OurBus and field observations, the two berths dedicated to their services sit empty a majority of the day. The proposed WUS expansion plan will not have such excess space available to continue to support today's inefficient practices. Thus, the task is to determine a recommended number of bus berths that can accommodate today's peak demand, plus 19% growth for 2040. This cannot be achieved with "business as usual." The daily profile of cumulative arrivals and departures is shown in **Figure *4***, demonstrating the variations in volumes between a mid-week and weekend day. All periods other than the peak hour(s) may be viewed as opportunities for service growth; however, determining the necessary size of the WUS bus terminal is primarily a peak travel day and peak hour issue.

Figure 4: WUS Cumulative Intercity Bus Movements by Day and Time

Public schedules for March 22-28, 2020; recorded in February 2020, before COVID-19 had an impact on scheduled services



Charter Buses at WUS

Charter bus movements at Union Station follow service-driven patterns that differ from those of intercity buses. Charter bus demand is tourist-driven and highly seasonal, with greatest demand from late March through mid-June, lower from mid-June through October, and lowest from November through February.[19]

Union Station is identified in the 2011 District of Columbia Motorcoach Action Plan Final Report as a "key generator of motorcoach activity in the city. It is a major transportation hub for visitors, offers a food court that caters to large groups, and the building itself is an attraction for its architecture and shops. In addition, this zone also includes the National Postal Museum – one of the only Smithsonian museums located outside the National Mall."[20] The report classifies the Postal Museum as a "medium-level" attraction, and Union Station as "high-level," in terms of annual visitors. In addition to this, WUS is one of few locations, particularly in a central location, that offers a charter bus drop-off area and parking. Drop-offs 20 minutes or less require no permit. Laying over for longer generally requires advance registration and payment of a fee, typically $30/bus July through February, and $45 in peak months. Unscheduled charter arrivals are not guaranteed parking and are turned away if none is available.[21]

The data used for charter bus volume both in this analysis and in the DEIS is based on Union Station Parking Garage daily charter counts conducted May 26 through June 17, 2016.[22] This was before a 50% increase in parking rates (reflected above) was implemented. It is possible that this increase could have reduced total charter demand, or redistributed more arrivals to before 10:00 AM, when rates are $10 less. Either of those outcomes could potentially reduce the volume of peak hour buses (see **Table *4***), but because current data was not available to dimension that, the analysis described in this paper used likely higher and more demanding peak hour volume. The DEIS charter bus volumes also include buses that are inactive and stay in the terminal for multiple hours, as well as those actively loading and unloading.

Consistent with the characteristics described for attractions and restaurants in the Motorcoach Action Plan and FRA documentation, peak charter activity occurs between March and June, and generates peak volumes of approximately ten to twelve buses per hour at the WUS bus terminal around midday (11 AM) and in the evening (5 PM).[23] These peaks closely correspond to buses dropping off groups in the late morning and picking them up later in the day. During other periods of the day and overnight, charter bus volumes are significantly lower and are not expected to impact capacity planning for the bus terminal, as they fall during periods of low intercity bus demand. Weekends, the time of highest intercity demand, have lower charter bus activity per the Motorcoach Action Plan.[24] Service levels of intercity buses being over 40% lower in the middle of the week complement higher charter bus demand during the same period. Peak activity of the two different services occurs on different days of the week. The DEIS, however, determines future berth needs as if the peaks coincide. It then projects 2040 needs given 51% growth, a figure that is not substantiated within the DEIS. This analysis maintains both these overly conservative assumptions for consistency.

[19] District of Columbia. (2011). Motorcoach Action Plan, Retrieved April 23, 2020, https://comp.ddot.dc.gov/Documents/Motorcoach%20Action%20Plan.pdfR.

[20] Ibid, ibid

[21] Union Station. (Retrieved May 19, 2020). Parking Garage - Bus Parking Rates. https://www.unionstationdc.com/parking/.

[22] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix A3h (Bus Terminal Capacity Technical Memorandum), p. 4, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

[23] Ibid, p. 3.

[24] Union Station. (Retrieved May 19, 2020). Parking Garage - Bus Parking Rates. https://www.unionstationdc.com/parking/.

DC Circulator Service at WUS

The DC Circulator is described on the DDOT website as providing "public transportation to the District's main attractions and most lively neighborhoods for business, culture and entertainment."[25] The system consists of six distinct routes across Washington, DC, and services each stop every ten minutes. Three DC Circulator routes serve Union Station including: Georgetown–Union Station, Congress Heights–Union Station, and the National Mall route. Two of these routes stop only at Columbus Circle, and do not enter the WUS bus terminal. Only the Georgetown–Union Station route has stops both at Columbus Circle and within the WUS bus terminal. The National Mall route has a layover on E Street south of Massachusetts Avenue, and the Congress Heights route lays over elsewhere. The Georgetown route today occupies two berths within the WUS bus terminal for layover and boarding purposes. The DC Circulator 2014 Transit Development Plan Update recommendation shows that space may not need to be provided in the new terminal design, as follows:

> **"Relocate bus stop locations for Circulator at Union Station.** Relocate the final Georgetown–Union Station bus stop location from the Union Station parking deck to Columbus Circle or a nearby on-street location easily accessible to riders coming to and from Union Station. Stop and transfer locations in the parking deck at Union Station are inconvenient, remote, and essentially invisible unless a rider already knows about them. Efforts at wayfinding signage in Union Station attempt to address this, but the stop is far from the Metro station and signage is sparse. The stops adjacent to Columbus Circle are already the busiest boarding and alighting point for two Circulator routes (Georgetown–Union Station and Union Station–Navy Yard). Dedicating space for the DC Circulator adjacent to First Street, NE, outside of the Union Station Metro Rail Station could be considered as an alternative location. Circulator buses would then only utilize the parking deck as a layover location for the route."[26]

With the passenger stop removed from the terminal, the only outstanding issue is layover space. In correspondence with the Burnham Place planning team in April 2020, DDOT indicated that it can be assumed DDOT would not need to have berths in the Union Station garage for operation of the Circulator route. As with the other Circulator routes serving Union Station, it is recommended here that layover space be located outside of the new intercity bus facility.[27]

[25] DC Circulator. (Retrieved May 19, 2020). About Us. https://www.dccirculator.com/connect/about-us/

[26] DDOT. (2014). DC Circulator 2014 Transit Development Plan Update, Retrieved April 23, 2020. http://dccirculator.com/wp-content/uploads/2015/08/2014-DC-Circulator-Transit-Development-Plan-Final-Report.pdf.

[27] Peckett, Haley, Project Manager, District Department of Transportation. "Re: Georgetown-Union Station Circulator research." Email received by Brian Harner, 20 April 2020.

Chapter 2: Synthesis of Practices in Intercity Bus Terminal Operation

Existing and Planned Intercity Bus Terminal Practices in the US

To benchmark the utilization rates of the WUS intercity bus terminal and to evaluate operations best practices, this study looked at intercity bus operations in other cities comparable in size, density and availability of transit. Philadelphia, Boston and San Francisco meet these criteria and have large intercity bus terminals. The comparisons of strategies employed by each terminal, average number of bus movements, and average buses per berth, help us understand best practices and illuminate strategies being used across the country to prepare for anticipated growth, further providing a baseline against which WUS planning can be undertaken. Because published schedules are available for Greyhound services in Boston, San Francisco and Washington, DC, these operations are highlighted here for comparison.

This analysis describes bus operations using the following key terms:

- **Movement:** each scheduled arrival and departure, considered separately.
- **Time Slot Allowance:** the time allotted for carriers to remain at a berth for each type of possible bus movement or function: arrival, departure, layover, and staging. Time slot allowances may vary by time of day and day of week. Not all movements or functions may be granted time slot allowances (e.g. layover and staging). Time slot allowances may be longer than actual dwell times.
- **Dwell Time:** the actual amount of time a bus remains at a berth for one or more functions. Dwell time should never exceed time slot allowances.
- **Bunching Buffer:** additional time built into station schedule planning to account for irregularity in bus arrivals.
- **Total Turnaround Time:** the sum of two sequential bus movement time slot allowances (arrival and departure), plus bunching buffer(s).

San Francisco

In San Francisco, Salesforce Transit Center (STC) opened in 2019 in a downtown multimodal facility (a brief operation the year before was shut down when critical structural issues were found). It will eventually serve California High-Speed Rail and commuter rail. For now, Greyhound is the only intercity bus operator using this off-street terminal, which otherwise and primarily serves commuter bus operations for AC Transit and WestCAT's Lynx. Greyhound leases two full-time berths from AC Transit, and one additional berth used intermittently to accommodate peak-hour service.[28] Only passenger-related activities occur at STC. The berths that Greyhound leases accommodate 52 bus movements on a typical weekday (Monday to Thursday) and 63 movements on a typical Friday.[29] Analysis infers that during peak hours on Fridays, Greyhound operates seven movements an hour, averaging 2.33 movements per hour per berth. This equates to each bus dwelling in a berth for an average of 26 minutes per movement. However, 26 minutes is higher than the actual time a bus occupies the berth, since it assumes a berth is never unoccupied. Given the vagaries of traffic, it is unlikely there will always be a bus arriving at the exact moment another departs, so the actual dwell time (when passengers board, exit, collect or store luggage and the driver inspects the bus) is likely no more than 20 minutes (this "bunching buffer" is illustrated in more detail in

[28] Salesforce Transit Center. (January 27, 2020). Phone interview (anonymous source).
[29] Data obtained from Greyhound's website for Wednesday, 02/26/2020 and Friday, 02/28/2020. Retrieved from https://greyhound.com on February 13, 2020.

Table 5). Greyhound operations at STC include no layover or schedule recovery time; Greyhound buses layover about 30 minutes away, in Oakland.[30]

Boston

Boston's only intercity bus station is the South Station Bus Terminal, served by over ten bus operators. The bus terminal is owned by the Massachusetts Bay Transportation Authority (MBTA) with property management services contracted out to a private company. Serving intercity buses only, the 25 berths handle approximately 300 movements a day. The berths are not actively managed with dynamic berth assignment (strategies described in detail later in this analysis), and thus anecdotally operate "at capacity".[31] Greyhound leases five berths at South Station; it operates 84 bus movements on a typical weekday and 90 bus movements on a typical Friday.[32] During the peak hour at 2 PM daily, the nine Greyhound movements yield an average berth utilization rate of 1.8 bus movements per hour per berth.

Table 2 summarizes peak hour berth utilization, based on Greyhound schedule information at Boston South Station, STC, and WUS (as described in **Chapter 1** above). These terminals use the traditional berth-leasing model, where each berth is dedicated to a single operator on a permanent basis. And while the three examined terminals display a range of utilization rates and average dwell times, **Table 2** shows that WUS's current utilization rates, and therefore efficiency, are well below the standard in peer terminals.[33]

Table 2: Berth Utilization Comparison – Greyhound at WUS, Boston and San Francisco

Station	Peak Hour	Movements/Hour/Berth
Union Station, DC (current)	1 PM	1.14
South Station, Boston	2 PM	1.8
STC, San Francisco	5 AM and 9 PM	2.33

Philadelphia

Plans for Philadelphia provide a further comparison with the WUS bus terminal. Greyhound owns a 13-year-old intercity bus terminal about a mile from Amtrak's 30th Street Station that accommodates Greyhound, Peter Pan, NJ Transit, and Fullington and Martz Trailways with 14 outdoor berths and an indoor waiting room. It is Greyhound's fourth busiest US terminal, designed and built for Greyhound by the developer of the Mellon Bank Building, as part of its acquisition of the old Greyhound Terminal. It does not accommodate curbside operators, despite Greyhound owning BoltBus. BoltBus and Megabus operate from a street adjacent to 30th Street Amtrak Station. Development plans for the station district, finalized in 2018, incorporate an open-air rooftop intercity bus terminal a block away from 30th Street Station. Planned for construction by 2025, the new intercity bus terminal will provide an indoor waiting area and outdoor canopies for passengers, with bus queuing outdoors.[34] Ramps connecting with I-76 will have to be relocated, and as part of that, it is planned to provide direct highway access to the terminal.

Projections for 2040 ridership at the planned 30th Street Station intercity bus facility are estimated to range between 8,300 and 10,900 passengers per day, with up to 20 bus movements at the station in the peak hour (similar to projected ridership at WUS).[35] To serve this total demand, nine berths are provided,

[30] Salesforce Transit Center. January 27, 2020, Phone interview (anonymous source).
[31] South Station Bus Terminal. February 13, 2020, Phone interview (anonymous source).
[32] Data obtained from Greyhound's website for Wednesday, 02/26/2020 and Friday, 02/28/2020. Retrieved from https://greyhound.com on February 15, 2020.
[33] Greyhound is used for the comparison since it has identified berth assignments in all three terminals, as well as clear published schedules.
[34] *30th Street Station District Plan,* Philly District 30. (2019). P.77. http://www.phillydistrict30.com/. Retrieved January 31, 2020.
[35] For the purpose of this analysis, each operating bus reflects one bus movement, i.e., either departures or arrivals.

with two more dedicated for Amtrak bus services.[36] Based on this projection, the planned capacity for each of the nine intercity bus berths averages 2.22 bus movements in the peak hour. At the projected maximum daily ridership of 10,900, each berth would accommodate a total of 1,211 passengers per day.

Airport Gate Operations Model and Applicability to Intercity Bus Operations

Philadelphia, San Francisco, and Boston have built or are building new or expanded intercity bus terminals. While modern in design, all follow operations/management practices unchanged for decades. Generally, bus companies lease or are assigned berths for their exclusive use, sometimes based on demand, but other times based on their willingness to pay or on low rates due to an over-supply of berths. Like WUS Bus Terminal, these other locations are planning for market growth, but their conditions and opportunities are not fully analogous. San Francisco's terminal occupies a site 1,500 feet in length (about the distance from the entrance of WUS stretching to H Street) and serves a relatively small intercity demand, comprised only of Greyhound's direct service to 15 cities. Philadelphia has a 13-year-old, privately-owned intercity terminal that does, and will continue to serve traditional intercity/regional carriers. Its new intercity bus terminal will be a supplement to that one, located some distance away, and targeted only at curbside companies, albeit with projected 2040 ridership similar to that projected for WUS bus terminal. It is across the street from, not integrated into the 30th Street Station. It will not have internal or external bus circulation issues, as projected access/egress will be directly linked to the interstate system, never passing through streets or the Amtrak station. Boston is availing itself of the opportunity to expand by 16 berths on air rights owned by the transit agency above the station's railyard. The Boston South Station Bus Terminal also has direct vehicular connection with the interstate highway system without use of local streets.

What these three comparable bus terminals have in common is that they all had sufficient space available to them to meet 2040 demand without having to consider more efficient ways of operation. How WUS differs is that space occupied by the new facility is potentially impactful to surrounding and planned uses and is physically constrained. Furthermore, the location for the new bus terminal is limited by the need for convenient connectivity with the other modes of transportation available at WUS. For the WUS bus terminal, this calls for precise determination of the intercity service needs, and then sizing that for the most efficient layout that will meet customer and operations' needs. The domestic model for this is provided by the Federal Aviation Administration's (FAA) slot administration program for major airports, and similar application of this operations model to intercity bus terminals found in Germany, Denmark, and the Netherlands.

As air traffic has increased over the years and deregulation has opened competition, airlines have looked to schedule their flights more competitively and advantageously. Just as current schedules at WUS show seven separate intercity bus departures at exactly 5:30 PM, airlines were scheduling more flights than could physically and safely occur. This led to delays and increased operating costs. The FAA stepped in with a slot administration program that determined how many take-offs and landings could occur each hour, honoring airline requests to the maximum degree, thereafter imposing departure times, shifting them to an adjacent hour, or not allowing them at all, through a detailed set of rules and procedures. Airlines then had to figure out how to assign staff and gates to ensure that the flight was present on the runway at its assigned time slot. Failure to achieve that could lead to revocation of the assigned slot. Where conditions are worst – JFK, Reagan National, and LaGuardia – the FAA itself runs the program. At slightly less capacity-strained locations such as Newark, O'Hare and LAX, airport administrators run the program. And some airports in neither category elect to adopt elements of the program simply to improve

[36] *30th Street Station District Plan,* Philly District 30. (2019). http://www.phillydistrict30.com/. Retrieved January 31, 2020.

performance and/or require gate-sharing to avoid capital expansion costs or reflect the unavailability of funding for expansion. Historically, airports have given preference to an Exclusive Use Agreement through which they lease gates to airlines for significant periods of time. Today, airports are moving towards a more dynamic system that allows for gate allocation to be more directly managed by airports as opposed to internally managed by airlines. In response to the increase in flights and air passengers, more and more airports utilize the Common Use Model in which the airport controls which airlines use which gates at which times.

In May 2018, Chicago O'Hare Airport began operating under a new common use lease agreement.[37] This decision was in response to increasing capacity constraints tied to an existing exclusive use leasing agreement. Airport operators predict this new model will result in 25% more gate capacity for the airport.[38] In the past decade, other airports have made similar moves in order to address their capacity issues including Cincinnati/Northern Kentucky International Airport and Philadelphia International Airport.[39] Oakland International Airport has converted all of their ticketing equipment, ticket counters, and gates to common use in order to give the airport the most flexibility, on a per flight basis, in assigning gates and other infrastructure to airlines.[40] Outside of the US, Dublin Airport, one of Europe's fastest growing, is integrating the Common Use Model with its revenue management system to ensure that airlines are only charged for the space or time they use.[41] As a result, free aircraft parking has been removed, and incentives like runway and resource usage fee discounts are offered to airlines for shifting aircraft arrival times to off-peak.[42]

The constraints under which airports operate are somewhat similar to those of intercity bus terminals in two ways: (1) the number of gates available for loading and unloading passengers is based on fixed physical infrastructure, and the number of planes (and passengers) that can be served at the gates is based on how fast a plane can be turned from arrival to departure (or how to minimize the overall time the plane sits at the gate); and (2) the number of takeoffs and landings the airport can handle per hour is based on runway capacity and factors of safety. This is similar to the physical number of bus berths in a bus station, and the number of buses that can be handled inside the station and on the adjacent street network.
The Common Use Model can promote more efficient use of the WUS bus terminal space and thus requires a smaller number of berths. The acceptance of shared berths in the FRA Screening Report is a major step toward incorporating this.[43]

Application of Common Use Model to Intercity Bus Terminals – German Case Studies

Several bus terminals in Germany (including Berlin, Frankfurt, and Hamburg) are already employing the Common Use Model. ZOB Hamburg, an intercity terminal located adjacent to Hamburg central train station, connects the city with hundreds of German and European cities. Built in the 1950's, it was completely reconfigured in 2003 to accommodate three million customers each year, and newly-equipped, including the implementation of a state-of-the-art passenger information system.[44]

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[37] Fitch: Chicago O'Hare Airport Inks New Airline Agreement, AJOT. (2018). https://www.ajot.com/news/fitch-chicago-ohare-airport-inks-new-airline-agreement. Retrieved February 5th, 2020.
[38] Ibid, ibid
[39] Airport Competition Plans, FAA Airports. (2014). Retrieved February 25, 2020.
[40] Ibid, ibid
[41] *Rack 'em & Stack 'em: The Automated Art of Airport Gate Management*. Medium. https://medium.com/swlh/rack-em-stack-em-the-automated-art-of-airport-gate-management-c0836d0b0219. Retrieved February 25, 2020.
[42] Ibid, ibid
[43] USDOT-FRA. (2017). Washington Union Station Expansion Project – Concept Screening Report. p. 35. https://www.usrcdc.com/wp-content/uploads/2017/02/fra_wus_concept_screening_report_july2017.pdf. Retrieved April 23, 2020.
[44] *History: The Hamburg Bus Station – History of the Renovation,* ZOB Hamburg, https://www.zob-hamburg.de/historie.php. Retrieved February 25, 2020.

ZOB Hamburg has 14 bus berths and a computer-based information and control system that drives its efficiency.[45] This system provides both passengers and drivers with up-to-date information regarding arrival and departure times, as well as flexible berth assignments for each bus operator. The system runs on a central server and contains two focus points: automated scheduling and real-time displays for passengers and drivers.[46]

ZOB Hamburg utilizes two in-house workstations in the supervisor's office to oversee the automated scheduling component of the system. Workers prepare timetables, assign layover spaces, and record fee data chargeable to the bus operators. Scheduling proposals can be modified up to a day in advance based on the existing timetables. Concurrently, these timetables are imported into the scheduling system to identify any possible conflicts, enabling bus dispatchers to communicate and correct scheduling proposals as needed. Once set, a day before the operation, the schedules and assignments cannot be modified except in an emergency or during major schedule disruption.

Bus drivers receive their berth assignment from a dynamic display panel at the entrance of the bus station. When the bus drivers are parked in the correct berth, they have access to additional detailed information regarding their route through a customized display.[47]

Passengers may access detailed information regarding bus arrivals and departures in several ways including a large LCD display in the main arrival and departure hall, displays at each individual bus berth, display panels at bus station food outlets, and display panels on the access routes from the underground and mainline rail stations. Passengers may also access a live arrival and departure board via the internet. As the computer-based system is connected to other bus stations and operators, it can provide passengers with information related to connectivity between services.[48]

Operations at the Frankfurt Main Bus Terminal further support the ability of carriers to operate efficiently and minimize their time within the terminal. The regulations governing the terminal operations of Flixbus, the intercity carrier for 90% of all trips in Germany, state that "use…of a registered bus slot is limited to 15 minutes per use [i.e. per each movement]. Exceeding the stopping time is not permitted."[49] Lest European practices be considered inappropriate for the US, it should be noted that the majority of American intercity bus trips are operated by subsidiaries of European bus operators who have adopted or adapted to these standards.

Dynamic berth scheduling (described in detail in Chapter 3) is critical to the Common Use Model. With dynamic berth scheduling, station management adjusts berth assignments 15-30 minutes before the bus is due for departure or arrival. This is not currently done in the US, but not because the technology is difficult or untried. Rather, the supply of intercity bus berths in American bus terminals is either sufficient or excessive, meaning there is no need to spend on a system. In Germany and elsewhere, though, conditions are favorable for dynamic berth scheduling, and it is employed.

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[45] Marahens, Wolfgang. *(September 19, 2005). RTPI @ Hamburg's new Central Bus Station,* Intelligent Transport. https://www.intelligenttransport.com/transport-articles/2199/hamburgs-new-central-bus-station/ . Retrieved February 25, 2020.

[46] Ibid, Ibid

[47] Ibid, ibid

[48] Ibid, ibid

[49] Frankfurt (Main) Bus Terminal. Use and Terminal Regulations of FlixBus DACH GmbH. April 9, 2019.

There is nothing inherently different about overseas intercity bus operations that would render the technology and operating principles different or incompatible. The technology exists today, even at WUS.

- GPS is a key component. Virtually every bus fleet, including WUS intercity carriers, is already equipped with it.
- When WUS bus station opened in 2012, Megabus developed and installed lowering devices on their double-decker buses to meet vertical clearance requirements. Their system identifies every bus at a distance from WUS and confirms that bus is lowered prior to entry. This remote transmission of location and data is a key element of dynamic berth scheduling.
- Most fleets are not only GPS-equipped, but also have automatic vehicle locators (AVLs). These identify bus location and vehicle number, for comparison to the schedule. AVLs have been in use for over 30 years. Knowing the identity of an arriving bus vis a vis its assigned berth is essential to dynamic berth scheduling.
- WAZE is one program, well-known and widely used, that calculates estimated time of arrival and continually updates it. This allows the dynamic berth scheduling system to confirm if the bus will arrive in its scheduled time slot. If not, it reassigns the bus to a berth that will be available when it arrives, with sufficient time for boarding passengers to queue at the proper gate.

All of the above elements – in use today – are the key components of a dynamic berth scheduling system. During hours of light bus movement activity, the system is likely to confirm and allow the use of pre-assigned berths. In peak hours, it will lead to a more efficient use of each berth and reduce the number of berths needed.

Chapter 3: Application of Dynamic Gate Scheduling and Active Terminal Management at WUS

Dynamic gate scheduling, shared berth operations, and active management have been long-used in airports and non-domestic intercity bus stations. Applying these techniques domestically, and specifically to the proposed WUS Bus Terminal, can more efficiently use space and reduce the number of berths needed to serve a given volume of passengers and buses while meeting operational needs and providing a high level of customer service.

At WUS, the number of other essential transportation/commercial/retail uses that must be accommodated within a constrained site is a test of the potential for this approach. A properly sized bus facility will not only accommodate growth in ridership, but also be well-integrated into the urban environment of WUS, respecting view sheds and placemaking, and contributing to the overall travel experience for all station users. An oversized facility can be expensive to build and operate, needlessly harm or eliminate pedestrian and bicycle facilities, and detract from the historic station and neighborhood environment. To determine a recommended facility size using best practices for urban center bus stations, an operations analysis was performed using actual, current intercity bus schedules operating from WUS (March 2020) and historic, average daily charter bus movements (noted in Analysis Assumptions, below). Based on available information, this is likely the only detailed effort to date to analyze the WUS bus terminal's current and future utilization with this degree of precision. While Sam Schwartz considered a range of alternative operating models, it recommended one, and then used only that one as an input to simulate the facility operation.

This analysis is based on a new terminal serving all WUS intercity and charter bus operations. Daylong parking spaces for charter buses, and layover, maintenance, etc. for intercity buses are not part of the design parameters of this analysis. Once completed, this analysis extrapolated today's intercity and charter bus hourly volumes by the 19% and 51% DEIS estimated growth factors, to generate peak bus volumes in the 2040 design year. These hourly projections became inputs to the operations simulation model that recommended size, in number of berths, that the new bus terminal will require.

Proposed Operations Model

The operations model that is reflected in this analysis is based on the following principles:

- **Active Terminal Management** – Berths are to be used for passenger operations only, and not solely by a fixed, inflexible allocation of arrival/departure times. Passenger-related activities are the sole focus of the terminal. Bus layover activities, staging, storage and maintenance work are not, and are to be located outside the confines of the WUS Bus Terminal, typically as determined by each of the carriers. Except for some operator-owned terminals, these functions are generally no longer accommodated on-site in modern bus terminals.

- **Berth Time Slot Assignment** – Carriers are assigned specific, predefined daily time slots based on their schedule of arrivals and departures, as capacity allows. To the degree possible, operators will have their trips grouped within the same berth(s), but on days and times of peak demand, all time slots may need to be filled, and certain trips may be assigned to an unfilled time slot in a different berth shared with other operator(s). During periods of low demand, it may not be necessary to fill all time slots, and a single operator may be assigned exclusive use of a berth, even if they don't have a full complement of bus movements. The program would encourage this for the convenience of operators

and customers. Thus, over the span of the day, many operators could share the same berth(s) and some berths can serve a single operator. Programmable video signage is an essential component of this methodology.

- **Station Schedule Planning** – Each service carrier can request time slots and the station management allocates time slots to accommodate those exact requests, to the degree that these do not exceed capacity or create conflicts. First priority is given to historical use. For instance, if Greyhound has had a departure at 5:00 PM for five years, it will be given preference for that time slot over another operator who wants to start a new, or relocate an existing trip to that slot. If the requested slot does not fit immediately after the previous departure, and might leave an unused gap during peak hours, carriers may be directed to adjust their schedules slightly to obtain a vacant slot. Carriers are not able to "bank" timeslots; they must use them at least 80% of the time or relinquish them.

- **Dynamic Berth Scheduling** – Schedule information is preloaded into the system, although final gate assignments are not made available to customers until 15-30 minutes before departure time. To account for delays and other unpredicted circumstances that may impact schedules, station management adjusts berths dynamically 15-30 minutes before the bus is due to occupy the berth for departure or arrival. It does this by receiving location and estimated travel time automatically from each bus when that bus is the shorter of 30 minutes away. The technology for this exists today, is in use at facilities including those in Berlin, Frankfurt, and Hamburg, and is likely to be further refined at time of construction. When there are no unpredicted circumstances, the system defaults to its preprogrammed plan. Change is only activated if and when needed. The actual gate assignment is provided via multiple mediums to drivers and passengers. These include multiple dynamic displays at the station, online information (website and designated app), and bus communication systems.

  The proposed WUS program allows highly efficient use of space by maximizing the potential of each berth in the terminal. This approach is consistent with the operational concept identified by the FRA for planning the WUS bus terminal:

  > FRA and the Project Proponents agreed on an active management approach to operate the future facility with shorter turnaround times for tour/charter and intercity operators. Based on an active management approach, [although not detailed to the extent shown above] FRA has determined that a bus terminal with approximately 20-25 berths can meet the 2040 bus demand at WUS. Buses will not be allowed to either "lay over" in a berth or to wait for an extended duration. This approach is consistent with the Purpose and Need requirement to facilitate intermodal travel and is similar to the requirements for the rail operations at WUS to meet the 2040 rail demand. Trains will not be allowed to store at the platforms in 2040 and trains will be turned around at the station quickly.[50]

DEIS Proposed Operations Model – A Comparison

Detailed data to support the DEIS recommendation for 20-25 berths is not publicly available, nor is it available for the subsequent DEIS preferred alternative that raised the estimate to be 20-40 berths. Nevertheless, although the growth factors applied in this analysis and the FRA guidelines are consistent, the different outcomes in berth requirements are likely the result of the following. FRA provides 30minutes for each bus movement Two sequential bus movements (arrival and departure) yield a total

[50] USDOT-FRA. (2017). Washington Union Station Expansion Project – Concept Screening Report. p. 35. https://www.usrcdc.com/wp-content/uploads/2017/02/fra_wus_concept_screening_report_july2017.pdf. Retrieved April 23, 2020.

turnaround time of 60 minutes. That builds in an inefficiency to every time slot, and ultimately to berth capacity, and still does not resolve instances of extreme delay. By contrast, the operations model and associated management approach described in this paper are based on flexibility in berth assignment, allowing real-time actions to fully utilize the facility. For instance, as soon as the scheduled berth becomes unavailable due to delays in bus arrival, that berth is allocated to a new bus while the late bus is assigned to another berth that will be available when it actually arrives. This approach maximizes the use of the software to instantly generate a new optimized plan whenever there is a need. In off-peak hours, when free time in the berth is available in the subsequent time slot, the late bus would not be reassigned.

The 30-minute time slot window and 60-minute turnaround time adopted in the DEIS were not empirically derived; rather, it is described as a consensus among private carriers who were consulted.[51] That does not make the 30-minute window unworkable. However, it makes the operation less efficient to the point of requiring between 13 and 28 unnecessary berths and a second level for the proposed bus terminal. That is because the DEIS predetermines that each berth will only handle two bus movements per hour regardless of how much less time a particular bus movement might need. The cost, customer inconvenience, and the excess space it will require can be avoided by applying the approach employed in the Sam Schwartz analysis. The Dynamic Berth Scheduling approach proposed here is further supported by observations of the two major carriers serving WUS to determine that actual arrival/unload dwell times generally do not exceed 10 minutes, and loading/departure times generally do not exceed 15 minutes. Coupled with dynamic dispatching, this enables more bus movements to be accommodated in each berth during peak hours (see details on page 26). The DEIS acknowledges that the bus terminal plan can be reconsidered at a later time, but the plan generated in this report indicates that there is no need to wait.

Analysis Assumptions

The analysis described in this paper sought to refine and support a more specific determination of bus berth requirements. To do so required a base of actual, existing bus volumes and scheduled operations. These were obtained from the following resources:

- For intercity service, the analysis used scheduled bus arrivals and departures scheduled for March 22-28, 2020, as published by each of the bus operators on their public websites in February 2020 before COVID-19 had an impact on scheduled services. Having sufficient berths to handle bus volumes is determined by peak hour(s) demand. To obtain that, this analysis calculated peak activity (demand) at every hour of the day over the week (Monday through Sunday). **Figure 5** shows the hourly scheduled bus movements for each day of the week. From that, the overall maximum activity was determined. The overall maximum activity separately counts arrivals and departures, which makes some of the hourly figures even higher than any of the observed daily movements (e.g. 11 AM and 1 PM). The maximum hourly intercity bus movements in this analysis is 28 (at 1 PM), the sum of 13 peak 1 PM arrivals on Saturday and 15 peak 1 PM departures on Sunday. This is higher than the observed Sunday 1 PM peak of 26, and 50% higher than the DEIS analysis baseline of 19 hourly peak movements.[52] Overall, this analysis accommodates 349 daily intercity movements as a baseline, 41% more than the DEIS's 248 movements.

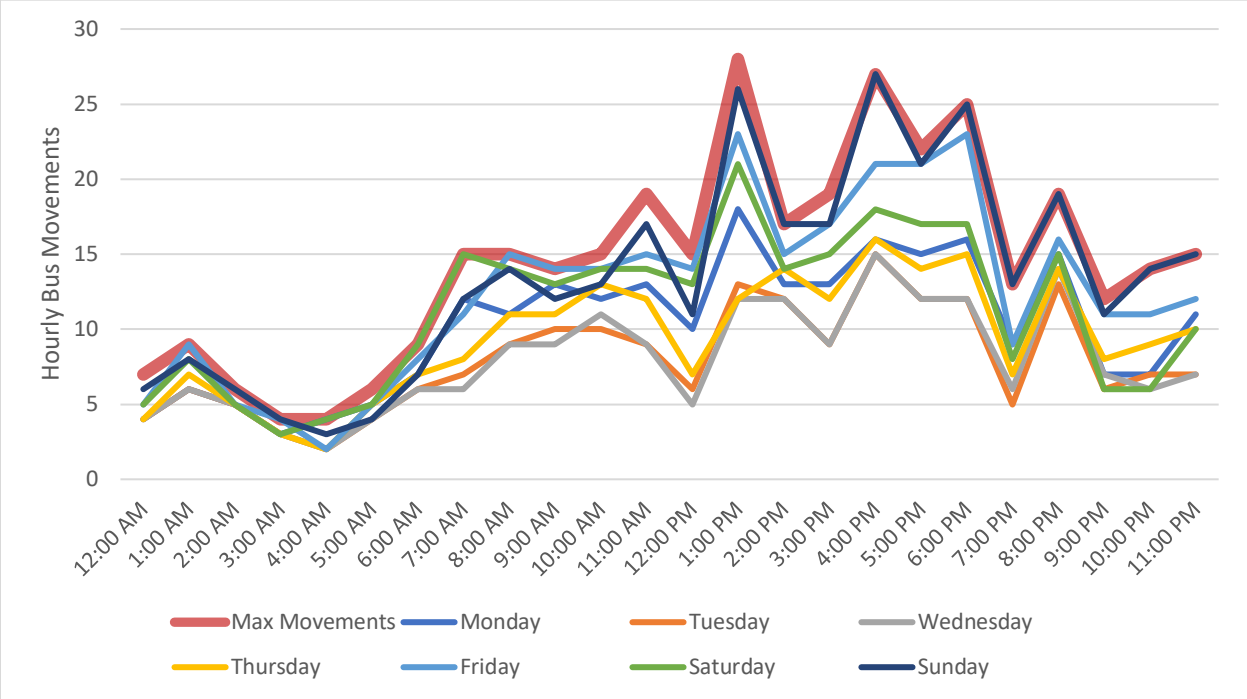
[51] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix A5e, p. 3, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

[52] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix A3h (Bus Terminal Capacity Technical Memorandum), p. 2, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

- For charter service, similar to the DEIS, this analysis assumes the activity recorded by the Union Station Parking Garage (USPG) in May-June 2016. According to that dataset, an average peak day has approximately 80 charter bus movements during the peak demand period. This was distributed to reflect peak hour demand of ten to eleven charter movements.[53] The reported level of charter activity predates the imposition of a 50% increase in parking rates that may have reduced the overall number and/or redistributed arrival times in a manner that could reduce peak hour bus activity. It also assumes that charter and intercity bus peaks coincide, rather than occurring mid-week and on Fridays and weekends, respectively.

Accounting for the overall maximum hourly activity for intercity buses and for the spring peak travel period for charter buses, this analysis was designed to provide outputs that would recommend the number of berths needed to accommodate peak activity at the terminal. It is important to note that this peak occurs at most for three months a year, and that typical seasonal off-peak and weekday total bus volumes are significantly lower. For instance, while the peak hour intercity activity on Monday through Thursday is 16-18 hourly bus movements, the assessment uses the peak day, which has 28 bus movements in the peak hour (see **Figure 5**). Thus, the intercity and charter bus volumes used in the model represent a conservative, more demanding approach toward estimating berth requirements.

Figure 5: WUS Intercity Bus Movements by Day/Time
as published by service providers for March 22-28, 2020



[53] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix A3h (Bus Terminal Capacity Technical Memorandum), p. 3, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

2040 Bus Volume Projection

To simulate future (2040) conditions, the analysis accounted for a 19% increase in intercity bus movements and a 51% increase in charter bus movements. These are based on the ridership growth rates indicated in the DEIS to project bus passengers in 2040, and used to project the minimum berth requirements under all DEIS Action Alternatives. **Table 3** compares the baseline and growth factor assumptions of the Sam Schwartz analysis and those of the DEIS.

Table 3: Baseline bus capacity and growth factor assumptions, current analysis and DEIS[54]

Criteria	Bus Type	Sam Schwartz Analysis	DEIS
Baseline peak hourly movements	Intercity	28	19
	Charter	11	11
Baseline peak daily movements	Intercity	349	248
	Charter	83	83
2040 Growth Factor (%)	Intercity	19	19
	Charter	51	51

The DEIS states that, during concept development, approximately 47 bus berths were estimated to meet 2040 intercity and charter demand.[55] Later refinement of the bus program reduced that estimate to 25 berths, under an active management approach with a 30-minute time slot limitation.[56] The result is a program with 16 intercity berths (13 active, 3 staging), 8 active charter berths, and 1 active DC Circulator berth.[57]

While the DEIS methodology directly translates projected growth in passenger volumes and bus movements to growth in berth requirements, this analysis deviates from that methodology. Applying a growth rate to berths in the 2015-2016 existing conditions is problematic because buses currently operate under unconstrained conditions and dwell in excess of the proposed 30-minute time slot limitations. Furthermore, not all buses operate at capacity under current conditions, therefore the growth in ridership is not directly applied to growth in bus movements or in berth requirements.

This analysis, in contrast, recommends a Best Practice operations model of twelve active berths, all of which would be used by both intercity and charter buses. It uses a more robust methodology that calculates future berth requirements based on projected bus movements and time slot limitations, providing a more accurate projection as to the necessary number of berths in the 2040 design year. **Table *4***, **Figure 6,** and **Figure *7*** show the derived numbers of bus movements per hour utilized in this analysis for both the current conditions and the future conditions (2040) assessments. In total, the existing conditions assessment reflects 432 daily bus movements, 349 of which are intercity bus movements and 83 are charter movements. The future conditions assessment, which reflects the projected growth of 19%

[54] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project – Appendix A3h (Bus Terminal Capacity Technical Memorandum) and Appendix A5e (Alternative Bus Program), Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

[55] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project – Chapter 3, p. 3-6, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

[56] Ibid, p. 3-18

[57] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project – Appendix A5e (Alternative Bus Program), p. 5, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

for intercity bus and 51% for charter bus, generates 552 bus movements, comprised of 416 intercity and 136 charter movements. The peak day, peak hour activity occurs during the 1 PM hour.

Table 4: Actual and Projected Hourly Bus Movements for Use in the Analysis for Determining Berth Requirements Under Baseline (2020) and Projected (2040) Conditions

Time	2020 Baseline			2040 Projection		
	Intercity	Charter	Total	Intercity	Charter	Total
Growth Factor	N/A	N/A	N/A	19%	51%	N/A
0:00	7	1	8	9	2	11
1:00	9	0	9	11	0	11
2:00	6	0	6	7	0	7
3:00	4	1	5	5	2	7
4:00	4	0	4	5	0	5
5:00	6	0	6	7	0	7
6:00	9	1	10	11	2	13
7:00	15	1	16	18	2	20
8:00	15	3	18	18	5	23
9:00	14	6	20	16	10	26
10:00	15	5	20	18	8	26
11:00	19	10	29	23	16	39
12:00	15	9	24	18	14	32
13:00 (peak)	**28**	**7**	**35**	**33**	**11**	**44**
14:00	17	5	22	20	8	28
15:00	19	2	21	23	4	27
16:00	27	4	31	32	6	38
17:00	22	11	33	26	17	43
18:00	25	7	32	30	11	41
19:00	13	6	19	15	10	25
20:00	19	1	20	23	2	25
21:00	12	1	13	14	2	16
22:00	14	1	15	16	2	18
23:00	15	1	16	18	2	20
Total	**349**	**83**	**432**	**416**	**136**	**552**
Average	**15**	**3**	**18**	**17**	**6**	**23**

Figure 6: WUS Hourly Bus Movements – Baseline (2020) Conditions

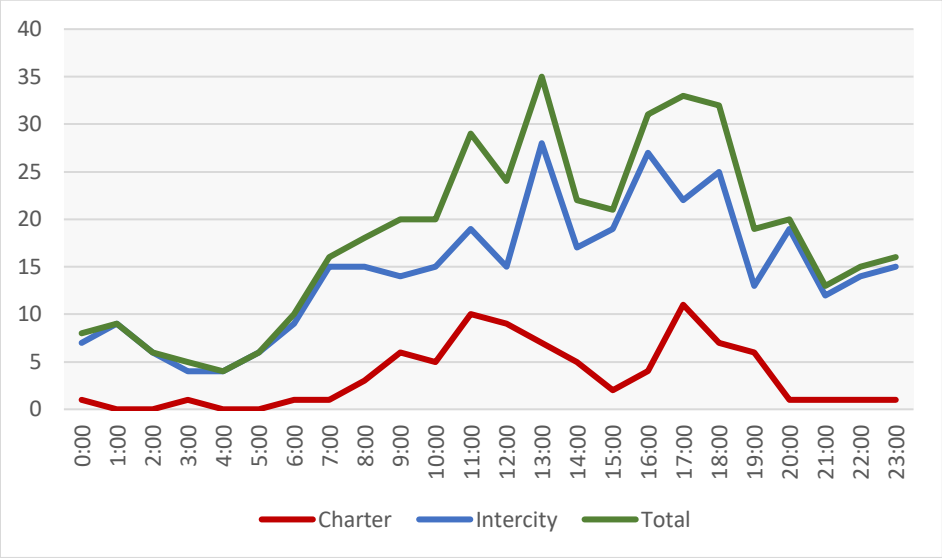
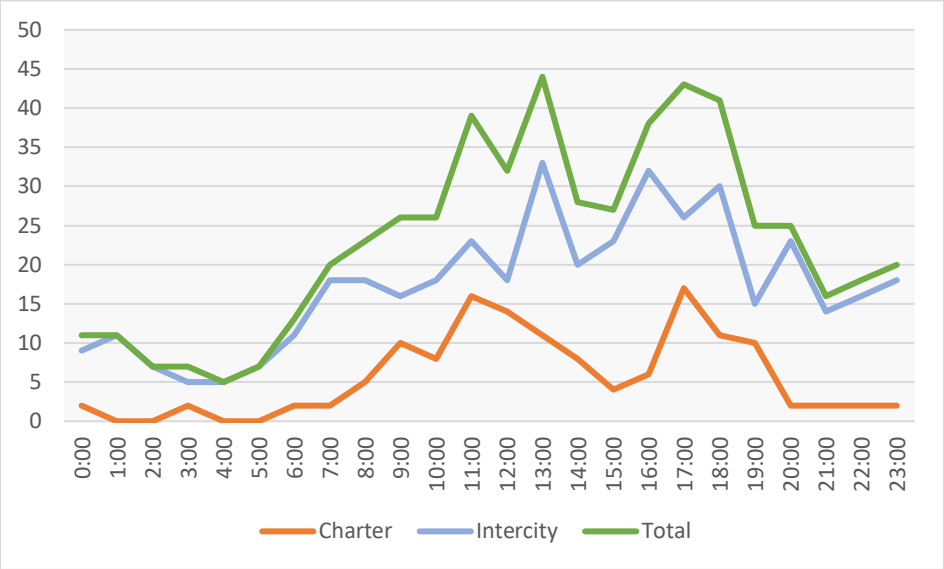


Figure 7: WUS Projected Hourly Bus Movements for 2040



Recommended Time Slot Parameters for Use in the Simulation Model

The operations analysis described in this paper accounts for a peak service day under three possible scenarios, all of which use identical operations concepts and procedures as described above, but differ in the time slot allowance associated with an arrival or departure. **Table 5** documents three different scenarios for time slot allowances and the total turnaround time associated with them. Under the Best Practice scenario, arriving buses are allowed to stay at their assigned berth up to ten minutes, and departing buses may stay up to 15 minutes; arriving buses that disembark passengers and subsequently board new passengers have a combined 25 minutes of dwell time. The Compressed and Conservative scenarios reflect reduced and increased dwell times. Under all scenarios five-minute bunching buffers are allocated between intercity bus movements. The five-minute buffer is not applied to charter buses, which generally require less time than intercity buses, since tour groups do not typically carry personal luggage.

Table 5: Time Slots and Turnaround Time by Scenario

Scenario	Operational Assumptions (in minutes)			
	Arriving Bus Time Slot	Departing Bus Time Slot	Bunching Buffer Per Movement[58]	Total Turnaround Time
Conservative	15	20	5	45
Best Practice	10	15	5	35
Compressed	5	10	5	25

As described in detail below, the recommended time slots for boarding and alighting activities under the Best Practice scenario are consistent with common practices for berth management, including:

A. Review of peak hour schedules at other US intercity bus terminals
B. Existing and potential dwell reduction strategies
C. Carrier incentives and lack of Federal dwell requirements
D. Timed field observations of loading and unloading of trips for two of WUS's major carriers, conducted in New York City in July 2020

A. US scheduling practice: Most US bus terminals have excess capacity, so carriers have neither incentive nor reason to strive for short turnaround times. Even at terminals with higher demand, pressure to achieve more arrivals and/or departures per berth per hour only occurs during peak periods that generally last one to two hours a day. As described in Chapter 2, European bus terminals operate in more constrained environments, demonstrating the ability of carriers to operate efficiently using dynamic berth scheduling.

B. Existing and Potential Dwell Reduction Strategies: Larger intercity operators have learned on their own that they can employ strategies to maximize service during hours of peak customer demand. These include stationing extra personnel at terminals to assist with baggage and to check tickets of customers while they are queued. These existing practices, as well as other strategies to expedite the boarding process (e.g. matching technology), could be expanded to further reduce dwell times.

C. Carrier incentives and Federal Motor Carrier Safety Administration (FMCSA) regulations: FMCSA Part 395 does not require any frequency or length of breaks for operators during their maximum 10-hour driving day. Thus, there is no external requirement for dwell duration. If dwell time includes driver

[58] Buffers were assigned to Intercity bus movements only.

functions such as ticket-taking, baggage handling, or vehicle inspection, that time counts toward the 10-hour daily maximum, and it may be in the carrier's interest to minimize. DEIS interviews with carriers found a consensus for 30-minute slots – a "desire," not a "need." The DEIS 30-minute time slot allowance for a single movement is very liberal by observation and example, and not driven by mandate.

D. Field observations: Field observations were conducted in New York City during July 2020 of the two major carriers serving WUS (incorporating many trips to/from WUS), including both double-decker and standard intercity buses.[59] The results, reported below, support the assumption of the Best Practice scenario that carriers can work with ten minutes allocated for arrivals and 15 minutes allocated for departures. For the 30 bus movements documented in July, alighting durations from arriving buses did not exceed 2 minutes, 30 seconds. Boarding durations onto departing buses were predominantly within the 15-minute recommendation. There were four departures that exceeded that, but it is important to note that boarding time observations, unlike alighting, are not necessarily the actual time required for boarding. They may include additional time for buses that arrive at the berth early or for convenience to let people start boarding ahead of time. Finally, some buses may load all passengers and then await a scheduled departure time.

The summary of the derived findings and the observed duration of intercity buses' boarding and alighting activities are displayed in **Table 6**, **Figure 8** and **Figure 9**.

[59] Field observations were conducted in several locations in Manhattan on Saturday July 4, 2020.

Table 6: Time duration of Intercity Boarding and Alighting Activities
based on field observations conducted in NYC in July 2020

	Duration (min:sec)	
	Alighting	Boarding
Average	01:28	10:34
Average with 20 passengers or more	01:58	12:55
Average with less than 20 passengers	00:57	08:38
Longest time observed	02:26	24:51
Shortest time observed	00:34	00:52
Number of observations	10	20

Figure 8: Alighting Time Duration and Number of Alighting Passengers for Arriving Intercity Buses

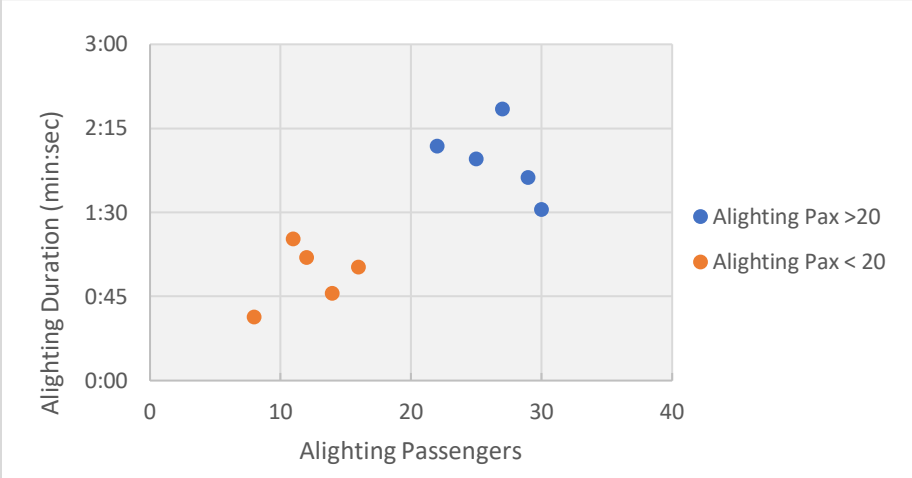
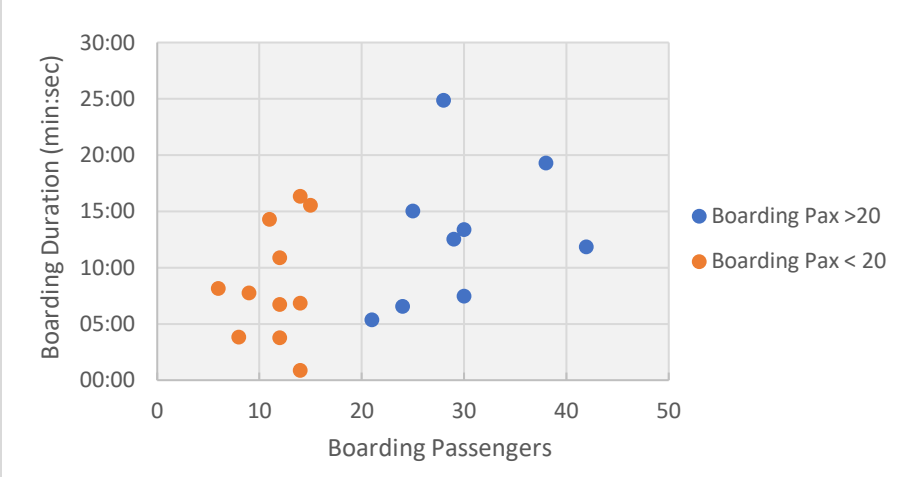


Figure 9: Boarding Time Duration and Number of Boarding Passengers for Departing Intercity Buses



Some movements might take longer or shorter than the assumed times. For example, a double decker Megabus might require more time for higher volumes. Our observations did not include a fully-loaded Megabus. Some custom or luxury charter services may use 30-35 passenger capacity vehicles that might need less time, but that would not present a problem vis a vis the recommended intervals. Time slots should be determined after discussions with, but not unilaterally by, the service providers. When held to account, providers have shown willingness and ingenuity in reducing dwell, for example by assigning extra staff to expedite the loading or removal of luggage. Assigning overly long time slots just because extra time is sometimes available discourages focus on efficiency and reliability, creates potentially confusing different procedures for different times, and inflates the number of berths required. In times of lighter activity when berth capacity is available, however, it is reasonable to assume that operations may be more flexible.

The model described here separates arrivals and departures, but allows slots allocated to arriving and departing movements by the same bus to be combined for a total turnaround time. For instance, under the Best Practice scenario, a single bus may dwell up to 25 minutes at a berth, including 10 minutes for passenger alighting activity, and 15 minutes for passenger boarding, in addition to retaining a five-minute buffer at both ends (total turnaround time of 35 minutes).

In contrast, the DEIS assumes a 30-minute time slot will be allocated to each bus movement during the peak hours of operation under the Active Management approach, which would be used for all Action Alternatives.[60] It is unclear how the DEIS applies this threshold to movements that only include an arrival or a departure. **Table 7** compares some of these potential differences.

Table 7: Time Slot Limitation Assumptions

Time Slot Application	Sam Schwartz Operations Model	DEIS
Bus Type	Limitations applied to both intercity and charter buses; 5-minute bunching buffer per movement not applied to charter buses.	Limitations applied to both intercity and charter buses
Movements	Time slot allowance of 10 or 15 minutes applied to individual bus movements (both arrivals and departures) in Best Practice scenario.	Time slot allowance of 30 minutes applied to individual bus movements (both arrivals and departures).

[60] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project, p. 5-94, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

Chapter 4: Determining the Number of Berths for the New WUS Bus Terminal

The results of the simulation model described in Chapter 3 are summarized in **Table 8**, **Figure 10**, and **Figure 11** for three scenarios. They range as follows:

- 7-13 berths could accommodate the existing intercity and charter volumes.
- 8-16 berths could accommodate the projected 2040 intercity and charter bus volumes based on the projected growth beyond 2020 volumes.
- The active berths proposed here could be supplemented with additional staging berths, also dynamically managed (see discussion on **Page 32**).

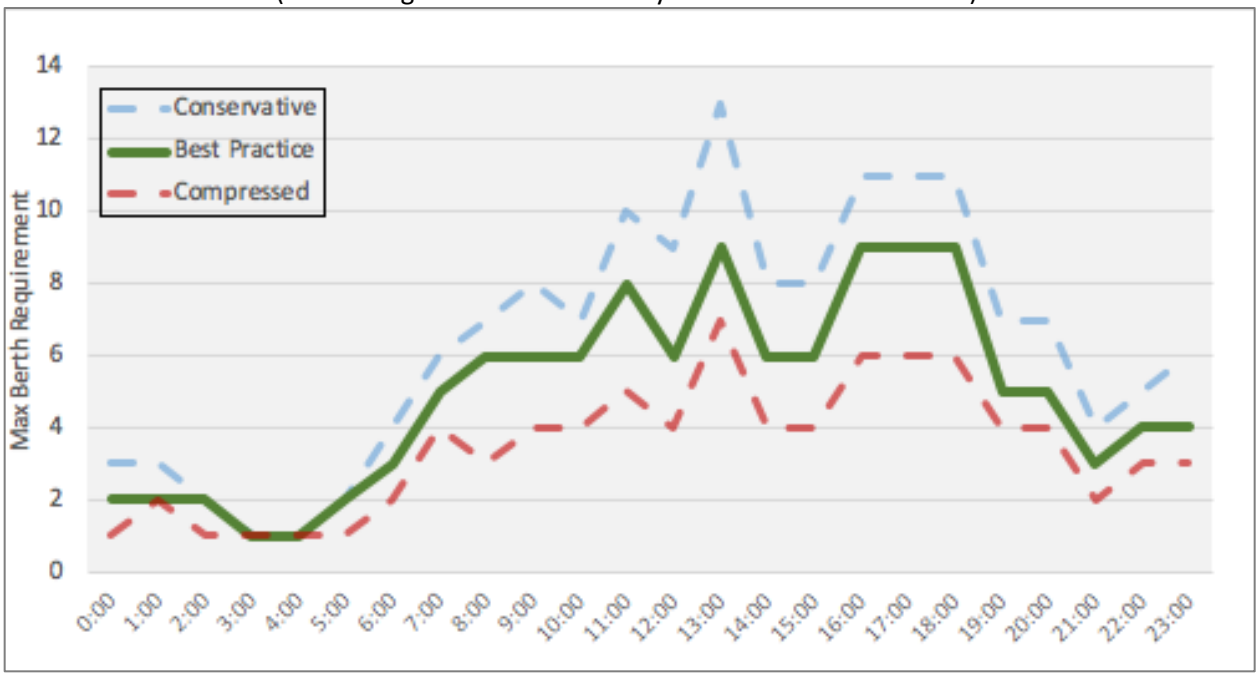
Table 8: Number of Bus Berths Needed to Accommodate Current and Future Demands at WUS

Scenario	2020 Existing Conditions	2040 Projection
Conservative	13	16
Best Practice	9	12
Compressed	7	8

Operations Model Applied to Existing Facility (baseline)

The berth requirements for existing bus movements are identified in **Table 8** above, and were developed by plotting hourly peak day bus volumes derived from maximum values across the entire week under each of three time slot scenarios. The 1 PM hour is the peak for bus movements for existing conditions. The 1 PM, 4 PM, 5 PM, and 6 PM hours all require the maximum berth requirements under the Best Practice scenario. **Figure 10** depicts this graphically.

Figure 10: Daily Berth Requirement Under Proposed Operations Plan
(accounting for baseline intercity and charter bus volumes)

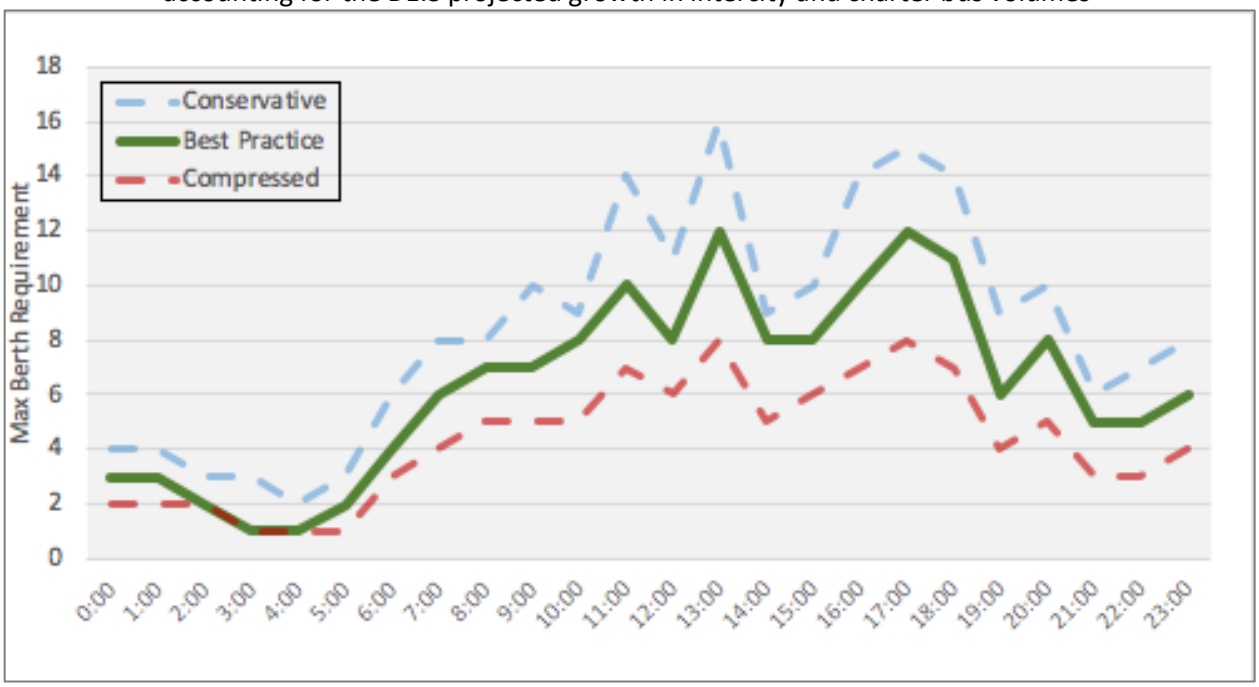


Operations Model Applied to 2040 Planned Facility Capacity

Figure *11* depicts the output of the model for 2040 hourly berth demand based on 19% growth for intercity and 51% growth for charter buses. As discussed, these rates are very conservative and aligned with the ridership growth rates indicated in the DEIS to project bus passengers and minimum berth requirements in 2040 under all DEIS Action Alternatives. The maximum number of berths required is based on the 1 PM and 5 PM peak hours, with twelve berths necessary to meet peak hour demand under the Best Practice scenario.

For terminal planning purposes, the Best Practice scenario (12 berths) is both attainable and reflective of common industry practice. The Conservative scenario (16 berths) does not attain the full potential of slot management, allowing 40% more time (35 minutes versus 25 minutes, not including buffer) for a combined arrival and departure. The Compressed scenario (8 berths) is likely achievable during peak times, but would require a higher degree of management involvement, and possibly revision of boarding/disembarking procedures. The Compressed scenario is probably not the appropriate planning model at this time, but it demonstrates that even though the Best Practice scenario provides sufficient capacity for growth to 2040, the Compressed scenario is available for use in case 2040 demand significantly exceeds predictions.

Figure 11: Daily Berth Requirement Under Proposed Operation Plan (2040 Design Year)
accounting for the DEIS projected growth in intercity and charter bus volumes



The Right Size for the New WUS Bus Terminal

Along with the Best Practice scenario, this analysis also considered even more conservative operational assumptions (beyond the Conservative scenario), closer to those in the DEIS. Sensitivity testing shows that different operational assumptions can 1) lead to the need for fewer berths or 2) allow buses to have additional turnaround time with the same number of berths. These assumptions include modifying growth in charter buses downward from 51%, and/or redistributing peak movements for charter and/or intercity buses to hours with less demand. For example, accommodating charter growth of 25% (as opposed to 51%) and redistributing some charter bus movements would allow 60-minute turnaround times in a 17-berth facility.

Notwithstanding the potential operational assumption adjustments described above, this analysis recommends the Best Practice scenario's twelve-berth terminal. As **Figure 11** shows, the Best Practice scenario can serve the 2040 growth in a future WUS bus terminal. Adherence to assigned time slot limitations is essential for a twelve-berth terminal during peak hours. However, the need for twelve berths will only come into play for approximately two hours per week, and more particularly, only when that coincides with the peak charter season during the mid-March to mid-June period. In fact, this analysis assumes that charter bus peak hours coincide with the intercity peak when evidence suggests the peaks do not overlap. In other words, the proposed twelve-berth terminal can likely serve the actual peak of the peak with flexibility built-in, and additional capacity would be available at the off-peak hours, days, and seasons. Based on the current distribution of bus movements through 2040, this twelve-berth terminal can comfortably accommodate more than 3 million annual passengers, depending on average bus occupancy (30 average passengers per bus is used in this analysis). Annual ridership could increase an additional five to ten percent through increases in bus occupancies, without any additional berths or bus movements.

Unanticipated growth could still be accommodated in other ways. Additional capacity can be created, without capital expense, using techniques available under active management. For instance, WUS management can require the last companies that request to add service to an already fully subscribed peak hour to shift those new trips to an adjacent hour, essentially requiring them to shift their desired arrival or departure times by 15 to 30 minutes, for example. This is the procedure in use for many years by the Federal Aviation Administration at the country's busiest airports.

Figure *11* shows that substantial capacity below peak volume is available on either side of the 1 PM peak hour to accommodate growth, with additional capacity also available adjacent to other near-peak hours, should demand unexpectedly escalate at those hours. In addition, other options can be examined to increase capacity, including a more detailed analysis of how to balance and plan charter and intercity bus movements, and methods to increase average occupancies per bus during peak and off-peak hours.

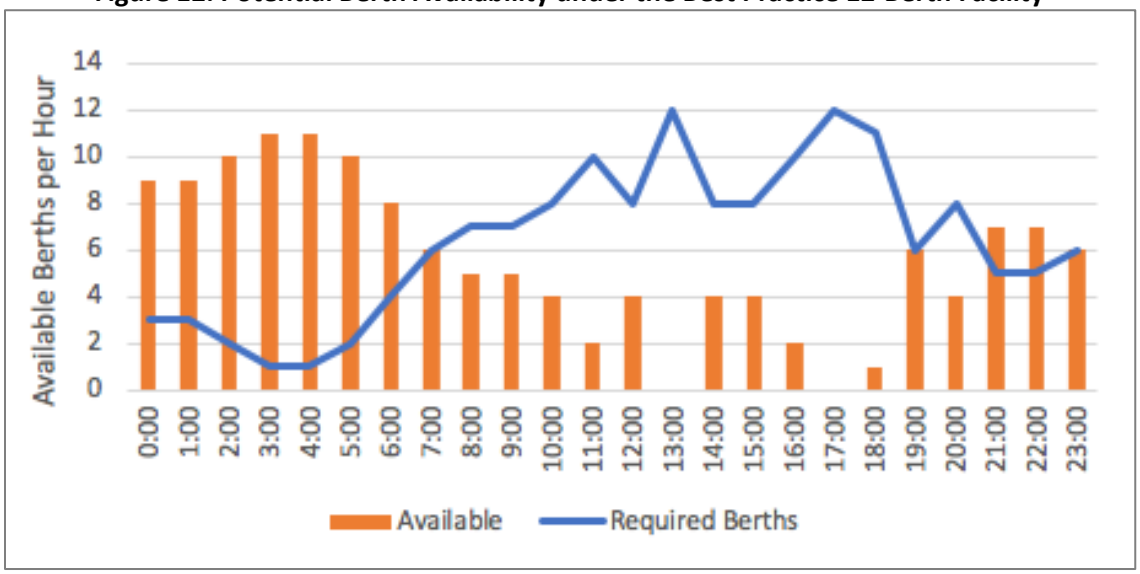
Layover Operations and Additional Capacity

The proposed operation described in this analysis assumes that all bus layover activities, staging, storage and maintenance work are located outside of WUS. Off-site layover may impact adjacent uses; neither this paper nor the DEIS identifies the times, durations, or magnitudes of layover requirements and associated impacts. Thus, the DEIS inclusion of three intercity staging berths cannot be properly evaluated and should not be a determinant of facility size at this time. A comprehensive layover analysis may show that some of this activity can be accommodated within the facility during off-peak days and hours.

The DEIS notes that the risks associated with a 25-berth program mean it could "only be achieved with sufficient space for buses to stage within the facility."[61] However, this cannot be substantiated without further assessment of when and if time slots in excess of 30 minutes might be needed in relation to peak activity. If staging spaces are included within the facility, management and active dispatching of those spaces would ensure their most efficient use. On-site staging spaces could benefit buses with passengers that arrive early during peak hours. The inclusion of staging spaces may be possible within the proposed WUS designs, without the added expense of a modified footprint.

Even the twelve-berth terminal described above for the 2040 design year would accommodate longer time slots and potential staging or layover activity during the off-peak hours. **Figure 12** shows the hourly number of berths that would be available with a twelve-berth facility. As can be seen, four berths or more would be available during most of the day. Excluding the 1 PM and 5 PM hours when all 12 berths are in use, the average available berths throughout the day is approximately six. The DEIS states that 20-25 berths would be required to meet 2040 bus demand under an active management approach, but that an additional 15 berths are recommended "given the complications of a strict active management approach and physical constraints.".[62] It is unclear what criteria was used to determine that approximately 15 additional berths would be needed, other than the fact that the Preferred Alternative's bus facility footprint can only fit 20 buses on one level, and 40 could be provided on two levels. Complications and/or impacts from future unforeseen growth would be lessened if they occurred off-peak. In addition, the potential to increase average bus occupancy and off-peak bus movements is recommended for further study, as a strategy for additional future capacity.

Figure 12: Potential Berth Availability under the Best Practice 12-Berth Facility



[61] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project – Appendix A5e, p. 3, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

[62] Ibid, p. 1; USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project – Appendix A4, Section 6-6, p. 35, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

Analysis Conclusions

The conclusion of this analysis is that the Best Practice twelve-berth bus terminal can more than meet the needs of WUS going forward. A comparison of the Best Practice scenario and the FRA plan is shown in **Table 9**.

The twelve-berth recommendation is considerably lower than the 52 berths available today at WUS, but the two cannot be compared. The current facility operates under an old model of berths leased to individual operators, where ability to pay and convenience trump efficiency, and the operator uses its space largely unfettered by management. Further, berths available today for use by charter operators are not so much a function of accommodating charter bus volume, but of maximizing the number of charter buses that can be offered short, midterm, or overnight parking. The DEIS states that it will not accommodate charter bus parking, or any bus stay beyond a 30-minute time limit.[63]

Even the Conservative scenario (16 active berths) is considerably smaller than the 20-40 berths that are recommended by the FRA. In preparing this paper, no data was available that would support or justify that range of berth inventory, but in general, detailed analyses with fixed assumptions would not yield such a large range conclusion. Nevertheless, the analysis that yielded that range would be important to review in moving forward. Size does matter for reasons other than just cost. As noted above, WUS must be planned as a well-balanced transportation center in order to function as optimally as possible. Not only must intercity and local transportation capacities work in harmony, but the sizes, locations, and access to all modes must work in harmony with the station setting and neighborhood. The proper balance of the bus program and facility size will benefit bus passengers and all WUS users, creating a vibrant, convenient, and safe transportation center that operates efficiently and sustainably.

A solution for any option could be a two-level facility, but this would be made more costly and less operationally efficient by the need for ramps. The Port Authority Bus Terminal in New York City is probably the only multi-level bus terminal in the US It requires multiple levels because it handles about 20 times the peak bus volume proposed for WUS. Handling that volume of buses on a single level in Manhattan would be logistically impractical, forgetting even the cost and unavailability of so much land. Even with multiple levels, there are no connecting ramps among levels at the Port Authority Bus Terminal, and intercity operations are clustered on a single level. At WUS, dividing even 40 berths among two levels would incur additional costs to build internal connecting ramps (as shown in the Preferred Alternative) to provide the flexibility to allow buses access to any berth and avoid the operational diseconomies of (small) scale.

Size matters in additional ways. If a 40-berth terminal is accepted, even absent substantiation, it could sustain a 2040 volume (by extrapolation) of 37,000 daily intercity bus passengers, far more than projected. To dimension this, the 2040 projection for a doubled WUS Amtrak operation is 32,000 passengers, which would be 5,000 fewer passengers than what could be accommodated in a 40-berth bus facility. The implications of that go beyond unnecessary cost. A good bus terminal is bustling, instilling feelings of vitality and security. The dispersal of people across 40 berths would result in each berth serving only 300 people in 24 hours. This will engender the opposite feeling, create security issues, and be more prone to criminal activity that might undercut the intended benefits of a central bus terminal. Furthermore,

[63] USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix C3, p. 5-202, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

converting unused space to pick-up/drop-off, as suggested,[64] could create conflicts between buses and private vehicles.

Table 9: Analysis Comparison

Category	DEIS Plan	Sam Schwartz Model
2040 Intercity Annual Passengers	2,975,000	3,000,000
2040 Intercity Passenger Growth	19%	19%
2040 Charter Passenger Growth	51%	51%
Charter and Intercity Turnaround Time	60 minutes	35 (Best Practice) to 45 minutes (Conservative)
Average Unused Berths, (excluding 2 peak hours of full use)	Not specified	6
Active Management Operation	Yes	Yes
Number of Recommended Berths	25 Total Berths • 13 intercity berths • 8 charter berths • 3 staging (non-active) • 1 DC Circulator	12 Total Berths • 12 shared intercity/ charter berths
Methodology for Facility Sizing	Apply growth factors to existing actively used berths	Model peak hour movements based on growth factors applied to carriers' scheduled departures and arrivals
Turnaround Time Rationale	Carrier input	• Field study measurements for boarding and alighting times • Study of US and international best practices

[64]USDOT-FRA. (June 2020). Draft Environmental Impact Statement for Washington Union Station Expansion Project - Appendix C3, p. 1-23, Retrieved June 24, 2020. https://railroads.dot.gov/environmental-reviews/washington-union-station-expansion-project/draft-environmental-impact.

Conclusions & Recommendations

The Washington Union Station Expansion Project has identified a need to construct a new intercity and charter bus terminal. The first step is to determine the level of bus and passenger activity that the bus terminal will need to support in 2040, and then the physical requirements necessary to accommodate those levels. Requirements will have to be met in the smallest possible footprint consistent with safety, a solid and functional design, and integration with the other transportation and development elements of this ambitious project. The efficiency of a small footprint will present the greatest flexibility for the overall project to succeed.

The similarities in operations between large intercity bus terminals and airports – the number of berths/gates, constrained time and space for boarding and alighting/deplaning, peaked demands straining physical and temporal limits, need for rapid turnaround time, and sufficient as well as efficient provision for movement of customers and vehicles – allow application of the best in modern design and management techniques used at domestic airports and overseas intercity bus stations to shape the planned new WUS bus terminal.

This paper's simulation model demonstrates that with 21st century management techniques, a twelve-berth terminal will meet (with spare capacity) demand through 2040. It does so while accounting for the overall maximum hourly activity for intercity buses and for the spring peak travel period for charter buses. It assumes the same 19% increase in intercity bus movements and 51% increase in charter bus movements as in the DEIS. It calculates future berth requirements based on projected bus movements and time slot limitations, rather than by applying a growth rate to the existing number of berths as done in the DEIS.

The conclusion, yielding a bus terminal with significantly fewer berths than the DEIS Action Alternatives, will reduce the cost of construction and operation, meeting the needs of customer multi-modality while supporting the economic viability of historic Washington Union Station and planned new development. The intercity bus terminal serving ZOB Hamburg in Germany already uses this method of operations management, employing automated scheduling to allocate arriving and departing buses to time slots in specific berths each day. These findings can be used to dimension and then best locate the WUS bus terminal in the coming redevelopment.

About the Author

Sam Schwartz is a leader in full-service consulting, design, operations and program management services for public and private clients. With 25 years of experience working on transit and rail projects for public agencies and commercial businesses, Sam Schwartz understands the need for cost effective solutions for complex challenges.

Sam Schwartz has an extensive staff of professionals with many members who have worked in the transportation/technology industries or in agency/government positions before joining the firm. We have built our team, approach, and project strategy around the recognition that success requires a thorough knowledge of transit and rail systems and processes as well as objective analysis capabilities and tools. Our transit and rail services include, but are not limited to, multi-modal transportation planning, engineering, operations, fare collection systems and policy, Mobility as a Service (MaaS), and conceptual facility design.

Sam Schwartz has been working on intercity, commuter, express, BRT, and local bus systems in New York throughout the firm's history and continues to be the sole provider of traffic engineering services for the 5,000-bus system that operates all bus routes in the City of New York. Sam Schwartz played a key role in the overall effort to support MTA NYCT in their initial development and implementation of the Select Bus Service (SBS) program in New York City. Our team has been part of successful implementations of varied New Mobility options, including ride-hailing services, ride-sharing services, microtransit, bikeshare, and Mobility as a Service (MaaS) plans in California, Washington, Colorado and Florida.

Appendix

Full list of intercity bus arrivals and departures at Washington Union Station, as published by the service providers for March 22-28, 2020. The schedules were recorded in February 2020, before COVID-19 had an impact on scheduled services

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:00 AM	Peter Pan	Departure	Washington	New York
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:00 AM	Peter Pan	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Megabus	Arrival	New York	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:00 AM	Megabus	Departure	Washington	New York
4:15 AM	Peter Pan	Arrival	New York	Washington
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:30 AM	Our Bus	Departure	Washington	New York
5:40 AM	Greyhound	Arrival	New York	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:15 AM	Megabus	Departure	Washington	Philadelphia
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:30 AM	Bolt Bus	Departure	Washington	New York
6:30 AM	Peter Pan	Departure	Washington	New York
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
7:00 AM	Megabus	Departure	Washington	New York
7:00 AM	Our Bus	Departure	Washington	Newark
7:00 AM	Peter Pan	Departure	Washington	New York
7:05 AM	Megabus	Departure	Washington	New York
7:15 AM	Bolt Bus	Departure	Washington	Philadelphia
7:15 AM	Peter Pan	Departure	Washington	Philadelphia
7:30 AM	Megabus	Arrival	New York	Washington
7:30 AM	Megabus	Arrival	Philadelphia	Washington
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:30 AM	Washington Deluxe	Departure	Washington	New York
7:35 AM	Greyhound	Departure	Washington	Pittsburgh
7:35 AM	Greyhound	Departure	Washington	Philadelphia
7:45 AM	Best Bus	Departure	Washington	New York
7:45 AM	Bolt Bus	Departure	Washington	Newark
8:00 AM	Bolt Bus	Departure	Washington	New York
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:00 AM	Our Bus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington
8:05 AM	Megabus	Departure	Washington	New York
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Best Bus	Departure	Washington	New York
8:30 AM	Peter Pan	Departure	Washington	Philadelphia
8:40 AM	Megabus	Arrival	New York	Washington
8:40 AM	Peter Pan	Arrival	Philadelphia	Washington
8:45 AM	Megabus	Arrival	Richmond	Washington
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Megabus	Departure	Washington	New York
9:00 AM	Washington Deluxe	Departure	Washington	New York
9:05 AM	Megabus	Departure	Washington	New York
9:10 AM	Megabus	Departure	Washington	Charlottesville
9:15 AM	Megabus	Arrival	New York	Washington
9:15 AM	Peter Pan	Departure	Washington	Philadelphia
9:15 AM	Peter Pan	Departure	Washington	New York
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:35 AM	Greyhound	Departure	Washington	Philadelphia

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
9:45 AM	Best Bus	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Megabus	Departure	Washington	New York
10:00 AM	Washington Deluxe	Departure	Washington	New York
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:30 AM	Megabus	Departure	Washington	New York
10:30 AM	Megabus	Departure	Washington	Newark
10:30 AM	Peter Pan	Departure	Washington	New York
10:35 AM	Megabus	Arrival	New York	Washington
10:45 AM	Bolt Bus	Arrival	New York	Washington
11:00 AM	Bolt Bus	Arrival	Philadelphia	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh
11:00 AM	Megabus	Departure	Washington	New York
11:10 AM	Our Bus	Arrival	New York	Washington
11:15 AM	Greyhound	Departure	Washington	Richmond
11:20 AM	Megabus	Arrival	Philadelphia	Washington
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:35 AM	Megabus	Arrival	New York	Washington
11:35 AM	Megabus	Departure	Washington	Philadelphia
11:45 AM	Bolt Bus	Arrival	New York	Washington
12:00 PM	Our Bus	Arrival	Richmond	Washington
12:00 PM	Megabus	Departure	Washington	New York
12:01 PM	Bolt Bus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:10 PM	Peter Pan	Arrival	Philadelphia	Washington
12:10 PM	Our Bus	Departure	Washington	Richmond
12:15 PM	Megabus	Arrival	New York	Washington
12:15 PM	Bolt Bus	Departure	Washington	Philadelphia
12:30 PM	Bolt Bus	Arrival	Newark	Washington
12:30 PM	Greyhound	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:35 PM	Megabus	Arrival	New York	Washington
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Our Bus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:05 PM	Megabus	Departure	Washington	New York
1:15 PM	Washington Deluxe	Arrival	New York	Washington
1:15 PM	Bolt Bus	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Bolt Bus	Arrival	New York	Washington
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:35 PM	Greyhound	Arrival	New York	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington
1:35 PM	Megabus	Arrival	New York	Washington
1:40 PM	Megabus	Arrival	New York	Washington
1:45 PM	Washington Deluxe	Arrival	New York	Washington
1:45 PM	Bolt Bus	Departure	Washington	Newark
1:50 PM	Our Bus	Arrival	Newark	Washington
2:00 PM	Best Bus	Arrival	New York	Washington
2:00 PM	Megabus	Departure	Washington	New York
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:15 PM	Washington Deluxe	Arrival	New York	Washington
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:55 PM	Greyhound	Departure	Washington	Philadelphia
2:55 PM	Greyhound	Departure	Washington	Wilmington
3:00 PM	Greyhound	Arrival	Philadelphia	Washington
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Bolt Bus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
3:00 PM	Megabus	Departure	Washington	New York
3:05 PM	Megabus	Arrival	Philadelphia	Washington
3:05 PM	Megabus	Departure	Washington	New York
3:15 PM	Bolt Bus	Arrival	Philadelphia	Washington
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:20 PM	Our Bus	Arrival	New York	Washington
3:20 PM	Our Bus	Departure	Washington	Newark
3:30 PM	Megabus	Arrival	Richmond	Washington
3:30 PM	Megabus	Departure	Washington	Richmond
3:30 PM	Washington Deluxe	Departure	Washington	New York
3:35 PM	Megabus	Departure	Washington	Philadelphia
4:00 PM	Bolt Bus	Arrival	New York	Washington
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:00 PM	Megabus	Departure	Washington	New York
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington
4:10 PM	Megabus	Arrival	Charlottesville	Washington
4:15 PM	Megabus	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:30 PM	Megabus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	Newark
4:35 PM	Megabus	Arrival	New York	Washington
4:45 PM	Bolt Bus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:45 PM	Washington Deluxe	Arrival	New York	Washington
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington
5:15 PM	Bolt Bus	Arrival	New York	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:30 PM	Megabus	Arrival	New York	Washington
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Best Bus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
5:30 PM	Bolt Bus	Departure	Washington	New York
5:30 PM	Greyhound	Departure	Washington	New York
5:35 PM	Megabus	Arrival	New York	Washington
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:40 PM	Peter Pan	Arrival	Philadelphia	Washington
5:45 PM	Peter Pan	Departure	Washington	Philadelphia
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Megabus	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:10 PM	Our Bus	Arrival	Newark	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:30 PM	Peter Pan	Departure	Washington	New York
6:30 PM	Bolt Bus	Arrival	New York	Washington
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:45 PM	Bolt Bus	Arrival	Newark	Washington
6:45 PM	Megabus	Departure	Washington	Philadelphia
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington
6:55 PM	Megabus	Arrival	Philadelphia	Washington
7:00 PM	Bolt Bus	Departure	Washington	New York
7:00 PM	Megabus	Departure	Washington	New York
7:15 PM	Megabus	Arrival	New York	Washington
7:15 PM	Washington Deluxe	Arrival	New York	Washington
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Our Bus	Arrival	New York	Washington
7:35 PM	Megabus	Arrival	New York	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Best Bus	Arrival	New York	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington
8:00 PM	Greyhound	Departure	Washington	New York
8:00 PM	Megabus	Departure	Washington	New York
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Bolt Bus	Arrival	New York	Washington
8:15 PM	Megabus	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Saturday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Megabus	Departure	Washington	New York
9:30 PM	Greyhound	Arrival	New York	Washington
9:35 PM	Greyhound	Departure	Washington	Charlottesville
9:45 PM	Bolt Bus	Arrival	New York	Washington
9:45 PM	Washington Deluxe	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:00 PM	Best Bus	Arrival	New York	Washington
10:15 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:35 PM	Megabus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Megabus	Arrival	New York	Washington
11:15 PM	Washington Deluxe	Arrival	New York	Washington
11:15 PM	Greyhound	Departure	Washington	New York
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:40 PM	Megabus	Arrival	Philadelphia	Washington
11:59 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Best Bus	Arrival	New York	Washington
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:10 AM	Our Bus	Arrival	New York	Washington
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:15 AM	Best Bus	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Megabus	Arrival	New York	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Best Bus	Arrival	New York	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:00 AM	Megabus	Arrival	New York	Washington
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:00 AM	Megabus	Departure	Washington	New York
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:40 AM	Greyhound	Arrival	New York	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:15 AM	Megabus	Departure	Washington	Philadelphia
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington
7:00 AM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
7:00 AM	Our Bus	Departure	Washington	New York
7:00 AM	Peter Pan	Departure	Washington	New York
7:05 AM	Megabus	Departure	Washington	New York
7:15 AM	Peter Pan	Departure	Washington	Philadelphia
7:30 AM	Megabus	Arrival	New York	Washington
7:30 AM	Megabus	Arrival	Philadelphia	Washington
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:35 AM	Greyhound	Departure	Washington	Pittsburgh
7:35 AM	Greyhound	Departure	Washington	Philadelphia
7:45 AM	Bolt Bus	Departure	Washington	Newark
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington
8:05 AM	Megabus	Departure	Washington	New York
8:10 AM	Megabus	Arrival	Charlottesville	Washington
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Best Bus	Departure	Washington	New York
8:30 AM	Our Bus	Departure	Washington	New York
8:30 AM	Peter Pan	Departure	Washington	Philadelphia
8:40 AM	Peter Pan	Arrival	Philadelphia	Washington
8:45 AM	Megabus	Arrival	Richmond	Washington
8:45 AM	Washington Deluxe	Departure	Washington	New York
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Bolt Bus	Departure	Washington	Philadelphia
9:00 AM	Megabus	Departure	Washington	New York
9:05 AM	Megabus	Departure	Washington	New York
9:15 AM	Megabus	Arrival	New York	Washington
9:15 AM	Best Bus	Departure	Washington	New York
9:15 AM	Peter Pan	Departure	Washington	New York
9:15 AM	Peter Pan	Departure	Washington	Philadelphia
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:35 AM	Greyhound	Departure	Washington	Philadelphia
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Megabus	Departure	Washington	New York
10:00 AM	Our Bus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Bolt Bus	Departure	Washington	New York
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:30 AM	Megabus	Departure	Washington	New York
10:30 AM	Peter Pan	Departure	Washington	New York
10:35 AM	Megabus	Arrival	New York	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh
11:00 AM	Megabus	Departure	Washington	New York
11:00 AM	Washington Deluxe	Departure	Washington	New York
11:15 AM	Best Bus	Departure	Washington	New York
11:15 AM	Greyhound	Departure	Washington	Richmond
11:20 AM	Megabus	Arrival	Philadelphia	Washington
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:30 AM	Peter Pan	Departure	Washington	New York
11:35 AM	Megabus	Arrival	New York	Washington
11:35 AM	Megabus	Departure	Washington	Philadelphia
11:45 AM	Bolt Bus	Arrival	New York	Washington
11:45 AM	Best Bus	Departure	Washington	New York
11:45 AM	Bolt Bus	Departure	Washington	Newark
12:00 PM	Megabus	Departure	Washington	New York
12:01 PM	Bolt Bus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:10 PM	Peter Pan	Arrival	New York	Washington
12:15 PM	Bolt Bus	Arrival	Philadelphia	Washington
12:15 PM	Megabus	Arrival	New York	Washington
12:30 PM	Bolt Bus	Arrival	Newark	Washington
12:30 PM	Greyhound	Arrival	New York	Washington
12:35 PM	Megabus	Arrival	New York	Washington
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington
1:00 PM	Best Bus	Departure	Washington	New York
1:00 PM	Bolt Bus	Departure	Washington	Philadelphia

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:05 PM	Megabus	Departure	Washington	New York
1:10 PM	Our Bus	Arrival	Newark	Washington
1:10 PM	Megabus	Departure	Washington	Charlottesville
1:10 PM	Megabus	Departure	Washington	Newark
1:15 PM	Bolt Bus	Departure	Washington	New York
1:15 PM	Washington Deluxe	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Bolt Bus	Arrival	New York	Washington
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:30 PM	Our Bus	Departure	Washington	New York
1:35 PM	Greyhound	Arrival	New York	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington
1:35 PM	Megabus	Arrival	New York	Washington
1:40 PM	Megabus	Arrival	New York	Washington
1:45 PM	Bolt Bus	Departure	Washington	Newark
1:45 PM	Bolt Bus	Departure	Washington	Philadelphia
1:45 PM	Greyhound	Departure	Washington	Philadelphia
2:00 PM	Best Bus	Arrival	New York	Washington
2:00 PM	Megabus	Departure	Washington	New York
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:15 PM	Washington Deluxe	Arrival	New York	Washington
2:20 PM	Our Bus	Arrival	New York	Washington
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:30 PM	Peter Pan	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:45 PM	Bolt Bus	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:55 PM	Greyhound	Departure	Washington	Philadelphia
2:55 PM	Greyhound	Departure	Washington	Wilmington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
3:00 PM	Greyhound	Arrival	Philadelphia	Washington
3:00 PM	Our Bus	Arrival	Richmond	Washington
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Bolt Bus	Departure	Washington	New York
3:00 PM	Greyhound	Departure	Washington	Philadelphia
3:00 PM	Megabus	Departure	Washington	New York
3:05 PM	Megabus	Arrival	Philadelphia	Washington
3:05 PM	Megabus	Departure	Washington	New York
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:20 PM	Our Bus	Departure	Washington	Newark
3:30 PM	Megabus	Arrival	Richmond	Washington
3:30 PM	Greyhound	Departure	Washington	New York
3:30 PM	Megabus	Departure	Washington	Richmond
3:35 PM	Megabus	Departure	Washington	Philadelphia
3:45 PM	Best Bus	Departure	Washington	New York
3:50 PM	Our Bus	Departure	Washington	Richmond
4:00 PM	Best Bus	Arrival	New York	Washington
4:00 PM	Bolt Bus	Arrival	New York	Washington
4:00 PM	Peter Pan	Arrival	New York	Washington
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:00 PM	Megabus	Departure	Washington	New York
4:00 PM	Our Bus	Departure	Washington	New York
4:00 PM	Washington Deluxe	Departure	Washington	New York
4:05 PM	Bolt Bus	Arrival	Newark	Washington
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington
4:15 PM	Bolt Bus	Arrival	New York	Washington
4:15 PM	Megabus	Arrival	New York	Washington
4:15 PM	Washington Deluxe	Arrival	New York	Washington
4:15 PM	Megabus	Departure	Washington	Pittsburgh
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:30 PM	Bolt Bus	Arrival	Philadelphia	Washington
4:30 PM	Our Bus	Arrival	New York	Washington
4:30 PM	Bolt Bus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	New York
4:35 PM	Megabus	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
4:45 PM	Bolt Bus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:50 PM	Best Bus	Departure	Washington	New York
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Best Bus	Arrival	New York	Washington
5:00 PM	Megabus	Departure	Washington	New York
5:05 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington
5:10 PM	Our Bus	Arrival	Newark	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:30 PM	Megabus	Arrival	New York	Washington
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Bolt Bus	Departure	Washington	New York
5:30 PM	Greyhound	Departure	Washington	New York
5:30 PM	Peter Pan	Departure	Washington	New York
5:30 PM	Washington Deluxe	Departure	Washington	New York
5:35 PM	Megabus	Arrival	New York	Washington
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:40 PM	Peter Pan	Arrival	Philadelphia	Washington
5:45 PM	Best Bus	Departure	Washington	New York
5:45 PM	Peter Pan	Departure	Washington	Philadelphia
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Washington Deluxe	Arrival	New York	Washington
6:00 PM	Bolt Bus	Departure	Washington	New York
6:00 PM	Bolt Bus	Departure	Washington	Philadelphia
6:00 PM	Megabus	Departure	Washington	New York
6:00 PM	Peter Pan	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:15 PM	Bolt Bus	Departure	Washington	Newark
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Our Bus	Departure	Washington	New York
6:30 PM	Bolt Bus	Arrival	New York	Washington
6:30 PM	Peter Pan	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
6:30 PM	Peter Pan	Departure	Washington	New York
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:45 PM	Bolt Bus	Arrival	Newark	Washington
6:45 PM	Bolt Bus	Arrival	Philadelphia	Washington
6:45 PM	Megabus	Departure	Washington	Philadelphia
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington
6:50 PM	Our Bus	Arrival	New York	Washington
6:55 PM	Megabus	Arrival	Philadelphia	Washington
7:00 PM	Best Bus	Arrival	New York	Washington
7:00 PM	Bolt Bus	Departure	Washington	New York
7:05 PM	Megabus	Departure	Washington	New York
7:15 PM	Megabus	Arrival	New York	Washington
7:15 PM	Washington Deluxe	Arrival	New York	Washington
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Peter Pan	Arrival	New York	Washington
7:30 PM	Best Bus	Departure	Washington	New York
7:30 PM	Megabus	Departure	Washington	Newark
7:30 PM	Our Bus	Departure	Washington	Newark
7:30 PM	Washington Deluxe	Departure	Washington	New York
7:35 PM	Megabus	Arrival	New York	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Best Bus	Arrival	New York	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington
8:00 PM	Greyhound	Departure	Washington	New York
8:00 PM	Megabus	Departure	Washington	New York
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Our Bus	Arrival	New York	Washington
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Bolt Bus	Arrival	New York	Washington
8:15 PM	Megabus	Arrival	New York	Washington
8:15 PM	Washington Deluxe	Arrival	New York	Washington
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:30 PM	Peter Pan	Departure	Washington	New York
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Sunday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
8:45 PM	Best Bus	Arrival	New York	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Best Bus	Arrival	New York	Washington
9:00 PM	Megabus	Departure	Washington	New York
9:15 PM	Bolt Bus	Arrival	New York	Washington
9:15 PM	Megabus	Arrival	New York	Washington
9:30 PM	Bolt Bus	Arrival	Philadelphia	Washington
9:30 PM	Greyhound	Arrival	New York	Washington
9:30 PM	Peter Pan	Arrival	New York	Washington
9:35 PM	Megabus	Arrival	New York	Washington
9:45 PM	Bolt Bus	Arrival	New York	Washington
9:45 PM	Washington Deluxe	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:00 PM	Best Bus	Arrival	New York	Washington
10:00 PM	Peter Pan	Arrival	New York	Washington
10:00 PM	Megabus	Departure	Washington	New York
10:15 PM	Bolt Bus	Arrival	New York	Washington
10:15 PM	Bolt Bus	Arrival	Newark	Washington
10:15 PM	Megabus	Arrival	New York	Washington
10:20 PM	Our Bus	Arrival	Newark	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:30 PM	Peter Pan	Arrival	New York	Washington
10:30 PM	Megabus	Departure	Washington	New York
10:35 PM	Megabus	Arrival	New York	Washington
10:45 PM	Our Bus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:00 PM	Megabus	Departure	Washington	New York
11:00 PM	Megabus	Departure	Washington	Philadelphia
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Megabus	Arrival	New York	Washington
11:15 PM	Washington Deluxe	Arrival	New York	Washington
11:15 PM	Greyhound	Departure	Washington	New York
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:40 PM	Megabus	Arrival	Philadelphia	Washington
11:59 PM	Megabus	Departure	Washington	New York
8:00 AM	Bolt Bus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020				
Sunday				
Scheduled Time	**Operator**	**Arrival/Departure**	**Origin**	**Destination**
9:35 AM	Greyhound	Departure	Washington	Charlottesville
12:00 AM	Peter Pan	Arrival	Philadelphia	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Monday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:00 AM	Megabus	Departure	Washington	New York
4:15 AM	Peter Pan	Arrival	New York	Washington
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:40 AM	Greyhound	Arrival	New York	Washington
5:40 AM	Peter Pan	Arrival	Philadelphia	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:15 AM	Megabus	Departure	Washington	Philadelphia
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington
7:00 AM	Megabus	Departure	Washington	New York
7:00 AM	Peter Pan	Departure	Washington	New York
7:05 AM	Megabus	Departure	Washington	New York
7:15 AM	Peter Pan	Departure	Washington	Philadelphia
7:30 AM	Megabus	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Monday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
7:30 AM	Megabus	Arrival	Philadelphia	Washington
7:30 AM	Bolt Bus	Departure	Washington	New York
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:35 AM	Greyhound	Departure	Washington	Pittsburgh
7:35 AM	Greyhound	Departure	Washington	Philadelphia
7:45 AM	Bolt Bus	Departure	Washington	Newark
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington
8:05 AM	Megabus	Departure	Washington	New York
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Our Bus	Departure	Washington	New York
8:30 AM	Peter Pan	Departure	Washington	Philadelphia
8:40 AM	Megabus	Arrival	New York	Washington
8:45 AM	Megabus	Arrival	Richmond	Washington
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Megabus	Departure	Washington	New York
9:05 AM	Megabus	Departure	Washington	New York
9:10 AM	Megabus	Departure	Washington	Charlottesville
9:15 AM	Megabus	Arrival	New York	Washington
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:30 AM	Our Bus	Departure	Washington	Newark
9:35 AM	Greyhound	Departure	Washington	Philadelphia
9:35 AM	Greyhound	Departure	Washington	Charlottesville
9:45 AM	Best Bus	Departure	Washington	New York
9:45 AM	Greyhound	Departure	Washington	Harrisburg
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Megabus	Departure	Washington	New York
10:00 AM	Washington Deluxe	Departure	Washington	New York
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:30 AM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Monday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
10:30 AM	Peter Pan	Departure	Washington	New York
10:35 AM	Megabus	Arrival	New York	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Best Bus	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh
11:00 AM	Megabus	Departure	Washington	New York
11:15 AM	Greyhound	Departure	Washington	Richmond
11:20 AM	Megabus	Arrival	Philadelphia	Washington
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:35 AM	Megabus	Arrival	New York	Washington
11:35 AM	Megabus	Departure	Washington	Philadelphia
11:45 AM	Bolt Bus	Arrival	New York	Washington
12:00 PM	Our Bus	Arrival	Richmond	Washington
12:00 PM	Megabus	Departure	Washington	New York
12:00 PM	Our Bus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:15 PM	Megabus	Arrival	New York	Washington
12:30 PM	Bolt Bus	Arrival	Newark	Washington
12:30 PM	Greyhound	Arrival	New York	Washington
12:35 PM	Megabus	Arrival	New York	Washington
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:05 PM	Megabus	Departure	Washington	New York
1:10 PM	Megabus	Departure	Washington	Newark
1:15 PM	Bolt Bus	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Bolt Bus	Arrival	New York	Washington
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:35 PM	Greyhound	Arrival	New York	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Monday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
1:35 PM	Megabus	Arrival	New York	Washington
1:40 PM	Megabus	Arrival	New York	Washington
1:45 PM	Bolt Bus	Departure	Washington	Newark
2:00 PM	Best Bus	Arrival	New York	Washington
2:00 PM	Megabus	Departure	Washington	New York
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:55 PM	Greyhound	Departure	Washington	Philadelphia
2:55 PM	Greyhound	Departure	Washington	Wilmington
3:00 PM	Greyhound	Arrival	Philadelphia	Washington
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Megabus	Departure	Washington	New York
3:05 PM	Megabus	Arrival	Philadelphia	Washington
3:05 PM	Megabus	Departure	Washington	New York
3:10 PM	Our Bus	Arrival	Newark	Washington
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Washington Deluxe	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:20 PM	Our Bus	Arrival	New York	Washington
3:30 PM	Greyhound	Departure	Washington	New York
3:30 PM	Megabus	Departure	Washington	Richmond
3:35 PM	Megabus	Departure	Washington	Philadelphia
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:00 PM	Megabus	Departure	Washington	New York
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington
4:10 PM	Megabus	Arrival	Charlottesville	Washington
4:15 PM	Megabus	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:30 PM	Megabus	Arrival	Richmond	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Monday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
4:30 PM	Megabus	Departure	Washington	New York
4:35 PM	Megabus	Arrival	New York	Washington
4:45 PM	Bolt Bus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Best Bus	Departure	Washington	New York
5:00 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:15 PM	Washington Deluxe	Departure	Washington	New York
5:30 PM	Megabus	Arrival	New York	Washington
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Greyhound	Departure	Washington	New York
5:30 PM	Our Bus	Departure	Washington	Newark
5:35 PM	Megabus	Arrival	New York	Washington
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Megabus	Departure	Washington	New York
6:00 PM	Our Bus	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:30 PM	Bolt Bus	Arrival	New York	Washington
6:30 PM	Peter Pan	Departure	Washington	New York
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:45 PM	Bolt Bus	Arrival	Newark	Washington
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington
6:55 PM	Megabus	Arrival	Philadelphia	Washington
7:00 PM	Bolt Bus	Departure	Washington	New York
7:00 PM	Megabus	Departure	Washington	New York
7:10 PM	Our Bus	Arrival	New York	Washington
7:15 PM	Megabus	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Monday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Greyhound	Arrival	Harrisburg	Washington
7:30 PM	Megabus	Departure	Washington	Newark
7:35 PM	Megabus	Arrival	New York	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Best Bus	Arrival	New York	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington
8:00 PM	Greyhound	Departure	Washington	New York
8:00 PM	Megabus	Departure	Washington	New York
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Bolt Bus	Arrival	New York	Washington
8:15 PM	Megabus	Arrival	New York	Washington
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Megabus	Departure	Washington	New York
9:15 PM	Megabus	Arrival	New York	Washington
9:30 PM	Best Bus	Arrival	New York	Washington
9:30 PM	Greyhound	Arrival	New York	Washington
9:45 PM	Bolt Bus	Arrival	New York	Washington
9:45 PM	Washington Deluxe	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:00 PM	Megabus	Departure	Washington	New York
10:20 PM	Our Bus	Arrival	Newark	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:35 PM	Megabus	Arrival	New York	Washington
10:45 PM	Our Bus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:00 PM	Megabus	Departure	Washington	New York
11:00 PM	Megabus	Departure	Washington	Philadelphia
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Megabus	Arrival	New York	Washington
11:15 PM	Greyhound	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020				
Monday				
Scheduled Time	**Operator**	**Arrival/Departure**	**Origin**	**Destination**
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:40 PM	Megabus	Arrival	Philadelphia	Washington
11:59 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Tuesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:40 AM	Greyhound	Arrival	New York	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington
7:00 AM	Megabus	Departure	Washington	New York
7:00 AM	Peter Pan	Departure	Washington	New York
7:30 AM	Megabus	Arrival	Philadelphia	Washington
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:35 AM	Greyhound	Departure	Washington	Pittsburgh
7:35 AM	Greyhound	Departure	Washington	Philadelphia
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Tuesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington
8:05 AM	Megabus	Departure	Washington	New York
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Our Bus	Departure	Washington	New York
8:45 AM	Megabus	Arrival	Richmond	Washington
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Megabus	Departure	Washington	New York
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:30 AM	Our Bus	Departure	Washington	Newark
9:35 AM	Greyhound	Departure	Washington	Philadelphia
9:35 AM	Greyhound	Departure	Washington	Charlottesville
9:45 AM	Best Bus	Departure	Washington	New York
9:45 AM	Greyhound	Departure	Washington	Harrisburg
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Megabus	Departure	Washington	New York
10:00 AM	Washington Deluxe	Departure	Washington	New York
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:35 AM	Megabus	Arrival	New York	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh
11:15 AM	Greyhound	Departure	Washington	Richmond
11:20 AM	Megabus	Arrival	Philadelphia	Washington
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:45 AM	Bolt Bus	Arrival	New York	Washington
12:00 PM	Megabus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:30 PM	Greyhound	Arrival	New York	Washington
12:35 PM	Megabus	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Tuesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:15 PM	Bolt Bus	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Bolt Bus	Arrival	New York	Washington
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:35 PM	Greyhound	Arrival	New York	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington
2:00 PM	Best Bus	Arrival	New York	Washington
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:55 PM	Greyhound	Departure	Washington	Philadelphia
2:55 PM	Greyhound	Departure	Washington	Wilmington
3:00 PM	Greyhound	Arrival	Philadelphia	Washington
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Bolt Bus	Departure	Washington	New York
3:00 PM	Megabus	Departure	Washington	New York
3:10 PM	Our Bus	Arrival	Newark	Washington
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Washington Deluxe	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:30 PM	Megabus	Departure	Washington	Richmond
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Tuesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
4:15 PM	Megabus	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:30 PM	Megabus	Arrival	Richmond	Washington
4:30 PM	Megabus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	Newark
4:35 PM	Megabus	Arrival	New York	Washington
4:45 PM	Bolt Bus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Best Bus	Departure	Washington	New York
5:00 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:15 PM	Washington Deluxe	Departure	Washington	New York
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Greyhound	Departure	Washington	New York
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Megabus	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:30 PM	Peter Pan	Departure	Washington	New York
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington
7:10 PM	Our Bus	Arrival	New York	Washington
7:15 PM	Megabus	Arrival	New York	Washington
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Greyhound	Arrival	Harrisburg	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020				
Tuesday				
Scheduled Time	**Operator**	**Arrival/Departure**	**Origin**	**Destination**
8:00 PM	Greyhound	Departure	Washington	New York
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Bolt Bus	Arrival	New York	Washington
8:15 PM	Megabus	Arrival	New York	Washington
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Megabus	Departure	Washington	New York
9:30 PM	Best Bus	Arrival	New York	Washington
9:30 PM	Greyhound	Arrival	New York	Washington
9:45 PM	Bolt Bus	Arrival	New York	Washington
9:45 PM	Washington Deluxe	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:15 PM	Megabus	Arrival	New York	Washington
10:20 PM	Our Bus	Arrival	Newark	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:30 PM	Peter Pan	Departure	Washington	New York
10:35 PM	Megabus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Greyhound	Departure	Washington	New York
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:59 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Wednesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:40 AM	Greyhound	Arrival	New York	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington
7:00 AM	Megabus	Departure	Washington	New York
7:00 AM	Peter Pan	Departure	Washington	New York
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:35 AM	Greyhound	Departure	Washington	Pittsburgh
7:35 AM	Greyhound	Departure	Washington	Philadelphia
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Wednesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
8:05 AM	Megabus	Departure	Washington	New York
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Our Bus	Departure	Washington	New York
8:45 AM	Megabus	Arrival	Richmond	Washington
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Megabus	Departure	Washington	New York
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:30 AM	Our Bus	Departure	Washington	Newark
9:35 AM	Greyhound	Departure	Washington	Philadelphia
9:45 AM	Best Bus	Departure	Washington	New York
9:45 AM	Greyhound	Departure	Washington	Harrisburg
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Megabus	Departure	Washington	New York
10:00 AM	Washington Deluxe	Departure	Washington	New York
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:30 AM	Peter Pan	Departure	Washington	New York
10:35 AM	Megabus	Arrival	New York	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Best Bus	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh
11:15 AM	Greyhound	Departure	Washington	Richmond
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:45 AM	Bolt Bus	Arrival	New York	Washington
12:00 PM	Megabus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:35 PM	Megabus	Arrival	New York	Washington
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Wednesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:15 PM	Bolt Bus	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Bolt Bus	Arrival	New York	Washington
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington
2:00 PM	Best Bus	Arrival	New York	Washington
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:25 PM	Greyhound	Departure	Washington	Philadelphia
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:55 PM	Greyhound	Departure	Washington	Wilmington
3:00 PM	Greyhound	Arrival	Philadelphia	Washington
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Bolt Bus	Departure	Washington	New York
3:00 PM	Megabus	Departure	Washington	New York
3:10 PM	Our Bus	Arrival	Newark	Washington
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Washington Deluxe	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:30 PM	Megabus	Departure	Washington	Richmond
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington
4:15 PM	Megabus	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Wednesday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
4:30 PM	Megabus	Arrival	Richmond	Washington
4:30 PM	Megabus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	Newark
4:35 PM	Megabus	Arrival	New York	Washington
4:45 PM	Bolt Bus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Best Bus	Departure	Washington	New York
5:00 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:15 PM	Washington Deluxe	Departure	Washington	New York
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Greyhound	Departure	Washington	New York
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Megabus	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:30 PM	Peter Pan	Departure	Washington	New York
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington
7:00 PM	Bolt Bus	Departure	Washington	New York
7:10 PM	Our Bus	Arrival	New York	Washington
7:15 PM	Megabus	Arrival	New York	Washington
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Greyhound	Arrival	Harrisburg	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Best Bus	Arrival	New York	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington
8:00 PM	Greyhound	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020				
Wednesday				
Scheduled Time	**Operator**	**Arrival/Departure**	**Origin**	**Destination**
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Bolt Bus	Arrival	New York	Washington
8:15 PM	Megabus	Arrival	New York	Washington
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Megabus	Departure	Washington	New York
9:30 PM	Best Bus	Arrival	New York	Washington
9:30 PM	Greyhound	Arrival	New York	Washington
9:35 PM	Greyhound	Departure	Washington	Charlottesville
9:45 PM	Bolt Bus	Arrival	New York	Washington
9:45 PM	Washington Deluxe	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:15 PM	Megabus	Arrival	New York	Washington
10:20 PM	Our Bus	Arrival	Newark	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:35 PM	Megabus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Greyhound	Departure	Washington	New York
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:59 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Thursday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Megabus	Arrival	New York	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:40 AM	Greyhound	Arrival	New York	Washington
5:40 AM	Peter Pan	Arrival	Philadelphia	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:15 AM	Megabus	Departure	Washington	Philadelphia
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington
7:00 AM	Megabus	Departure	Washington	New York
7:00 AM	Peter Pan	Departure	Washington	New York
7:15 AM	Peter Pan	Departure	Washington	Philadelphia
7:30 AM	Bolt Bus	Departure	Washington	New York
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:35 AM	Greyhound	Departure	Washington	Pittsburgh

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Thursday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
7:35 AM	Greyhound	Departure	Washington	Philadelphia
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington
8:05 AM	Megabus	Departure	Washington	New York
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Best Bus	Departure	Washington	New York
8:30 AM	Our Bus	Departure	Washington	New York
8:30 AM	Peter Pan	Departure	Washington	Philadelphia
8:45 AM	Megabus	Arrival	Richmond	Washington
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Megabus	Departure	Washington	New York
9:10 AM	Megabus	Departure	Washington	Charlottesville
9:15 AM	Megabus	Arrival	New York	Washington
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:30 AM	Our Bus	Departure	Washington	Newark
9:35 AM	Greyhound	Departure	Washington	Philadelphia
9:45 AM	Best Bus	Departure	Washington	New York
9:45 AM	Greyhound	Departure	Washington	Harrisburg
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Megabus	Departure	Washington	New York
10:00 AM	Washington Deluxe	Departure	Washington	New York
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:30 AM	Megabus	Departure	Washington	New York
10:30 AM	Megabus	Departure	Washington	Newark
10:30 AM	Peter Pan	Departure	Washington	New York
10:35 AM	Megabus	Arrival	New York	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Best Bus	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Thursday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
11:00 AM	Megabus	Departure	Washington	New York
11:10 AM	Our Bus	Arrival	New York	Washington
11:15 AM	Greyhound	Departure	Washington	Richmond
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:35 AM	Megabus	Departure	Washington	Philadelphia
11:45 AM	Bolt Bus	Arrival	New York	Washington
12:00 PM	Megabus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:10 PM	Our Bus	Departure	Washington	Richmond
12:15 PM	Megabus	Arrival	New York	Washington
12:35 PM	Megabus	Arrival	New York	Washington
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:15 PM	Bolt Bus	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington
1:40 PM	Megabus	Arrival	New York	Washington
2:00 PM	Best Bus	Arrival	New York	Washington
2:00 PM	Megabus	Departure	Washington	New York
2:00 PM	Our Bus	Departure	Washington	New York
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:55 PM	Greyhound	Departure	Washington	Philadelphia

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Thursday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
2:55 PM	Greyhound	Departure	Washington	Wilmington
3:00 PM	Greyhound	Arrival	Philadelphia	Washington
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Bolt Bus	Departure	Washington	New York
3:00 PM	Megabus	Departure	Washington	New York
3:05 PM	Megabus	Arrival	Philadelphia	Washington
3:10 PM	Our Bus	Arrival	Newark	Washington
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Washington Deluxe	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:30 PM	Megabus	Arrival	Richmond	Washington
3:30 PM	Megabus	Departure	Washington	Richmond
3:35 PM	Megabus	Departure	Washington	Philadelphia
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:00 PM	Megabus	Departure	Washington	New York
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Bolt Bus	Departure	Washington	New York
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington
4:10 PM	Megabus	Arrival	Charlottesville	Washington
4:15 PM	Megabus	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:30 PM	Megabus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	Newark
4:35 PM	Megabus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Best Bus	Departure	Washington	New York
5:00 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:15 PM	Washington Deluxe	Departure	Washington	New York
5:30 PM	Megabus	Arrival	New York	Washington
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Greyhound	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Thursday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
5:30 PM	Our Bus	Departure	Washington	Newark
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Megabus	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:15 PM	Bolt Bus	Arrival	New York	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:30 PM	Peter Pan	Departure	Washington	New York
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:45 PM	Megabus	Departure	Washington	Philadelphia
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington
6:55 PM	Megabus	Arrival	Philadelphia	Washington
7:00 PM	Bolt Bus	Departure	Washington	New York
7:00 PM	Megabus	Departure	Washington	New York
7:10 PM	Our Bus	Arrival	New York	Washington
7:15 PM	Megabus	Arrival	New York	Washington
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Greyhound	Arrival	Harrisburg	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Best Bus	Arrival	New York	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington
8:00 PM	Greyhound	Departure	Washington	New York
8:00 PM	Megabus	Departure	Washington	New York
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Megabus	Arrival	New York	Washington
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020				
Thursday				
Scheduled Time	**Operator**	**Arrival/Departure**	**Origin**	**Destination**
9:15 PM	Megabus	Arrival	New York	Washington
9:30 PM	Best Bus	Arrival	New York	Washington
9:30 PM	Greyhound	Arrival	New York	Washington
9:35 PM	Greyhound	Departure	Washington	Charlottesville
9:40 PM	Megabus	Arrival	Pittsburgh	Washington
9:45 PM	Washington Deluxe	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:00 PM	Megabus	Departure	Washington	New York
10:15 PM	Megabus	Arrival	New York	Washington
10:15 PM	Bolt Bus	Departure	Washington	New York
10:20 PM	Our Bus	Arrival	Newark	Washington
10:30 PM	Best Bus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:35 PM	Megabus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:00 PM	Megabus	Departure	Washington	New York
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Megabus	Arrival	New York	Washington
11:15 PM	Greyhound	Departure	Washington	New York
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:40 PM	Megabus	Arrival	Philadelphia	Washington
11:59 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:00 AM	Best Bus	Arrival	New York	Washington
12:00 AM	Megabus	Departure	Washington	New York
12:00 AM	Megabus	Departure	Washington	Philadelphia
12:30 AM	Megabus	Arrival	New York	Washington
12:35 AM	Megabus	Arrival	New York	Washington
1:15 AM	Washington Deluxe	Arrival	New York	Washington
1:30 AM	Best Bus	Arrival	New York	Washington
1:30 AM	Megabus	Arrival	Richmond	Washington
1:35 AM	Greyhound	Arrival	New York	Washington
1:35 AM	Greyhound	Arrival	Philadelphia	Washington
1:35 AM	Greyhound	Arrival	Wilmington	Washington
1:50 AM	Megabus	Arrival	New York	Washington
1:50 AM	Greyhound	Departure	Washington	Richmond
1:55 AM	Greyhound	Arrival	Richmond	Washington
2:00 AM	Megabus	Departure	Washington	New York
2:00 AM	Megabus	Departure	Washington	Philadelphia
2:25 AM	Greyhound	Departure	Washington	New York
2:30 AM	Megabus	Arrival	New York	Washington
2:30 AM	Megabus	Departure	Washington	New York
3:00 AM	Megabus	Arrival	New York	Washington
3:10 AM	Greyhound	Arrival	New York	Washington
3:35 AM	Greyhound	Arrival	Richmond	Washington
3:50 AM	Greyhound	Departure	Washington	New York
4:00 AM	Megabus	Arrival	New York	Washington
4:29 AM	Megabus	Arrival	New York	Washington
5:00 AM	Megabus	Departure	Washington	New York
5:30 AM	Megabus	Arrival	New York	Washington
5:30 AM	Megabus	Arrival	Philadelphia	Washington
5:30 AM	Our Bus	Departure	Washington	New York
5:40 AM	Greyhound	Arrival	New York	Washington
6:00 AM	Greyhound	Departure	Washington	Wilmington
6:00 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	New York
6:05 AM	Megabus	Departure	Washington	Richmond
6:15 AM	Megabus	Departure	Washington	Philadelphia
6:20 AM	Greyhound	Arrival	Richmond	Washington
6:30 AM	Bolt Bus	Departure	Washington	New York
6:45 AM	Greyhound	Departure	Washington	New York
7:00 AM	Megabus	Arrival	New York	Washington
7:00 AM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
7:00 AM	Our Bus	Departure	Washington	Newark
7:00 AM	Peter Pan	Departure	Washington	New York
7:15 AM	Peter Pan	Departure	Washington	Philadelphia
7:30 AM	Megabus	Arrival	New York	Washington
7:30 AM	Megabus	Arrival	Philadelphia	Washington
7:30 AM	Greyhound	Departure	Washington	Philadelphia
7:35 AM	Greyhound	Departure	Washington	Pittsburgh
7:35 AM	Greyhound	Departure	Washington	Philadelphia
7:45 AM	Bolt Bus	Departure	Washington	Newark
8:00 AM	Best Bus	Departure	Washington	New York
8:00 AM	Bolt Bus	Departure	Washington	New York
8:00 AM	Greyhound	Departure	Washington	New York
8:00 AM	Megabus	Departure	Washington	New York
8:00 AM	Our Bus	Departure	Washington	New York
8:05 AM	Greyhound	Arrival	New York	Washington
8:05 AM	Greyhound	Arrival	Pittsburgh	Washington
8:05 AM	Megabus	Departure	Washington	New York
8:15 AM	Washington Deluxe	Departure	Washington	New York
8:25 AM	Megabus	Departure	Washington	Philadelphia
8:30 AM	Peter Pan	Departure	Washington	Philadelphia
8:40 AM	Megabus	Arrival	New York	Washington
8:40 AM	Peter Pan	Arrival	Philadelphia	Washington
8:45 AM	Megabus	Arrival	Richmond	Washington
8:50 AM	Megabus	Departure	Washington	Richmond
9:00 AM	Bolt Bus	Departure	Washington	Philadelphia
9:00 AM	Megabus	Departure	Washington	New York
9:10 AM	Megabus	Departure	Washington	Charlottesville
9:15 AM	Megabus	Arrival	New York	Washington
9:15 AM	Best Bus	Departure	Washington	New York
9:15 AM	Peter Pan	Departure	Washington	New York
9:15 AM	Peter Pan	Departure	Washington	Philadelphia
9:20 AM	Greyhound	Arrival	Richmond	Washington
9:20 AM	Megabus	Departure	Washington	Front Royal
9:30 AM	Bolt Bus	Departure	Washington	New York
9:30 AM	Megabus	Departure	Washington	Pittsburgh
9:30 AM	Washington Deluxe	Departure	Washington	New York
9:35 AM	Greyhound	Departure	Washington	Philadelphia
9:45 AM	Greyhound	Departure	Washington	Harrisburg
10:00 AM	Greyhound	Departure	Washington	New York
10:00 AM	Greyhound	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
10:00 AM	Megabus	Departure	Washington	New York
10:05 AM	Megabus	Arrival	Philadelphia	Washington
10:05 AM	Megabus	Departure	Washington	New York
10:15 AM	Best Bus	Departure	Washington	New York
10:15 AM	Megabus	Arrival	New York	Washington
10:15 AM	Megabus	Departure	Washington	Richmond
10:30 AM	Bolt Bus	Departure	Washington	New York
10:30 AM	Greyhound	Departure	Washington	Philadelphia
10:30 AM	Megabus	Departure	Washington	New York
10:30 AM	Megabus	Departure	Washington	Newark
10:30 AM	Peter Pan	Departure	Washington	New York
10:35 AM	Megabus	Arrival	New York	Washington
11:00 AM	Greyhound	Arrival	Philadelphia	Washington
11:00 AM	Greyhound	Departure	Washington	New York
11:00 AM	Greyhound	Departure	Washington	Pittsburgh
11:00 AM	Megabus	Departure	Washington	New York
11:00 AM	Washington Deluxe	Departure	Washington	New York
11:10 AM	Our Bus	Arrival	New York	Washington
11:15 AM	Greyhound	Departure	Washington	Richmond
11:30 AM	Megabus	Arrival	New York	Washington
11:30 AM	Peter Pan	Arrival	New York	Washington
11:30 AM	Bolt Bus	Departure	Washington	New York
11:30 AM	Peter Pan	Departure	Washington	New York
11:35 AM	Megabus	Arrival	New York	Washington
11:35 AM	Megabus	Departure	Washington	Philadelphia
11:45 AM	Bolt Bus	Arrival	New York	Washington
11:45 AM	Bolt Bus	Departure	Washington	Newark
12:00 PM	Our Bus	Arrival	Richmond	Washington
12:00 PM	Megabus	Departure	Washington	New York
12:01 PM	Greyhound	Departure	Washington	New York
12:05 PM	Megabus	Departure	Washington	New York
12:10 PM	Peter Pan	Arrival	New York	Washington
12:10 PM	Peter Pan	Arrival	Philadelphia	Washington
12:10 PM	Our Bus	Departure	Washington	Richmond
12:15 PM	Bolt Bus	Arrival	Philadelphia	Washington
12:15 PM	Megabus	Arrival	New York	Washington
12:30 PM	Bolt Bus	Arrival	Newark	Washington
12:30 PM	Greyhound	Arrival	New York	Washington
12:35 PM	Megabus	Arrival	New York	Washington
12:45 PM	Best Bus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
12:55 PM	Megabus	Departure	Washington	Philadelphia
1:00 PM	Greyhound	Arrival	New York	Washington
1:00 PM	Washington Deluxe	Arrival	New York	Washington
1:00 PM	Bolt Bus	Departure	Washington	Philadelphia
1:00 PM	Megabus	Departure	Washington	New York
1:00 PM	Our Bus	Departure	Washington	New York
1:00 PM	Peter Pan	Departure	Washington	New York
1:05 PM	Greyhound	Arrival	Richmond	Washington
1:05 PM	Greyhound	Arrival	Philadelphia	Washington
1:05 PM	Greyhound	Arrival	Wilmington	Washington
1:15 PM	Bolt Bus	Departure	Washington	New York
1:15 PM	Washington Deluxe	Departure	Washington	New York
1:20 PM	Greyhound	Departure	Washington	Richmond
1:25 PM	Greyhound	Departure	Washington	Philadelphia
1:30 PM	Bolt Bus	Arrival	New York	Washington
1:30 PM	Megabus	Arrival	Philadelphia	Washington
1:35 PM	Greyhound	Arrival	New York	Washington
1:35 PM	Greyhound	Arrival	Philadelphia	Washington
1:35 PM	Megabus	Arrival	New York	Washington
1:40 PM	Megabus	Arrival	New York	Washington
1:45 PM	Bolt Bus	Departure	Washington	Newark
1:45 PM	Bolt Bus	Departure	Washington	Philadelphia
1:45 PM	Greyhound	Departure	Washington	Philadelphia
1:50 PM	Our Bus	Arrival	Newark	Washington
2:00 PM	Best Bus	Arrival	New York	Washington
2:00 PM	Megabus	Departure	Washington	New York
2:00 PM	Peter Pan	Departure	Washington	New York
2:05 PM	Megabus	Departure	Washington	New York
2:15 PM	Megabus	Arrival	New York	Washington
2:30 PM	Megabus	Arrival	Front Royal	Washington
2:30 PM	Greyhound	Departure	Washington	New York
2:35 PM	Megabus	Arrival	New York	Washington
2:40 PM	Greyhound	Arrival	Richmond	Washington
2:45 PM	Bolt Bus	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	New York	Washington
2:50 PM	Greyhound	Arrival	Pittsburgh	Washington
2:50 PM	Greyhound	Arrival	Philadelphia	Washington
2:55 PM	Greyhound	Departure	Washington	Philadelphia
2:55 PM	Greyhound	Departure	Washington	Wilmington
3:00 PM	Greyhound	Arrival	Philadelphia	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
3:00 PM	Peter Pan	Arrival	New York	Washington
3:00 PM	Bolt Bus	Departure	Washington	New York
3:00 PM	Greyhound	Departure	Washington	Philadelphia
3:00 PM	Megabus	Departure	Washington	New York
3:05 PM	Megabus	Arrival	Philadelphia	Washington
3:15 PM	Megabus	Arrival	New York	Washington
3:15 PM	Washington Deluxe	Arrival	New York	Washington
3:15 PM	Greyhound	Departure	Washington	Richmond
3:20 PM	Our Bus	Arrival	New York	Washington
3:20 PM	Our Bus	Departure	Washington	Newark
3:30 PM	Megabus	Arrival	Richmond	Washington
3:30 PM	Peter Pan	Arrival	New York	Washington
3:30 PM	Best Bus	Departure	Washington	New York
3:30 PM	Megabus	Departure	Washington	Richmond
3:30 PM	Washington Deluxe	Departure	Washington	New York
3:35 PM	Megabus	Departure	Washington	Philadelphia
4:00 PM	Bolt Bus	Arrival	New York	Washington
4:00 PM	Greyhound	Departure	Washington	New York
4:00 PM	Greyhound	Departure	Washington	Wilmington
4:00 PM	Megabus	Departure	Washington	New York
4:05 PM	Bolt Bus	Arrival	Newark	Washington
4:05 PM	Greyhound	Arrival	Wilmington	Washington
4:05 PM	Megabus	Departure	Washington	New York
4:10 PM	Greyhound	Arrival	Wilmington	Washington
4:10 PM	Megabus	Arrival	Charlottesville	Washington
4:15 PM	Megabus	Arrival	New York	Washington
4:15 PM	Megabus	Departure	Washington	Pittsburgh
4:20 PM	Greyhound	Arrival	New York	Washington
4:20 PM	Greyhound	Arrival	New York	Washington
4:30 PM	Bolt Bus	Arrival	Philadelphia	Washington
4:30 PM	Bolt Bus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	New York
4:30 PM	Megabus	Departure	Washington	Newark
4:35 PM	Megabus	Arrival	New York	Washington
4:45 PM	Bolt Bus	Arrival	New York	Washington
4:45 PM	Megabus	Arrival	Pittsburgh	Washington
4:50 PM	Greyhound	Departure	Washington	Pittsburgh
5:00 PM	Best Bus	Departure	Washington	New York
5:00 PM	Megabus	Departure	Washington	New York
5:10 PM	Megabus	Arrival	Philadelphia	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
5:15 PM	Bolt Bus	Arrival	New York	Washington
5:15 PM	Megabus	Arrival	New York	Washington
5:15 PM	Greyhound	Departure	Washington	New York
5:15 PM	Megabus	Departure	Washington	Philadelphia
5:30 PM	Megabus	Arrival	New York	Washington
5:30 PM	Megabus	Arrival	Newark	Washington
5:30 PM	Peter Pan	Arrival	New York	Washington
5:30 PM	Bolt Bus	Departure	Washington	New York
5:30 PM	Greyhound	Departure	Washington	New York
5:30 PM	Our Bus	Departure	Washington	Newark
5:30 PM	Peter Pan	Departure	Washington	New York
5:35 PM	Megabus	Arrival	New York	Washington
5:40 PM	Greyhound	Arrival	Richmond	Washington
5:40 PM	Peter Pan	Arrival	Philadelphia	Washington
5:40 PM	Washington Deluxe	Departure	Washington	New York
5:45 PM	Best Bus	Departure	Washington	New York
5:45 PM	Peter Pan	Departure	Washington	Philadelphia
5:55 PM	Greyhound	Departure	Washington	New York
6:00 PM	Bolt Bus	Departure	Washington	Philadelphia
6:00 PM	Megabus	Departure	Washington	New York
6:05 PM	Greyhound	Departure	Washington	Richmond
6:05 PM	Megabus	Departure	Washington	New York
6:10 PM	Greyhound	Arrival	Pittsburgh	Washington
6:10 PM	Our Bus	Arrival	Newark	Washington
6:15 PM	Megabus	Arrival	New York	Washington
6:15 PM	Washington Deluxe	Arrival	New York	Washington
6:15 PM	Bolt Bus	Departure	Washington	Newark
6:20 PM	Greyhound	Arrival	New York	Washington
6:25 PM	Greyhound	Arrival	New York	Washington
6:30 PM	Bolt Bus	Arrival	New York	Washington
6:30 PM	Peter Pan	Arrival	New York	Washington
6:30 PM	Peter Pan	Departure	Washington	New York
6:30 PM	Washington Deluxe	Departure	Washington	New York
6:35 PM	Megabus	Arrival	New York	Washington
6:40 PM	Greyhound	Arrival	New York	Washington
6:45 PM	Bolt Bus	Arrival	Newark	Washington
6:45 PM	Bolt Bus	Arrival	Philadelphia	Washington
6:45 PM	Megabus	Departure	Washington	Philadelphia
6:50 PM	Greyhound	Arrival	Philadelphia	Washington
6:50 PM	Megabus	Arrival	Richmond	Washington

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
6:55 PM	Megabus	Arrival	Philadelphia	Washington
7:00 PM	Best Bus	Departure	Washington	New York
7:00 PM	Bolt Bus	Departure	Washington	New York
7:00 PM	Megabus	Departure	Washington	New York
7:15 PM	Megabus	Arrival	New York	Washington
7:25 PM	Greyhound	Arrival	New York	Washington
7:30 PM	Greyhound	Arrival	Harrisburg	Washington
7:30 PM	Our Bus	Arrival	New York	Washington
7:35 PM	Megabus	Arrival	New York	Washington
7:55 PM	Greyhound	Arrival	Philadelphia	Washington
8:00 PM	Best Bus	Arrival	New York	Washington
8:00 PM	Greyhound	Arrival	Charlottesville	Washington
8:00 PM	Greyhound	Departure	Washington	New York
8:00 PM	Megabus	Departure	Washington	New York
8:05 PM	Megabus	Departure	Washington	New York
8:10 PM	Greyhound	Departure	Washington	Richmond
8:15 PM	Bolt Bus	Arrival	New York	Washington
8:15 PM	Washington Deluxe	Arrival	New York	Washington
8:20 PM	Greyhound	Arrival	Richmond	Washington
8:30 PM	Megabus	Departure	Washington	Philadelphia
8:30 PM	Peter Pan	Departure	Washington	New York
8:35 PM	Megabus	Arrival	New York	Washington
8:35 PM	Greyhound	Departure	Washington	New York
8:35 PM	Greyhound	Departure	Washington	Richmond
8:40 PM	Megabus	Arrival	Philadelphia	Washington
8:55 PM	Megabus	Arrival	Richmond	Washington
9:00 PM	Megabus	Departure	Washington	New York
9:15 PM	Bolt Bus	Arrival	New York	Washington
9:15 PM	Megabus	Arrival	New York	Washington
9:30 PM	Best Bus	Arrival	New York	Washington
9:30 PM	Bolt Bus	Arrival	Philadelphia	Washington
9:30 PM	Greyhound	Arrival	New York	Washington
9:35 PM	Megabus	Arrival	New York	Washington
9:35 PM	Greyhound	Departure	Washington	Charlottesville
9:40 PM	Megabus	Arrival	Pittsburgh	Washington
9:45 PM	Bolt Bus	Arrival	New York	Washington
9:55 PM	Greyhound	Arrival	New York	Washington
10:00 PM	Best Bus	Arrival	New York	Washington
10:00 PM	Peter Pan	Arrival	New York	Washington
10:00 PM	Megabus	Departure	Washington	New York

Washington Union Station - Intercity Bus Schedules for March 22-28, 2020

Friday

Scheduled Time	Operator	Arrival/Departure	Origin	Destination
10:15 PM	Bolt Bus	Arrival	Newark	Washington
10:15 PM	Megabus	Arrival	New York	Washington
10:15 PM	Washington Deluxe	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	New York	Washington
10:30 PM	Megabus	Arrival	Newark	Washington
10:30 PM	Peter Pan	Arrival	New York	Washington
10:35 PM	Megabus	Arrival	New York	Washington
10:55 PM	Greyhound	Arrival	Richmond	Washington
11:00 PM	Peter Pan	Arrival	New York	Washington
11:00 PM	Megabus	Departure	Washington	New York
11:00 PM	Megabus	Departure	Washington	Philadelphia
11:10 PM	Greyhound	Arrival	Philadelphia	Washington
11:15 PM	Megabus	Arrival	New York	Washington
11:15 PM	Greyhound	Departure	Washington	New York
11:20 PM	Greyhound	Arrival	New York	Washington
11:20 PM	Megabus	Departure	Washington	Richmond
11:30 PM	Greyhound	Departure	Washington	Richmond
11:40 PM	Megabus	Arrival	Philadelphia	Washington
11:45 PM	Washington Deluxe	Arrival	New York	Washington
11:59 PM	Megabus	Departure	Washington	New York

APPENDIX C2

RESPONSE TO AUGUST 26, 2020 GREYHOUND LETTER

Response to August 26, 2020 Greyhound Letter

September 28, 2020

This document is a response to the Greyhound letter dated August 26, 2020 and addressed to David Valenstein at FRA (Greyhound letter) regarding plans for the bus facility for Washington Union Station (WUS) in the Station Expansion Project (SEP) Draft Environmental Impact Statement (DEIS). Because of the importance of balancing public and private goals for the bus facility, we believe it is necessary to provide a specific response to the Greyhound letter. We believe the Greyhound letter makes a number of misleading claims and is largely based on conjecture rather than facts. This document responds to each of the key points raised.

It is important to note that this document frequently references a detailed study by Sam Schwartz Engineers (SSE), that was completed in September 2020 to examine the appropriate size and location of a future bus facility at WUS. The SSE report is attached and included as part of our DEIS Comments.

Location: Greyhound establishes the priority of a properly sized bus facility adjacent to the historic train station.
"Greyhound's basic position on the Expansion Project is that the intercity bus deck must continue to be located immediately adjacent to the main terminal building with passenger loading and unloading and bus staging areas sufficient to accommodate current passenger demand and likely future growth"

RESPONSE: We support the location of the bus facility adjacent to Union Station and the need to properly size the bus facility to accommodate future bus demand.

Capacity: The Greyhound letter stresses heavily the importance of bus capacity at the Station. Given the various angles Greyhound has taken relative to bus capacity, we have broken this particular subject into subsections. We should note that there is no dispute over the intercity bus growth projections that are included in the FRA assessment and these projections were used in the SSE analysis. It should also be noted that WUS is in the middle of a high density urban environment where land expansion is not possible and surrounding road infrastructure is significantly constrained. As a result of this constrained urban environment, all facilities at the station must be sufficiently, but not excessively, sized.

Claim: Bus facility must be sized to meet future demand:
"The Technical Memorandum concludes that by 2040, there will be a need for 47 "active spaces" for intercity bus, charter and tour bus, and DC Circulator on the bus deck. Page 8, Table 1. This includes 2 spaces for "operational flexibility" but does not appear to include the twelve 2016 "layover spaces".

"Although I believe the 47 spaces are understated, that number is far above the 17-27 gates proposed in the action alternatives other than Alternative A-C, and indeed is substantially above the 40 gates proposed in A-C. It shows that rather than causing a "moderate" adverse impact on intercity bus operations, alternatives reducing total spaces to 17-27 slips would effectively eliminate most, if not all, intercity bus service from Union Station. "

RESPONSE: We wholeheartedly agree that the bus facility in the WUS SEP must be sized to meet future demand. However, we believe that this should be accomplished with a smaller and better designed facility. While the FRA, SSE, and Greyhound are all using the same assumptions for growth in intercity

bus service, their conclusions are drastically different. FRA's analysis and the detailed analysis by SSE both conclude that a facility with fewer slips than those called for by Greyhound would be sufficient to meet future demand. In fact, SSE concluded that future demand for intercity and charter service at WUS could be accommodated with as few as 12 slips. While the SSE conclusions are based on a thorough and rigorous analysis, Greyhound has presented no analysis to support any of its claims relative to the size of the facility.

Claim: Alternative A-C proposes reducing bus capacity and the bus program is treated as a lower priority in the Alternative, as compared to rail: "*The Project is titled the Washington Union Station Expansion Project, yet intercity rail capacity is being expanded to accommodate 148% growth in intercity rail traffic and 163% and 187% increase in commuter rail traffic while all of the action alternatives in the DEIS recommend a reduction in intercity bus capacity." And*
"these five alternatives propose reducing the bus capacity at Union Station between 56% and 72% while increasing rail capacity between 148% and 187%."

RESPONSE: A fundamental flaw in the Greyhound letter is conflating passenger capacity with bus parking. This error fuels much of the concern imbedded in the Greyhound letter. In fact, the proposed rail program at WUS provides a perfect corollary to dispel the passenger capacity/bus parking myth. Indeed, the rail program at Union Station will increase passenger capacity by 148% to 187%, but they will be achieving this growth while REDUCING the number active rail tracks (i.e. train parking slips) at Union Station from 20 to 19. The passenger capacity increases are not the result of an increase in the scale of the infrastructure, rather they are the result of a program that embraces modern, global best practices relative to operating efficiencies. A modern facility like the one promised for WUS requires that transportation operators embrace the tools and best practices available to ensure efficient operations. Rail operators have embraced this opportunity and vastly expanded (more than doubling) passenger capacity while reducing the number of train tracks available.

Claim: The bus facility proposed in Preferred Alternative A-C is insufficiently sized: "*the 'current' 61 gates (as listed in the 2016 Technical Memorandum) may not be sufficient in the future."*

RESPONSE: Greyhound has provided no evidence or analytical support for suggesting more than 24 slips (as established in the FRA DEIS) are necessary. Greyhound also ignores the fact that FRA and stakeholders have prioritized the WUS bus facility for intercity and charter bus operations. For clarity, FRA recommends 13 intercity slips, 8 charter slips, and 3 staging slips. While we believe FRA's bus assessment provides more slips than necessary, it does apply some methodology for determining future demand for slips (unlike the Greyhound letter). Sam Schwartz Engineers has undertaken an extensive analysis of the entire bus operation at Union Station, utilizing FRA and FHWA projections for passenger growth and best practices for bus operations in the United States and Europe. The conclusion of the SSE analysis is that a 14- to 18- slip facility can easily accommodate future intercity and charter bus service at WUS. The attached technical report from SSE provides the detailed analysis that is necessary to establish the proper size of the WUS intercity and charter bus facility. WUS is in the middle of a high density urban environment and constructing a bus facility above an operating rail yard will be an expensive proposition. Given these facts, it would seem self-evident that all facilities at the station must be sufficiently, but not excessively sized.

Claim: Projections for future demand ignore other bus slip users: ***"****the Technical Memorandum projects a need for 47 active bus slips in 2040 (25 intercity, 18 charter, tour and sightseeing, and 4 DC Circulator), but it ignores the multiple other buses that utilize the bus deck."*

RESPONSE: The FRA DEIS recommends 13 intercity slips, 8 charter slips, 3 staging slips, and 1 slip for DC Circulator; a total of 25 slips (not the 47 slips referenced in the Greyhound letter). It should be noted that a) FRA determined that the Union Station bus terminal should accommodate intercity and charter bus operations only, and b) the District Department of Transportation (DDOT) has determined it does not want a slip in the facility for the DC Circulator. As indicated by Greyhound, there are a multitude of buses that currently utilize the Union Station bus facility. None of these other buses have a connection to intercity or charter bus activity or to other station functions. These other bus users are largely at Union Station simply because the garage has excess capacity. The FRA and stakeholder determination that the WUS bus facility should focus on intercity and charter bus operations is well considered as it focuses on the core multi-modal purpose of the SEP. As such, the DEIS does not "ignore" the other users of the current garage, but rather establishes that intercity and charter buses should be prioritized for WUS. The SEP should plan for a world class, efficient, intermodal facility and, as such, the services planned should only be those that contribute to this goal and reinforce the functionality of the station.

Claim: Capacity estimates ignore special events and holiday peak demand: *"the peak period calculations used to determine capacity needs are based on time-of-day "average" peak periods. They do not take into account day-of-the-year peaks. Those days (Christmas, Thanksgiving, Easter, Cherry Blossom Festival, all Federal holidays, summer weekends, etc.), when multiple extra buses are operated on many schedules, are the true peaks that make intercity bus service viable."*

RESPONSE: The analysis that SSE has undertaken is detailed and robust, and includes documentation of all intercity bus movements, including all carriers currently operating at Union Station, and not just Greyhound lines. The SSE examination of peak season, peak day, and peak hour bus movements, as well as average and peak passenger demand and individual bus capacities, is the kind of study and documentation that is required to plan and design this public facility, and ensure that it is not excessively sized for the convenience of the various private bus operators. While criticizing the FRA DEIS, the Greyhound letter does not offer any details about their operations, or the operations of any other carriers at Union Station to back up its critiques. The SSE report provides the necessary and thoughtful assessment of bus schedules and bus movements to support a fact-based conclusion relative to bus slip requirements.

Claim: Bus service operators are incapable of operating at higher operating efficiencies: *"the Technical Memorandum notes that the 'terminal could adopt a dynamic management approach', which could affect the bus slip projections. This approach would utilize technology to allocate buses to available spaces based on current demand. The Memorandum concedes that 'there are no bus terminals managed dynamically in the United States', but suggests that examples in the UK and New Zealand might apply." "reasons include costs, complexity of operations, and multiplicity of operators. Although we are willing to cooperate in any effort to improve efficiency, we see no evidence that dynamic management could significantly reduce the number of bus slips required at Union Station."*

RESPONSE: We are encouraged that Greyhound is interested in improving efficiency through terminal management techniques, as will be done for the rail program at the station. In the extensive research undertaken by SSE on dynamic management models at intercity bus facilities, they have found its application to be successful at stations with a greater degree of complexity, number of operators, and

passenger capacities than are proposed for Union Station. Further, and contrary to Greyhound's claim that these practices are costly, they have found that one of the benefits of the implementation of such a management systems is the *reduction* of operating costs. Dynamic management is already in use at all major airports in the United States and has been proven effective in the management of takeoff, landing, and gate assignments.

The design of the future railroad terminal at Union Station incorporates dynamic management of tracks and platforms to achieve optimum capacity. The Amtrak plan for the terminal actually decreases the number of tracks in use at the terminal from a total of 20 to 19, while increasing platform and passenger space, recognizing that it is the space made available for passenger circulation and waiting that is actually more critical to station capacity than provision of extra tracks available for train parking. To make this possible, the DEIS identifies that Amtrak will have a turn time of 20 minutes for its future Metropolitan service. In other words, a 300 to 400 passenger train will be able to arrive, and another train with 300 – 400 new passengers depart within the 20-minute window. This turn time, accommodating as many as 600 to 800 passengers in 20 minutes, is dramatically more efficient than the 60-minute turn time proposed for a 50 to 80 passenger bus proposed by FRA in the DEIS. Our research of international best practices for bus facilities shows that a turn time of 35 to 45 minutes for bus operations is more than adequate to accommodate passenger boarding and alighting and is beneficial to passengers as well.

Greyhound and other intercity bus carriers have taken a number of measures to change their equipment and operations over the past decade, taking advantage of advances in technology and changing ridership demographics. In fact, Greyhound has undertaken the disposal of many of its bricks and mortar facilities in large and mid-sized cities across the United States over the past several years. The company has sold (or placed on the market) its center-city stations in Washington, DC; Jacksonville, FL; Portland, ME; Denver, CO; Boise, ID; Bowling Green, KY; Knoxville, TN; Shreveport, LA; Reno, NV; Eugene, OR; and other cities. As noted in the Bowling Green Daily News "Many Greyhound stations have been replaced by no-frills curbside pickup locations as the financially ailing company tries to cut costs and make money by selling some real estate." In describing Greyhound's sale of its Boise station, the Idaho Statesman noted "While the owner of struggling bus carrier Greyhound looks for a buyer, the Dallas-based company is quietly selling off and closing terminals across the country. In July, Greyhound Lines sold its downtown Boise terminal to a Boise development company. The company plans to close the 60-year-old station at 1212 W. Bannock St. and open a kiosk to serve passengers from the Flying J truck stop on Federal Way."

Clearly, Greyhound is beginning to make changes in its operations and facilities to adapt to changing business conditions and technologies. For the design and planning of the bus facility at Washington Union Station, it is critical that this important public facility utilize modern best practices at urban stations, where space is limited, and real estate is precious. Greyhound has understandably sought to minimize its facility operations and maintenance expenses by selling it legacy bus stations and finding space at curbside or other types of private and public facilities. It can be expected that operations and maintenance of the bus facility at Union Station will be carried out by the station ownership, rather than the tenant intercity carriers. Thus, the station owner and manager must carefully consider the appropriate size and economic model for running the facility. Greyhound provides no evidence in their letter that the operations model proposed by the FRA and endorsed by Akridge is infeasible.

Elements of active management are already in place at Union Station and in equipment installed on many buses today, with almost all carriers currently equipping their buses with GPS in order to monitor and update schedules for passenger convenience and fleet management.

We note here that building a new Union Station is an undertaking that will last decades into the future, and that the station must be built to accommodate transportation needs for the years to come, rather than reflecting a model from the past. "Smart" transportation networks will become the norm, with more efficient routing and management of buses and other transportation modes. All of these considerations, modern best practices, efficiency and economics, and current practices, argue for implementation of an active management model at Union Station.

Environmental Justice

"EO 12898 requires federal agencies to make achieving environmental justice part of their mission. They must do so by identifying and addressing disproportionately high and adverse impacts of their actions on minority and low-income populations in order to achieve an equitable distribution of benefits and burdens."

"Greyhound would like to work with FRA and the Project Proponents2 to modify Alternative A-C so it will meet current and likely future demand from intercity bus passengers and thus be in compliance with Executive Order 12898"

RESPONSE: We fully support the need to properly size the bus facility to fully accommodate projected intercity bus demand. That said, there is nothing the Executive Order 12898 that suggests the public should invest in an over-sized bus garage. In fact, a correctly sized facility will be more economical to operate, meet passenger growth, and fully comply with Executive Order 12898. Oversizing the bus facility to accommodate long layovers and staging areas for the convenience of private bus operators has no benefit to bus passengers, and in fact would make the facility excessively more expensive to build and operate.

Union Station is in Washington's urban center, in the midst of a mix of neighborhoods, including several neighborhoods with lower, working class incomes. Traffic and air-quality in these surrounding neighborhoods are adversely impacted when excessive auto/bus traffic is directed to Union Station. The core priority of intercity/charter bus should be fully satisfied, but excess bus capacity (and auto parking capacity) will induce demand and generate notable adverse impacts to the surrounding community.

We note that the DC Attorney General filed legal action on December 10, 2019 claiming that Greyhound had repeatedly violated its idling laws at Union Station. "The District brings this action to obtain all appropriate relief to remedy Greyhound's continued disregard for District regulations and District air quality." Motor vehicle exhaust is "the largest source of air pollution in Washington," the suit says. An over-sized bus facility, as currently exists at Union Station, facilitates excessive idling adversely impacting air quality for DC residents.

Greyhound has provided no evidence or analytical support for their statement that the garage is undersized to meet passenger demand. In other sections of this memorandum, we specifically refute this claim and demonstrate, through the detailed analysis of SSE, that an 18 slip facility can more than adequately meet current and future passenger demand.

Finally, nowhere in its 12 page letter does Greyhound speak to the importance of providing a great passenger terminal experience for the intercity bus passenger. In fact, we believe an excessively sized bus garage substantially reduces the ability to provide an accessible and high quality passenger experience. This is clearly evidenced by the bus facility design in Alternative A-C. In this plan, the bus passenger waiting area is surrounded on all sides by a bus parking lot, has no access to natural light or fresh air, no access to quality public space and has a front door on H Street, opposite from where most bus passengers will be accessing the bus terminal facility. Further, a bus terminal facility surrounded on all sides by buses creates inherent pedestrian and accessibility conflicts.

We believe the bus facility should be connected to world class public spaces that will elevate the bus passenger accommodations from a dark garage waiting room to a first class passenger experience. Consideration of the actual intercity bus passenger experience should be a top priority in assessing the success of the intercity bus facility at WUS.

Bus staging

"For Alternative A-C to work, there must be an adequate bus staging area in, or very close to, Union Station. Even the DEIS recognizes the need for a bus staging area, but concludes that 'these locations have not been determined.'"

RESPONSE: Akridge agrees that the issue of staging is an important consideration, but we note that it is not the federal government's responsibility to provide staging or parking facilities for private, for profit intercity bus carriers such as Greyhound. In fact, Greyhound has sold for profit many of its intercity bus properties, including Greyhound's facility in Washington which was a few blocks from WUS. Further, Greyhound does not provide any factual support for their statement that staging could have "significant impacts on traffic surrounding the building."

Staging needs were considered and discussed in the bus facility study undertaken by Sam Schwartz Engineers. SSE analyzed a full set of weekly schedules for all bus carriers currently using Union Station and noted significant differences in carrier operations and scheduling. This analysis provides a better picture of potential staging needs than the statement in the Greyhound letter that "all bus staging is contained on the bus deck and has no impact on surrounding street traffic," which is simply not true. The SSE study establishes that potential staging needs that may require more active bus company management are limited to the two peak hours that occur each week, if at all, and that two or three staging spaces can be of real benefit during this time. Sam Schwartz has identified this potential need and included such staging spaces in their facility program and model.

The FRA identifies that the future configuration of Union Station will not allow bus cleaning, maintenance, or refueling, and this is the operational environment that exists at the station today. Thus, any aspect of a carrier's schedule or route that requires cleaning, maintenance, or refueling automatically means that offsite staging is required for those functions. In addition to these route considerations, a number of the scheduled services utilize Union Station as a mid-route stop. Buses that pick-up and drop-off passengers at Union Station mid-route desire to spend the minimum amount of dwell time at Union Station, for obvious reasons, and do not require any staging or layover.

It is incorrect to assume that a smaller and more efficient facility does not provide any staging or layover space. The 14- to 18- slip facility identified by Sam Schwartz as more than capable of meeting 2040 passenger needs includes a minimum of 2-3 staging spaces during the peak hour. Off-peak, between 6

am and midnight (daytime and evening hours), this facility can easily provide staging and layover space for an average of 6-8 buses at all hours. Overnight, the 14-18 slip facility also provides unused spaces available for staging or layover. As done at other facilities in the US, intercity bus companies should optimize the management of their own schedules and fleets to make efficient and economical use of the WUS facilities.

The Salesforce Transit Center example: The Greyhound letter references the success of the Salesforce Transit Center in San Francisco. "*Greyhound has recently occupied a great example of enlightened urban design, the Transbay multi model facility in San Francisco (shown below). Transbay, which opened in 2019, offers world class amenities and is considered a destination for users and visitors to the Bay area. I am confident that the Project designer will be equally creative here.*"

RESPONSE: We agree with Greyhound that the Salesforce Transit Center (STC) is an exemplary model of an urban, multi-modal transportation center. In fact, our team has studied this facility and spent time on-site, observing its use, operations, and features. While every site and program are unique, STC is able to incorporate a 52-slip bus facility (designed to accommodate commuter bus and intercity bus) that is raised approximately four-stories above street level. Greyhound leases 2.5 slips within this facility for its operations. The design of STC is organized to eliminate intercity and commuter bus impacts at street level and prioritize pedestrian and retail use on the ground floor. Importantly, as noted in the Greyhound letter, intercity and commuter bus access to the transit center is achieved by means of a dedicated roadway connecting to the San Francisco Oakland Bay Bridge, which in and of itself is a design feature. We agree with Greyhound that bus access points to urban transit centers must be carefully planned, and share Greyhound's concerns regarding safety of pedestrians in the spaces surrounding the bus facility. We would note that the exit from the bus facility shown in Alternative A-C poses severe pedestrian hazards at H Street, where the majority of streetcar passengers will cross the street toward the station.

The Salesforce Transit Center also includes a spectacular park on its roof that is directly connected on two sides to adjacent office buildings. Similar to the Salesforce Transit Center, in our own studies of how to incorporate a world-class bus facility into the Union Station expansion, we have conceived of a high-end bus station with direct access to the open spaces and pedestrian circulation elements. These features are at the heart of the project, including the Central Concourse serving rail and Metro passengers, Burnham Place, and the neighborhood.

Creating great urban spaces, as at Salesforce Transit Center, requires deliberate prioritization and balancing of tradeoffs between program elements relative to their sizes, locations, access, and adjacencies. Oversizing a bus and/or parking facility creates insurmountable project design challenges that foreclose the opportunity to meet the potential of the SEP and jeopardize project viability. A willingness to embrace the challenge of balancing these priorities can yield an amazing world class project where all uses integrate harmoniously.

APPENDIX D

PROPERTY RIGHTS

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September 10, 2020

FOR SETTLEMENT PURPOSES ONLY

VIA EMAIL: ronald.batory@dot.gov

Mr. Ronald J. Batory
Administrator
Federal Railroad Administration
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Re: Burnham Place, Union Station Redevelopment

Dear Administrator Batory:

This firm represents Akridge and its affiliated entities (collectively "Akridge") in connection with the Burnham Place project and, in particular, the relationship between Burnham Place and the Washington Union Station Expansion Project ("Expansion Project").

As you know, Akridge has been an active and vocal supporter of the plans to refurbish and expand Union Station. Modernizing train service, updating the facility, and developing a new neighborhood adjacent to a world-class transportation facility will bring significant benefits to the country, the region, and the District of Columbia. Akridge has worked alongside Amtrak, the District of Columbia, and key stakeholders for the better part of 20 years to push for the design and implementation of a project which will be successful for everyone. And during that time, Akridge has repeatedly raised the issues surrounding its property rights—namely, how certain alternatives that were being considered encroached on Akridge's property or stifled Akridge's ability to utilize its property through the Burnham Place project. Candidly, we feel that the concerns we have expressed, particularly over the last few years, have not been taken seriously and, as a result, the concepts that Akridge has proposed and has wanted to discuss have been ignored.

The purpose of this letter is to outline why Alternative A-C in the Draft Environmental Impact Statement ("DEIS") issued by FRA on June 4, 2020, is not buildable. The DEIS glosses over the unique property issues in the vicinity of Union Station. We believe that when the property

rights are correctly viewed, Alternative A-C depends upon the use of air-rights property which belongs to Akridge and which cannot be accessed or acquired except through a negotiated, voluntary agreement with Akridge.

Although Akridge intends to file its comments on the DEIS separately, this letter outlines our concerns about the impact of the Expansion Project on our property rights. Since Alternative A-C is the agency's Preferred Alternative, we focus our comments in this letter on that alternative, although all of the DEIS Alternatives have similar issues. For the reasons discussed below, we submit:

- Akridge's air-rights property in the vicinity of Union Station is a unique property. By law, Congress ordered that Amtrak could not own those air rights and Congress directed that they be sold to a private owner, which turned out to be Akridge. Congress has therefore established the boundaries of what property can be used for public development and what property remains for private development.

- Neither of the proponents of the Expansion Project—Amtrak and the Union Station Redevelopment Corporation—has the statutory authority to acquire the Akridge air rights by eminent domain once Congress ordered that the air rights be owned by a private owner and not by Amtrak or GSA. Absent a voluntary agreement with Akridge, none of the DEIS Alternatives can be effectuated as currently documented.

- Even assuming that the entities were not barred from using eminent domain to acquire the air rights, the entities' exercise of eminent domain must still comport with their limited eminent-domain authority. Alternative A-C would involve the use of air rights for purposes not within the scope of Amtrak's authority. Any attempt by Amtrak to exercise eminent-domain authority to advance purposes outside its limited statutory authority would be subject to challenge.

- In addition to the direct acquisition of air rights that belong to Akridge, the Expansion Project and Alternative A-C purport to control the use of significant private air rights in other ways. The DEIS Alternatives severely diminish the development potential of the air rights that would remain under Akridge's ownership and control, in a manner that is subject to challenge. And while the issue of cost or damages is beyond the scope of this letter, it needs to be noted that the price tag for the use of Akridge's air rights as presumed by Alternative A-C *in its current form* and the related cost for diminished value of the remainder of Akridge's property is measured in the hundreds of millions of dollars.

For the Burnham Place Project to become a reality, Akridge requires the air rights proposed to be taken for Alternative A-C (as currently conceived in the DEIS) and the other DEIS Alternatives. Akridge cannot acquiesce in a taking of its air rights. Akridge's property rights and the lack

of authority to acquire those rights stand as insurmountable obstacles to proceeding with Alternative A-C, as currently conceived. However, there is a path forward. Akridge intends to present in its DEIS comments a variation on Alternative A-C that would avoid undue impacts on Akridge's protected air rights, would rely on a consent-based program, and would allow the Expansion Project to move forward to meet its purpose. In fact, the approach Akridge will propose is consistent with the input and guidance that Akridge has provided on this project over the last five years.

A. As Proposed, Alternative A-C Would Require Control of a Substantial Portion of Akridge's Air Rights.

As stated in the DEIS:

> *Along with the features common to all Action Alternatives, Alternative A-C would include:*
>
> - *An east-west train hall approximately 113,500 square feet in size. Track and platform ends would remain outside the train hall.*
> - *Approximately 280,000 square feet of total retail space and an approximately 297,400-square-foot Amtrak support area.*
> - *Parking for approximately 1,600 cars in a new above-ground facility combined with the bus facility below it into a multimodal surface transportation center, located where the existing WUS parking garage stands.*
> - *A two-level bus facility below the parking facility in the multimodal surface transportation center. The bus facility would be capable of accommodating 40 bus slips (20 per level). If not needed for buses, the second level could potentially be used for other activities such as for-hire and private pick-up and drop-off.*
> - *Two new deck-level roadways (southeast and southwest roads) south of the H Street Bridge and two new intersections (west and east intersections), along with a new east-west road parallel to the train hall. WUS-related traffic would move in a one-way, counterclockwise pattern across the deck. Buses would reach the bus facility via the west intersection and the southwest road. They would exit via a right-turn only ramp directly onto H Street. Cars would reach the deck, parking garage, and pick-up and drop-off area by traveling either southbound along the southwest road from H Street or northbound via the west ramp from First Street. They would exit via either the southeast road northbound to H Street NE or the east ramp southbound to F Street NE or the front of WUS (for taxis).*

> *In Alternative A-C, approximately 1.1 acres of private air rights would be acquired for various Project Elements. Approximately 380,000 square feet of Federally owned air rights would be available for potential development.*

(Draft EIS at ES 28-29. *See also* DEIS at 3-81-3-88.)

The private air rights discussed in the DEIS are asserted to be essential to Alternative A-C, as currently conceived. However, aside from a very generalized assertion that the acquisition of the private air rights would provide just compensation in conformity with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970,[1] there is no discussion of the significant legal impediments that any acquisition of the Akridge air rights (other than through a negotiated arrangement) would face or of the impact that the taking of Akridge's air rights would have on the Burnham Place project. That impact would be severe.

The actual impact of Alternative A-C on Akridge's air rights is not 1.1 acres as stated in the DEIS. It's closer to 3.8 acres as illustrated in the attached drawing.

Alternative A-C would squeeze the Burnham Place project from every direction. The 10-story bus and parking facility and the associated access road constrain the normal layout and development of the privately owned air-rights parcel—resulting in challenging or impracticable ingress and access. The westernmost portion of the Akridge parcel is left sandwiched between the structured parking and H Street. That portion is rendered unbuildable because of the design of the bus and parking facility, and the reality that because the parking structure is unscreened, its presence raises the risk and vulnerability profile for any adjacent private construction. The proposed Expansion Space access road leads to awkward, unsafe, and inefficient intersections with H Street.

Functionally, Alternative A-C would consume over 60% of the acreage on Akridge's parcel south of H Street, and would leave Akridge the use of less than 30% of its H Street frontage, as illustrated in the attached drawing. Moreover that loss of acreage and density cannot be compensated for elsewhere in the Burnham Place project. Because of height limits and other land-use restrictions, Akridge cannot shift to other portions of the Burnham Place tract the developable square feet which would be consumed by Alternative A-C.

Although the DEIS says that the private air rights "would be acquired," as noted there is no discussion in the DEIS about how that could happen or the legal impediments to any such acquisition. We think that cannot happen as discussed next.

B. Congress Has Directed That Amtrak Not Own These Air Rights.

The Akridge air rights are unique and are not like other private properties which are adjacent to railroad rights-of-way or rail facilities. These air rights became privately owned based on

[1] See, e.g., DEIS at Section 5-9-6. The DEIS also leaves unstated the method that might be used to acquire the private air rights.

Congress's explicit direction. In Section 9102 of the Balanced Budget Act of 1997, Congress directed Amtrak and the Washington Terminal Company to convey to the General Services Administration ("GSA") certain air rights above the railway yard adjacent to and north of Union Station. (P.L. 105-33, § 9102, 111 Stat. 670-71). Congress set a deadline of December 31, 1997, for the transfer. Congress made explicit that the conveyance from Amtrak was "a condition of future Federal financial assistance." (P.L. 105-33 at Section 9102(d)(1), currently found at 40 U.S.C. §6901 note). *See also id.* at §9102(d)(2)("If Amtrak does not meet the condition established by paragraph (1), Amtrak shall be prohibited from obligating Federal funds after March 1, 1998.").

By the same statute, Congress directed the GSA to sell for fair-market value the air rights adjacent to Union Station, including the air rights which had been conveyed to GSA by Amtrak. (*Id*. at §9102(a).) The statute stated that these air rights totaled about 16.5 acres.

Pursuant to a sealed-bid sales process (GSA Solicitation No. WPR-02-001), GSA accepted the bid of Washington Bell, an Akridge affiliate, to purchase the air rights. GSA executed and delivered a quitclaim deed to the Akridge/Burnham entities, which deed was later clarified and restated by the Quitclaim Deed dated as of September 25, 2006 by and among the United States, acting through both GSA and FRA, Burnham South, LLC, Burnham Central, LLC, and Burnham North, LLC ("Quitclaim Deed").

As relevant here, the Quitclaim Deed contains several specific and limited reservations running to the United States as grantor. However, with the exception of those limited reservations and certain easements of record, the Quitclaim Deed reflects a conveyance of the air rights which had been owned by GSA or Amtrak, with no continuing control over the use of those air rights by GSA or Amtrak. The United States did not retain any ownership interest in those air rights.

Through the congressionally mandated process, the air rights adjacent to Union Station were declared to be private air rights which Amtrak could not own. Congress did not authorize nor did GSA or Amtrak reserve any future ownership or right to ownership of those air rights, or any future conversion of the private air rights back to public ownership.

Nor did Congress authorize a recapture of the air rights in the event such air rights were later deemed desirable for the redevelopment of Union Station or a change in rail-service needs. To the contrary, Congress specifically forbade Amtrak from owning the air rights after December 31, 1998, upon pain of losing federal funding if it owned the air rights after that date.

Moreover, as the Quitclaim Deed itself recognizes, all parties understood at the time of conveyance that there would be future redevelopment in and around Union Station. Yet neither the terms of the sale by GSA nor the Quitclaim Deed authorize Amtrak to resume ownership of the air rights in the event of such redevelopment or otherwise require Akridge to convey any of the air rights to facilitate such development.

The legislature alone is empowered to decide what constitutes the "public use" for property. And once property has been dedicated to a public use, any change in that use through the exercise

of eminent domain must be clearly expressed by the legislature. For example, in *Union Center Redevelopment Corp. v. National R.R. Passenger Corp.*, 103 F.3d 62 (8th Cir. 1997), Amtrak had exercised its condemnation power to acquire three parcels of land near Union Station in St. Louis, Missouri, for the eventual purpose of constructing a rail passenger service station. After federal funding for the proposed station was withdrawn but while Amtrak continued to pursue funding for its station project, Amtrak entered into leases with the Postal Service and with a parking company. A Missouri-chartered redevelopment company filed a condemnation action to acquire two of the parcels. Amtrak argued that its authorizing statute preempted any state or local law that would allow for the condemnation of Amtrak's property because such a law would conflict with Amtrak's statutory authority to decide what property is required for intercity rail passenger service. The Eighth Circuit agreed that the Missouri condemnation could not proceed because of preemption.

However, the lower court and the Eighth Circuit also discussed an alternative rationale for preventing the Missouri condemnation. The courts reasoned that where property has been dedicated to public use, that use can only be overridden by the legislature:

> It may be conceded, as a general rule of law, that lands once appropriated to one public use cannot be taken under proceedings in invitum [against a person's will] and applied to the same or an inconsistent use, unless the intention of the legislature that it should be so taken is manifested in express terms or by necessary implication.
>
> * * *
>
> [B]efore allowing a municipality or a public service entity to take other public property that would destroy the previous "necessary" use, specific legislative delegation is required[, the] rationale being that the legislature, not the subsequent condemning authority is the proper entity to decide between mutually conflicting or destructive uses of public property.

103 F. 3d at 65, 66 (citations and quotations omitted). Where the legislature has spoken—as Congress has here—about what serves the public interest regarding the use of property once owned by the United States, Congress itself would have to countermand that direction.

Through its 1997 legislation, Congress "carved up" the government-owned air rights associated with Union Station. It created a defined publicly controlled area and a defined privately controlled area. Alternative A-C presumes that Amtrak can use eminent domain to expand the publicly controlled area at the expense of the privately controlled area even though Congress has not changed its legislative mind. It is not up to a condemning authority like Amtrak to opt for a conflicting use once Congress has spoken clearly and definitively on the subject.[2] It is not up to

[2] This point is a corollary to the proposition that Amtrak's eminent domain rights do not extend to the acquisition of properties held by other government entities. Under 49 U.S.C. §24311(a)(1)(A),

Amtrak or those who would use Amtrak's limited eminent-domain authority to "adjust" the line separating public and private property.

We note that at no point during the formulation of the Expansion Project plans has Amtrak expressed an interest in exercising its limited eminent-domain authority to take Akridge's private air rights. To the contrary, it is our understanding that Amtrak has advocated staying within the publicly controlled envelope of rights or possibly negotiating some additional transactions or exchanges with Akridge that would benefit the parties.

In sum, Congress ordered Amtrak and GSA to turn certain air rights into *private* air rights. Congress could not have made clearer its intent about what rights were to be in private hands and what rights were to be in public hands. Those private rights therefore are not available to be taken for public use and could only be acquired through an agreement reached with their owner, Akridge.

C. Amtrak's Eminent-Domain Authority Does Not Support This Acquisition.

The specific direction of Congress that these air rights be sold into private hands and that Amtrak be prohibited from owning them should be the end of the analysis. Any exercise of eminent domain has to be supported by statutory authority or, at the very least, cannot be contrary to Congress' specific decision that the property not be owned by the United States. However, even assuming for discussion that Congress had not already spoken, Amtrak's eminent-domain power does not extend to the acquisition of the Akridge air rights for the purposes of the Expansion Project. We offer this discussion even though Amtrak has expressed no interest to our knowledge in taking Akridge property for the Expansion Project.

Amtrak has been delegated certain limited eminent-domain authority. Congress has allowed Amtrak to acquire by eminent domain interests in property that are "necessary for intercity passenger rail transportation." *See* 49 U.S.C. §24311(a)(1). Courts have repeatedly recognized that Amtrak's power to take property is confined to the terms of its statutory grant. *See, e.g., National R.R. Passenger Corp. v. Two Parcels of Land*, 822 F.2d 1261, 1264-65 (2d. Cir. 1987); *National R.R. Passenger Corp. v. 3.44 Acres More or Less of Land and Building Located at 900 2nd Street NE, Washington, DC*, 266 F. Supp. 3d 63, 67 (D.D.C. 2017).

In a recent case upholding Amtrak's use of its eminent-domain authority to acquire the Railway Express Agency Building near Union Station, the court did not simply rubberstamp Amtrak's declaration that the property to be taken was necessary. Instead, the court subjected Amtrak's exercise to the following test: "[A]mtrak may condemn property only if it [the property] has a significant connection to its [Amtrak's] goal of providing intercity passenger rail transportation." *National R.R. Passenger Corp. v 3.44 Acres*, 266 F. Supp. 3d at 72. The court identified how the property to be acquired had a "significant relationship with Amtrak's goal of providing intercity

---

Amtrak cannot acquire by eminent domain interests in property of "a State, a political subdivision of a State, or a governmental authority."

passenger rail transportation," including constructing new track, providing access points for emergency vehicles, controlling and reconfiguring easements across, under, and above the property, and housing Amtrak staff. *See id.* at 65, 72-73.

In light of that standard, Amtrak is without statutory authority to acquire the air-rights property in order to implement the Expansion Project, including Alternative A-C. The Expansion Project would use the acquired private air rights to support expanded intercity bus service—something which is not significantly related to providing intercity passenger rail transportation. Indeed, it is a use which competes with intercity passenger rail transportation. Alternative A-C also requires the private air rights to construct automobile parking—not because intercity rail passengers need such parking but in order to support other goals. When Congress gave Amtrak eminent-domain authority, it did not intend for that authority to be exercised for any "mere profit motive." *Id*. at 72. Indeed, Amtrak has publicly stated that it does not seek or require the large parking structure and that the station's parking needs should be satisfied with an underground-parking solution. That solution would not consume Akridge's property. That solution would also align with Amtrak's stated position regarding what amount of parking is needed for intercity passenger rail needs.

Moreover, while the courts have not required that Amtrak demonstrate "strict, last-resort necessity" to support the exercise of eminent domain, *see id.*, the concept of "necessity" must have content. Alternative A-C has features which are not necessary for intercity passenger rail service. And the Akridge air-rights property is not necessary to complete a suitable and valuable redevelopment of those features of Union Station which do support intercity passenger rail service. Congress long ago established what property would be necessary for Amtrak's core purposes, including expansion for those purposes, when Congress ordered that certain air rights be sold to a private owner and the balance remain in the hands of the public. Indeed, the fine calibrations that are reflected in the final envelopes of the publicly controlled vs. privately controlled space—for example, deciding whether air rights started at 70 feet or 80 feet—are evidence that Congress acted deliberately in decreeing how much space Amtrak or other agencies needed to implement their functions.

The judicial decisions upholding Amtrak's determination that certain property is "necessary" have made clear why and how the selected property tied into the provision of intercity passenger rail service. *See, e.g., National R.R. Passenger Corp. v. 4.0446 Acres More or Less of Land*, 2019 WL 1057932 *7 (E.D. Pa., March 6, 2019) (site of electrical power substation "bears a direct nexus to Amtrak's goals"); *National R.R. Passenger Corp. v. 4,945 Square Feet of Land*, 1 F. Supp. 2d. 79, 82 (D. Mass. 1998)(property to be used to develop electrical tower). We believe that a reviewing court will not be able to conclude under the law that the air-rights property that would have to be acquired is necessary for intercity passenger rail service, even assuming that it could be acquired.

D. No Other Statutes Authorize Acquisition of the Air Rights by Eminent Domain.

The DEIS assumes away the issue of gaining site control for the air rights which would be needed for the alternatives discussed in the DEIS. In truth, as outlined above, there are two threshold issues of condemnation authority, either of which is sufficient to block Amtrak from acquiring the air rights through the use of eminent domain.

The provisions of the Union Station Redevelopment Corporation statute do not remove these barriers to the exercise of eminent domain. Under that act, currently codified at 40 U.S.C. §§ 6901-6910, the Secretary of Transportation was vested with title to the "Union Station complex," which was defined with reference to properties covered by the National Visitors Center Facilities Act of 1968. *See* 40 U.S.C. §§ 6901, 6902. The properties covered by the act were those originally leased by the Secretary of the Interior from The Washington Terminal Company. *See* National Visitor Center Facilities Act of 1968, P.L. 90-264, Sec. 101. The current USRC statute was adopted in 1981 as the Union Station Redevelopment Act of 1981, P.L. 97-125 Sec. 3. That statute authorized the Secretary of Transportation to acquire property interests "in or relating to or adjacent to the Union Station complex that the Secretary of Transportation deems necessary to carry out the purposes of this subtitle." P.L. 97-125, Sec. 116 (now codified at 40 U.S.C. § 6904(a).

But it was *after* this statute was enacted that Congress decreed in its 1997 Balanced Budget Act that the pertinent air rights be conveyed by Amtrak and sold into the private market. By its legislative determination, Congress was taking these air rights outside the reach of the Department of Transportation. Even if the air rights might have originally been encompassed within the 1981 statutory definition of "Union Station complex" or as "relating to or being adjacent to the Union Station complex," the air rights certainly could no longer be deemed as such once Congress ordered that they be sold to private developers for a fair-market price. It is inconceivable that Congress intended that the Secretary of Transportation have the right to acquire for purpose of Union Station redevelopment the very air rights that Congress ordered to be sold. It is a fundamental principle of statutory construction that when the legislature enacts laws on the same subject, the laws should be read in harmony as much as possible. *Cf. Bock v. Commissioner*, 129 F.2d 243, 245 (2d. Cir. 1942) ("The familiar 'easy-to-say-so-if that-is-what-was-meant' rule of statutory interpretation has full force here. The silence of Congress is strident."). So too here. Had Congress intended to allow the Secretary of Transportation acting though the Union Station Redevelopment act to control these air rights directly or through acquisition by eminent domain after 1997, Congress would have to have said so, and it did not.

Similarly, Section 23411(a)(2) of Amtrak's eminent-domain authority should not be read as authorizing the exercise of eminent-domain following the Congressionally mandated disposition of that property. That section authorizes the exercise of eminent domain by Amtrak if "requested by the Secretary of Transportation in carrying out the Secretary's duty to design and build an intermodal transportation terminal at Union Station in the District of Columbia if the Secretary assures Amtrak that the Secretary will reimburse Amtrak." 49 U.S.C. § 24311(a)(2). This section was adopted by Congress in 1974, more than 20 years *before* Congress ordered that the subject air

rights be sold to the private sector. The later enactment directing the sale of the air rights cannot be harmonized with a reading of the 1974 Act that would allow Amtrak to acquire (on behalf of the Secretary of Transportation) air rights that Congress ordered Amtrak not to own after December 31, 1997.[3]

E. The DEIS Fails to Identify a Feasible Alternative Under Which Akridge Willingly Provides Use of its Air Rights for Just Compensation.

Akridge has a protected property interest in the air rights that the DEIS identifies as necessary to facilitate the alternatives discussed in the DEIS. As explained above, neither Amtrak nor the Department have been authorized by Congress to countermand Congress' direction that these air rights be vested in private hands. Should steps be taken to acquire the air rights through a condemnation action, Akridge believes that the reviewing court will find that Amtrak and the other agencies have not been authorized to exercise eminent domain for these purposes. Moreover, although the resolution of the issue is beyond the scope of this letter, the fair-market value of the air rights, if taken, would be astronomical because the deprivation of the air rights severely impacts the ability of the private developer to deliver a Burnham Place project anywhere near as valuable as the project which can be achieved by using these air rights. Stated differently, the before-and-after value of Akridge's property is likely measured in the hundreds of millions of dollars. While the DEIS notes that Akridge would be entitled under federal law to just compensation if its air rights were taken, it fails to discuss any legal basis for such a taking (which as shown is lacking) or to fully acknowledge the implications of such a taking, or the value of those rights.

Accordingly, neither Alternative A-C as presented in the DEIS nor any of the other alternatives is a feasible alternative because Akridge's protected property interest cannot be obtained for the Project absent Akridge's willingness to negotiate to provide any of the air rights. With respect to an EIS, "[a]n agency's discussion of alternatives must be bound by some notion of 'feasibility.'" *Navajo Nation v. U.S. Forest Service*, 408 F. Supp. 2d 866 (D. Ariz. 2006), *aff'd in part, rev'd in part and remanded on other grounds*, 479 F.3d 1024 (9th Cir. 2007). "An alternative that does not accomplish the purpose of the project in question" because the alternative cannot be accomplished is "unreasonable and does not require detailed attention in the FEIS." *City of Bridgeton v. FAA*, 212 F.3d 448 (8th Cir. 2000) (citing *City of Richfield v. FAA*, 152 F.3d 905, 907 (8th Cir. 1998)).

The proposed Alternative A-C is not reasonable because it is premised on a mistaken belief that the air rights necessary for the Alternative can be obtained over Akridge's objection, which

[3] There is an additional argument against the use of the eminent-domain authority set forth in 49 U.S.C. § 24311(a)(2). That authority was tied to the Amtrak Improvement Act of 1974 and the latter's authorization to the Secretary of Transportation to design, plan, and coordinate the construction of a model intermodal transportation terminal at Union Station. See P.L. 930496 (October 28, 1974). The statutory timeframe for that project ended long ago and with it so did the associated eminent-domain rights.

they cannot. *See, e.g., Missouri Min., Inc. v. I.C.C.*, 33 F.3d 980 (8th Cir. 1994) (finding rail alternative to not be reasonable and need not be considered in the agency's EIS because the proponent of the rail project did "not own and has no right to use" the alternative rail line supported by plaintiffs). In order to meet NEPA's intent and allow FRA, Amtrak and the Department to consider only reasonable, feasible alternatives for the Project, Akridge intends to present in its comments on the DEIS a variation on Alternative A-C that would improve the Expansion Project, satisfy its established objectives and also avoid undue impacts to Akridge's protected air rights.

We appreciate that Akridge's property rights are a significant issue for the Expansion Project. That is why for years Akridge has presented analysis and drawings which showed the significant adverse impacts arising from the various concepts and alternatives. In each and every case where Akridge pointed to adverse impacts, Akridge also proposed a range of solutions responsive to Expansion Project and Burnham Place priorities. Our concerns increased after August 2017 when FRA released its Preliminary Alternatives. Akridge has documented since then not only the adverse impacts but the possible mitigations which could be implemented for the Expansion Project to reduce the damage to the Burnham Place project. Indeed, the drawing we have enclosed with today's letter is a version of the same kind of drawings Akridge has put before FRA for years. (*See, e.g.* letters dated May 14, 2018, and July 23, 2018, from Akridge to David Valenstein). So while Akridge's position should come as no surprise to FRA or the proponents of the Expansion Project, be assured that it is not Akridge's desire to erect an impassable roadblock to the Expansion Project. Akridge believes the purpose and priorities of the Expansion Project and the essential elements of a successful Burnham Place project are, in fact, compatible. Achieving an optimized and harmonious project that captures the essential, combined potential requires mutual consideration and collaboration. Akridge stands ready to discuss variations of Alternative A-C that would respect Akridge's property rights while allowing both the Expansion Project and the Burnham Place project to move forward successfully.

Thank you for the opportunity to share this analysis.

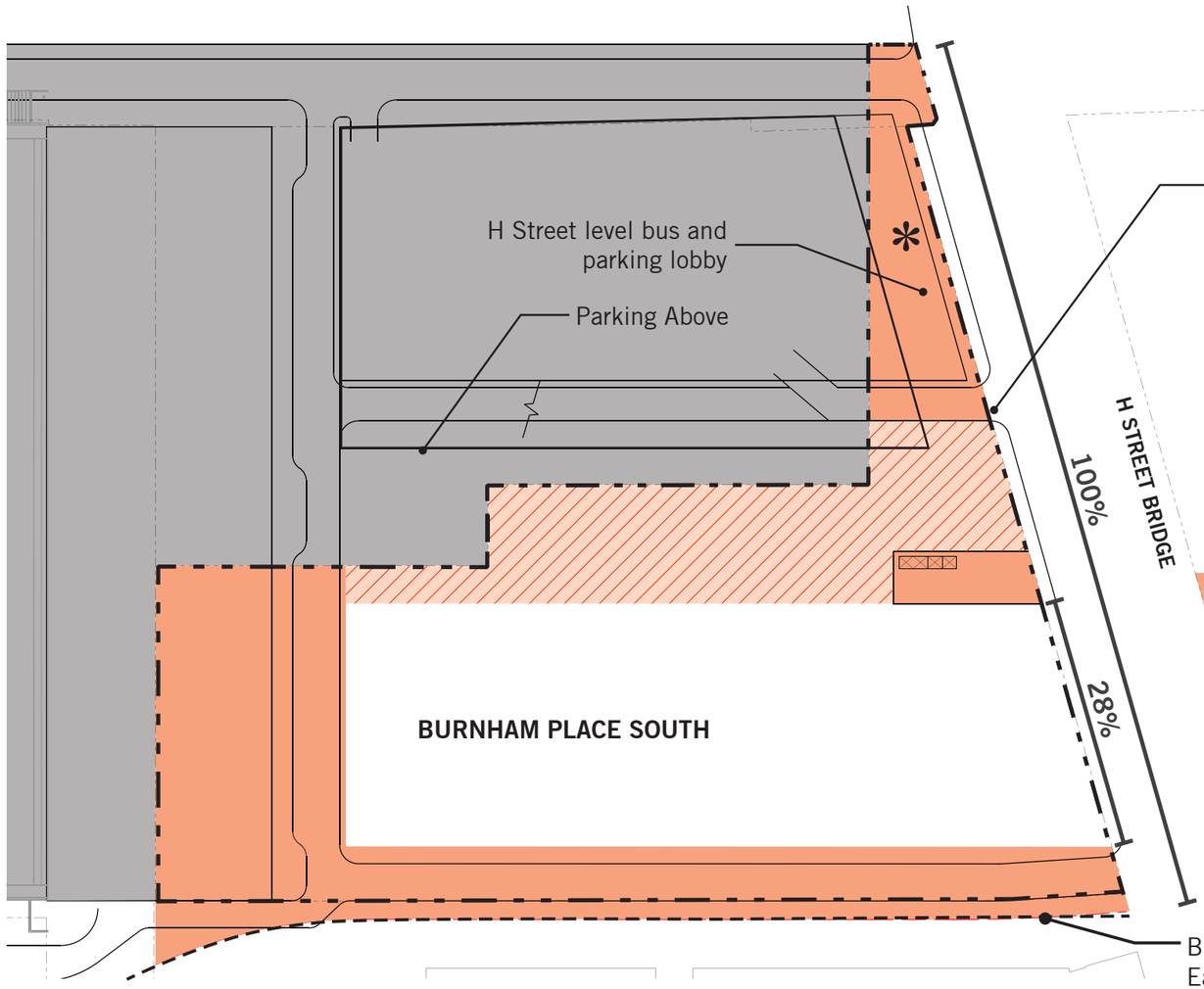
Sincerely yours,

HOLLAND & KNIGHT LLP

Paul J. Kiernan

cc: Mr. Paul Nissenbaum, Associate Administrator, paul.nissenbaum@dot.gov
Mr. Peter Cipriano, Senior Advisor, peter.cipriano@dot.gov

Impact of A-C on Burnham Place Property



BP South Parcel

6.16 acres total
3.81 acres or 61.8% consumed by A-C design

725 lf of H Street frontage
525 lf or 72% consumed by A-C design

* **The westernmost portion of the BP South Parcel is sandwiched between H Street and the SEP proposed Bus/Parking facility and considered unbuildable:**

- The H Street level is occupied by a Bus/ Parking facility lobby and is insufficient to provide a lobby, elevator/stair core and loading dock for private development

A-C elements on Burnham Place Property

Property consumed by A-C for access zone, visual connection and daylighting

* 0.31 acres of BP Access Easement is included in South BP Parcel

BURNHAM PLACE

WASHINGTON, D.C. | 08/26/2020 |

AKRIDGE Invested.

shalom baranes associates | architects

APPENDIX E

VISION FRAMEWORK AND ANIMATION

APPENDIX E1

VISION FRAMEWORK AND ANIMATION

Vision Framework

This document describes a framework for planning a world-class station district that considers the important planning overlays of placemaking, circulation, neighborhood integration, and historic preservation. As opposed to the DEIS approach of improving on far from ideal existing conditions as its starting point, this document describes a blank slate planning approach where all essential program elements are considered, right sized, and their locations optimized.

This document also includes an illustrative vision for a world-class station district. It describes the types of spaces and amenities that are achievable if the planning framework permits. Stated another way, Alternative A-C, without modification, would be a failure due to a resulting planning framework that precludes the types of spaces and amenities illustrated in this this vision.

WASHINGTON UNION STATION EXPANSION PROJECT

VISION FRAMEWORK

SEPTEMBER, 2020

AKRIDGE
Invested.

IAB

shalom baranes associates | architects

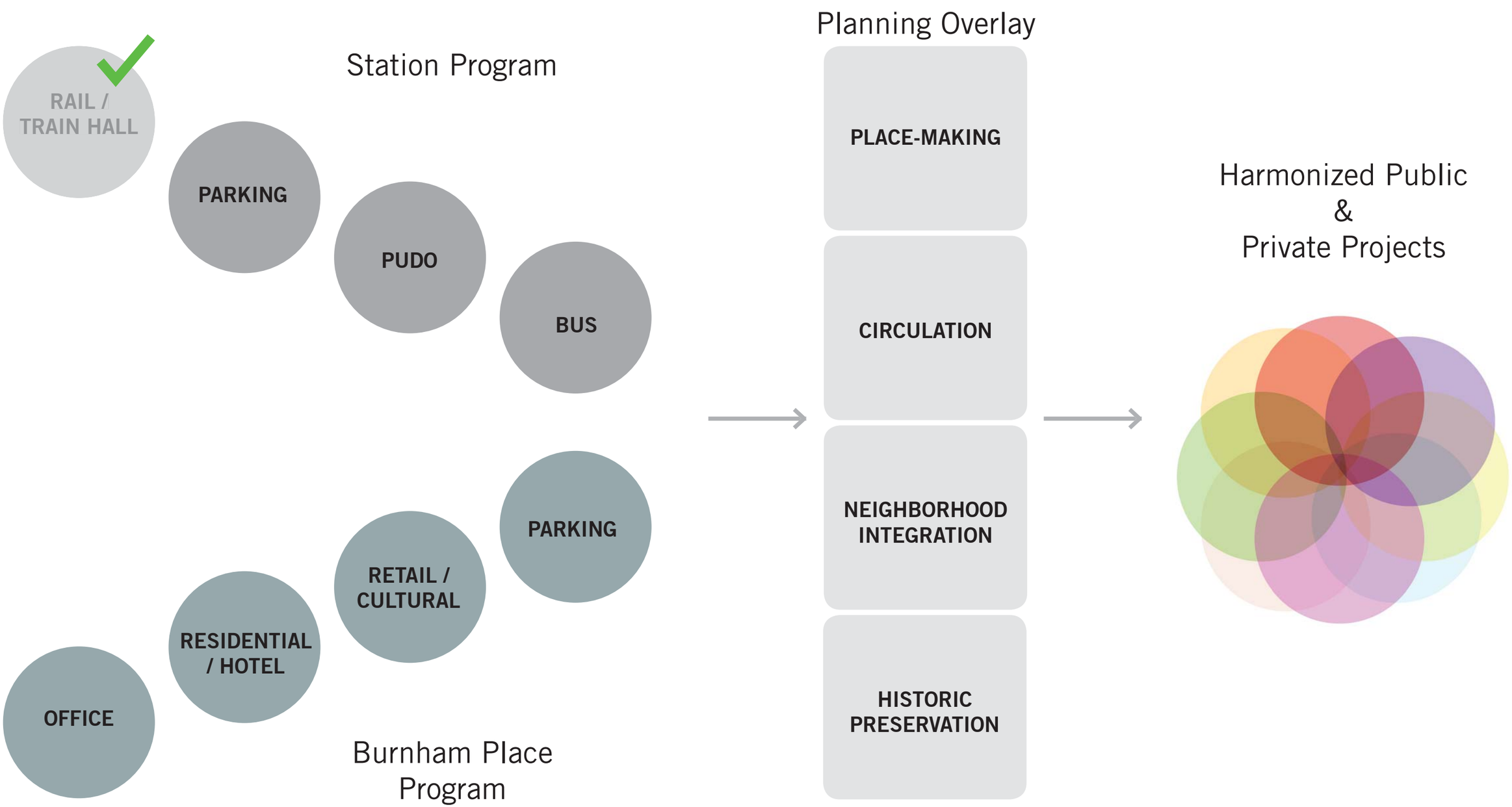
PLANNING FRAMEWORK

Washington Union Station Expansion Project

OPPORTUNITIES - CHALLENGES - SOLUTIONS

How do we balance capacity growth with experience and vitality?

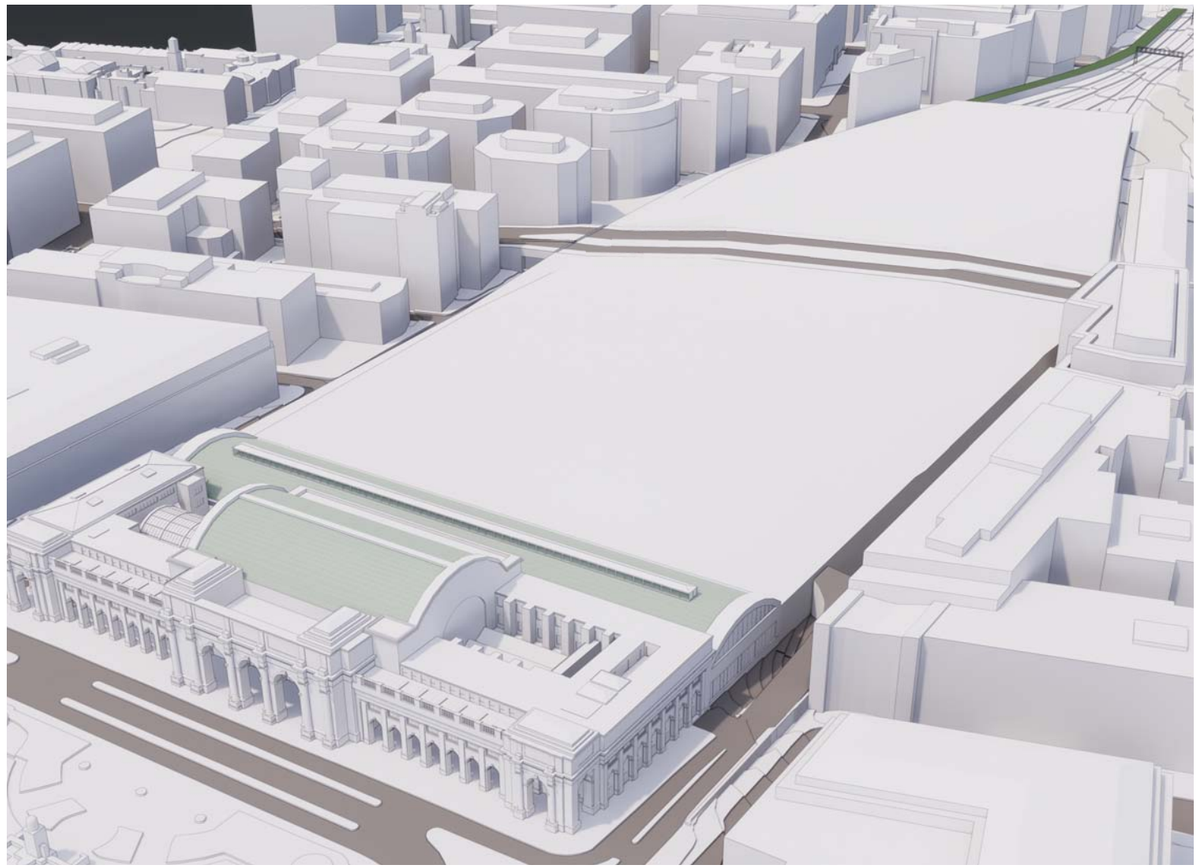
Requirements for a Successfully Integrated Project

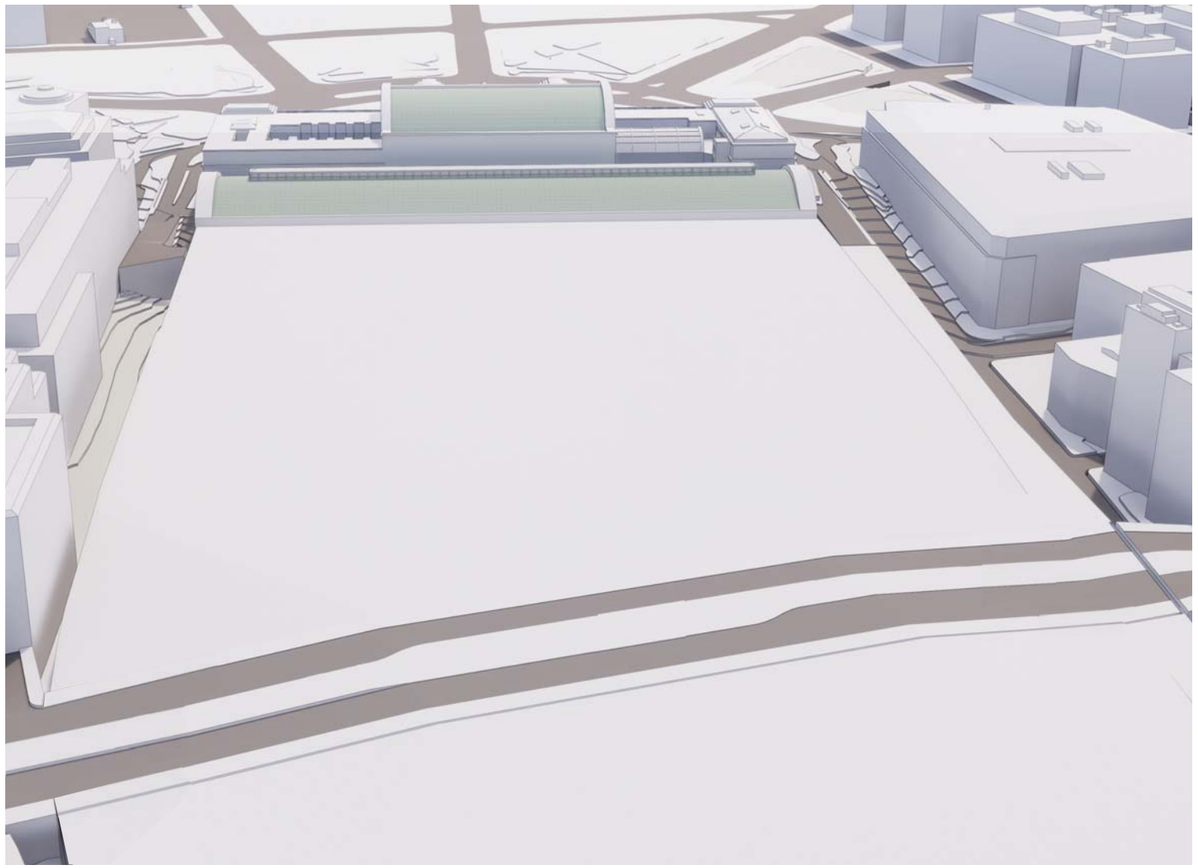


Existing Conditions

Blank Slate as a Starting Point

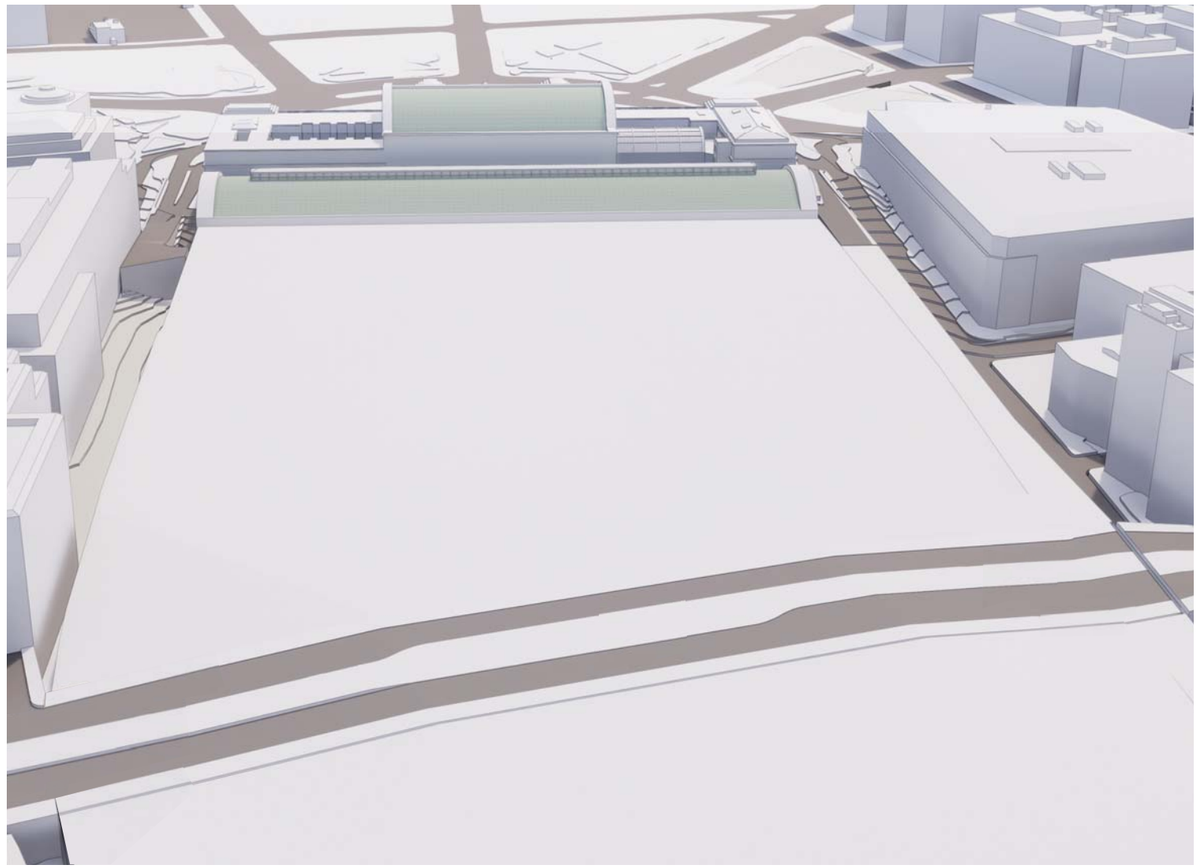
Garage demolition required for rail growth demands a blank slate planning approach



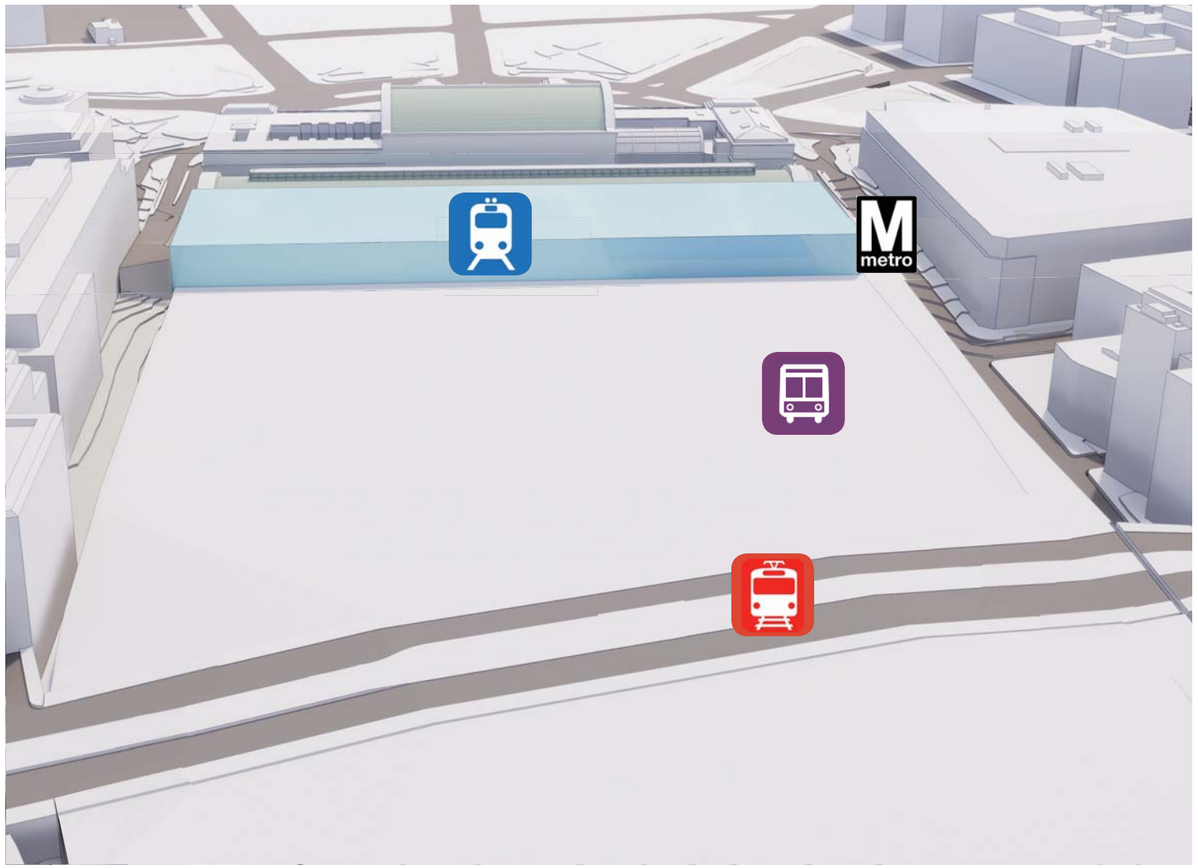


Essential Transportation Elements

STARTING POINT



ESSENTIAL TRANSPORTATION ELEMENTS



TRAIN HALL

BUS

STATION PARKING

PEDESTRIAN ACCESS

PUDO

BIKE

OPEN SPACE

DAYLIGHT ACCESS

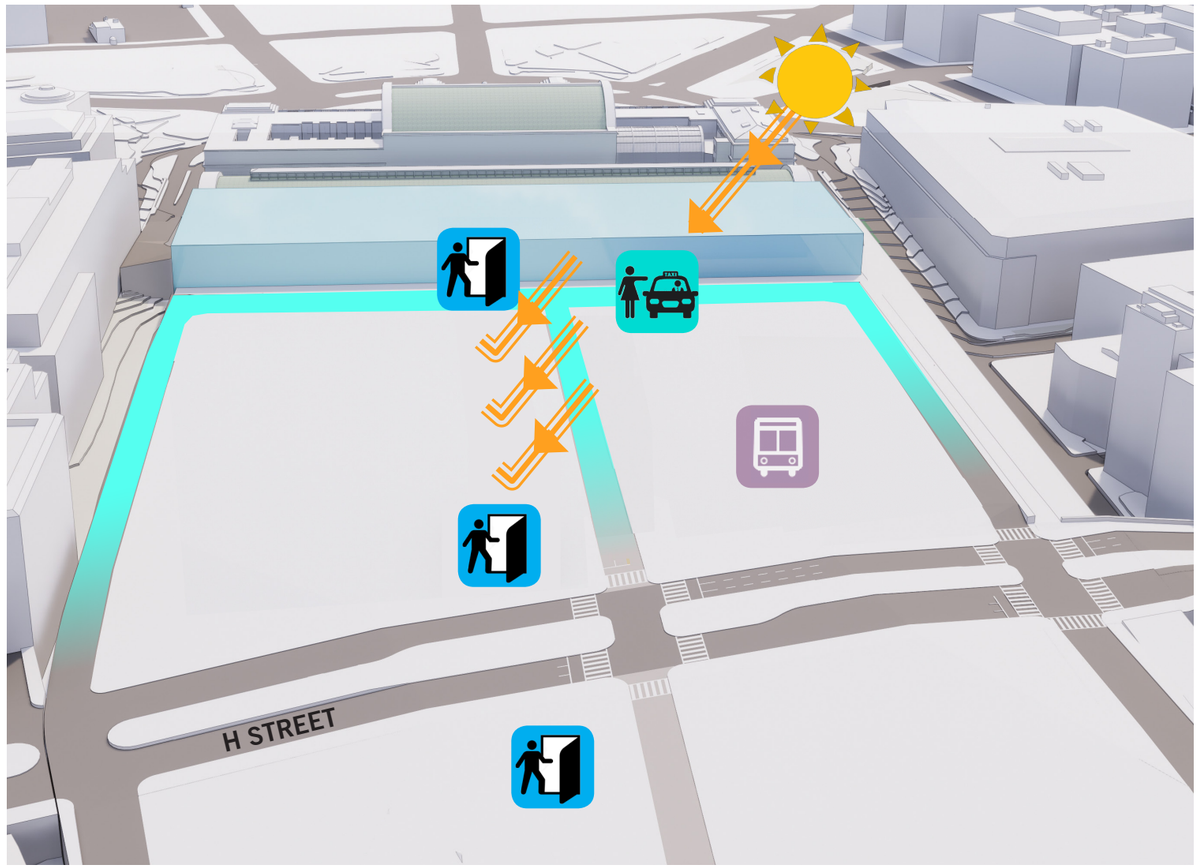
METRO STATION

STREETCAR

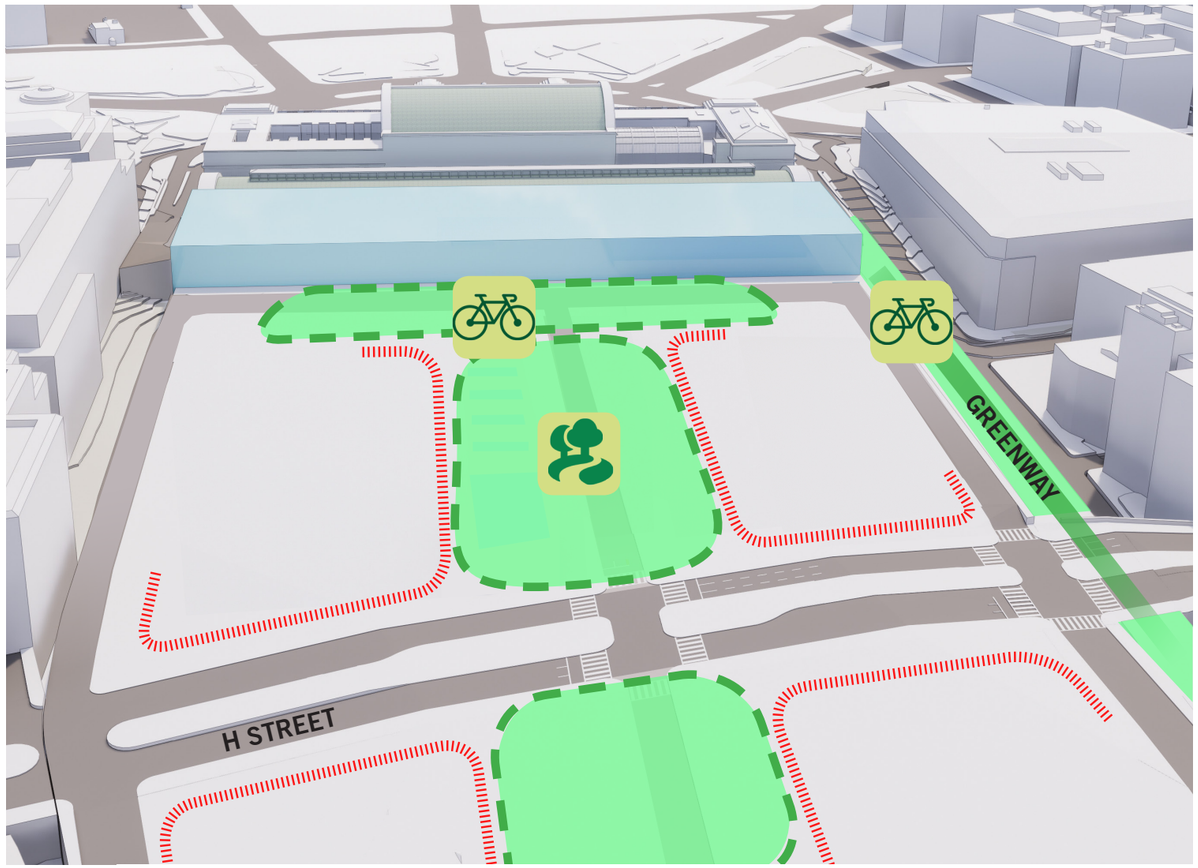
ACTIVATED FRONTAGE

Circulation and Open Space

FUNCTIONAL CIRCULATION NETWORK



OPEN SPACE NETWORK



TRAIN HALL

BUS

STATION PARKING

PEDESTRIAN ACCESS

PUDO

BIKE

OPEN SPACE

DAYLIGHT ACCESS

METRO STATION

STREETCAR

ACTIVATED FRONTAGE

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View from H Street looking south to the Civic Space, New Train Hall, and Historic Station

Deck Level Plan - Civic Space/ Neighborhood Park/ Train Hall Plaza

1 Civic Space

2 Train Hall Plaza (Above PUDO)

3 Neighborhood Park (Above Bus Facility)

4 Greenway Overlook

Active Deck-Level Uses & Frontage (Below MIxed-Use Development)

0 80 160

AKRIDGE Invested.

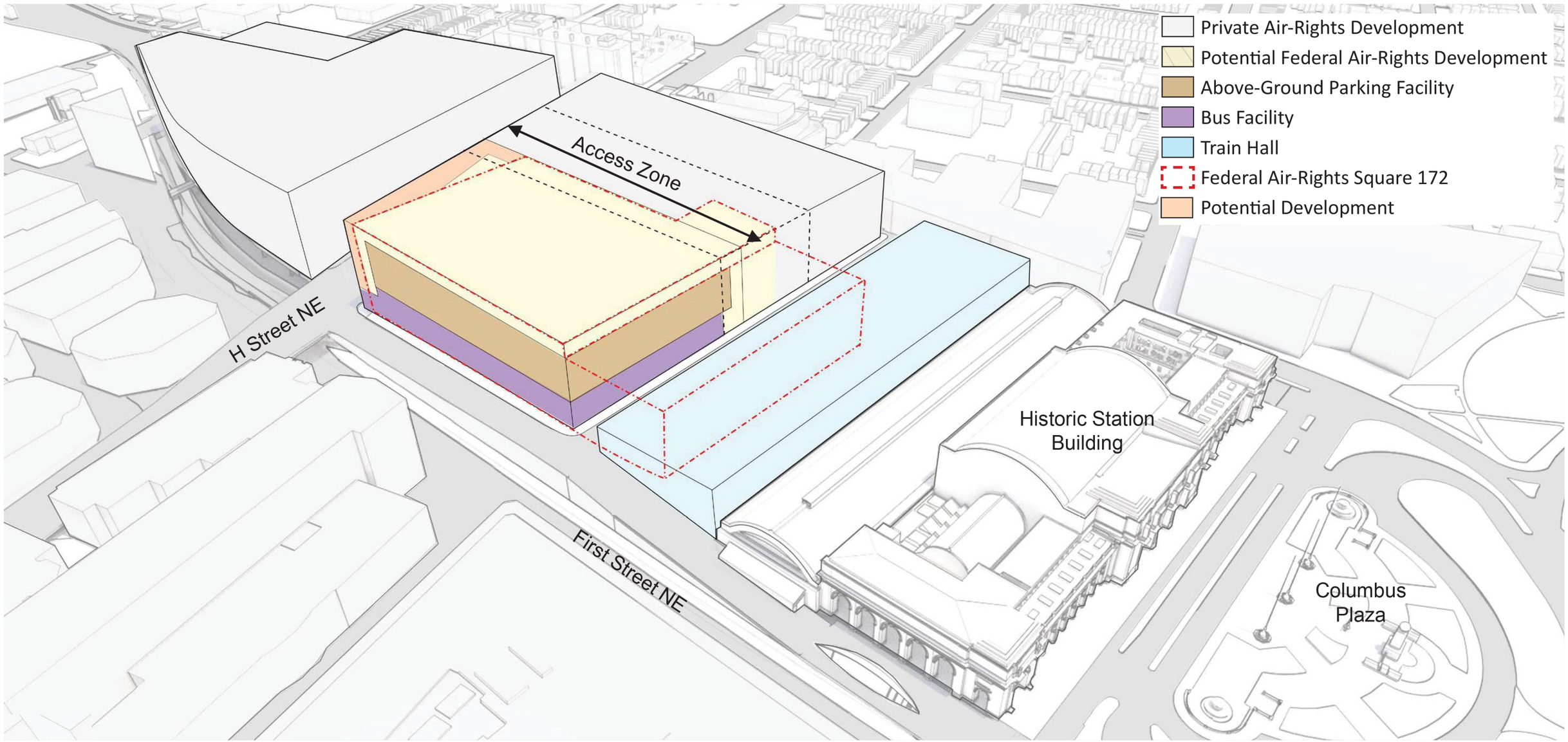
From Civic Space looking south to the new Train Hall Plaza

From within the Neighborhood Park looking northeast to the Amphitheater

View from the Greenway Overlook looking south towards the Historic Station

MODIFYING ALTERNATIVE A-C TO ACHIEVE A BALANCED VISION

DEIS Diagram of Preferred Alternative A-C



AERIAL PERSPECTIVE LOOKING NORTHEAST

CREDIT: DEIS Alternative A-C (Preferred Alternative) (June 2020): https://railroads.dot.gov/current-environmental-reviews/washington-union-station-expansion-project/alternative-c-preferred

Alternative A-C Lacks Compatibility with World-Class Urban Design

First Street, NE looking North

Columbus Circle

Ronald Reagan National Airport drop-off zone

H Street NE and North Capitol Street

Modifications Required to Minimize Adverse Impacts

1. Right-size parking and optimize location and configuration

H Street, NE Parking Garage

2. Establish a distributed PUDO plan, including one high-capacity, below-grade, centralized facility

Columbus Circle Gridlock

3. Create a first-class and right-sized bus facility

Existing Bus Facility, Union Station

Broad Stakeholder Agreement on Parking Reduction to 295 Spaces

"Passenger parking is not essential to Amtrak's operation … **in the event the property owner, determines the parking program should be downsized, Amtrak encourages the reevaluation of locating the parking facility below the tracks and platforms.**"

"**OP urges FRA to…reduce the overall parking program from the current proposal of 1,600 vehicular parking spaces to 295 spaces** (since the existing parking structure is slated for demolition and new construction to take its place, it makes no sense to rebuild a similarly oversized parking garage)"

CREDIT: DEIS, Appendix A6 - Parking Program Memorandum (June 2020)

Alternative A-C Pick-Up and Drop-Off (PUDO) Flaws

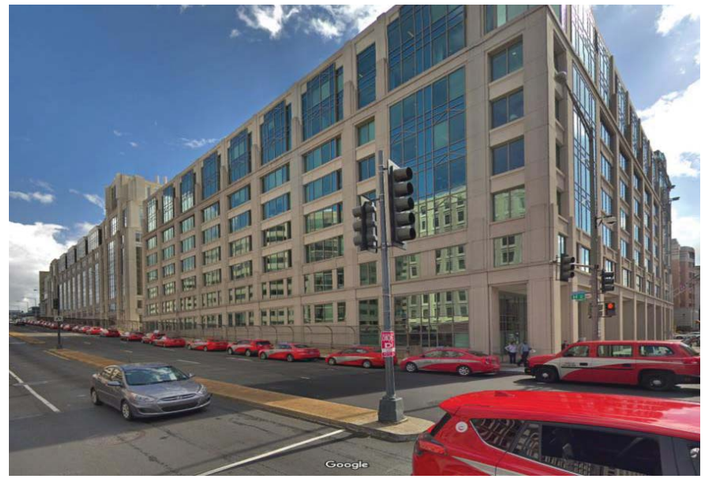
- Union Station will generate 3600+ peak hour (each AM and PM) PUDO trips in 2040 – 25% higher than existing National Airport peak hour PUDO.

- Proposed street level PUDO plan cannot accommodate Uber and Lyft demand, has no cell phone waiting area and overloads Columbus Circle.

- Severe congestion with queues extending for blocks and neighborhood traffic spillover lead to system failure.

- Pedestrian/bicycle safety and circulation are significantly compromised.

Columbus Circle Gridlock

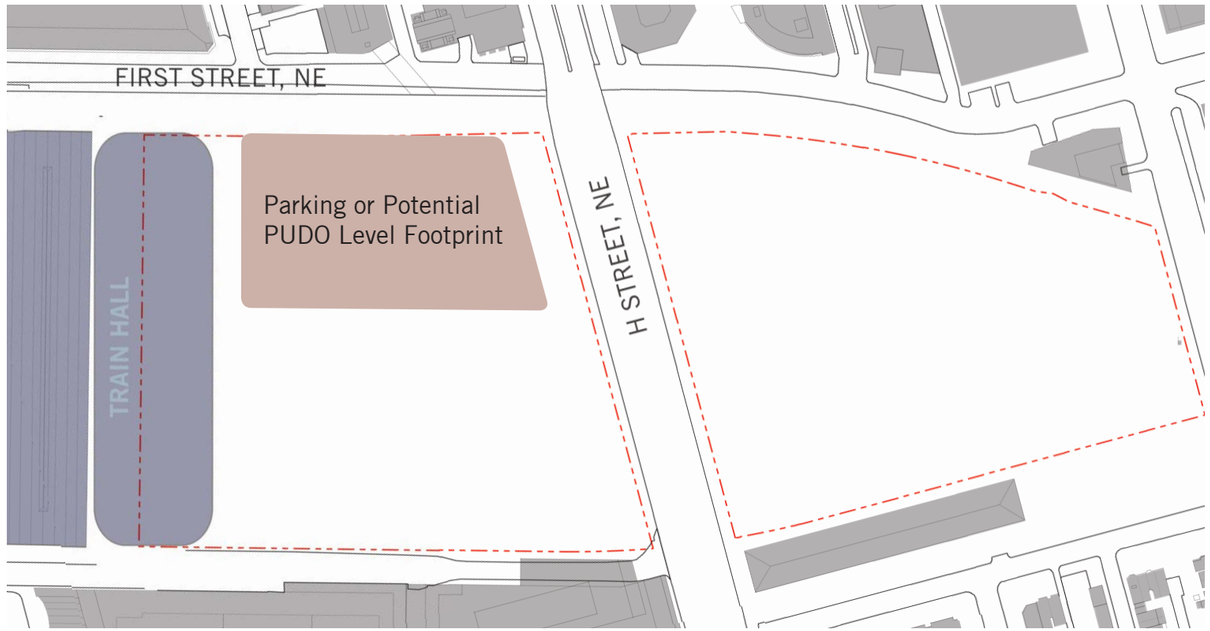


H Street NE and North Capitol Street

PUDO and Station Parking - Above-Grade vs. Below-Grade

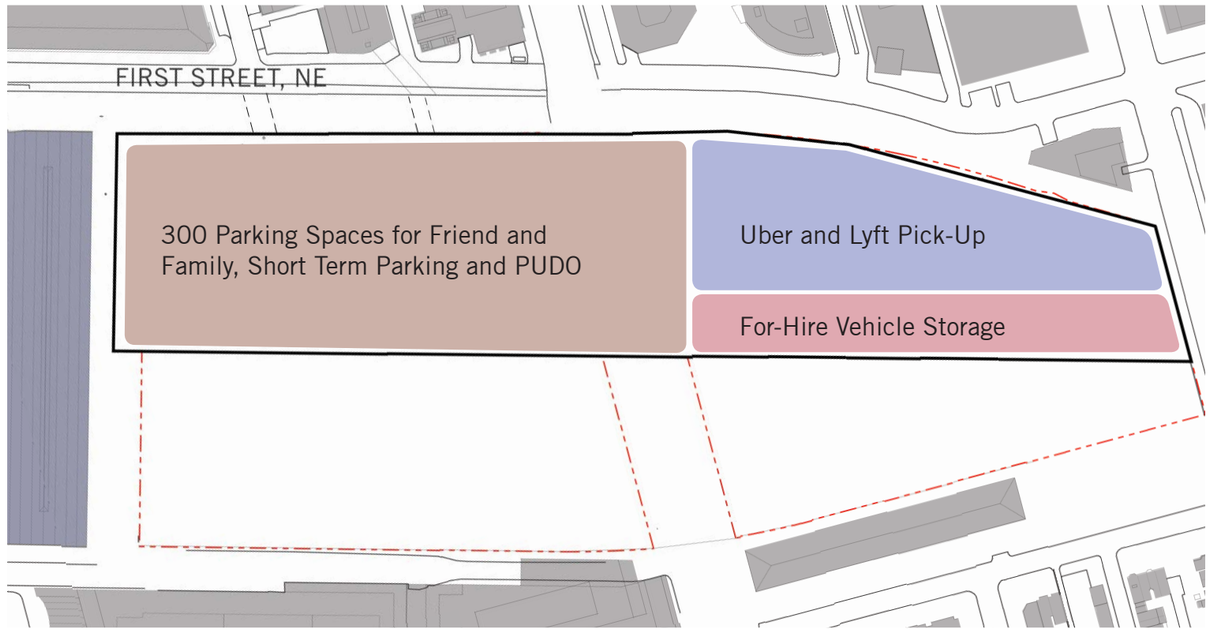
ALTERNATIVE A-C ABOVE-GRADE PLAN

Six levels above the bus facility - 115,200 SF



A-C MODIFIED BELOW-GRADE PLAN

A-C Modified below-grade plan - 480,000 SF

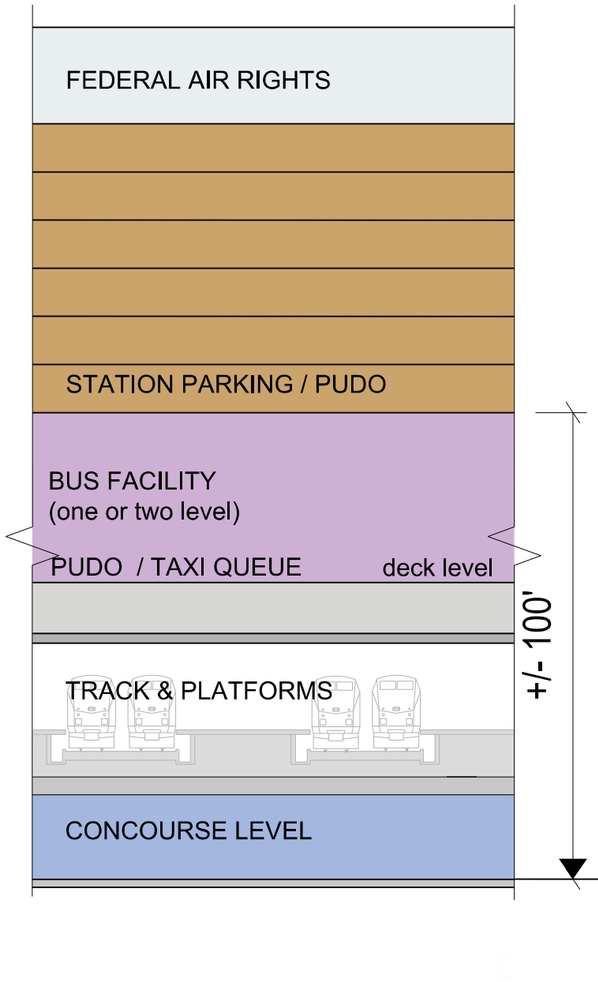


"OP urges FRA to...add a dedicated pick-up-drop-off facility to the Preferred Alternative, assess its benefits, and develop mitigations for negative impacts"

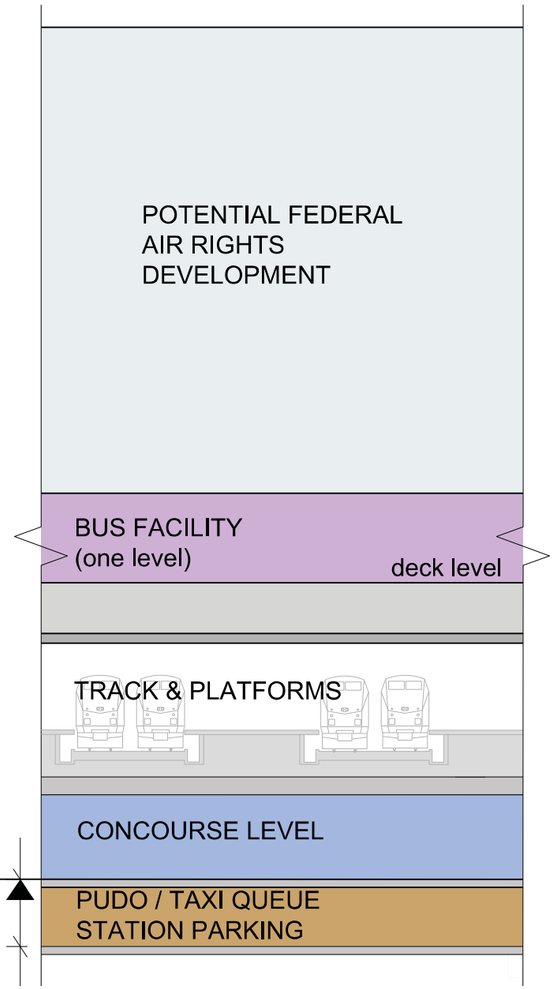
Andrew Trueblood, Director of the DC Office of Planning, August 28, 2020

PUDO and Station Parking - Above-Grade vs. Below-Grade

ALTERNATIVE A-C
PROGRAM STACKING



PROPOSED ADJUSTMENTS TO
PROGRAM USE STACKING



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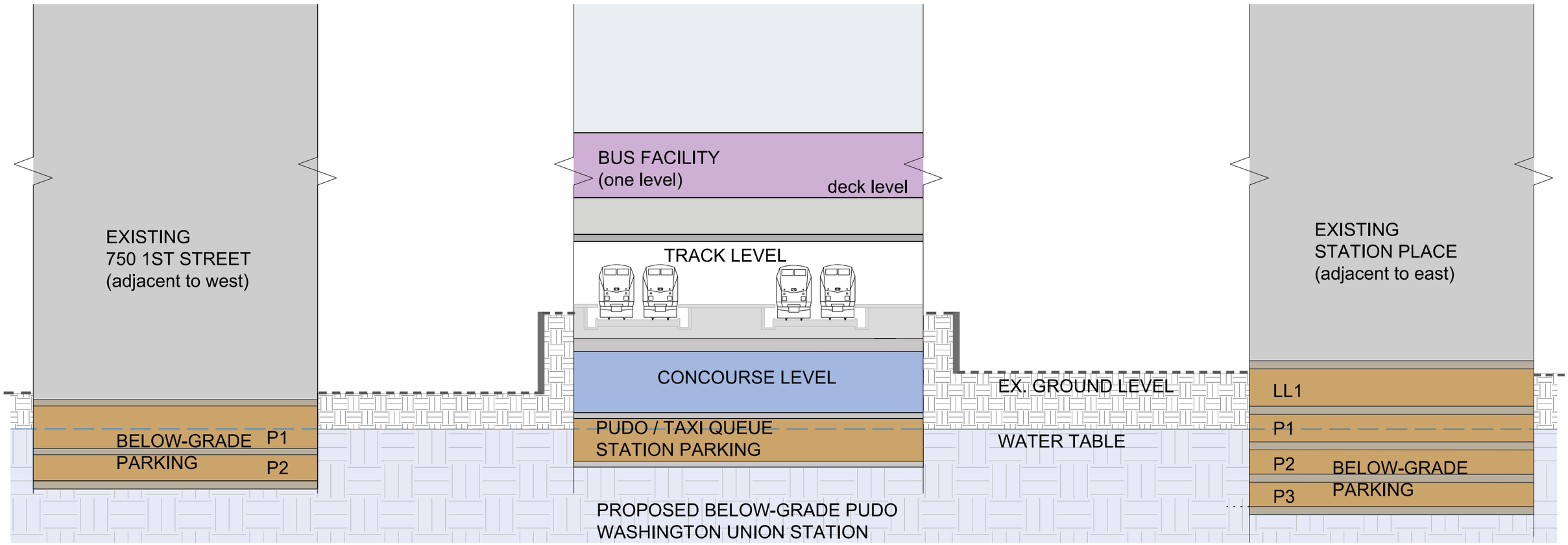
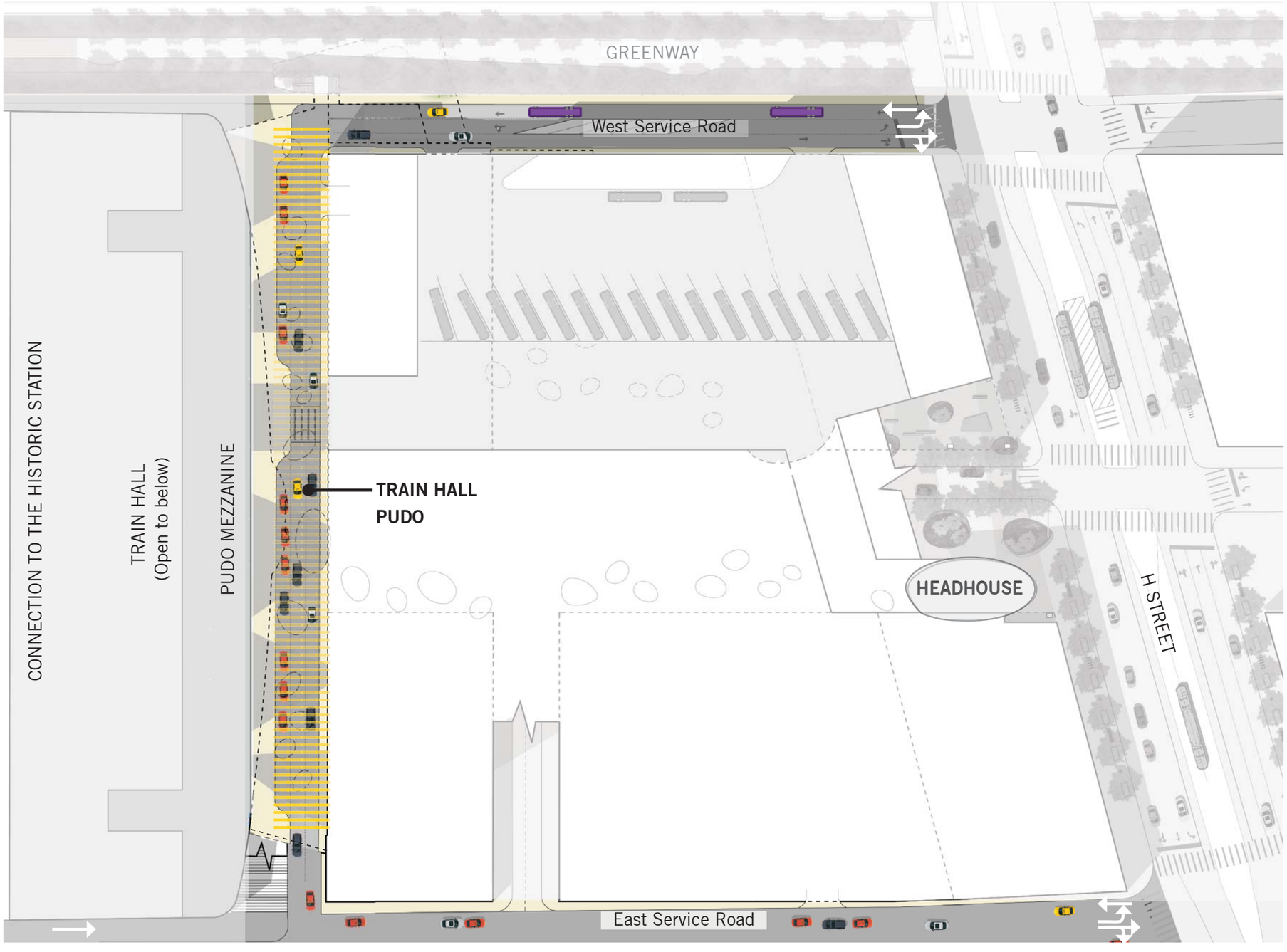
Below-Grade PUDO and Station Parking - Depth of Excavation



Below-grade parking is included in 5 Alternatives studied in the EIS and can be changed without material impact to process

Train Hall PUDO



Skylights or Openings

0 80 160

N-S Section View Looking West

Illustrative rendering created to describe the covered PUDO concept

Train Hall PUDO

Illustrative rendering created to describe the covered PUDO concept

Key Ingredients for World-Class Bus Terminal at Union Station

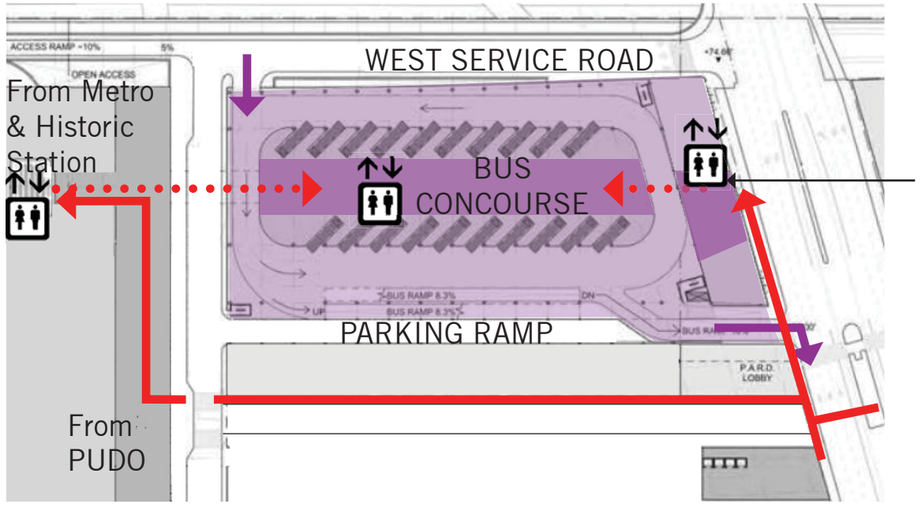
	FRA'S A-C PLAN	A-C MODIFIED PLAN
Adjacent to historic Union Station	☐	☐
First class passenger experience	☐	☐
Direct connection to vibrant urban space	☐	☐
Designed to minimize neighborhood traffic impacts	☐	☐
Appropriately sized facility	☐	☐

"The number of bus slips provided should be used as efficiently as possible...Ensuring the numbers of parking spaces and bus slips are justified and right-sized...will also provide flexibility in where those spaces can be located on the site, allowing more opportunity for the development of vibrant public spaces." Letter from ANC 6C, March 20, 2020

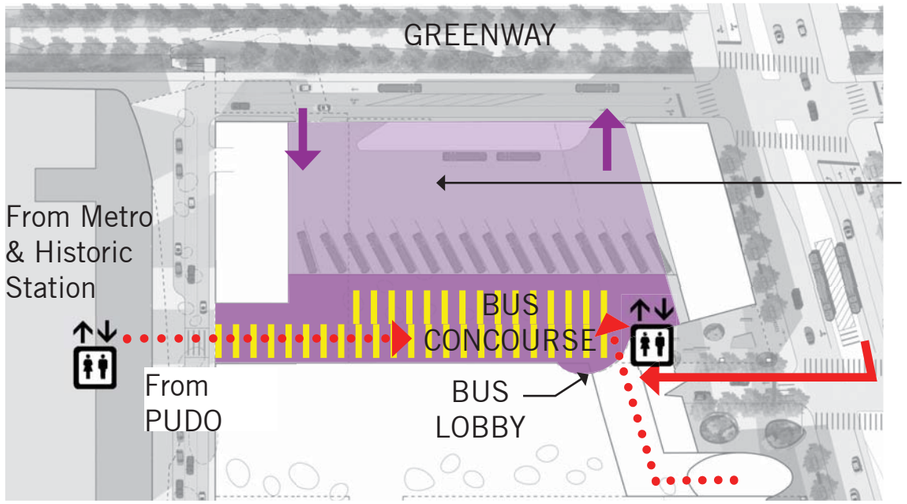
First Class Passenger Experience

Connection at grade
Connection below-grade

Alternative A-C



A-C Modified

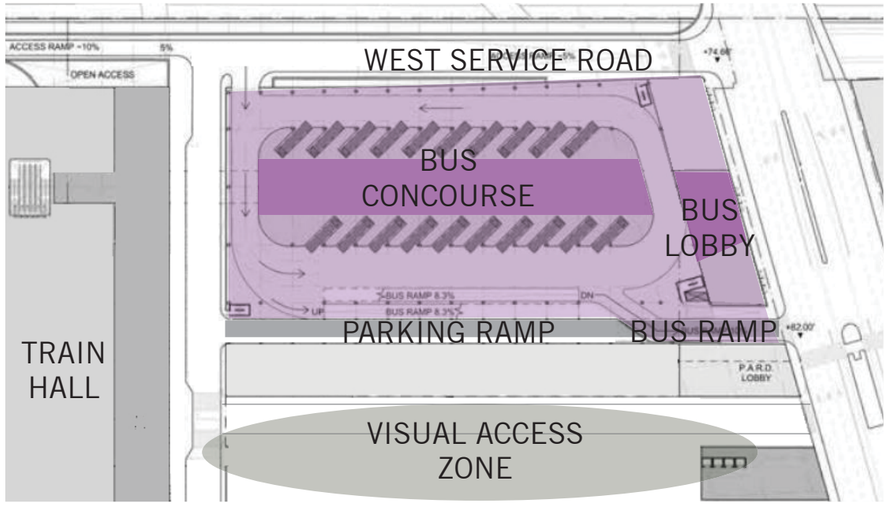


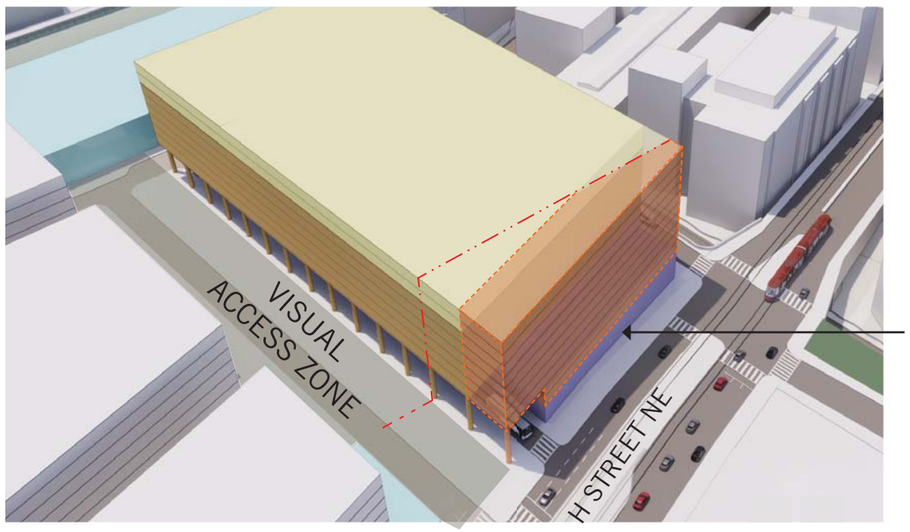
Direct Connection to Vibrant Urban Space

Skylight zone

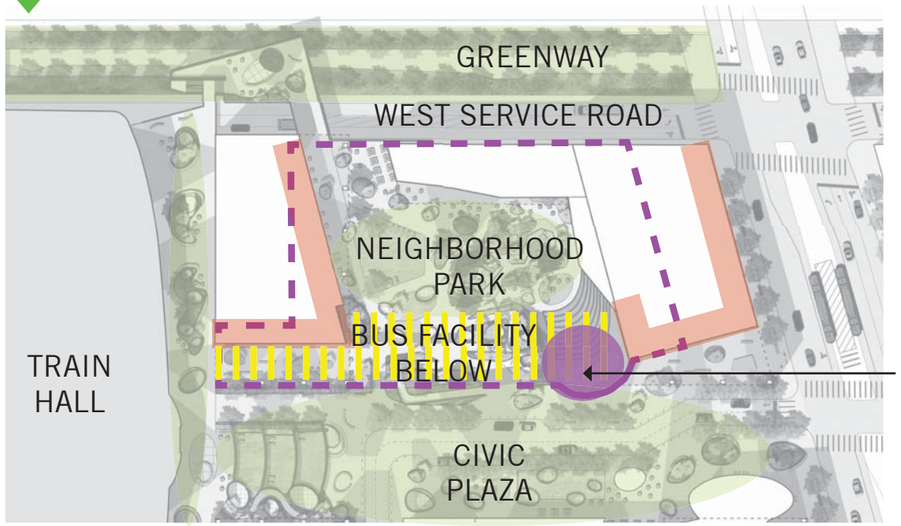
Active use

Alternative A-C



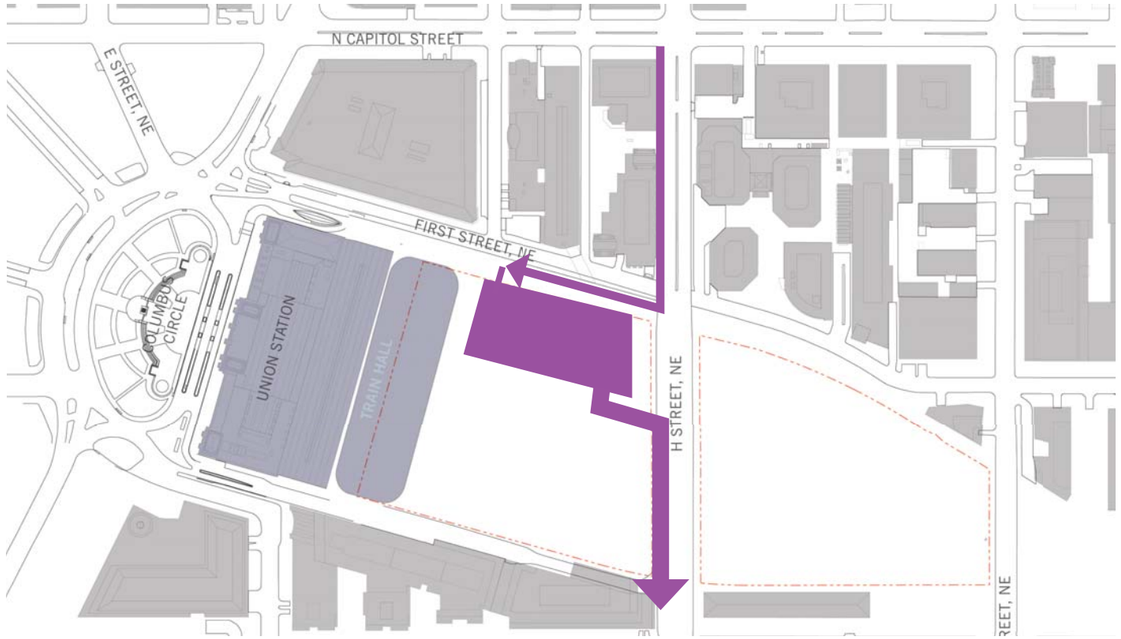


A-C Modified

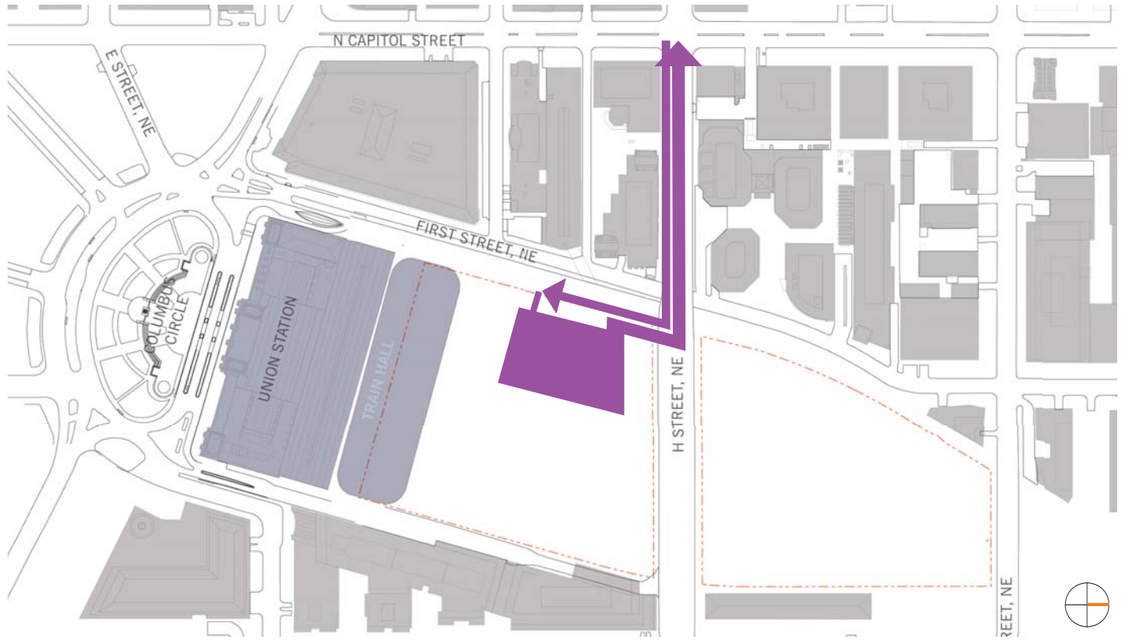


Designed to Minimize Neighborhood Traffic Impacts

Alternative A-C



A-C Modified



Appropriately Sized Facility

- FRA identified a 24-slip bus facility as the appropriate size to meet the 2040 intercity and charter passenger demand
- An analysis by Sam Schwartz Engineers (SSE), an internationally recognized bus facilities planning expert, concludes that a 12-slip facility can serve in excess of 2040 project demand
- “A-C Modified” proposes an 18-slip facility


Salesforce Transit Center, Bus Terminal, San Francisco


Stoke on Trent City Bus Station, Stoke, UK

Appropriately Sized Facility

✗ Alternative A-C ✓ A-C Modified

Bus Facility Analysis Comparison		
Category	**FRA Plan - 25 slips**	**A-C Modified Plan**
2040 intercity annual passengers	2,975,000	3,000,000
Peak hour (2 hours per week, 3 months per year) intercity turnaround time:	60 minutes	35 (Best Practice) to 45 minutes (Conservative)
Number of slips recommended	25 total slips · 13 intercity slips · 8 charter slips · 3 staging (not-active) slips · 1 DC Circulator slip	18 total slips · 12 to 16 shared intercity/charter slips · 2 staging (not-active) slips (DC Circulator not included)

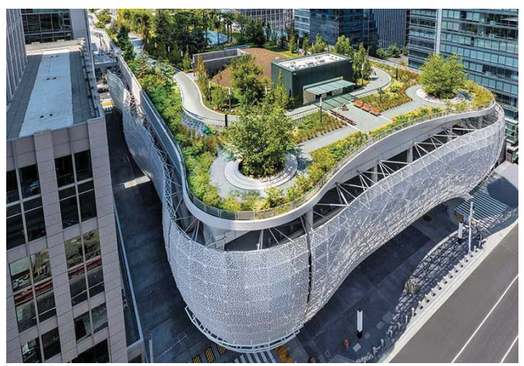
Turnaround Comparison - Washington Union Station Amtrak 2040 service vs Intercity Bus			
	Passengers	**FRA Turnaround**	**SSE Turnaround**
Amtrak Metropolitan Service	350 - 450	20 mins*	
Intercity bus	50 - 80	60 mins	35 - 45 mins

* DEIS Appendix B, Terminal Infrastructure Report, p.27

WUS Rail operator will increase passenger capacity by over 100% while decreasing number of tracks from 20 to 19.

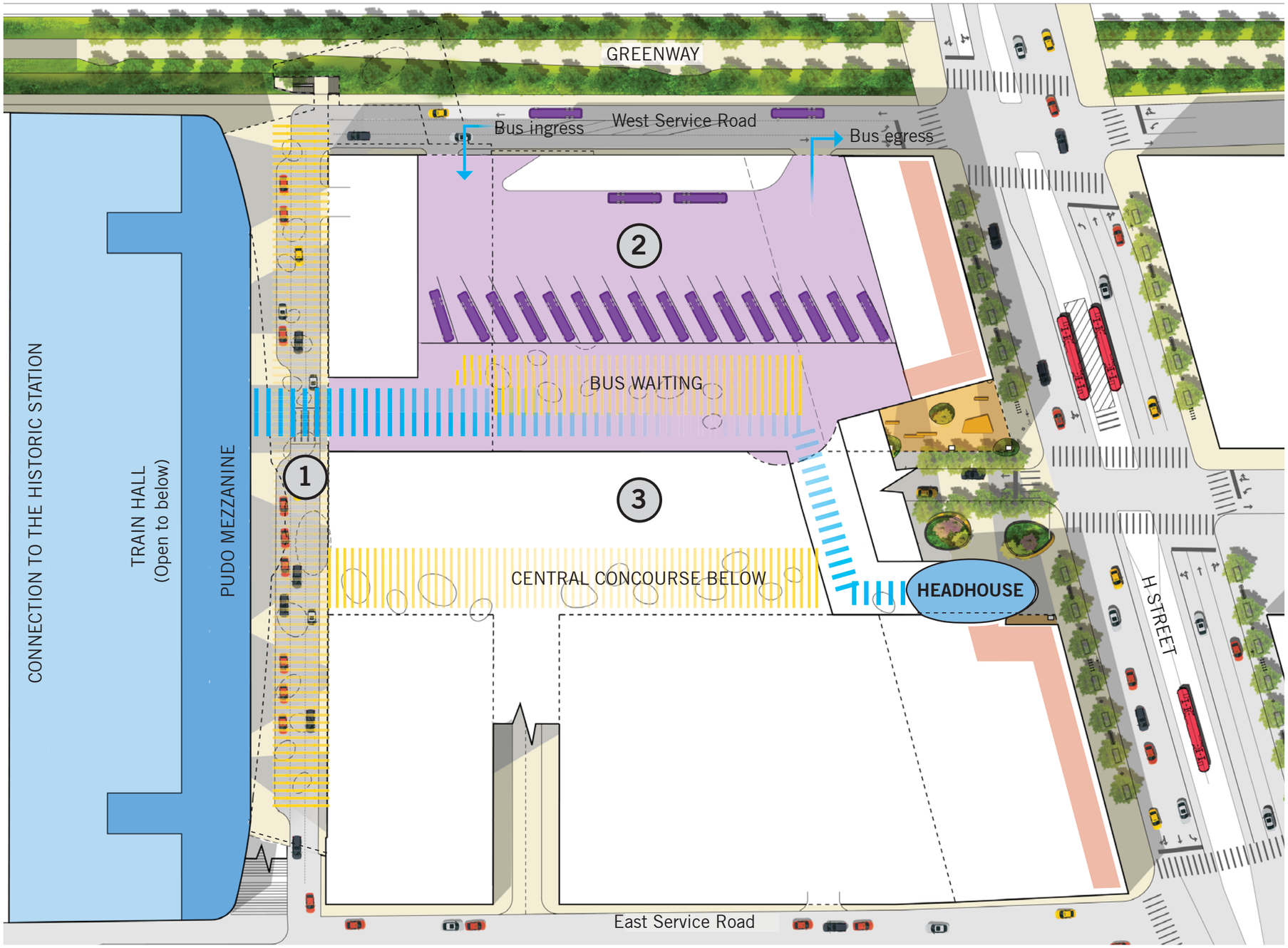
Key Ingredients for World-Class Bus Terminal at Union Staion

	FRA'S A-C PLAN	A-C MODIFIED PLAN
Adjacent to historic Union Station	✓	✓
First class passenger experience	✗	✓
Direct connection to vibrant urban space	✗	✓
Designed to minimize neighborhood traffic impacts	✗	✓
Appropriately sized facility	✗	✓



Salesforce Transit Center, Bus Terminal, San Francisco

In-Deck Plan - Bus/ PUDO/ Parking



1 Station/ Bus PUDO Loop
(Plaza Above)

2 Bus Facility
(Neighborhood Park Above)

3 Parking Area (Civic Space Above)

Bus Facility Connection

Active Deck-Level Uses & Frontage
(Below MIxed-Use Development)

Skylights or Openings
(Above Transportation Spaces)

0 80 160

N-S Section through the Bus Facility

Illustrative rendering created to describe a bus facility with a Neighborhood Park above and connections to PUDO and the bus lobby on the Civic Space

View from above the Civic Space looking west into the Neighborhood Park