WASHINGTON
UNION STATION
STATION EXPANSION

Supplemental Draft Environmental Impact Statement

Appendix S1

Multimodal Refinement Report

U.S. Department of Transportation
Federal Railroad Administration

May 2023

WASHINGTON
UNION STATION
STATION EXPANSION

Project Memorandum

DATE:	May 2023
REFERENCE:	Washington Union Station Expansion
SUBJECT:	Multimodal Refinement Report

This report documents the planning and coordination activities related to the multimodal program of the Washington Union Station (WUS) Expansion Project (Project) following the publication of the Draft Environmental Impact Statement (DEIS). The report is divided into four sections, grouped by mode:

- **Parking**. This section details the work led by the Federal Railroad Administration (FRA) to determine an updated parking program for WUS.
- **Pick-Up and Drop-Off**. This section details the work done by FRA and the Project Proponents, Amtrak and Union Station Redevelopment Corporation (USRC), to update the pick-up and drop-off program at WUS, including the introduction of a below-ground facility.
- **Bus.** This section details the work done by FRA and the Project Proponents, Amtrak and Union Station Redevelopment Corporation (USRC), in coordination with the bus carriers, to update the bus facility program.
- **Pedestrian and Bicycle.** This section details the work done by FRA and the Project Proponents to further develop the approach to pedestrian and bicycle access to WUS.

1 Parking Program

1.1 Introduction

This section documents the Federal Railroad Administration's (FRA) review of the Washington Union Station (WUS) Expansion Project (the Project) parking program following the close of the public comment period for the 2020 Draft Environmental Impact Statement (DEIS) that was prepared under the National Environmental Policy Act (NEPA) to analyze the potential Project impacts. In the 2020 DEIS, the development of the parking program is discussed in DEIS Appendix A6*, Parking Program Memorandum* and, more briefly, in **Chapter 3***, Alternatives.* The parking demand analysis supporting that proposed program was conducted in 2016-2017 using 2015-2016 data. During the DEIS comment period, FRA received comments from agencies, organizations, and the general public expressing concern about the size of the parking program envisioned in the DEIS Alternatives.

Additionally, FRA received the following three outside technical analyses evaluating the parking program used in the Alternatives:

- As part of the Parking Working Group convened after the January 2020 National Capital Planning Commission (NCPC) Hearing, the District of Columbia Office of Planning (DCOP) and the District Department of Transportation (DDOT) made a case for an alternative parking program of 295 spaces.[1]
- On September 28, 2020, Akridge, the developer of the adjacent Burnham Place project, provided an analysis from their transportation consultant Sam Schwartz Engineers that articulated an alternative parking program of 55 to 432 spaces, but ultimately concurred with the District's recommendation described above.[2]
- On October 21, 2020, NCPC staff transmitted a peer review analysis conducted by Kimley-Horn, dated October 1, 2020, that reviewed FRA's and the District's respective approaches to developing a right-sized parking program documented in DEIS Appendix A6.[3]

Considering the substantial interest and comments from agencies, stakeholders, and the public, FRA re-evaluated the Project's parking program, as documented in this memorandum. The analysis presented below updates FRA's policy approach to define an appropriate level of parking that accommodates diverse vehicular uses in an expanded WUS, taking into account stakeholder and agency feedback, including the three outside technical analyses listed above.

Building on the work documented in DEIS Appendix A6, the post-DEIS analysis:

- Updated existing baseline conditions. The original parking demand analysis was developed using 2015-2016 data; the updated analysis incorporated newly obtained 2017-2019 data from USRC and its parking garage operator Union Station Parking Garage LLC (USPG); and
- Re-evaluated future parking demand using the two demand analysis approaches used during the DEIS preparation. The first approach estimated demand for station related long-term parking, short-term parking, and rental car functions based on projections derived from existing demand; the second approach, consistent with FRA's work during the Parking Working

[1] DCOP DEIS Comment Letter. September 28, 2020.
[2] Akridge DEIS Comment Letter. September 28, 2020.
[3] Email from NCPC to FRA. October 21, 2020.

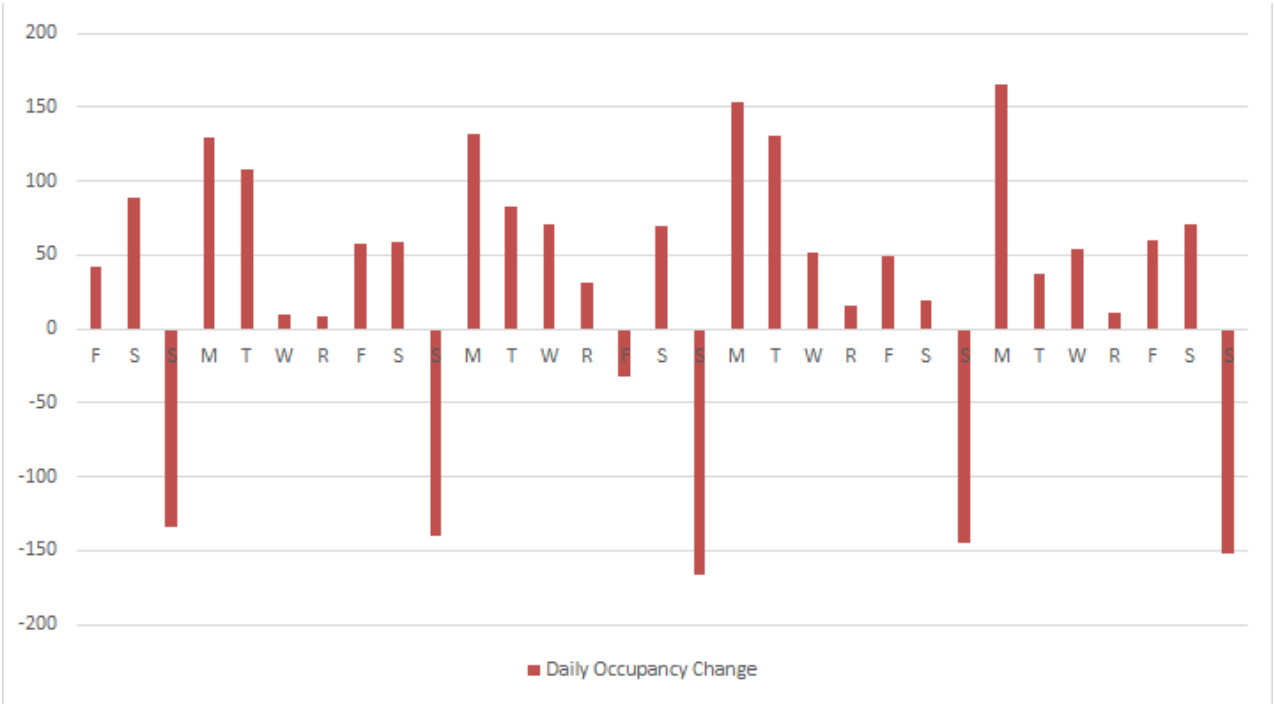
Group process, sought to estimate the demand associated with "use cases" for (or types of) station related vehicular activity.

1.2 Existing Conditions

In Fall 2020, FRA received parking data provided by USRC and USPG. USPG provided three data sets spanning the period from January 2017 through December 2019. The first set characterized daily parking activity based on length of stay. The second set showed entries and exits on an hourly basis. The third set listed monthly permits. Based on data from 2017 to 2019, FRA characterized existing parking behavior at WUS, as described below. This existing condition review serves as an update to, and clarification of, the assessment provided in DEIS Appendix A3, *Final Concept Development and Evaluation Report,* and DEIS Appendix A6**,** *Parking Program Memorandum*.

At a high level, FRA sought to understand the overall nature of entries into and exits from the garage.[4] This information was useful for several reasons. It explained weekly flows in and out of the facility; clarified the peak hour of operations; and helped to identify the late-night activity that may not be easily served by modes of travel other than personal vehicle. **Figure 1-1** and **Figure 1-2** show the timing of parking at WUS based on 2017-2019 data, providing a high-level overview of parking activity at WUS during this period.

Figure 1-1. Average Net Entries and Exits by Day of Week, March 2017-2019[5]

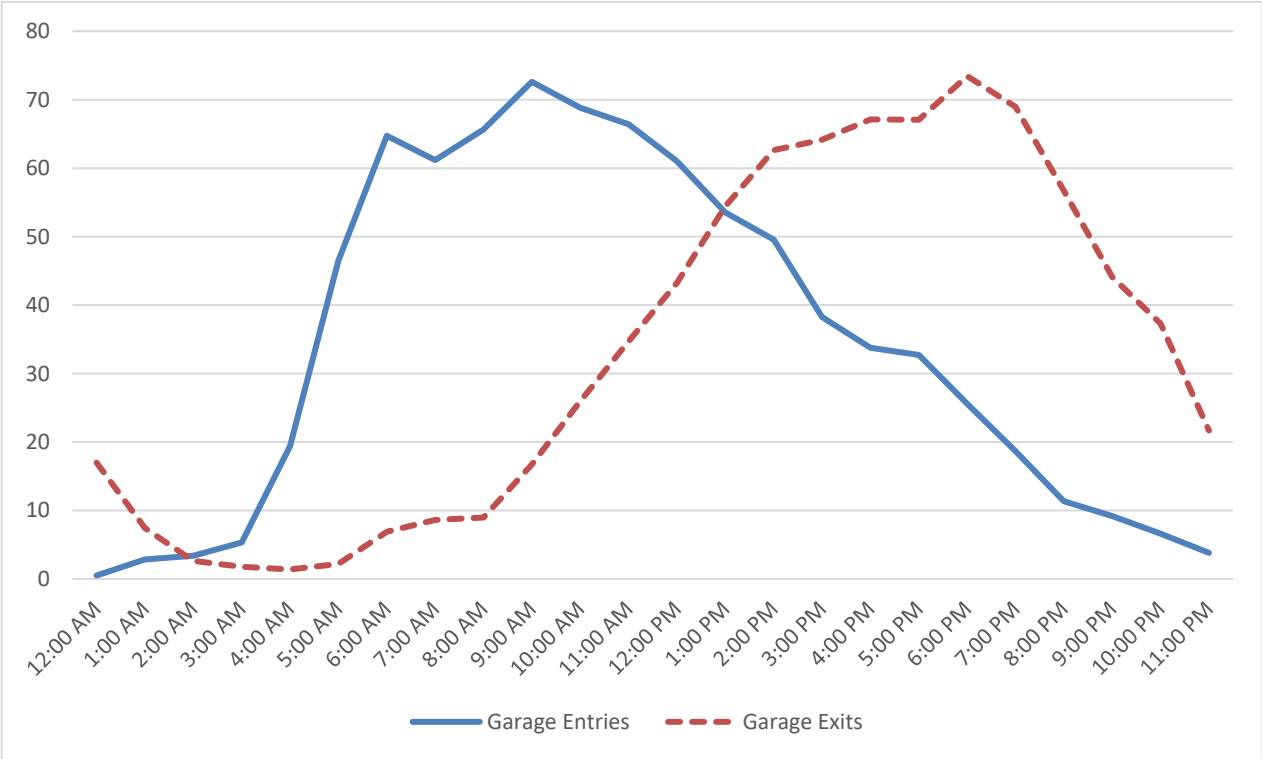


Note: *Thursdays are denoted with an "R."*

[4] This data includes monthly permit holders and all other parkers.

[5] Source: Union Station Redevelopment Corporation and Union Station Parking Garage.

Figure 1-2. Average Weekday Entries and Exits by Hour of Day, March 2017-2019



Consistent with an intercity transportation facility such as WUS, the weekly net entry and exit pattern displayed in **Figure 1-1** shows more long-term parkers entering the facility early in the week; fewer entering it mid-week; and many leaving it on Sunday. As shown in **Figure 1-2**, entries and exits indicate that the WUS parking garage generates relatively few peak-hour trips—approximately 70 entries or exits in each peak hour (8-9 AM and 5-6 PM). The garage does see an early initial morning peak at around 5-6 AM and an early initial afternoon peak at around 1-2 PM.

1.2.1 Long-Term Parking

For stays lasting from 10 to 24 hours, WUS garage parkers are charged the "Daily Maximum" rate.[6] Beyond 24 hours, additional fees apply. In the post-DEIS analysis, as in the original analysis performed in 2016, all parkers who that stay in the facility longer than 24 hours are considered long-term parkers associated with intercity travel.[7] In 2016, of those who stayed between 10 and 24 hours, 40 percent were considered long-term parkers, with the remaining 60 percent assumed to be associated with regular commuter demand.[8] An evaluation of recent Amtrak mode of access survey data from passengers indicates that this split remains an appropriate assumption.[9]

[6] For 2017, the time cut-off is 12-24 hours based on available USPG data.

[7] For this analysis, a "parker" refers to a single vehicle parking in the facility and does not imply anything about the number of people in the vehicle.

[8] The regular commuter demand represents individuals who are working at WUS or living/working in the area and using USPG as their parking facility.

[9] The 2016 split was informed by conversations with USRC in 2016 and analysis of the parking demand. In 2016, two methods were used to project parking demand. The first method made use of Amtrak survey data and the second method used existing parking garage data, as documented in DEIS Appendix A6. In 2016, assigning 40% of the 10-24 hour demand to intercity use aligned the parking garage data with the Amtrak survey estimate. FRA evaluated the appropriate split to use for the 2017-2019

Table 1-1 summarizes the characteristics of long-term stays at WUS. FRA estimated the average length of stay for long-term parking by considering the weighted average of the 24+-hour parkers and the 40 percent of 10-24-hour parkers considered to be long-term parkers.

Table 1-1. Long-term Parking Behavior at WUS, 2017-2019

Number of Parkers or Length of Stay	2017 Data	2018 Data	2019 Data
Daily average number of "Daily Maximum" parkers	120	125	125
"Daily Maximum" parkers considered long-term parkers*	48	50	50
Daily average number of multi-day parkers (24-hour and beyond)	184	176	178
Estimated daily number of long-term parkers**	**232**	**226**	**228**
Average length of stay in days for long-term parkers	2.13	2.27	2.30
Average length of stay in hours for long-term parkers	51	54	55

* As noted above, 40% of daily parkers were assigned to the long-term program.

** All multi-day parking vehicles and 40% of daily maximum parkers.

The duration of parking stays at WUS in 2017-2019 confirmed a demand for long-term parking at the station. Multiple-day stays generate overlapping demand that must be considered when planning the size of the proposed parking facility.

1.2.2 Short-Term Parking

Based on the data and parking policies, there are two main types of short-term parking at WUS. The first type is extremely short, less than 10 minutes, presumably associated with picking up or dropping off passengers. The second type consists of stays lasting from 10 minutes to ten hours.[10] The specific activities performed by the second type of parkers are not known. WUS offers validation for short-term parking. However, the validating machines are located in the mezzanine and are available to all parkers; therefore, while validation confirms that a parker passed through the station, it is not possible to link validation data to specific reasons for parking at WUS. **Tables 1-2 and 1-3** show the average daily number of short-term parkers for both types of short-term stays in 2017-2019. Only the data in **Table 1-3** were used to estimate the short-term parking demand.

data based on the latest Amtrak updates. Data that Amtrak provided in early 2020 indicated a more recent mode split of 3%, reduced from the 4% and 8% shared previously. Using that information would result in approximately 246 estimated parkers in 2017, comparable to the 232 identified based on the parking data above.

[10] 2017, the data provided by USPG included a time cutoff of 2-12 hours, versus 2-10 hours in 2018 and 2019. Monthly parkers are excluded from the data.

Table 1-2. Less than 10 Minute Parking at WUS, Daily Average, 2017-2019

	2017 Data	2018 Data	2019 Data
Number of Parkers	43	38[11]	40

Table 1-3. Up to 1 to 10 Hour Parking at WUS, Daily Average, 2017-2019[12]

Category of Parking Time Length	2017 Data	2018 Data	2019 Data
Vehicles up to1 hour, unvalidated	97	78	79
Vehicles up to 1 hour, validated	115	75	68
Up to one hour, total	**212**	**153**	**147**
Vehicles 1- 2 hours, unvalidated	62	40	40
Vehicles 1-2 hours, validated	58	43	38
1-2 hours, total	**120**	**83**	**78**
Vehicles 2-10 hours[13]	302	208	200
Total	**634**	**444**	**425**

Table 1-3 suggests that compared to 2017, both 2018 and 2019 experienced a substantial downward shift in short-term parking demand. The cause for this change cannot be ascertained from either the available parking data or USPG management policies.

1.2.3 Rental Car Activity

The existing parking garage has a rental car area located on a mezzanine between the bus deck and the main parking area. The rental car area is divided among Hertz, Avis, and National rental car companies. The rental car area consists of 52,000-square feet of space, including 140 striped parking spaces. Between 2017 and 2019, daily rental car parking demand ranged from 250 to 295 vehicles, based on

[11] Only December 2018 data were available.
[12] Only the 10-minute to 10-hour time period was incorporated as short-term parking in this table.
[13] For 2017, the time cutoff in the data provided by USPG was 2-12 hours, versus 2-10 hours in 2018 and 2019. The estimate was proportionally reduced.

USPG data shown in **Table 1-4**. This demand is able to exceed the striped spaces due to stacked parking or use of overflow spaces in the main garage, the latter described below.

Table 1-4. Average Rental Car Facility Occupancy, 2017-2019

Space and Use	Avis	Hertz	National	Total
Square Footage	~17,000	~17,000	~18,000	52,000
Average Car Counts	75-85	80-90	95-120	250-295

Based on monthly permit data (see **Section 1.2.4** below), additional spaces in the parking garage are assigned to both rental car and carsharing functions. These additional spaces supplement the mezzanine facility for the three traditional operators and also serve as the base of operation for carsharing providers. As of September 2019, 200 spaces were assigned to Getaround, 53 to Maven, and 5 to Zipcar. Ten spaces were used for traditional rental car overflow. An additional six spaces were leased by the rental car companies collectively for staff parking and operational needs.

As a major rental car facility in the District, WUS attracts local demand as well as intercity passenger demand. The rental car companies do not generally nor consistently make information available on the respective share of these two types of demand. One company indicated that 57 percent of driver licenses presented during rental car check-in were issued in the District, Maryland, or Virginia, while 43% were issued elsewhere.[14] In the absence of other data, FRA has used these percentages to estimate the breakdown between local and intercity demand across all rental companies.

1.2.4 Monthly Parking

USPG operates a monthly parking program. As documented in DEIS Appendix A3, the Project Proponents identified Level 3 of the facility as being reserved for use by monthly parkers, with a capacity of 536 spaces. In early 2020, USPG made public further information on the number of monthly parkers at WUS, indicating that there were at that time 1,400 valid monthly passes. This number appears to have created the impression among some stakeholders that, of the approximately 2,200 parking spaces at WUS, about two-thirds are used for monthly parking.[15] Further conversations with USPG in September 2020 indicated that, in fact, pre-pandemic monthly uses remained largely contained within the Level 3 monthly parking area.[16] Additionally, the monthly users category partially overlaps with rental car activity, as it includes or has included spaces set aside for carsharing services and for overflow from other rental car providers, as described above.

USPG also provided monthly reports of monthly permit holders. FRA is not accommodating monthly parking as part of the Project. However, understanding how it contributes to existing parking demand at WUS is important for planning for future demand.

Five months in 2019 were selected to provide a representative range of monthly parking information. The number of monthly parkers increased substantially, by 54%, between January and December 2019. On average, there were 1,053 parkers with monthly passes in 2019. This growth was driven substantially by an increase in the facility's use by emerging carsharing services. Maven increased its passes from 51 to 183. Getaround went from no presence to 250 passes by the end of the year. As a large, centrally

[14] Email from USRC to FRA. March 4, 2020.
[15] See, for example, DC Council Resolution 23-509.
[16] Phone conversation with Kevin Forma, USRC, and LaJuana Jones, USPG. September 28, 2020.

located facility, the WUS parking garage is a magnet for emerging transportation services. The future of this demand is uncertain, however, as General Motors shut down Maven in April 2020.[17] As noted further below, neither of these types of ridesharing activities nor any other types of monthly parking were incorporated into FRA's 2040 parking demand estimates.

1.2.5 Overall Garage Occupancy

USPG also provided daily parking garage occupancy data for 2019. Based on those data, average maximum daily weekday occupancy levels at WUS were calculated as shown in **Table 1-5**. These values represent, on average, the maximum number of daily vehicles in the garage during the weekdays of a given month. Note that rental cars using the mezzanine facility are not included in the occupancy data below. **Table 1-5** shows a steady increase in average occupancy from February to June, the period for which data was provided. This increase may be due to increased travel as weather improves.

Table 1-5. Average Occupancy at WUS, 2019

Month	Average Max. Daily Occupancy
February 2019	810
March 2019	1,060
April 2019	1,137
May 2019	1,272
June 2019	1,334

1.3 Policy and Planning Decisions

Policy decisions relating to parking and rental car demand are integral to estimating future use for planning. DEIS Appendix A6, *Parking Program Memorandum,* identified a set of policy considerations that influenced the development of the original parking program. In response to public and agency comment on the DEIS, FRA re-evaluated and clarified its policy and planning approach to long-term and short-term parking, rental cars, station office, and parking location, as described below.

Long-Term Parking – While Amtrak has indicated that it does not require long-term parking for its operations at WUS, FRA considers that some long-term parking is needed for WUS to remain an attractive and accessible option for intercity travelers, including those traveling in the early morning or late evening and those who cannot easily use alternative transportation options. Offering some long-term parking also enhances the efficient management of multimodal demand at the station. The policy approach is to accommodate a level of long-term, intercity-travel-related parking that is responsive to anticipated changes in multimodal demand. As noted above, monthly parkers will not be accommodated in the proposed future parking facility.

In 2016, parking demand estimates considered the 90th percentile of occupancy to identify the daily demand for the facility. This approach sought to plan for the regular (10% of the time) peak demands

[17] Sean O'Kane, "GM shuts down car-sharing service Maven," *The Verge* April 21, 2020. Accessed from https://www.theverge.com/2020/4/21/21229838/gm-maven-shut-down-car-sharing-service. Accessed on January 10, 2021.

that the garage experiences today. In 2017, when the parking program was reduced to approximately 1,600 spaces, an updated average (50th percentile) of Amtrak passenger demand data was used to support this program estimate. Agency comments on the DEIS and at the January and July 2021 NCPC Commission meetings expressed strong support for moving away from seeking to meet this peak vehicular demand.[18] Based on the feedback received and on the precedent set in 2017, a lower planning threshold, the 50th percentile, is used for this revised estimate. This 50th percentile approach seeks to accommodate a typical level of demand (as opposed to peak level demands) while being responsive to District and other stakeholder requests to reduce planned parking levels at WUS.

Short-Term Parking – Short-term parking at WUS accommodates passenger matching activity; access to station retail and events; and visitor access to the Capitol area as envisioned by the Union Station Redevelopment Act of 1981. The Visitors and Commemoration Element of the Federal Elements of the *Comprehensive Plan for the National Capital* encourages visitors to make use of public parking facilities and transportation alternatives.[19] The recent updates to the District elements of the *Comprehensive Plan* call for underground parking to support the H Street NE corridor.[20] The WUS garage is a central, standalone public parking facility with access to multimodal transportation in the District. FRA's policy approach is to accommodate a level of short-term parking that is responsive to comprehensive plan goals and anticipated changes in multimodal demand.

Rental Car Program – Availability of rental cars is an important component of multimodal connectivity for intercity passengers. Today, the WUS parking garage houses rental car services used by both intercity passengers and local District residents or workers. While it is not feasible to force private operators to discriminate among customers, FRA's policy is to base any future rental car program on anticipated future intercity demand. (In the 2016 estimate, the Project Proponents based the future rental car program on both intercity and local demand.) Carsharing services will not be specifically or additionally planned for in the new facility, but FRA recognizes that future traditional rental car operations may resemble these more flexible models in the future.

Federal Air rights Development – The potential Federal air rights development at WUS would be a mixed-use development within the federally owned air rights currently occupied by the parking facility. To be competitive with other mixed-use developments, some tenant parking would need to be provided.[21] The DEIS alternatives did not identify a potential location for parking associated with the federal air rights development, which would be developed separately from the SEP.

Station Office Uses – WUS includes an office complex, located in the historic Station. Parking to support this office space may allow it to maintain its market competitiveness.[22]

1.4 Revised Estimate of Future Parking Demand

As documented in DEIS Appendix A6, *Parking Program Memorandum*, in 2016, FRA developed an approach to estimate future parking demand based on existing long-term, short-term, and rental car activity. As part of the Parking Working Group formed in early 2020, FRA also investigated a set of "use

[18] NCPC held Commission meetings on WUS on January 9 and July 9, 2020.

[19] Element VC A.7.

[20] DCOP. April 2020. Proposed Policy CH-2.1.1.5: Parking. https://plandc.dc.gov/sites/default/files/dc/sites/Comprehensiveplan/publication/attachments/Chapter%2015_Capitol-Hill_April2020.pdf

[21] This assumption is consistent with the District's recommendations for mixed-use development parking at WUS, as expressed in DCOP's DEIS comment letter, dated September 28, 2020.

[22] This approach is consistent with the District's recommendations for mixed-use development parking at WUS.

cases" for parking demand. This use case approach broke down long and short-term demand into specific types of demand associated with certain passenger types, activity types, or times of day. Using the new 2017 to 2019 data, FRA adjusted assumptions and estimates for both approaches, as described below.

1.4.1 Estimated Future Demand – Long-Term Demand

For the analysis documented in DEIS Appendix A6, FRA estimated the demand for long-term parking using the factors listed below. These factors were updated, as applicable, as part of this revised estimate based on the latest information collected.

- **Amtrak Data**: In 2016, 2017, and 2020, Amtrak provided results from their passenger survey regarding mode of access to and from WUS. Data provided in 2017 indicated that approximately 4 percent of passengers drove and parked at WUS. Based on that information, with a baseline ridership of 16,395, the data suggest that 328 daily Amtrak boarders drove and parked at the Station at the outset of our analysis period.[23]
- **Planning Threshold:** As noted above, the 90th percentile was used to estimate "regular" demand in 2016. A threshold of 50th percentile was established in the 2017 parking revision and has been retained as the planning threshold for this analysis. Numbers associated with the 75th percentile are provided for reference.
- **Existing Long-Term Parking Demand and Average Length of Stay**: Based on parking garage data, all parkers who stayed more than 24 hours and 40 percent of parkers who stayed more than 10 hours in the garage were assumed to reflect long-term, intercity-travel demand. To account for the full parking demand of long-term parkers, FRA also calculated their average length of stay as described in **Section 2.1** above. Based on 2019 data, the average length of stay was adjusted from 1.87 days in the 2016 estimate to 2.30 days for this updated estimate.
- **Intercity Travel Growth Rate**: FRA used a growth rate based on anticipated intercity activity at WUS to calculate the future long-term parking demand associated with this activity. The analysis originally assumed a 95 percent growth rate in intercity travel to estimate future parking demand. This growth rate was based on *NEC FUTURE* EIS estimates for Amtrak growth at WUS through 2040. In January 2020, Greyhound provided information on parking demand from intercity bus users. As long-term parkers can be assumed to include both Amtrak and bus passengers, FRA adjusted the growth rate to the weighted average of the anticipated growth in intercity train (still based on *NEC FUTURE* EIS estimates) and bus ridership in the *NEC FUTURE* Action scenario (95 and 19 percent, respectively),[24] resulting in an overall parking demand growth rate of 83 percent.
- **Future Mode Shift:** Knowing that local planning calls for shifts away from single-occupancy vehicles, FRA assumed a mode shift percentage informed by available analysis and modeling. This mode shift percentage estimates anticipated change in travel behavior due to future policy decisions. The 2016 analysis documented in DEIS Appendix A6 used a 10 percent mode shift derived from the 2040 Metropolitan Washington Council of Governments (WCOG) regional travel demand model, based on the model's assumed movement away from single-occupancy vehicle commuting in the Travel Activity Zone (TAZ) near WUS as a result of the projects incorporated in the region's Constrained Long-Range Plan. The regionwide mode shift away from single-occupancy vehicle commuting in that same timeframe was 7 percent. The

[23] Of all daily riders, it is assumed that half are boarding and half are alighting.

[24] This analysis uses the 19% bus growth rate based on assumptions at the time of the analysis in 2020 and early 2021.

mode shift anticipated for the WUS area thus was approximately 145 percent of the regional shift.

For this update, long-term parking demand and average length of stay were recalculated based on the 2017-2019 data obtained from the WUS parking garage operator as described in **Section 1.2** above. These parameters were then used as the basis for the updated estimates shown in **Tables 1-6** and **1-7**. FRA also adjusted the future mode shift factor after considering a DEIS comment that recommended an alternative way of assessing it. The comment noted that DDOT's *Move DC* plan calls for a 13 percent reduction in automobile trips in the District relative to a projected future 2040 baseline. Assuming a similar relationship between the regionwide mode shift and the WUS area mode shift in the MWCOG model (145 percent), FRA revised its future mode shift projection from 10% to 19 percent.[25] The District of Columbia's December 2020 decision to join the Transportation & Climate Program to reduce transportation emissions reinforces the appropriateness of a more substantial projected future mode shift.[26]

Table 1-6. Estimates of Long-Term Parking Demand (2040) – 50th Percentile

	DEIS Appendix A6 Analysis	**2017 Update**	**2018 Update**	**2019 Update**
Source	Amtrak survey data (4% mode share)	2017 garage activity data	2018 garage activity data	2019 garage activity data
Estimated Long-Term Parkers	328	232	226	228
Average Length of Stay	1.87	2.13	2.27	2.30
Intercity Growth	1.95	1.83	1.83	1.83
Assumed Mode Shift	0.90	0.81	0.81	0.81
Long-Term Demand	**1076**	**732**	**760**	**777**

[25] Akridge DEIS Comment Letter. September 28, 2020.

[26] "Massachusetts, Connecticut, Rhode Island, D.C. are First to Launch Groundbreaking Program to Cut Transportation Pollution, Invest in Communities," *Transportation and Climate Initiative*. December 21, 2020. Accessed from https://www.transportationandclimate.org/final-mou-122020. Accessed on January 10, 2021.

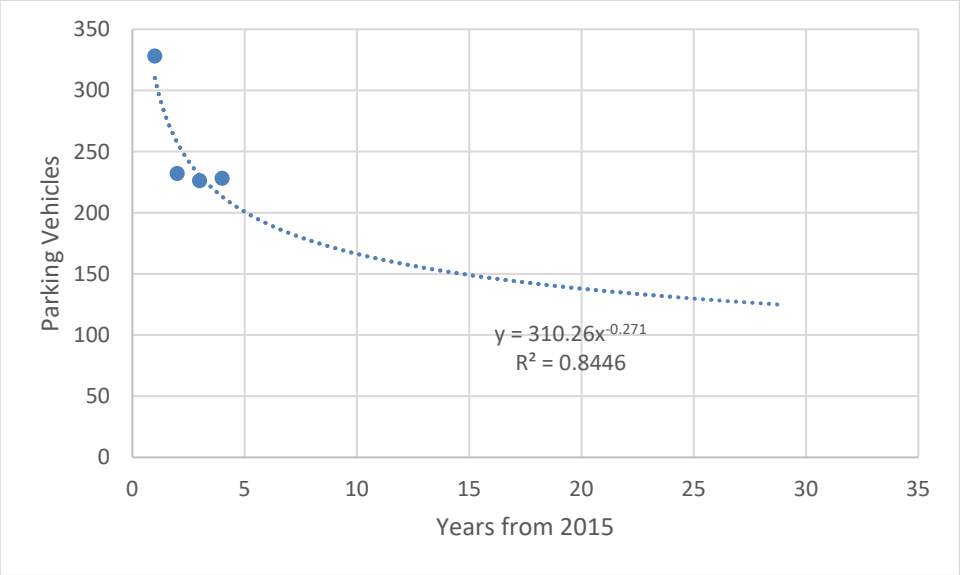
Table 1-7. Estimates of Long-Term Parking Demand (2040) – 75th Percentile

	2017 Update	**2018 Update**	**2019 Update**
Source	2017 garage activity data	2018 garage activity data	2019 garage activity data
Estimated Long-Term Parkers	286	296	299
Average Length of Stay	2.02	2.15	2.20
Intercity Growth	1.83	1.83	1.83
Assumed Mode Shift	0.81	0.81	0.81
Long-Term Demand	**856**	**943**	**976**

In consideration of a comment in the October 1, 2020 peer review memorandum transmitted by NCPC, which suggested the analysis should consider *trends* in parking demand when developing the parking program, FRA looked for discernable trends in the 2016-2019 data obtained from the WUS garage. FRA then extrapolated these trends to 2040. Trends over the four years of available parking data were projected forward based on a best-fit power law curve, as shown in **Figure 1-3** below.[27] This extrapolation identifies what parking use might look like in 2040 if the identified trends were to remain constant.

[27] The power law curve was the best fit for the data provided and intuitive with the trend being examined. Changes in mobility are unlikely to be linear. Consumer behavior, such as that around mode choice, is likely to exhibit Pareto characteristics where, while a smaller portion of the population may choose to drive over time, it is highly likely that a non-zero portion will still need to, or prefer to, drive based on the transportation options available to them. The formula for the curve is Long-Term Parking Demand = $310.26*year^{-0.271}$.

Figure 1-3. Projecting Trends in Future Long-Term Parking Demand[28]



Using the formula generated by this analysis, FRA identified a 2040 (year 25) estimate of **140** daily long-term parkers in the absence of increases in services at WUS. To estimate future demand, these values were then increased using the growth factors, as shown in **Table 1-8,** and reduced using the mode shift factor, since traffic-reducing policies would have an additional impact on parking use. The most recent information regarding length of stay (for 2019) was used to estimate the length of stay of future parkers. On this basis, a total of **477 spaces** may be sufficient to meet 2040 long-term parking demand at WUS.

Table 1-8. Revised Estimate of Long-Term Parking Demand (2016-2019 Trend projected to 2040)

	Revised Estimate
Estimated Long-Term 2040 Parkers	140
Average Length of Stay	2.30
Intercity Growth	1.83
Assumed Mode Shift	0.81
Long-Term Demand	**477**

[28] 2016-2019 parking data included in this chart. 50th percentile parking data.

1.4.2 Estimated Future Demand – Short-term Parking

In the original estimate documented in DEIS Appendix A6, *Parking Program Memorandum,* FRA defined short-term parking as parking lasting less than five hours.[29] Based on 2015-2016 data, a daily average of approximately 860 parkers at WUS stayed there for less than five hours. Based on a peaking analysis of how these parking visits "stacked" on top of one another - i.e., how many spots were needed at one time - a short-term estimate of approximately 429 spaces was calculated with an associated peaking factor of 2.15.[30]

The 2017-2019 data used in this analysis provided information on parkers who stayed more than 10 minutes but less than 10 hours. Using those data, FRA re-estimated short-term parking demand as shown in **Tables 1-9** and **1-10**. 2019 data indicated a peaking factor of 1.56. This value was averaged with the previous peaking factor of 2.15, resulting in the peak factor of 1.86 that was used in the present analysis. Therefore, based on the 2019 data, while there are approximately 425 daily short-term parkers, **only 230 spaces** are needed to accommodate peak demand based on 2019 conditions.[31]

Table 1-9. Estimates of Short-Term Parking Demand (2040) – 50th Percentile

Source	**DEIS Appendix A6 Analysis**	**2017 Update**	**2018 Update**	**2019 Update**
Estimated Short-Term Parkers	860	660	446	425
Estimated Short-Term Space Need	429	355	240	230

Table 1-10. Estimates of Short-Term Parking Demand (2040) – 75th Percentile

Source	**2017 Update**	**2018 Update**	**2019 Update**
Estimated Short-Term Parkers	779	548	525
Estimated Short-Term Parkers	421	296	284

Even with the wider timeframe afforded by the 2017-2019 data, the estimated number of 2040 short-term parkers was substantially smaller than what was estimated in the 2016 analysis.

As was done for long-term parking, FRA also evaluated the trend in short-term parking demand discernible in the 2016-2019 data, a period during which short-term parking demand declined by 63%.

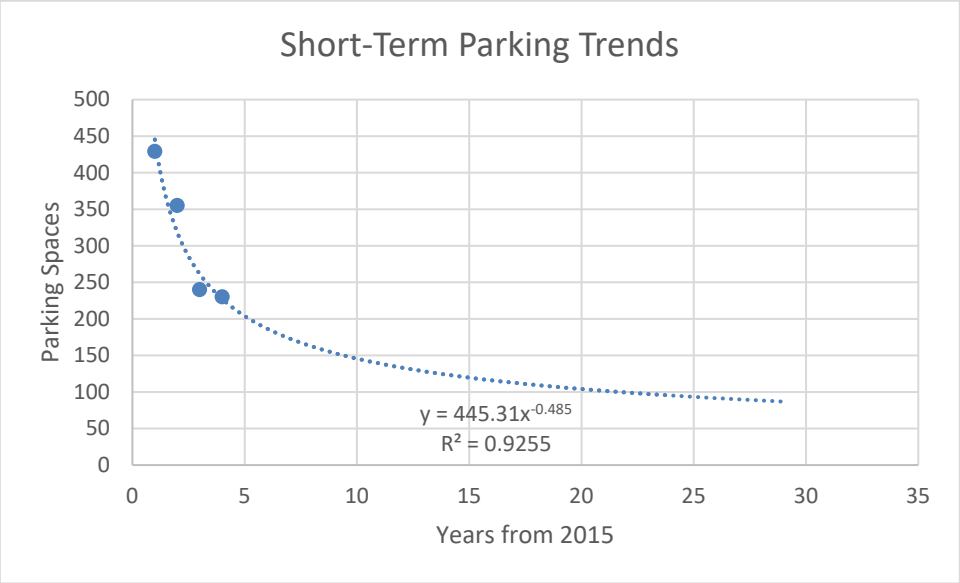
[29] In DEIS Appendix A6, this demand was referred to as "retail." The terminology has been changed to more accurately reflect the range of uses associated with short-term demand at WUS. In DEIS Appendix A6, "retail" parking was rounded down to 400 spaces to reflect a more aggressive approach to managing short-term parking demand.

[30] A peaking factor represents the relative demand in peak times and explains the parking level needed to meet the peak usage period within daily demand.

[31] 2019 was used as the basis for this peaking analysis due to the higher granularity of the available data.

The trend was then projected forward to 2040 using a best-fit power law curve, as shown in **Figure 1-4** below.[32]

Figure 1-4. Estimating Short-Term Demand[33]



Using the formula generated by this analysis, FRA identified a 2040 (year 25) estimate of **100** daily long-term parkers. As parking demand associated with retail is not expected to increase from the future added retail, that finding means that **100 spaces** may be sufficient to meet the 50th percentile of short-term demand in 2040.

1.4.3 Estimated Future Demand – Rental Cars

As noted in **Section 2, Existing Conditions** above, based on the estimate of one operator, approximately 43 percent of current rental car activity is tied to non-local uses. Using this rate as a reasonable proxy for intercity demand, FRA took 43 percent of the total current demand (295) and then grew it by 83 percent (combined intercity growth rate), as shown in **Table 1-11**.[34]

Table 1-11. Estimate of Rental Car Demand (2040)

Factor	
Current Use, per USPG	295
Intercity Share	43%
Current Intercity Demand	127
Intercity Growth Rate	1.83
Rental Car Estimate	**232**

[32] See footnote 29 for further explanation. The formula for this curve is Short-Term Parking Demand = 445.31*year$^{-0.485}$

[33] 2016-2019 parking data included in this chart. 50th percentile parking data.

[34] The available data does not allow for a trend analysis as was conducted for long- and short-term parking.

During the Parking Working Group process, the District indicated that they did not have enough information to assess what would be an appropriate rental car program, but favored a program tied only to the intercity demand. As noted above, FRA believes that the re-evaluated program of an estimated 232 spaces or space equivalents would be appropriate to fully serve this demand.

1.4.4 Estimated Future Demand – Station Land Uses

The Union Station office complex, formerly occupied by Amtrak, totals approximately 120,000 square feet and is located in the PDR-3 zoning district. Based on parking minimums for a transit-adjacent development in the PDR-3 zone (0.4 space per 1,000 square feet), FRA identified the recommended parking level for Station office uses as 48 (**Table 1-12**).[35]

Table 1-12. Estimate of WUS Office Parking Demand

Station Office Parking	
Office Gross Square Feet (GSF)	120,000
PDR-3 Zoning Parking Requirement (Transit-Adjacent) per 1,000 GSF	0.40
Office Parking Spaces	**48**

1.4.5 Estimating Future Demand – Use Case Approach

Due to concerns about the provision of any parking for intercity transportation expressed in DEIS comments, FRA also evaluated specific use cases relating to intercity parking demand. As documented in DEIS Appendix A6*, Parking Program Memorandum,* during the Parking Working Group process, FRA developed a series of use cases for estimating parking demand associated with specific land uses or activities. The above analyses are consistent with this approach. This section further focuses on estimates for long-term and short-term parking demand associated with clear subsets of station users whose transportation needs may be best met by the provision of parking. Those estimates as alternative, not additive, to the short- and long-term parking demand estimates presented above. The use cases considered include:

- **Early Morning/late evening passengers.** Intercity passengers arriving early or departing early in the morning or late in the evening may have limited transit options. DDOT data indicated increases in pick-up/drop-off activity later in the evening as WMATA service decreases then ceases. Providing parking may better manage this demand.
- **Passengers requiring accommodation.** As FRA intends to make WUS accessible to all users, including those with limited mobility, it aims to provide not only ADA compliance, but also design approaches to support older users, individuals with children, and passengers with large luggage. Short- and long-term parking options may be more convenient and useful for passengers meeting these criteria than a busy curbside or underground pick-up/drop-off operation. Short-term parking may include “kiss and ride”-type parking opportunities to allow such passengers to match more easily with their ride.
- **General Kiss and Ride demand.** Some short-term pick-up and drop-off activities for users of all abilities may be best managed through kiss and ride to minimize queueing on active curbsides.

[35] The District recommended that all office uses, whether in PDR-3 or USN, follow the 0.4 spaces per 1,000 square feet outlined in DDOT’s Comprehensive Transportation Review (CTR) guidelines, which is consistent with this estimate.

1.4.5.1 Early Morning/Late Evening Passengers

Based on USPG data for fall 2019, approximately 16 percent of all WUS parkers exit the garage between 9 PM and 7 AM, while 21 percent of all parkers enter during these windows. Approximately 39 percent of these entries and 34 percent of these exits are associated with parking durations of more than 24 hours. If the 40 percent of the 10-24-hour parkers considered to be intercity passengers are included, then approximately 10% of all existing parking activity at WUS involves long-term parkers entering or exiting the facility in the late evening or early morning. In 2019, this represented approximately 78 parkers on an average day and 98 parkers on a 75th percentile day. The parking space estimate for these passengers is shown in **Table 1-13**.

Table 1-13. Early Morning/Late Evening Long-Term Passengers[36]

	Revised Estimate
Estimated Early Morning/Late Evening Long-term Passengers	78
Average Length of Stay	2.30
Intercity Growth	1.83
Assumed Mode Shift	0.81
Long-Term Demand	**266**

To better understand short-term demand, FRA further examined short-term parking activity in the 9 PM – 7 AM timeframe using 2019 data, as shown in **Table 1-14** below. Approximately 9 percent of the daily 10-minute to 2-hour parking occurred during this time period. The activity in this timeframe has a peaking factor of 4.25. Based on 2019 data, on average 22 parkers would park for a short time during this period. With the peaking factor, **5 spaces** would be needed to accommodate these parkers. With the assumed 83% growth rate, future demand would be **9 spaces** in 2040.

Table 1-14. Early Morning/Late Evening Short-Term Passengers[37]

	Revised Estimate
Estimated Early Morning/Late Evening Short-term Passengers	22
Peaking Factor	4.25
Spaces Needed Today	5
Intercity Growth	1.83
Future Short-Term Demand	**9**

[36] Based on USPG 2019 parking data.
[37] Based on USPG 2019 parking data.

1.4.5.2 Passengers Requiring Accommodation

As indicated in DEIS Appendix A6*, Parking Program Memorandum,* FRA estimates that 7 to 10 percent of intercity passengers require some level of accommodation not needed by the general population. By 2040, it is anticipated that approximately 44,000 daily Amtrak and intercity bus passengers will use WUS daily. If 10% of them are assumed to require accommodation, approximately **88 daily spaces** would be needed to serve these passengers, as shown in **Table 1-15**.

Table 1-15. Estimate of Long-term Accommodation Parking

Factor	
2040 daily Amtrak and intercity bus passengers	43,900
Daily boardings	21,950
Daily boardings needing accommodation	2,195
Assumed mode split[38]	4%
Accommodation spaces	88

FRA also reviewed overall short-term parking activity to estimate accommodation parking. As shown in **Table 1-9** above, approximately 230 spaces were needed to accommodate short-term parking demand in 2040 based on 2019 data. Assuming that this overall short-term demand remains constant, **23 spaces** (10 percent) would be needed to provide short-term accommodation parking.

1.4.5.3 General Kiss and Ride Demand

In addition to the short-term parking demand, future WUS operations may require pick-up and drop-off waiting space to promote passenger matching through very short (likely less than 10 minute) parking. As at airports, passengers do not always immediately connect with their ride, which can lead to queueing and delays. The DEIS identified 385 PM period private pick-ups.[39] Assuming that 50% of these pick-ups are accommodated through kiss and ride facilities (192 cars in the peak hour),[40] and that each kiss and ride space has a conservative capacity of four cars/hour, then **48 spaces** would be needed to meet kiss and ride demand.

1.4.6 Comparison to Previous Estimate

Based on the re-evaluation documented in this memorandum, FRA has updated its estimate of future parking demand for the WUS Expansion Project, as detailed in **Table 1-16**.

[38] FRA relied on the existing overall intercity parking mode shift of 4% in making this projection in the absence of other data regarding future trends for passengers needing accommodations.

[39] PM period was used because it is the period of highest PUDO activity.

[40] A conservative assessment based on comparable WMATA station activity.

Table 1-16. Comparison of Future Parking Estimates

Activity	DEIS Estimate	FRA Full Demand Estimate	*Change from DEIS Estimate*	FRA Use Case Estimate -	*Change from DEIS Estimate*
Long-Term Parking	1,076	477	*-599*	354[41]	*-722*
Short-Term Parking	400	100	*-300*	80[42]	*-320*
WUS Office Parking	0	48	*+48*	48	*+48*
Rental Cars	260	232	*-28*	232	*-28*
Total Station	**1,736[43]**	**857**	*-879*	**714**	*-1,022*

1.5 Planning Considerations

The above memorandum identified FRA's approach to re-evaluate the parking program following the DEIS. The two approaches indicated a reduced but still meaningful future demand for parking, as well as specific use cases for which parking may be an effective means of managing vehicular demand. FRA identified the full demand estimate in **Table 1-17** above as the desired parking program for the Project. Providing sufficient parking to meet use cases like those needing accommodations is needed to meet the parking requirements for WUS.

The appropriate parking program for the Preferred Alternative depends on policy and engineering considerations. With the Proponents, FRA evaluated meeting the full demand program in a below-ground facility alongside pick-up and drop-off facilities (see **Section 2**) in the Preferred Alternative. That program would require one half-level in the B2 level of the facility and portions of the B1 level split with the pick-up and drop-off demand. Due to cost and construction time considerations, FRA and the Proponents modified this original vision to include only one below-ground level for parking and pick-up and drop-off activity.

Based on the available space, the parking estimated to be provided at this stage is as shown in **Table 1-17** and consistent with the minimum program outlined by the use case estimate. Parking demand not met by this program would be assumed to make use of Metrorail, pick-up and drop-off, or

[41] Includes long-term late night/early morning demand and passengers requiring accommodation for intercity activity.

[42] Includes short-term late night/early morning demand and passengers requiring accommodation, as well as general kiss and ride activities.

[43] For the DEIS, the planning number of 1,600, which is consistent with this estimate and lease requirements associated with the parking facility, was used to inform facility sizing.

board at another station, such as New Carrollton.[44] Additionally, the parking program ultimately developed will provide an opportunity to accommodate electric vehicle (EV) charging.

Table 1-17. Preferred Alternative Parking Program

Type of Space	Number of Spaces
Long-Term Parking	312
Friends and Family Short-Term Parking	150
Rental Cars	100
Total	**562**

[44] See DEIS Appendix A6.

2 Pick-Up and Drop-off Program

2.1 Introduction

Pick-up and drop-off (PUDO) activity is the principal source of traffic for the Project and a major multimodal element of WUS now and into the future. During the DEIS process, multiple stakeholders expressed concerns about PUDO traffic operations with regard to the overall volume of traffic, the circulation pattern of that traffic around WUS, and the queueing that might result from that traffic on public and private roadways.

Comments from the DDOT and other stakeholders recommended that FRA and the Proponents evaluate a below-ground PUDO facility that would manage pick-up and drop-off activities, including active loading and unloading of passengers and queueing and staging areas. In 2021, the SEP team evaluated this approach and identified a workable framework for moving a meaningful portion of future SEP PUDO operations below-ground. As part of this revised approach, a clear implementation strategy for both curbside and internal facility management of PUDO operations would be required. This section outlines the planning approach envisioned for the revised PUDO program for the Preferred Alternative.

2.2 Approach to Below-ground Facility

There are two forms of PUDO demand envisioned at WUS in the future. The first is "for-hire," (FHV) denoting both taxi and transportation networking company (TNC) services. Throughout the planning process, the SEP team has envisioned that the differences in the regulatory framework between TNCs and taxis would continue to shrink over time. However, certain areas in the DEIS Alternative planning and for the Preferred Alternative envisioned different spaces for taxis versus TNCs. The second form of demand is "private," denoting PUDO activity associated with friends or family dropping someone off at the facility. From an operational standpoint, the FHV PUDO activity can take advantage of "re-match," where, following a drop-off, a FHV can then pick-up a new passenger waiting at the facility. This re-match activity reduces overall traffic associated with the facility.

As in the DEIS Alternatives, in the Preferred Alternative, roadways around WUS would be used for PUDO activity, namely First Street, Second Street, the existing lanes in front of WUS, and adjacent to the train hall on the H Street deck. The below-ground facility would serve as a centralized area to reduce the pressure on, and support the operations of, these other locations. Centralized PUDO facilities are increasingly a fundamental piece of multimodal transportation facilities, particularly airports, in order to manage congestion and operations. In these facilities and in the plan for the Preferred Alternative, different types of spaces are provided for the different elements of PUDO operations. The spaces proposed to be accommodated in the below-ground facility in the Preferred Alternative are listed below:

- **For-Hire Vehicle Queueing for Front of WUS:** Today, taxis serve the front of WUS in the two lanes nearest the historic station. Taxis queue along the existing west and east ramps, sometimes extending as far back as H Street. By providing space for queueing in the below-ground facility, a new ramp from the below-ground area to the front of WUS on the east side could be provided. This approach would remove queueing for the front from the H Street level. The queueing area would be a set of parallel lanes in which FHVs would line up.
- **For-Hire Vehicle/Private Drop-Off Areas:** The below-ground facility would provide areas for FHVs and Private PUDO to drop-off passengers. These areas would be curbsides to allow drop-

off and then exit circulation. Both FHVs and private vehicles could use the same curbside as their operational requirements for drop-off are similar.

- **For-Hire Vehicle Pick-Up Areas:** The below-ground facility would provide areas for FHVs to pick up passengers. These areas would be curbsides to allow drop-off and then exit circulation. Only for-hire vehicles would use curbsides because the matching associated with passenger pick-up for private pick-ups often results in delays that can disrupt pick-up operations.
- **For-Hire Vehicle Queueing and Staging for Below-ground:** The below-ground facility would also provide queueing space for pick-up activities in the below-ground area. The queueing area would be a set of parallel lanes in which taxi FHVs would line up and a set of parking-like spaces for transportation networking company FHVs. These facilities are proposed to be different because of the different types of dispatching approaches used between the two types of for-hire services. However, facility policies and the future of transportation technology may result in a single area being viable. The ability to provide electric vehicle (EV) charging in these areas will be evaluated during design.
- **Private PUDO Parking Areas:** As noted in **Section 1** above, the below-ground facility would also include short-term spaces to facilitate station pick-up and potentially drop-off. These spaces would be designed as a parking facility, similar to a cell phone lot seen at many airports, and would allow for private PUDO vehicles to match with their passengers without clogging up curbsides. The ability to provide electric vehicle (EV) charging in these areas will be evaluated during design.

Table 2-1 shows the space allocated to these activities for planning purposes.

2.2.1 Sizing the Below-ground Facility

Having identified the different types of spaces that the facility would provide, FRA and the Proponents then worked to adequately size the facility. As one option within a multi-location PUDO system in the heart of the city, it is not reasonable to expect all WUS users to make use of a below-ground facility. Additionally, the historic station building remains an important piece of the urban fabric and will remain the front door of WUS.

Under the new concourse plan envisioned in the Preferred Alternative, passengers would board and alight from trains at both a concourse in the general vicinity of the current Claytor Concourse (the south end of the platform) and at the H Street Concourse (more central to the platform). Based on a review of passenger flows, it is estimated that approximately 42 percent of future WUS users would have a travel path that would be convenient for using the below-ground facility. In addition to that program, approximately 15 percent of for-hire PUDO activity would be expected to use the below-ground queueing areas to serve the front of WUS.

Based on this assumed logical program capacity, the SEP team developed square footage goals associated with the PUDO program. These square footage goals include both curbside/queueing and associated circulation.

Table 2-1. PUDO Facility Program Space Planning

Program Element	Planning Goal SF
For-Hire Vehicle (FHV) Queueing for Front of WUS	7,200 square feet (sf)
FHV Queueing for Below-ground	21,600 sf
FHV Staging for Below-ground	37,200 sf
FHV/Private PUDO Drop-off	23,700 sf
FHV Pick-Up	29,400 sf

2.3 Overall PUDO Distribution

The below-ground facility would be one element of the overall distribution of PUDO activity at WUS. As described further in **Section 3,** the front of WUS is envisioned to transition from PUDO and hop-on/hop-off sightseeing bus activity to a place where transit buses take priority. Therefore, based on the capacity of the below-ground facility, the desire to support transit at the front of WUS, and the distribution of activity within WUS, the SEP estimated the distribution of PUDO for both FHVs and Private PUDO activity. This distribution is described in **Table 2-2** below.

Table 2-2. WUS PUDO Distribution

	First Street (PUDO)	Second Street	Front of WUS	H Street	Below-ground Facility
For-hire Pick-Up/Drop-off	5%	3%	35% (AM) 32% (PM)	19% (AM) 21% (PM)	38% (AM) 39% (PM)
Private Pick-up/Drop-off	5%	3%	17% (AM) 19% (PM)	33% (AM) 31% (PM)	42% (AM) 42% (PM)

2.4 PUDO Policy

Implementation of the PUDO facility would likely require policy coordination with District agencies, including DDOT, the District Department of Public Works (DDPW), the Metropolitan Police Department (MPD), and the District Department of For-Hire Vehicles (DFHV), and for-hire vehicle stakeholders. Areas for further policy and planning development as the SEP advances are:

- **Curbside Management:** Reducing congestion on above-ground and below-ground curbsides will require active management. Responsibility for this management would need to be further defined, including enforcement power on Station-controlled and District-controlled spaces.
- **Policies to Encourage Use of Below-ground Facility:** At airports and dense urban developments like the Wharf, agencies have implemented policies to guide for-hire vehicle users to designated locations and to prevent the hailing of vehicles outside of these zones. The implementation of

such policies in this area would encourage the use of the below-ground facility and reduce undesirable spillover of the PUDO program into neighboring areas.

- **Policies to Limit Overall PUDO Activity:** While PUDO is a necessary and important part of the multimodal transportation system at WUS, it is also the principal source of traffic congestion. Therefore, efforts should be made to limit the overall volume of PUDO activity. Policies to discourage PUDO at WUS in favor of other modes could include extra charges for PUDO trips to/from WUS and wayfinding that prioritizes transit access.

3 Bus Program

3.1 Overview

As WUS is a multimodal facility, the bus program plays a large role in the local and regional travel facilitated by the Station. The Union Station Redevelopment Act of 1981 envisioned a critical role for buses at the redeveloped WUS. In 2012, intercity bus service was introduced to the bus deck. As documented in DEIS Appendix A5e**,** *Action Alternatives Refinement Report, Appendix D: Reference Materials,* the DEIS Alternatives envisioned a planning program of 25 slips based on an active, or dynamic, management approach, with Alternative A-C providing 40 slips. Previous early planning related to the bus facility was also documented in DEIS Appendix A3h**,** *Final Concept Development and Evaluation Report, Appendix H: Bus Terminal Capacity Technical Memorandum.*

During the DEIS process, FRA received comments on the bus facility related to the facility size, location, and operations. Bus operators and stakeholders raised concerns about the 25-slip program, the operational approach, and the perception of the bus facility as separated from the larger planned WUS facilities. Other stakeholders in the District expressed a desire to minimize the size of the bus facility to fit within an urban context. Congresswoman Eleanor Holmes Norton, in her letter to the National Capital Planning Commission, endorsed a 40-slip facility for WUS.

Based on this range of stakeholder comment, FRA coordinated with the Project Proponents to develop updates to the bus facility related to size, operations, and location and design. In developing this program, FRA and the Project Proponents coordinated with the bus carriers on planning and design assumptions. FRA and the Project Proponents also coordinated with DDOT given the facility's role as the central intercity bus hub in the District.

This section outlines the updates to the location and design, the facility size, the operations approach, and the continued coordination and policy considerations associated with the bus facility.

3.2 Location and Design

In considering updates to the facility, FRA and the Project Proponents evaluated potential options for its location. The SEP team first considered north-south oriented facilities either on the west or east side of the air rights above the tracks south of H Street. In evaluating facilities, the SEP team sought opportunities to improve the ability for the facility to integrate with the station and planned land uses. However, accommodating these connection considerations resulted in these north-south options facing challenges in successfully facilitating bus operations due to the constrained geometry of the resulting bus facilities. That geometry would have limited flexibility and result in inefficient bus circulation patterns.

Therefore, FRA and the Project Proponents evaluated options for an east-west-oriented bus facility north of the train hall. The team considered options that would place the facility aboveground, at-grade, or submerged into the H Street deck. All options would successfully accommodate bus operations by providing efficient bus slip and circulation layouts, with access provided from both the west and the east service roads at the H Street level. However, the options above the deck would interrupt views of the barrel vault of the Historic Station and/or pedestrian circulation on the deck level. Therefore, FRA and the Project Proponents advanced the east-west option submerged in the H Street deck. This approach is shown in **Chapter 3,** *Alternatives.* This approach would also permit potential charging infrastructure for battery electric buses.

In addition to operational advantages, the east-west facility integrated the bus facility into the main space of the station train hall, with passenger waiting areas provided in a train hall mezzanine. This integration would result in easier multimodal connections for bus passengers and easier access to existing and planned amenities in the station. FRA and the Project Proponents shared the east-west approach with bus stakeholders in 2021. The stakeholders expressed support for the design and orientation of the facility and its integration with these larger station elements. Specific comments related to bus slip design are described further in **Section 3.3** below.

3.3 Bus Facility Demand

The SEP team took a three-step approach to analyze the future demand, operations, and resulting slip need for the bus facility: a) document existing volumes for core operations,[45] b) grow these volumes, and c) then establish the operational program that defines the slip need (see **Section 3.4** below).

3.3.1 Existing Volumes

For intercity operations, the WUS team collected pre-COVID schedules for carriers at the facility and documented exact bus volumes throughout each day and across the week. The data established patterns of intercity demand by day and hour, with peak demand typically occurring within hourly windows on Friday and Sunday afternoons. For tour/charter operations, the WUS team used counts of tour/charter activity provided by USRC in May-June 2016 and in December 2018-December 2019. March through June represents the peak tour and charter season. Tour/charter activity regularly peaks during the meal hours and is higher on weekdays than weekends.

3.3.2 Future Growth

To plan for 2040 conditions, the SEP team then grew the volume of activity at the facility by two factors, one for intercity bus operations and one for tour/charter bus operations.

3.3.2.1 Intercity Bus Operations

The intercity growth factor used in the DEIS was 27 percent. This growth factor derives from the *NEC FUTURE* process, which was also used to estimate the growth rates of the intercity and passenger rail activity. The Action Alternative has smaller bus growth because lower-cost rail services included in *NEC FUTURE* would be expected to capture some of the bus demand. The WUS team used the 27 percent growth factor in the DEIS as a reasonable and conservative planning estimate for the intercity bus operations.

However, the bus carriers expressed concerns that this growth rate was inadequate to capture expected demand and to accommodate future services being introduced in the bus facility.[46] Therefore, FRA and the Project Proponents evaluated a range of estimates to understand whether another growth rate would be more appropriate for planning in the SDEIS.

A review of estimates identified the following growth potential growth rates and their source:

- **Federal Highway Administration (FHWA).** FHWA developed a Travel Analysis Framework (TAF) Multimodal Interregional Passenger Travel Origin Destination Data project, in which intercity bus travel was modeled. The 2014 estimates indicated a 27 percent growth to 2040 in

[45] Core operations are defined as regular scheduled intercity service and regular tour/charter service. Large, infrequent event tour buses, as well as DC Circulator, shuttles, and long-term storage of vehicles are not included.

[46] While the bus carriers have provided information regarding schedules, operating assumptions, and peak hour operations, bus carriers did not provide a growth rate based on their long-term planning.

Washington bus passenger demand. [47] These estimates are consistent with what was used in the Station Expansion Project DEIS.

- ***NEC FUTURE* FEIS Preferred Alternative.** The Preferred Alternative for *NEC FUTURE* envisions bus demand being partially captured by new, low-cost rail service, referred to as the Metropolitan service, and also assumes investments in rail that increase its time competitiveness. As a result, the Preferred Alternative scenario estimates a 16 percent growth to 2040 in Washington bus passenger demand. [48] These estimates are lower than what was used in the Station Expansion Project DEIS.
- ***NEC FUTURE* FEIS No-Action Alternative.** The No-Action Alternative for *NEC FUTURE* assumes that rail capacity and speed-enhancing projects on the Northeast Corridor would not be constructed and that the Metropolitan service would not be introduced. The No-Action Alternative scenario estimates a 49 percent growth to 2040 in Washington bus passenger demand.[49] These estimates are higher than what was used in the Station Expansion Project DEIS.
- **DePaul Chaddick Institute.** DePaul's Chaddick Institute studies trends in the intercity bus industry. Their 2020 report on the New York – Washington bus market indicated a 7.6 percent growth in New York-Washington service between 2009 and early 2020, which would translate to a 14.5 percent growth rate to 2040.[50]

Based on feedback from the carriers and the District that the facility should seek to provide flexibility for a high rate of future demand, FRA and the Proponents indicated that the 49 percent growth rate would be used to inform the bus facility.

3.3.2.2 Tour/Charter Bus Operations

For the tour/charter data, as documented in DEIS Appendix A5e**,** *Action Alternatives Refinement Report, Appendix D: Reference Materials,* the SEP team used Destination DC visitor statistics to identify the annual growth rate for tourism to DC. Based on this rate, the project assumed that tour/charter growth would occur in a direct, linear, and proportional relationship with overall visitor growth. That resulted in a 51 percent growth rate to 2040.

3.4 Bus Facility Operations

With the existing volumes and future growth established, the SEP team then modeled the future space needs to meet the expected program. Informing these space needs is the operational program planned for the bus facility. The approach to refining the operational program included a) setting the overall management approach, b) confirming the assumptions associated with bus operations at the facility, and c) refining the management approach based on stakeholder feedback.

[47] FHWA. 2014. "Traveler Analysis Framework." Accessed from https://www.fhwa.dot.gov/policyinformation/analysisframework/03.cfm. Accessed on November 16, 2022.
[48] FRA. 2017. NEC FUTURE FEIS. Accessed from https://www.fra.dot.gov/necfuture/. Accessed on November 16, 2022.
[49] Ibid.
[50] Brian Antolin. 2020. "The Evolution of New York – Washington Intercity Bus Service: 2000 to 2020." Chaddick Institute. Accessed from https://las.depaul.edu/centers-and-institutes/chaddick-institute-for-metropolitan-development/research-and-publications/Documents/New%20York%20-%20Washington%20Working%20Paper%20Final%20(1).pdf. Accessed on November 16, 2022.

3.4.1 Facility Management Approach

A fundamental planning element of the SEP is to expand operations in a way that makes efficient use of limited and constrained urban space. Improved turnaround times for rail operations are essential for achieving the substantial rail growth envisioned in the Project, with a greater than doubling of rail ridership accomplished primarily through new operational efficiencies. The new concourse network is designed to more move passengers throughout the facility. The below-ground PUDO facility is designed to provide a high-capacity and efficient operation removed from District streets.

The bus planning took a similar approach. To manage peak demands, the facility would make use of active, or dynamic, management. Using dynamic management, the owner-operator of the facility would seek to use planning time guidelines to manage demand. Individual slips would not be assigned to specific bus operators, as they are today, but would be allocated dynamically based on facility operations. This "pooling" of capacity allows more overall throughput. This strategy is used in bus facilities in Europe, New Zealand, and in transit bus applications in the US, but has not been used in the US for intercity or tour/charter operations, as described in **Section 3.4.2** below. Additionally, in order to provide buses with additional flexibility in operation even under a dynamically managed environment, the facility would make use of a meaningful number of "flex slips" that would generally be programmed for staging and storage, but also may be used to accommodate peak demands.

3.4.2 Dynamic Management Precedents

Because this approach to dynamic management is relatively new to multimodal facilities, the SEP team reviewed other locations that have adopted similar approaches in intercity and transit contexts.

There are two methods in making dynamic assignments, either through low-tech, manual entry approaches in small facilities like Birmingham, Alabama, or through software-informed approaches, as seen elsewhere in the world. This scheduling software can leverage automatic vehicle location (AVL) data to alert the hub of the bus's likely arrival time and facilitate bay assignment, as is done in Perth, Australia and Christchurch, New Zealand.

This section divides dynamically managed facilities between those that include intercity operations, potentially with other services like transit bus or tour/charter, and those that are transit-bus-only but have relevant planning features applicable to the design of the WUS terminal. Such planning features, as described further below, include angled slip design, zonal assignment of bus slips, and facility controllers who oversee and direct operations in coordination with bus operators and carriers.

3.4.2.1 Facilities with Intercity Services

Birmingham Intermodal Facility

In Birmingham, Alabama, intercity and transit buses arriving at the Birmingham Intermodal terminal go to the first available bay upon their arrival without a software or human manager. The bus operator then manually enters in their route/departure number, and electronic signs and announcements are made throughout the terminal to notify customers where to board. In this eighteen-bay facility, this approach is employed for both the transit buses and the intercity Greyhound and Megabus services that service Birmingham. There are an estimated 60 round trip bus movements in and out of the facility each day.[51]

[51] Federal Transit Administration. 2011. *Finding of No Significant Impact: Birmingham Intermodal Transfer Facility*. Accessed from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Signed%20FONSI%209-21-2011_0.pdf. Accessed on July 1, 2021.

ZOB Hamburg: Hamburg, Germany

ZOB Hamburg serves as the central intercity and tour bus facility for Hamburg, Germany. This station has 14 bus berths with a computer-based system that schedules flexible berth assignments and communicates them to both passengers and drivers. Bus schedules are generated automatically every morning based on upcoming timetables and schedules and then schedules are modified by human controllers based on apparent conflicts. Bus drivers can see their bus assignment at a display as they enter the station. Passengers can view arrival and departure information both from displays throughout the station and via the internet. PSI Transportation GmbH,[52] a Berlin software company, was used for the information and control system used for the dynamic bus bay assignment. This station includes service from intercity bus operators, such as Flixbus, and tour buses, such as Becker Reisen. There are ten operators that serve this station. This facility, at 3 million annual passengers, is comparable to WUS annual passenger volumes.[53]

Nijmegen and Eindhoven: The Netherlands

Dynamic bay assignment originated in The Netherlands, with the earliest facilities beginning use of such systems in 1990. The latest technology to support fully dynamic facilities is known as D-BUS (Dynamic Bus Platform Assignment and Information System) and is active or ready to be activated at four facilities. Nijmegen Centraal Station has 10 bays that are served by Breng – local Dutch public transit, NIAG – local German public transit, and the intercity route operator Arriva, as well as an airport shuttle operated by KLM. The dynamic D-BUS system here has resulted in a 70 percent reduction in space needs for bus operations.[54]

Dynamic operations have been in place in Eindhoven since the early 1990s. Eindhoven is served by both Hermes Bus and Connexxion – local Dutch public transit operators – and Arriva, an intercity operator.

Toronto Union Station: Toronto, Canada

Toronto's Union Station has adopted a dynamic bus allocation system for the new GO bus terminal, serving commuter and intercity bus. The new terminal opened in December 2020. The new terminal has 14 bays on two levels, doubling the number of bays from the old terminal. Eight to nine bays are assigned to GO Transit while the remaining bays are for intercity carriers. The station has GO Transit service as well as service from seven intercity bus operators. The dynamic bus system is currently operated manually on a weekly basis. Slots are leased to carriers in 15-minute slots based on observed occupancy times.

Staff are provided to greet and direct buses and bus passengers. Buses are initially assigned to a zone, with all slips in a single zoon within 200-300 feet of each other. The terminal has electronic displays installed to provide passengers the zone for their trip three hours before departure, with signs in each zone providing information for the exact bay to use 20 minutes before departure. Static signs accompany dynamic signs.

The terminal uses a slot fee model where they sell slots to the intercity carriers, which are priced around GO Transit's peak periods, with highest fees being in the PM peak. Metrolinx also has operating rules regarding what third party carriers can and cannot do within the terminal to discourage long layovers.

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[52] *Intelligent Transport.* 2005. "RTPI @Hamburg's new Central Bus Station." Accessed from https://www.intelligenttransport.com/transport-articles/2199/hamburgs-new-central-bus-station/. Accessed on July 1, 2021.

[53] Ibid.

[54] David Crawford. 2013. "Vehicle identification systems aid dynamic bus operations." *ITS International.* Accessed from https://www.itsinternational.com/its8/feature/vehicle-identification-systems-aid-dynamic-bus-operations. Accessed on July 1, 2021.

Alongside these policies, Metrolinx has accommodated the rental of bays for the entire day based on carrier requests.[55]

3.4.2.2 Transit Bus-Only Facilities

Perth Station: Perth, Australia

Transperth is a public transit agency in Perth, Australia which has been using a dynamic bus bay allocation model. [56] In its so-called "busport" serving local transit buses, there are two zones: Zone A and Zone B, each with 8 bus bays for a total of 16 bays. In this zone-based model, the same bus always leaves from the same zone. Therefore, if a passenger takes the same bus frequently, they will know which zone they need to wait in. For bus operations, this zonal approach still allows efficient sharing of slips within zones.

The buses are allocated departure stands a few minutes before they arrive at the facility, which are then displayed on the departure screen. There is also an app, Transperth Assist, which tells passengers which stand their bus will be departing from. Next Generation Technologies implemented the dynamic stand management system and real time tracking system for the station. [57] The busport only has Transperth transit bus service, no intercity buses operate out of the station. Approximately 28,000 daily passengers use the facility.[58]

Christchurch: Christchurch, New Zealand

Christchurch[59] faced an issue of having limited space when designing their latest so-called "bus interchange," where multiple transit bus routes converge. Given the reduced footprint of the facility, Christchurch decided to implement a dynamic bus bay allocation system with a compact, pull-in-back-out bus bay station design with 16 bays. This slip choice is consistent with the design used in intercity facilities like WUS, providing a useful comparison despite the transit nature of the facility. The facility manages 96 bus movements per hour.[60] The company Connexionz was used to redesign, develop, and install the technology for the bus management. [61] The system tracks buses as they approach the station to assign them to free bus bays.

[55] Interview with Metrolinx staff. July 2021 and January 2023.
[56] Transperth. 2022. "Perth Busport."Accessed from https://www.transperth.wa.gov.au/PerthBusport. Accessed on November 18, 2022.
[57] NGT. 2021. "Intelligent Transportation Solutions." Accessed from https://www.ngtdowner.com/intelligent-transport-solutions. Accessed on May 30, 2021.
[58] David Prestipino. 2016. "Public sentiment riding on the rails as Transperth opens new $217m Perth Busport." Accessed from https://www.watoday.com.au/national/western-australia/public-sentiment-riding-on-the-rails-as-transperth-opens-new-217m-perth-busport-20160712-gq43w2.html. Accessed on May 20, 2021.
[59] Jarrett Walker. 2015. "Christchurch: A New Transit Hub." Accessed from: https://humantransit.org/2015/11/christchurch-a-new-transit-hub.html. Accessed on May 13, 2021.
[60] Gledhill et al. 2015. "The Delivery of the new Christchurch Bus Interchange." Accessed from https://www.scnz.org/wp-content/uploads/2020/11/THE-DELIVERY-OF-THE-NEW-CHRISTCHURCH-BUS-INTERCHANGE-da-Silva-min.pdf. Accessed on July 2, 2021.
[61] Connexionz. 2017. "Christchurch Bus Interchange Redesign." Accessed from https://www.connexionz.com/wp-content/uploads/2017/10/CS-Christchurch-bus-exchange.pdf. Accessed on July 1, 2022.

Figure 3-1. Christchurch Station Layout[62]

As in Perth, the facility uses a zonal approach to slip assignments. The facility is divided into four sections of four slips each, with specific routes assigned to the sections, but not to any specific slip. When certain routes see substantially higher demands, those routes can bleed into adjacent zones in order to achieve 5 or 6 slips-worth of capacity.

The facility is overseen by a controller with view of the station bus operations that provides slip assignments to buses as they enter the facility. The station also has audio announcements and Braille totems to help hearing and visually impaired passengers find their bays. The station only serves local public transit routes; there is no intercity bus service here.

These examples were used to inform the approach to active/dynamic management operations in the Preferred Alternative, as described in **Section 3.5.3** below.

3.4.3 Bus Operational Assumptions

To further determine the bus slip needs at the facility, FRA and the Project Proponents needed to understand how much time buses would occupy on average. The SEP team received feedback from the bus operators on operational assumptions for boarding, alighting, and staging between bus movements. Bus operators also provided feedback on what proportion of buses perform a "full movement," with alighting, staging, and then boarding of a new bus route, versus which buses would arrive at the facility for either passenger alighting or boarding but not both. Based on the feedback from carriers and operations of the facility, FRA and the Project Proponents developed two scenarios to model to estimate future demand for the facility, as shown in **Tables 3-1** and **3-2** below.

[62] Source: Warwick Isaacs. 2014. "Bus Interchange a world-class facility." *Stuff* Accessed from https://www.stuff.co.nz/the-press/news/transport/9877648/Bus-Interchange-a-world-class-facility. Accessed on October 10, 2021.

Table 3-1. Modeled Bus Time Scenario 1

Intercity Activity	**Share of Activity**	**Time in Facility**
Alighting, Staging, then Boarding	60%	110 minutes
Alighting or Boarding Only	40%	25 minutes per boarding/alighting
Tour/Charter Activity	**Share of Activity**	**Time in Facility**
Alighting, Staging, then Boarding	60%	110 minutes
Alighting or Boarding Only	40%	25 minutes per boarding/alighting

Table 3-2. Modeled Bus Time Scenario 2

Intercity Activity	**Share of Activity**	**Time in Facility**
Alighting, Staging, then Boarding	60%	105 minutes
Alighting or Boarding Only	40%	30 minutes per boarding/alighting
Tour/Charter Activity	**Share of Activity**	**Time in Facility**
Alighting, Staging, then Boarding	60%	90 minutes
Alighting or Boarding Only	40%	15 minutes per boarding/alighting

The slip utilization times in **Tables 3-1** and **3-2** were selected because they represented reasonable estimates of the time that intercity or charter buses would need to either complete a full turnaround of both alighting and boarding passengers, or to include some staging or waiting time between alighting and boarding to accommodate schedule needs in the case of intercity buses, or passenger exploration and dining at WUS in the case of charter buses. These times were informed by coordination with the intercity and tour/charter carriers. The 40-60 split between the shorter and the longer time emerged both from that same coordination and from analysis checks to match existing bus operations with these assumptions.

These scenarios represent reasonable approaches to estimating demand, allowing the majority of buses to spend, on average, at least an hour and a half in the facility between arrivals and departures. These scenarios are also more flexible than the approach taken in the DEIS, where all buses were limited to a 30-minute operation. This flexibility would respond to multiple stakeholder comments. Operators expressed concern that the 30-minute operation was too tight for the range of potential outcomes for buses that have to contend with traffic, provide for operator rest, and accommodate bus inspections and cleaning. Additionally, neighborhood stakeholders have expressed concern about the volume of buses using H Street NE and other nearby roadways. This flexibility would permit the facility to meet the future demand with fewer deadhead bus trips for laying over, as compared to the planning approach presented in the 2020 DEIS.

3.5 Developing the Bus Facility Size

With the operational assumptions informed by the information in **Section 3.4**, FRA and the Project Proponents then modeled the estimated bus slip demand in 2040 for the facility to determine its appropriate size. FRA and the Project Proponents used the two scenarios in **Section 3.4** to evaluate different potential future operating contexts. As shown in **Figures 3-2** and **3-3** below, the modeling conducted estimated hour-by-hour demand in the facility on a regular weekly basis.

In the figures, the bars represent the weekly peak at that hour. The facility would have a peak demand of around 33-34 slips in the 5:00 PM hour on Sundays.

Figure 3-2. Projected 2040 Bus Slip Demand, Modeled Scenario 1

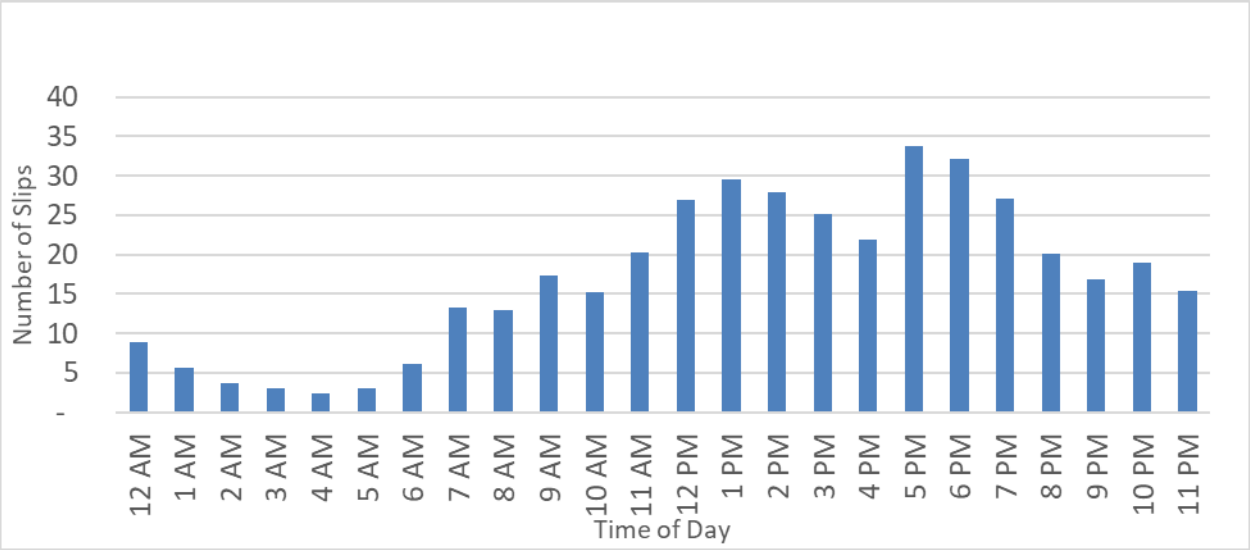
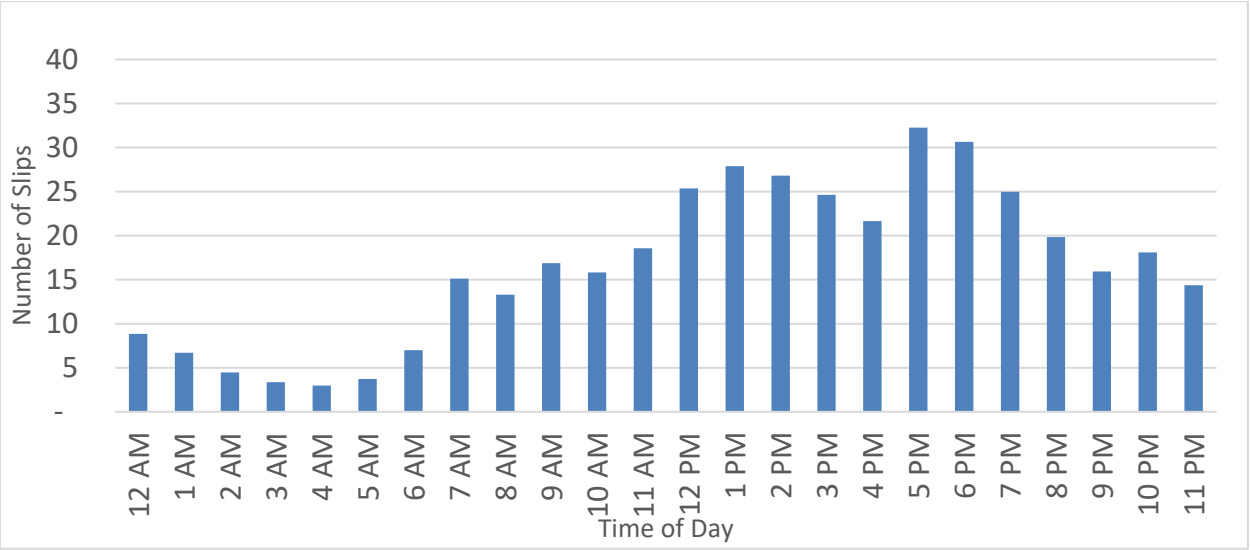


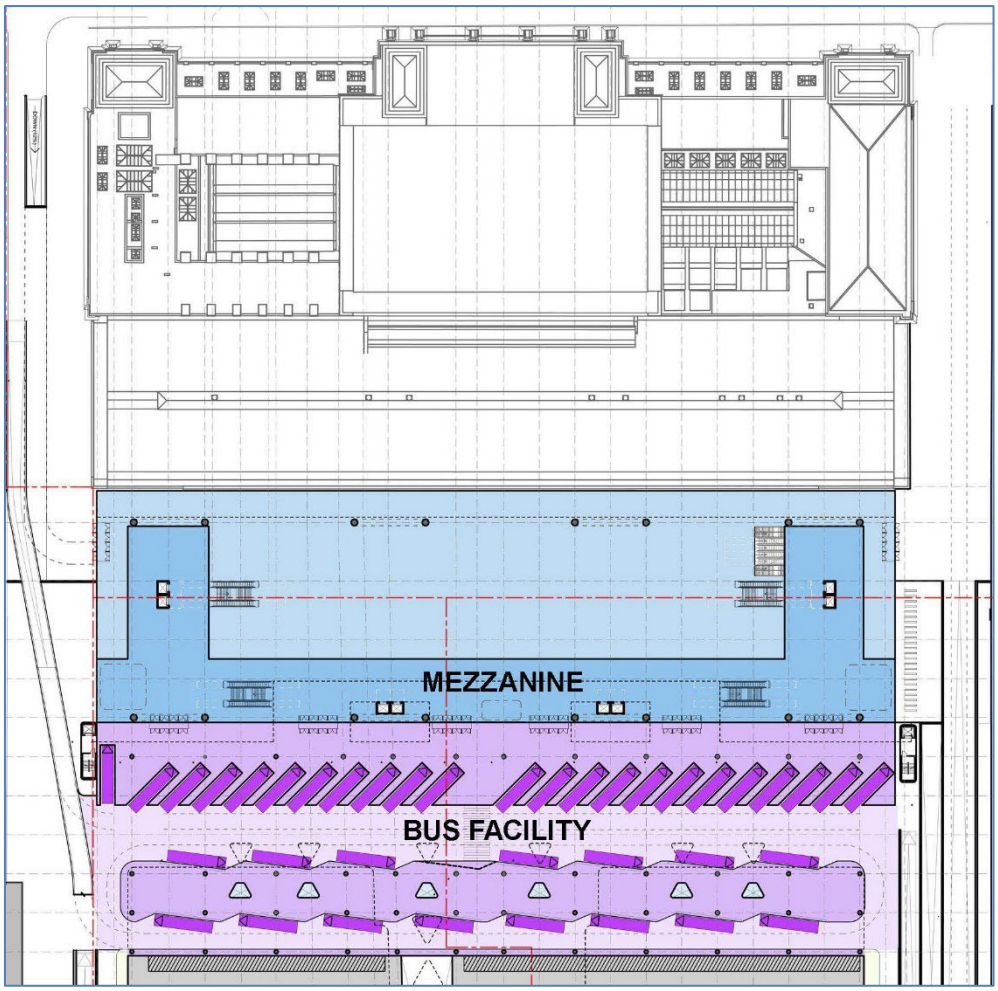
Figure 3-3. Projected 2040 Bus Slip Demand, Modeling Scenario 2



With the demand information in-hand, FRA and the proponents then considered the appropriate size of the facility itself. FRA and the Project Proponents indicated that a buffer of approximately 15 percent would provide flexibility for the facility, consistent with the increase in demand seen during holidays (see **Section 3.5.1** below). This buffer would result in a facility demand of 37-38 slips between the two scenarios.

The SEP design team then evaluated accommodating this program in the east-west bus facility (described in **Section 3.2**). The design indicated that a facility with 23 angled slips, 15 permanent sawtooth slips, and one sawtooth slip that could be activated in certain occasions could be accommodated. This facility is shown in **Figure 3-4** below.

Figure 3-4. Preferred Alternative Bus Facility Design

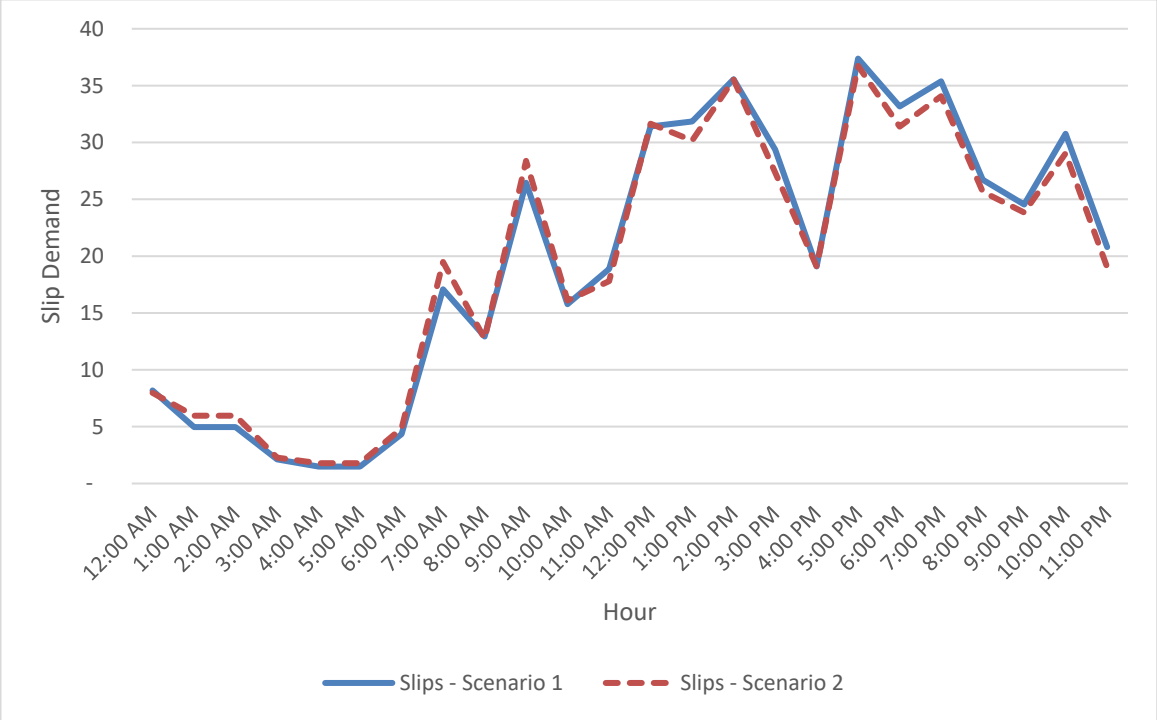


3.5.1 Meeting Holiday Intercity Demand

The Wednesday prior to and the Sunday after the Thanksgiving holiday represent major peak demand times for the facility. At the request of the intercity carriers, the SEP team evaluated how bus volumes increase during the yearly peaks and whether those could be accommodated within the facility. Based on proprietary business information provided by the carriers, the SEP team identified the increased volumes expected for the Wednesday and Sunday around the Thanksgiving holiday.

In analyzing that activity, the SEP team kept all other assumptions constant, such as the time assumptions described in **Section 3.4.3** above and tour/charter volumes.[63] The analysis showed that while the facility would approach its maximum capacity on the Thanksgiving Sunday (**Figure 3-5**), bus demand would still be able to be accommodated in the 38-39 slip facility, with demand reaching a maximum of 37 slips in the 5:00 PM hour in either scenario. This finding reinforces the appropriateness of the 38-39 slip facility identified, as it indicates that the facility is well-sized to meet expected, yearly peak demand.

Figure 3-5. Projected Bus Slip Demands, Thanksgiving Sundays



3.5.2 Meeting Peak Tour/Charter Demand

When major events happen within the District, the WUS facility sees additional demands associated with tour/charter bus activity. WUS serves as a piece of the District's overall special event management coordinated by the Mayor's Office of Special Events.

In current operations, there are two ways that special events result in modifications to WUS bus facility operations: active pick-up/drop-off slips and dense parking. Under dense parking, additional buses are placed in ad-hoc parking spaces within the facility.

The pick-up/drop-off strategy involves the use of two slips for active loading and unloading, and extensive coordination with the tour/charter carriers using WUS for a special event without reservations. Groups and buses are organized at the facility, and buses are staged near the facility to be quickly cycled through the facility for pick-up or drop-off. This operational approach in today's condition and in a No-Action Alternative environment, makes use of the District streets, notably H Street, as a

[63] FRA and the Project Proponents note that the assumption to maintain tour/charter volumes consistent for the purposes of this analysis is conservative, as USRC data indicate that tour/charter volumes decrease during the holiday season. Conversations with intercity bus carriers suggest that tour/charter operators are providing additional service for intercity carriers during this time.

component to meet the demands of tour/charter buses during large events. This management strategy for pick-up/drop-off could continue in the future within the new facility, as space allows.

To estimate the prevalence of "special events," FRA and the Project Proponents further reviewed USRC data. As part of planning the facility, the SEP team has relied on data from USRC to understand the tour/charter volumes. The modeling has relied on tour/charter volumes from the high spring season of tour/charter demand at WUS to serve as a baseline. To answer this question, FRA further reviewed a year of bus data from fall 2018-summer 2019 and grew the volumes based on the 51 percent growth rate used to project future demands.

Using this information, FRA and the Project Proponents evaluated when increased tour/charter activity in 2040 would result in an increase in volumes beyond the buffer created by the 39 slips. The team identified that approximately 4-10 days would see elevated tour/charter bus volumes annually that would require additional management on-site outside of the facility.[64]

Based on the USRC data, the dates where the facility would be at capacity are associated with March for Life, the Cherry Blossom festival, and Memorial Day week. It appears that most of Memorial Day week serves as a special event week where operations would be affected. The timing of the peak periods is such that these large events are primarily expected to occur within be the spring tour/charter high season; therefore, the need for special operations would appear to be concentrated during that portion of the year.

In addition to the pick-up/drop-off operational approach described above, the second way that large events are handled today is to employ operational measures to increase parking levels temporarily. To accommodate the additional demand projected in the future, FRA and the Project Proponents have identified additional strategies for bus operations and parking on the site. During special events, the H Street PUDO area adjacent to the proposed train hall could be converted to a place for bus operations and parking, with approximately 15 buses accommodated.

Therefore, even with the generous space assumptions shown in the figure below, during special events, the facility would potentially have at least 54 bus spaces available. With this expandable, flexible approach, a comparable special event program can be managed at the facility in the future. Commitments and further coordination related to special events are described in **Section 3.6.1** below.

[64] The Mayor's Office of Special Events, not the facility, is the clearinghouse for special event activity in the District. Therefore, this represents a best estimate based on information available to the facility.

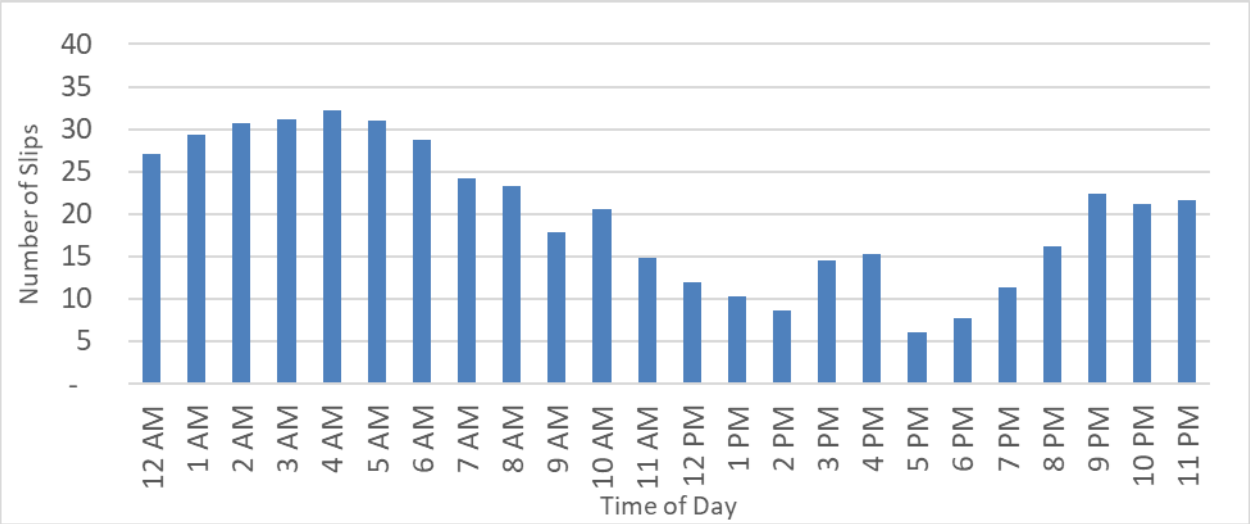
3.5.3 Operational Approach Considerations

Having estimated the demand and developed a facility size that can accommodate peak demands, FRA and the Project Proponents considered how the approach to facility management and operations (see **Section 3.4.1** above) could further respond to comments from carriers. Intercity carriers had expressed concerns that a fully actively managed facility would put constraints on their operations and may create confusion for passengers looking for a bus slip.[65]

Therefore, FRA and the Project Proponents identified opportunities to clarify the operational approach. Building on the international examples explored in **Section 3.4.2,** it is appropriate to make use of a "zonal" approach to slip assignment. As a result, while a particular bus arrival may not always go to slip 2, but it would always go to, for example, slips 1-4. Additionally, a balance of permanently assigned slips and then some slips that are shared could achieve much of the same capacity benefits of a fully dynamic model while providing more certainty to carriers. These approaches would be further evaluated as the Project advances.

FRA and the Project Proponents also considered when during the day dynamic management might be needed. As shown below (**Figure 3-6**), under Modeling Scenario 1, large portions of the day would see greater than 10 slips availability in the facility. Outside of the daily peak hours around lunch time and 5:00 PM, it is likely that slips could be assigned in a more traditional manner. Additionally short-term bus storage and layover needs could be accommodated, including in the overnight periods. These considerations will be further evaluated as the Project advances.

Figure 3-6. Available Slips on Daily Basis in 2040[66]



3.6 Future Planning, Project Commitments, and Carrier Comments

The bus facility program incorporated in the Preferred Alternative and described in this section continues to be the subject of coordination and dialogue with bus operators and other stakeholders. Future planning will further refine the design of the facility, the layout of bus slips, and the overall

[65] For tour/charter operations, the facility today operates in a dynamic management fashion, where tour/charter buses are assigned the available slot and make reservations for available timeslots.

[66] The weekly average of available spaces from Modeling Scenario 1 is shown.

management approach. Additionally, FRA and the Proponents have made a series of commitments, as described in **Section 3.6.1** below.

In July 2022, FRA and the Proponents presented the Preferred Alternative to the National Capital Planning Commission (NCPC). The bus operators provided testimony at NCPC outlining priority areas for further consideration, as noted in **Section 3.6.2** below.

3.6.1 Project Bus Commitments

Based on feedback from bus carriers and the District Department of Transportation, FRA and the Project Proponents outlined the central planning issues that would serve as the basis of project commitments: operations, design, and evolving operating trends. These issues are incorporated into the below project commitments.

Operations Plan - USRC would develop a Bus Facility Operations Plan in coordination with the bus carriers using the facility, DDOT, and the Mayor's Office of Special Events. The plan would address:

- Approach to dynamic management, including use of zones and patterns to improve wayfinding and operations;
- Technology used to implement management approach;
- How special events in the District will be managed;
- How peak intercity periods will be managed;
- How revenues, costs, and slip fees will be managed and allocated in the facility to balance operational and maintenance needs and bus industry economics;
- Safety and security systems planning; and
- Operational approaches for electric charging or other alternative fuels.

Design - USRC would coordinate with the bus carriers on the design of the future facility and multiple connections and amenities for bus passengers.

Evolving Operating Trends - USRC would regularly evaluate trends in bus demand at WUS and in the District to identify refinements to operations planning or design.

3.6.2 Bus Operator NCPC Comments

As noted above, at the July 2022 NCPC hearing and in a subsequent letter to USDOT, Greyhound Lines submitted testimony outlining areas for the Project to address. Those areas included continued coordination on a larger bus facility, the management of the additional bus slips provided on the H Street level, the operating costs of the facility, and the prioritization of scheduled service.[67] USRC will continue to coordinate with the bus carriers on these and other issues through the EIS process and Project planning.

[67] Testimony of Greyhound Lines, Inc. before the National Capital Planning Commission. July 7, 2022: Letter from the Washington Union Station Bus Coalition to USDOT. December 7, 2022.

4 Pedestrian and Bicycle Program

4.1 Introduction

During the DEIS process, FRA and the Proponents received feedback regarding the pedestrian and bicycle program for WUS. Comments and subsequent updates focused on three areas:

- The provision of adequate bicycle parking and storage to accommodate growth in bicycle access to WUS;
- The approach to the west ramp to facilitate pedestrian and bicycle access on the west side of WUS; and
- The ability to improve pedestrian and bicycle access to WUS.

Following the DEIS, FRA and the Proponents worked to identify opportunities for additional bicycle parking and facilities and to develop a plan and program for the west ramp that better accommodated pedestrian and bicycle connectivity. This section describes how those efforts were incorporated into the Preferred Alternative.

4.2 Bicycle Parking and Storage

As a multimodal transportation hub, the SEP aims to achieve a high level of bicycle parking and storage to support the use of bicycling as a meaningful mode of access to WUS. The District of Columbia has some of the highest rates of bicycle commuting in the country and has a well-developed Capital Bikeshare network.

The DEIS Alternatives included approximately 200 bicycle storage spaces beyond that available pre-pandemic, in addition to a total of approximately 100 Bikeshare spaces. While that size was expected to meet future demand, following the DEIS, FRA and the Proponents looked for opportunities to meaningfully expand the future capacity. This goal, informed by stakeholder feedback, was designed to create an opportunity for greater mode-shift toward bicycles in the future and to respond to the ongoing policy commitment of the District to expand the bicycle network, which is likely to increase bicycle use in the future.

Accordingly, in the Preferred Alternative, the SEP team identified a total of 900 spaces. The locations of this bicycle storage include within the station near the First and Second Street entrances to the H Street Concourse and adjacent to the west and east ramps, for a total of four storage locations accessible to bicyclists arriving at the station.

4.3 West Ramp

In the DEIS, Alternative A-C identified the west ramp as a space for continued vehicular access and circulation on site. This approach was consistent with DDOT feedback at the time related to maximizing internal circulation in an effort to reduce traffic on District roadways. However, feedback during the NCPC Commission meeting in January 2020 and subsequently in response to the DEIS indicated a strong desire among agencies and stakeholders to envision the ramp as a space primarily for pedestrians and bicycles.

Therefore, FRA and the Project Proponents updated the design of the west ramp such that it would serve to provide multimodal access to the H Street deck level. The ramp connects from the front of WUS

to the south end of the H Street Bridge. At that location, it is envisioned that a large crosswalk would provide access for pedestrians and bicyclists to the north side of H Street.

District planning documents have previously called for the construction of a "greenway" from WUS to the end of the separated Metropolitan Branch Trail north of L Street NE. This project would require decking over the WMATA right-of-way to make the connection and is outside of the scope of the SEP. However, the revised approach to the west ramp facilitates, and does not preclude, the future construction of the greenway north of H Street.

4.4 Pedestrian and Bicycle Access

Consistent with the DEIS Alternatives, the Preferred Alternatives includes improvements to the pedestrian and bicycle environment at WUS. The southwest corner of the front of WUS would be simplified from a vehicular traffic perspective to provide more space for pedestrian and bicycle movement. The southwest corner of WUS, at the existing colonnade and WMATA entrance, is expected to see the largest volume of pedestrian traffic in the future.

FRA and the Proponents also identified a set of commitments associated with pedestrian and bicycle access to WUS. For pedestrian access, the Project Proponents have committed to identify pedestrian crossing improvements to address conflicts. The Preferred Alternative would include pedestrian access on the west ramp from the front of WUS to the H Street level. It would also not preclude the construction of a future "greenway" from H Street to the Metropolitan Branch Trail. Additionally, future SEP planning would refine roadway modifications with a focus on Vision Zero goals and specific treatments to reduce crossing distances and reduce conflicts among pedestrians, bicyclists, and vehicles.