

WASHINGTON
UNION STATION
STATION EXPANSION

Draft Environmental Impact Statement for Washington
Union Station Expansion Project

Appendix B – Washington Union Station Terminal Infrastructure EIS Report



U.S. Department of Transportation
Federal Railroad Administration

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Washington Union Station Terminal Infrastructure EIS Report

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1. Introduction

An iconic landmark and historic structure, Washington Union Station and Terminal (“WUS”, “Station”, or “Terminal”) was built in 1907 by the Pennsylvania Railroad and the B&O Railroad with a lay-out to accommodate 30 tracks, providing efficient operations and tie-ins between three railroads in the nation’s capital. While the days of steam locomotives and turntables in the yard are gone, the station and terminal still function as a junction for three railroads Amtrak, Maryland Area Regional Commuter (MARC) and Virginia Railway Express (VRE). In addition, Metrorail (WMATA) service, never contemplated by the station’s original designers, provides a robust connecting service in the form of an urban distribution network.

WUS is basically landlocked; to the north is the Northeast Corridor (NEC), the route to and from the WUS Terminal and the reason for the Terminal, which is the railroad passenger facility. On the south of the Terminal is the historic station building, i.e., the “Station”, and Columbus Plaza, on the west is WMATA and 1st Street while on the east is the historic REA building, commercial properties and 2nd Street. Furthermore, the Terminal is constructed on a retained fill which was required to stay within the then-governing “ruling grades” necessary for the operation of the steam-powered railroad.

The Terminal tracks are bifurcated by a longitudinal wall that facilitated the grade change separating the east side run-through (“lower level”) tracks from the west side (“upper level”) stub-ended tracks which terminate at the station. Currently there are 21 station tracks (not all of which can be used by revenue trains): tracks #22 through #30 are on the lower level and tracks #7 through #20 are on the upper level. Additionally, due to the various operators, car configurations and boarding conditions in the Terminal there are both high and low boarding level platforms on each level.

Based on the growth of rail travel as a safe and efficient means of transportation, along with the projected increase in ridership on the NEC, a Terminal Master Plan for the Washington Union Station was developed by Amtrak and its partners in 2012 to provide a vision for the possibility of a future redevelopment at Union Station. The plan was developed to accommodate both the near term and long range needs of both the Station and the Terminal. The goals of the 2012 Master Plan were to create a conceptual lay-out for a world class transportation hub which:

- Increases passenger and rail capacity
- Provides wide, unobstructed platforms
- Improves horizontal and vertical circulation
- Fits the existing Terminal boundaries.

The Washington Union Station: Terminal Infrastructure Planning and Concept Design Project (“Terminal Infrastructure”, “TI Project” or “Project”) builds upon the concepts of the 2012 Master Plan vision and the ancillary studies [such as the Rail Ops Feasibility Study¹, Washington Terminal Yard Master Plan² and the Near & Immediate ADA Platform Improvements (Level Boarding) task³].

1.1 Supporting the Project Purpose

The Terminal Infrastructure Project provides the future railroad components to be included in the Washington Union Station Expansion Project (SEP). The existing Terminal needs to be upgraded to meet future intercity and commuter ridership requirements, operational criteria, and modern design standards. The purpose of the Project, through integration with SEP, is to

- Support current and long term growth in rail service and operational needs. This Project provides conceptual design of Terminal rail infrastructure including planning and development of alignments,

¹ *Amtrak Washington Union Station (WUS) Master Plan, Phase 1 Rail Improvements Feasibility Study*, dated May 21, 2014, prepared by AECOM and LTK

² *Amtrak Washington Terminal Yard Master Plan – DRAFT*, dated September 8, 2014, prepared by STV

³ Technical Memorandum, *Washington Union Station Near and Intermediate ADA Platform Improvements*, dated August 26, 2014, prepared by AECOM

tracks, platforms, catenary and power, signals and communications and facilities in accordance with Amtrak design guidelines, as well as the vision embodied in the Washington Union Station Master Plan.

- Identify station facilities and operations to meet the future needs including support services, loading facilities and logistics.
- Address issues and achieve compliance related to the Americans with Disabilities Act (ADA) and emergency egress requirements.

This Terminal Infrastructure EIS Report (“Report”) provides a description of how codes, standards, requirements and procedures were applied to determine a proposed conceptual design for the future Terminal.

1.1.1 Rail Capacity and Operations

In its present configuration, the Terminal is functioning at or beyond practical capacity with routine double berthing of trains due to lack of sufficient platform and midday layover space. Improved Terminal rail system capacity and operations for Amtrak, MARC and VRE cannot rely strictly on building more storage yards. Rather this is accomplished through a “systems approach” by improving the rail utilization within the Terminal, the efficiency of flows between station and yards, and the efficiency of train servicing and inspection.

The overriding assumption in this Project is that passenger rail capacity of the Washington D.C. area and the Northeast Corridor as a whole will be expanding and the station must be improved to meet those needs. Chapter 8 of this Report will discuss the rail operation assumptions in more detail; however, they can be summarized by stating that Amtrak plans to:

- Increase Regional train consists to 10 cars by 2020 and 12 cars by 2030
- Increase Acela trains to 60 trips (2020) and 90 trips (2040) per day, reducing Acela turn time to 90-minutes
- Increase Regional service to 58 trips per day by 2030

In a similar manner, both VRE and MARC are planning service increases by 2030 or 2040. There are also long-range plans to introduce a new Metropolitan service akin to the former Amtrak “Clocker” service between Philadelphia to New York as part of the Federal Railroad Administration (FRA)’s NEC Future Plan.

1.1.2 Increased Passenger Capacity

All passengers should have adequate space for movement, and the boarding and alighting of the trains should be a positive experience. Projections for increased ridership mean more passenger movements on the platforms and through the Terminal. Industry standards indicate that the minimum desired functional Level of Service (LOS) would be Level C, which is 7-10 SF per person. That desired LOS establishes the minimum platform width of the Terminal based on train ridership projections. Efficient connectivity from the Terminal platform areas to the concourse and to other transportation modes is an important measure of the facility’s usefulness and also contributes to its ability to function as a safe station. Safe and efficient egress routes will have to be designed based on the preliminary architectural assumptions.

Many people work in close proximity to WUS and present movement through the station is difficult at times. In addition to providing for adequate circulation of passengers to and from the platforms, TI and SEP must be sensitive to the movement between the platform areas and WMATA, buses, taxis, and generally in and around the historic station. Expanded connection capacity is required to be responsive to the needs of the forecasted passenger growth. Reviewing and refining concourse locations and connection points from the platforms to the concourse will be critical to provide clear, intuitive, and efficient passenger movements.

1.1.3 Code Compliant Platforms

The existing platforms at the Terminal are antiquated, sub-standard widths for desired LOS and are non-compliant, meeting neither the ADA nor fire and life safety criteria (NFPA 130 *Standard for Fixed*

Guideway Transit and Passenger Rail Systems). The platforms are, in many cases, also deteriorated. Code-compliant platforms promote better passenger experiences and will improve circulation, safety and operations.

The TI Project will increase the widths of the platforms and significantly improve the passenger egress routes, and many of these routes will take advantage of the proposed Central Concourse below track level, and the proximity of the H Street Bridge and tunnel.

1.2 Organization of Report

This report is a summarization of the proposed conceptual technical design of the TI Project that was used as the basis for the development of the subsequent design work and as an input into the SEP. Each technical section will include a brief description of what design elements are addressed in that section, a synopsis of the goals, requirements and/or purpose of the design element.

The technical sections discussed herein are:

- Alignment and Track
- Civil Engineering
- Rail Operations

A dedicated High Speed Rail (HSR) alignment through WUS was investigated but it was determined to not be feasible. Should demand warrant a HSR alignment in the future, the HSR report identified a possible route with connections to the Terminal and WUS along Second Street N.E.

2. Project Overview

2.1 Project Site

The Terminal Infrastructure Project site includes reconfiguration of the existing passenger platforms providing at WUS, and also extends to the railroad operational and infrastructure facilities immediately adjoining the platforms. The proposed design of the TI Project addresses the need to provide continuity of track access to all of the areas at and supporting revenue and non-revenue operations alike.

Figure 2-1 Project Site



The southern limit of TI is “A” Interlocking, approximately 780’ south of the northern portal of the 1st Street Tunnel. The northern limit of the Project is at CP Avenue near where the NEC crosses 9th Street NE. The site is bordered by the existing WMATA ROW on the west and is contained within the NEC ROW.

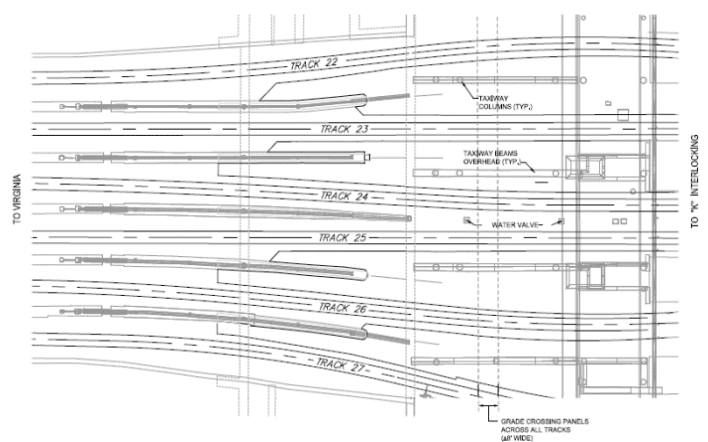
The site spans nearly three miles of NEC ROW, and the track conditions, topography, operational concerns, physical constraints and proposed work vary significantly along the route. For sake of reference, the Project work has been informally subdivided into smaller areas of work. The major subdivisions of work areas are described below.

2.1.1 1st Street Tunnel

The 1st Street Tunnel portion of the work is contained within the multi-track portion of the longer tunnel that provides the northbound approach to WUS. Referred to as the “Subway” portion of the tunnel, it is where all of the Union Station lower-level tracks converge into the two-track portion of the tunnel, which provides train access to Alexandria, VA and points south.

The NEC south of WUS is not electrified, so this portion of the site must accommodate not only the VRE and Amtrak long-distance low level platforms, but also the special trackwork that provides the operational flexibility to enable the Amtrak trains to be switched from electric to diesel locomotives.

Figure 2-2 1st Street Tunnel - northern portal



2.1.2 Terminal and “K” Interlocking

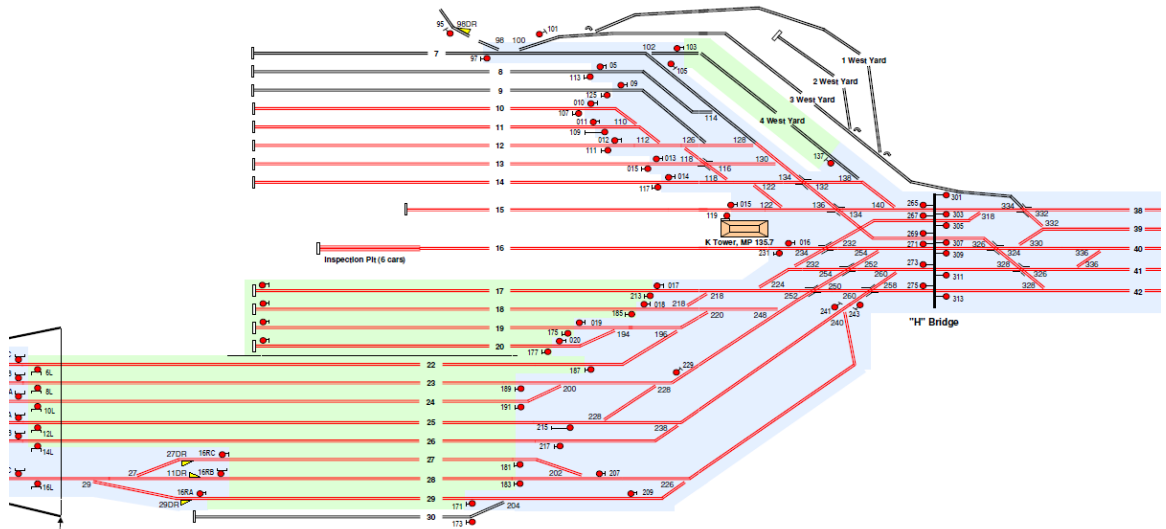
The Terminal area of the site is generally considered to include all of the existing passenger platforms north of Union Station. The tracks on the western side of the site are stub-ended tracks that provide access for Amtrak and MARC passengers to Union Station from points north and west. For purposes of this Report, these are referred to as the “upper level” tracks and platforms.

Figure 2-3 Terminal and K Interlocking



The easternmost tracks and platforms are run-through tracks that provide Amtrak long-distance and Regional trains and VRE passengers’ access to Union Station. These tracks provide both northbound and southbound routes and are physically lower than the upper level tracks. For that purpose, this Report refers to these tracks as the “lower level” or “run-through” tracks.

Figure 2-4 Existing Terminal Diagram

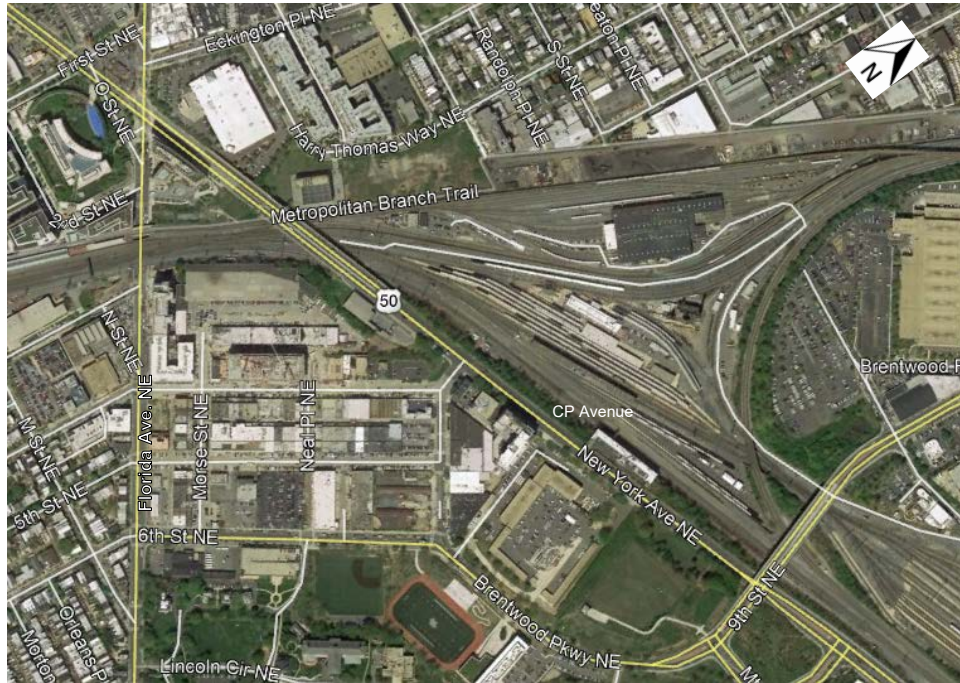


As discussed later in this Report, the East/West Terminal platform area is approximately 630' wide and extends from the northern portal of the 1st Street Tunnel to H Street, where the right of way (ROW) gradually decreases to less than 100' near the J Bridge (a signal system location) at “K” Interlocking, a distance of approximately 2500' to the north of the portal. It is in this area of the site that many of the switching operations occur from one track to another in the WUS Terminal.

The SEP will extend from the existing Union Station facility to K Street NE. North of that point to “C” Interlocking (loosely referred to as the “throat”), tracks are generally tangent along the NEC between “K” Interlocking and “C” Interlocking.

2.1.3 “C” Interlocking and Ivy City

The NEC’s “C” Interlocking stretches from K Bridge (a signal system location) near Florida Avenue NE to CP Avenue (near 9th Street NE).



The tracks and special trackwork in this interlocking provide the operational flexibility to divert from the NEC to storage facilities, maintenance facilities and CSX lines utilized by MARC trains. The tracks in the area north of New York Avenue NE and south of 9th Street NE form a v-shaped area bordered on the west by CSX’s Metropolitan Division (which supports MARC’s Brunswick Line) and the NEC on the east. The areas between them are storage tracks for Amtrak’s Coach Yard and Wedge Yard, presently utilized by MARC and VRE, respectively.

2.1.4 Amtrak Facilities

Several of the existing Amtrak non-revenue, non-station facilities in the Terminal area will have to be relocated in order to make space for the TI Project. These include the maintenance buildings in West Yard and the K Tower. The near-term projects and the coordination and interaction between these projects and the TI Project are discussed in various subchapters of this Report.

2.2 Coordination with other Properties and Agencies

There are a number of buildings and/or agencies with which there needs to be coordination in order to facilitate the construction of the TI project. The following provide an overview of some of the agencies, companies and adjacent property issues that need to be considered during the design of the project.

2.2.1 REA Building

The REA Building and, in particular, the western apron and the surrounding parking lot must be maintained in its present configuration in order to provide access to the planned Amtrak and TI Project infrastructure. There is on-going consideration of using at least portions of the REA building for the relocated Amtrak maintenance facilities. Additionally, the proposed reconstructed Substation 25A will be located north of K Street north of the REA Building. The track and overhead catenary system improvements, therefore, must not impact or impede the planned uses of the REA Building, and the track alignment must maintain 12’ lateral clearance to the REA Building apron.

2.2.2 WMATA

The TI work must not adversely impact the daily operations of the tracks and station facilities of WMATA, which is immediately adjacent to the western limits of the Terminal and as far north as “C” Interlocking.

There will be TI work planned for a proposed easement within the existing WMATA ROW near the WMATA NoMa-Gallaudet U Station. The present design includes the construction of TI’s proposed track #37, which will provide both an operating track during the construction of the Terminal area and a pocket track/locomotive storage track at the completion of the work and is planned to allow WMATA to construct a siding track in the future.

2.2.3 VRE Mid-day Storage Facility

The VRE is currently in the preliminary engineering and environmental investigation phase for the development of a new mid-day storage facility for VRE trains just north of New York Avenue overhead bridge on the east side of the NEC tracks. While this Project is in the early stages of development, preliminary plans provided by VRE for the proposed storage facility have been included in TI documents. The design of the TI Project to date has been, as much as practicable, developed so as not to preclude VRE’s present plans/alignments for the storage facility.

2.2.4 “H” Street Bridge

The District Department of Transportation (DDOT) is in the process of designing a replacement of their current H Street Bridge that crosses the Terminal area. Due to its length, the replacement bridge will be a multi-span structure whose piers will be located within the footprint of the Union Station Terminal ROW. The timing and duration of the bridge replacement will likely occur prior to, or during, the initial phases of the SEP. The design of the TI Project must be closely coordinated with the design of the H Street Bridge so that the new bridge piers will not be placed within the train clearance envelopes of either the existing or proposed track alignments. Likewise, the demolition and construction of the two projects must be coordinated to avoid conflicts with operational requirements.

2.2.5 WUS Parking Garage

The WUS parking garage is owned by USA and managed through USDOT and FRA. The USDOT leases the federal property to the USRC. The existing garage will need to be demolished and replaced in order to facilitate the proposed track and platform plan. The demolition of the garage will require close coordination with USRC and USI in order to maintain adequate temporary bus and parking adjacent to the station in accordance with current lease obligations to USI.

2.2.6 Burnham Place

Akridge, the private developer who purchased the air-rights above a portion of the Terminal from the U.S. General Services Administration in 2006 is proposing A 3.7 million SF mixed-use development of office, residential, hotel and retail, known as Burnham Place.

The Burnham Place development project, which is separate from the SEP, will create a new neighborhood center behind WUS and above the Terminal that will connect it to the surrounding communities of NoMa, H Street, and Capitol Hill. The configuration of the track alignments in the Terminal area have been developed to be complimentary to the proposed development of the Burnham Place. Similarly, the Burnham Place development is anticipated to accommodate a number of elements serving the station and rail passengers, potentially including station entrances, sky-lighting at concourses, passenger pick-up and drop-off areas, and other elements serving the station such as utility or MEP requirements.

2.2.7 Other Amtrak Projects

2.2.7.1 Near-term Improvements

There are several projects currently being designed whose construction is scheduled to occur before the first of the SEP demolition commences.

Platform 8/9

Existing tracks #8 & #9 in the Terminal were non-electrified tracks and, as such, only diesel-powered train sets were able to utilize these tracks. As part of a goal to provide additional operational flexibility to the present Terminal, Amtrak electrified both tracks and is currently underway with the in-house construction of the catenary. The TI Project will benefit from the electrification as it provides for greater construction flexibility for the TI project.

Platform 22/Subbasement Rehabilitation

The ability to efficiently and effectively reconstruct the run-through tracks, along with the reconstruction of the structural elements of the Subbasement reconstruction, requires that existing non-revenue track #22 and the adjacent platform be reconstructed to permit revenue service. The platform for track #22 will be reconstructed to provide for a minimum of 750 feet of useable platform length and shall remain as a low level (8" high above top of rail) platform due to the need to accommodate both VRE and some Amtrak long distance train sets.

2.2.7.2 Substation 25A

The WUS switching station, designated as Substation 25A ("Sub 25A"), receives traction power supply from the Ivy City Sub 25 and distributes the power to the overhead catenary system in the station. Due to the age and condition of the switching substation, Amtrak has undertaken the reconstruction to ensure a safe/reliable electric system. In advance of the TI work the equipment within this area will be relocated and as part of the reconstruction additional equipment and structures will be added. The new Sub 25A will be located just north of K Street to avoid conflict with planned TI and SEP changes. The available site, approximately 17,500 SF in size, was reviewed to ascertain the site suitability based on Sub 25A footprint dimensions, circuit breaker dimensions, control building size and proposed station equipment layout.

2.2.7.3 Satellite Commissary

The existing Satellite Commissary is a refrigerated mini-storage facility where prepackaged food products are stored after being shipped from the full Commissary in Ivy City to the Terminal prior to being stocked on trains. The Satellite Commissary is necessary to facilitate Amtrak operations required as part of the cleaning and stocking of the trains in a manner that reduces the dwell time and enables trains to be recycled into service after inspection.

The existing facility, which is located beneath the H Street Bridge was built as a temporary facility and has outlasted its useful life. Additionally, the current Satellite Commissary needs to be relocated prior to the proposed reconstruction of the H Street Bridge by DDOT. A new Satellite Commissary will be constructed in the southwest corner of the Terminal.

2.2.7.4 Washington Union Station Concourse Modernization Project

The Claytor Concourse, Union Station's intercity and commuter concourse, will be modernized and reconfigured to alleviate congested conditions, doubling its present capacity. The Concourse Expansion Program will enhance passenger comfort and accessibility, while enlivening the space with new architectural finishes and natural light. In addition to the expansion of the concourse, improvements by WMATA for a new Metrorail

staircase and new 1st Street entrance will bring a consolidated set of passenger improvements to the western portion of the concourse.

3. Design Approach and Standards

3.1 Design Criteria

The design of the proposed elements of the TI Project was developed after numerous meetings with Amtrak and Station stakeholders.

3.1.1 Agencies and Stakeholders

Several entities, both public and private, are affected by the proposed work at Amtrak's Washington Union Station (WUS) Terminal. These include:

- Amtrak
- FRA
- Union Station Redevelopment Corporation (USRC)
- Akridge (Burnham Place developers)
- MARC
- VRE
- WMATA
- DDOT

3.1.2 Conceptual Design Approach

The conceptual design approach is to develop track and platform alignment alternatives that consider the following objectives:

- Provide a plan that considers the future rail service plans of Amtrak, MARC, and VRE.
- Provide a combination of high-level and low-level platform tracks to provide planned revenue rail service, while facilitating accessibility and boarding of all carriers.
- Provide, to the greatest extent possible, tangent platforms that are able to meet the minimum berthing length requirements of planned Amtrak, VRE, and MARC rolling stock.
- Provide platforms and egress paths that provide Level of Service "C" or better and are fully code compliant.
- Provide diesel/electric locomotives interoperability on all tracks.
- Provide the ability to switch from electric to diesel locomotives (and vice versa) for long-distance trains without occupying platforms unnecessarily.
- Develop a conceptual design that accommodates the proposed private air-rights construction above the Terminal as well as future SEP construction below the Terminal.

4. Project Survey

4.1 Survey Source and Method

This section identifies the source of all survey utilized on the Project as well as identify the method by which the survey was conducted. The following survey exploration and documentation were used to define the Project site and to establish key clearances to existing structures.

4.1.1 LIDAR and Traverse survey from AMT

In August 2014 AMT, LLC performed both a land survey and LiDAR survey of the Terminal area.

4.1.2 Historic station and maintenance facility survey from USRC and Amtrak

- John J. Allen Associates provided a survey of the Union Station area, dated June 1988.
- The Wiles Mensch Corporation performed some survey of the overall Union Station and Terminal area for the USRC in February 2011. The same firm certified the survey of the Union Station area for the D.C. Office of the Surveyor in January 2012 done, at least in part, for the Union Station Development Corporation.
- DeLeuw, Cather & Company developed an “Ownership Map” for WMATA defining the property parcels along 1st Street in the area near G Street and H Street.

4.2 Survey Assessment

The design of the alignment and platform configurations of the Terminal was based on the assumption that the Amtrak ROW in the Terminal area was approximately 630' wide, on a more or less East/West axis. That dimension was derived by reviewing a LiDAR survey provided by Amtrak, developed by AMT and documents developed by Wiles Mensch Corporation provided by USRC. There were some minor discrepancies between those and the documents found in the D.C. Surveyor's office due largely due to the focus of each survey and control points being slightly different. While the discrepancies weren't significant, there was an apparent difference in the overall width of the Amtrak ROW that had to be resolved in order to verify that the proposed concept design of the Terminal.

4.2.1 Independent verification

Due to numerous historic easements and parcel transfers from one owner to another, it was difficult to properly correlate the multiple survey data sources, which prompted further exploration.

As part of the TI project, AECOM's subconsultant, AB Consultants Inc., performed spot-checks of original LiDAR documents. AB Consultants Inc. began work at the Union Station site on February 11, 2015 to check the survey performed by AMT using first a laser scanner and found the survey performed by AMT to be within a reasonable accuracy and consider the AMT survey to be acceptable based on the following survey checks: check AMT's survey control; platforms under H Street; bridge columns under H Street; railroad tracks under H Street; bridge beams under H Street; and several special trackwork elements.

Subsequent to that survey check, AECOM also requested that another subconsultant, RJM Engineering, Inc., perform an assessment of the Amtrak ROW based on a collection of documents from the D.C. Surveyor's office and associated parcel documents prepared for WMATA's adjacent property. RJM made an independent assessment of the existing ROW at the Washington Terminal, and those documents suggests that the ROW width at the Union Station Terminal is 625.5'±.

4.3 Design

4.3.1 Survey Datum

The conceptual design was developed using the same datum as that used by AMT. The datum is as follows:

4.3.1.1 Horizontal Datum

Maryland State Plane Datum MD NAD83/2011 (EPOCH 2010)

4.3.1.2 Vertical Datum

NAVD88 (Geoid 12A)

4.3.1.3 Miscellaneous

AECOM was provided with a complete set of AMT drawings for the Survey Control Network in Union Station (2014), wherein AMT indicates that the coordinates indicated are in ground units (actual lengths measured on the ground), and that the project scale factor is 0.9999517620.

4.3.2 Project Baseline

The Terminal track lay-out design (horizontal and vertical) was developed assuming a self-contained project baseline for purposes of coordinating the conceptual design of multiple disciplines. The design baseline was established by approximating the location of the southern end of the stub-ended tracks, and then “split” the width of the proposed Central Concourse (based on early alignment options). That point of beginning (POB) was given the random stationing STA 100+00 and was extended northward on a bearing of N15° 42' 54.1"E.

Subsequent to the initial establishing of the design baseline, the baseline stationing was reversed to increasing southbound to be consistent with the overall Amtrak approach to the stationing convention used in the area.

5. Alignment and Track

5.1 Description

5.1.1 Elements of Design

The proposed alignment for the Terminal tracks represents the culmination of the study of numerous variations of the number of tracks, platform widths and configuration, their possible effect on the DDOT's planned H Street bridge replacement, the proposed WUS overbuild, and adjacent non-Amtrak elements. A detailed discussion of the 21 alignments considered for the Terminal area is included in Appendix A, Alignments.

The design of the Terminal tracks also considered:

- Amtrak revenue service, both existing and proposed
- the operations of MARC and VRE, including the proposed mid-day layover facility planned by VRE north of New York Avenue
- the existing ROW limits
- existing ROW elements, including the REA Building
- the 1st Street Tunnel infrastructure
- the planned replacement of the H Street bridge, whose new columns will be located within the Terminal footprint
- improvements to the clearances to the existing overhead New York Avenue bridge columns
- modifications to the MARC Brunswick Line tracks north of New York Avenue to provide better flexibility from the Brunswick Line to and from the WUS platforms

5.1.2 Existing Conditions

The existing track and platform configuration of the Terminal was followed as a guideline for the development of the proposed TI Project alignment. However, there were several planned, significant changes to the conditions, limitations, uses and planned construction in the Union Station area that required that the future Terminal configuration be much more than a simple replacement-in-kind.

There are several significant Terminal-area changes which provided numerous restrictions and constructability considerations for the development of the proposed alignment. Many of these are discussed elsewhere in this Report and other predecessor reports by AECOM and others. Some of those considerations were prompted by the planned non-track developments include:

- Construction of a multi-story Central Concourse;
- Relocation of the Amtrak Satellite Commissary and ancillary support spaces from West Yard and elsewhere;
- Planned reconstruction of the H Street bridge by DDOT
- VRE planned mid-day storage facility
- Columns to support the deck for a new parking and/or bus facility and columns to support the deck of the private air rights development and open space above the Terminal

5.2 Goals / Requirements / Purpose

The proposed track and platform configurations are the result of the consideration of a multitude of goals and requirements and represent some distinct differences from the present Terminal area trackwork. Several of the goals are described in the following paragraphs.

5.2.1 Authorized Speed

At the request of Amtrak Operations, the two NEC tracks (Track 40 and Trak 42) have been designed for operation at 45 MPH. The remaining tracks will be Terminal “yard tracks” that will operate at a speed not to exceed 15 MPH. All tracks, including the NEC tracks, traversing special trackwork will be confined to the allowable speeds defined by their “maximum civil speed” and Amtrak standards.

5.2.2 Terminal Tracks

The number of tracks were developed in accordance with the Amtrak engineering criteria while working within the physical constraints of the Amtrak ROW, the desired location and size of the Central Concourse for SEP, and the architectural and egress requirements of the platforms.

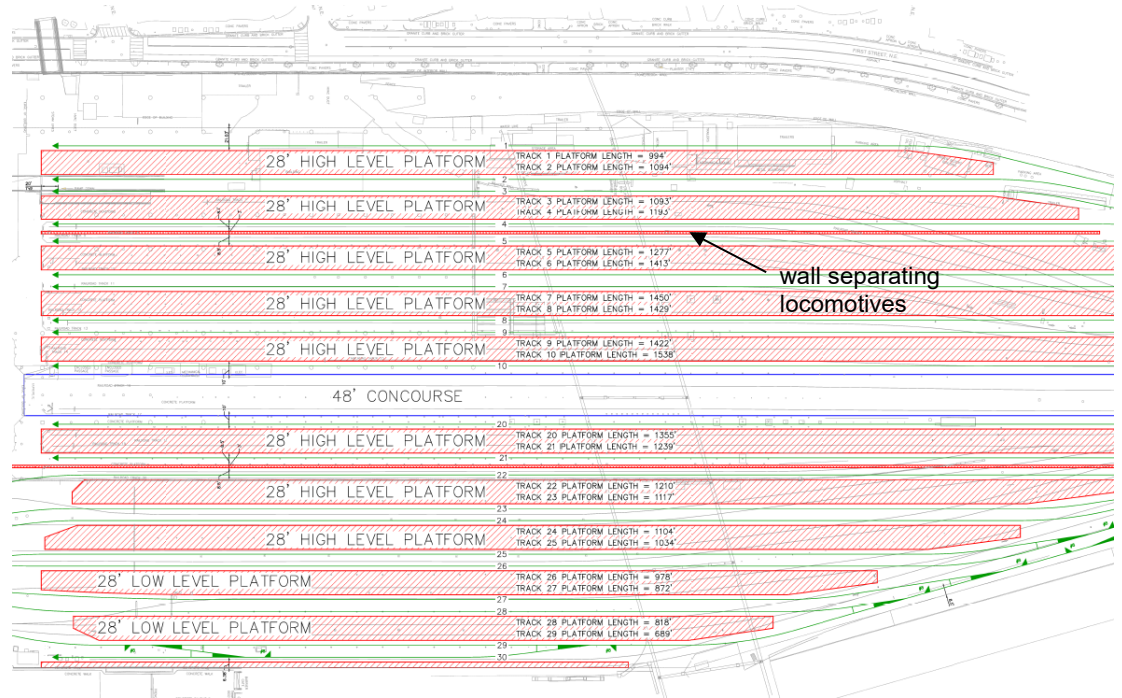
The length and number of tracks were also developed in response to the operational requirements, present and proposed future (year 2040) of Amtrak, VRE and MARC. Operational considerations are discussed in Section 7.

5.2.2.1 Separation of diesel and electric locomotives

A decision was made not to designate specific platform tracks for use by specific service, and there will be no distinction between passenger trains powered by diesel locomotives and those powered by electric locomotives.

Early version of the Terminal configuration showed barriers or walls between the designated platform berths of trains using electric and diesel locomotives. The purpose of this barrier was to provide a means of isolating and ventilating the diesel exhaust, separating them from the remainder of the Terminal that berthed electric powered trains. This can be shown in many of the superseded Terminal configurations (for example, between tracks #4 and #5 in Option 1).

Figure 5-1 Early barrier for separation of electric and diesel locomotives



5.2.2.2 Inspection Pits

Amtrak determined that there should be one or two inspection pits provided in the new stub-ended Terminal tracks. Inspection will also be conducted at Ivy City Yard or another Amtrak inspection facility.

5.2.3 Tracks between “K” Interlocking and “C” Interlocking

Presently the five tracks between the two interlockings will not support the planned operational improvements for Amtrak. As such, the number of revenue tracks was increased from five to six tracks with the addition of track #43. Additionally, a seventh run-around track, track #37, will be constructed within the limits of the present WMATA ROW, adjacent to the NoMA Station, that will both enhance train operations during the reconstruction of the Terminal area and provide additional “pocket track” capability after the reconstruction. Due to the limited ROW width, 13'-6” track centers were approved by Amtrak Engineering and will be used in the platform areas and in the “throat” tracks.

The proposed design of track #43 will provide not only additional flexibility for Amtrak, but when the planned VRE mid-day storage facility is constructed near New York Avenue, VRE trains can leave the lower level tracks northbound without crossing into and/or affecting the revenue operations in the “K” Interlocking limits.

5.2.4 Track Structure

The proposed design assumes that all tracks north of K Street and all areas of special trackwork (turnouts, double slip switches, etc.) will be constructed as ballasted track on wood switch timbers. Ballasted track is more cost-effective and more flexible to construct and reconfigure during the reconstruction of the WUS area than direct fixation (“DF”) track. Further, Amtrak did not want to utilize concrete switch ties, so standard wood switch timber is assumed for ease of maintenance throughout special trackwork.

All standard tracks from K Street south to the stub tracks in the upper level and 1st Street Tunnel portal on the lower level will be constructed as DF track. While there are numerous types of DF track, they provide common benefits to the WUS:

- provide opportunities for mitigation of vibrational effects and noise transmission in the track structure,
- ability to provide fixed profile and alignment of station tracks that will not shift over time, as ballasted track may do,
- the concrete track structure within the platform tracks will be easier to wash down and maintain,
- minimize the dead load of the track structure on the Terminal elements below the track.

5.2.5 Special Trackwork

The special trackwork used in the Project limits must provide access from any track in C Interlocking to any track in the Terminal. The design must also provide the desired redundant, bi-directional, concurrent train operations through the area.

5.2.5.1 Terminal and K Interlocking

Amtrak Engineering approved the use No. 9 turnouts, which does not conform to Amtrak standards criteria, as the Project turnout standard minimize the space required. Amtrak has experienced maintenance difficulties with the existing No. 8 turnouts in the Terminal area and expressed a preference for the use of larger special trackwork. With the exception of one No. 8 crossover, the design was developed using No. 9 turnouts.

The use of Amtrak’s standard turnouts, crossovers and special trackwork were preferred; however, the spatial confines of the site did not allow the use of standard Amtrak No. 10 special trackwork and still provide the flexibility of operations required. The length of No. 10 special trackwork made it impossible to provide the desired dual ladder tracks within K Interlocking limits and still provide required useable lengths of the station platforms.

5.2.5.2 North of K Interlocking

The areas outside of the station platforms and K Interlocking, the route alignment should provide the best available operational flexibility. In addition, the reconfiguration of any

tracks in Coach Yard, Wedge Yard and the approaches to Ivy City and the Brunswick Lead should utilize similar turnouts to those used in the throat.

The track configuration passing through the bays between the piers of the overhead New York Avenue bridge was rationalized to improve upon the present close-clearance condition.

5.2.6 Platform/Terminal Configuration

The proposed Terminal platforms must provide the number, width and configurations necessary for providing improved revenue train service.

5.2.6.1 Platform lengths

In order to facilitate the operation of multiple train consists, the following platform lengths are required:

- Acela & Amtrak Long Distance trains – 1200' minimum, 1350' desired
- Amtrak Regional trains – 1050'
- MARC & VRE trains – 850' minimum, 1050' desired
- Proposed Express & Metropolitan trains – 1200' minimum, 1350' desired

5.2.6.2 High-Level Platforms

The proposed concept should provide the maximum number of high-level (48" above top of rail) platform access to provide level boarding of Amtrak Acela and Regional and for all MARC trains.

5.2.6.3 Low-Level Platforms

The design of the lower level tracks must provide at least three (3) low-level platform edges. These are to accommodate the low-level boarding of the VRE trains and Amtrak Superliner long distance trains that discharge passengers onto low-level (15" above top of rail) platforms.

5.2.6.4 Platform Curvature and Gradient

Track curves within the limits of the platforms must have a curvature of 1°-40'-00", or less, to be compliant with Amtrak Dwg. #AM70050G, "Minimum Roadway Clearances", which notes: "*High passenger platform must not be constructed on track having a curvature in excess of 1°-40' or where speed requires elevation of outer rail in excess of one inch.*"

In accordance with Amtrak Spec. 63, grades through station platforms should be as close to 0.00% as possible, and not exceed 0.08%, and must be compliant with ADA accessibility requirements. Vertical curves within platforms should be avoided, if possible.

5.2.7 Storage / Locomotive Changes

Trains operating immediately south of the WUS utilize diesel-powered locomotives. Electric locomotives entering WUS whose route continues southbound must be switched from an electric to a diesel locomotive power at WUS, and vice-versa.

The successful operation of revenue trains through the congested ROW between CP Avenue and the Terminal tracks (and through to Virginia) relies heavily upon the ability to store, or "pocket", locomotives and non-revenue trains close to the Terminal. In addition, there is also a need to temporarily hold revenue trains when the Terminal tracks are occupied.

The configuration of the Terminal area should provide the ability to allow Amtrak to switch from diesel to electric locomotives efficiently, preferably without having "light engines" occupying useable platform space.

5.3 Proposed Design

5.3.1 Concept Selected

Through review of the proposed track alignments with Amtrak, FRA, VRE, MARC and the SEP team, it was determined that Option 14 would be carried forward into concept design and through the Draft Environmental Impact Statement (DEIS) process for the SEP. The TI Report only advanced design of Option 14, although Option 16 remains available for FRA as a potential refinement at a later stage.

The Project area will extend from the area of CP Avenue north of “C” Interlocking southward through “C” Interlocking and “K” Interlocking and provide a transition into the present six-track portal and the four-track configuration of “A” Interlocking within the 1st Street Tunnel.

There were numerous alignment alternatives developed throughout the course of the conceptual design work. Appendix A contains a matrix and explanations of many of the track and platform alternatives considered during the design process and provides a short discussion of how numerous decisions and options were considered during the development of the present Option 14.

5.3.2 Station Platforms

The configuration of proposed Option 14 is shown in Appendix A20, “Option 14” and in greater detail in Appendix B1, “Track Alignment”.

5.3.2.1 Lower Level (“run-through” tracks)

There are seven run-through tracks in the eastern half of the Terminal. There are two high-level island platforms for tracks #22 through #25. There is one low level island platform for tracks #26 and #27, and one half-width low-level platform for track #28. The lower-level tracks and their associated platforms were curved to more closely mimic the geometry of the ROW in the Terminal area and to increase the useable length of many of the platforms.

The profiles of the lower level mimic the existing track profiles, which are required to match the existing elevation and gradient of the 1st Street Tunnel portal.

5.3.2.2 Upper Level (“stub end” tracks)

There are twelve high-level, stub-ended tracks in the western half of the Terminal, tracks #1 through #12. The platforms are all 48" above top of rail to provide service to Acela, Regional trains and MARC trains.

With the exception of the northern end of track #1, the stub-ended platforms are on tangent alignments. Track #1 is curved at the northern end of the platform, which was done to maximize the platform length, similarly to what was done in the lower-level tracks.

Their profiles are less than 0.24%, and most are generally at a grade of 0.08%. (see Appendix B1).

5.3.2.3 Platform Dimensions

The platforms are all 30' wide, with the exception of the 23' wide half platform adjacent to track #28. With the exception of platforms #9/10 and #11/12, all platforms have stepped-back or “bullet-nosed” ends due to their need to parallel the curvature of the tracks at the northern ends of the upper level platforms and at both ends of the lower level platforms. Because of those irregular shapes the lengths of the platforms were considered useable as long as the width of the platform was 25' (desirable; 20' absolute minimum) so that passenger movement along the platform wasn't compromised.

5.3.3 Interlocking Design

5.3.3.1 “K” Interlocking

The proposed K Interlocking provides concurrent, bi-directional redundancy for operations into both the upper level and lower level tracks. The K Interlocking configuration is shown in Appendix B on sheets #P-015 and #P-016.

The track configuration provides additional flexibility by replacing the existing five tracks between K Interlocking and C Interlocking (tracks #38 through #42) with six tracks (adding track #43 on the east side) plus a 1,000'± siding track (track #37) by encroaching into the existing WMATA ROW to the west.

The present centerline location of tracks #38 through #42 will be shifted in order to provide space for the sixth track in the throat and still provide 13'-6" track center-to-center distances.

5.3.3.2 “C” Interlocking

The reconfiguration of C Interlocking provides the same flexibility provided by the existing interlocking plant while improving lateral clearances to the New York Avenue overhead bridge piers, allow operational improvements made by the addition of the sixth main line track, and establishing a potential turnout location for the proposed VRE mid-day storage facility. The proposed C Interlocking configuration includes modifications proposed for CP Avenue.

While the track alignment does not include details of the proposed VRE mid-day storage facility, the design does not preclude the development of that facility.

5.3.3.3 Approach & Storage Tracks

The proposed Option 14 alignment has created several track “pockets” that could be used to store locomotives and trains, when necessary. There are 1000'± long pockets between “K” Interlocking and “C” Interlocking on track #38 and track #39 that can store trains, and one 1200' pocket in the same area on track #40.

In addition to the long track pockets, there are locations between proposed signals on track #42 and track #43 where a light locomotive could be held temporarily. These pockets were based on a very early concept of the signal system, and these spots should be better defined in future design development.

The track configuration in the lower level tracks approaching the 1st Street Tunnel has been modified in order to allow the locomotive power changes without the need for the “light” locomotives to occupy space in useable platform space. The proposed configuration includes the removal of a number of columns and the strengthening the roof structure of the Tunnel. The configuration is included in Appendix B, sheet #P-019. (More information on column removal is provided in the East-to-West Column Removal Phasing Analysis appended at the end of this report).

6. Civil

6.1 Description

6.1.1 Elements of Design

This section provides a description of the preliminary design approach for the access pathways, platform and track drainage and potential changes necessary to the existing utilities in the Terminal area.

6.1.2 Existing Conditions

6.1.2.1 Platform and Track Drainage and Utilities

The present stormwater and wash-down drainage of the Terminal areas are based upon the open-air configuration of the station platforms and their canopies. There are old drawings that show a few locations where the platform storm drainage is directed toward the municipal combined sewer system, both at H Street and at F Street.

6.1.2.2 1st Street Tunnel Drainage

A memo from 1991 entitled "Preliminary Report Source of Subbasement Leaks" by Harry Weese Associates indicated that the drainage and waterproofing within the 1st Street Tunnel (referred to as the "Long Haul Tunnel" in the memo) had failed. It stated:

- The drainage system for the tracks in the Long Haul Tunnel is inoperative. The trench drains at the north end of the Tunnel are abandoned and standing water was noticed inside the trenches during various site visits.
- The drainage system for the tracks was described as inoperative as early as in 1977, in a report prepared by DeLeuw, Cather/Parsons entitled "Special Study for the FRA Task Force on Union Station", dated October 1977. The same report mentions that there is no waterproofing in the area of the tracks above the subbasement.
- After reviewing the documents prepared by Sverdrup & Parcel for the construction of the Link Structure, and after a visual inspection of the tracks, we can say that there is no indication that a new drainage system was ever built, nor new waterproofing installed.

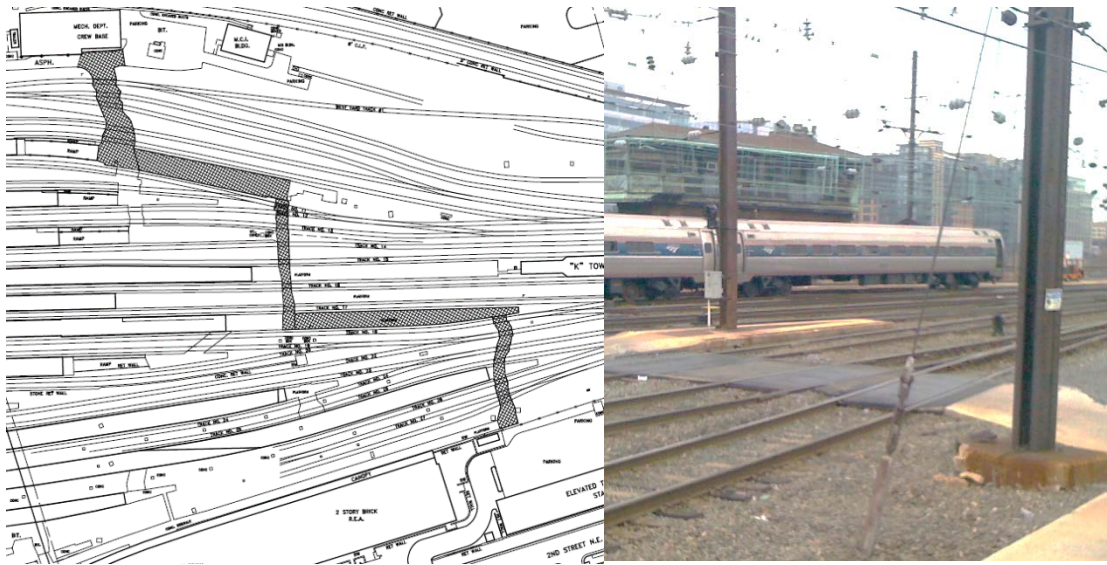
That issue is south of the tunnel portal, it should be considered during the on-going sub-basement design (by others) or as part of future tunnel improvements.

6.1.2.3 Pathways

The vehicular access circulation in the Terminal area is provided by at-grade asphalt crossings from the area of the west side of the REA Building parking lot (see Figure 6-1). Additional access for vehicular maintenance vehicles is presently provided by travelling along the existing open track bed along the east side of track #42. That access pathway begins at a gravel driveway at 3rd St. NE near Florida Ave. near the Central Armature Works, Inc. and follows the ROW south as far as the REA Building. Additional information can be reviewed in the *Vehicular Access and Circulation Report* dated December 17, 2013.

Those pathways will not support the proposed track configuration in the Terminal area, since the proposed platform locations and alignments are entirely different in location and length.

Figure 6-1 - Existing vehicular pathways



6.2 Goals / Requirements / Purpose

6.2.1 Drainage

The drainage for the proposed Terminal infrastructure changes will require a different set of drainage requirements, since the majority of the Terminal area will be covered by the proposed overbuild structures. The majority of the drainage required will be concerned with incidental stormwater drainage being carried into the enclosed areas of the Terminal and with conducting the platform wash-down water into acceptable sewer system inlets.

6.2.2 Pathways

Pathways in the Terminal areas must provide access for Amtrak track and OCS maintenance vehicles, occasional access for small golf-carts from the proposed Commissary and for a limited, secondary access for emergency vehicles across the Terminal area.

Access pathways must be provided for rubber-tired vehicles to access the special trackwork areas in and around C Interlocking, the K Interlocking slip “ladders”, and the special trackwork near the 1st Street Tunnel portal. In addition, Amtrak Engineering has requested that an access pathway be provided to allow for maintenance vehicles to access the special trackwork proposed to be located in the vicinity of the 1st Street Tunnel portal.

The pathways must:

- be continuous from the paved driveway on 2nd Street NE to all “destinations”
- be wide enough for a boom truck-sized heavy utility vehicle (10’ minimum width,
- must provide 12’ minimum lateral clearance to existing canopy of the REA building,
- provide access to and from the portal all the way to the special trackwork near the New York Avenue overhead bridge (C Interlocking),
- provide access from the east side of the Terminal area to the west side of the Terminal,
- be able to traverse both ballasted track and proposed direct fixation track areas, and
- avoid conflicts with signal apparatus and avoid crossing the moveable portions of special trackwork.

6.2.3 Utilities

All existing utilities must be protected in place or relocated prior to the demolition of the Terminal infrastructure. In addition, the utility design must account for the utilities associated with the construction of the overbuild structures.

6.3 Proposed Design

6.3.1 Drainage

The design at the conceptual phase of the design assumes that the majority of the drainage will be generated from the wash-down water on the platforms, and that stormwater will be limited to water and snowmelt coming from rail vehicles entering the station. The preliminary design has a two-fold approach:

- The platforms will have a gull-wing cross section, which is consistent with the architectural design to prevent unattended wheeled vehicles and wheelchairs from rolling into the track areas. Wash-down or other water on the platform will flow toward the center of the platform and then run longitudinally to a drain. The platform drain will connect to a longitudinal carrier pipe running beneath the platforms which, in turn, will conduct them to existing drains/inlets/manholes.
- Water dripping or entering into the track areas will be directed toward track drains “scuppers” placed along the outside edges of the concrete direct fixation track slabs. That drainage will then be directed to the longitudinal carrier pipes and handled similarly as the platform drainage discussed above.
 - In the location of the inspection pit(s), the track bed drainage will be collected in a drain in the pit and will be directed to the longitudinal drains.

6.3.2 Pathways

The present open track bed adjacent to track #42 will be reconfigured to become part of the proposed track #43, and the existing pathway from Florida Avenue must be relocated and/or reconfigured to provide that access. It is anticipated that a long grade crossing parallel with and atop track #43 will be provided to allow rubber-tired vehicles to travel along track #43 to provide a roadway from Florida Avenue to the Terminal area.

While the WUS design of portions of the Project concerning outlying elements of work are not included herein, it is anticipated that the design of the REA Building area will include an access path to below-track portions of the Station and/or the proposed Commissary facility. Portions of the track pathway between the 1st Street Tunnel and the REA Building may need to be constructed on a cantilevered structure above street elevation in order to allow street access to the REA Building and/or Commissary.

7. Rail Operations

7.1 Description

7.1.1 Elements of Design

Future plans for WUS include reconstruction of the station infrastructure, and demand-based service increases by Amtrak, MARC and VRE rail operations. This section details the current state of station operations and determines the impacts of future changes by modeling infrastructure and operations.

7.1.2 Existing Conditions

Washington Union Station is the southern terminus of Amtrak's NEC and handles High Speed, Regional, Long Distance and commuter rail service to our nation's capital. The current station has 23 tracks served by three passenger rail operations: VRE, MARC and Amtrak. Simulations of these three rail operations are conducted in Rail Traffic Controller software and include not only WUS but the mainline tracks approaching the station. Freight and passenger trains are simulated over a 24 hour period in a complete model that includes track alignment, yards, switches, signals, and platforms as well as train characteristics and engine performance.

7.2 Summary of Rail Operations

The rail operations for the present, 2030+ and 2040 NEC FUTURE operating plans were reviewed in significant detail by the TI Team.

The following gives a brief overview of that operations analysis.

7.2.1 Summary of Operations Analysis

There are presently 219 weekday revenue trips operating at WUS, including Amtrak's Acela, Northeast Regional and Long Distance services, MARC's Brunswick, Camden and Penn Line services and VRE's Fredericksburg and Manassas Line services. Two future operating plans were developed and simulated; operating plan service levels are summarized in Table 7-1 below.

A 2030+ Operating Plan (the "+" symbol representing the intent of this plan to cover the 2030 decade from 2030 to 2039), including 360 daily trips, is based on future plans of each of the rail operators. The 2040 NEC FUTURE Operating Plan includes 630 daily trips and presents the long-range vision of the FRA for WUS operations, including the addition of new services.

The NEC FUTURE plan includes Metropolitan service which will replace some Regional and some commuter service in the future. The service may be operated by Amtrak or by another operator; this has not yet been determined. Intercity service will replace the remainder of Regional service under the NEC FUTURE plan.

Table 7-1 Ops. Table 1 - Revenue Train Volumes for Existing and Future Operating Plans per Direction

Operator	Service	Existing Baseline		2030+		2040 NEC FUTURE	
		Peak Hour	Full Day	Peak Hour	Full Day	Peak Hour	Full Day
Amtrak	HSR	1	16	3	45	4	57
	Regional/SEHSR/ Intercity (LD excluded)	3	22	3	27	1.5	23
	Long Distance	1	7	1	6	0.5	6
TBD	Metropolitan	0	0	0	0	4	58
MARC	Penn	4	27/28	6	39	7*	57*
	Camden	2	10	2	10	4	30
	Brunswick	3	9/10	2	12	6	38
VRE	Fredericksburg	2	8	3	19	4*	23*
	Manassas	2	8	3	22	4*	23*

* Includes MARC/VRE run-through service at 4 trains per hour per direction in the peak hour.

Real-world data was analyzed to introduce variability into the lateness of trips entering at the model boundaries, accounting for accrued trip delays outside the area simulated. Existing Baseline operations were simulated on a model of the existing WUS infrastructure. A future station layout known as Option 14 with 12 stub-end tracks and 7 run-through tracks was tested in simulation with the future operating plans. The future station is fully accessible with three low level run-through platform edges in addition to the run-through and stub end high level platform edges. The future station complex includes redesigned and expanded “A”, “K” and “C” Interlockings located south and north of the station platforms.

Future infrastructure plans are sufficient to meet the demands of expected growth with the simulation models showing all trains successfully dispatched. With the large future increase in service, operational performance is predicted to decline somewhat with respect to the Existing Baseline. Existing operations at WUS are occasionally congested, but results show the station presently provides the flexibility necessary for reasonable operational performance given the existing schedule. From the Existing Baseline to 2030+, average speed decreases and delay increases overall, but On-Time Performance (OTP) improves across the board. Shorter future dwell times help platform occupancy percentages decrease from the Existing Baseline to 2030+, indicating more efficient use of infrastructure as service grows by 64 percent versus today’s train volumes.

The 2040 simulation assumes additional efficiency measures at WUS, including use of dual mode locomotives (in lieu of diesel to electric and electric to diesel engine changes) for all run-through Amtrak trains except for Long Distance service. The 2040 simulation retains operating variability for trains arriving from the south, given assumed continued ownership and dispatch by freight railroads in the future. In contrast, the 2040 simulation assumes much more reliable operation for trains arriving from the north, given the significant NEC reliability investments represented by NEC FUTURE. In the 2040 simulation results, Acela and MARC trains show increased delay from 2030, along with significant delay to newly introduced Metropolitan trains. Other 2040 simulation metrics show slight decreases versus 2030+ operating plan results, as is expected given the significantly increased service levels (75 percent growth versus 2030 and 188 percent growth versus today). Though levels of congestion increase as train volumes nearly triple versus today in the 2040 operating plan, the simulations show that the future Option 14 infrastructure is capable of supporting 2040 operations (see Appendix C, *2040 NEC FUTURE Operating Plan*).

Results of the three scenarios simulated, Existing Baseline, 2030+, and 2040 NEC FUTURE, are shown in Table 7-2 and Table 7-3 below.

Table 7-2 Ops. Table 2 – Average Speed (mph) by Service

Service	Existing Baseline	2030+	2040 NEC FUTURE
Acela	45.2	33.4	31.9
Regional	32.6	33.9	30.0
Long Distance	31.9	32.0	29.7
Amtrak (combined)	34.7	33.5	30.6
Metropolitan	NA	NA	31.5
VRE	27.9	26.2	23.0
MARC	32.3	26.0	26.5
Passenger (combined)	32.3	29.4	27.3
Freight	29.3	24.3	27.1
All Trains	31.9	28.7	27.3

Table 7-3 Ops. Table 3 – Stopped Delay per 100 Miles by service

Service	Existing Baseline	2030+	2040 NEC FUTURE
Acela	0:02:08	0:43:15	1:04:08
Regional	0:23:05	0:20:56	0:16:05
Long Distance	0:20:27	0:27:22	0:15:07
Amtrak (combined)	0:18:41	0:28:33	0:33:11
Metropolitan	NA	NA	1:14:16
VRE	0:04:04	0:11:53	0:04:58
MARC	0:22:13	0:46:11	0:55:49
Passenger (combined)	0:15:55	0:26:09	0:37:08
Freight	0:20:05	0:49:34	0:16:47
All Trains	0:16:29	0:29:26	0:35:06

Special trackwork utilization analysis, based on 24-hour simulations, revealed that most crossovers included in the Option 14 track and signal design are used for double or triple parallel moves in both future operational cases. Only three crossover tracks were used less than three times per day in either simulated case, and none went unused in both cases. Therefore, it is recommended that the Option 14 track layout be adopted as presently designed, with no rationalization to reduce capital cost, maintenance cost or construction complexity.

The Existing, 2030 and 2040 Operating Plans are included in Appendix C, “Future Build Simulation Technical Memo”.

7.2.1.1 Behavior and Relationships in the Operations Plans

The simulations of the Existing Baseline and 2030+ differ significantly from one another in their assumptions, infrastructure, and operations. Therefore, while individual changes in statistics may be explainable, overall trends may not be consistent across simulation evaluation categories due to significant changes in both simulated infrastructure and simulated operations.

Regional, Long Distance, and VRE trips see little change in average speed from the Existing Baseline to 2030+, while Acela and MARC see decreases. These decreases are likely a result of the much higher train volume in 2030+, causing congestion and reducing speeds entering and exiting WUS. This volume is also the likely cause of the increased delay for all trips, especially Acela. Acela performance decreases are due to their baseline operation reflecting significantly higher speeds than the surrounding traffic. When there is limited congestion, the disparity in speed between Acela and other WUS rail services is not a problem. But, as overall train volume increases, Acela trips must be reduced in speed to travel with the flow of the remainder of the passenger traffic.

Overall, platform utilization decreases slightly from the Existing Baseline to 2030+. Although there are more trips in 2030+, reductions in dwell times, and the movement of some midday MARC trains away from on-platform storage, reduces the overall capacity demands on the station over the full day and in the peak hour.

Improved future station infrastructure is able to handle higher 2030+ train volumes resulting in improved OTP for most services. Regional and VRE trips saw improved OTP in 2030+, possibly due to updated signaling and infrastructure as simulated in the 1st Street Tunnel and Long Bridge corridor. Acela trips suffered more congestion entering WUS in 2030+ when compared with the baseline but were nonetheless able to achieve higher OTP. Long Distance OTP increased significantly. This is due to the reduced size of the randomized distribution applied to Long Distance trains entering the simulation. In the Existing Baseline, Long Distance trains were entering the simulation up to 100 minutes late, which matches real world performance. In 2030+, this value is reduced to 50 minutes, under the assumption that both on and off NEC operations are significantly streamlined for Long Distance trains. This improvement bumps many Long Distance trains back under the 30 minute threshold for lateness.

7.2.2 2040 NEC FUTURE Operating Plan

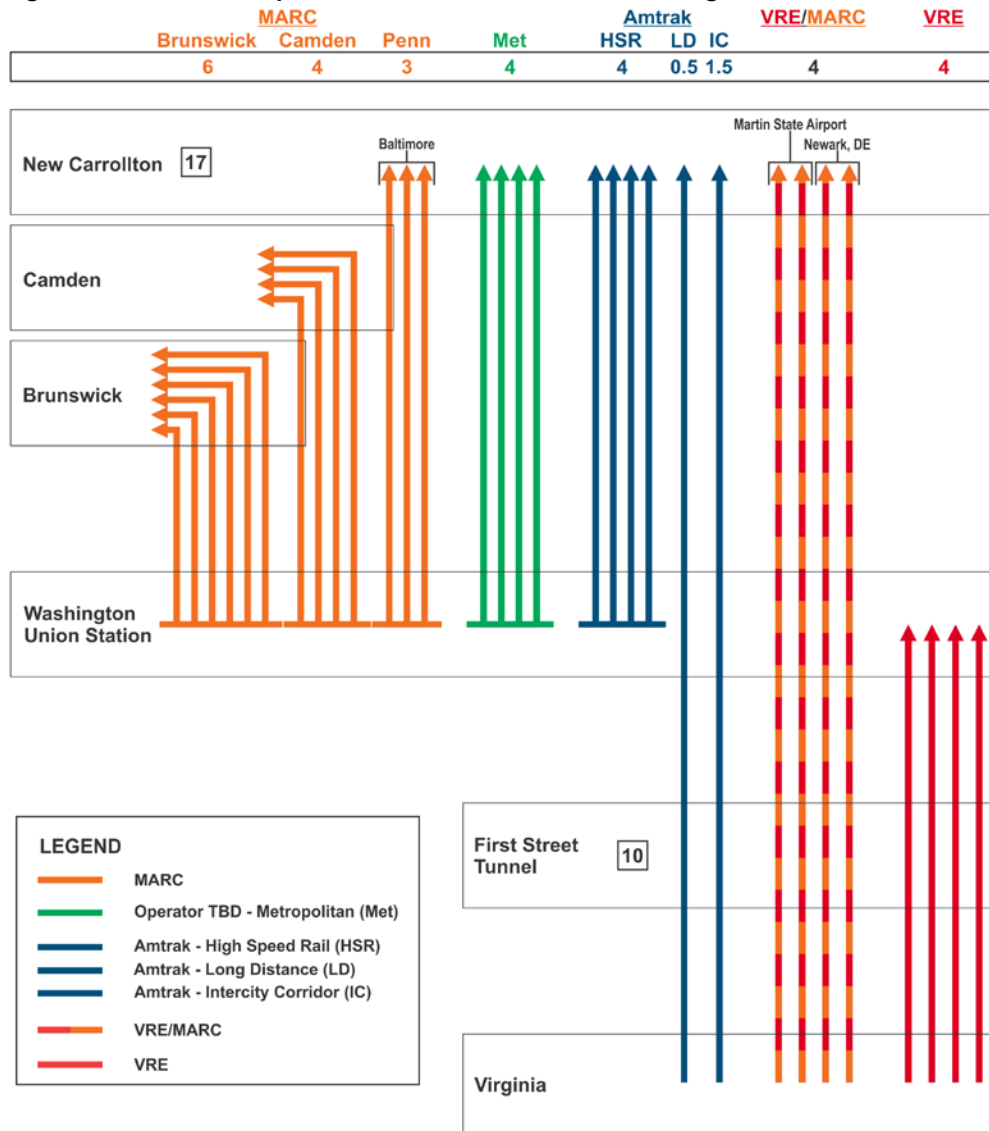
A 2040 blended plan was derived from the NEC FUTURE Alternative 2 service levels and reflects a rationalization of service levels north to New Carrollton. The purpose of the Blended 2040 Operating Plan is to provide a level of service to reasonably stress potential new infrastructure in simulations, without causing cascading delays which deteriorate performance to the point where analysis of the results may produce no useful information about the quality of the proposed design. The starting point was the FRA NEC FUTURE service plan scenario. However, NEC FUTURE service volumes for combined MARC Penn Line and Metropolitan services likely exceed the anticipated market demand and, therefore, some rationalization of the service plan is reasonable. Additionally, some capacity shortfalls exist at several locations outside of the proposed improvements associated with Washington Terminal projects. These improvements include Washington Terminal Yard (Ivy City) Master Plan, VRE Midday Storage Facility and the Long Bridge Corridor. Therefore, a blended operating plan was developed in order to “stress test” TI improvements while not biasing the results by overloading rail links that feed the TI improvements.

Service volumes in this 2040 NEC FUTURE blended plan are presented in Table 7-4 and Figure 7-1.

Table 7-4 Revenue Train Volumes for 2040 NEC FUTURE Blended Operating Plan (Per Direction)

Operator	Service	Peak Hour	Full Day
Amtrak	HSR	4	57
	Intercity (LD excluded)	1.5	23
	Long Distance	0.5	6
TBD	Metropolitan	4	58
MARC	Penn	7*	57*
	Camden	4	30
	Brunswick	6	38
VRE	Fredericksburg	4*	23*
	Manassas	4*	23*

* Includes MARC/VRE run-through service

Figure 7-1 Northbound peak service volumes around Washington Union Station


7.2.2.1 Differences from FRA NEC FUTURE Plan

As part of the process of creating blended operating plans for simulation, some alterations were made to the FRA NEC FUTURE service plan provided to the TI Team, including:

- To create an Operating Plan for 2040 the NEC FUTURE service plan at WUS was used. Close arriving and departing Metropolitan trips were paired at WUS to create scheduled terminal dwells close to, but no less than, 20 minutes. Of the 58 northbound trains in the FRA NEC FUTURE plan, 38 had their departure times adjusted to achieve 20-minute scheduled turn times. Eight of the 58 southbound arrivals also had their times adjusted; clockface headways were retained in both cases.
- In the FRA NEC FUTURE plan, there are 58 scheduled southbound Metropolitan trips at WUS but only 55 northbound trips. To create directional consistency, three Metropolitan trips were added northbound
 - MET 686, WUS: 22:03
 - MET 578, WUS: 22:54
 - MET 688, WUS: 23:03
- In the FRA plan there were 57 scheduled southbound HSR trips at WUS, but only 56 scheduled northbound HSR trips at WUS. To create directional consistency, one HSR trip was added northbound departing WUS at 20:23 (EXP 1072).
- In the FRA plan, through-running Intercity trips have a scheduled dwell at WUS of 15 minutes. Run-through Intercity trips in 2040 are supposed to have a scheduled dwell of 24 minutes per project documentation. Southbound departure times and northbound arrival times at WUS were adjusted to achieve 24-minute scheduled dwells.
- In the FRA plan, trips A128 and A144 originate south of WUS. These trips are supposed to originate at WUS to achieve balanced bidirectional service. Therefore, A128 and A144 originate in WUS at their scheduled departure times for that location.
- In the FRA plan, the combined Intercity and Long Distance train volumes fall short of the collective FRA NEC FUTURE goal of two trips per direction per hour. The project plans call for 23 Intercity trips plus 6 Long Distance trips per direction running at a frequency of two per hour. Therefore, 5 Intercity trips were added per direction to bring volumes up to a sufficient level to meet these criteria and ensure a consistent clockface schedule. All added trips run through WUS, two to the Manassas Line and three to the Fredericksburg Line: A105, A115, A117, A133, A137, A122, A130, A132, A136, A150.
- The FRA NEC FUTURE plan did not include the Capitol Limited. The Capitol Limited eastbound and westbound trips were added to fit into Long Distance slots of the overall Intercity/Long Distance clockface pattern.
- In the FRA NEC FUTURE plan, the “Regional” (Commuter Rail – MARC Penn Line) southbound operating plan contains 82 arrivals at WUS. As noted above, this volume can be reduced to 57 daily one-way trips, consistent with market forecasts. A total of 25 southbound MARC trains were removed to reach 57 trains per day, including reducing peak hour service to 7 trains per hour. The same reduction was made to northbound MARC Penn Line service.
- Camden and Brunswick Line schedules were created based on service plan values for this project
- VRE schedules in the FRA NEC FUTURE plan match documents provided by that agency so no changes were made except that trips for MARC/VRE run through

service were selected from closely timed trips from both plans in the applicable direction.

7.2.3 2025 Operational Analysis

A 2025 Operating Plan was developed for the purpose of allowing a constructability review of the T1 Project and did not include any of the network modeling developed for the other operating plans. As such, the operations simulation analysis conducted to test the future infrastructure and 2030+ and 2040 operating plans bears no resemblance to the construction phasing analysis conducted, and they were developed for very different reasons.

The results of the operations review performed for the Constructability review were presented to the railroads in a PowerPoint presentation of 4/5/18. The pertinent slides of that presentation are included in Appendix D.

Appendices

Appendix A Alignments

A1. Matrix of Options

	# Revenue Tracks	# Run-through Tracks	Minimum Track Centers	Min Platform Width	Curved Platforms	Meet Prelim RTC Model	Open Concourse	Light Wells in Wide Central Platform	First Street Skylight	Centralized Concourse	Spectral Trackwork	"K" Redesign Track 43	Tunnel Portal Redesign	Engine Pooling Track	Engine Switching	Redundancy
	<i>Terminal Capacity</i>						<i>Light and Air</i>				<i>Interlocking</i>		<i>Ops Flexibility</i>			
Option 1	20	8	14'	28'	X	-	✓	X	✓	✓	#8	X	X	X	X	X
Option 1a	20	8	14'	28'	X	-	✓	X	✓	✓	#8	✓	✓	X	✓	X
Option 2	22	8	14'	26'	X	-	✓	X	X	X	#8	X	X	X	X	X
Option 3	20	8	14'	28'	X	-	✓	X	✓	✓	#8	✓	✓	X	✓	✓
Option 4	20	8	14'	26'	X	-	✓	X	✓	✓	#8	✓	✓	X	✓	✓
Option 5	21	8	13'	28'	X	-	✓	X	X	✓	#9	✓	✓	X	✓	✓
Option 6	21	8	13'	28'	X	-	✓	X	X	✓	#9	X	X	X	X	✓
Option 7	20	8	13'	28'	X	-	✓	X	✓	✓	#9	✓	✓	X	✓	✓
Option 8	20	8	13'	28'	X	-	✓	X	✓	✓	#9	X	X	X	X	✓
Option 7M	20	8	13.5'	30'	X	X	✓	X	✓	✓	#9	✓	✓	X	✓	✓
Option 9a	22	8	13.5'	28'	X	-	X	X	X	✓	#9	✓	✓	X	✓	✓
Option 9b	21	8	13.5'	31'	X	X	X	X	X	✓	#9	✓	✓	X	✓	✓
Option 9c	20	8	13.5'	36'	X	-	X	X	X	X	#9	✓	✓	X	✓	✓
Option 9d	20	8	13.5'	31'	X	X	X	✓	✓	X	#9	✓	✓	X	✓	✓
Option 10	20	8	13.5'	30'	X	✓	✓	X	✓	✓	#9	✓	✓	X	✓	✓
Option 11	18	6	13.5'	30'	✓	✓	✓	X	X	✓	#9	✓	✓	✓	✓	✓
Option 12	19	6	13.5'	30'	✓	✓	X	X	X	X	#9	✓	✓	✓	✓	✓
Option 13	18	6	13.5'	30'	✓	✓	X	✓	X	X	#9	✓	✓	✓	✓	✓
Option 14	19	7	13.5'	30'	✓	✓	✓	X	X	✓	#9	✓	✓	✓	✓	✓
Option 15	20	7	13.5'	30'	✓	✓	X	X	X	X	#9	✓	✓	✓	✓	✓
Option 16	19	7	13.5'	30'	✓	✓	X	✓	X	X	#9	✓	✓	✓	✓	✓

A2. Option 1

1. Description of Option

Option 1 was created as a baseline design, maintaining a full open concourse and matching the existing “K” interlocking configuration as much as possible. Track #30 was added to create a small pocket to store locomotives along the eastern wall of the Terminal.

2. Positive Elements

- 14’ track centers
- Full 48’ open Concourse
- 28’ Platforms
- Track #30 with 233’ of locomotive storage
- Maintain existing capacity between “C” and “K” Interlockings
- Match existing “K” Interlocking configuration
- Crossing diamond provides for efficient movement through “K” Interlocking

3. Disadvantages

- Run-through tracks don’t align well with portal
- Pocket length is insufficient to hold 4 locomotives
- Single point failures cause inaccessibility to more than 2 platform edges
- VRE platform lengths are insufficient
- Uses the smaller Amtrak No. 8 special trackwork
- Platforms aren’t sized for columns
- No locomotive operational flexibility at tunnel portal

4. Summary

This option was eliminated from further consideration since the usable platform lengths provided aren’t sufficient. The special trackwork configurations creates a single point failure could cause multiple platform edges to become inaccessible; and track #30 has little operational usefulness.

A3. Option 1a

1. Description of Option

Option 1a was created as a variant to Option 1 where track #43 is re-introduced. This required a shift of all track centers between “C” Interlocking and “K” Interlocking to provide enough lateral room for the additional track within the ROW, while still matching the existing “K” Interlocking configuration.

2. Positive Elements

- 14’ track centers
- Full 48’ Central Concourse
- 28’ platforms
- Track #30 with 931’ of locomotive storage
- Maintain existing capacity between “C” and “K” Interlockings
- Match existing “K” Interlocking configuration
- Crossing diamond provides for efficient movement through “K” Interlocking
- Includes track #43

3. Disadvantages

- Run-through tracks don’t align well with portal
- VRE platform lengths are insufficient
- Pocket track only ties in to north end of run-through tracks
- Shift of tracks between “C” and “K” Interlockings
- Single point failures cause inaccessibility to more than 2 platform edges

- Platforms aren't sized to accommodate desired overbuild column clearances
- Uses the smaller Amtrak No. 8 special trackwork
- No locomotive operational flexibility at tunnel portal

4. Summary

This option has been eliminated for the same reasons as Option 1 (see Appendix A2.4).

A4. Option 2

1. Description of Option

Option 2 was created in an attempt to add more revenue tracks and platforms to Option 1. This was achieved by reducing the platform widths from 28' to 26', reducing the width of the Central Concourse from 48' to 29'-10", and shifting the concourse location slightly. The design of the throat, and "K" Interlocking was based off of Option 1 and modified for the extra tracks.

2. Positive Elements

- 14' track centers
- Maintain existing distance between "C" and "K" Interlockings
- 2 additional stub-ended revenue tracks
- Match existing "K" Interlocking configuration
- Crossing diamond provides for efficient movement through "K" Interlocking

3. Disadvantages

- Only a 29'-10" Open Concourse
- 26' platforms
- No pocket for locomotive storage
- VRE platform lengths are insufficient
- Single point failures cause inaccessibility to more than 2 platform edges
- Run-through tracks don't align well with portal
- Uses the smaller Amtrak No. 8 special trackwork
- Platforms aren't sized to accommodate desired overbuild column clearances
- No locomotive operational flexibility at tunnel portal

4. Summary

This option has been eliminated. The 26' wide platforms aren't feasible and the 29'-10" shifted Central Concourse was not acceptable. This option has been redesigned as Options 5 and 6 (see Appendix A7 and Appendix A8).

A5. Option 3

1. Description of Option

Option 3 introduces half platforms to the run-through tracks to narrow the overall footprint of the run-through tracks, better aligning them with the tunnel tracks. Option 3 was based on the design of Option 1a (see Appendix A3.1), where track #43 is re-introduced, but eliminates track #30. Additional flexibility was introduced by adding a No. 8 slip switch on the south side of Tracks 22 and 23 to promote flexibility in switching locomotives.

2. Positive Elements

- 14' track centers
- Full 48' Central Concourse
- 28' platforms
- Track #43 with 244' of locomotive storage
- Match existing "K" Interlocking configuration
- Locomotive switching flexibility at tunnel portal
- Maintain existing distance between "C" and "K" Interlockings

- Crossing diamond provides for efficient movement through “K” Interlocking
 - Run-through tracks better align with tunnel portal with side platforms
 - VRE platforms reach 700’+
3. Disadvantages
- Locomotive operational flexibility greatly affects track #22 platform length
 - Pocket length is insufficient to hold 4 locomotives
 - All tracks between “C” and “K” Interlockings must be moved
 - Single point failures cause inaccessibility to more than 2 platform edges
 - Uses the smaller Amtrak No. 8 special trackwork
 - Platforms aren’t sized to accommodate desired overbuild column clearances
4. Summary

This option has been eliminated. The special trackwork configurations create a single point failure could cause multiple platform edges to become inaccessible. The operational flexibility provided by the tunnel portal is an inefficient use of space. This option (combined Option 4) has been redesigned as Options 7 and 8 (see Appendix A9 and Appendix A11).

A6. Option 4

1. Description of Option
- Option 4 was created as a variant of Option 3 where the platforms were arranged so that the proposed H Street Bridge construction could occur separately from the project. This was achieved by configuring the platforms so that the H Street Bridge columns could be placed in locations where they would not encroach into the track clearance envelopes for either the present track or proposed track alignments. This was achieved by varying proposed platform widths throughout the station using a combination of 26’ to 30’ full center platforms and 18’ to 20’-7” “half” platforms. The operational flexibility added on the south side of tracks #22 and #23 in Option 3 was eliminated in this option
2. Positive Elements
- 14’ track centers
 - Full 48’ Central Concourse
 - Match existing “K” Interlocking configuration
 - VRE platforms reach 700’+
 - Track #43 with 244’ of locomotive storage
 - Crossing diamond provides for efficient movement through “K” Interlocking
 - Run-through tracks better align with tunnel portal with side platforms
 - Maintain existing distance between “C” and “K” Interlockings
3. Disadvantages
- No operational flexibility for locomotive exchanging at the tunnel portal
 - Variable width platforms (26’ – 30’)
 - Uses the smaller Amtrak No. 8 special trackwork
 - All tracks between “C” and “K” Interlockings must be realigned
 - Single point failures cause inaccessibility to more than 2 platform edges
 - Pocket length is insufficient to hold 4 locomotives
 - Platforms aren’t sized to accommodate desired overbuild column clearances
4. Summary
- This option has been eliminated as the special trackwork is designed in a way where a single point failure could cause multiple platform edges to become inaccessible. This option (combined with Option 3) has been redesigned as Options 7 and 8 (see Appendix A9 and Appendix A11).

A7. Option 5

1. Description of Option

This option was developed as a revision to Option 2 (see Appendix A4.1), with elements added from Option 3. In this revision all platforms returned to minimum 28' widths; the Central Concourse was re-centered and the width was set to 36'; half-width platforms on the run-through tracks were introduced; additional crossovers were added to the south end of the run-through tracks in a "saw tooth" layout to provide operational flexibility for locomotive switching; and added one additional half-width platform to the upper-level stub-ended tracks on the western side of the Terminal to provide an extra revenue track.

This option also redesigned the configuration of "K" Interlocking special trackwork to provide operational redundancy for access to all pairs of tracks at the platforms as efficiently as possible. This design reintroduced track #43 and provided a "pooling track" along the REA Building that can be used for locomotive storage.

2. Positive Elements

- 28' platforms
- 1 additional stub-ended revenue track
- Track #43 with 535' of locomotive storage
- Reconfigured "K" Interlocking provides redundancy for access to platform edges
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- Run-through tracks better aligned with the tunnel portal with side platforms
- VRE platforms reach 700'+

3. Disadvantages

- 13' track centers
- Only a 27' Central Concourse
- Requires full reconfiguration of "K" Interlocking
- All tracks between "C" and "K" Interlockings must be realigned
- Reduced capacity between "C" and "K" Interlockings
- Platforms aren't sized to accommodate desired overbuild column clearances

4. Summary

This option has been eliminated. The space used to provide the additional revenue track in the upper level did not provide enough clearance on the western edge for the desired skylight and other edge condition requirements. In addition, this option had substandard track centers and a relatively small Central Concourse.

A8. Option 6

1. Description of Option

Option 6 was created as a variant of Option 5 that simply eliminated track #43. This option has all the same elements as the previous, but the redesign of "K" Interlocking ties into the existing tracks to the north.

2. Positive Elements

- 28' platforms
- 1 additional stub-ended revenue track
- Reconfigured "K" Interlocking provides redundancy for access to platform edges
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- Run-through tracks better aligned with the tunnel portal with side platforms
- VRE platforms reach 700'+

3. Disadvantages
 - 13' track centers
 - Only a 36' Central Concourse
 - Requires full reconfiguration of "K" Interlocking
 - No track #43 or pocket for locomotive storage
 - Reduced capacity between "C" and "K" Interlockings
 - Platforms aren't sized to accommodate desired overbuild column clearances

4. Summary

This option has been eliminated for the same reason as Option 5 (see Appendix A7.4) and as Track 43 is needed for capacity.

A9. Option 7

1. Description of Option

The option was developed as a revision to Option 3 and 4 (see Appendix A5.1 and Appendix A6.1, respectively) combining elements from both of those options. In this revision the half-width platforms on the run-through tracks and the introduction of track #43 were maintained; the platforms become a uniform 28' width; additional crossovers were added to the south end of the run-through tracks in a "saw tooth" layout to provide operational flexibility for locomotive switching; the configuration of "K" Interlocking special trackwork was redesigned to provide redundancy of access to all pairs of tracks at the platforms as efficiently as possible; and provided a 500'+ "pooling track" along the REA Building that can be used for locomotive storage.

2. Positive Elements

- Full 48' Central Concourse
- 28' platforms
- Track #43 with 535' of locomotive storage
- Reconfigured "K" Interlocking provides redundancy for access to platform edges
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- Run-through tracks better aligned with the tunnel portal with side platforms
- VRE platforms reach 700'+

3. Disadvantages

- 13' track centers
- Requires full reconfiguration of "K" Interlocking
- All tracks between "C" and "K" Interlockings must be realigned
- Reduced capacity between "C" and "K" Interlockings
- Platforms aren't sized to accommodate desired overbuild column clearances

4. Summary

This option requires revisions with respect to platform width and potential reconfigurations of "K" Interlocking and isn't recommended as-is.

A10. Option 7 Modified (7M)

1. Description of Option

Option 7 Modified is a revision to Option 7 which takes into account comments provided by Amtrak and FRA personnel. This option retains the 2012 Master Plan layout, including a 48' wide Central Concourse and twenty revenue tracks.

2. Positive Elements

- 48' Central Concourse
- 30' platforms

- Track #43 with 487' of locomotive storage
 - "K" Interlocking route redundancy
 - Locomotive switching flexibility at tunnel portal
 - Uses AREMA No. 9 Special Trackwork
 - Run-through side platforms
 - VRE platforms reach 700'+
3. Disadvantages
- 13.5' track centers
 - Requires full reconfiguration of "K" Interlocking
 - All tracks between "C" and "K" Interlockings must be realigned
 - Reduced capacity between "C" and "K" Interlockings
 - Substandard run-through platform lengths
4. Summary
- The option is not recommended. Although it provides the greatest flexibility through the interlocking compared to any of the previous options, this option still fails to provide the required platform lengths on the run-through tracks to the East.

A11. Option 8

1. Description of Option
- This option was created as a variant of Option 7 that simply eliminated reintroduction of track #43. This option has all the same elements as the previous, but the redesign of "K" Interlocking ties into the existing tracks to the north.
2. Positive Elements
- Full 48' Central Concourse
 - 28' platforms
 - Reconfigured "K" Interlocking provides redundancy for access to platform edges
 - Locomotive switching flexibility at tunnel portal
 - Uses AREMA No. 9 special trackwork
 - Run-through tracks better align with tunnel portal with side platforms
 - VRE platforms reach 700'+
3. Disadvantages
- 13' track centers
 - Requires full reconfiguration of "K" Interlocking
 - No track #43 or pocket for locomotive storage
 - Reduced capacity between "C" and "K" Interlockings
 - Platforms aren't sized to accommodate desired overbuild column clearances
4. Summary
- This option has been eliminated, since it does not provide track #43 for storage for capacity.

A12. Option 9a

1. Description of Option
- This option was created without an open concourse in order to introduce additional stub-ended revenue tracks, reaching twenty-two revenue tracks. Option 9a was a variant of Option 7 Modified (see Appendix A10.1) but reduced the platform widths to 28' to allow for the installation of the overbuild platforms, assuming that a 120' longitudinal (north-south) span was possible for the overbuild columns.

2. Positive Elements

- 22 revenue tracks
- Track #43 with 487' of locomotive storage
- Provides "K" Interlocking redundancy
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- Run-through side platforms
- VRE platforms reach 700'+

3. Disadvantages

- No Central Concourse is provided
- 28' platforms
- 13.5' track centers
- Requires full reconfiguration of "K" Interlocking
- All tracks between "C" and "K" Interlockings must be realigned
- Reduced capacity between "C" and "K" Interlockings
- Substandard run-through platform lengths

4. Summary

This option has been eliminated because the assumed 120' longitudinal span for overbuild columns wasn't achievable in all locations.

A13. Option 9b

1. Description of Option

Option 9b was created without an open concourse in order to introduce an additional stub-ended revenue track, similarly to Option 9a. However, Option 9b incorporated 31' platforms to provide for 28' platforms and space for 3'-wide overbuild columns.

2. Positive Elements

- Additional revenue track
- 31' platforms
- Track #43 with 487' of locomotive storage
- "K" Interlocking redundancy
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- Run-through side platforms
- VRE platforms reach 700'+

3. Disadvantages

- No Central Concourse
- 13.5' track centers
- Requires full reconfiguration of "K" Interlocking
- All tracks between "C" and "K" Interlockings must be realigned
- Reduced capacity between "C" and "K" Interlockings
- Substandard run-through platform lengths

4. Summary

This option has been eliminated, since the usable platform lengths provided aren't sufficient as determined by a preliminary Rail Utilization Spreadsheet analysis.

A14. Option 9c

1. Description of Option

Option 9c investigated how wide the platforms could be if only twenty revenue tracks were provided, and the track and platform layout were to expand to the extents of the ROW. Option 9c eliminated the open concourse and utilized 36' wide platforms.

2. Positive Elements

- 36' platforms
- Track #43 with 487' of locomotive storage
- "K" Interlocking redundancy
- Run-through side platforms
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- VRE platforms reach 700'+

3. Disadvantages

- No Central Concourse
- 13.5' track centers
- Requires full reconfiguration of "K" Interlocking
- All tracks between "C" and "K" Interlockings must be shifted
- Reduced capacity between "C" and "K" Interlockings
- Substandard run-through platform lengths

4. Summary

This option has been eliminated. The wider, 36' platforms are unnecessary for providing passenger use and their width creates shorter usable platform lengths on tracks at the edges of the ROW.

A15. Option 9d

1. Description of Option

Option 9d was created to assess the benefits of replacing the open concourse approach with a single, very wide central platform. The proposed purpose of the widened central platform was to incorporate light wells to give the same architectural lighting benefits to the lower station levels as the open concourse in previous options. This option had twenty revenue tracks and a single 56'-wide central "mega-platform" that would incorporate light wells to the pedestrian concourse below the platform.

2. Positive Elements

- Mega platform/light wells
- 31' platforms for remaining tracks
- Track #43 with 487' of locomotive storage
- "K" Interlocking redundancy
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- Run-through side platforms
- VRE platforms reach 700'+

3. Disadvantages

- No open Central Concourse
- 13.5' track centers
- Requires full reconfiguration of "K" Interlocking
- All tracks between "C" and "K" Interlockings must be shifted
- Reduced capacity between "C" and "K" Interlockings

- Substandard run-through platform lengths
4. Summary

This option has been eliminated, since the usable platform lengths provided aren't sufficient as determined by preliminary Rail Utilization Spreadsheet analysis.

A16. Option 10

1. Description of Option

Option 10 was created to illustrate the potential gains in platform capacity if the historic REA Building were to be removed and the tracks and platforms occupied its footprint. The option was designed based on Option 7 Modified (see Appendix A10.1); however, this modification can be made to all Options.
2. Positive Elements
 - 30' platforms
 - 32' Central Concourse
 - Track #43 with 487' of locomotive storage
 - "K" Interlocking redundancy
 - Run-through side platforms
 - Locomotive switching flexibility at tunnel portal
 - Uses AREMA No. 9 special trackwork
 - VRE platforms reach 700'+
 - All platforms reach required/desired lengths
3. Disadvantages
 - REA Building must be removed.
 - 13.5' track centers
 - Requires full reconfiguration of "K" Interlocking
 - All tracks between "C" and "K" Interlockings must be shifted
 - Reduced capacity between "C" and "K" Interlockings
4. Summary

This option is not preferred and will not be considered due to the implications of removing the REA Building.

A17. Option 11

1. Description of Option

This option was created after preliminary Rail Utilization Spreadsheet analysis showed significant capacity concerns about the operational capacity concerns raised by Options 7 Modified, 9b, & 9d. The Option 11 alignment was based on Option 7 Modified (see Appendix A10.1), incorporating an open concourse and 12 stub-ended tracks. Option 11 reduced the number of run-through tracks to six, with a stub-ended storage track (track #28).

This option introduced the use of curves along the lower level platforms and elongated them to provide the desired platform lengths. Option 11 also shifted the Central Concourse eastward to place it along the line dividing the upper-level tracks from the lower level tracks to enhance the constructability of the project. The design of "K" Interlocking was not updated / modified for this variation, since it was unnecessary for the purposes of this option study.
2. Positive Elements
 - 30' platforms
 - Wide, variable-width, tapered concourse
 - Track #43 storage of 4+ locomotives
 - "K" Interlocking redundancy

- Revised run-through design
 - Locomotive switching flexibility at tunnel portal
 - Uses AREMA No. 9 special trackwork
 - All platforms reach required/desired lengths
 - Preliminary Rail Utilization Spreadsheet analysis appears to provide a functional design
3. Disadvantages
- Impacts to the REA Building parking lot
 - 13.5' track centers
 - All tracks between "C" and "K" Interlockings must be realigned
 - Reduced capacity between "C" and "K" Interlockings
 - Reduced number of run-through tracks
4. Summary
- This option has been eliminated. This option has only six run-through tracks, which lack the redundancy within the station required by Amtrak.

A18. Option 12

1. Description of Option
- Option 12 was created after preliminary Rail Utilization Spreadsheet analysis showed significant capacity inadequacies with Options 7 Modified, 9b, & 9d. The configuration of Option 12 was a variant of Option 9b (see Appendix A14.1) incorporating an additional stub-ended track and omitted a Central Concourse. Option 12 reduced the number of run-through tracks to six, maintained a thirteenth upper level track, added a stub-ended storage track in the lower level, in order to curve the platforms and elongate them to reach the required platform lengths, similar to Option 11. The design of "K" Interlocking was not updated for this variation, since it was unnecessary for the purposes of this option study.
2. Positive Elements
- 30' platforms
 - Track #43 storage of 4+ locomotives
 - "K" Interlocking redundancy
 - Revised run-through design
 - Locomotive switching flexibility at tunnel portal
 - Uses AREMA No. 9 special trackwork
 - All platforms reach required/desired lengths
 - Preliminary Rail Utilization Spreadsheet analysis appears to provide a functional design
3. Disadvantages
- REA Building parking lot impacts
 - 13.5' track centers
 - All tracks between "C" and "K" Interlockings must be shifted
 - Reduced capacity between "C" and "K" Interlockings
 - No open Central Concourse
 - Reduced number of run-through tracks
4. Summary
- This option has been eliminated. This option has only six run-through tracks, which lack the redundancy within the station required by Amtrak.

A19. Option 13

1. Description of Option

The design of Option 13, like Option 12, was created after preliminary Rail Utilization Spreadsheet analysis showed significant capacity inadequacies with Options 7 Modified, 9b, & 9d. The configuration of Option 13 was a variant of Option 9d (see Appendix A15.1), incorporating a wide central platform in lieu of an open Central Concourse. Option 13 reduced the number of run-through tracks to six, added a stub-ended storage track in the lower level in order to curve the platforms and elongate them to reach the required platform lengths, similar to Option 11. Option 13 also shifted the central concourse to the east to benefit the constructability of the project. The design of “K” Interlocking was not updated for this variation, since it was unnecessary for the purposes of this option study.

2. Positive Elements

- 30' platforms
- Wide Mega Platform
- Track #43 storage of 4+ locomotives
- “K” Interlocking redundancy
- Revised run-through design
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- All platforms reach required/desired lengths
- Preliminary Rail Utilization Spreadsheet analysis shows functional design

3. Disadvantages

- REA Building parking lot impacts
- 13.5' track centers
- All tracks between “C” and “K” Interlockings must be shifted
- Reduced capacity between “C” and “K” Interlockings
- Reduced number of run-through tracks

4. Summary

This option has been eliminated. This option has only six run-through tracks, which lack the redundancy within the station required by Amtrak.

A20. Option 14

1. Description of Option

Option 14 was created as a variant of Option 11 (see Appendix A17.1), increasing the number of run-through tracks to seven, removing the stub-ended storage track at the east side of the run-through tracks, and increasing the distance from track #1 to the west ROW line to accommodate the overbuild. Maintenance access roads have also been provided.

2. Positive Elements

- 30' platforms
- Wide, variable-width, tapered concourse
- Track #43 storage of 4+ locomotives
- “K” Interlocking redundancy
- Revised run-through design
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- All platforms reach required/desired lengths
- Preliminary RTC modeling shows functional design

3. Disadvantages

- REA Building parking lot impacts
- 13.5' track centers
- All tracks between “C” and “K” Interlockings must be shifted

- Reduced capacity between “C” and “K” Interlockings
- Reduced number of run-through tracks

4. Summary

This option has been selected as a viable means of addressing multiple project challenges. The design is recommended to progress to the next stage because it appears to provide the platform capacity, the number of tracks necessary to allow operational flexibility, and it allows the preservation of the REA Building.

A21. Option 15

1. Description of Option

Option 15 was created as a revision to Option 12 (see Appendix A18.1), increasing the number of run-through tracks to seven, removing the lower-level storage track, maintaining a thirteenth track in the upper level, and increased the distance from track #1 to the west ROW line to accommodate the overbuild. Maintenance access roads were also provided. Like previous variants, this option does not provide an open Central Concourse.

2. Positive Elements

- 30' platforms
- Track #43 storage of 4+ locomotives
- “K” Interlocking redundancy
- Revised run-through design
- Additional revenue track
- Locomotive switching flexibility at tunnel portal
- Uses AREMA No. 9 special trackwork
- All platforms reach required lengths
- Preliminary Rail Utilization Spreadsheet analysis shows functional design

3. Disadvantages

- REA parking lot impacts
- 13.5' track centers
- “K” Interlocking design incomplete
- All tracks between “C” and “K” Interlockings must be shifted
- Reduced capacity between “C” and “K” Interlockings
- No Central Concourse
- Short, triangular platform between tracks #12 and #13
- Reduced number of run-through tracks

4. Summary

This option has been eliminated. Providing a thirteenth upper level revenue track creates a non-standard triangular platform between track #12 and track #13, so those two Acela platforms are only able to accommodate single berthing. As such, the additional revenue track provides very little, if any, additional capacity.

A22. Option 16

1. Description of Option

Option 16 was created as a variant of Option 13 (see Appendix A19.1), increasing the number of run-through tracks to seven, removing the storage track, and increasing the distance from track #1 to the west ROW line to accommodate the overbuild. Maintenance access roads have also been provided.

2. Positive Elements

- 30' platforms

- Wide, triangular mega platform
 - Track #43 storage of 4+ locomotives
 - “K” Interlocking redundancy
 - Revised run-through design
 - Locomotive switching flexibility at tunnel portal
 - Uses AREMA No. 9 special trackwork
 - All platforms reach required, desired lengths
 - Preliminary RTC modeling shows functional design
3. Disadvantages
- REA Building parking lot impacts
 - 13.5’ track centers
 - “K” Interlocking design incomplete
 - All tracks between “C” and “K” Interlockings must be realigned
 - Reduced capacity between “C” and “K” Interlockings
 - Reduced number of run-through tracks
4. Summary

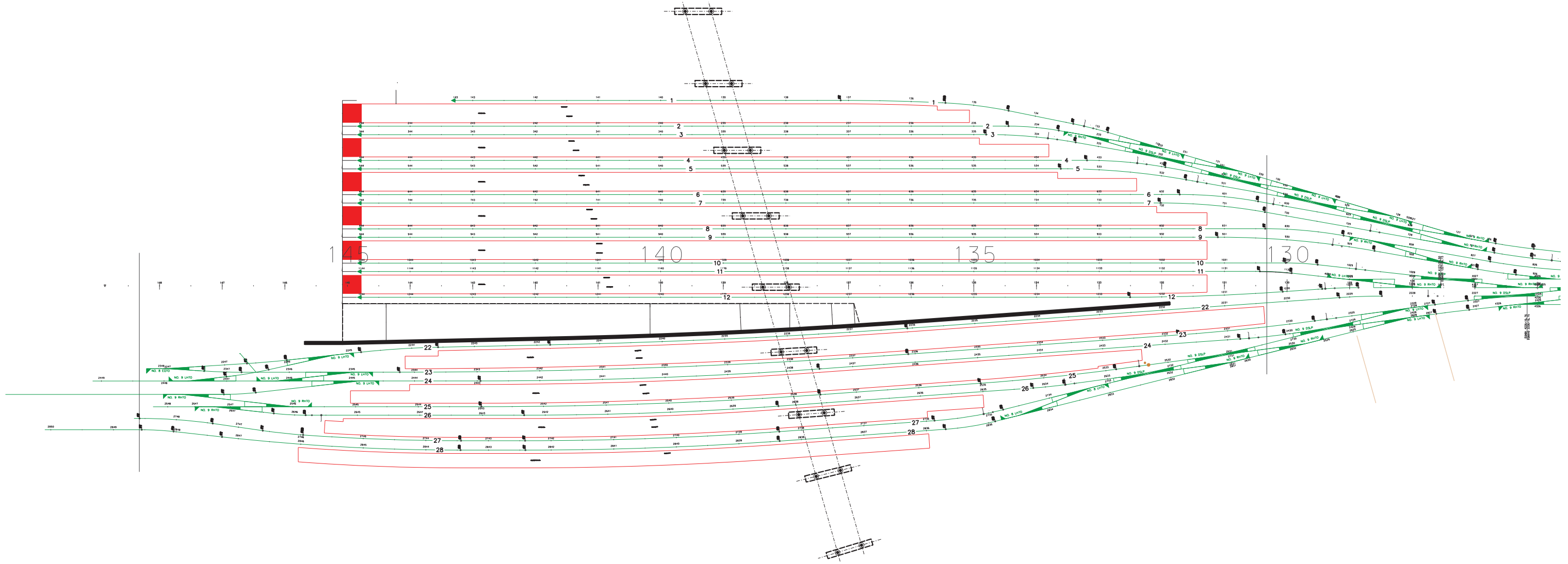
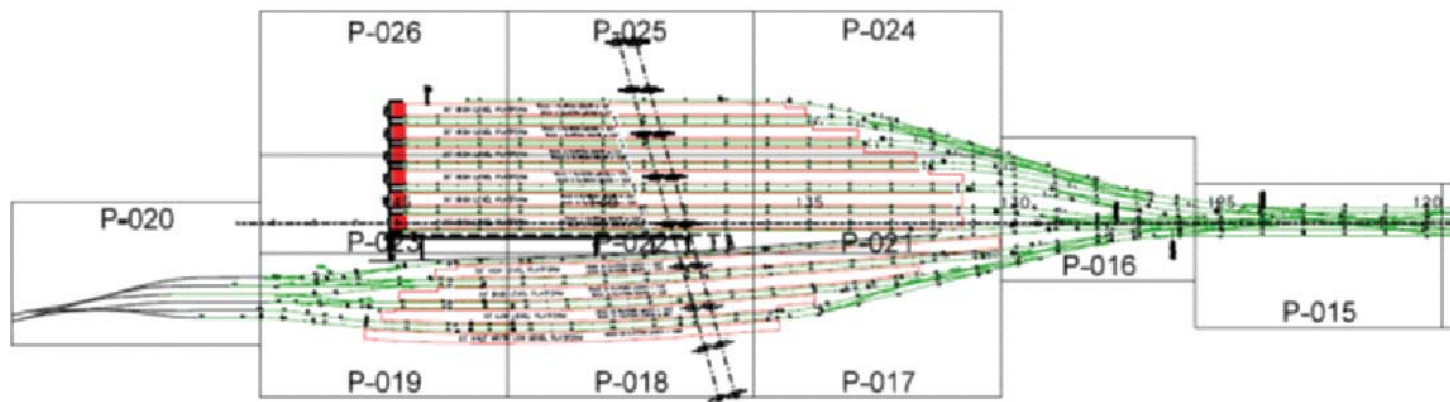
This option, while not eliminated, is not analyzed in the EIS Report. The triangular, wide central platform has a non-traditional shape, creating uncertainties with respect to the “grid” desired for the overbuild structures. In addition, there are potential security concerns concerning the use of the proposed light wells that will replace the open Central Concourse. If the structural and security considerations are properly addressed, this Option 16 may become a viable alternative to Option 14.

Appendix B Alignment - Option 14

B1. Track Alignment

1. The following sheets show the alignment of Option 14 (also provided in Appendix A20).

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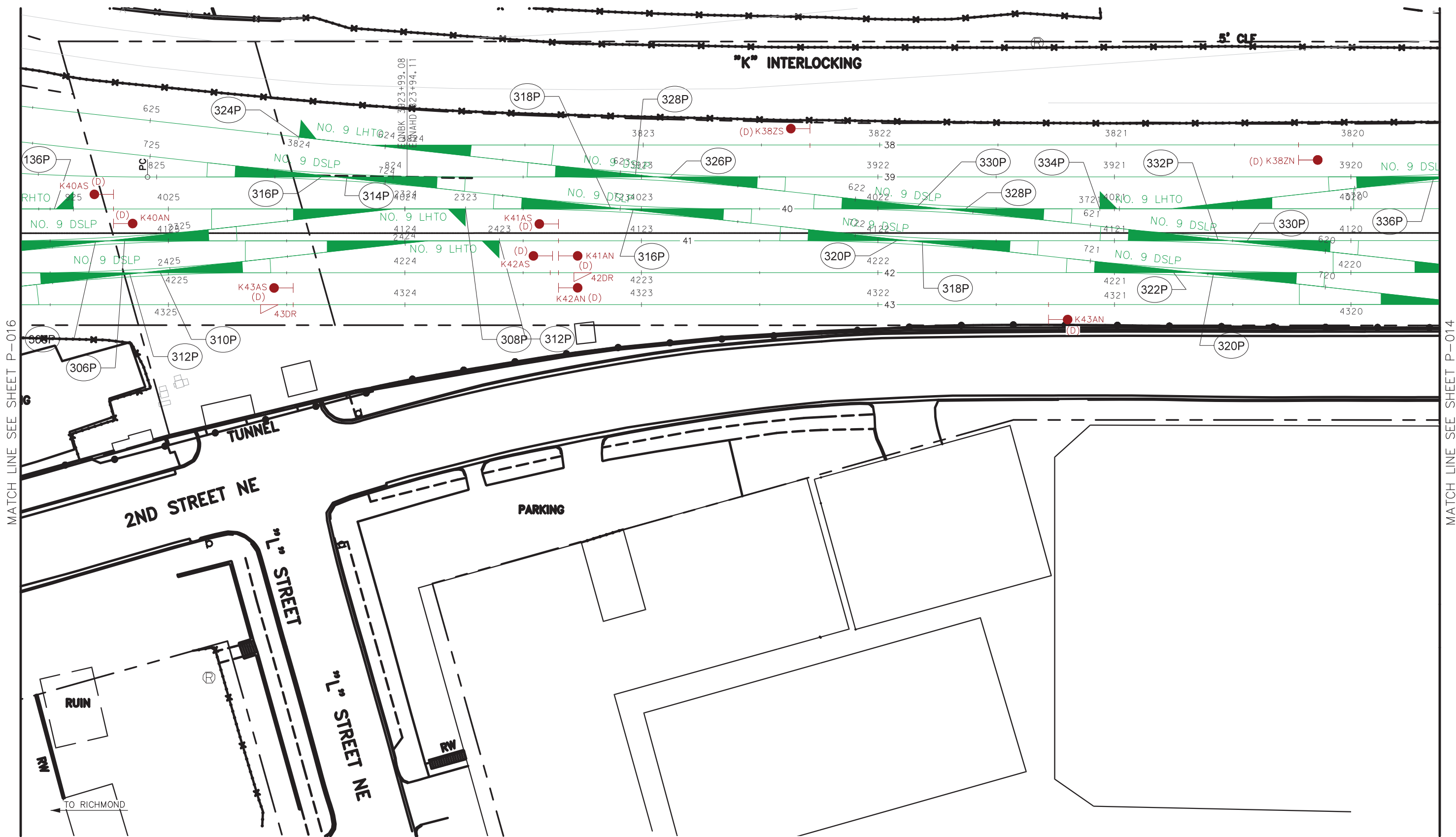
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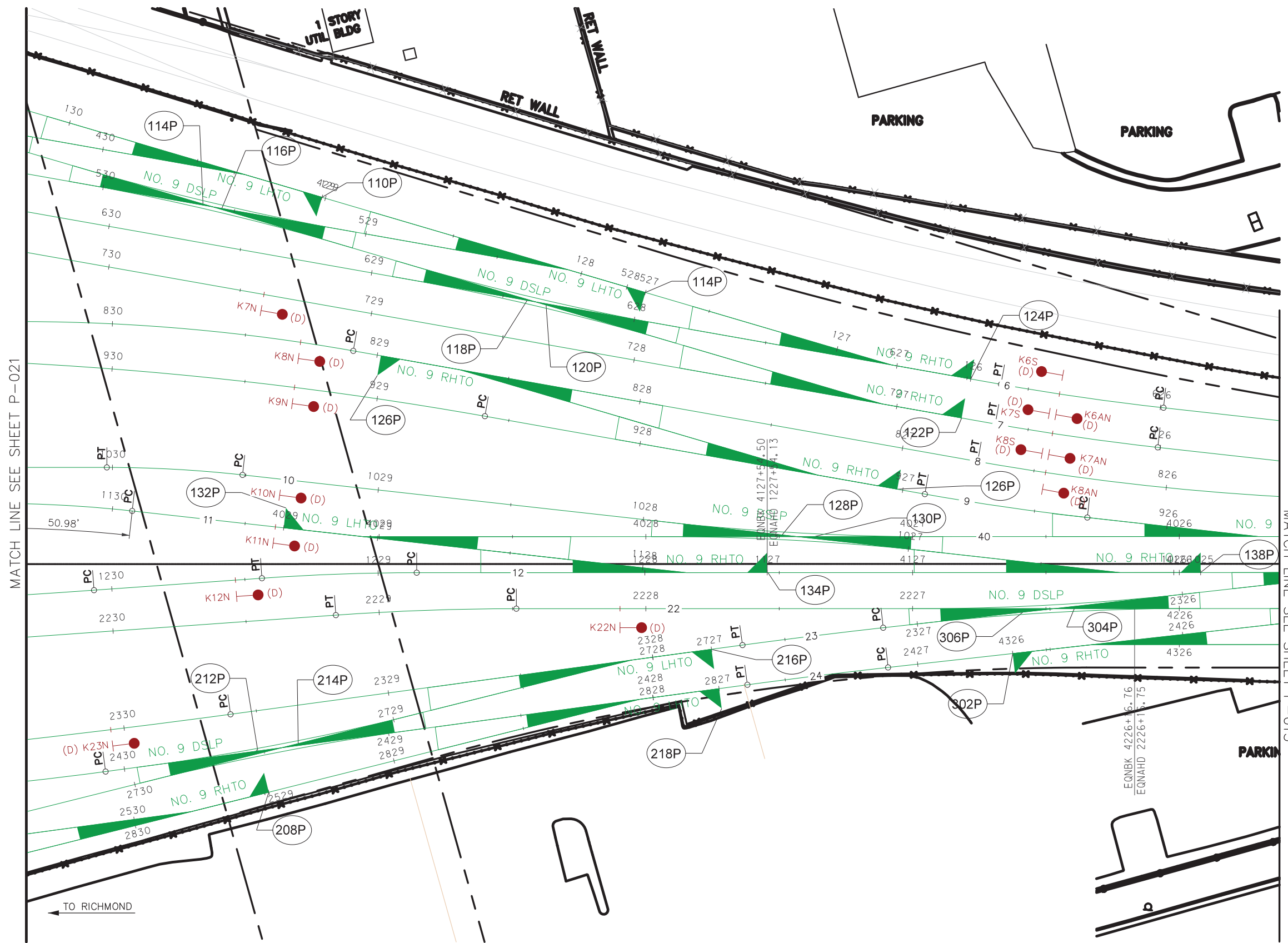
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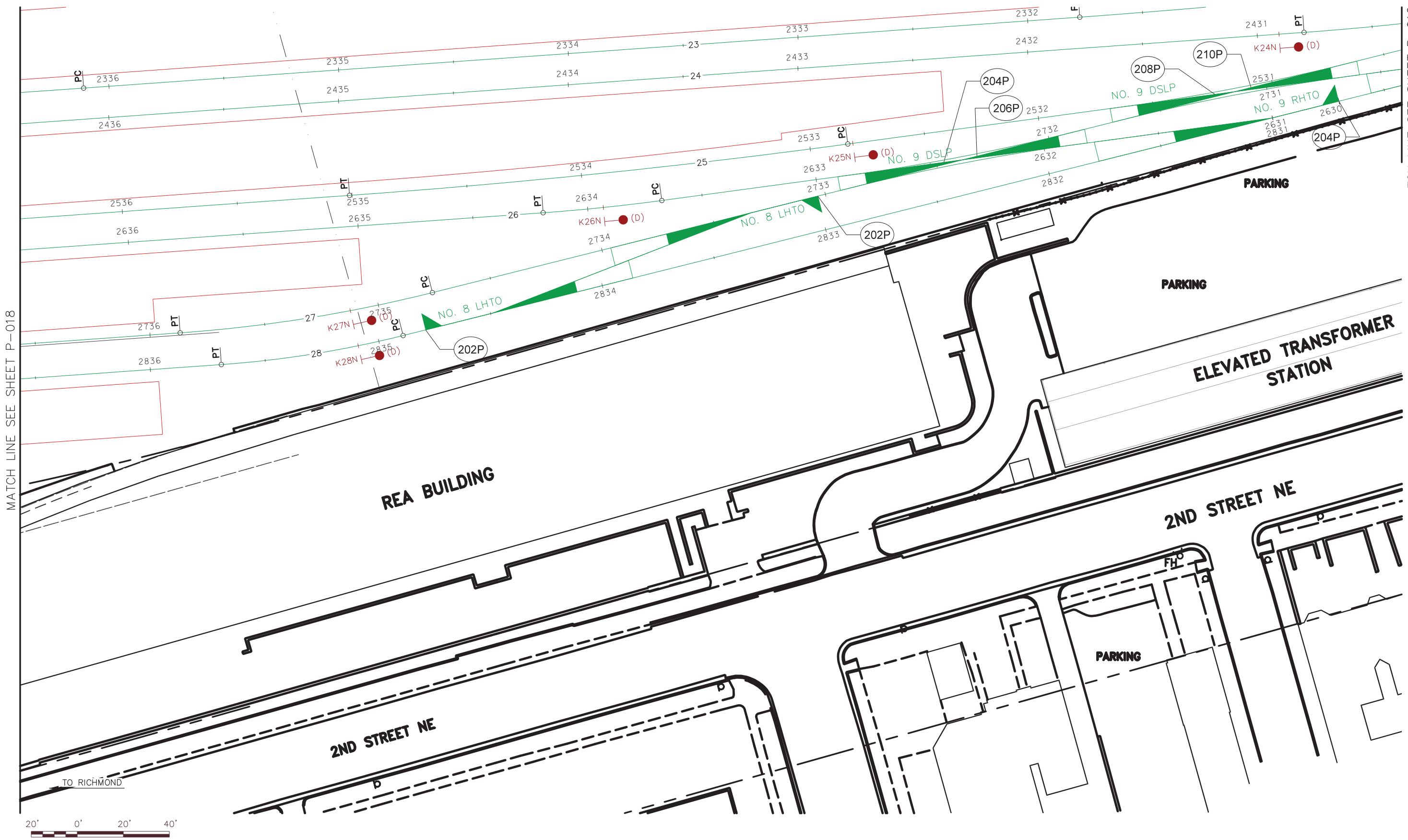
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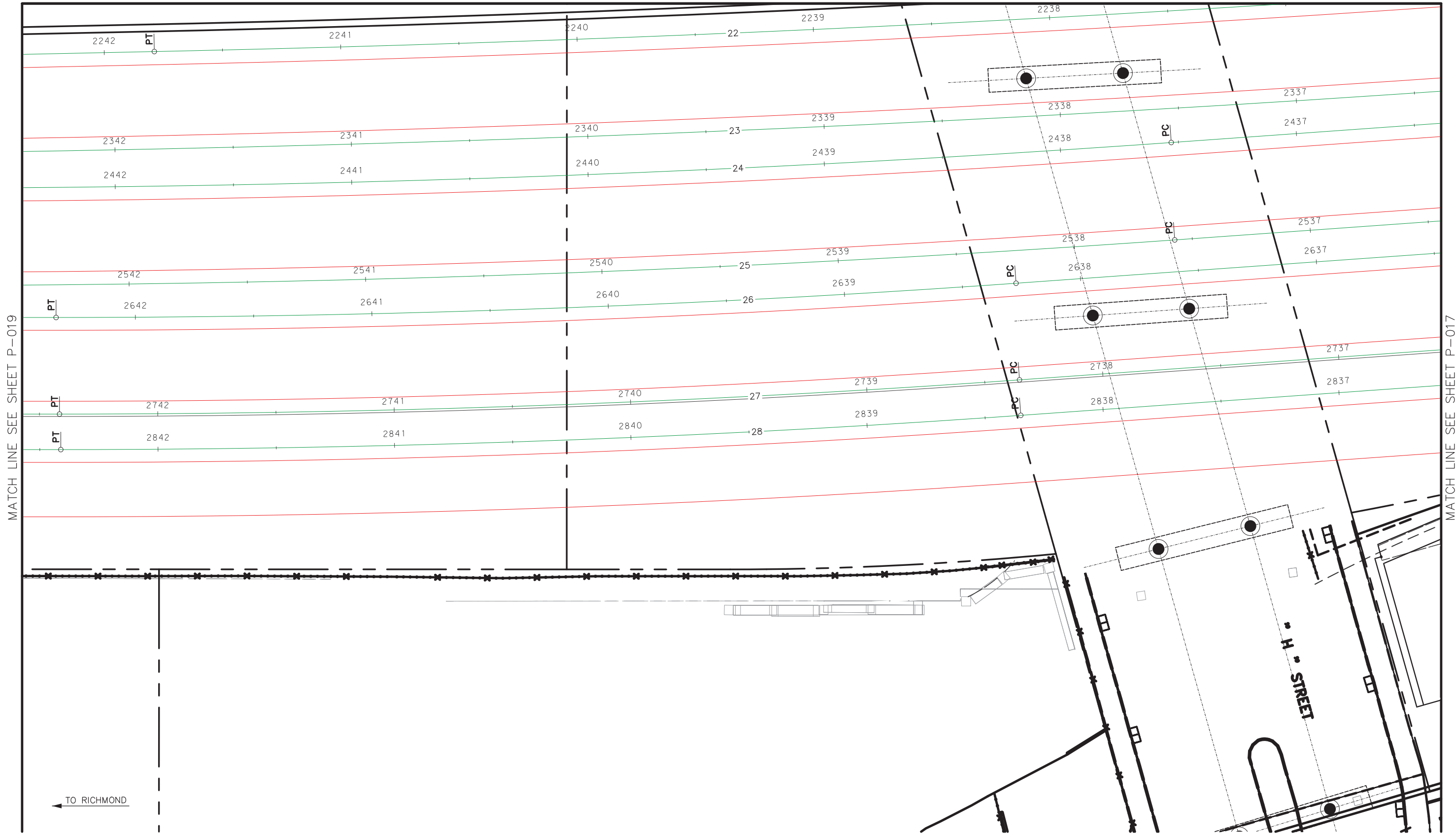
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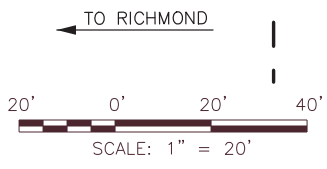
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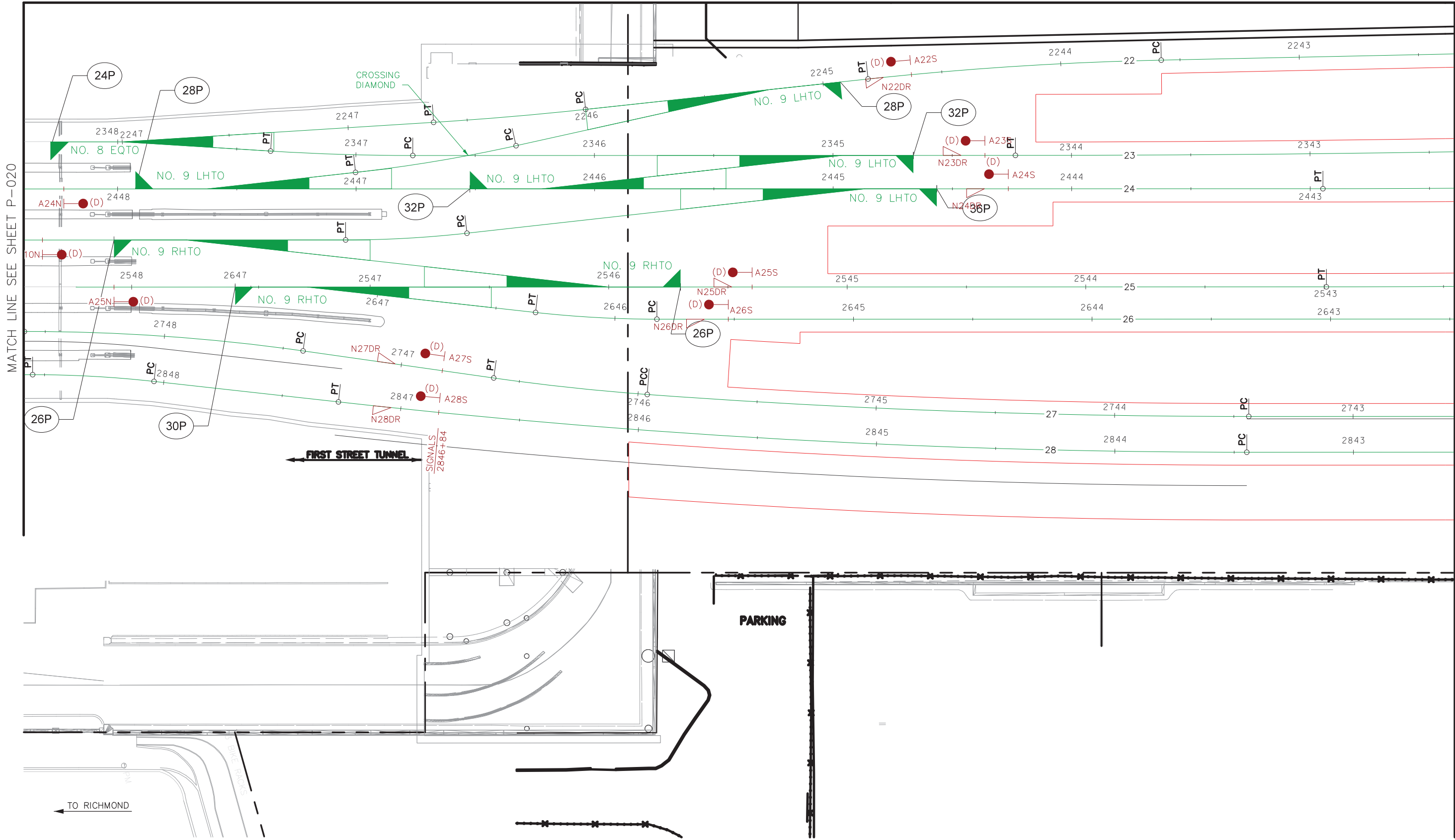
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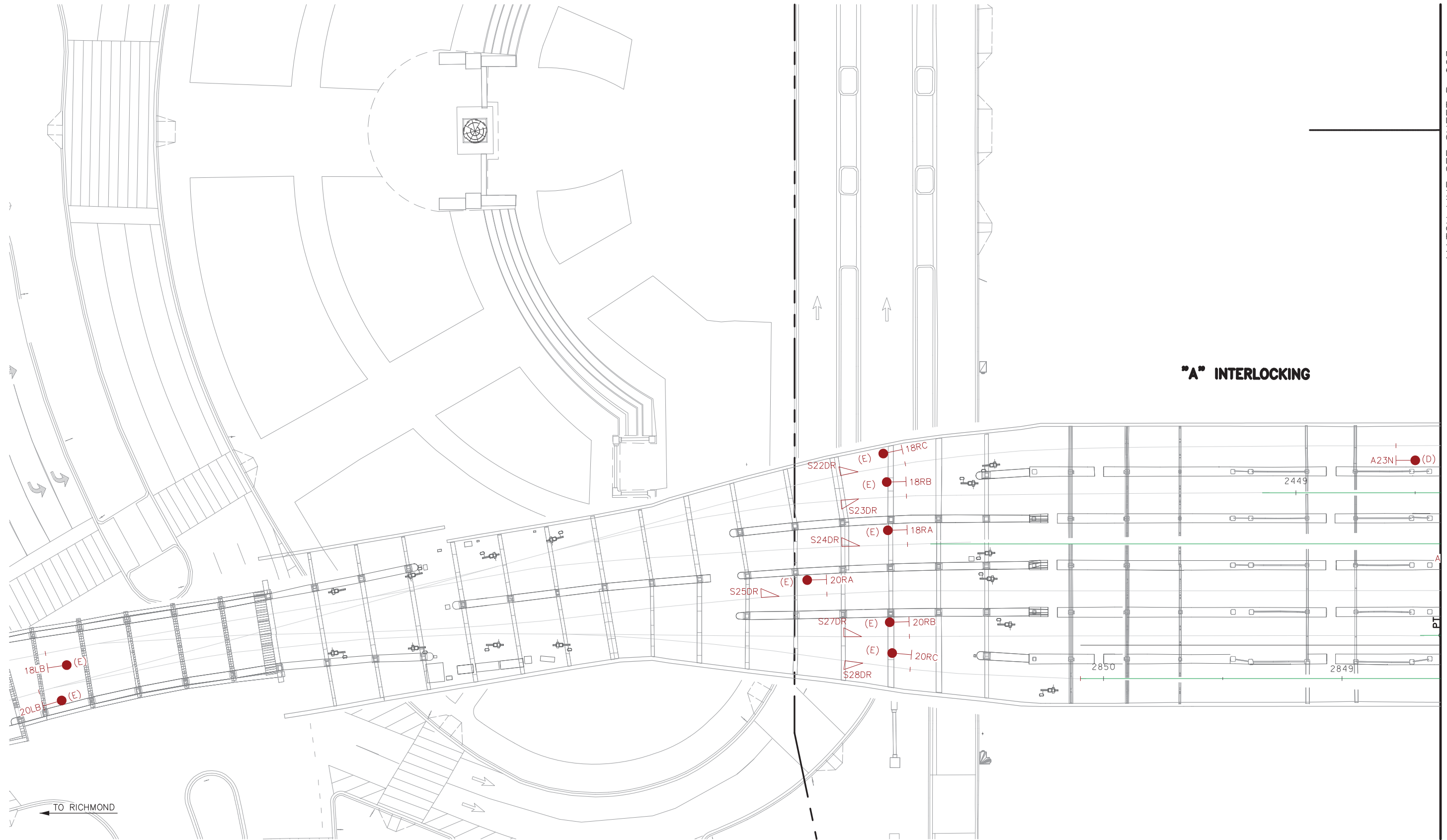
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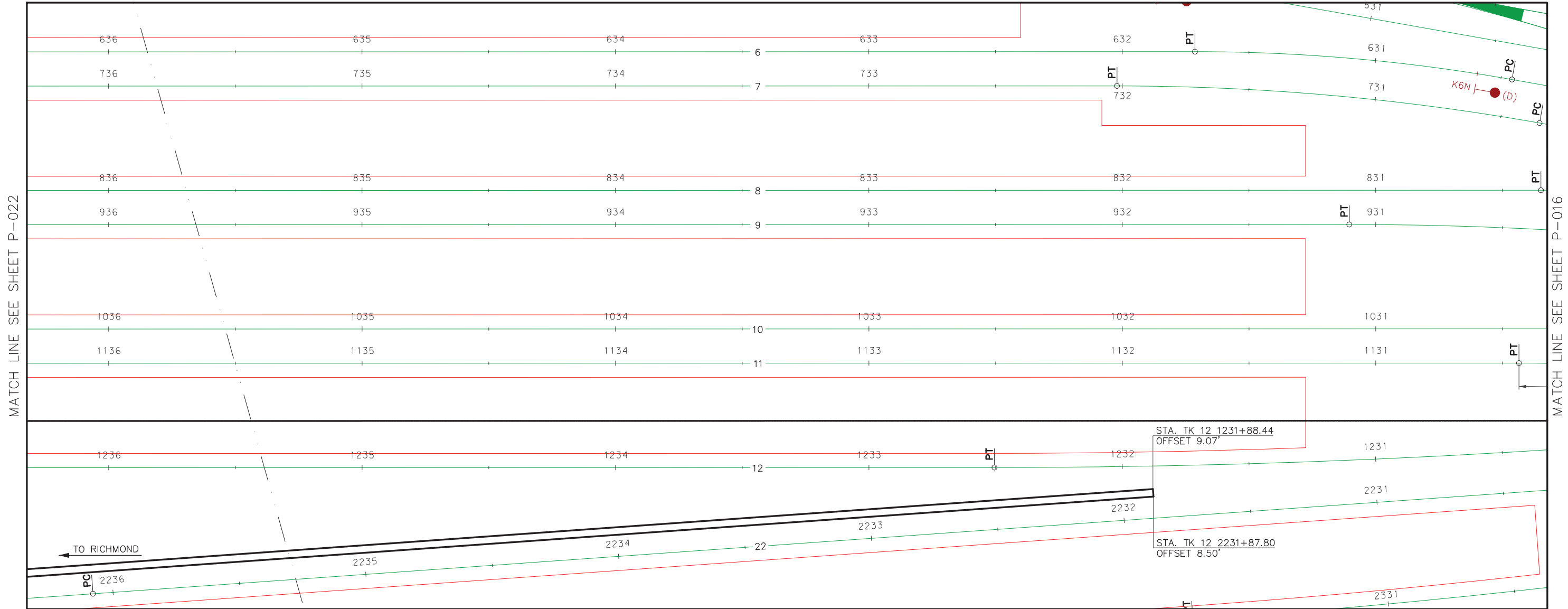
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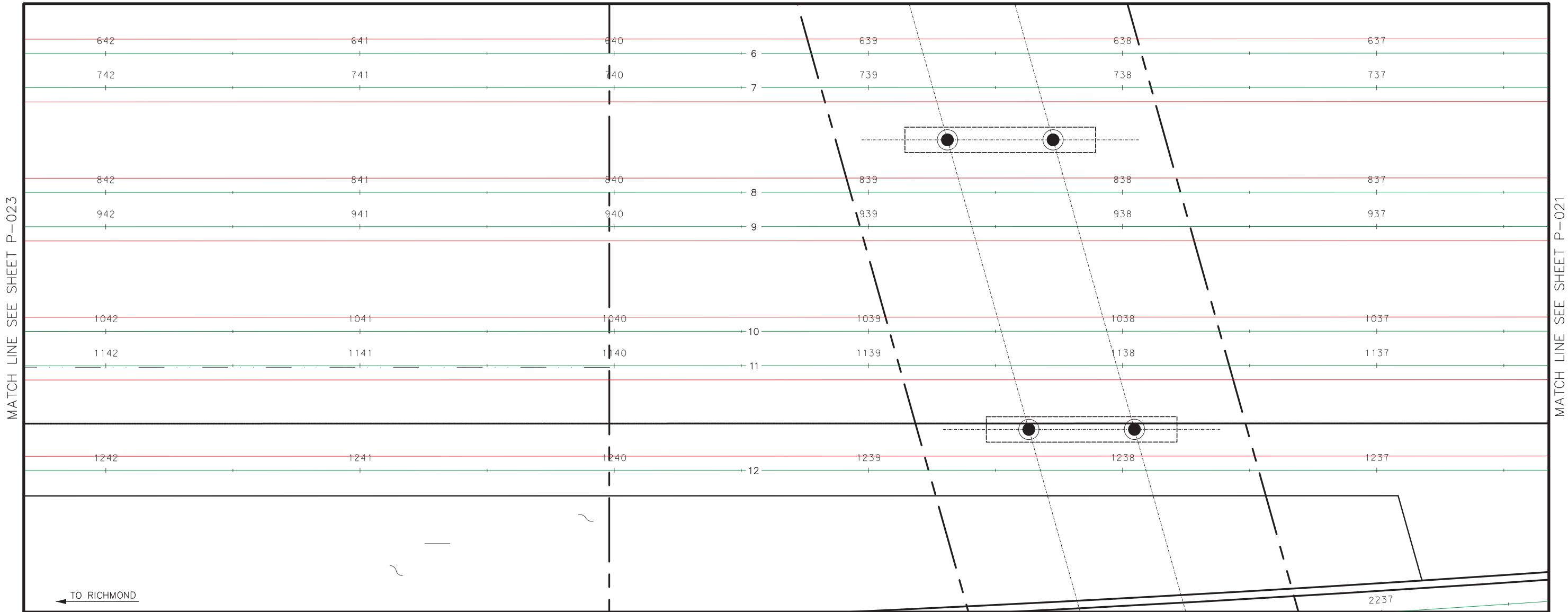


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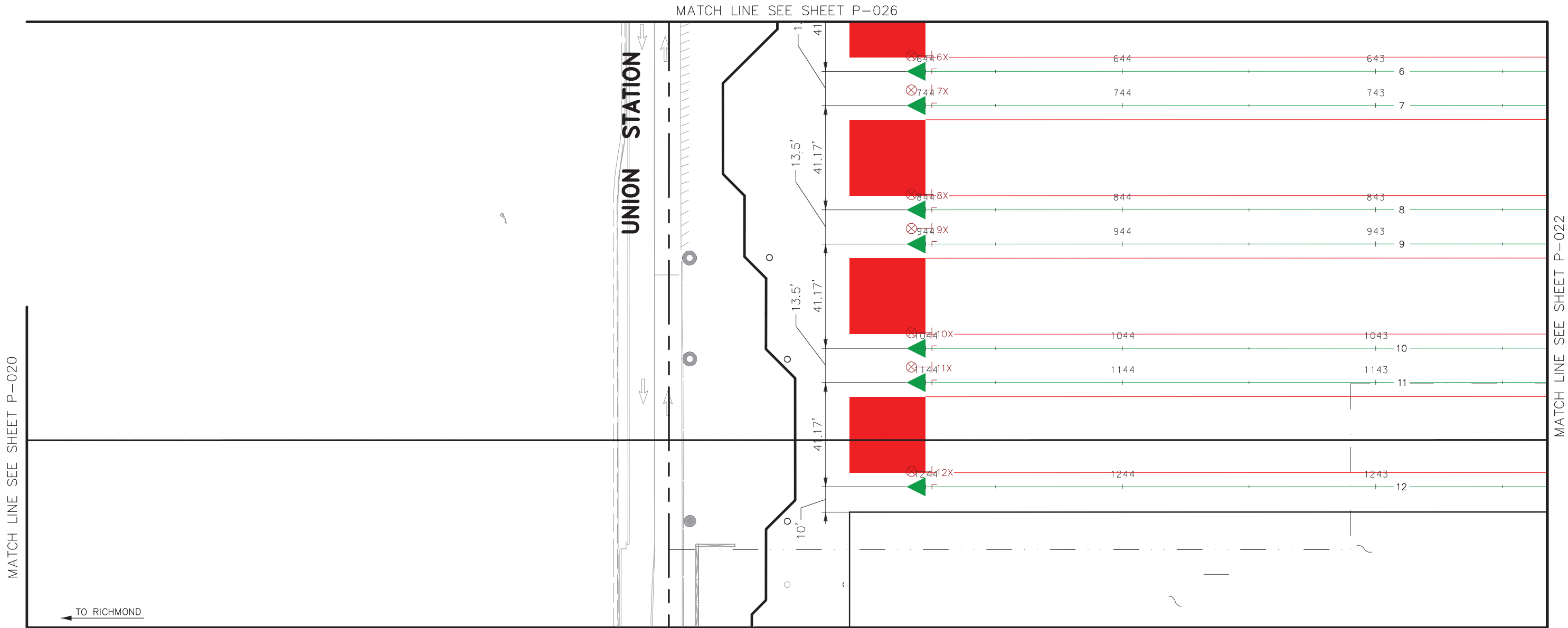
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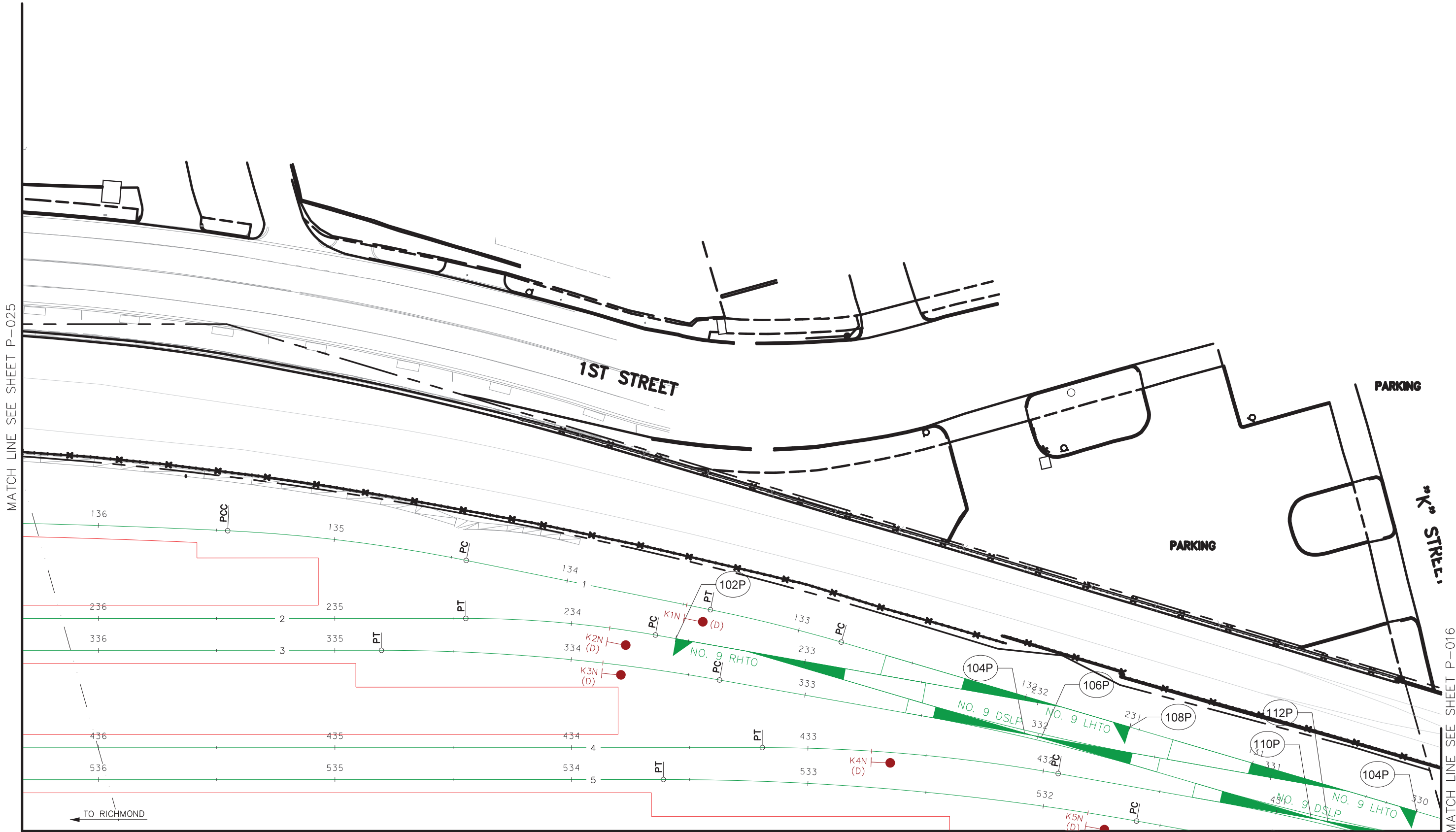
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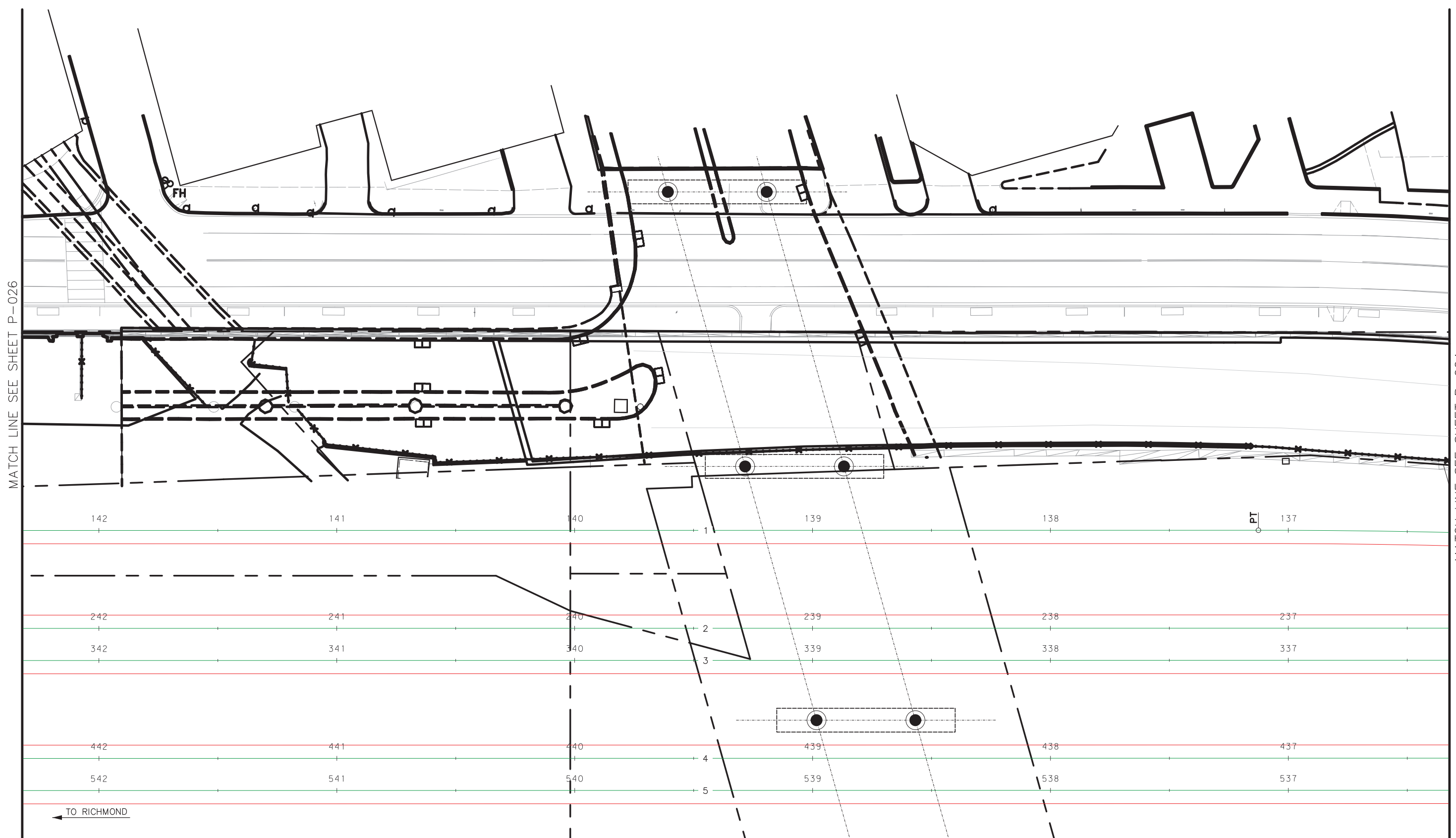
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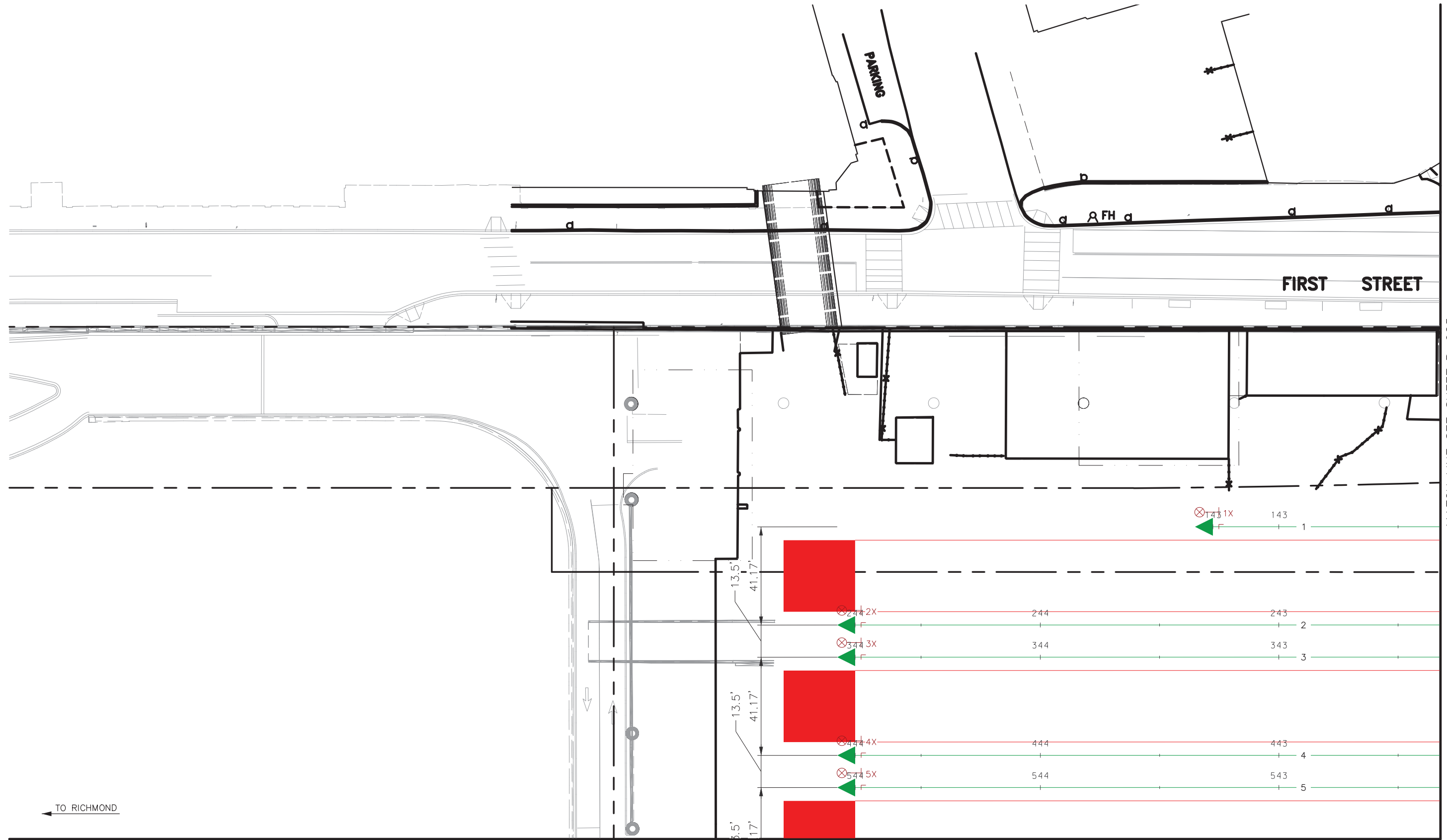
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Appendix C Future Build Simulation Technical Memo

Washington Union Station Terminal Infrastructure Future Build Simulation Technical Memo

December 2018



Prepared by:

AECOM

LTK
LTK Engineering Services

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Executive Summary

Washington Union Station (WUS) is the southern terminus of Amtrak’s Northeast Corridor and handles High Speed, Regional, Long Distance and commuter rail service to our nation’s capital. The current station has 23 tracks served by three passenger rail operations: VRE, MARC and Amtrak. Future plans include reconstruction of the station infrastructure, and demand-based service increases by all three rail operations. This report details the current state of station operations and determines the impacts of future changes by modeling infrastructure and operations. Simulations are conducted in Rail Traffic Controller software and include not only WUS but the mainline tracks approaching the station. Freight and passenger trains are simulated over a 24 hour period in a complete model that includes track alignment, yards, switches, signals, and platforms as well as train characteristics and engine performance.

There are presently 219 weekday revenue trips operating at WUS, including Amtrak’s Acela, Northeast Regional and Long Distance services, MARC’s Brunswick, Camden and Penn Line services and VRE’s Fredericksburg and Manassas Line services. Two future operating plans were developed and simulated; operating plan service levels are summarized in Table 1. A 2030+ Operating Plan (the “+” symbol representing the intent of this plan to cover the 2030 decade from 2030 to 2039), including 360 daily trips, is based on future plans of each of the rail operators. The 2040 NEC FUTURE Operating Plan includes 630 daily trips and presents the long-range vision of the Federal Railroad Administration (FRA) for WUS operations, including the addition of new services. The NEC FUTURE plan includes Metropolitan service which will replace some Regional and some commuter service in the future. The service may be operated by Amtrak or by another operator; this has not yet been determined. Intercity service will replace the remainder of Regional service under the NEC FUTURE plan.

Table 1 – Revenue Train Volumes for Existing and Future Operating Plans per Direction

Operator	Service	Existing Baseline		2030+		2040 NEC FUTURE	
		Peak Hour	Full Day	Peak Hour	Full Day	Peak Hour	Full Day
Amtrak	HSR	1	16	3	45	4	57
	Regional/SEHSR/ Intercity (LD excluded)	3	22	3	27	1.5	23
	Long Distance	1	7	1	6	0.5	6
TBD	Metropolitan	0	0	0	0	4	58
MARC	Penn	4	27/28	6	39	7*	57*
	Camden	2	10	2	10	4	30
	Brunswick	3	9/10	2	12	6	38
VRE	Fredericksburg	2	8	3	19	4*	23*
	Manassas	2	8	3	22	4*	23*

* Includes MARC/VRE run-through service at 4 trains per hour per direction in the peak hour.

Real-world data was analyzed to introduce variability into the lateness of trips entering at the model boundaries, accounting for accrued trip delays outside the area simulated. Existing Baseline operations were simulated on a model of the existing WUS infrastructure. A future station layout known as Option 14 with 12 stub-end tracks and seven run-through tracks was tested in simulation with the future operating plans. The future station is fully accessible with three low level run-through platform edges in addition to the run-through and stub end high level platform edges. The future station complex includes redesigned and expanded “A,” “K,” and “C” Interlockings located south and north of the station platforms.

Results of the three scenarios simulated, Existing Baseline, 2030+, and 2040 NEC FUTURE, are shown in Table 2 and Table 3.

Table 2 – Average Speed (mph) by Service

Service	Existing Baseline	2030+	2040 NEC FUTURE
Acela	45.2	33.4	31.9
Regional	32.6	33.9	30.0
Long Distance	31.9	32.0	29.7
Amtrak (combined)	34.7	33.5	30.6
Metropolitan	NA	NA	31.5
VRE	27.9	26.2	23.0
MARC	32.3	26.0	26.5
Passenger (combined)	32.3	29.4	27.3
Freight	29.3	24.3	27.1
All Trains	31.9	28.7	27.3

Table 3 – Stopped Delay per 100 Miles by Service

Service	Existing Baseline	2030+	2040 NEC FUTURE
Acela	0:02:08	0:43:15	1:04:08
Regional	0:23:05	0:20:56	0:16:05
Long Distance	0:20:27	0:27:22	0:15:07
Amtrak (combined)	0:18:41	0:28:33	0:33:11
Metropolitan	NA	NA	1:14:16
VRE	0:04:04	0:11:53	0:04:58
MARC	0:22:13	0:46:11	0:55:49
Passenger (combined)	0:15:55	0:26:09	0:37:08
Freight	0:20:05	0:49:34	0:16:47
All Trains	0:16:29	0:29:26	0:35:06

Future infrastructure plans are sufficient to meet the demands of expected growth with the simulation models showing all trains successfully dispatched. With the large future increase in service, operational performance is predicted to decline somewhat with respect to the Existing Baseline. Existing operations at WUS are occasionally congested, but results show the station presently provides the flexibility necessary for reasonable operational performance given the existing schedule. From the Existing Baseline to 2030+, average speed decreases and delay increases overall, but On-Time Performance (OTP) improves across the board. Shorter future dwell times help platform occupancy percentages decrease from the Existing Baseline to 2030+, indicating more efficient use of infrastructure as service grows by 64 percent versus today’s train volumes.

The 2040 simulation assumes additional efficiency measures at WUS, including use of dual mode locomotives (in lieu of diesel to electric and electric to diesel engine changes) for all run-through Amtrak trains except for Long Distance service. The 2040 simulation retains operating variability for trains arriving from the south, given assumed continued ownership and dispatch by freight railroads in the future. In contrast, the 2040 simulation assumes much more reliable operation for trains arriving from the north, given the significant NEC reliability investments represented by NEC FUTURE. In the 2040 simulation results, Acela and MARC trains show increased delay from 2030, along with significant delay to newly introduced Metropolitan trains. Other 2040 simulation metrics show slight decreases versus 2030+ operating plan results, as is expected given the significantly increased service levels (75 percent growth versus 2030 and 188 percent growth versus today). Though levels of congestion increase as train volumes nearly triple versus today in the 2040 operating plan, the simulations show that the future Option 14 infrastructure is capable of supporting 2040 operations.

Special trackwork utilization analysis, based on 24-hour simulations, revealed that most crossovers included in the Option 14 track and signal design are used for double or triple parallel moves in both future operational cases. Only three crossover tracks were used less than three times per day in either simulated case, and none went unused in both cases. Therefore, it is recommended that the Option 14 track layout be adopted as presently designed, with no rationalization to reduce capital cost, maintenance cost or construction complexity.

Simulation Methodology

Simulation Software

Track Assignment Utility

WUS layout options were tested for operational feasibility using the Station Track Assignment Utility from LTK Engineering Services. The Station Track Assignment Utility models the assignment of incoming trains to specific station tracks based on the typical dispatcher decision-making process, and can model the capacity of specific platform layouts. Platform length, interlocking configuration, physical train characteristics (versus platform and overall clearance constraints) and operational requirements (such as electrified tracks) are considered. The Station Track Assignment Utility was used as a first pass analysis of the operational feasibility of numerous future infrastructure layout options for WUS. It provided significant insight into the selection of Option 14 as the preferred future WUS Terminal Infrastructure layout.

RTC

Primary simulation was conducted using Rail Traffic Controller (RTC) version 72j from Berkeley Simulation Software. The simulation model is derived from the RTC model previously used in the 2016 Washington Terminal Yard Master Plan development. The simulated existing infrastructure has been updated to reflect present day conditions. The simulated Existing Baseline Operating Plan has also been updated to match current timetables. The RTC dwell time inputs have been substantially revised to reflect Minimum Required Dwell Times at the station for all train types. All operational simulations, results and charts presented herein are a product of RTC.

Temporal Simulation Limits

The simulations reflect Friday operations for a 24 hour time period.

Geographic Simulation Limits

The existing WUS Terminal Infrastructure (TI) geographic limits for the RTC rail operations simulation are shown in Figure 1. Interlockings are shown conceptually as boxes but are modeled in full detail in RTC, including switch and crossover locations, straight and diverging speeds, signal control lines and parallel route capabilities. Non-interlocked (automatic signal) territory is also shown conceptually but was modeled with full vertical profile, station locations, signal locations and associated signal control lines. The simulation infrastructure includes the CSXT Virginia Avenue Tunnel double tracking, now in the advanced stage of construction.

Per discussion with the FRA, NEC Tracks 2 and 3 were modeled for approximately 2 to 3 miles north of the northern limits of “C” Interlocking. The full extents of NEC Tracks 2 and 3 between “C” and planned Hanson Interlocking (just south of New Carrollton Station on the NEC) were not be modeled because the details of NEC FUTURE-related capacity upgrades are undefined at present. By modeling 2 to 3 miles of NEC Tracks 2 and 3, simulated southbound trains have sufficient distance to stop at “C” should a route not be established in time. A simulation-only time point was established in the RTC model at the extreme northern limits of this territory. It serves as a southbound train insertion point and as a northbound train removal and on-time performance reference point.

The Future WUS TI geographic limits for the RTC rail operations simulation are shown in Figure 2. The infrastructure components shown here are discussed in detail in the Section entitled Future Infrastructure – WUS TI Option 14. In addition to existing components, the future simulation project limits include Amtrak’s planned Washington Coach Yard and Ivy City Yard improvements, as well as VRE’s planned Midday Storage Facility.

Washington Union Station Terminal Infrastructure Rail Operations Simulation Limits - Current

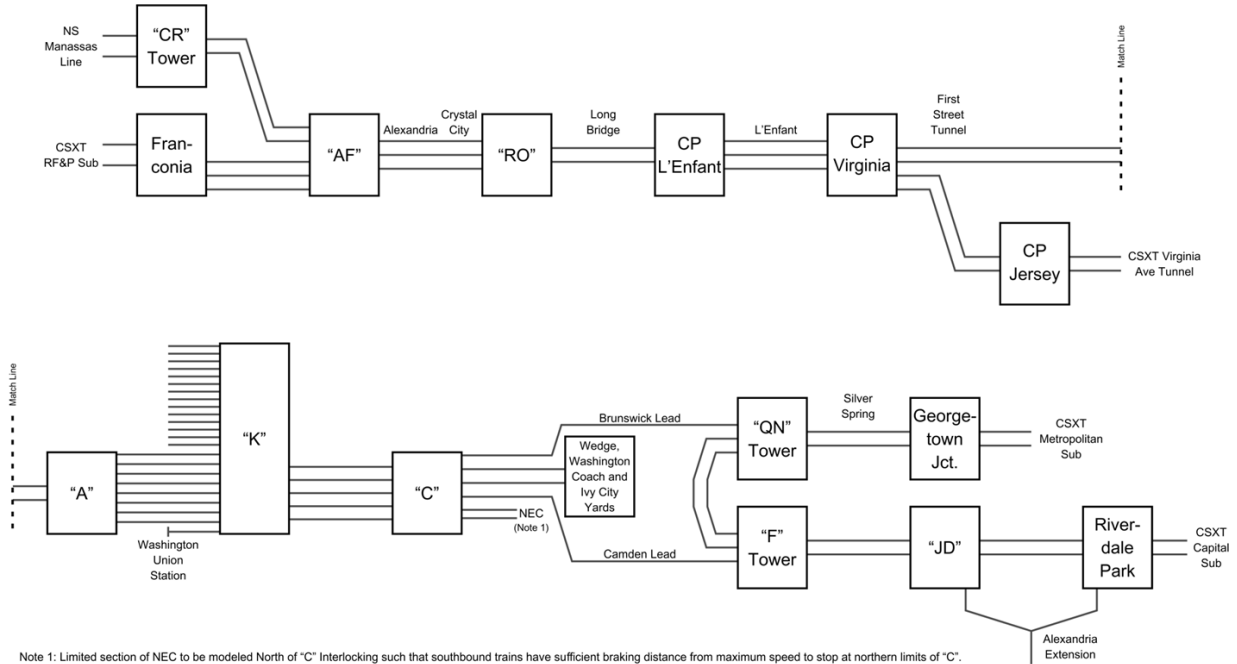


Figure 1: Washington Union Station Terminal Infrastructure Rail Operations Simulation Limits - Current

Washington Union Station Terminal Infrastructure Rail Operations Simulation Limits - Future

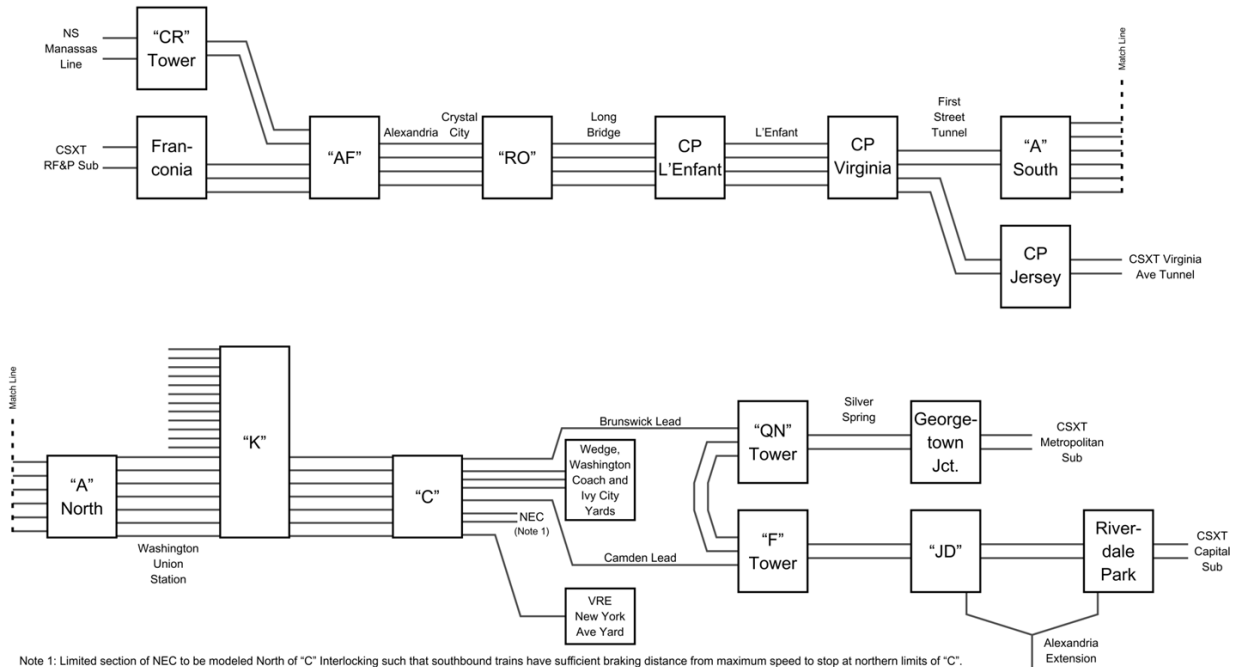


Figure 2: Washington Union Station Terminal Infrastructure Rail Operations Simulation Limits - Future

On-Time Performance Locations and Thresholds

An important result statistic presented herein is OTP, a measure of what percentage of trains arrive at their simulated endpoint within a defined lateness threshold. This threshold varies by rail operator and service based on trip length, type of service and expected reliability. Thresholds as used by constituent rail operators today, and applied to all scenarios simulated here, are shown in Table 4.

Table 4 – OTP Thresholds for Services Operating in the WUS Area

VRE	6 minutes
MARC	6 minutes
Amtrak Acela	10 minutes
Amtrak Regional	10 minutes
Amtrak Long Distance	30 minutes

OTP is traditionally calculated at trip end points. Because the simulated geographic extent of the WUS simulations are small, some adjustments were made to traditional reporting locations used by the WUS rail operators. Southbound OTP was calculated arriving at WUS for terminating trains and departing WUS for through-running trains. It was also calculated for all southbound trains at Alexandria. Northbound OTP was calculated arriving at WUS for VRE. All other through trips had OTP calculated based on WUS departure times, and all northbound trips had OTP calculated at the northern simulation limits: Silver Spring, Riverdale Park and NEC MP 131. Under this methodology, all run-through trips have their OTP measured at two locations, WUS and their simulation exit location.

Operating Variability

Variability (randomization) is an important consideration in validating that simulation results reflect practical, achievable predictions of operating capacity and reliability. RTC allows for four randomization parameters to be adjusted -- early departure, late departure, dwell time, and operator handling. Early and late departure variability is used here to set the initial departure time (IDT) of each simulated train trip. Variability in RTC is based on a uniform distribution so that values are selected from the permitted range with equal probability when randomization is invoked.

The distribution of lateness for Amtrak trains at WUS in both directions was determined from WUS (“K” Tower) data for one week in October 2015. The data provided the actual time of arrival for each scheduled train as compared to its scheduled arrival time at WUS. This data was collected during a week which was assumed to be free of major operational delays. In addition, because “K” Tower is located close to the WUS platforms, This approach assumed that no time was lost for trains between entering the simulation limits and arriving at WUS. Distributions determined from this data are applied to trains at their simulation entry points to represent the variability of operations of these trips beyond the simulation limits.

Histograms of the “K” Tower data were created for each service type at WUS. IDT variability for existing operations follows uniform distributions from the 10th percentile to the 90th percentile of “K” Tower lateness data. IDT variability for future operations follows a uniform distribution from the 10th percentile to the 50th percentile of “K” Tower lateness data. The reduction in variability in the future assumes improved operational efficiency on the corridors that feed WUS. Histogram distributions of the “K” Tower data, existing uniform distribution and future uniform distribution for each service type and direction at WUS are presented in Figure 3 to Figure 11. Table 5 and Table 6 present the extent of each distribution in terms of its temporal bounds. Distributions are applied to all trains at their simulation entry points in all simulations.

For the MARC Brunswick Line, the October 2015 “K” Tower data showed virtually no operating variability. Therefore, no Brunswick Line arrival distribution is presented below, and no operating variability is reflected in the RTC inputs.

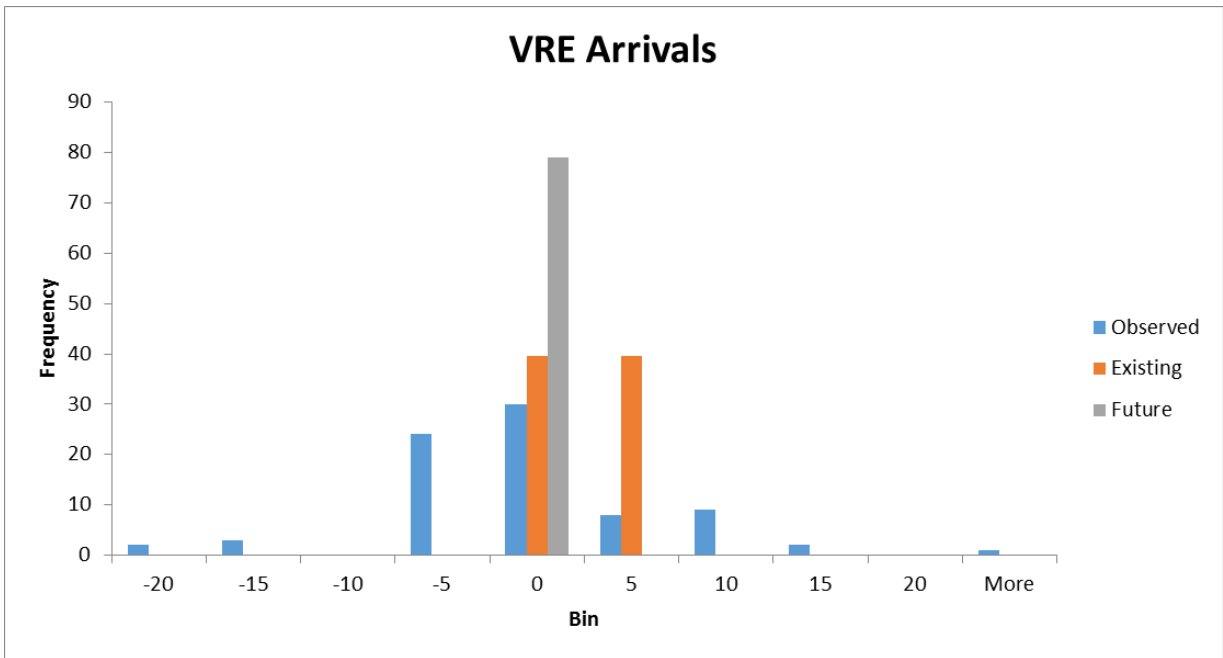


Figure 3: IDT distributions for northbound VRE trips at Franconia and CR Tower.

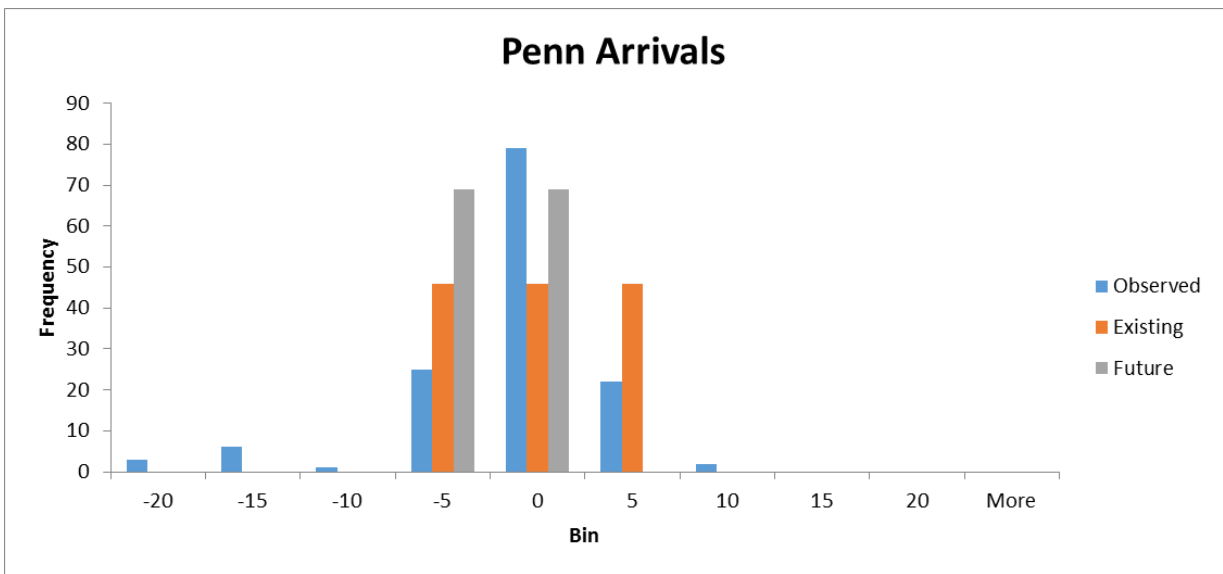


Figure 4: IDT distributions for MARC southbound Penn Line trips at MP 131.

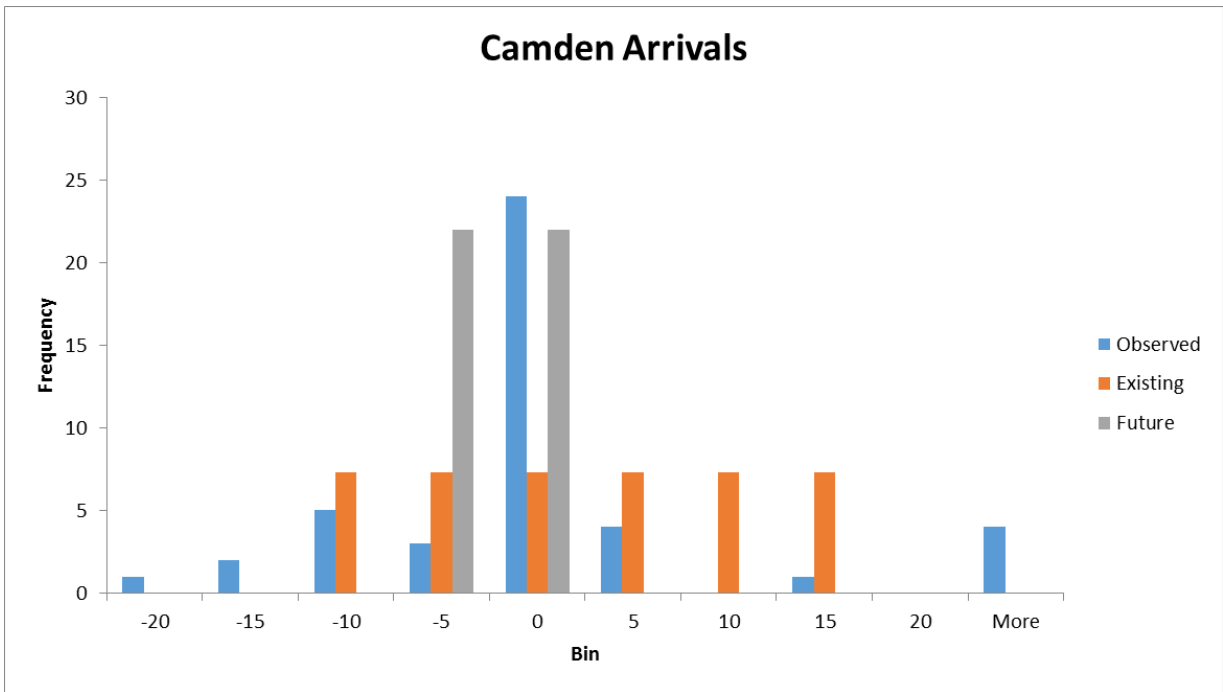


Figure 5: IDT distributions for southbound MARC Camden Line trips at Riverdale Park.

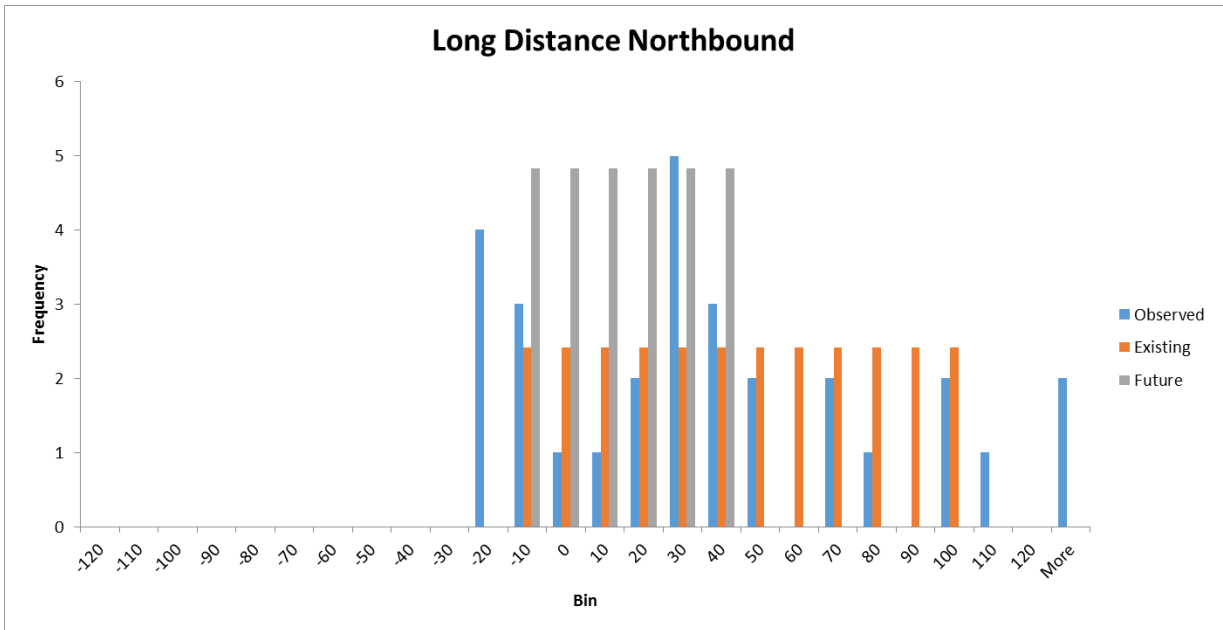


Figure 6: IDT distributions for northbound Long Distance trips at Franconia and CR Tower.

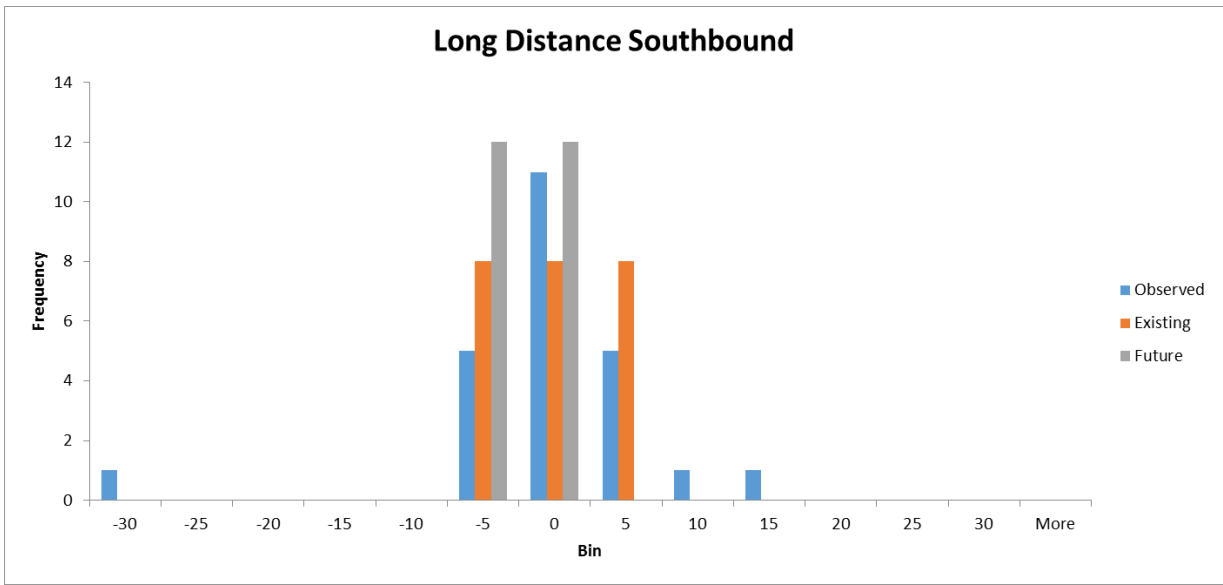


Figure 7: IDT distributions for southbound Long Distance trips at MP 131 and Silver Spring.

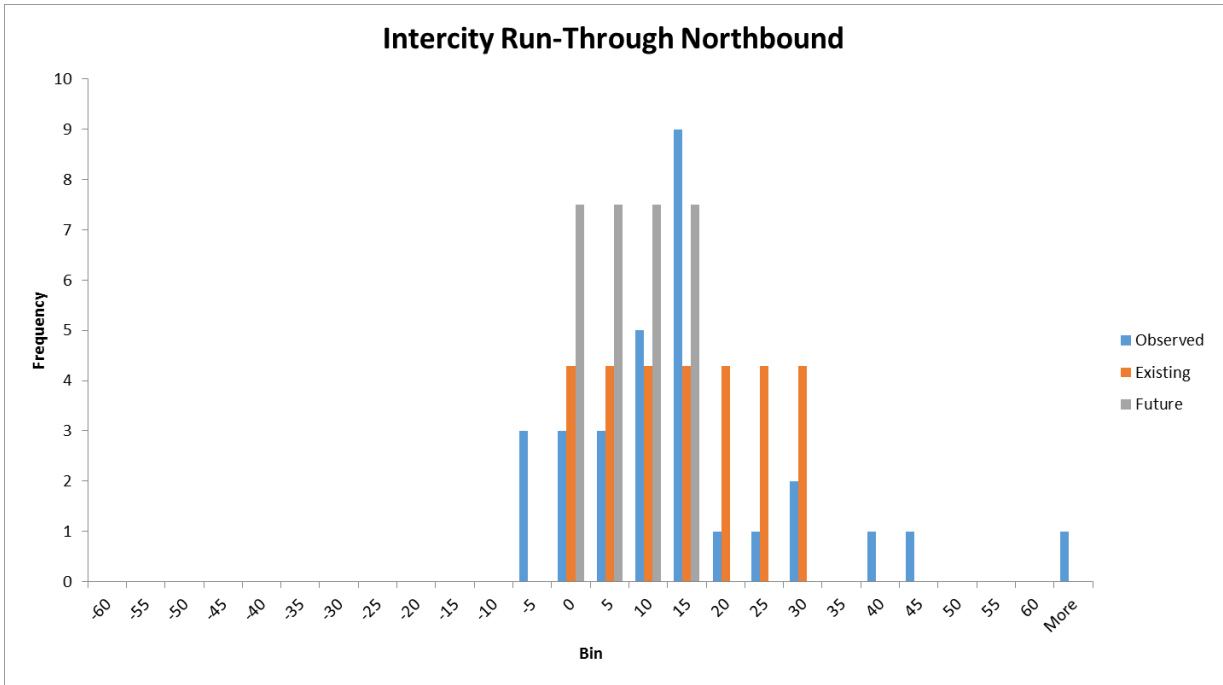


Figure 8: IDT distributions for northbound Intercity run-through trips at Franconia and CR Tower.

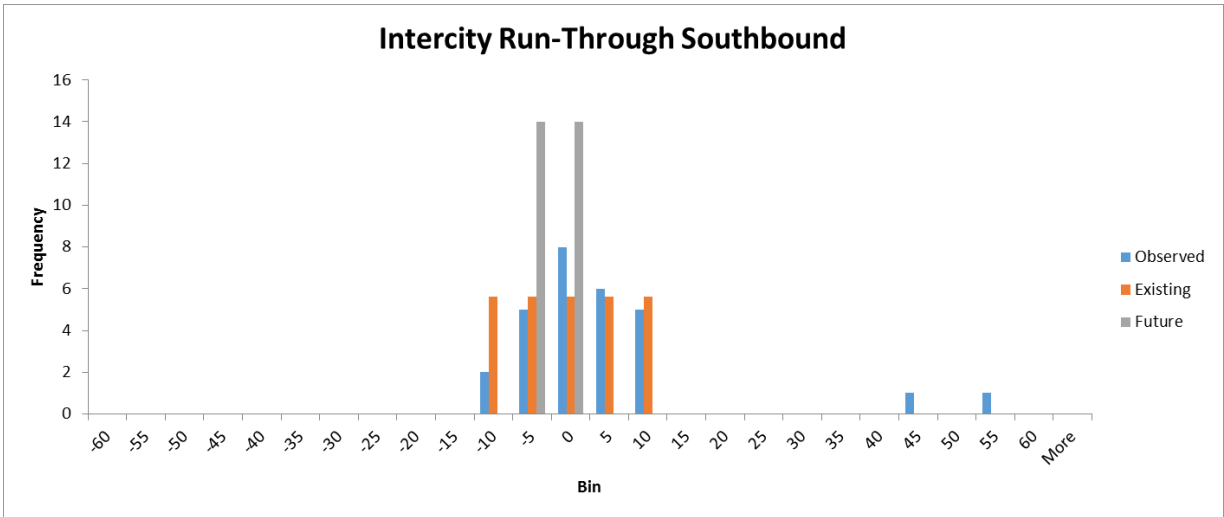


Figure 9: IDT distributions for southbound Intercity run-through trips at MP 131.

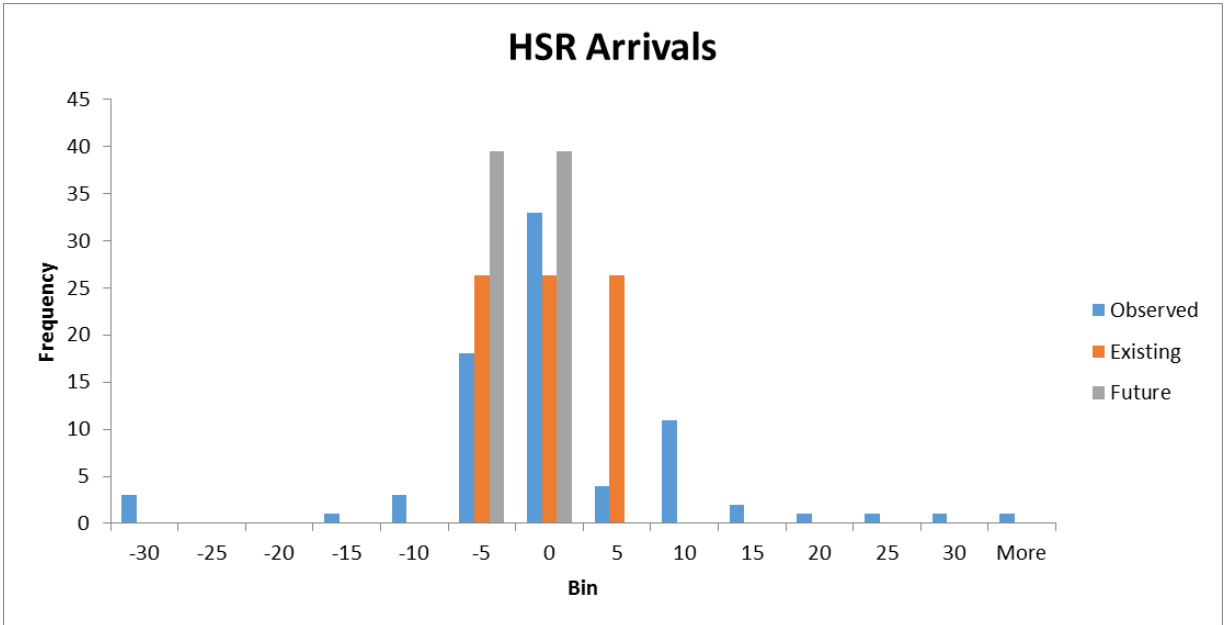


Figure 10: IDT distributions for southbound Acela and HSR trips at MP 131.

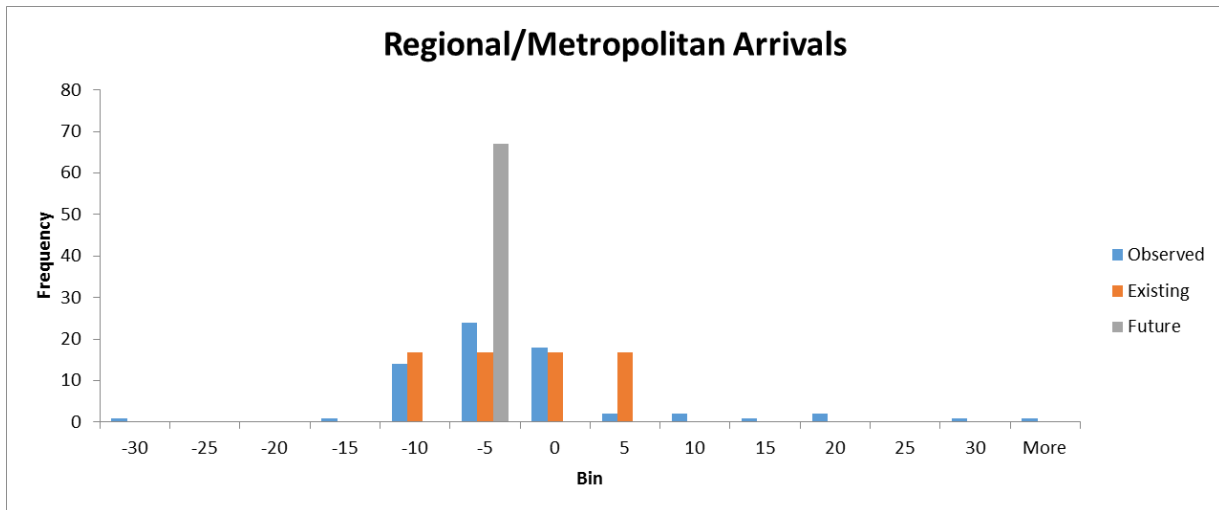


Figure 11: IDT distribution for southbound Regional and Metropolitan trips at MP 131.

Table 5 – Uniform Distribution Bounds for Randomization of Simulation Entry Times in Existing Baseline Simulation

Simulation Entry Location	Service and Direction	Variability	Lower Bound: # of minutes late (negative indicates early)	Upper Bound: # of minutes late
Franconia or CR Tower	VRE Northbound	Yes	0	10
	Long Distance Northbound	Yes	-10	110
	Regional Run-Through Northbound	Yes	0	35
NEC MP 131	High Speed Rail Southbound	Yes	-5	10
	Regional Southbound (Terminating at WUS)	Yes	-5	10
	Regional Southbound (Run-Through)	Yes	-5	15
	Long Distance Southbound	Yes	-5	10
	MARC Penn Southbound	Yes	-3	10
Georgetown Jct.	MARC Brunswick Southbound	No	N.A.	N.A.
Riverdale	MARC Camden Southbound	Yes	-3	20
Washington Union Station	VRE Southbound	No	N.A.	N.A.
	MARC Penn Northbound	No	N.A.	N.A.
	MARC Camden Northbound	No	N.A.	N.A.
	MARC Brunswick Northbound	No	N.A.	N.A.
	High Speed Rail Northbound	No	N.A.	N.A.
	Regional Northbound (Originating at WUS)	No	N.A.	N.A.

Table 6 – Uniform Distribution Bounds for Randomization of Simulation Entry Times in Future Build Simulations

Simulation Entry Location	Service and Direction	Variability	Lower Bound: # of minutes late (negative indicates early)	Upper Bound: # of minutes late
Franconia or CR Tower	VRE Northbound+	Yes	0	5
	Long Distance Northbound	Yes	-10	50
	Intercity Northbound	Yes	0	18
NEC MP 131	High Speed Rail Southbound	Yes	-5	3
	Intercity Southbound	Yes	-5	3
	Long Distance Southbound	Yes	-5	3
	Metropolitan Southbound	Yes	-5	0
	MARC Penn Southbound	Yes	-3	3
Georgetown Jct.	MARC Brunswick Southbound	No	N.A.	N.A.
Riverdale	MARC Camden Southbound	Yes	-3	5
Washington Union Station	VRE Southbound	No	N.A.	N.A.
	MARC Penn Northbound	No	N.A.	N.A.
	MARC Camden Northbound	No	N.A.	N.A.
	MARC Brunswick Northbound	No	N.A.	N.A.
	High Speed Rail Northbound	No	N.A.	N.A.
	Metropolitan Northbound	No	N.A.	N.A.

Existing Infrastructure

Stub End Platforms

There are 14 existing stub-end tracks at WUS numbered 7 to 20. Except for rare southbound terminations/northbound originations on the run-through tracks, the stub-end tracks serve all terminating and originating trips at WUS including Acela, Regional, and MARC. Tracks 10 to 20 on the stub-end upper level of the station are electrified and can support either diesel or electric propulsion. Tracks 7 to 9 are not electrified and can support only diesel propulsion, limiting them to use by MARC. The 14 stub-end tracks are served by nine island platforms. Tracks 9 to 14, and 17 to 20 have access to high level platforms for level boarding with 48" above TOR coaches. Tracks 7, 8, 15, and 16 are accessible only from low level platforms which must be accessed with trap-equipped coaches or low boarding equipment (limited to the Superliner-equipped Capitol Limited). Platform useable lengths of these tracks varies and is presented in Table 7. While some station tracks have multiple platform edges (platforms on the west and east sides), the secondary access side to each platform is generally limited to train servicing and is not reflected in Table 7.

**Table 7 – Existing Station Configuration
Platform Useable Lengths and Constraints**

Track #	Platform Useable Length (ft)	Boarding Level	Station Configuration
7	640	Low	Stub-end
8	1105	Low	Stub-end
9	1250	High	Stub-end
10	900	High	Stub-end
11	900	High	Stub-end
12	900	High	Stub-end
13	1140	High	Stub-end
14	1235	High	Stub-end
15	970	Low	Stub-end
16	1540	Low	Stub-end
17	1280	High	Stub-end
18	1050	High	Stub-end
19	970	High	Stub-end
20	970	High	Stub-end
22	1650	No passenger access	Run-through
23	1650	Low	Run-through
24	1650	Low	Run-through
25	1820	Low	Run-through
26	1820	Low	Run-through
27	750	Low	Run-through
28	785	Low	Run-through
29	710	No passenger access	Run-through
30	715	No passenger access	Stub-end

Run-through Platforms

Commonly referred to as the “lower-level” of WUS, there are nine tracks, numbered 22 to 30, in the eastern portion of the station. Eight of these tracks are through routes while Track 30 is a stub-end track accessible from the north end of the station only. Tracks 22, 29 and 30 do not have in-service passenger platforms and can only be used for storing trainsets or pooling locomotives. Figure 12 shows Track 22’s use as an engine pool track on the right, and the abandoned Track 21 corridor covered in snow on the left. All run-through station tracks have low-level platforms which must be served by low boarding coaches or coaches equipped with traps. Platform useable lengths vary and are presented in Table 7. Tracks 22 to 29 are electrified; Track 30 can only support diesel propulsion.



Figure 12: Track 22 locomotive pool track, and abandoned Track 21 (left)

Locomotive Changes

Catenary power for electric locomotives ends in the First Street Tunnel just south of WUS. Therefore, any trains running through WUS must undergo a locomotive change in the station because diesel power is required to the south and electric power is required on the NEC (specifically, in the tunnels approaching New York’s Penn Station) to the north. Under current operations, this engine change is supported by the use of Tracks 29 and 22 as locomotive pool tracks. Diesel locomotives ready to be added to southbound trains are queued in the planned order of use on Track 22, as in Figure 12, while electric locomotives are pooled on Track 29. A southbound run-through train sees its electric locomotive reverse direction to Track 29, followed by a new diesel locomotive (or locomotives, depending on train length) from Track 22. A northbound run-through train sees its diesel locomotive (or locomotives) uncoupled from the train and proceeding to Ivy City Yard while the electric locomotive reverses direction from Track 29. Only Amtrak performs locomotive changes at WUS. The need for locomotive changes continues in future operating plans, and therefore it is crucial that engine storage pockets be retained in future station and interlocking designs.

Interlockings

Three major interlockings bound WUS from north to south: “C”, “K” and “A”. Each of these interlockings is redesigned in the future WUS TI Option 14 track layout. “C” Interlocking provides the connection between the NEC, Camden Line, Brunswick Line and various yards; the existing layout is shown in Figure 13. From “C” Interlocking, the two main NEC tracks become Tracks 40 and 42 between “C” and “K” interlockings. This “throat area” provides a signaled pocket along five tracks between “C” and “K” interlocking and is vital to an efficient flow of trains into and out of WUS. The pocket is 920 feet long between bounding signal bridges, sufficient to hold a consist of 10 cars and one locomotive.

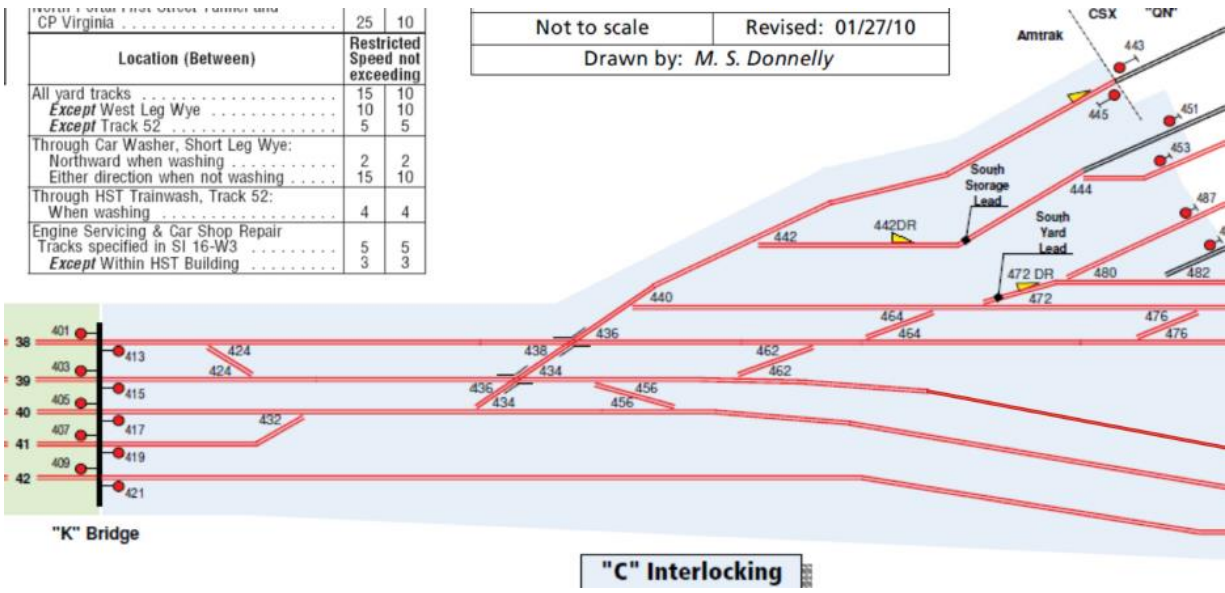


Figure 13: Existing "C" Interlocking layout

South of this pocket is "K" Interlocking which provides access to the WUS platform tracks. Its current layout is presented in Figure 14. Not all station tracks are reachable from all throat tracks under the current layout. For example, the highest numbered station track that can be reached from Track 38 is Track 18. A description of possible parallel moves in "K" Interlocking is shown in Appendix D: Existing Parallel Moves Chart.

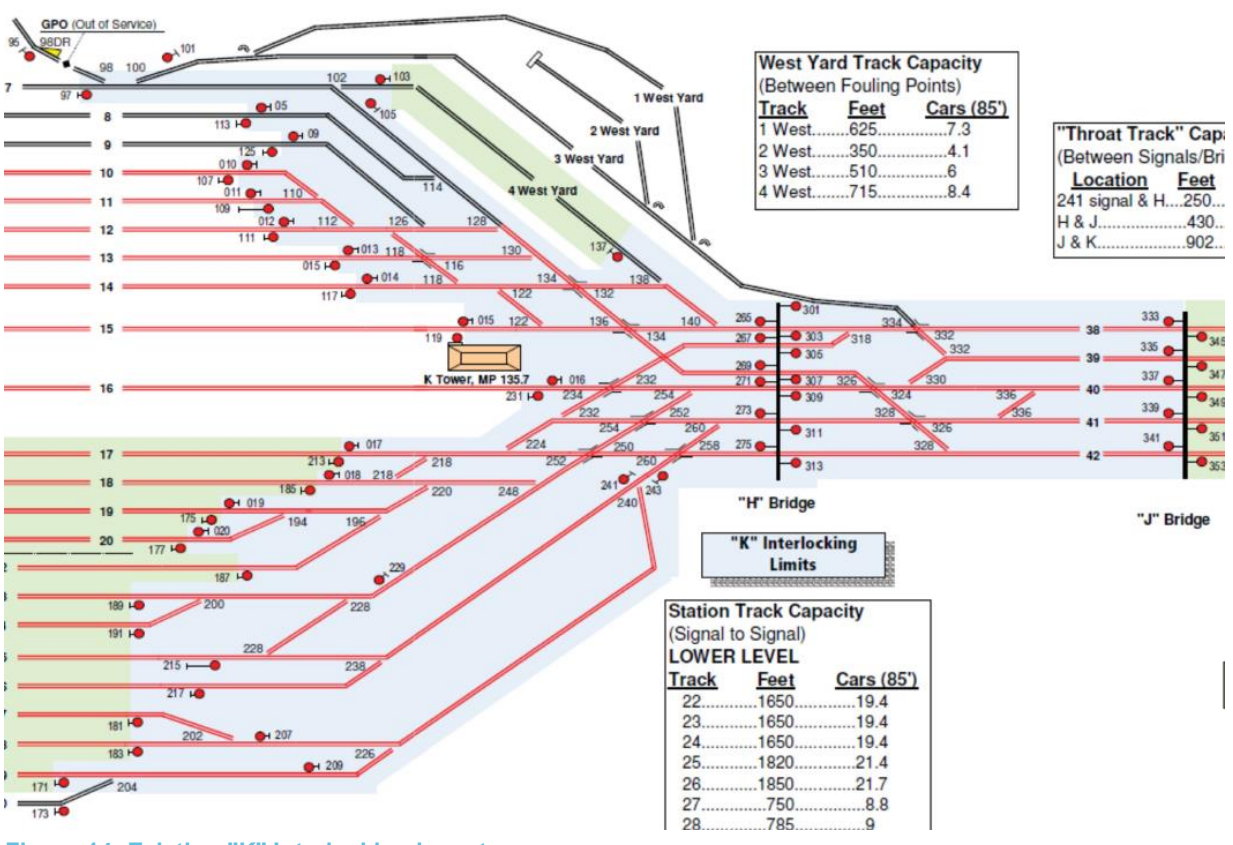


Figure 14: Existing "K" Interlocking layout

South of the run-through station tracks, “A” Interlocking serves as the transition from eight station tracks to the two First Street Tunnel tracks. The current layout is presented in Figure 15. Track connectivity here is essential to completing the southbound engine changes for through-running trains.

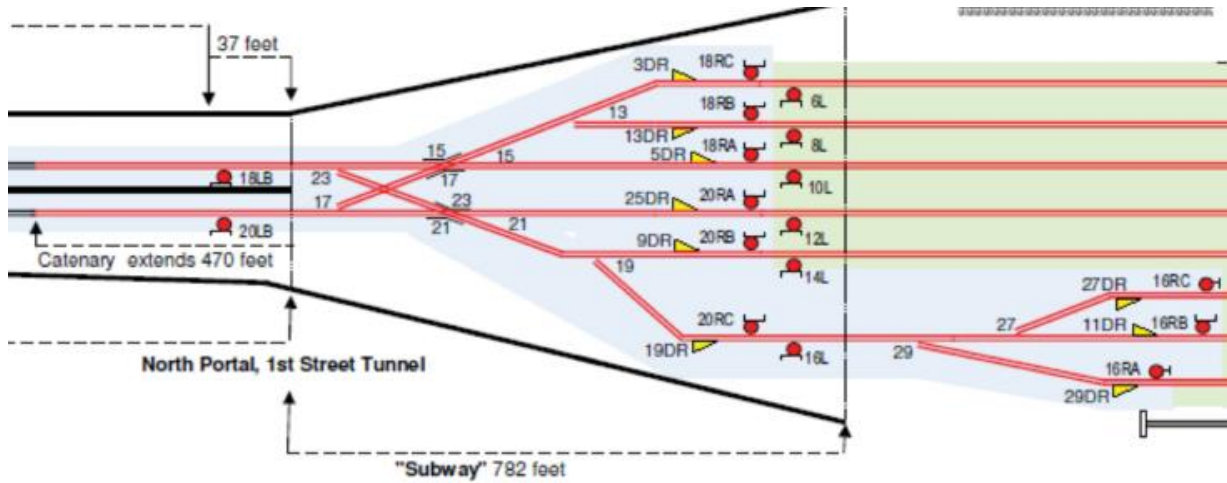


Figure 15: Existing "A" Interlocking layout

Yards

West Yard

West Yard is composed of a series of un-electrified tracks west of “K” Interlocking. Originally part of “K” Interlocking used to access now-abandoned station Tracks 1-6, the West Yard tracks can now accommodate four consists. West Yard is used by MARC to store trains laying over in the WUS area during the midday. Useable lengths of West Yard tracks are presented in Table 8.

Table 8 – West Yard Track Lengths

Available Yard Tracks	Length (feet)
West 1	625
West 2	350
West 3	510
West 4	715

Wedge Yard

Wedge Yard is owned and operated by MARC. It exists today with six tracks of varying length located southeast of the Washington Coach Yard, accessed from Track 52. It is used for the storage of MARC consists laying over midday to provide peak period service. Useable lengths of Wedge Yard tracks are presented in Table 9.

Table 9 – Wedge Yard Track Lengths

Available Yard Tracks	Length (feet)
Wedge 1	834
Wedge 2	579
Wedge 3	409
Wedge 4	494
Wedge 5	664
Wedge 6	834

Coach Yard

Washington Coach Yard is owned and operated by Amtrak and is located just north of “C” Interlocking, between the CSX owned branches of the Brunswick and Camden Lines. It houses a car wash as well as disused mail facilities. It is surrounded by branches of the wye which connects Ivy City Yard, the Brunswick Line and WUS. Figure 16 shows the layout and track lengths of Coach Yard. There are both electrified and non-electrified sections of Coach Yard; in Figure 16 tracks shown in red are electrified while tracks shown in black are not. Current operations dictate that VRE can utilize the non-electrified tracks to store consists in the midday to provide peak focused service. The electrified tracks are used for storing and staging of some Amtrak trains.

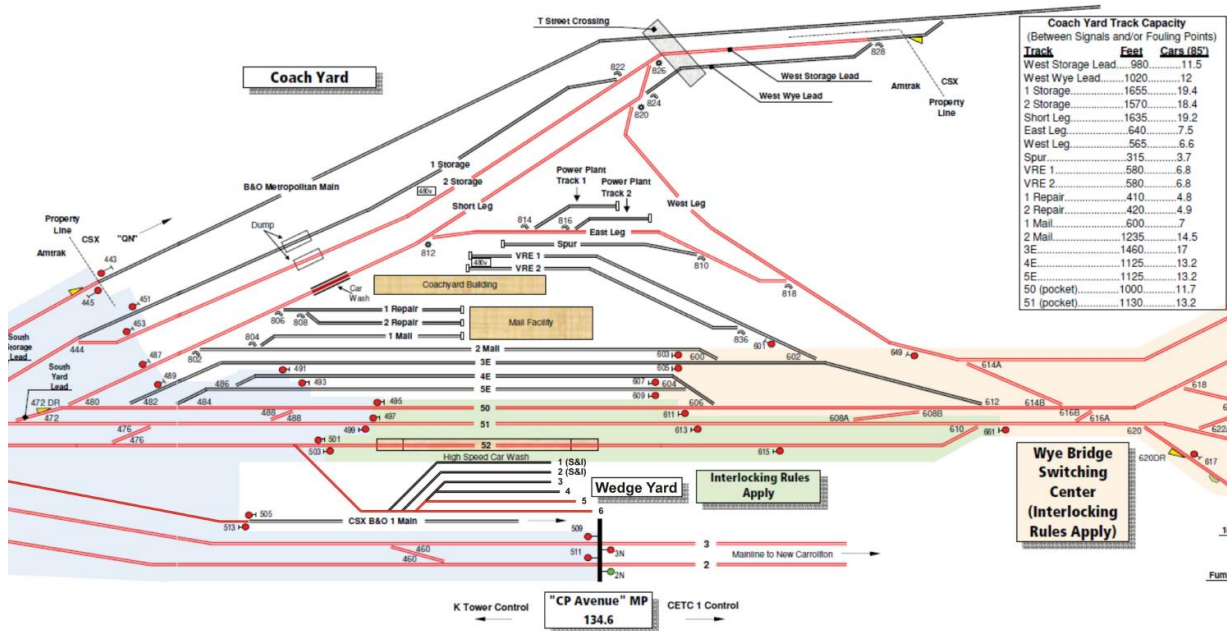


Figure 16: Coach Yard Existing Layout

Ivy City Yard

Ivy City Yard is Amtrak’s primary storage and maintenance facility in Washington. It contains storage tracks as well as maintenance facilities for both diesel and electric locomotives, as well as coaches and high speed trainsets. Service and inspection facilities are also located in Ivy City Yard. It is located northeast of Coach Yard, separated from the parallel NEC by the CSX-owned Camden Line lead track. Access to WUS and the NEC from Ivy City Yard is through several run-through tracks at Coach Yard. The layout of Ivy City Yard and the associated track capacities are presented in Figure 17 and Table 10.

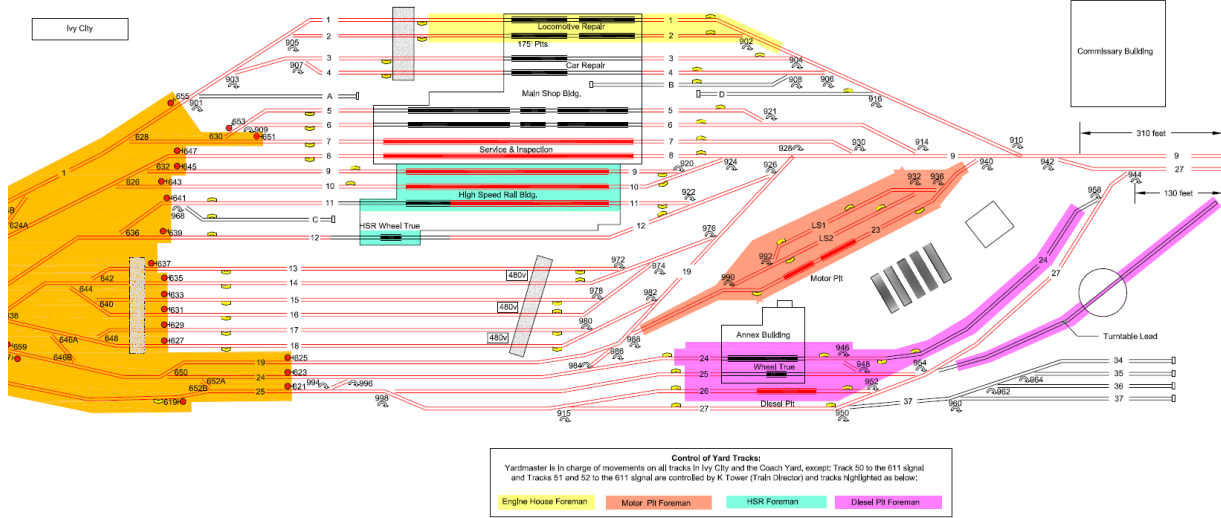


Figure 17: Existing Ivy City Yard Layout

Table 10 – Ivy City Yard Existing Track Capacity

Ivy City Track Capacity			Ivy City Track Capacity cont.		
Track	Feet	Cars*	Track	Feet	Cars*
1 South (S of xing)	175	2.0	13 (S derail to 480)	930	10.9
(N of xing)	145	1.7	(btwn derails)	985	11.5
1 North	95	1.1	14 (S derail to 480)	930	10.9
2 South (S of xing)	175	2.0	(btwn derails)	985	11.5
(N of xing)	145	1.7	15 (S derail to 480)	900	10.5
2 North	100	1.1	(btwn derails)	950	11.1
3 South (S of xing)	105	1.2	16 (S derail to 480)	900	10.5
(N of xing)	195	2.2	(btwn derails)	950	11.1
3 North	285	3.3	17 (S derail to 480)	975	10.2
4 South (S of xing)	100	1.1	(btwn derails)	955	11.2
(N of xing)	195	2.2	18 (S derail to 480)	875	10.2
4 North (S of derail)	80	<1	(btwn derails)	955	11.2
(N of derail)	165	1.9	Fumigation Track	580	6.8
A	280	3.2	LS 1	230	2.7
B (in house)	150	1.7	LS 2	320	3.7
(S of derail)	80	<1	23 (btwn derails)	420	4.9
(N of derail)	165	1.9	(over each pit)	110	1.2
D	355	4.1	24 (S of building)	225	2.6
5 (S of derail)	100	1.1	(pit in building)	170	2.0
(in house)	815	9.5	(946sw & derail)	200	2.3
(btwn derails)	1230	14.4	(btwn N derails)	165	1.9
6 (S of derail)	100	1.1	(N of derails)	400	4.7
(in house)	815	9.5	25 (S of derail)	600	7.0
(btwn derails)	1140	13.4	(in building)	170	2.0
(N of derail)	105	1.2	(N of building)	215	2.5
7 (S of derail)	300	3.5	26 (S of derail)	190	2.3
(in house)	785	9.2	(btwn derails)	540	6.3
(btwn derails)	1170	13.7	27 (984sw to 915sw)	250	2.9
(N of derail)	285	3.3	(S of S derail)	170	2.0
8 (S of derail)	480	5.6	(btwn derails)	400	4.7
(in house)	785	9.2	(950sw to 952sw)	70	<1
(btwn derails)	1165	13.7	(N of 956sw)	165	1.9
(N of derails)	70	<1	Turn Table (S of TT)	210	2.4
9 (South)	650	7.6	(on TT)	100	1.1
(in house)	685	8	(N of TT)	235	2.7
10 (south)	650	7.6	34	165	1.9
(in house)	685	8	35	165	1.9
11	2475	29	36	270	3.1
C	280	3.2	37 (lead)	385	4.5
12	1500	17.6	(N of 960)	385	4.5

* 85 foot car lengths used

Existing Operations

The Existing Baseline Operating Plan contains all Amtrak, MARC and VRE trips operating at WUS in 2015. Current day operating rules and yarding assignments apply. The daily breakdown of WUS trips is presented in Table 11 and the full Existing Baseline Operating Plan is presented in Appendix A: Existing Baseline Operating Plan.

Table 11 – Revenue Train Volumes for Existing Baseline Operating Plan (Per Direction)

Operator	Service	Peak Hour	Full Day
Amtrak	Acela	1	16
	Regional	2 (Note 1)	16
	Regional Run-through	1	6
	Long Distance	1	7
MARC	Penn	4	27/28 (Note 2)
	Camden	2	10
	Brunswick	3	9/10 (Note 2)
VRE	Fredericksburg	2	8
	Manassas	2	8

Note 1: Regional trains generally operate at a one train per peak hour service level

Note 2: A non-revenue trip is operated in one direction, resulting in different revenue train trip volumes by direction.

VRE

Under Existing Baseline operations, VRE operates 16 daily revenue round trips to WUS. This includes eight Fredericksburg Line trips and eight Manassas Line trips. VRE also operates one daily non-revenue Manassas Line round trip for midday layover and equipment servicing purposes. VRE's existing service is primarily a peak direction service. All eight of the Fredericksburg Line trips arrive at WUS between 6:30 am and 9:30 am at an average of two trips per hour. There is no other northbound Fredericksburg Line Service. Southbound Fredericksburg trains depart WUS between 1:00 pm and 7:00 pm, focusing on the 3:00pm to 7:00pm period at a rate of two trips per hour. On the Manassas Line, seven northbound trips arrive at WUS between 6:00am and 9:00am at a rate of two per hour. Eight of the southbound departures occur in the afternoon and evening period at a rate of two per hour during the peak.

Because VRE operates a predominantly peak direction service, most VRE consists need to layover during the midday period in the WUS area. Only three daily VRE trips arrive in WUS and turn on the platform for immediate southbound departure. All other VRE trips proceed to Washington Coach Yard after arriving at WUS. Here they layover the midday period on tracks not in use by Amtrak.

All VRE service is provided by consists of four to eight gallery cars pulled by a diesel locomotive. In the existing station configuration, all run-through platforms are low level and so all can handle VRE's gallery cars which are not equipped with traps for high level platform boarding.

MARC

MARC operates 27 southbound revenue Penn Line trains and 28 northbound revenue Penn Line trains daily. The imbalance is made up for by a non-revenue train operating into WUS from the north to provide the consist for the additional northbound trip. The Penn Line is MARC's busiest line, with a frequency of four trips per hour in the peak period. Bi-directional Penn Line service is available all day, with two trips per hour in the reverse peak and one trip per hour in the off-peak. MARC Penn Line consists are four to eight single level or multi-level coaches pulled by a diesel or electric locomotive.

MARC has a limited number of electric locomotives and tends to assign them to longer Penn Line trains in peak periods.

Nine southbound revenue Brunswick Line trips operate daily to WUS, and ten northbound revenue trips depart WUS for Brunswick Line destinations, including Frederick, MD; Brunswick, MD; and Martinsburg, WV. The imbalance is made up for by a southbound non-revenue trip from an outlying MARC Yard. Brunswick Line service is peak direction only. All southbound trains arrive at WUS between 6:00 am and 9:30 am, and all northbound trains depart WUS between 1:30pm and 7:30pm. During peak periods, Brunswick Line trains operate at a frequency of two per hour. Brunswick Line consists include three to six single level coaches and one diesel locomotive. Brunswick Line trains are generally assigned to WUS Tracks 7 to 9, which are easily accessible from the incoming Brunswick Line tracks through “C” and “K” Interlockings.

Under Existing Baseline operations ten Camden Line trains operate southbound and 11 operate northbound. The extra northbound consist is supplied by a non-revenue trip from Camden Yards in Baltimore, MD. Unlike Brunswick Line service, Camden Line service operates bi-directionally in both the morning and evening peak periods. There is no off-peak service on either line. Bi-directional peak service is provided on the Camden Line to allow commuter travel from Baltimore to Washington or vice versa. At WUS, peak direction service operates at two trains per hour, with one reverse-peak trip per hour. Camden Line consists include three to five single level coaches pulled by a diesel locomotive.

All MARC lines provide peak focused service, so some MARC consists must layover during the midday in the WUS area. Under current operations, MARC uses West and Wedge Yards and the WUS platform tracks to hold these trains. Six midday consists layover in Wedge Yard and four layover in West Yard; Table 12 displays the specific yard track assignments. One MARC train per day is drilled out of the station’s upper level and stored on stub-end Track 30 in WUS’s lower level. This trip does not depart from Track 30, but rather returns to the upper level to make its departure. All other MARC trains remain on their WUS platform tracks for the duration of their time in the station, including layovers that exceed four hours.

Table 12 – Existing MARC Midday Layover Yard Assignments

Available Yard Tracks	Useable Length (feet)	Arriving Train	Departing Train
West 1	625	M880	M893
West 2	350	M890	M891
West 3	510	M892	M852
West 4	715	M874	M426
Wedge 1	834	M421	M850
Wedge 2	579	M419	M532
Wedge 3	409	M523	M430
Wedge 4	494	M415	M634
Wedge 5	664	M511	M642
Wedge 6	834	M517	M536

Amtrak

Amtrak service at WUS includes Acela High Speed Rail service, Northeast Regional service and Long Distance service. Regional and Long Distance services feature a mix of run-through trains and terminating/originating trains.

Acela

Acela is Amtrak’s high-speed premium NEC intercity service. Amtrak operates 16 daily Acela round-trips at WUS. Acelas are not a peak oriented service but rather an all-day service with a constant one train per hour service level throughout the day. Current Acela consists are fixed consists of six coaches and two electric power cars. Midday Acela trips turn on the WUS platforms while morning departures and afternoon arrivals are shuttled to and from Ivy City Yard for service, inspection and overnight

storage. At WUS, Acela trips utilize centrally-located Tracks 17 to 20, providing the most convenient boarding from the station waiting room for this premium fare service.

Regional

Amtrak Regional trips provide corridor service along the NEC from points in New York, Massachusetts and Vermont through WUS to Virginia. On peak weekdays (Fridays), 22 Regional trips per direction operate at WUS daily. Of this total, 16 trips originate/terminate at WUS, while the remaining six trips run through the station to/from destinations in Virginia. Regional trips operate all day but have a peak focus; two peak trips per hour and one off-peak trip per hour. The terminating/originating trips utilize any electrified stub-end platform at WUS and have consists of five to eight single level coaches pulled by a single diesel locomotive. No terminating or originating Regional trips turn on the platforms at Washington. All arriving consists are sent to Ivy City Yard for service and inspection before being returned to the station or stored overnight in Coach or Ivy City Yards.

Run-through Regional trips have consists of six to eight single level coaches. They are pulled by a single electric locomotive north of WUS, and by one to two diesel locomotives south of WUS. All coaches are equipped with traps to utilize the low level run-through platform station tracks. Regional run-through trips must undergo an engine change while on these platforms to switch from diesel propulsion south of WUS to electric propulsion on the NEC or vice versa.

Long Distance

Seven Long Distance round trips operate through WUS daily. Six of these trips operate through WUS to points in Carolina, Florida, Louisiana and Illinois. These six run through services are: Carolinian, Crescent, Cardinal, Palmetto, Silver Star, and Silver Meteor. All run-through Long Distance trips require an engine change from diesel south of WUS to electric on the NEC. Long Distance consists vary, but generally consist of seven to 11 coaches, including sleepers, dinettes and baggage cars pulled by two diesel locomotives or one electric locomotive.

The Capitol Limited is the only non-through-running Long Distance trip, providing service between Chicago and WUS via the Brunswick Line. The Capitol Limited uses Superliner equipment with low level boarding only and as a result cannot use the high level stub-end platforms at WUS. Therefore, the Capitol Limited berths on the low level platforms of Tracks 15 and 16. Capitol Limited trainsets are stored and serviced in Ivy City Yard. The Capitol Limited always operates with two diesel locomotives.

Private Cars

Amtrak provides space at WUS for the berthing of private cars. One private car, the Marco Polo, resides permanently at the station. At WUS, private cars typically layover against the bumping posts on the stub-end station tracks. The number of private cars in WUS at one time varies greatly. In order to provide an accurate simulation, a conservative estimate of eight private cars is assumed to be in the station at all times – two single cars, a pair of cars and a quartet of cars. These cars effectively shorten the useable lengths of the tracks on which they dwell.

CSXT

CSXT owns multiple lines included in the simulation and operates multiple freight trains per day through portions of the study area on different routes. CSXT operates Benning Yard in the District of Columbia which connects to the NEC and Camden Lines via Chesapeake Junction, and to Long Bridge and Points south via CP Virginia and the Virginia Ave. Tunnel. Most CSXT freight through Washington passes through Benning Yard; CSXT does not operate any trains through WUS.

In the study area, CSXT presently operates intermodal, merchandise and local freight trains. These trips run between Benning Yard and locations in Rocky Mount, NC; Baltimore, MD and Brunswick, MD. An average of 15 CSXT freight trains operate today across the study area, with the busiest route being Rocky Mount to Baltimore via the Fredericksburg Line, Long Bridge, Benning Yard and the Camden Line. CSXT freight trains run throughout the day and interact with passenger trains on the Brunswick and Camden Lines north of WUS and on the Long Bridge and Fredericksburg Line south of CP Virginia.

NS

Norfolk Southern does not run any trains through the simulated study area today. The Class 1 freight carrier does retain perpetual trackage rights across the Long Bridge and through WUS to the NEC which it could choose to utilize in the future.

Future Infrastructure – WUS TI Option 14

Station Stub End Tracks & Concourse

The planned WUS TI Option 14 track layout completely replaces all existing trackage at WUS with a new configuration. Existing Tracks 7-20 are replaced in the future by 12 stub-end tracks numbered 1-12. Each track is served by a single island platform, such that six island platforms serve all 12 stub-end tracks. The layout of the stub-end tracks is shown in Figure 18. The platforms range in length from 769 feet to 1350 feet; lengths of all platforms are included in Table 13. All tracks are electrified, and all platforms are high level in the planned design. Southeast of Track 12 is an open area which serves as the station concourse and separates the stub-end tracks from the run-through tracks. The four stub-end tracks nearest the concourse, Tracks 9-12, provide priority berthing for Amtrak’s Acela and future High Speed Rail services.

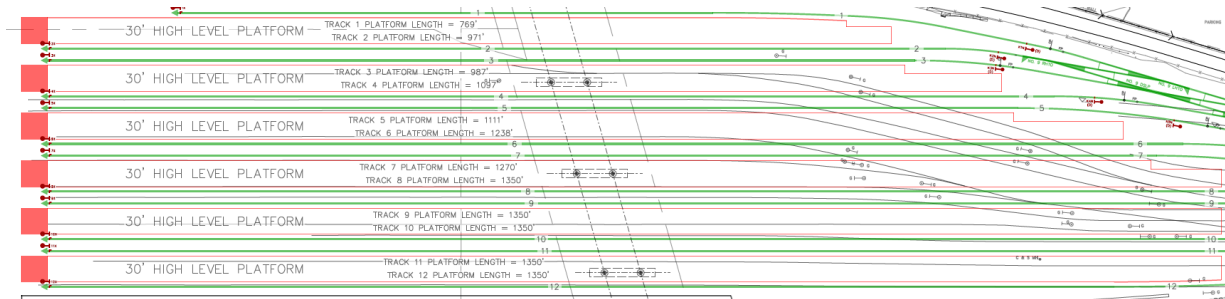


Figure 18: WUS Future stub-end track layout

**Table 13 – Future Station Configuration
Platform Useable Lengths and Constraints**

Track	Platform Useable Length (feet)	Boarding Level	Station Configuration
1	769	High	Stub-end
2	971	High	Stub-end
3	987	High	Stub-end
4	1097	High	Stub-end
5	1111	High	Stub-end
6	1238	High	Stub-end
7	1270	High	Stub-end
8	1350	High	Stub-end
9	1350	High	Stub-end
10	1350	High	Stub-end
11	1350	High	Stub-end
12	1350	High	Stub-end
22	1320	High	Run-through
23	1375	High	Run-through
24	1170	High	Run-through
25	1196	High	Run-through
26	1023	Low	Run-through
27	964	Low	Run-through
28	1008	Low	Run-through

Run-through Tracks & Engine Changes

The existing lower level of WUS is replaced by seven run-through station tracks numbered 22-28 in the planned Option 14 track layout. Tracks 22-27 are served by three island platforms, while Track 28 is served by a side platform. All run-through tracks are gently curved to allow for sufficient platform length, required interlocking connectivity, and the retention of the REA Building. The layout of the run-through portion of the future station is shown in Figure 19. The platforms range in length from 974 feet to 1375 feet; lengths of all platforms are included in Table 13. All tracks are electrified. Tracks 22-25 have high

level platforms, while Tracks 26-28 have low level platforms. Therefore, all VRE trains (which have gallery cars capable of using only low level platforms) as well as the terminating/originating Capitol Limited must use Tracks 26-28, while run-through Amtrak service can use any track. Amtrak run-through service will favor the greater accessibility of the high level platforms serving Tracks 22-25.

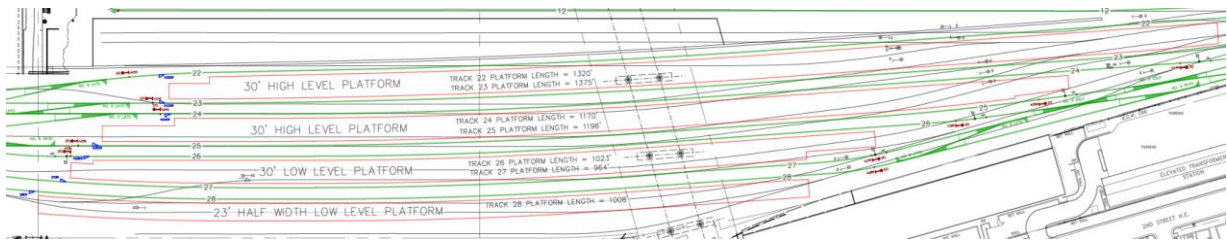


Figure 19: WUS Future run-through track layout

Under future operations through-running trains are still required to make engine changes on the run-through tracks at WUS, as no extension of catenary south of the 1st Street Tunnel is planned. However, existing Tracks 22 and 29 are eliminated as engine pool tracks under the future station layout, requiring a more precise operation for the engine change. Increased future train volume precludes the use of station tracks as engine pool tracks. Instead, engine changes are conducted using small pockets available in “A” and “K” Interlockings. Locomotives are no longer stored in WUS and always return to Ivy City Yard between trips

A northbound through-running trip arrives in WUS and its diesel locomotive(s) departs immediately for Ivy City Yard. Prior to the through train arrival, an electric replacement locomotive is dispatched to a signaled pocket along Track 22 or Track 23 within “K” Interlocking. The occupancy of one of these two tracks does not obstruct any other moves within “K” as shown in Figure 20. Once the diesel power has cleared the platform track, the electric power can make its way from the “K” Interlocking pocket and couple to the northbound train. This exchange requires prior dispatcher knowledge of the arrival of a northbound train in order to get the electric locomotive in place in the “K” Interlocking pocket.

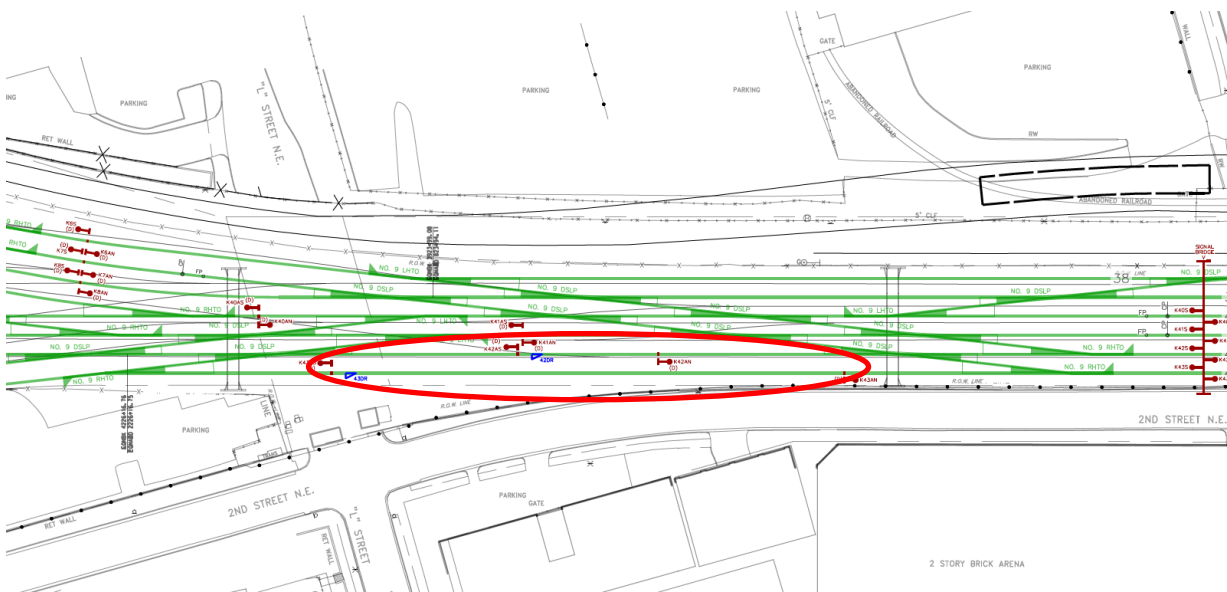


Figure 20: WUS engine Pockets and associated derails (blue) in “K” Interlocking

A southbound run-through trip arrives in Washington and its electric locomotive pulls forward into one of four pockets accessible from Tracks 22-25. Each run-through track has at least two means of egress south into the tunnel, so this electric locomotive does not obstruct the incoming electric locomotive or other southbound traffic. Prior to the trip arriving at WUS, diesel locomotives are dispatched to one of the “A” interlocking pockets with access to the track the run-through train will be dispatched to. To access this pocket, diesel locomotives proceed in advance of the incoming train along the same platform track. This is so not to disrupt other operations in the station’s lower level in the case that all

other platforms are occupied at that time. With the electric locomotive removed, the diesel locomotives can then proceed to the train and couple to it. The electric locomotive then returns to Ivy City Yard by way of the track just vacated by the departing train. This operation requires the dispatcher know which platform the approaching train will be routed to, in order to properly dispatch the diesel power ahead of the incoming train.

Interlockings

“C”

“C” Interlocking brings together the Camden Line, Brunswick Line, Northeast Corridor and accesses to Amtrak’s Washington Coach and Ivy City Yards. It consolidates tracks before they enter the “throat area” toward “K” Interlocking and WUS. Under the future Option 14 track configuration, “C” interlocking is reconfigured to provide connectivity with additional tracks in the terminal throat and more efficient flow to the WUS yards. Tracks 41 and 42 provide a continuous route through “C” Interlocking from the throat tracks to Tracks 2 and 3 of the NEC. The future layout of “C” Interlocking is shown in Figure 21.

The “pocket” track area between “C” and “K” Interlockings exists today as five tracks, each 902 feet long between home signals. This area is important to the holding (“pocketing”) of trains so that no single train simultaneously occupies both “C” and “K” interlocking. Under the future infrastructure plan, the pocket track area between the two interlockings is increased to seven tracks, numbered 37 to 43 from west to east. Most tracks are long enough to hold a train, with the longest, Track 40, at 1260 feet between interlockings. Lengths of all pocket tracks between “C” and “K” are presented in Table 14, and the layout is shown in Figure 22.

Table 14 – “C” – “K” Pocket Track Lengths

Track	Signal to Signal Length (feet)
Track 43	460
Track 42	960
Track 41	960
Track 40	1260
Track 39	1070
Track 38	910
Track 37	910

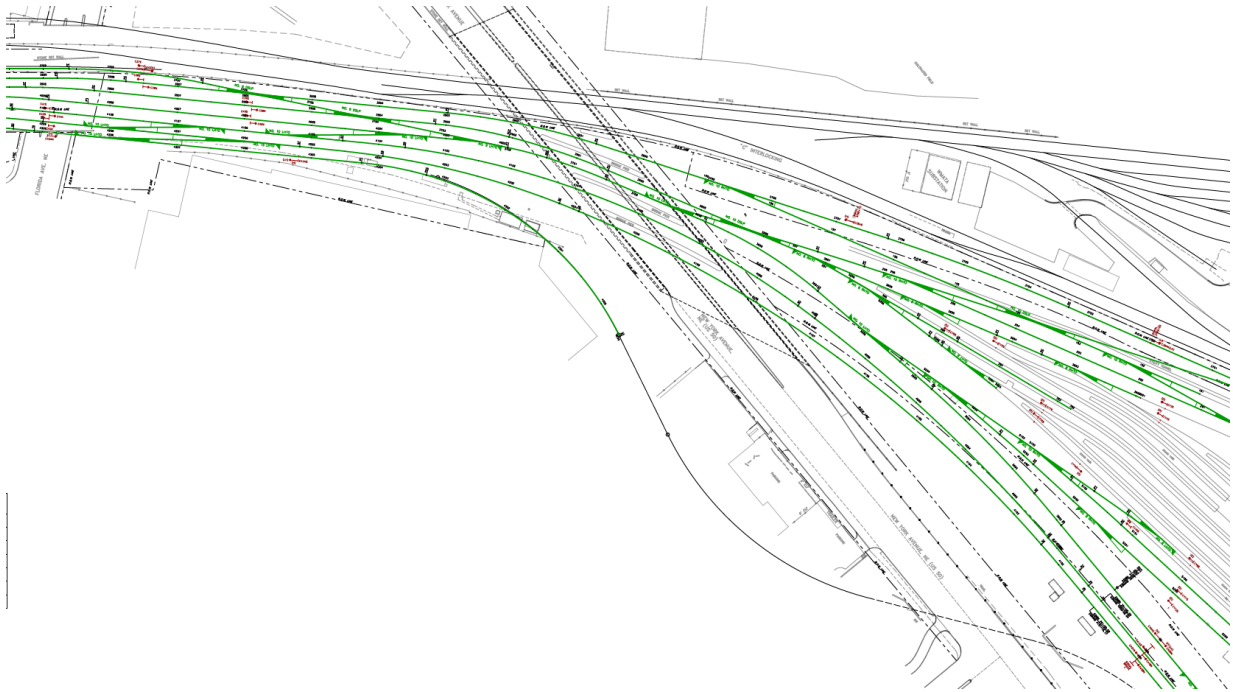


Figure 21: Future “C” interlocking layout

“K”

In the new Option 14 track layout, a re-graded and reconstructed “K” Interlocking supports level access from stub-end platforms to the WUS station building. The reconstruction of “K” Interlocking also includes connectivity to additional throat tracks. With the future “K” Interlocking design, a train can access any station track from any throat track; the current layout does not offer this level of routing flexibility south of pocket tracks between “C” and “K”. Many more parallel moves are made possible by the future “K” configuration as well, a complete chart of parallel moves is presented in Appendix E: Option 14 Parallel Moves Chart. The layout of “K” Interlocking is presented in Figure 22 and Figure 23.

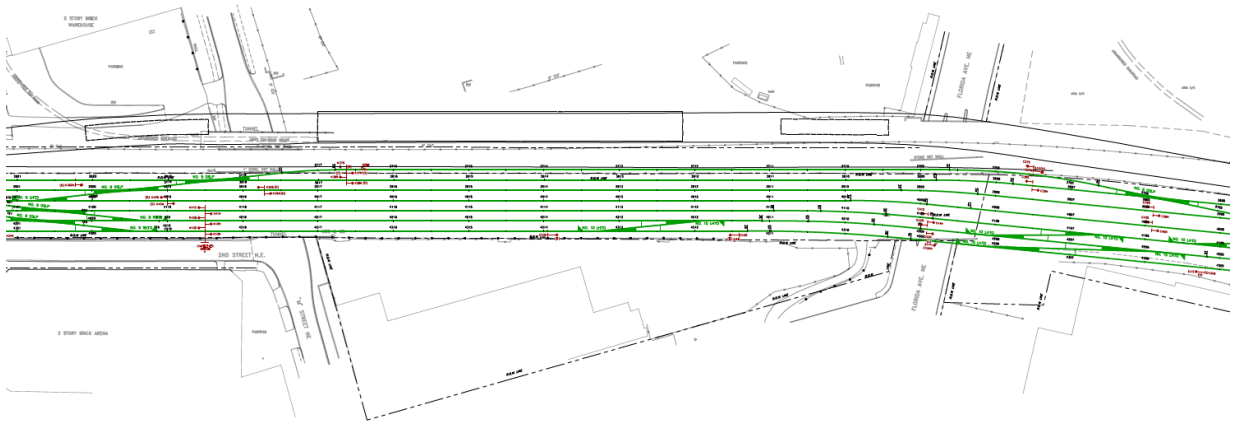


Figure 22: “C” – “K” Interlocking throat and pocket tracks

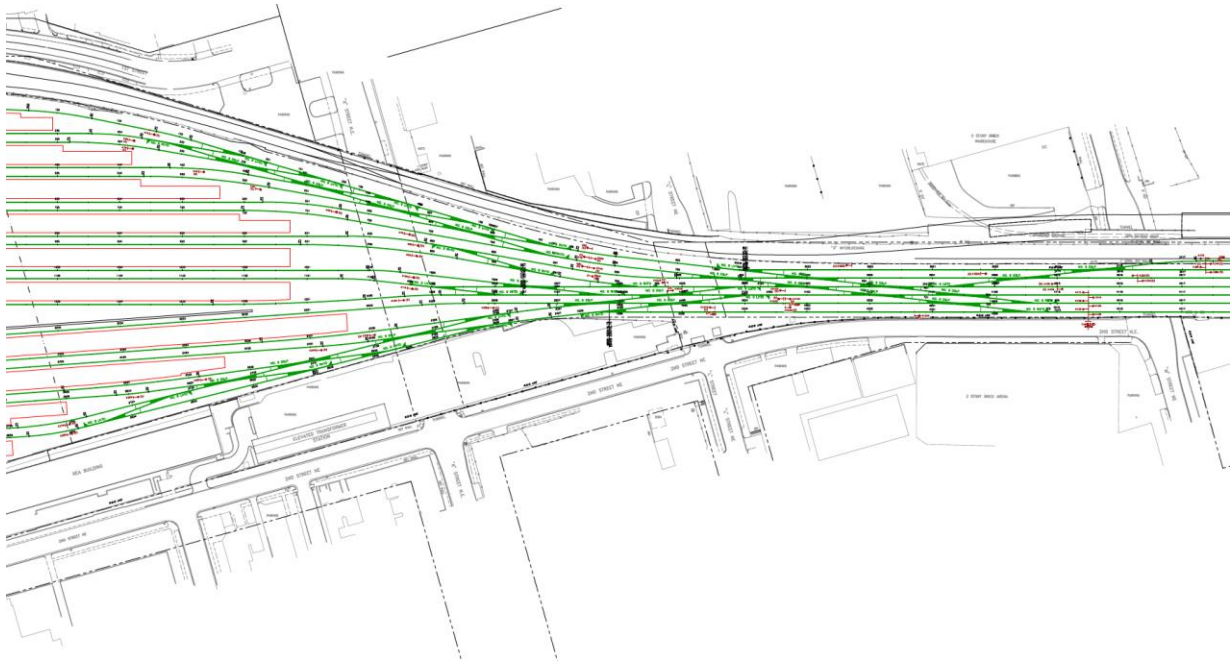


Figure 23: "K" interlocking future layout

Track 43 within "K" Interlocking includes a signaled 380 foot pocket. There is also a shorter pocket of 100 feet in length on Track 42. These are included in the design to serve as staging locations for electric locomotives waiting to be coupled to northbound through-running trains during engine changes at WUS.

"A"

The northern half of "A" Interlocking is reconfigured in the future WUS plans. Each of the platform tracks supporting routine southward engine changes (Tracks 22-25) have switches providing two points of access to the six tunnel connecting tracks to the south. A signaled pocket exists on each of these tracks to facilitate southbound engine changes, allowing an electric locomotive to be moved off of the southward train while the diesel locomotive waits to back onto the train. South of these pockets, the existing "A" Interlocking configuration is retained, necking down to the two First Street Tunnel tracks. The reconfigured northern layout is presented in Figure 24.

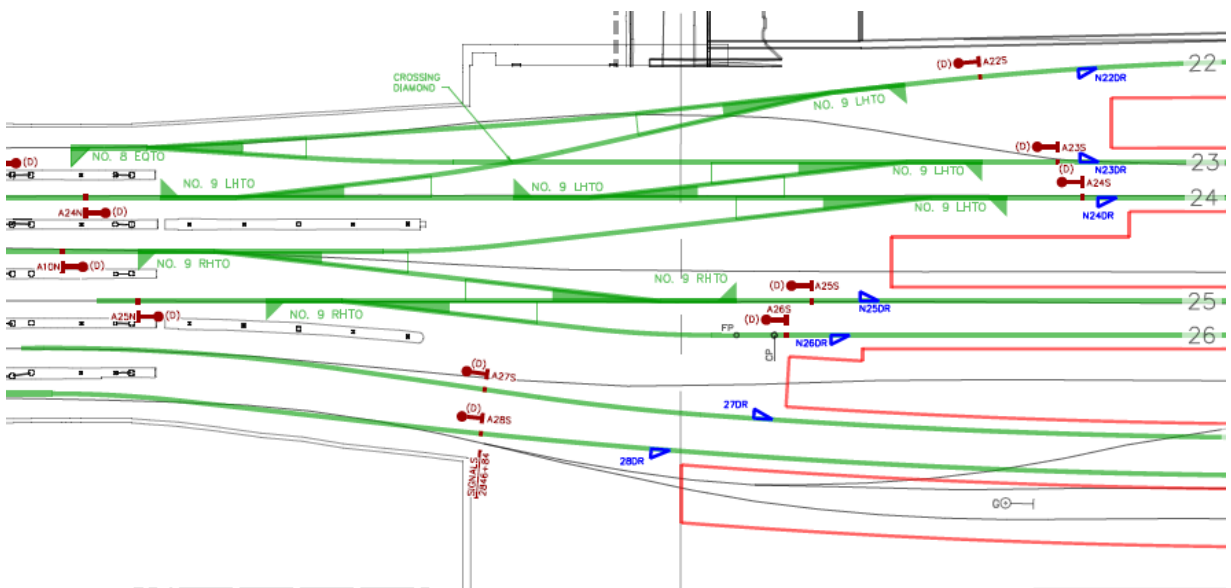


Figure 24: "A" Interlocking north future layout

Yard Facilities

Design for future Washington Terminal Yard (WTY) facilities was completed in the prior Washington Terminal Yard Master Plan. Specific yard operations are not simulated for the TI analysis, but a brief overview of the available yards is presented here. Yard capacity was evaluated to confirm that it meets demands for all future operating plans both in the overnight and in the midday periods.

Wedge Yard

No future infrastructure changes are included under the TI design for MARC's Wedge Yard.

Coach Yard

By 2030, the Coach Yard is improved and expanded to eliminate the original mail buildings and replace them with new through tracks. It is assumed that under the 2030+ operating plan MARC trainsets could use Coach Yard during midday layover periods, while Regional consists would overnight there. Under 2040 NEC FUTURE operations, MARC trainsets are assumed to utilize Coach Yard for midday layovers, while Metropolitan trains are stored there in the overnight period. Useable length and number of Coach Yard tracks are presented in Table 15; Coach Yard tracks are generally the longest in the WTY area.

Table 15 – Coach Yard Track Lengths

Available Yard Tracks	Length (feet)
1 Storage	1655
2 Storage	1570
Power House	1629
Power House Spur	350
1 Repair	1300
2 Repair	1300
1 Mail	1300
2 Mail	1235
3E	1460
4E	1125
5E	1125
50	1000
51	1130

Ivy City Yard

Ivy City Yard is reconfigured for exclusive use by Amtrak trains in 2030. This includes service, inspection, and maintenance facilities. Ivy City Yard has sufficient capacity to meet the needs of Amtrak under the 2030+ and 2040 operating plans. The number and useable length of future Ivy City tracks is presented in Table 16.

Table 16 – Ivy City Yard Track Lengths

Available Yard Tracks	Length
Ivy City 1	1100
Ivy City 2	400
Ivy City 3	200
Ivy City 4	1100
Ivy City 5	1100
Ivy City 6	1100
Ivy City 7	1100
Ivy City 8	1100
Ivy City 9	1100
Ivy City 10	1100
Ivy City 11	1100
Ivy City 12	1100
Ivy City 13	1100
Ivy City 14	1100
Ivy City 15	1100
Ivy City 16	750
Ivy City 17	750
Ivy City 18	750
Ivy City 19	750
Ivy City 20	750
Ivy City 21	750
Ivy City 22	750

VRE Midday Storage Facility

The final yard available for train storage in the WTY area in the future is VRE’s planned Midday Storage Facility. This is a linear yard between the NEC tracks east of Ivy City and New York Ave. It is connected to the WUS TI network via the restored Union Market Lead and Track 43 to “K” Interlocking. According to VRE designs, it has space for 16 trains, sufficient for VRE’s midday layover needs in the 2030+ and 2040 NEC FUTURE plans

Capacity Constraints

North of WUS

The existing operating conditions on NEC Tracks 2 and 3 between “C” Interlocking and New Carrollton Station limit capacity to 17 trains per hour per track, representing a three and one half minute headway. This is based on the signal locations, signal control lines, operating speeds and alignment of the two tracks. Given right-of-way constraints at New York Avenue, the design of “C” interlocking is constrained in its ability to accommodate additional tracks. Current plans call for connections to NEC Tracks 2 and 3 and connections to MARC Brunswick and Camden Lines, along with accommodation of train movements to/from Washington Coach and Ivy City Yards. Therefore, for the purpose of evaluating TI infrastructure and related projects at Washington, two NEC tracks are assumed north from “C” Interlocking to planned Hanson Interlocking, just south of New Carrollton Station. Due to this constraint, no more than 17 trains per hour per direction can be scheduled to operate north of WUS in the future operating plans presented herein.

South of WUS

Only a limited number of trains can pass through the First Street Tunnel without improved ventilation. At present, Amtrak northbound dispatching procedures allow a train to enter the tunnel only if it has a path available to an open station platform track, thereby avoiding the prospect of a train stopping in the tunnel for an extended time period and subjecting passengers to excessive diesel exhaust. Simulations were conducted to determine the practical capacity of the First Street Tunnel given this dispatch protocol. These involved running a typical Amtrak train from L'Enfant to WUS under best-available wayside and cab signal aspects, given an 8% schedule margin that represents typical Amtrak train handling. Figure 25 shows the resultant speed versus location and time versus location simulation of the single train. The solid purple line shows the simulated location of the front of the train while the dashed purple line shows the simulated location of the rear of the train. Note the speed changes, time at which the head of the train enters CP Virginia and time at which the tail of the train clears "A" interlocking, defining the minimum theoretical dispatch interval of northbound trains through the First Street Tunnel.

The resultant time from the passing of CP Virginia's northbound home signal to the clearing of "A" Interlocking is the First Street Tunnel's required headway, given its requirement for single occupancy in each tunnel bore. This idealized headway time is 4:51, supporting a theoretical train volume of 12 trains per direction per hour. Consistent with UIC (Union Internationale des Chemins de Fer or International Union of Railways) criteria, practical capacity determination is based on a headway 25 percent longer than this idealized version, yielding a tunnel practical capacity of just under 10 trains per hour per direction.

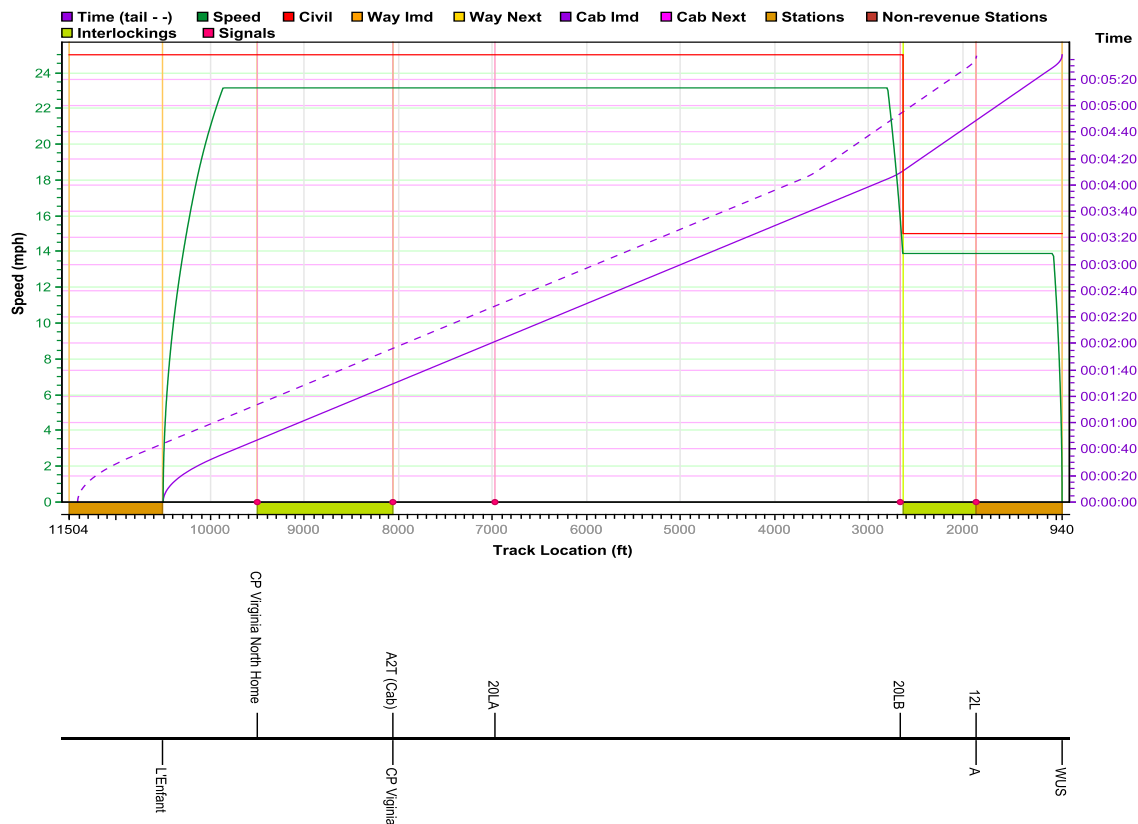


Figure 25: Speed-Distance-Time graph for the idealized headway simulation test of the First Street Tunnel.

Present bidirectional service volumes through the First Street Tunnel are about three intercity trains and eight commuter trains in the peak hour. This is consistent with the capacity of the First Street Tunnel of nine to 10 trains per hour per direction. In the 2030+ plan, this grows to a combined five intercity and 12 commuter rail trains in the two directions – growth of 55 percent in terms of train movements. While representing significant growth, the 2030+ plan is consistent with existing First Street Tunnel capacity.

The 2040 NEC FUTURE operating plan with run-through focus increases First Street Tunnel movements to 14 trains per hour per track, which would require re-signaling and associated significant fire life safety improvements, such as vent plant towers within the grounds of the U.S. Capitol. Such improvements would be needed to improve the capacity of the tunnel while adhering to National Fire Protection Association (NFPA) Standard 130 but are beyond the scope of the Washington Union Station and TI projects. Instead, the stub-end 2040 NEC FUTURE simulation operating plan (no through running of Metropolitan service to/from Virginia) approaches the existing capacity limits of the First Street Tunnel with 10 scheduled trains per hour, while not triggering the need for vent plant towers and other significant capital investments.

Operating Speeds

An important design component of the future WUS layout is two through tracks connecting the two NEC tracks south of New Carrollton through “C” Interlocking into WUS with higher operating speeds than typical 15 mph terminal operation. The TI civil speed limit along these two tracks, Tracks 41 and 42, is maintained at 45 to the northern limits of “K” Interlocking. Other tracks north of “K” have their speeds capped at 15 mph due to curves and forced diverging moves to access them. Diverging routes through all switches in “A”, “K” and “C” Interlockings are designed for 15 mph.

Train Control Design

A future signal system has been designed for the proposed Option 14 future station layout. This includes signal locations and signal logic for all interlocking and automatic signals within the study area, specifically focusing on the reconfiguration of “A”, “C” and “K” Interlockings and the creation of signal pockets essential to supporting northward and southward engine changes. The WUS TI concept signal design is consistent with Amtrak C&S Engineering braking distance criteria. This signal design has been included in the Option 14 simulation model and governs the movement of all trains therein.

Future Operations

2030+ Operating Plan

The 2030+ Operating Plan represents planned future service volumes provided by the three WUS rail operators. Growth from Existing Baseline operations presented here represents VRE, MARC and Amtrak's best reasonable assumptions about the levels of service they will be running in the year 2030. For MARC and VRE, this includes increased service levels and full day operations on all lines. For Amtrak, this means the introduction of SEHSR service, with increased train volumes south of WUS, and more Acela trips north of WUS. Unlike the NEC FUTURE 2040 Operating Plan, the 2030+ plan includes no new services. Train volumes in the 2030+ Operating Plan can be found in Table 17 and Figure 26, while the 2030+ Operating Plan in its entirety can be found in Appendix B: 2030+ Operating Plan.

**Table 17 – Revenue Train Volumes for
2030+ Operating Plan
(Per Direction)**

Operator	Service	Peak Hour	Full Day
Amtrak	HSR	3	45
	SEHSR	1	9
	Regional	1	10
	Regional Run-through	1	8
	Long Distance	1	6
MARC	Penn	6	39
	Camden	2	10
	Brunswick	2	12
VRE	Fredericksburg	3	19
	Manassas	3	22

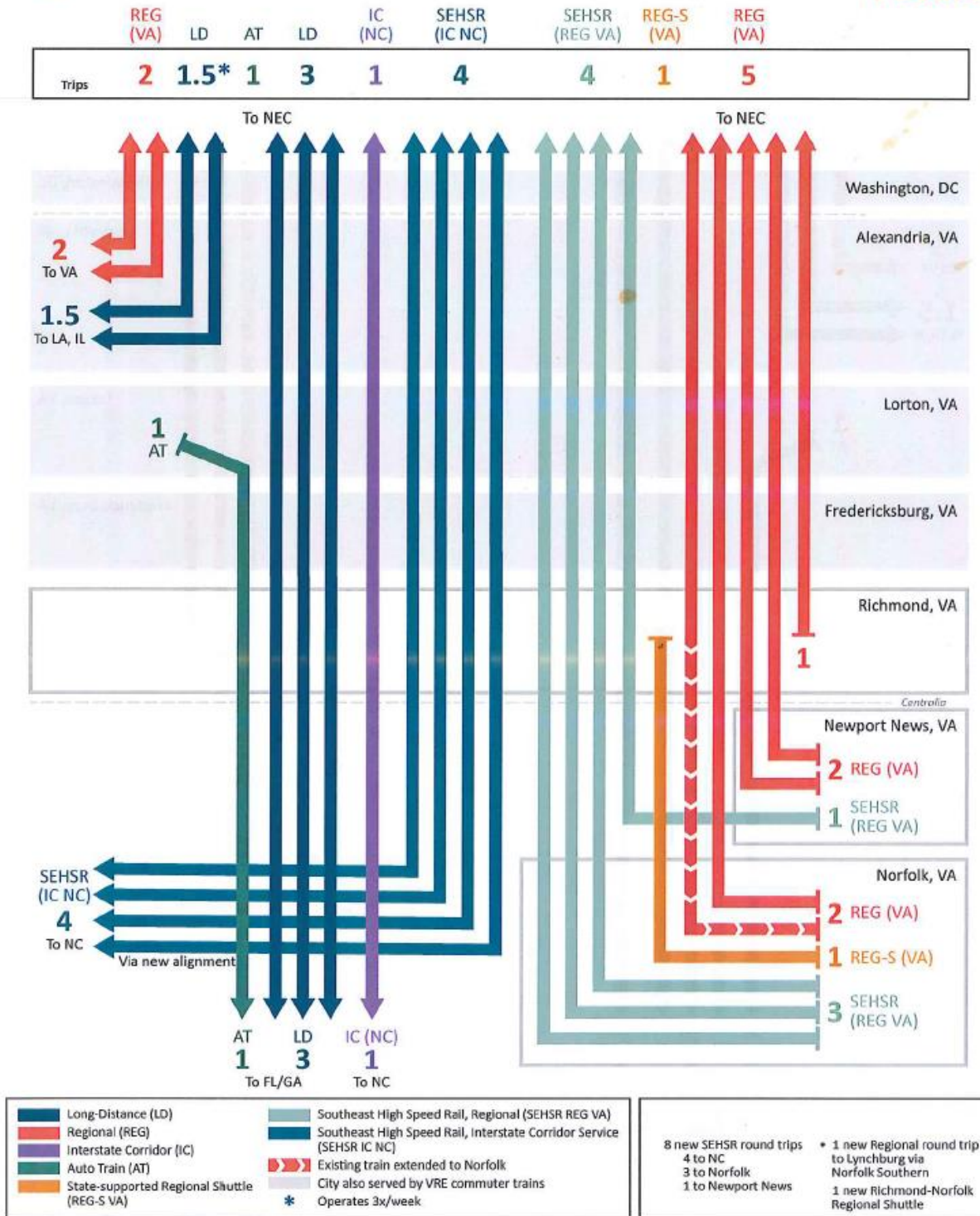


Figure 26: 2030+ Operating Plan daily volumes south of WUS

VRE

Under 2030+ operations, VRE increases service on both the Fredericksburg and Manassas Lines. The Fredericksburg Line has 19 round trips per day serving WUS. This includes three trips per hour in the

peak period and one trip per hour in the off peak period. The Manassas Line has 22 round trips per day serving WUS. This includes three peak period trips per hour and one off-peak trip per hour. The three additional trains per direction on the Manassas Line provide peak period service volume for a slightly longer temporal window than is provided on the Fredericksburg Line. This is a significant service increase over the peak direction current operation for both lines.

The existing VRE operating plan is layover focused, with only three trains being turned on the platforms at WUS to return to Virginia. The 2030+ plan features significant reverse peak service, and many more VRE trips turning on the platform. Of the 41 daily VRE arrivals at Washington, 34 are turned on the platforms in the 2030+ plan. The remaining seven are laid over midday at VRE’s Midday Storage Facility in the Washington Terminal area. Three of the midday layovers are Fredericksburg Line trains, while the remaining four serve the Manassas Line.

All VRE equipment remains low level boarding in the 2030+ plan. Consists are six to ten gallery cars pulled by a single diesel locomotive. Therefore, under this future plan, VRE can utilize only Tracks 26-28 at WUS.

MARC

Under the 2030+ Operating Plan MARC’s Brunswick Line sees a slight increase in service from nine round trips per day to 12 per day. The line retains its primarily peak centered focus with ten peak direction trips at a frequency of two per hour. Two Brunswick Line trips per direction also operate in the reverse peak periods. The 2030+ Camden Line plan retains a schedule very similar to existing operations. Ten Camden Line round trips operate per day. Five of these trips operate during peak periods to Washington and five during peak periods at the line’s other terminus in Baltimore, MD. MARC Camden and Brunswick Line trains include four to six coaches in the 2030+ plan, each pulled by a single diesel locomotive.

The Penn Line exhibits significantly increased service, moving from 27 daily trips under existing operations to 39 daily trips in 2030+. This represents full day service on the Penn Line including six trains per hour in the peak and two trains per hour in the off-peak and reverse peak periods. The Penn Line is the only MARC line offering regular off-peak (midday) service in the 2030+ Operating Plan. MARC Penn Line trains are between four and eight cars long under the 2030+ plan and are pulled by a single diesel locomotive.

Due to peak focused scheduling on all MARC lines in the 2030+ Operating Plan, some MARC trains must layover in the midday in the Washington Terminal area. MARC can utilize its six-track Wedge Yard as well as the 13-track reconstructed Coach Yard to accommodate these 17 daily midday layovers. Available yard tracks are long enough to hold all 17 trains. Specific MARC assignments to yard tracks can be seen in Table 18. No MARC trains are stored midday on the platform tracks at WUS. MARC trips utilize WUS Tracks 1-8 under 2030+ operations, with exclusive use of Tracks 1 and 2.

Table 18 – 2030+ MARC Midday Layover Yard Assignments

Available Yard Tracks	Length	Arriving Train	Departing Train
1 Storage	1655	M898	M8XXa
2 Storage	1570	M880	M428
Power House	1629	None	None
Power House Spur	350	None	None
1 Repair	1300	M425	M873
2 Repair	1300	M431	M891
1 Mail	1300	M847	M422
2 Mail	1235	M9905	M426
3E	1460	M523	M430
4E	1125	M9919	M544
5E	1125	M517	M536
50	1000	M892	M414

Table 18 – 2030+ MARC Midday Layover Yard Assignments

Available Yard Tracks	Length	Arriving Train	Departing Train
51	1130	M419	M532
Wedge 1	834	M409	M440
Wedge 2	579	M876	M877
Wedge 3	409	M890	M895
Wedge 4	494	M421	M438
Wedge 5	664	M415	M9940
Wedge 6	834	M9911	M9936

Amtrak

HSR

High Speed Rail (HSR) service is provided by integrated trainsets in the 2030+ plan. Amtrak is planning 45 HSR round trips per day at WUS. HSR service is not scaled to meet increased demands in the peak periods in 2030+; three HSR trips operate per hour per direction during most hours of the day. To meet early morning and late evening service demands 14 HSR consists overnight at Ivy City Yard in 2030+. Within WUS, HSR trains have preferential use of Tracks 9-12, with overflow access to Tracks 7 and 8. This centers HSR service around the passenger concourse presented in the future station layout.

Southeast High Speed Rail

Southeast High Speed Rail (SEHSR), currently being advanced by the States of Virginia and North Carolina, is included in the 2030+ plan. SEHSR service was incorporated into the DC2RVA Operating Plan and provides express service via the Fredericksburg Line to Raleigh and Charlotte, NC and Norfolk and Newport News, VA. A diagram of all Amtrak run-through service at WUS, including SEHSR, is presented in Figure 26. This service does not replace Regional service to these destinations but rather supplements it with higher speed express stop service utilizing updated trainsets. Consists are ten coaches and two diesel locomotives south of WUS, and one electric locomotive north of WUS. Coaches are high floor level, utilizing high level platforms of Tracks 22-25 at WUS, but with traps for low level platform access south of WUS.

Nine SEHSR round trips operate per day. Service at WUS is spread throughout the day, not centered on any peak period. Four daily round trips serve North Carolina, with three trips to Charlotte and one to Raleigh. The other five daily round trips terminate in Virginia, with three to Norfolk and two to Newport News.

Regional

Amtrak Regional service continues under the 2030+ Operating Plan with 18 daily trips per direction. Ten southbound Regional trips terminate at WUS daily, and ten northbound Regional trips originate there. All Regional service is provided throughout the day, without a peak period focus. Eight Regional run-through round trips operate through WUS daily to destinations in Virginia and Carolina. A diagram of all Amtrak run-through service at WUS, including Regionals, is presented in Figure 26. Two round trips operate on the Manassas Line to Lynchburg, VA and Roanoke, VA. Six roundtrips operate on the Fredericksburg Line, two to Norfolk, VA; two to Newport News, VA; and one to Richmond, VA. One daily Regional roundtrip also operates to Charlotte replacing the Carolinian Long Distance train and providing connections to the Piedmont service.

NEC Regional trips consist of a single electric locomotive pulling ten single level coaches. Terminating and originating trips use Tracks 3-8 at WUS. There are no midday platform turns for Regional trains in 2030+; all consists are sent to Ivy City yard upon termination, and brought from Ivy City for origination. Regional run-through consists are ten single level coaches. North of WUS they operate with a single electric locomotive while south of WUS they operate with two diesel locomotives. Run-through Regional service must have an engine change performed at WUS, to provide service on the electrified NEC north of WUS and the diesel territory south of WUS. Coaches are high floor level, utilizing high level platforms

of Tracks 22-25 at WUS, but with traps for low level platform access south of WUS. Given the presence of traps on this fleet, these trains can use WUS Tracks 26-28 and their low level platforms if required.

Long Distance

Long Distance service remains unchanged from the Existing in the 2030+ Operating Plan. Schedules and consists of Long Distance trains are assumed to remain the same. The only service change is the replacement of the Carolinian train with Regional trips A3079 and A80 serving the same stations.

Run-through Long Distance trains utilize high level platform Tracks 22-25 at WUS. These trains have traps and can use the low level platforms of Tracks 26-28 if necessary. The Capitol Limited uses low level boarding Superliner equipment and therefore must use Tracks 26-28 at WUS. The Capitol Limited is not a through train and its consists must be turned on the run-through tracks to return to Ivy City Yard, the only such move of the day at WUS. This differs from existing Capitol Limited operations which use stub-end low level platforms in the station's upper level that do not exist in the future.

Freight

CSXT

There are 22 CSXT trains operating per day in the 2030+ simulation. These same freight operations also apply to the 2040 NEC FUTURE simulation. CSXT trips operate from points south of Washington, across the Long Bridge and through the Virginia Ave. Tunnel to Benning Yard. In the north, trips from Benning Yard rejoin the study area at Chesapeake Jct. from whence they can proceed north on the Camden Line to Baltimore, or south on the Camden Line to the Brunswick Line to West Virginia and points west. Within the study area, these 22 trips are split evenly between northbound and southbound operations; about half of each direction operates on the Camden Line to Baltimore and points north, and half operate on the Brunswick Line to points west. One round trip per day also operates north from Benning Yard onto the NEC; carrying coal to generating plants in Maryland. CSXT trains interact with MARC trips on the Camden and Brunswick Lines, and with VRE and Amtrak trips south of Jersey Interlocking on Long Bridge and the Fredericksburg Line.

NS

No Norfolk Southern trains are simulated to operate in the 2030+ case. NS has trackage rights over the Long Bridge and through WUS onto the Northeast Corridor, but no such freight operation is assumed in the timeline of the 2030+ Operating Plan. NS is the only freight railroad with trackage rights through WUS; therefore, no freight trips operate through the station in 2030.

2040 NEC FUTURE Operating Plan

A 2040 blended plan was derived from the NEC FUTURE Alternative 2 service levels and reflects a rationalization of service levels north to New Carrollton. The purpose of the Blended 2040 Operating Plan is to provide a level of service to reasonably stress potential new infrastructure in simulations, without causing cascading delays which deteriorate performance to the point where analysis of the results may produce no useful information about the quality of the proposed design. The starting point was the FRA NEC FUTURE service plan scenario. However, NEC FUTURE service volumes for combined MARC Penn Line and Metropolitan services likely exceed the anticipated market demand and, therefore, some rationalization of the service plan is reasonable. Additionally, some capacity shortfalls exist at several locations outside of the proposed improvements associated with Washington Terminal projects. These improvements include Washington Terminal Yard (Ivy City) Master Plan, VRE Midday Storage Facility and the Long Bridge Corridor. Therefore, a blended operating plan was developed in order to "stress test" TI improvements while not biasing the results by overloading rail links that feed the TI improvements.

Service Volumes in this 2040 NEC FUTURE blended plan are presented in Table 19 and Figure 27. The full operating plan is presented in Appendix C: 2040 NEC FUTURE Operating Plan.

**Table 19 – Revenue Train Volumes for
2040 NEC FUTURE Blended Operating Plan
(Per Direction)**

Operator	Service	Peak Hour	Full Day
Amtrak	HSR	4	57
	Intercity (LD excluded)	1.5	23
	Long Distance	0.5	6
TBD	Metropolitan	4	58
MARC	Penn	7*	57*
	Camden	4	30
	Brunswick	6	38
VRE	Fredericksburg	4*	23*
	Manassas	4*	23*

* Includes MARC/VRE run-through service

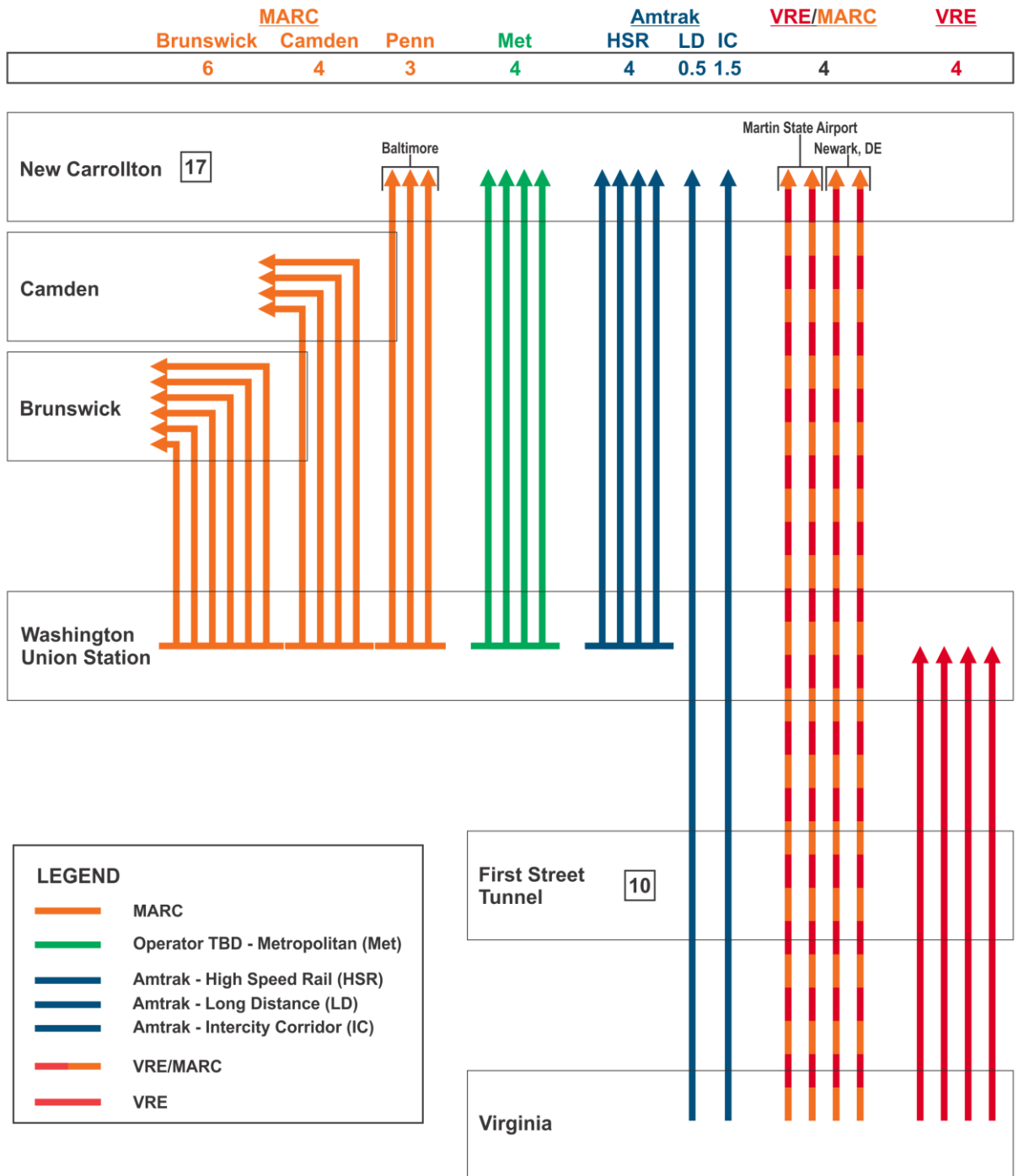


Figure 27: Northbound peak service volumes around Washington Union Station.

Differences from FRA NEC FUTURE Plan

As part of the process of creating blended operating plans for simulation, some alterations were made to the FRA NEC FUTURE operating plan provided to the TI Team, including:

- In the FRA plan, all Metropolitan trains run through WUS to terminate/originate at Alexandria. To meet WUS TI goals all of these trains were truncated to terminate/originate on the stub end tracks at WUS. To achieve this, the scheduled times presented in the FRA plan at WUS were used. Close arriving and departing Metropolitan trips were paired at WUS to create scheduled

terminal dwells close to, but no less than, 20 minutes. Of the 58 northbound trains in the FRA NEC FUTURE plan, 38 had their departure times adjusted to achieve 20 minute scheduled turn times. Eight of the 58 southbound arrivals also had their times adjusted; clockface headways were retained in both cases.

- In the FRA NEC FUTURE plan, there are 58 scheduled southbound Metropolitan trips at WUS but only 55 northbound trips. To create directional consistency, three Metropolitan trips were added northbound:
 - MET 686, WUS: 22:03
 - MET 578, WUS: 22:54
 - MET 688, WUS: 23:03
- In the FRA plan there were 57 scheduled southbound HSR trips at WUS, but only 56 scheduled northbound HSR trips at WUS. To create directional consistency, one HSR trip was added northbound departing WUS at 20:23 (EXP 1072).
- In the FRA plan, through-running Intercity trips have a scheduled dwell at WUS of 15 minutes. Run-through Intercity trips in 2040 are supposed to have a scheduled dwell of 24 minutes per project documentation. Southbound departure times and northbound arrival times at WUS were adjusted to achieve 24 minute scheduled dwells.
- In the FRA plan, trips A128 and A144 originate south of WUS. These trips are supposed to originate at WUS to achieve balanced bidirectional service. Therefore, A128 and A144 originate in WUS at their scheduled departure times for that location.
- In the FRA plan, the combined Intercity and Long Distance train volumes fall short of the collective FRA NEC FUTURE goal of two trips per direction per hour. The project plans call for 23 Intercity trips plus 6 Long Distance trips per direction running at a frequency of two per hour. Therefore, 5 Intercity trips were added per direction to bring volumes up to a sufficient level to meet these criteria and ensure a consistent clockface schedule. All added trips run through WUS, two to the Manassas Line and three to the Fredericksburg Line: A105, A115, A117, A133, A137, A122, A130, A132, A136, A150.
- The FRA NEC FUTURE plan did not include the Capitol Limited. The Capitol Limited eastbound and westbound trips were added to fit into Long Distance slots of the overall Intercity/Long Distance clockface pattern.
- In the FRA NEC FUTURE plan, the “Regional” (Commuter Rail – MARC Penn Line) southbound operating plan contains 82 arrivals at WUS. As noted above, this volume can be reduced to 57 daily one-way trips, consistent with market forecasts. A total of 25 southbound MARC trains were removed to reach 57 trains per day, including reducing peak hour service to 7 trains per hour. The same reduction was made to northbound MARC Penn Line service.
- Camden and Brunswick Line schedules were created based on service plan values for this project
- VRE schedules in the FRA NEC FUTURE plan match documents provided by that agency so no changes were made except that trips for MARC/VRE run through service were selected from closely timed trips from both plans in the applicable direction.

VRE

Under the 2040 NEC FUTURE Operating Plan, 23 daily round trips run on both the Fredericksburg and Manassas Lines. This includes quarter hourly peak direction service on each line and amounts to a total of 46 VRE roundtrips daily. One VRE trip per hour serves WUS in the off-peak from each line, with two trips per hour in the reverse peak. Ten daily peak direction trips, five from each line, layover midday in VRE’s Midday Storage Facility in the Washington Terminal area. The remaining VRE trains are turned back southbound on the platforms at WUS, or run-through onto MARC territory as part of the FRA NEC FUTURE Regional service.

In the morning and evening peak periods, four northbound VRE trips continue into MARC territory on the Penn line, and four southbound VRE trips originate in MARC territory on the Penn Line. This run-through service accounts for all VRE reverse peak trips, and four of the eight peak direction trips

servicing WUS. Of the four run-through trips per hour, two are Fredericksburg Line trips and two are Manassas Line trips.

VRE consists which operate only south of WUS, including trips which turn at WUS and trips which utilize the VRE midday layover yard, continue to use low level boarding equipment in 2040. However, run through VRE service with MARC must use high level boarding coaches equipped with traps to access high level NEC platforms on the Penn Line. Therefore, turning and yarding VRE trips are constrained to low level platform run-through Tracks 26-28 at WUS, while MARC/VRE run-through trips can use those tracks, or the high level platform run-through Tracks 22-25.

Low level VRE only service operates using consists of six to ten gallery cars pulled by a single diesel locomotive. VRE to MARC run-through service operates using consists of six to ten multi-level coaches equipped with traps pulled by a single diesel locomotive. No engine changes are required for VRE/MARC run-through trains.

MARC

Under the 2040 NEC FUTURE Operating Plans, MARC service on the Brunswick Line increases to 38 round trips per day. This represents full day bi-directional service and includes six trips per hour in the peak periods. One round trip per hour serves WUS from the Brunswick Line during the off-peak period. Brunswick Line trains are only paired with Brunswick Line trains at WUS, eliminating the occasional interlining of MARC trains as is practiced today. Some peak service Brunswick Line trains layover during the midday period in the WUS area. Most 2040 Brunswick Line trips are served by eight car trains with a single diesel locomotive. A few select Brunswick Line trains have been shortened to five to six cars to better fit into WUS or Wedge Yard.

MARC service on the Camden Line increases to 30 round trips per day in the 2040 NEC FUTURE Operating Plan. This represents full day bi-directional service and includes four trips per hour in the peak periods. Reverse peak service is provided at three trains per hour, while midday service is one roundtrip per hour. Camden Line trains are only paired with Camden Line trains at WUS. Some peak period service Camden Line trains layover midday in Washington, either on platforms at WUS or in the Wedge or Coach Yards. All Camden Line trains are six cars and one diesel locomotive in 2040.

MARC Penn Line service supports 57 round trips per day under the 2040 NEC FUTURE Operating Plan. The growth on the Penn Line is constrained by two factors. With the introduction of Metropolitan service, some of the commuter load is taken by faster Metropolitan trains, thus reducing demand for MARC trips on the Penn Line. Secondly, only two NEC tracks exist between “C” Interlocking and the planned Hanson Interlocking at New Carrollton Station, giving that NEC segment a maximum capacity of 17 trains per hour per direction. With the service levels proposed by the FRA for Metropolitan, High Speed Rail, Intercity and Long Distance service, only seven slots are left per direction for MARC Penn Line trains during the peak at New Carrollton. Therefore, MARC Penn Line service has been reduced to seven trains per hour from the ten per hour originally proposed by the FRA. Four Penn Line trips run per hour in the reverse peak, and two per hour in the off-peak. Some peak service Penn Line trains layover midday in the WUS area. All 2040 Penn Line trains include eight cars and one diesel locomotive.

Four southbound Penn Line trips per morning and evening peak hour do not terminate at WUS. These four trips use the run-through tracks at WUS to continue south as VRE service. Run-through service between MARC and VRE occurs northbound as well, with four trains per hour in both the morning and evening peak periods. These Penn Line trips do not originate at WUS but are instead a continuation of northbound VRE service through WUS. Therefore, during peak periods, 4/7 of Penn Line peak direction service is MARC/VRE run-through. In the reverse peak, 100% of Penn Line service is MARC/VRE run-through.

Due to MARC peak-focused scheduling, 27 MARC consists must layover midday in the WUS area. In 2040 MARC has access to the six tracks of their Wedge Yard. MARC also has access to 13 tracks in the re-constructed Coach Yard; five of these tracks are long enough to berth two trains. Therefore, MARC has 24 yard berths for midday yard storage, and must store the remaining three trainsets on the station platforms at WUS. Midday layover yard assignments for MARC trains are shown in Table 20.

Table 20 – MARC 2040 NEC FUTURE Midday Layover Yard Track Assignments

Available Yard Tracks	Length	Arriving Train	Yard Arrival	Layover	Train Length	Yard Departure	Departing Train
1 Storage: Berth 1	1655	M221	8:26	9:20	749	17:46	M266
2 Storage: Berth 1	1570	M223	8:33	7:43	409	16:16	M248
3 Storage: Berth 1	1655	M207	7:11	9:35	749	16:46	M254
Power House: Berth 1	1629	M003	6:41	10:24	749	17:05	M038
1 Repair	1300	M005	6:51	10:44	749	17:35	M040
2 Repair	1300	M007	7:21	10:24	749	17:45	M042
1 Mail	1300	M009	7:36	10:29	749	18:05	M044
2 Mail	1235	M117	7:52	9:11	579	17:03	M146
3E: Berth 1	1460	M123	8:37	9:41	579	18:18	M154
4E	1125	M011	7:51	10:24	749	18:15	M046
5E	1125	M013	8:21	10:14	749	18:35	M050
50	1000	M015	8:36	10:09	749	18:45	M052
51	1130	M017	8:51	10:14	749	19:05	M056
1 Storage: Berth 2	1655	M225	8:47	9:29	749	18:16	M208
2 Storage: Berth 2	1570	M229	9:03	9:43	749	18:46	M214
3 Storage: Berth 2	1655	M211	7:33	9:43	749	17:16	M260
Power House: Berth 2	1629	M253	9:56	8:58	749	18:54	M218
3E: Berth 2	1460	M249	9:26	9:13	749	18:39	M210
Wedge 1	834	M127	9:07	8:28	579	17:35	M152
Wedge 2	579	M209	7:26	8:28	579	15:54	M244
Wedge 3	409	M213	7:41	12:05	409	19:46	M224
Wedge 4	494	M235	10:11	6:58	494	17:09	M258
Wedge 5	664	M217	8:03	9:36	664	17:39	M264
Wedge 6	834	M027	9:53	6:22	749	16:15	M034
WUS Platforms	Var.	M019	8:59	6:56	749	15:55	M030
WUS Platforms	Var.	M025	9:29	6:36	749	16:05	M032
WUS Platforms	Var.	M029	9:49	7:16	749	17:05	M036

In the 2040 NEC FUTURE Operating Plan, Brunswick Line trains generally use consists of eight single level or multi-level coaches pulled by a diesel locomotive. Camden Line trains generally use the same coaches in six car consists pulled by a single diesel locomotive. The specific breakdown of consist lengths is shown in Appendix C: 2040 NEC FUTURE Operating Plan. MARC Penn Line trains are all powered by a single diesel locomotive. Penn Line only trains have eight multi-level coaches, while VRE/MARC run-through service have consists of six to ten multi-level coaches equipped with trap doors.

MARC trains generally utilize WUS Tracks 1-8 in the 2040 NEC FUTURE plan. Tracks 9-12 are reserved for HSR trains. MARC Penn Line trips have a track assignment preference for Tracks 6-8, while Brunswick and Camden Line trains have a preference for Tracks 1-3. Tracks 1 and 2 are used exclusively by MARC while all other MARC stub-end tracks are shared with Intercity and Metropolitan trains.

Amtrak

High Speed Rail

In the 2040 NEC FUTURE Operating Plan, 57 HSR round trips operate daily using equipment similar to today's Acela on clockface headways. This includes four trips per hour in both the morning and evening peak periods in each direction, and three trains per hour in each direction in the off-peak. Most HSR

trains make revenue to revenue turns on the WUS platforms. The plan requires 13 daily moves to or from Ivy City Yard to facilitate the delivery of early morning service or retain clockface headways through peak to off-peak service shifts. This includes both overnight and midday layovers. HSR trains have preferential use of Tracks 9-12 at WUS, and at high volume times can utilize Tracks 3-8. Amtrak wishes to keep HSR service centered around the new station concourse due to premium nature of the service.

Intercity Corridor Service

The 2040 NEC FUTURE Operating Plan includes Intercity Corridor service, which replaces some of the local corridor service provided by Regionals. Specifically, Regional service south of WUS to points in Virginia and North Carolina is served by Intercity trains. Intercity Corridor trips run at a consistent clockface headway all day, with no peak period service increase. Two slots per hour per direction exist for Intercity Corridor trips in each direction at WUS. One Intercity slot every town hours is left open for a Long Distance trip to fill. The plan includes 23 Intercity Corridor trips per direction.

Of the 23 daily Intercity Corridor trips, 18 run through WUS in each direction, originating and terminating at points south of WUS. They serve terminal destinations such as Newport News, VA; Norfolk, VA; Roanoke, VA; and Charlotte, NC. Five daily northbound Intercity trips originate in Washington and five daily southbound trips terminate there. Northbound originations depart early morning and southbound terminations arrive late at night with the trains serviced and stored overnight at Ivy City.

Most Intercity Corridor consists are 12 single level coaches pulled by a single electric locomotive north of WUS and two diesel locomotives south of WUS. Run-through Intercity Corridor trains utilize the high level run-through platforms on Tracks 22-25 at WUS but given that their coaches are equipped with traps, can use low level platform Tracks 26-28 if required. Run-through Intercity trips must undergo an engine change at Washington to switch from diesel propulsion south of WUS to electric propulsion on the NEC and vice versa. Originating and terminating Intercity Corridor trips use the stub-end tracks at WUS, commonly Tracks 6-8 but they are not constrained to these.

Long Distance

Six Long Distance trains serve WUS under 2040 NEC FUTURE operations, including the Crescent, Cardinal, Palmetto, Silver Star, Silver Meteor and Capitol Limited. All except for the Capitol Limited operate through WUS connecting points on the NEC to points south of Washington. The Capitol Limited operates over the Brunswick Line and terminates and originates at WUS. As specified in the FRA NEC FUTURE operating plan, one Long Distance train operates per direction every two hours at WUS. These trips operate in an open slot in the Intercity Corridor service clockface pattern. Therefore, Long Distance trains operate at a service volume of 0.5 trips per hour, each scheduled at a headway of two hours from the previous. It is not yet clear if fitting Long Distance trips into WUS on the schedules desired is possible given the significant length and complexity of Long Distance routes.

Long Distance consists range from nine to 12 coaches pulled by a single electric locomotive north of WUS and two diesel locomotives south of WUS. Long Distance trains utilize the high level run-through platforms on Tracks 22-25 at WUS but given that their coaches are equipped with traps, can use low level platform Tracks 26-28 if required. Long Distance trips must undergo an engine change at Washington to switch from diesel propulsion south of WUS to electric propulsion on the NEC and vice versa.

Metropolitan

Metropolitan trains provide high speed regional level service in the 2040 NEC FUTURE Operating Plan. They provide service to major and minor hubs along the NEC, while skipping local stations which are served only by commuter trips. Metropolitan trains make use of 12 car EMU consists. The operator of Metropolitan trains in 2040 has not yet been determined.

Under the 2040 operations simulated as part of the WUS TI work, all Metropolitan trains originate and terminate at WUS. This differs from the original FRA NEC FUTURE plan, which assumed that all Metropolitan trains would continue through WUS on the run-through tracks to serve L'Enfant and Crystal City

Stations in Virginia before terminating at Alexandria. The FRA recommended use of the modified terminal-focused plan for the Metropolitan Service to test the greatest stress on TI platform capacity, as well as “K” Interlocking throat capacity for those Metropolitan consists laying over in yards north of WUS.

The FRA has proposed 58 Metropolitan trains daily per direction. This includes four trips per hour in the peak and three trips per hour in the off-peak, operating on clockface headways every hour. Scheduled arrival and departure times at Washington were adjusted from the FRA’s plans for 38 northbound trips, and eight southbound trips. These changes were made in conjunction with truncating Metropolitan operations at WUS in order to meet the 20 minute minimum scheduled turn time for Metropolitan trains. Clockface operations were retained.

To support early morning service northbound from WUS, eight Metropolitan trainsets are stored overnight in the Coach yard. They utilize the same Coach Yard tracks used by MARC trains for midday layovers. This frees up Ivy City Yard for use exclusively by Amtrak. At WUS, Metropolitan trains utilize primarily Track 4 and 5 in 2040 but have the option to use any of the WUS stub-end tracks, including Tracks 9-12 when it does not interfere with berthing High Speed Rail trains.

Freight

CSXT

There are no assumed changes in CSXT 2040 operations versus existing and 2030+ CSXT operations within the WUS TI simulation limits.

NS

One round trip NS train is simulated to operate through WUS in 2040. NS has trackage rights through WUS and this trip utilizes them to operate from the Manassas Line over the Long Bridge and through the run-through tracks of Washington Union Station and north onto the Northeast Corridor and return. This represents the only freight train operation through WUS under 2040 NEC FUTURE operations. Two additional NS round trips are simulated to operate over Long Bridge to Benning Yard via the Virginia Ave. Tunnel daily. All these trips operate in the overnight hours and do not interact with any passenger trains for the length of their route within the simulation limits

Scheduled and Minimum Required Dwell Times

Minimum scheduled dwell times at WUS are based on the time required for the service on each type of train to be completed after arrival and before departure. The main tasks to be completed are passenger alighting, stocking or stripping of food service cars (where applicable), baggage unloading and loading (where applicable), engine changes, terminal departure brake tests, and passenger boarding. For trains heading south from the station, Positive Train Control initialization for travel over CSX (and, in some cases, NS territory) is required at the station as well. Because these systems are not presently in service, this time is not known. A conservative assumption for this time is 10 minutes.

All Amtrak originating and terminating trains at WUS require stocking or stripping of food service cars. At present, all trains for which food service cars must be stocked require at least 90 minutes on a station track prior to departing for a new trip. All trains for which food service cars must be stripped, require at least 60 minutes on a station track after trip completion. These are contractual provisions in Amtrak’s agreement with its Food & Beverage Service contractor. Future operations assume that these times may be significantly reduced, as the TI configuration of the station provides for more efficient movement of contractors stocking, restocking and stripping trains.

Although Amtrak through-running trains to and from Virginia and points south do not have stocking or stripping requirements, dwell times make allowance for “topping off” (restocking) of food service cars while at the station.

Amtrak maintains a set of minimum scheduled dwell times at WUS for each of the types of service it operates. These minimum scheduled dwell times are further subdivided by type of operation, such as a

revenue turn in the station versus a non-revenue movement to a yard. The minimum dwell time standards, which reflect the input of the Amtrak Operations Department, are shown in Table 21.

MARC and VRE minimum scheduled times shown in Table 21 are based on current scheduled operations. Due to the nature of commuter service, the dwell times are relatively short compared to Amtrak. No VRE or MARC trains require engine changes at the station, and no servicing is done on station tracks.

Minimum simulated dwell times are included in Table 21. These dwell times are an input into the simulation and determine how long a late arriving train is required to stay on the platform before departure. The minimum simulated dwell times are set at 80% of the minimum scheduled dwell time. This provides each train with a schedule recovery potential of 20% of the minimum scheduled dwell.

Table 21 dwell times cover all operating plans modeled. Values not in parentheses are the existing dwell times used in the Baseline Simulation. These dwell times are retained for most services under 2030+ operations. This represents a conservative estimate to see if the new station can handle operations with limited to no dwell time reduction. For 2030+ operations the only difference from existing is for HSR platform turns. These are reduced from 120 minutes to 90 minutes scheduled. Dwell times for 2040 NEC FUTURE operations are assumed to be much lower due to the drastic increase in service volume. Values for 2040 NEC FUTURE dwells are given in parentheses in Table 21.

**Table 21 – Dwell Times by Type of Operation
Baseline & 2030+ (2040 Values in Parentheses)**

Type of Service and Operation	Minimum Scheduled Dwell Time - minutes	Minimum Simulated Dwell Time - minutes	Comments
High Speed Rail Southbound Termination	60 (40)	48 (32)	Current values based on Amtrak contract specification for stripping food service car.
High Speed Rail Northbound Origination	90 (40)	72 (32)	Current values based on Amtrak contract specification for stocking food service car from commissary.
High Speed Rail Midday Turn on Platform	120* (40)	96* (32)	Present dwell times are 130 minutes. However, with schedule changes, Minimum Dwell Time for this service can be as short as 120 minutes.
Intercity (Regional in 2016): Southbound Termination	60 (30)	48 (24)	Based on Amtrak contract specification for stripping food service car.
Intercity (Regional in 2016): Northbound Origination	90 (30)	72 (24)	Based on Amtrak contract specification for stocking food service car from commissary.
Intercity (Regional in 2016): Midday Platform Turn	N.A.(30)	N.A. (24)	
Intercity (Regional in 2016): Through without baggage, requires engine change	24 (22)	19 (18)	Many Conductors will not board dark train.
Metropolitan: Southbound Termination	N.A.(20)	N.A. (16)	
Metropolitan: Northbound Origination	N.A.(20)	N.A. (16)	
Metropolitan: Midday Platform Turn	N.A.(20)	N.A. (16)	
Long Distance: Southbound through with baggage, requires engine change	30 (24)	24 (20)	Baggage work requires minimum of 15 minutes; many Conductors will not board dark train. In addition, Conductors must separate long trips from short trips and also separate sleeping car passengers.

**Table 21 – Dwell Times by Type of Operation
Baseline & 2030+ (2040 Values in Parentheses)**

Type of Service and Operation	Minimum Scheduled Dwell Time - minutes	Minimum Simulated Dwell Time - minutes	Comments
Long Distance: Northbound through with baggage, requires engine change	25 (24)	20 (20)	Baggage work requires minimum of 15 minutes; many Conductors will not board dark train.
Long Distance: Southbound Termination	60 (40)	48 (32)	Capitol Limited, existing based on Amtrak contract specification for stripping food service car.
Long Distance: Northbound Origination	90 (40)	72 (32)	Capitol Limited, existing based on Amtrak contract specification for stocking food service car from commissary.
MARC: Revenue to Revenue Turn	15 (15)	12 (12)	Based on 2030+ schedule for 641 -> 642 turn at station
MARC: Revenue to Non-Revenue Turn	12 (12)	10 (10)	Based on 2030+ schedule for 431 -> 431X turn at station
MARC/VRE: Revenue to Revenue Through Running	NA (9)	NA (7)	
MARC: Non-Revenue to Revenue Turn	10 (10)	8 (8)	Based on 2030+ schedule for 891X -> 891 turn at station
VRE: Discharge only, same-direction move to yard	6 (6)	5 (5)	VRE presently schedules 6 minutes for passenger drop-off. This increases to 10 minutes in 2040 but is deemed excessive for this type of operation.
VRE: Pick up only, same-direction move from yard	10 (12)	8 (10)	Based on 2040 schedule for VRE Train 529 Future time increases are due to PTC considerations.
VRE: Station Turn	10 (15)	8 (12)	Existing based on 2040 schedule for 520 -> 511 turn at station. Future time increases are due to PTC considerations and consistency with MARC scheduled/minimum simulated turn times. VRE is planning 20 minute scheduled turn times in 2040 but this is deemed excessive for this type of operation.

* Reduced to 90 minutes and 72 minutes respectfully under 2030+ operations.

Results

Existing Baseline Simulation Results

Random

Existing simulation results provide a baseline for comparison to future infrastructure and operations. The metrics calculated for each simulation scenario are: Average Speed, Delay per 100 miles, Conflicts per 100 miles, Station Track Utilization and On-Time Performance (OTP).

Table 22 – Existing Baseline Average Speed by Service

Service	Speed (mph)
Acela	45.2
Regional	32.6
Long Distance	31.9
Amtrak (combined)	34.7
VRE	27.9
MARC	32.3
Passenger (combined)	32.3
Freight	29.3
All Trains	31.9

Table 23 – Existing Baseline Delay per 100 Miles by Service

Service	Delay/100 miles (hh:mm:ss)
Acela	0:02:08
Regional	0:23:05
Long Distance	0:20:27
Amtrak (combined)	0:18:41
VRE	0:04:04
MARC	0:22:13
Passenger (combined)	0:15:55
Freight	0:20:05
All Trains	0:16:29

In the Existing Baseline scenario, there are 89.1 gross conflicts per 100 miles of operation. This approximately one conflict per mile is a result of train-to-train conflicts between both passenger and freight trips. Average speeds range from a high of 45 mph for Acela trips to a low of 28 mph for VRE trips, and are presented in Table 22.

Delay per 100 miles, shown in Table 23, is highest for Regional trips, at 23 minutes, and lowest for Acela trips, at just over two minutes. For the full day, existing operations have a platform utilization of 39.8%, with the most used track being Track 11 at 89.2%. In the peak hour for station occupancy, which is defined as 14:50 to 15:50 under Existing Operations, the station is at 64% occupancy, with several tracks at 100% occupancy. Track 15 shows over 100% occupancy, indicating that MARC trains have double berthed on the track during the peak hour as shown in Table 24. The reported utilization of Tracks 22 and 29 is by diesel and electric engines used in through train engine changes and does not represent any revenue train usage of these tracks.

Table 25 presents the OTP for each passenger service in the Existing Baseline and reflects the randomization inputs described earlier. Most services perform at over 90%, with only the Long Distance

Service and the MARC Camden Line falling below that number. All NEC services operate at over 90% as would be expected, while the Brunswick Line is simulated at 100% OTP. It should be noted that over such a small area OTP may not match real world simulated values. However, OTP is a valuable statistic of comparison between these Existing Baseline results and those of future infrastructure and operational scenarios.

Table 24 – Existing Baseline Station Platform Utilization at WUS

Track	Full Day	Peak Hour
7	8.4%	66.7%
8	26.0%	14.9%
9	31.8%	66.7%
10	87.9%	100.0%
11	89.2%	42.3%
12	85.0%	100.0%
13	60.7%	100.0%
14	48.6%	100.0%
15	42.1%	172.3%
16	40.3%	87.0%
17	65.4%	28.7%
18	37.5%	0.0%
19	54.2%	100.0%
20	48.5%	100.0%
22	42.8%	97.9%
23	16.1%	29.6%
24	14.6%	25.0%
25	19.8%	38.1%
26	24.5%	91.8%
27	4.6%	0.0%
28	8.1%	11.1%
29	60.1%	100.0%
30	0.0%	0.0%
Full Station	39.8%	64.0%

Table 25 –OTP

Service	Existing Baseline
Amtrak Acela	90.6%
Amtrak Regional (IC)	90.0%
Amtrak Long Distance	65.6%
Metropolitan	NA
MARC Brunswick	100.0%
MARC Camden	85.0%
MARC Penn	98.1%
VRE	93.3%
Total	89.9%

Discussion

Existing Simulation results are useful as a baseline for comparison to the results of the future operational and infrastructure scenarios. Because of the limited geographic extent of the model, OTP is calculated at WUS upon arrival, and near the simulation end points on departure: Alexandria, MP 131, Riverdale and Silver Spring. Because these are not recording locations today, and because the simulated area is not large enough to cause lateness sufficient to meet OTP lateness thresholds, simulated OTP should only be compared between scenarios and cannot be compared to real world values. Other statistics, including speed and platform occupancy, match expected values for current day operations. Acelas run fastest and with the least delay, consistent with existing dispatching. The simulation results show that the run-through tracks are more lightly used than the stub-end tracks over a 24-hour period.

Time-Distance (“String”) Charts

Time-distance (“string”) charts were generated for the 24 hour simulation period, covering between CP Virginia (south of the First Street Tunnel) and the northern limits of simulation on the NEC. The strings (plot lines) are color-coded by class of train service as shown in Figure 34.

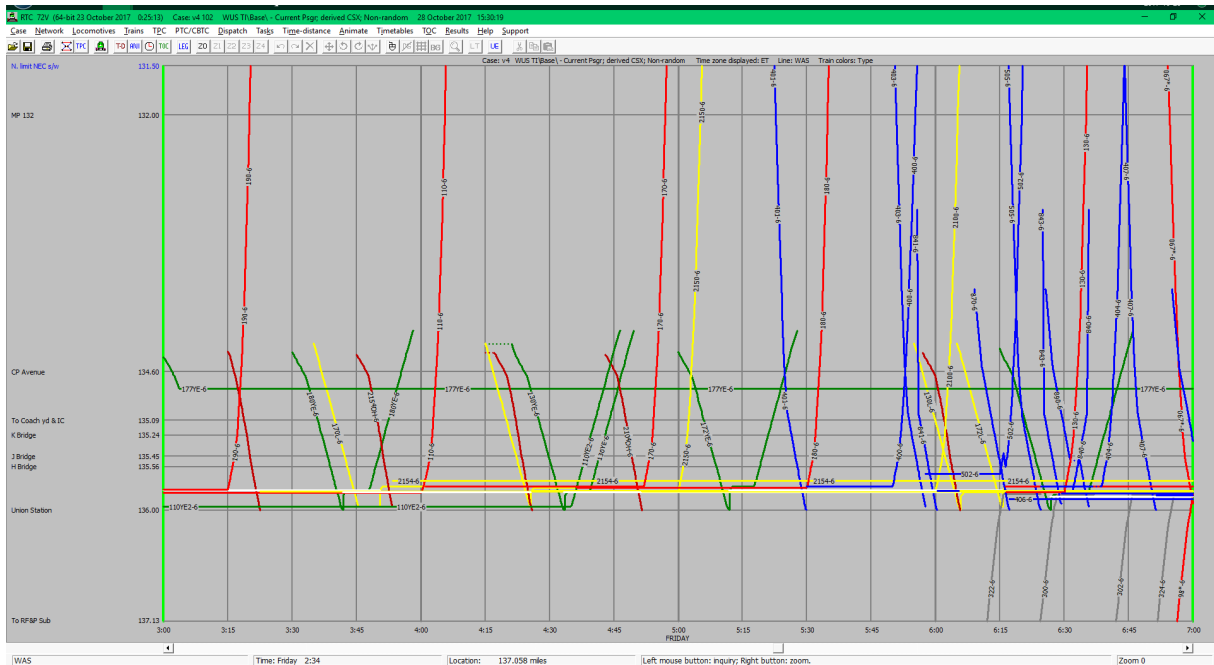


Figure 28: Existing Baseline String Chart 3:00-7:00

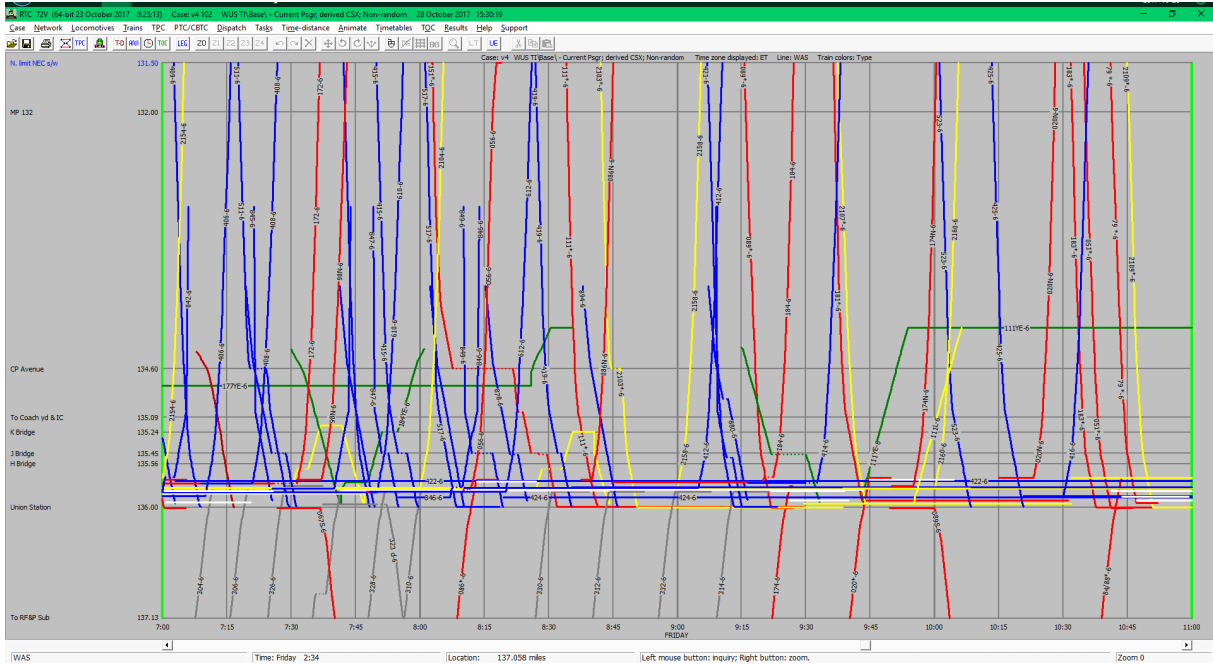


Figure 29: Existing Baseline String Chart 7:00-11:00

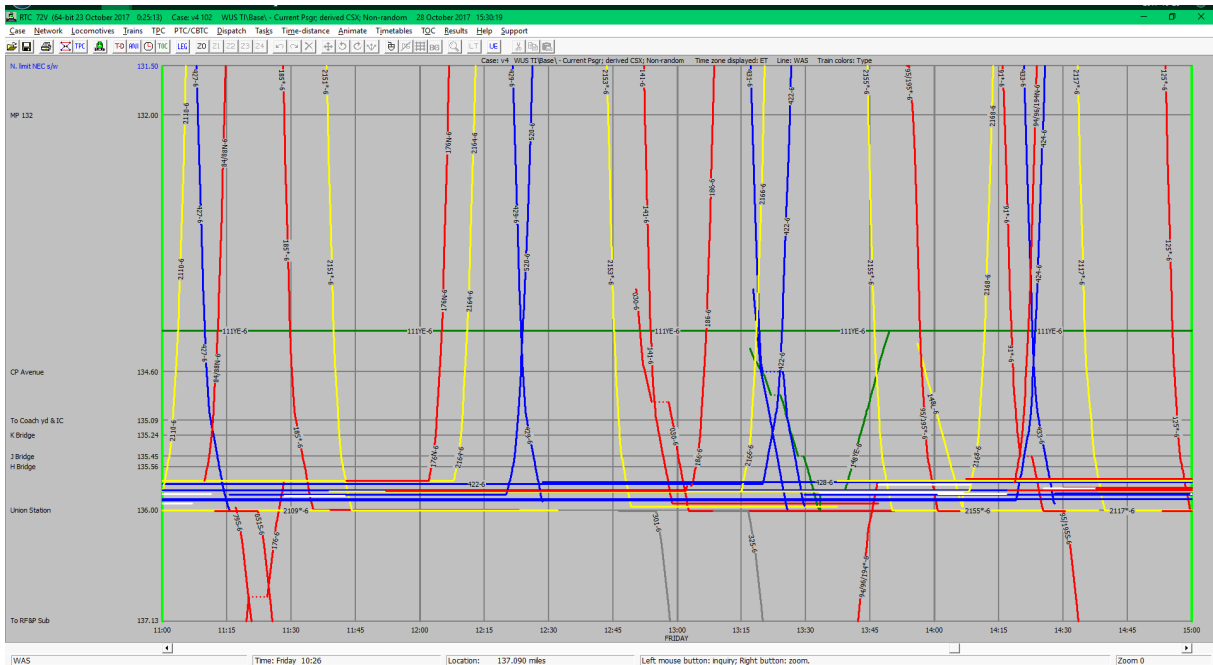


Figure 30: Existing Baseline String Chart 11:00-15:00

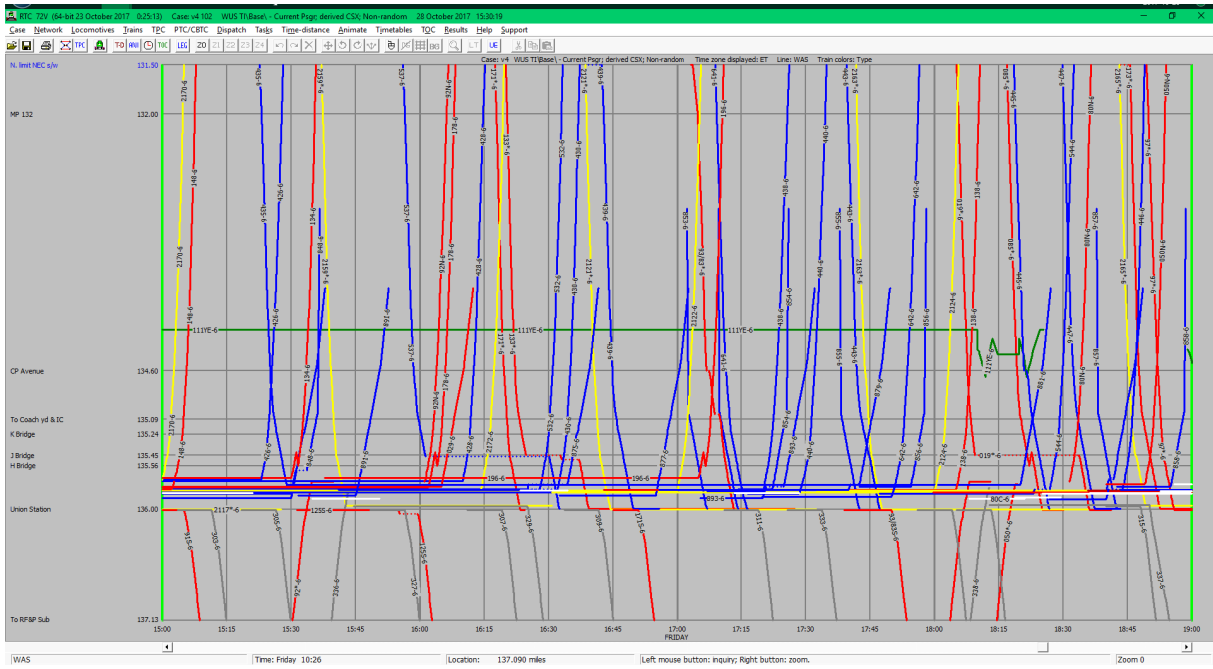


Figure 31: Existing Baseline String Chart 15:00-19:00

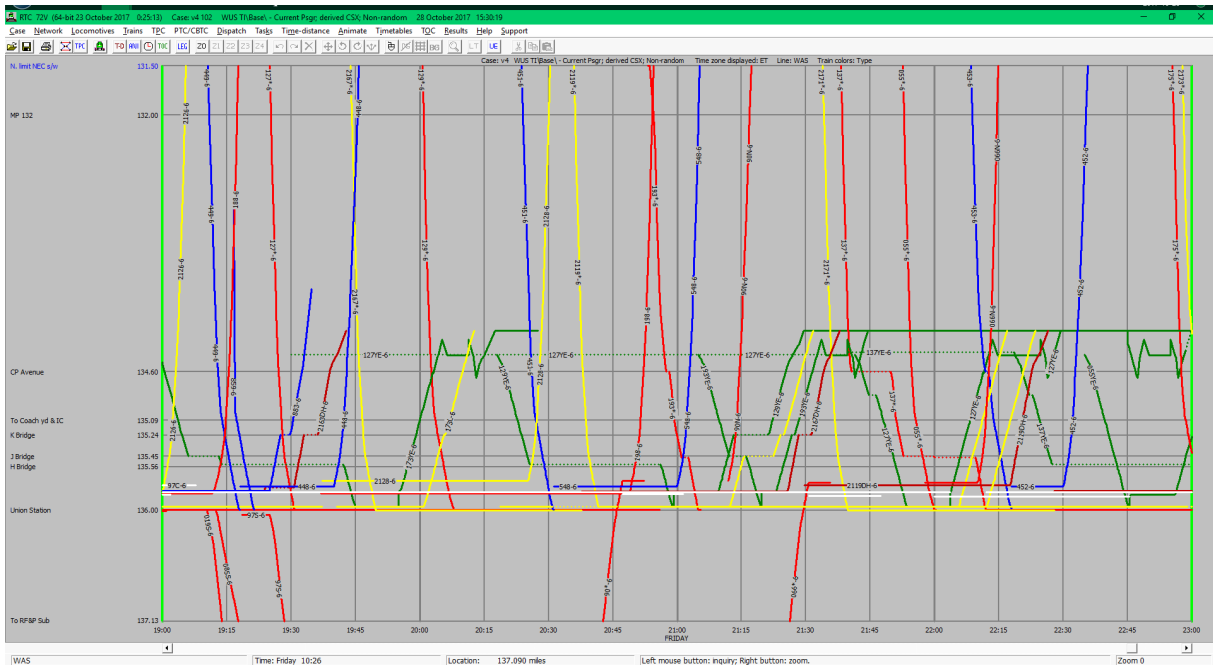


Figure 32: Existing Baseline String Chart 19:00-23:00

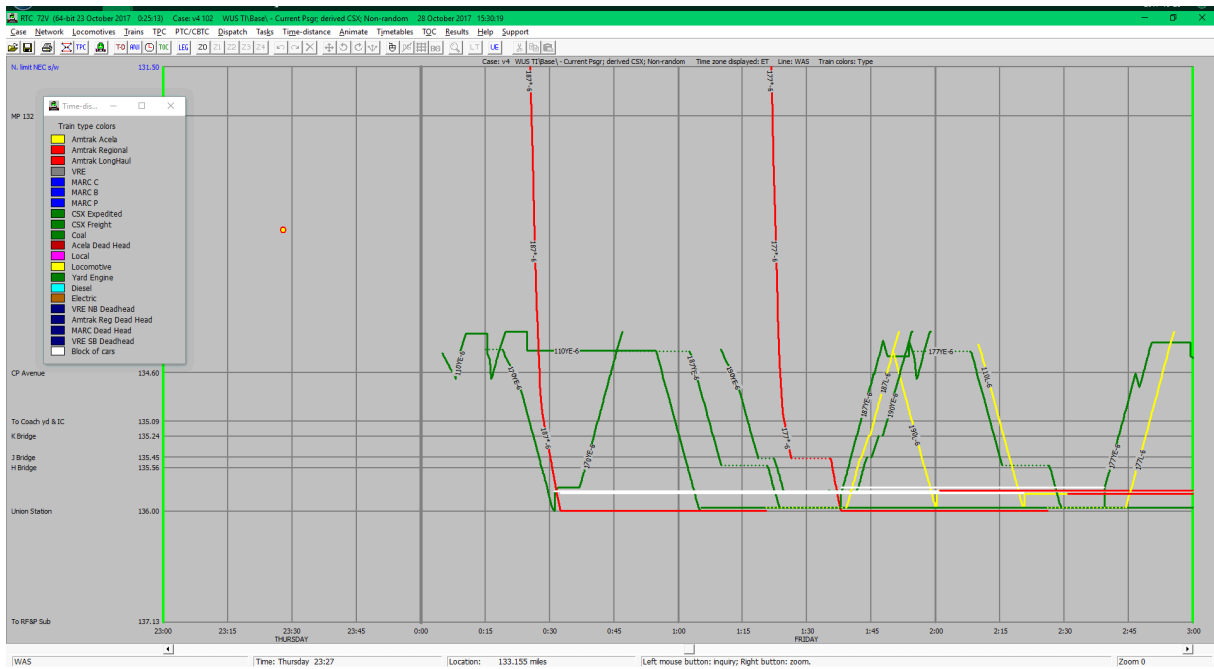


Figure 33: Existing Baseline String Chart 23:00-3:00

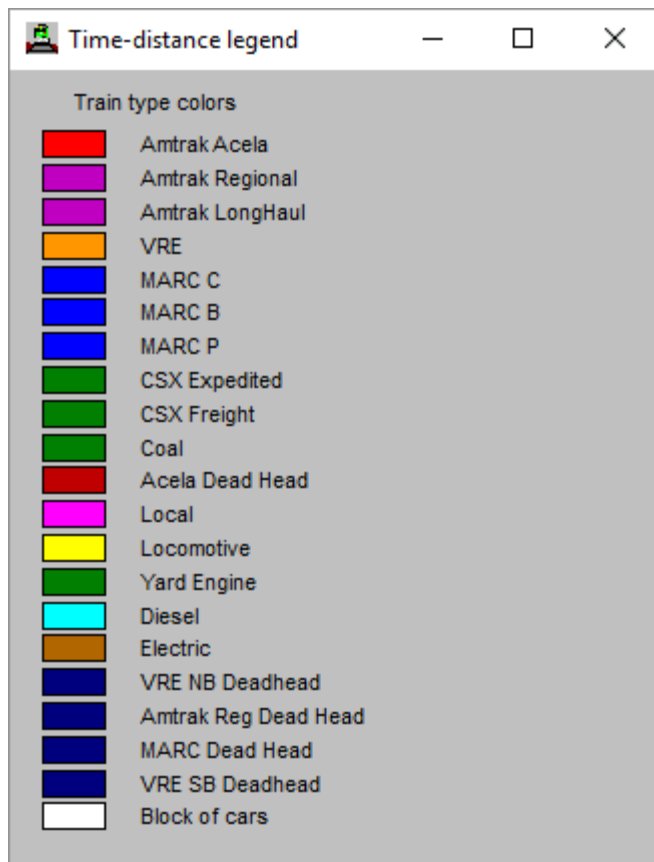


Figure 34: Key for Existing Baseline String and Occupancy Charts

Occupancy Charts

Simulated occupancy charts of WUS cover the upper and lower levels of the station. Those tracks which can be used for double berthing are split into a north end and a south end row, shown with

separate occupancy. In cases where a single train occupies both north and south berths of a given track, its occupancy is reported in only one row of the chart.

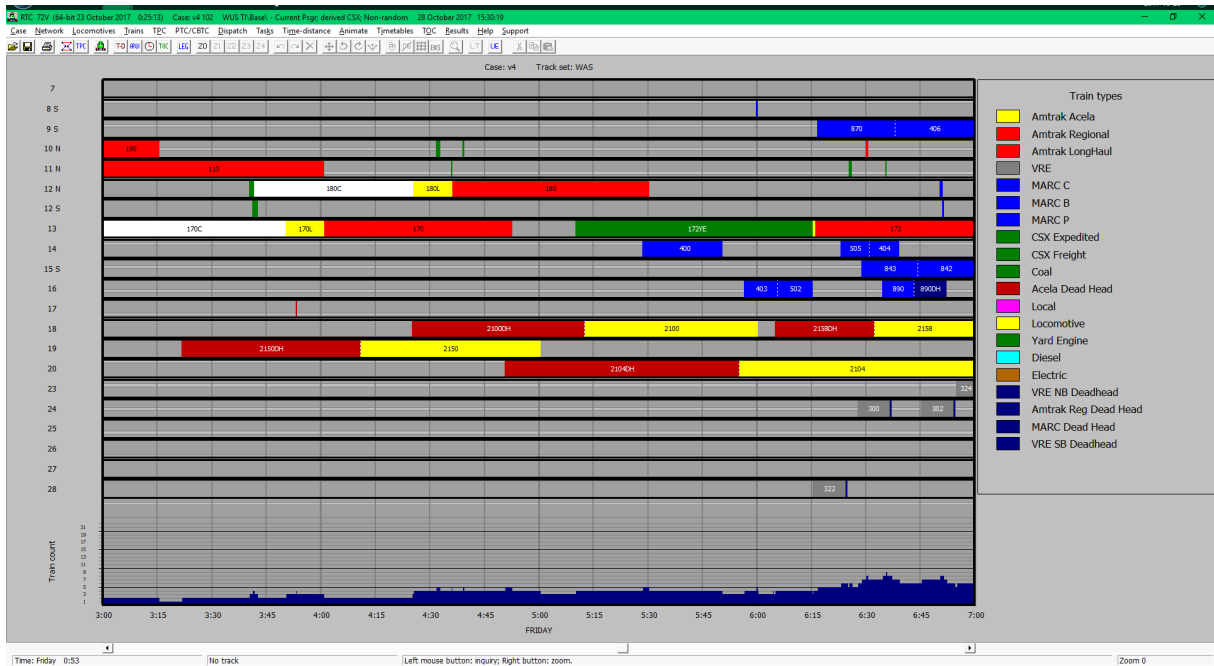


Figure 35: Existing Baseline Occupancy Chart, Run-Through Tracks: 3:00-7:00

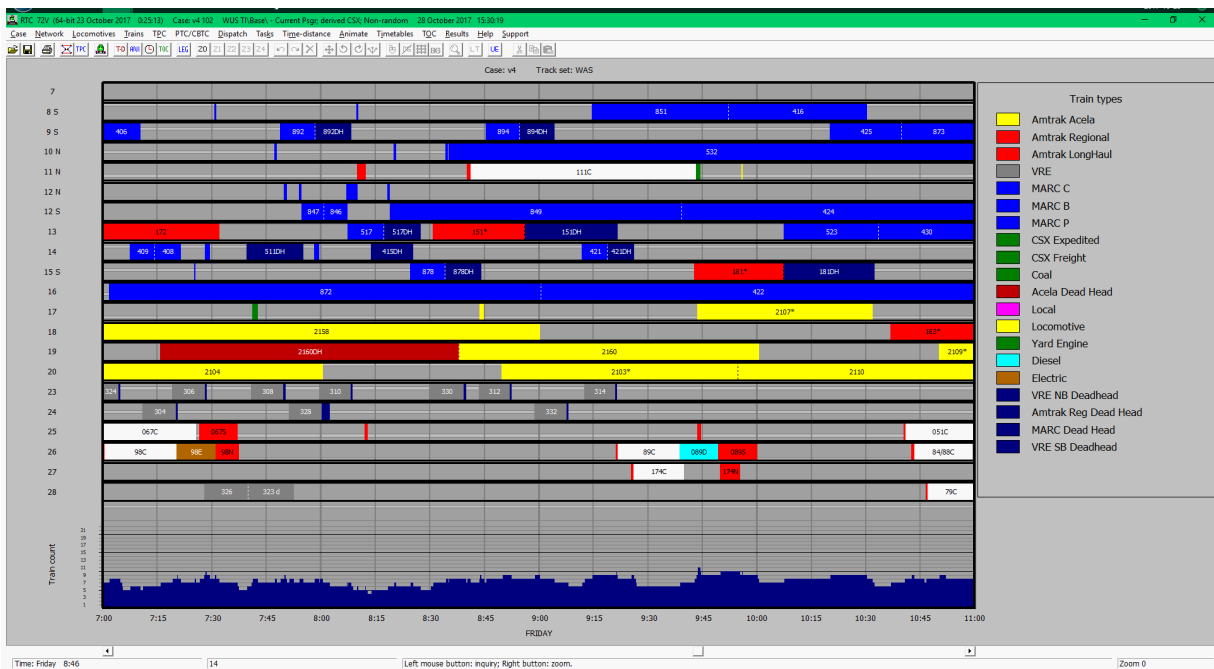


Figure 36: Existing Baseline Occupancy Chart, Run-Through Tracks: 7:00-11:00

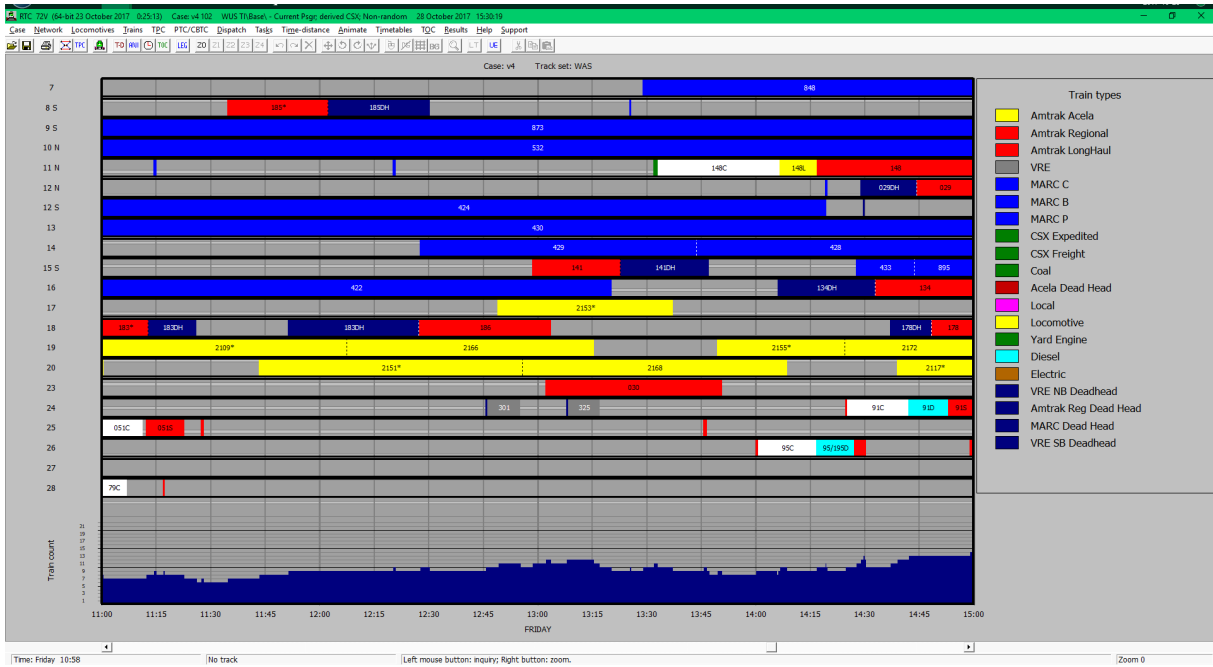


Figure 37: Existing Baseline Occupancy Chart, Run-Through Tracks: 11:00-15:00

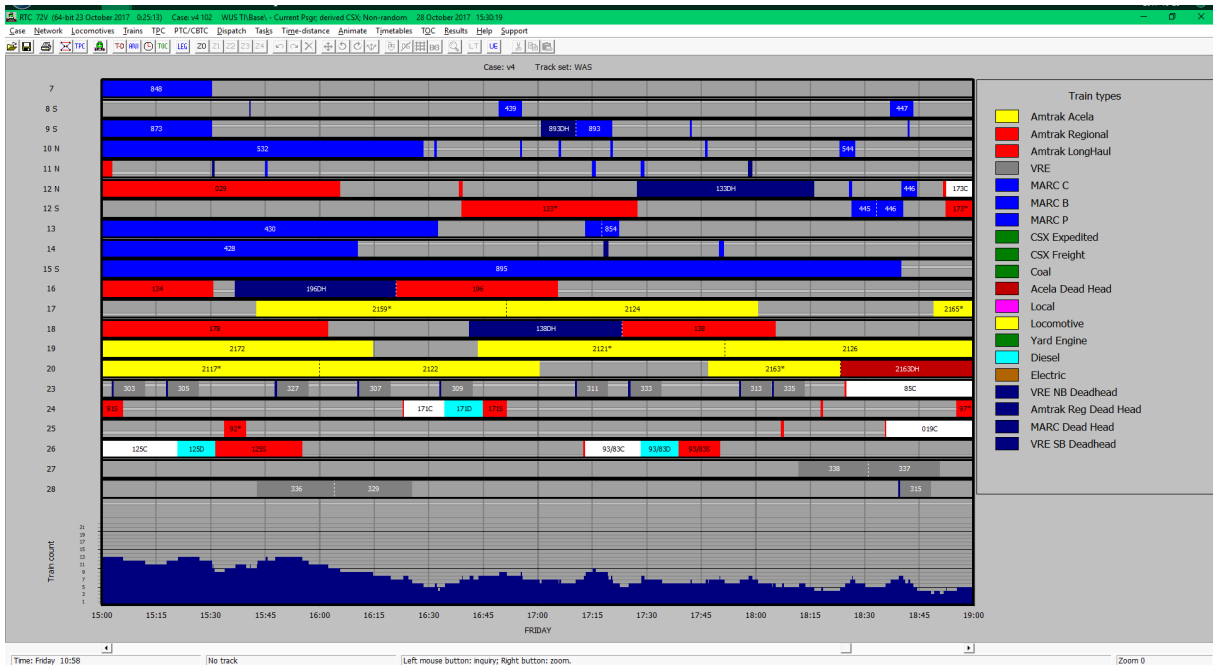


Figure 38: Existing Baseline Occupancy Chart, Run-Through Tracks: 15:00-19:00

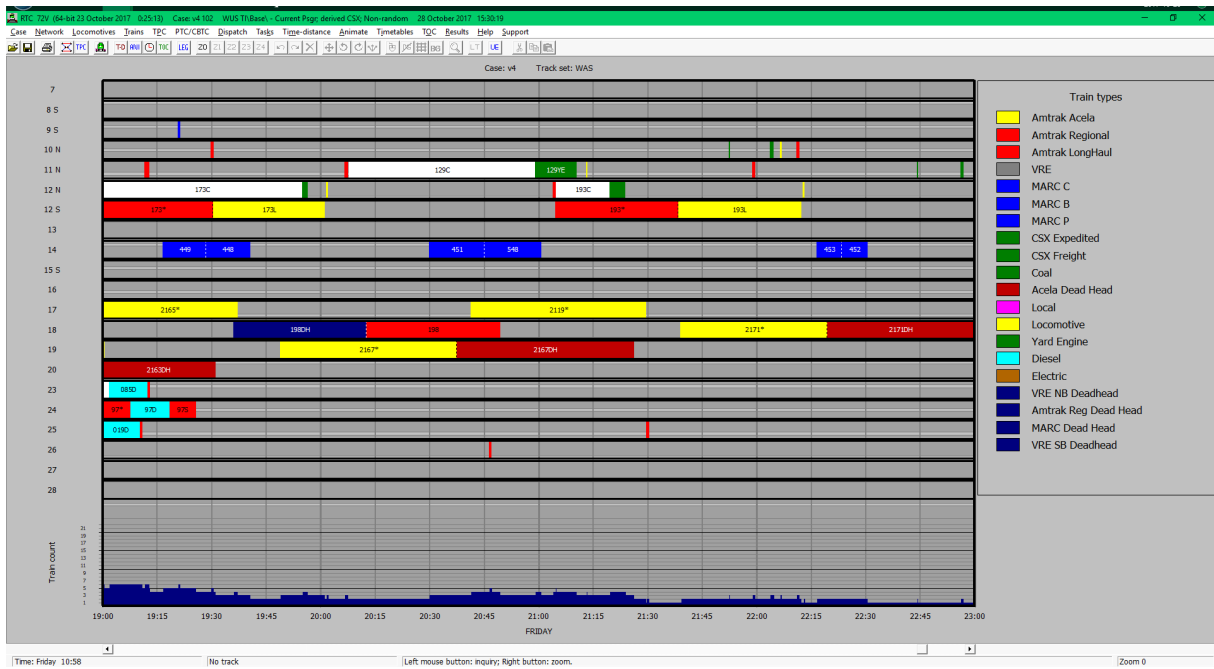


Figure 39: Existing Baseline Occupancy Chart, Run-Through Tracks: 19:00-23:00

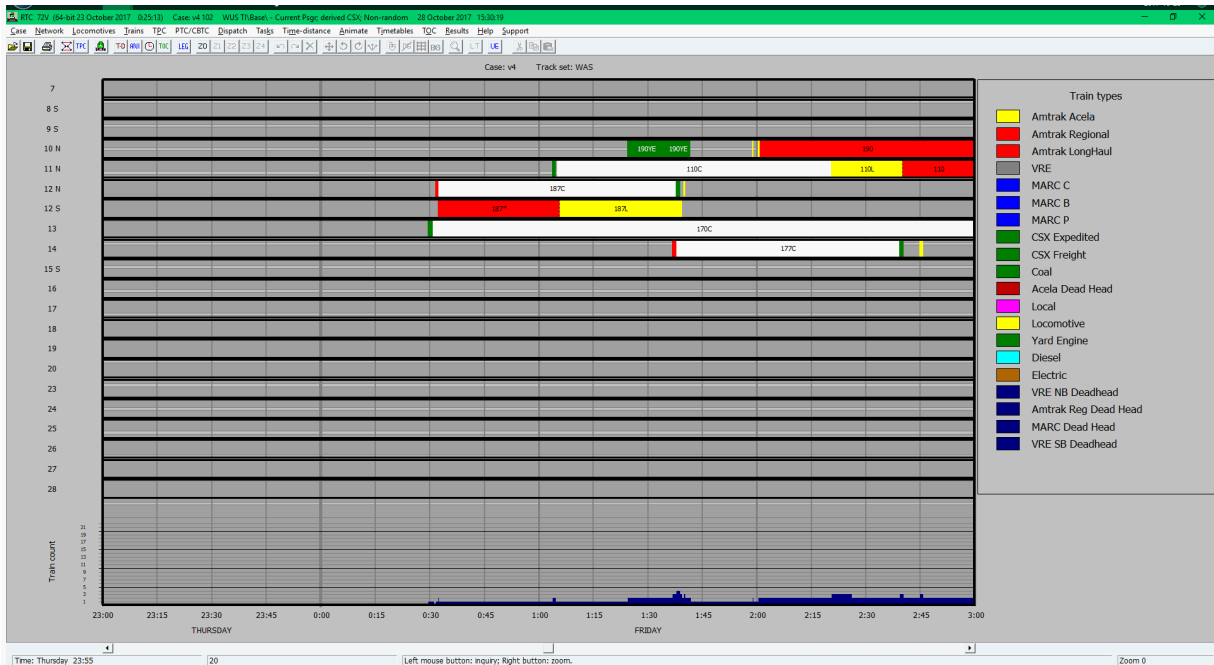


Figure 40: Existing Baseline Occupancy Chart, Run-Through Tracks: 23:00-3:00

2030+ Plan Simulation Results

Random

Results from simulation of the 2030+ operations are useful to compare back to the Existing Baseline and to the 2040 NEC FUTURE operations which utilize the same infrastructure.

Table 26 – Average Speed (mph) by Service

	Existing Baseline	2030+
Acela	45.2	33.4
Regional.	32.6	33.9
Long Distance	31.9	32.0
Amtrak (combined)	34.7	33.5
VRE	27.9	26.2
MARC	32.3	26.0
Passenger (combined)	32.3	29.4
Freight	29.3	24.3
All Trains	31.9	28.7

Table 27 – Stopped Delay per 100 Miles by Service

	Existing Baseline	2030+
Acela	0:02:08	0:43:15
Regional	0:23:05	0:20:56
Long Distance	0:20:27	0:27:22
Amtrak (combined)	0:18:41	0:28:33
VRE	0:04:04	0:11:53
MARC	0:22:13	0:46:11
Passenger (combined)	0:15:55	0:26:09
Freight	0:20:05	0:49:34
All Trains	0:16:29	0:29:26

There are 83.9 gross conflicts per 100 miles traveled in the 2030 simulation, a modest reduction from 89.1 gross conflicts per 100 miles traveled in the baseline. Under 2030+ operations, Long Distance and Regional trips have average speeds similar to those in the Existing Baseline, as seen in Table 26. Acela trips have much lower average speeds; down to 33 mph in 2030+, from 45 mph in the Existing Baseline. Both VRE and MARC are slower in 2030+ than today, MARC more significantly than VRE. In Table 27, delay increases in 2030+ over the Existing Baseline for all services. The highest increase is to Acela trips which experience nearly 45 minutes of delay in 2030+. VRE and MARC delay per distance traveled double.

Simulated 2030+ platform utilization at WUS is presented in Table 28. With fewer tracks of different dimensions, a side by side comparison of platform utilization is not possible between Existing Baseline and 2030+ results. Platform usage in 2030+ is spread fairly evenly throughout the day, with the highest usage tracks being those centered around the station concourse. Over the course of the day the run-through tracks see lower usage, but these results do not account for time that operations on run-through tracks are disrupted due to engine changes. OTP under 2030+ operations is presented in Table 29. All Amtrak services have increased OTP in 2030+ with Acela at 96.7% and Long Distance over 86%. MARC Brunswick and Penn Lines have decreased OTP in 2030+ as compared to the Existing Baseline, while Camden Line OTP improves. VRE OTP remains essentially constant.

Table 28 – Station Platform Utilization at WUS

Track	2030+	
	Full Day	Peak Hour
1	20.0%	34.2%
2	15.9%	79.3%
3	3.7%	0.0%
4	63.4%	91.3%
5	43.7%	70.7%
6	42.2%	80.4%
7	47.0%	88.2%
8	70.9%	79.9%
9	64.8%	100.0%
10	62.4%	72.1%
11	72.0%	100.0%
12	63.6%	44.9%
22	24.1%	0.0%
23	12.1%	38.4%
24	20.0%	0.0%
25	29.1%	55.1%
26	31.2%	69.3%
27	26.9%	73.1%
28	22.8%	63.3%
Full Station	38.7%	60.0%

Table 29 –OTP

Service	Existing Baseline	2030+
Amtrak Acela	90.6%	96.7%
Amtrak Regional (IC)	90.0%	93.0%
Amtrak Long Distance	65.6%	86.1%
Metropolitan	N.A.	N.A.
MARC Brunswick	100.0%	91.7%
MARC Camden	85.0%	94.4%
MARC Penn	98.1%	92.9%
VRE	93.3%	93.8%
Total	89.9%	93.6%

Discussion

The simulations of the Existing Baseline and 2030+ differ significantly from one another in their assumptions, infrastructure, and operations. Therefore, while individual changes in statistics may be explainable, overall trends may not be consistent across simulation evaluation categories due to significant changes in both simulated infrastructure and simulated operations.

Regional, Long Distance, and VRE trips see little change in average speed from the Existing Baseline to 2030+, while Acela and MARC see decreases. These decreases are likely a result of the much higher train volume in 2030+, causing congestion and reducing speeds entering and exiting WUS. This volume is also the likely cause of the increased delay for all trips, especially Acela. Acela performance decreases are due to their baseline operation reflecting significantly higher speeds than the surrounding traffic. When there is limited congestion, the disparity in speed between Acela and other

WUS rail services is not a problem. But, as overall train volume increases, Acela trips must be reduced in speed to travel with the flow of the remainder of the passenger traffic.

Overall, platform utilization decreases slightly from the Existing Baseline to 2030+. Although there are more trips in 2030+, reductions in dwell times, and the movement of some midday MARC trains away from on-platform storage, reduces the overall capacity demands on the station over the full day and in the peak hour.

Improved future station infrastructure is able to handle higher 2030+ train volumes resulting in improved OTP for most services. Regional and VRE trips saw improved OTP in 2030+, possibly due to updated signaling and infrastructure as simulated in the First Street Tunnel and Long Bridge corridor. Acela trips suffered more congestion entering WUS in 2030+ when compared with the baseline but were nonetheless able to achieve higher OTP. Long Distance OTP increased significantly. This is due to the reduced size of the randomized distribution applied to Long Distance trains entering the simulation. In the Existing Baseline, Long Distance trains were entering the simulation up to 100 minutes late, which matches real world performance. In 2030+, this value is reduced to 50 minutes, under the assumption that both on and off NEC operations are significantly streamlined for Long Distance trains. This improvement bumps many Long Distance trains back under the 30 minute threshold for lateness.

Time-Distance (“String”) Charts

Time-distance string Charts were generated for a 24 hour period for 2030+ Operations, covering between CP Virginia and the northern limits of simulation on the NEC.

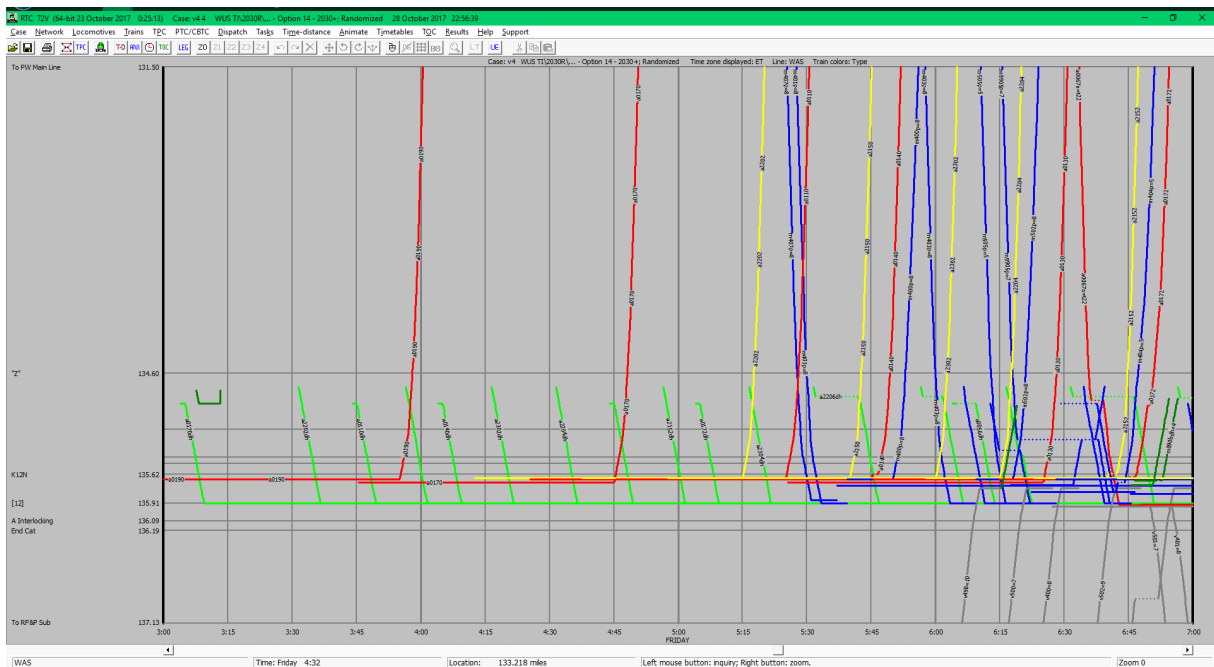


Figure 41: WUS 2030+ String Chart 3:00 – 7:00



Figure 42: WUS 2030+ String Chart 7:00 – 11:00

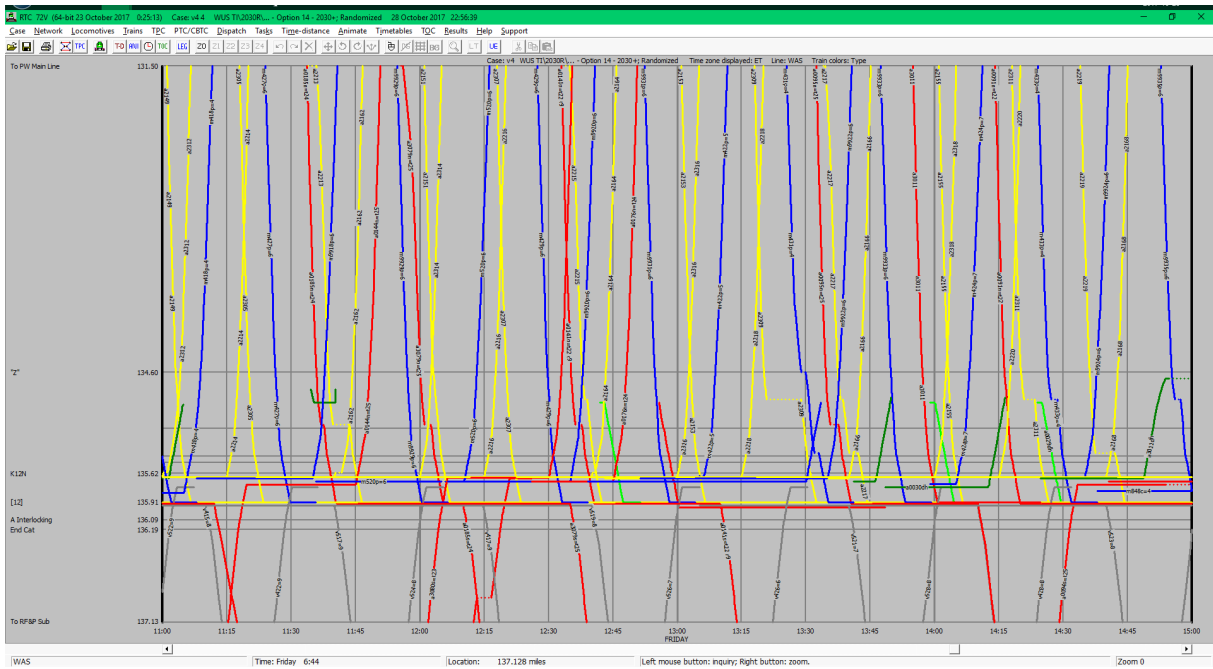


Figure 43: WUS 2030+ String Chart 11:00 – 15:00

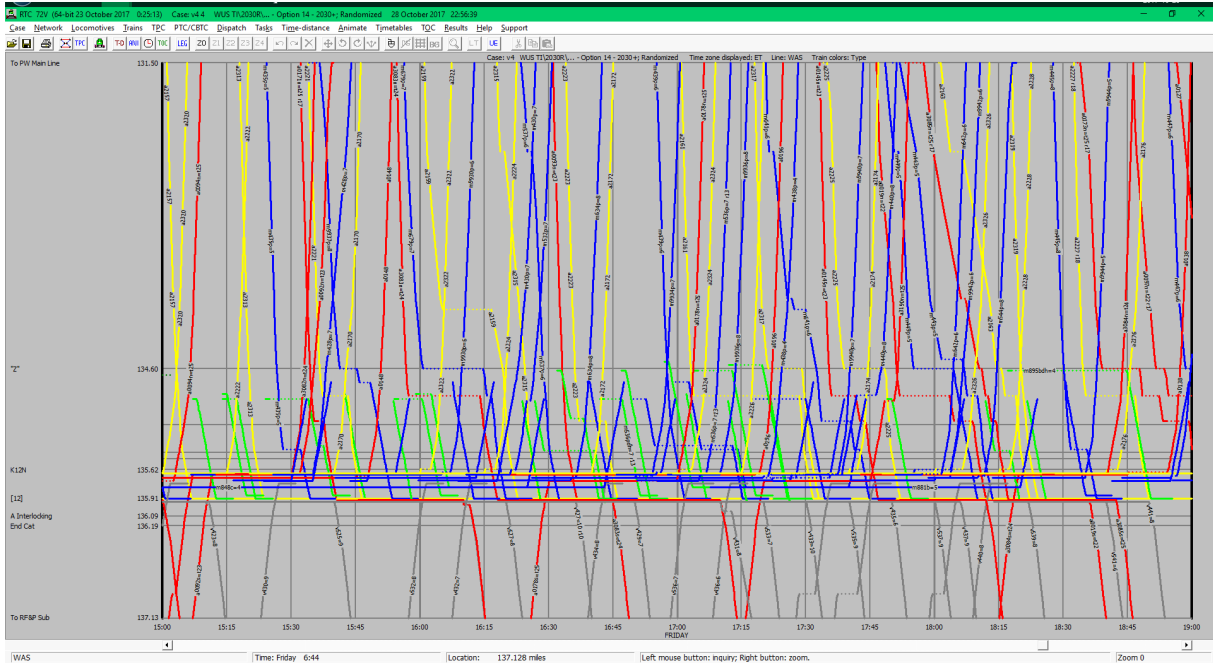


Figure 44: WUS 2030+ String Chart 15:00 – 19:00

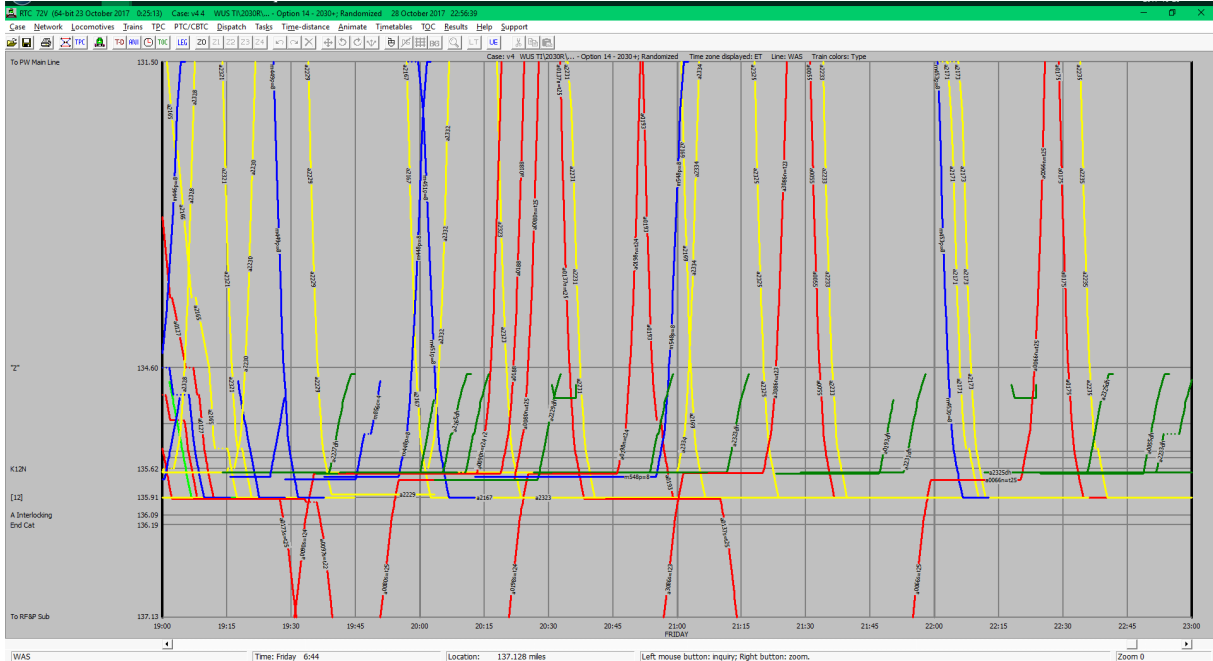


Figure 45: WUS 2030+ String Chart 19:00 – 23:00

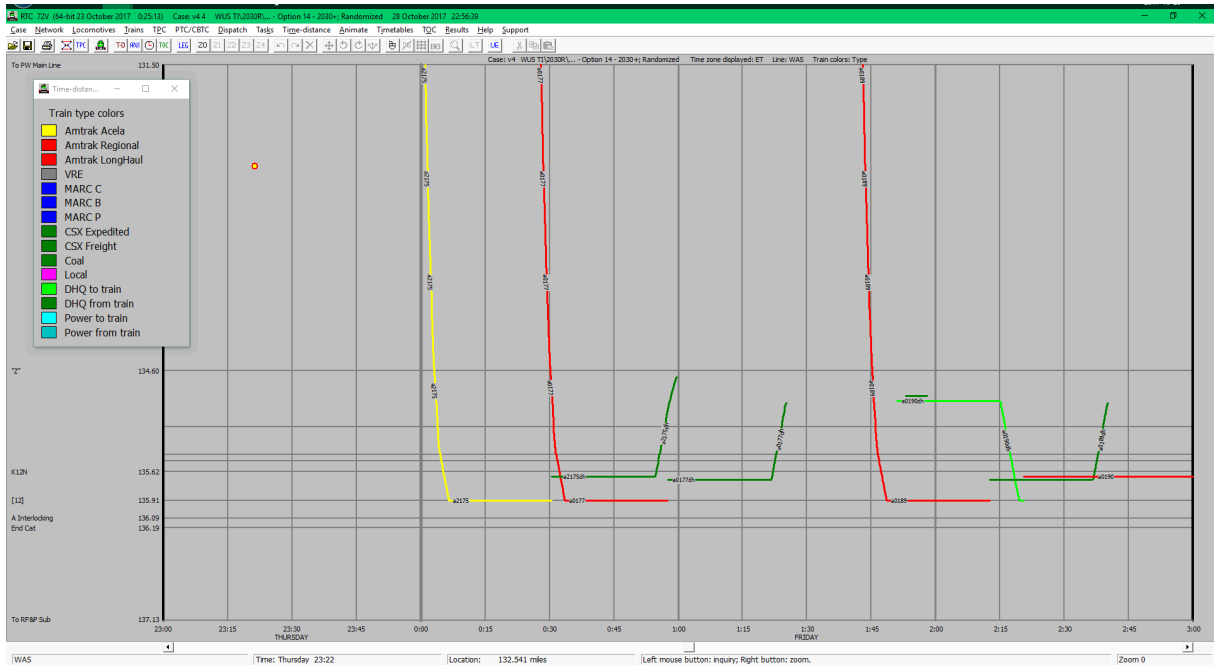


Figure 46: WUS 2030+ String Chart 23:00 – 3:00

Occupancy Charts

WUS platform occupancy charts of simulated 2030+ operations with future Option 14 infrastructure were generated for the 24-hour simulation.

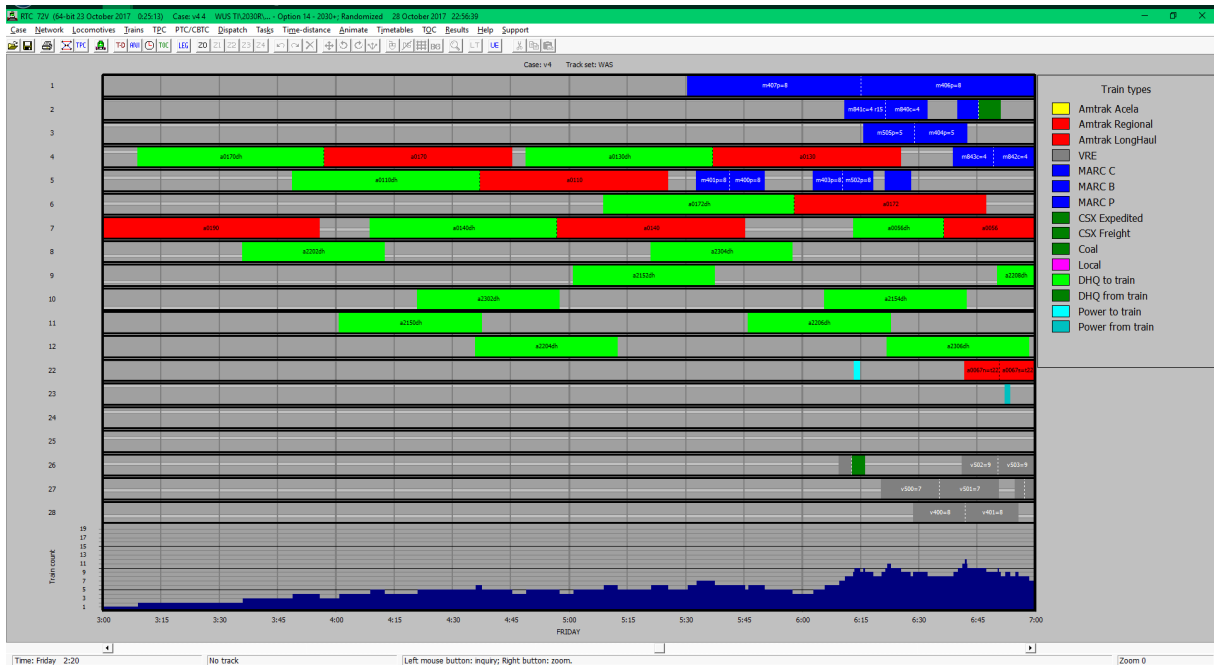


Figure 47: WUS 2030+ Occupancy Chart 3:00 - 7:00

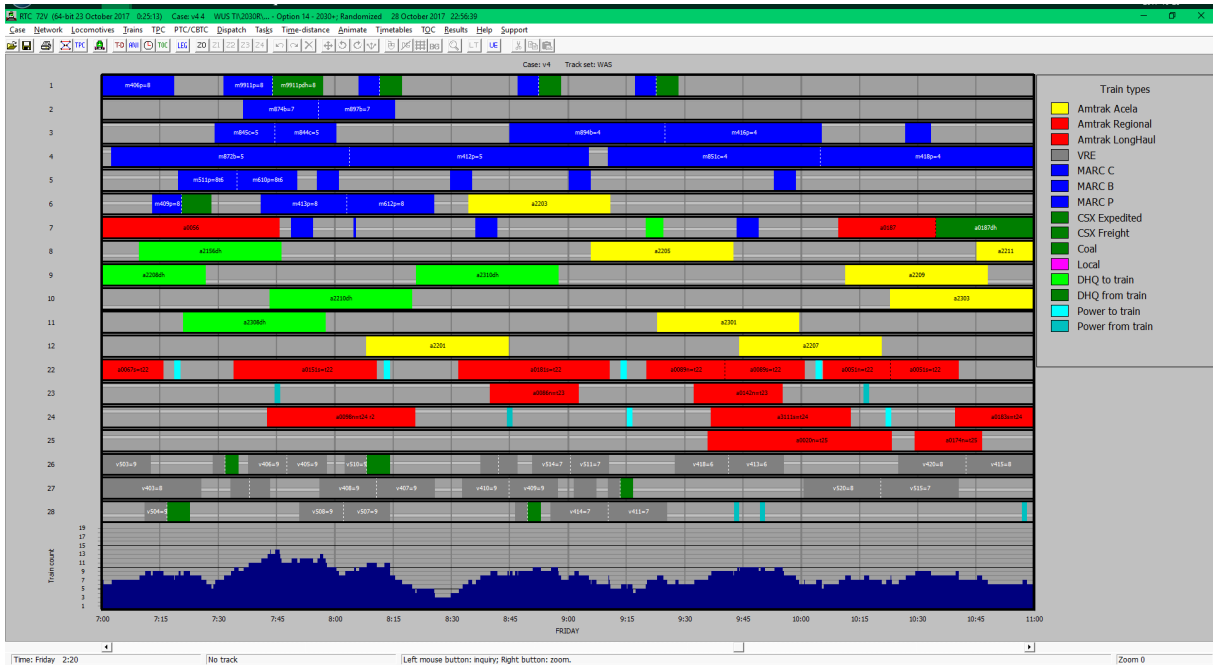


Figure 48: WUS 2030+ Occupancy Chart 7:00 - 11:00

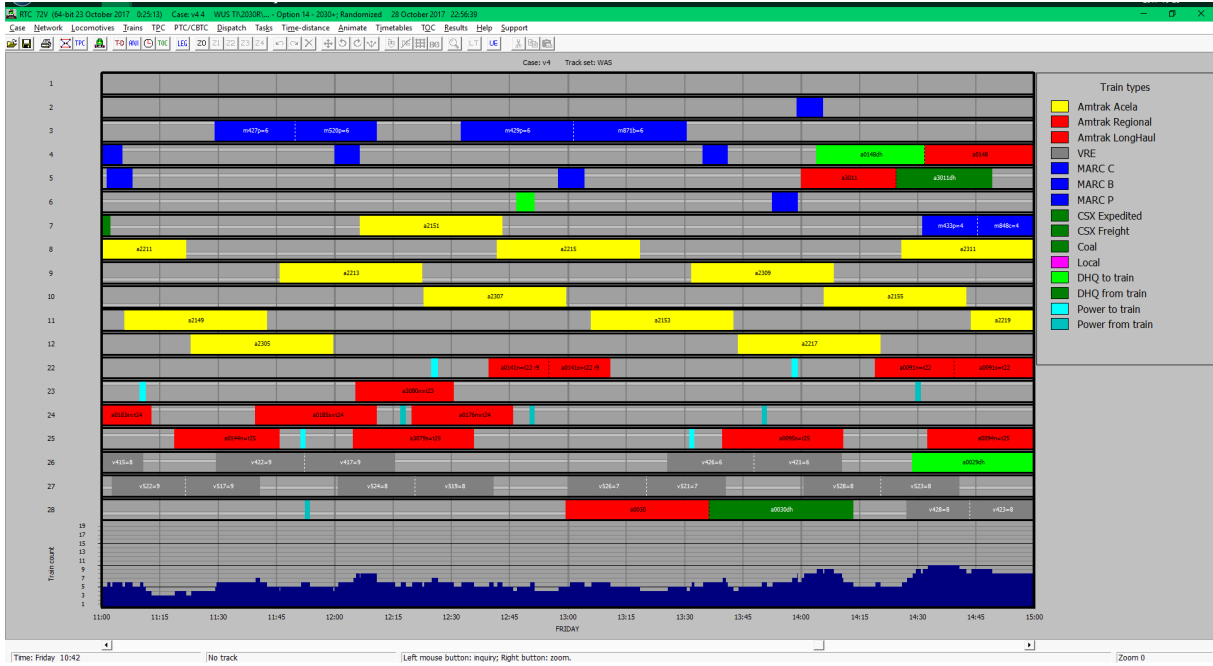


Figure 49: WUS 2030+ Occupancy Chart 11:00 - 15:00

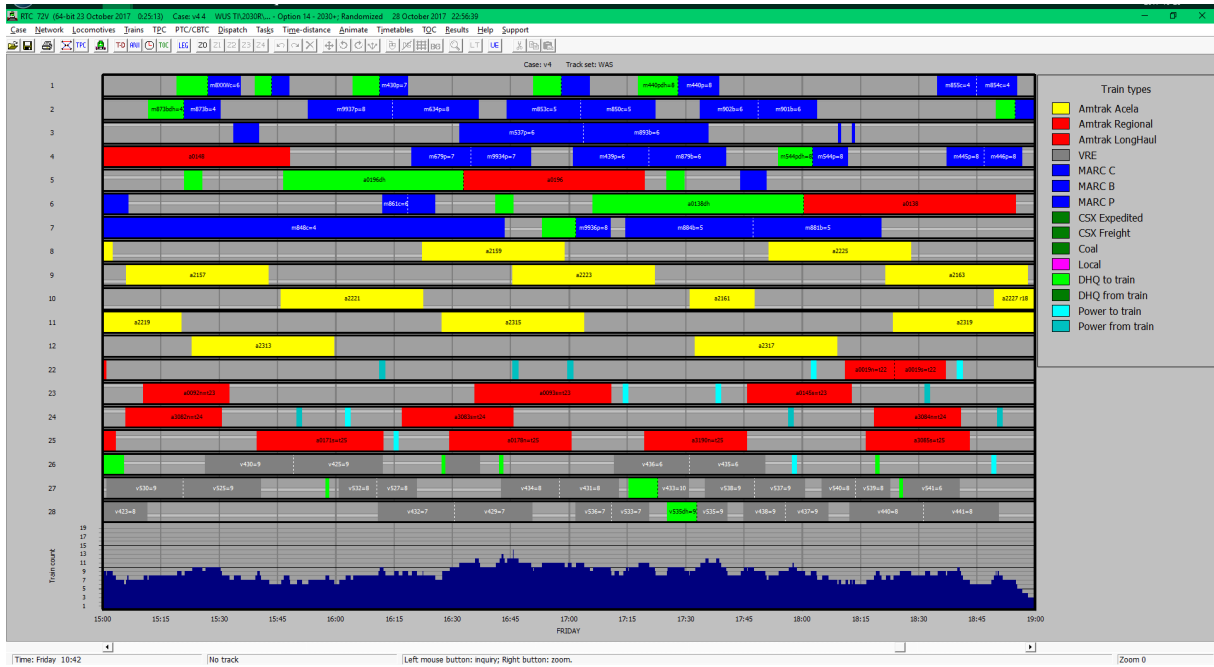


Figure 50: WUS 2030+ Occupancy Chart 15:00 - 19:00

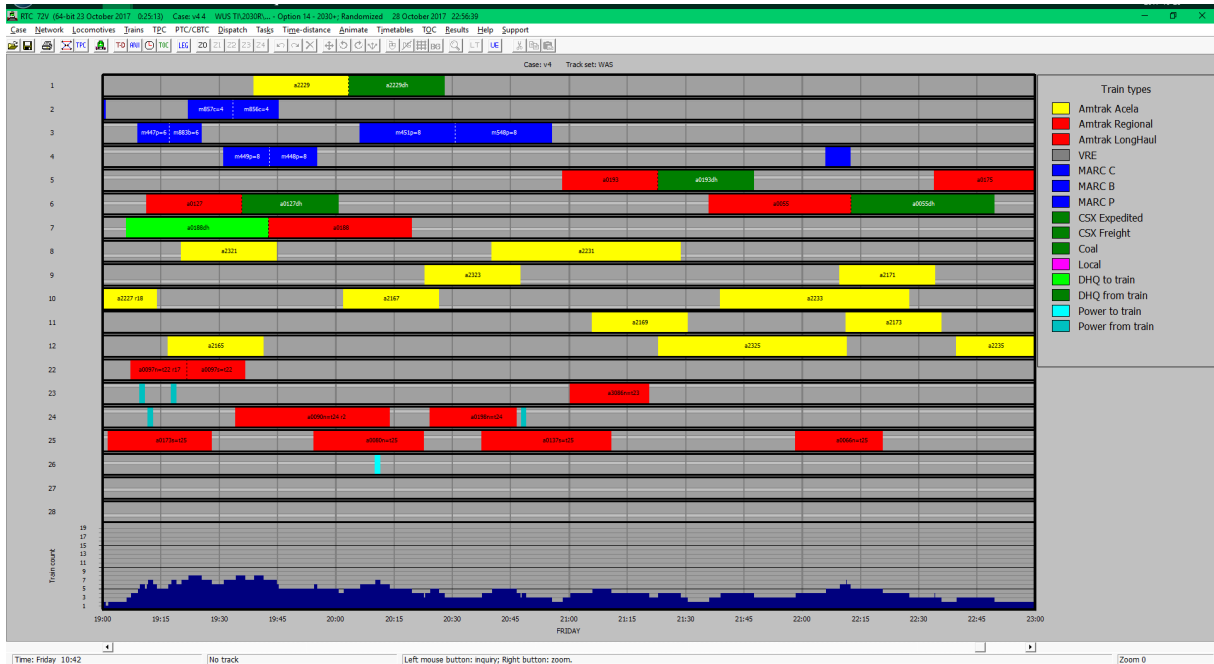


Figure 51: WUS 2030+ Occupancy Chart 19:00 - 23:00

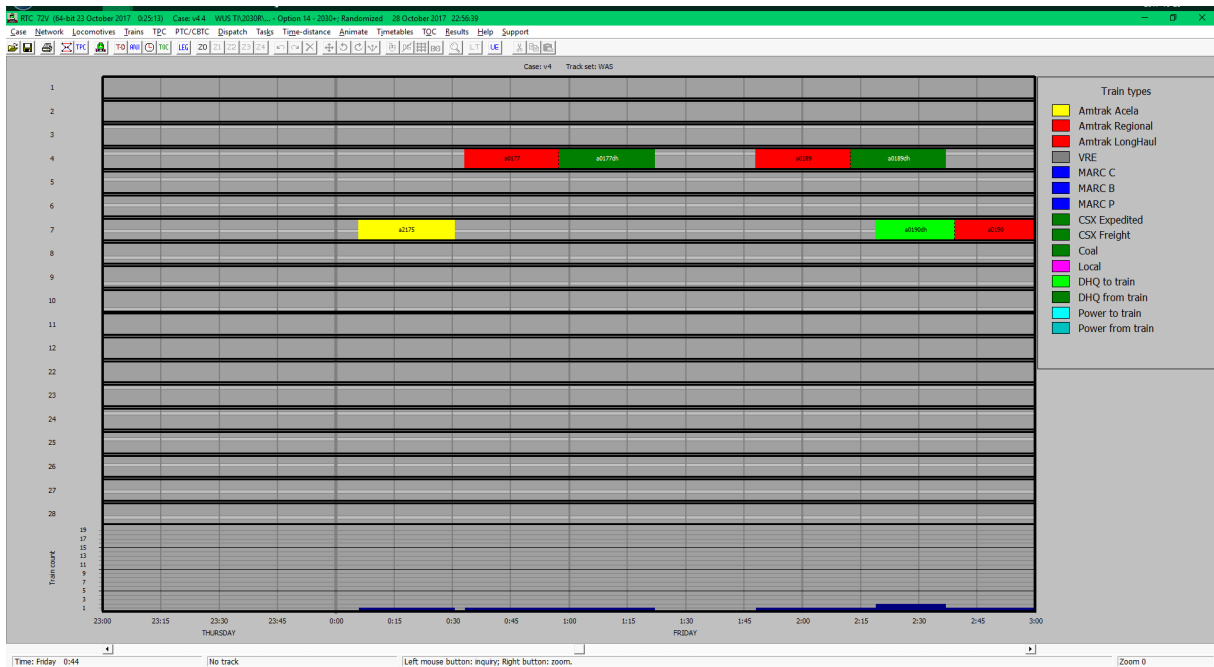


Figure 52: WUS 2030+ Occupancy Chart 23:00 - 3:00

2040 NEC FUTURE Plan Simulation Results

Simulating the full 2040 NEC FUTURE Operating Plan on the future TI Option 14 infrastructure is challenging. Very high train volume leads to extensive delays. Steps were taken to reduce the congestion of simulated trains in the interest of completing a representative full day of simulation. To this end, all run-through Intercity Corridor trips are simulated as running with dual mode locomotives. This eliminates the need for engine changes for these trips, freeing up additional time and space in the run-through portion of WUS, as well as 'K' and 'C' Interlockings. These trains have their WUS dwells reduced to ten minutes, with adjusted schedules for earlier departure times in both cases. Long Distance trips retain engine changes at WUS in the simulation.

Based on expected improvements in NEC operations due to overall NEC FUTURE capital investments, variability is removed from southbound trains entering the simulation in 2040 at MP 131 and Riverdale. Northbound trains still have their simulation entry times randomized south of WUS due to operation dispatched by Class 1 freight carriers. Congestion south of WUS along the Long Bridge Corridor necessitated the introduction of a simulated high density freight complaint signal design in that area. This concept signal design represents higher signal density than that simulated for 2030+ and manages train flow to achieve reasonable operational results. The 2040 NEC FUTURE results reflect these adjustments.

Random

Results from simulation of the 2040 NEC FUTURE operations are useful to compare back to the Existing Baseline and to the 2030+ operations which utilize the same infrastructure.

Table 30 – Average Speed (mph) by Service

	Existing Baseline	2030+	2040 NEC FUTURE
Acela	45.2	33.4	31.9
Regional	32.6	33.9	30.0
Long Distance	31.9	32.0	29.7
Amtrak (combined)	34.7	33.5	30.6
Metropolitan	N.A.	N.A.	31.5
VRE	27.9	26.2	23.0
MARC	32.3	26.0	26.5
Passenger (combined)	32.3	29.4	27.3
Freight	29.3	24.3	27.1
All Trains	31.9	28.7	27.3

Table 31 – Stopped Delay per 100 Miles by Service

	Existing Baseline	2030+	2040 NEC FUTURE
Acela	0:02:08	0:43:15	1:04:08
Regional	0:23:05	0:20:56	0:16:05
Long Distance	0:20:27	0:27:22	0:15:07
Amtrak (combined)	0:18:41	0:28:33	0:33:11
Metropolitan	N.A.	N.A.	1:14:16
VRE	0:04:04	0:11:53	0:04:58
MARC	0:22:13	0:46:11	0:55:49
Passenger (combined)	0:15:55	0:26:09	0:37:08
Freight	0:20:05	0:49:34	0:16:47
All Trains	0:16:29	0:29:26	0:35:06

There are 114.7 conflicts per 100 miles traveled in 2040, a somewhat higher density of train conflicts per service delivered than the Existing Baseline or the 2030 operating plan. Average speed by service is presented in Table 30. Overall, the speed of passenger services decreases slightly in 2040 from 2030+ operations. Most services see moderate decreases in average speeds in 2040 caused by higher train volume and congestion. Only the speed of MARC trips increases slightly. Stopped Delay per 100 miles of service is presented in Table 31. Many services experience less delay in 2040 than in 2030+ including, Regional, Long Distance and VRE trips which benefit from the higher density signaling south of WUS. MARC and Acela delay remain relatively consistent. Metropolitan service has very high delay, near one and one quarter hours of delay per 100 miles.

Platform utilization in 2040 is presented in Table 32. The occupancy of the full station increases to 41.7%, up three percentage points from 2030+. During the peak hour, full station occupancy increases to 64.4%. Many individual tracks see higher usage in 2040 than in 2030+. Heavily used tracks in 2040 include Tracks 2, 10, 11, and 12. Lighter platform utilization throughout the day is found on Tracks 3, 22, 27 and 28. OTP by service type is presented in Table 33. Overall OTP is slightly lower in 2040 than in 2030+ at 91.6%. Most services follow a similar pattern by dropping a few percentage points from 2030+, likely due to the increased train volume in 2040.

Table 32 – Station Platform Utilization at WUS

Track	2030+		2040 NEC FUTURE	
	Full Day	Peak Hour	Full Day	Peak Hour
1	20.0%	34.2%	49.7%	100.0%
2	15.9%	79.3%	81.2%	49.4%
3	3.7%	0.0%	24.4%	46.5%
4	63.4%	91.3%	53.3%	53.6%
5	43.7%	70.7%	49.2%	58.8%
6	42.2%	80.4%	50.1%	58.0%
7	47.0%	88.2%	42.0%	63.6%
8	70.9%	79.9%	44.1%	28.3%
9	64.8%	100.0%	42.5%	51.6%
10	62.4%	72.1%	63.9%	92.9%
11	72.0%	100.0%	66.2%	96.6%
12	63.6%	44.9%	62.5%	81.6%
22	24.1%	0.0%	8.5%	0.0%
23	12.1%	38.4%	21.0%	64.2%
24	20.0%	0.0%	29.5%	96.4%
25	29.1%	55.1%	38.3%	50.6%
26	31.2%	69.3%	34.8%	72.5%
27	26.9%	73.1%	10.6%	63.4%
28	22.8%	63.3%	19.8%	96.1%
Full Station	38.7%	60.0%	41.7%	64.4%

Table 33 – OTP

Service	Existing Baseline	2030+	2040 NEC FUTURE
Amtrak Acela	90.6%	96.7%	94.9%
Amtrak Regional (IC)	90.0%	93.0%	92.2%
Amtrak Long Distance	65.6%	86.1%	74.3%
Metropolitan	NA	NA	92.0%
MARC Brunswick	100.0%	91.7%	89.5%
MARC Camden	85.0%	94.4%	93.1%
MARC Penn	98.1%	92.9%	87.6%
VRE	93.3%	93.8%	96.7%
Total	89.9%	93.6%	91.6%

Discussion

2040 NEC FUTURE operations produce results slightly worse than 2030+ operations. Higher train volumes lead to more train conflicts and inferior performance in most cases between the two sets of operations tested on the planned future infrastructure.

Overall average speeds slowed slightly, but evenly, from 2030+ to 2040 operations. The average passenger speed decreased by about two miles per hour, and most of the services followed suite. The increased 2040 train volumes cause congestion which slows down the services with respect to the 2030+ operating plan. Eliminating the variability of simulation entry times for southbound trains helps maintain speeds in 2040 by keeping trains closer to their previous results. Overall, passenger delay increases in 2040, but the performance of individual services varies significantly. The elimination of engine changes for Intercity Corridor service and the improvement of the signaling system south of

WUS, lead to major reductions in delay to run-through services. HSR and MARC trains show increased delay from 2030+; reduced variability is offset by increased train volume and congestion. Newly introduced Metropolitan trains, the volume of which is sufficient to cause extensive delays, are a major factor in the overall delay increase. Metropolitan train delays are exacerbated by the relatively short terminal turn times at WUS and the greater probability of inbound and outbound Metropolitan trains delaying one another.

Station platform utilization increases slightly from 2030+ to 2040 but is not quite at maximum capacity for most of the day. However, during the peak hour, and several other points during the day, the future station infrastructure is simulated to be at capacity for some tracks. Although 2040 operations have significantly higher train volume than 2030+ operations, the use of dual mode locomotives on Intercity Corridor trains reduces platform utilization slightly by reducing the necessary dwell times for this service, whose trains previously had to change locomotives. These platform utilization results show two important points: the station is just large enough to hold peak period trip volumes planned for Washington in the future; and most of the delay and operational performance reduction that occurs throughout the day is caused by interlockings, track geometry, and other factors outside the station platform tracks themselves.

OTP is lower in 2040 than in 2030+ for all services. This reduction is fairly even and consistent across the board but is not a major drop. Overall, the reduction in variability and introduction of dual mode locomotives for Intercity Corridor service helps balance out service increases in 2040. OTP and other metrics are likely to show worse performance if the same randomization of lateness principles are applied across the board. The planned future infrastructure for WUS is capable of supporting 2040 NEC FUTURE operations if some performance improving assumptions are made. Even with these operational advantages attributed to the 2040 operations simulations, the train volume in 2040 is approaching the upper limit of what the future Option 14 infrastructure plan for WUS can support and produces results less desirable than those of the Existing Baseline.

Time-Distance (“String”) Charts

Time Distance String Charts are provided here over a 24 hour period for 2030+ Operations, covering between CP Virginia and the northern limits of simulation on the NEC.

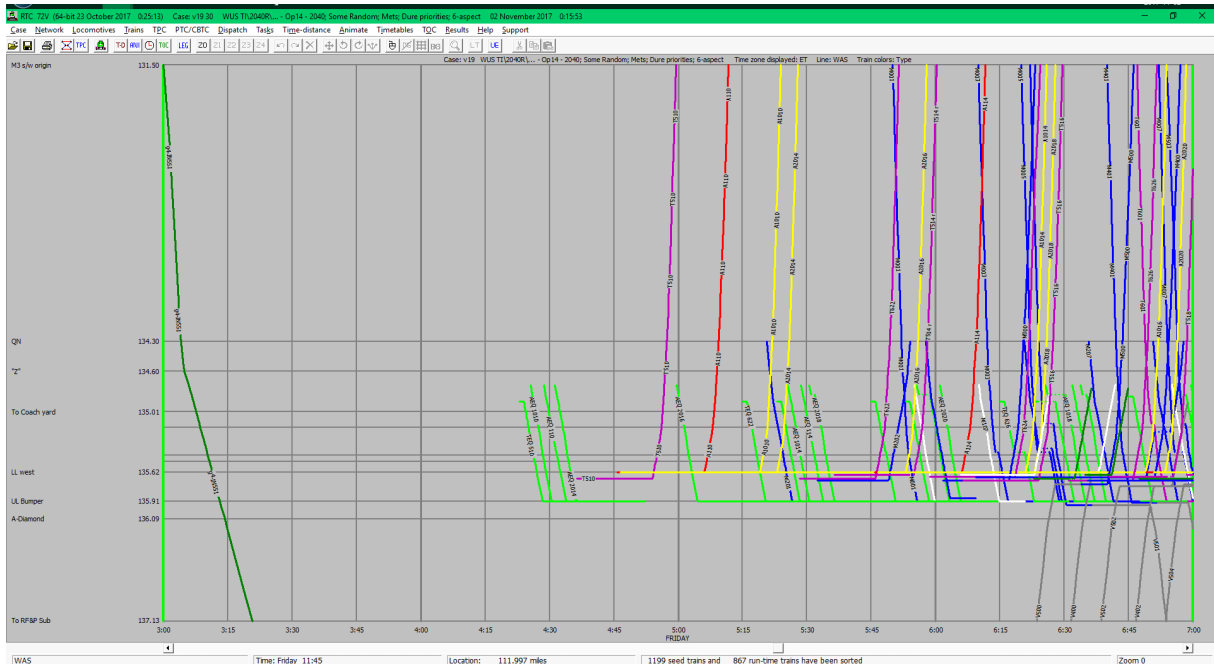


Figure 53: WUS 2040 String Chart 3:00 - 7:00

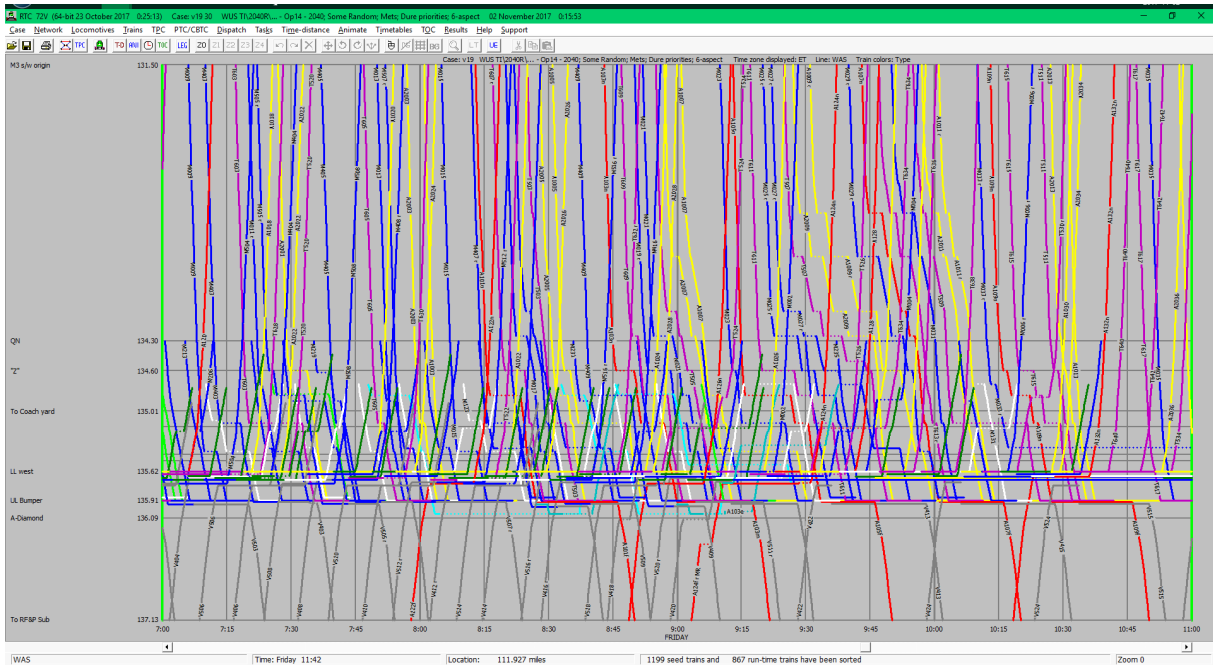


Figure 54: WUS 2040 String Chart 7:00 – 11:00

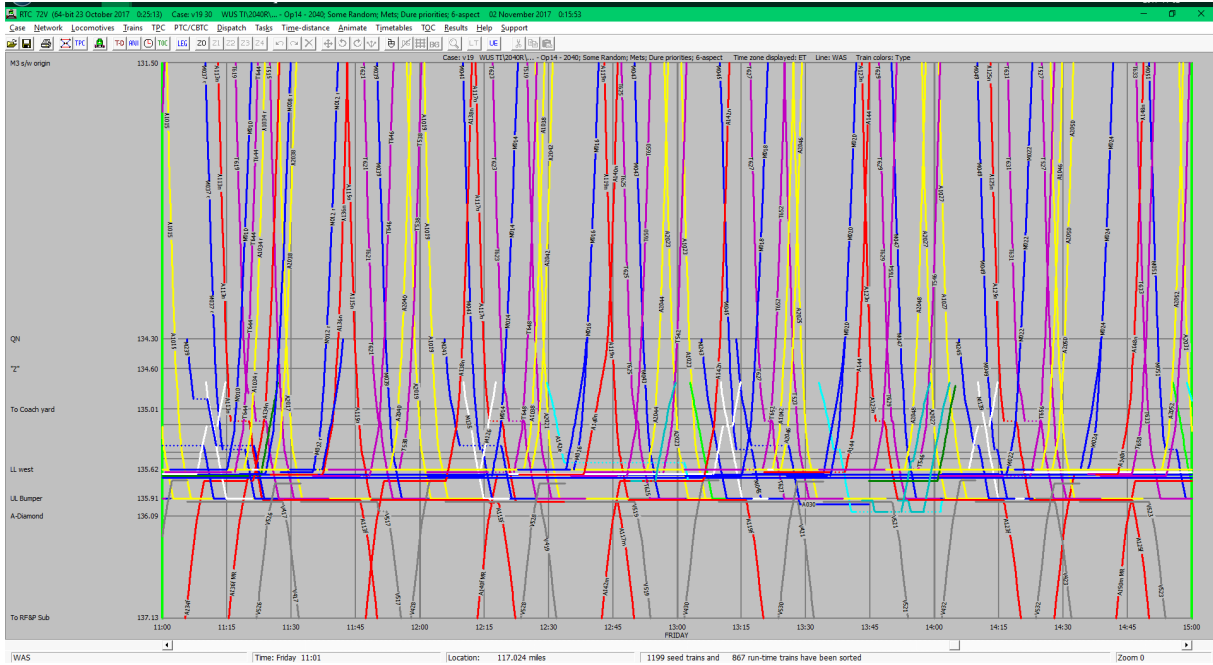


Figure 55: WUS 2040 String Chart 11:00 - 15:00

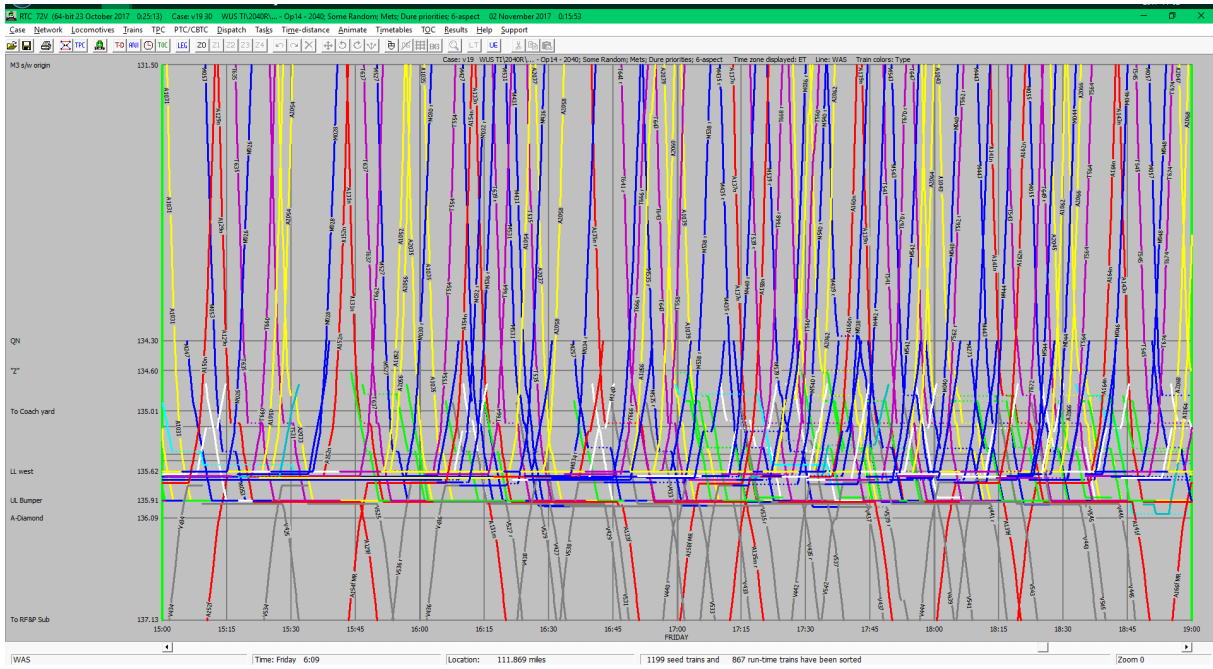


Figure 56: WUS 2040 String Chart 15:00 - 19:00



Figure 57: WUS 2040 String Chart 19:00 - 23:00

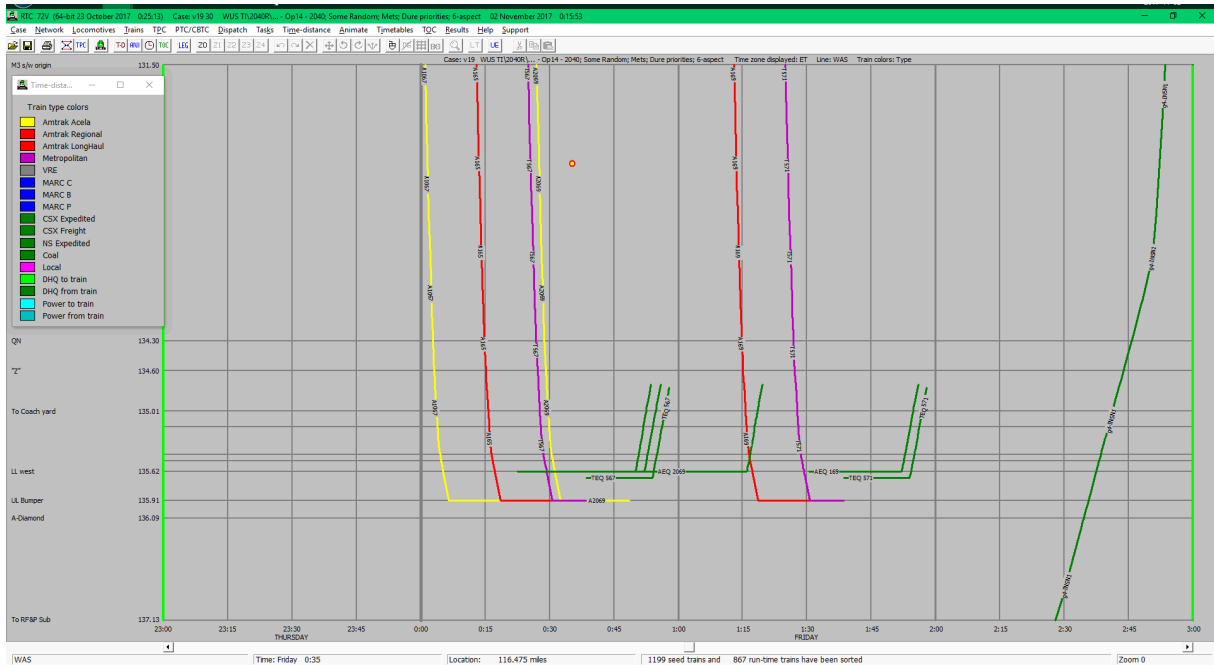


Figure 58: WUS 2040 String Chart 23:00 - 3:00

Occupancy Charts

WUS platform occupancy charts for 2040 NEC FUTURE operations were generated for the full 24-hour simulation.

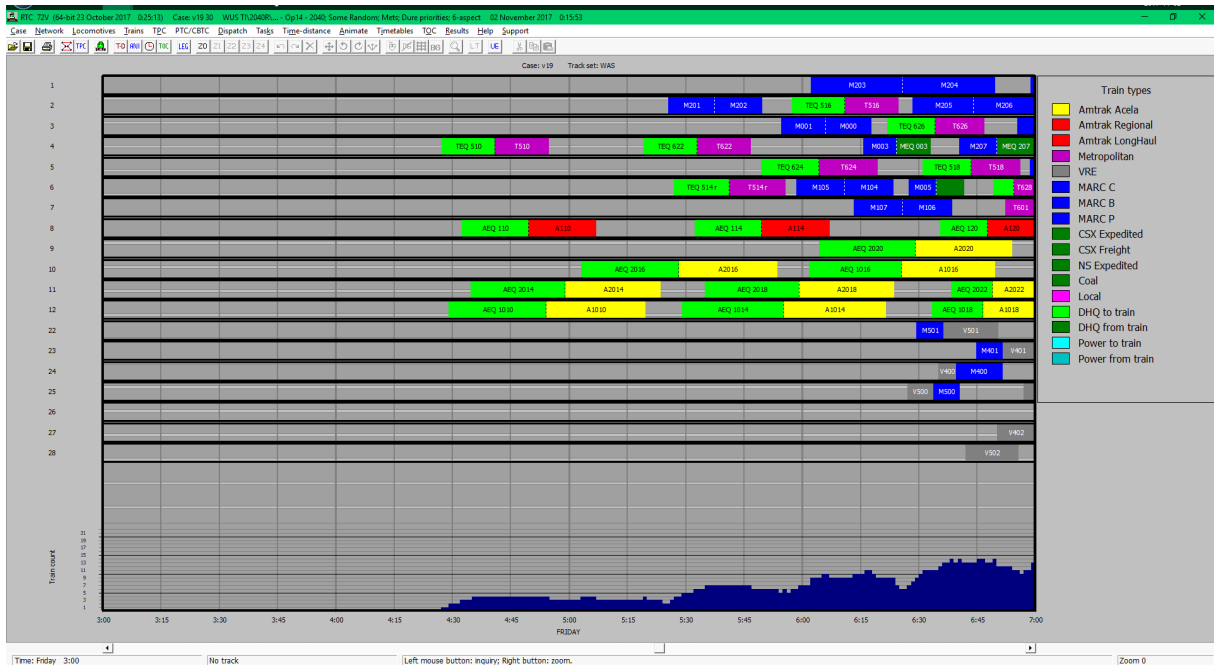


Figure 59: WUS 2040 Occupancy Chart 3:00 - 7:00

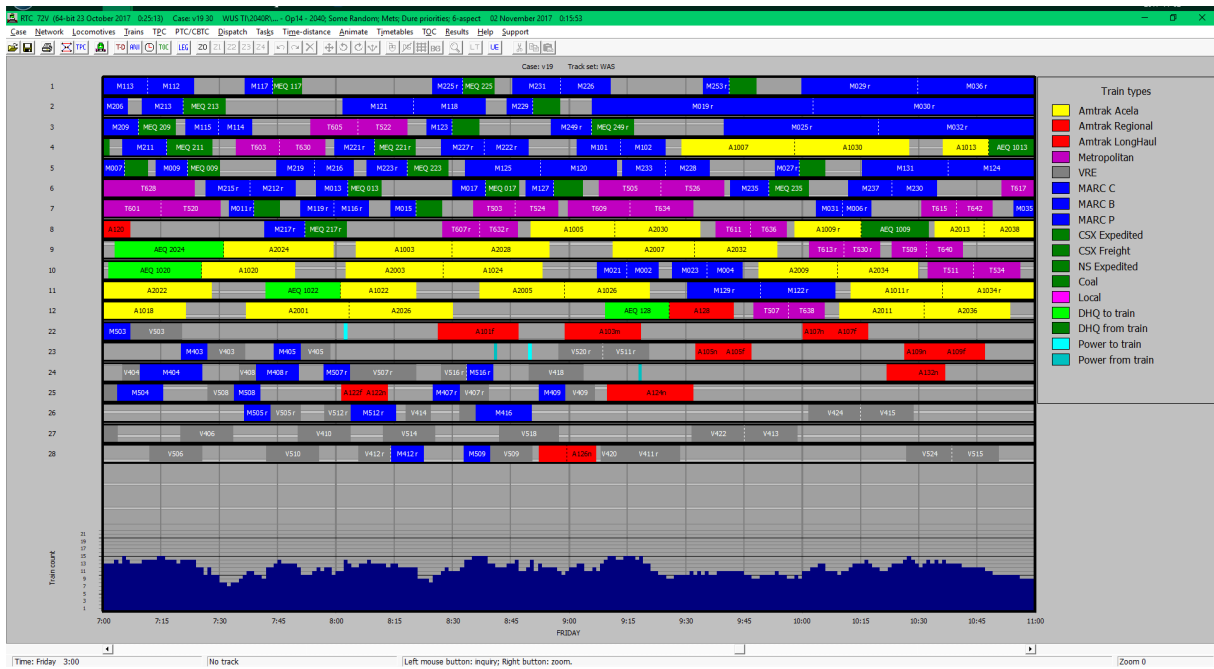


Figure 60: WUS 2040 Occupancy Chart 7:00 - 11:00

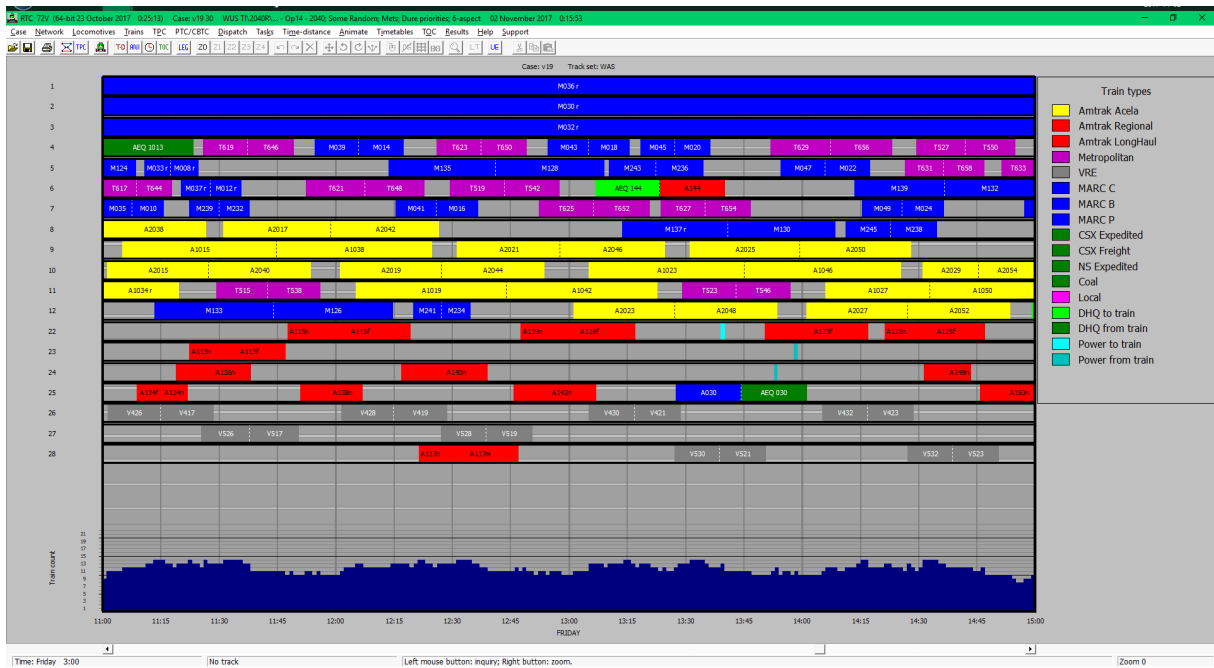


Figure 61: WUS 2040 Occupancy Chart 11:00 - 15:00

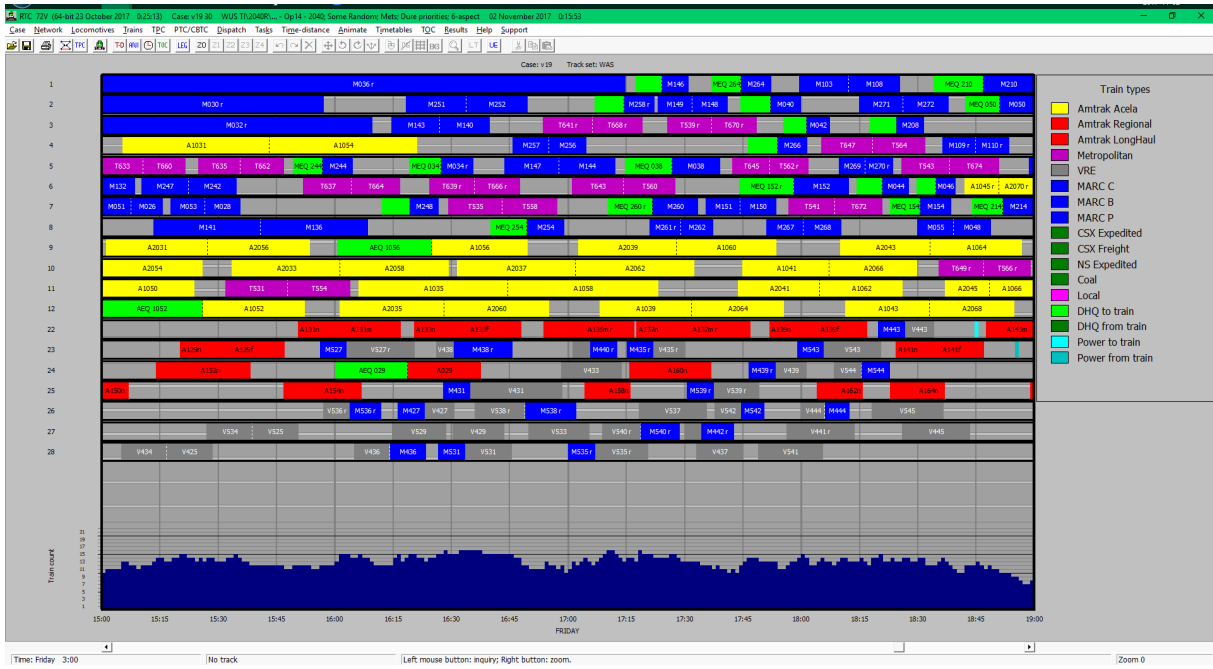


Figure 62: WUS 2040 Occupancy Chart 15:00 - 19:00

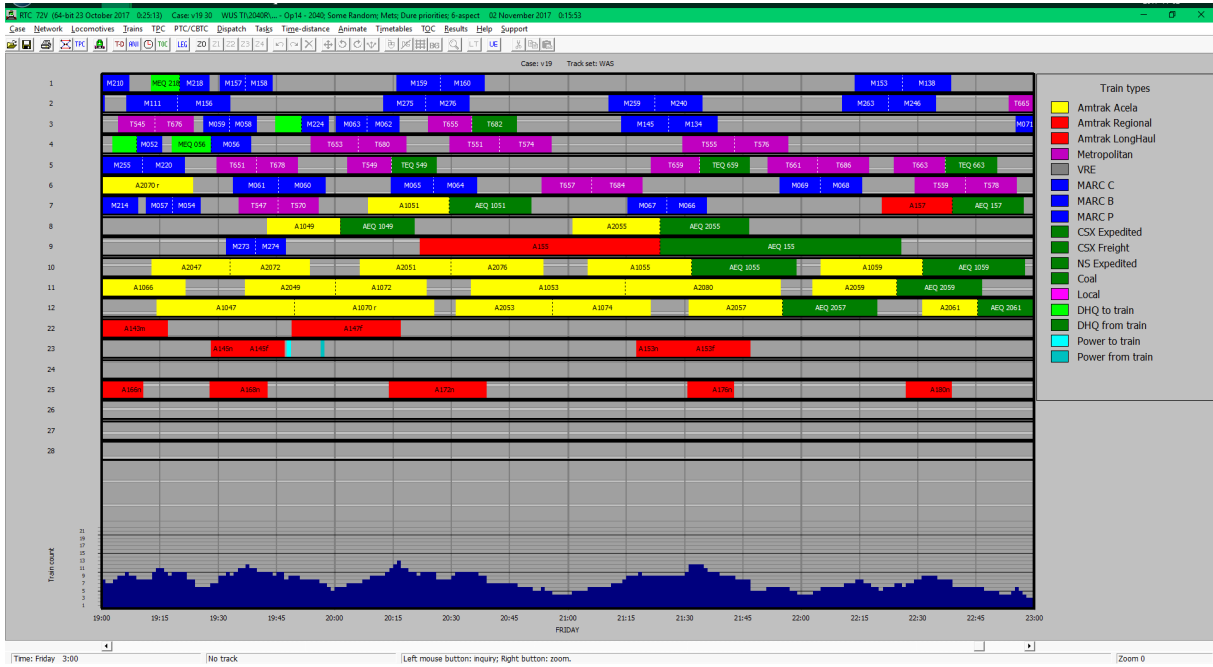


Figure 63: WUS 2040 Occupancy Chart 19:00 - 23:00

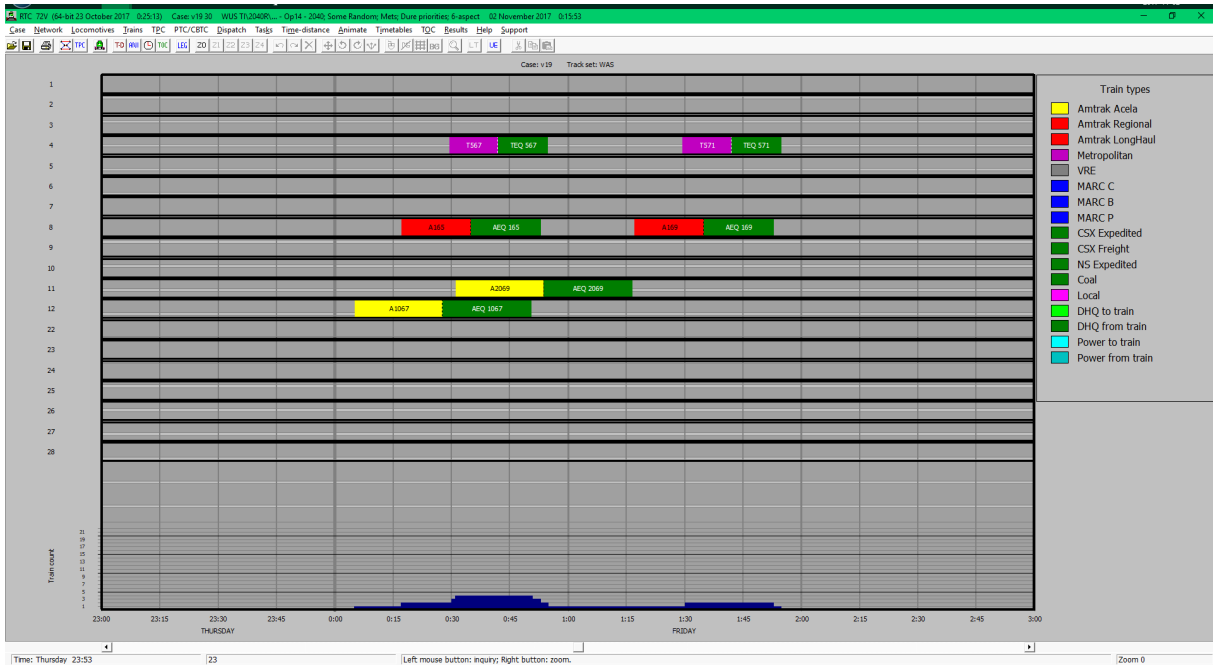


Figure 64: WUS 2040 Occupancy Chart 23:00 - 3:00

Special Trackwork Utilization Analysis

The future infrastructure layout for WUS and the immediate surroundings includes significant complexity in the track design. This includes a large number of crossovers providing for parallel moves in “K” Interlocking. Analysis was conducted to review the utility of each “K” Interlocking crossover over the course of a full day of simulated operation. The number of times each crossover was used per day in simulations of the 2030+ and 2040 Operating Plans was counted. Crossovers with low usage were then identified.

The simulation analysis found that all Option 14 “K” Interlocking crossovers are used in 2030+ operations; three of them are used less than three times per day. All “K” Interlocking crossovers are used in 2040 operations; one is used one to two times per day and one is used three times per day. All other crossovers in both cases are used more than three times per day. Limited use crossovers in 2030+ and 2040 are shown in Figure 65 and Figure 66, where green tracks are used one to two times per day and yellow links are used three times per day.

After comparison, only the 202 crossover between tracks 27 and 28 appears as limited use under both sets of operations. Most crossovers presented in the design are used for double or triple parallel moves in both operational cases, while those that aren’t are more likely to be used in one type of focused service over another.

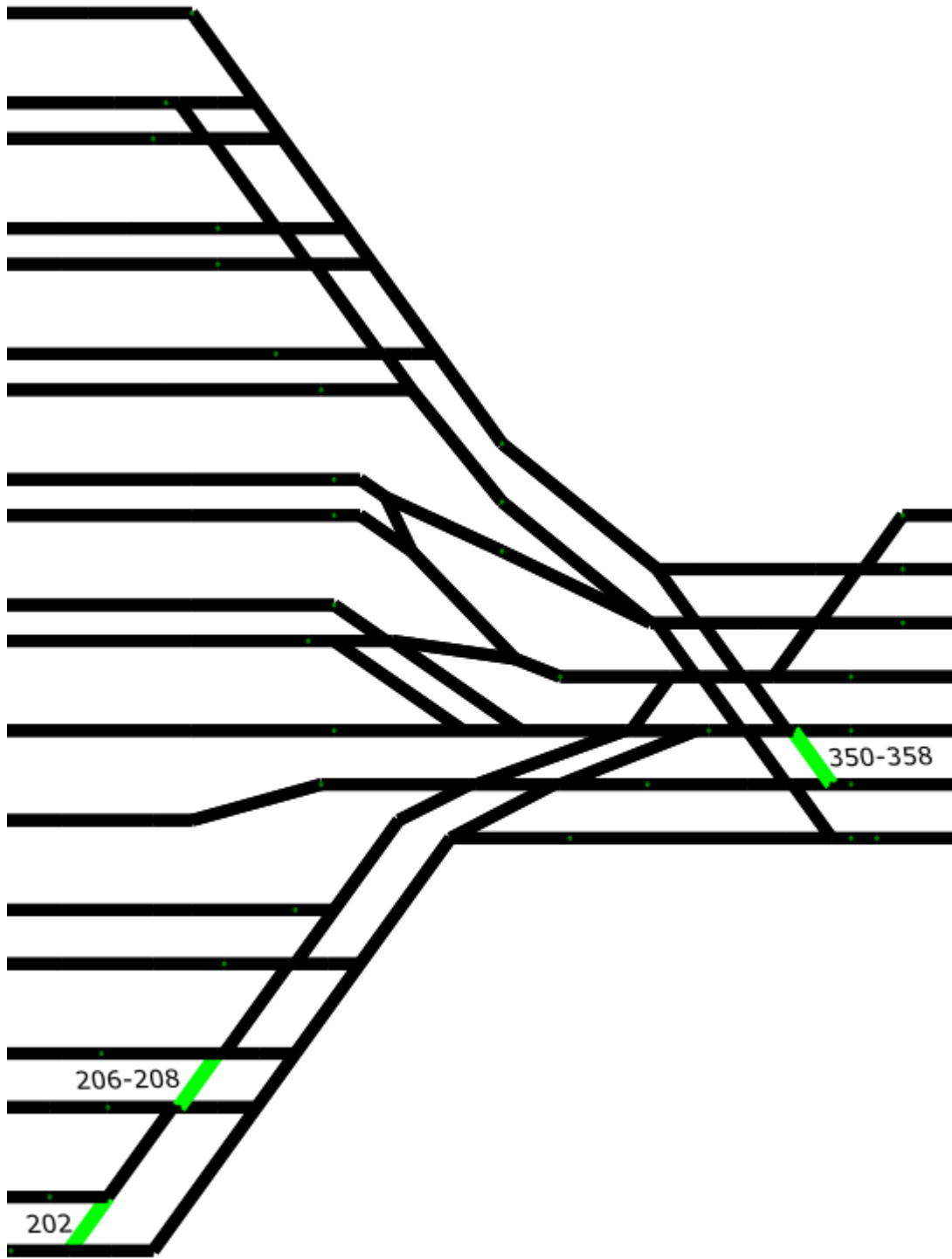


Figure 65: Limited Use Crossovers under 2030+ operations

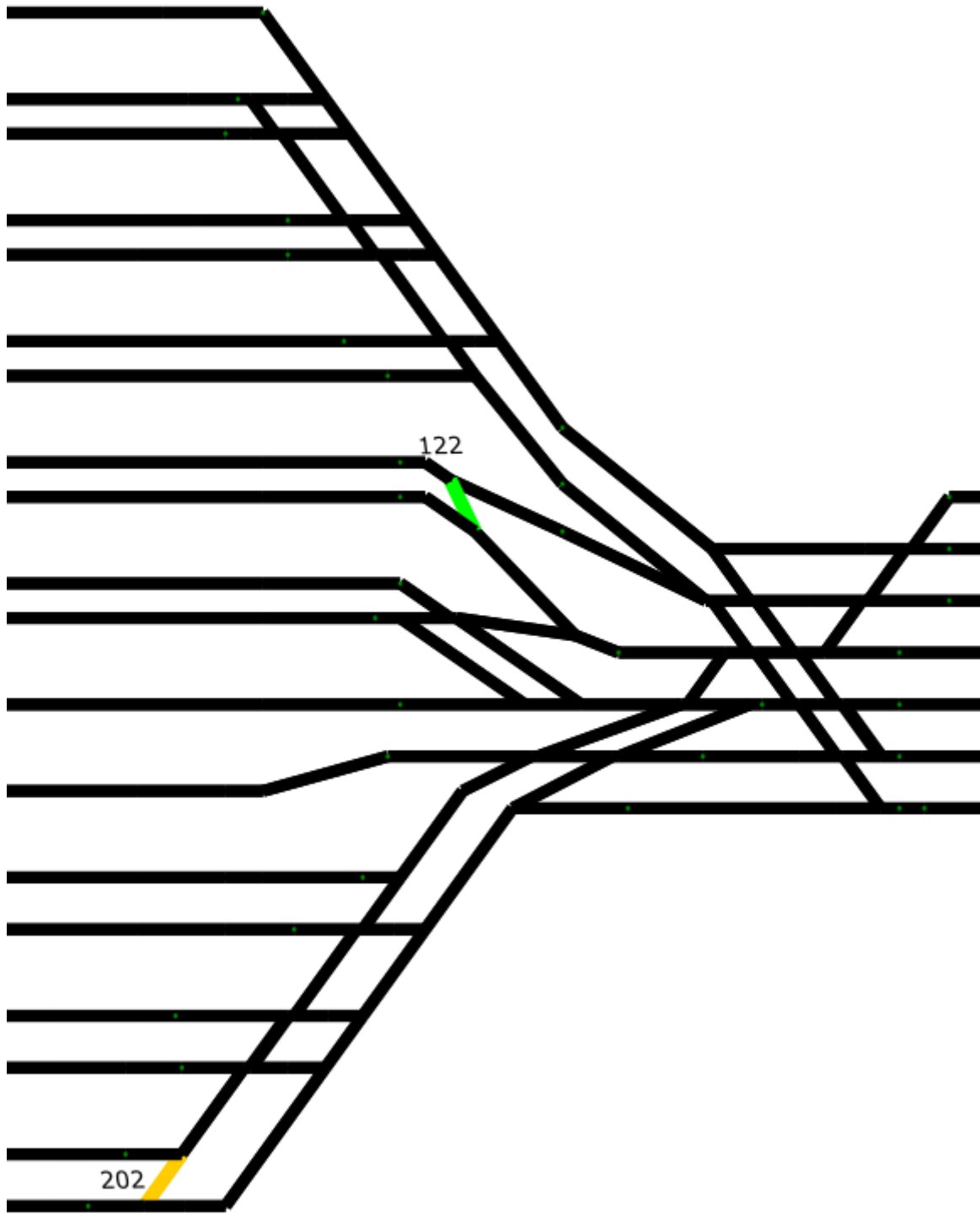


Figure 66: Limited use crossovers under 2040 operations

Conclusions

WUS Option 14 future infrastructure plans are sufficient to meet the demands of expected service growth. With the large future increase in service, operational performance declines with respect to the Existing Baseline. Existing operations at WUS are occasionally congested, but results show the station provides the operational flexibility necessary for reasonable operational performance given the existing schedule. Future infrastructure, combined with future service levels, presents train volumes approaching station and signal capacities. This leads to reasonable decreases in performance. Even with these increases in congestion, future infrastructure at WUS can functionally support the future increases in service levels.

Under 2030+ operations and the Option 14 TI infrastructure, delay increases and average speed decreases with respect to the Existing Baseline. The future infrastructure handles this congestion in a more efficient manner, resulting in higher OTP. More efficient station and yard assignments also result in a slight decrease in 2030+ station occupancy, despite increased train volumes. NEC FUTURE 2040 operations represent a large service increase over 2030+ operations without large decreases in operational performance. OTP and average speed decline only slightly from 2030+ to 2040, despite the large increase in the number of trains and conflicts. Under 2040 operations, the future Option 14 TI infrastructure is nearing capacity as platform occupancy and delays increase. Adjustments to 2040 operations were required to ensure smooth simulation of the station area. Overall, these results show that the future station infrastructure meets increased future demand with only modest decreases in operational performance.

Appendices

Appendix A: Existing Baseline Operating Plan



Southbound Train ID	A187	A177	AEQ 190	AEQ 110	AEQ 170	AEQ 2150	AEQ 180	AEQ 2100	AEQ 130	M401	AEQ 2154	M403	AEQ 172
<i>From</i>													
<i>To</i>	AEQ 187	AEQ 177	A190	A110	A170	A2150	A180	A2100	A130	M400	A2154	M502	A172
<i># of Locomotives</i>	1	1	1	1	1	2	1	2	1	1	2	1	1
<i># of Coaches</i>	8	8	8	7	8	6	7	6	7	6	6	6	8
<i>Train Class</i>	REG	REG	REG NR	REG NR	REG NR	ACELA NR	REG NR	ACELA NR	REG NR	MARC P	ACELA NR	MARC P	REG NR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T11	T12	T11	T12	T11	T17	T13	T18	T12	T11	T17	T11	T13
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	0:26	1:16								5:20		5:47	
<i>C</i>	0:30	1:20								5:24		5:51	
West Yard													
Ivy City Yard			1:30	2:15	3:07	3:15	3:45	4:15	4:45		5:15		5:41
Coach Yard													
Wedge Yard													
<i>K</i>	0:34	1:24	1:44	2:29	3:21	3:29	3:59	4:29	4:59	5:28	5:29	5:55	5:55
Arr. Washington Union	0:35	1:25	1:45	2:30	3:22	3:30	4:00	4:30	5:00	5:29	5:30	5:56	5:56
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

Notes

- Interlocking Passing times are approximations only
- "-" Indicates a station at which the given train does not stop
- "~" indicates that the train does not have a scheduled arrival time at Washington
- Blank cells indicate that the train does not pass through that location
- Italics indicate interlocking passing times for which the train does not stop

Southbound Train ID	M841	V321	M505	M870	M843	AEQ 2104	AEQ 56	M890	M407	A67	M409	M872	M845
<i>From</i>		V322											
<i>To</i>	M840		M404	M406	M842	A2104	A56	MEQ 890	M610		M408	M422	M844
<i># of Locomotives</i>	1	1	1	1	1	2	1	1	1	1	1	1	1
<i># of Coaches</i>	3	6	7	4	3	6	5	3	6	6	7	4	4
<i>Train Class</i>	MARC C	VRE M	MARC P	MARC B	MARC C	ACELA NR	REG NR	MARC B	MARC P	REGR	MARC P	MARC B	MARC C
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	T7	T25	T11	T8	T8	T18	T11	T7	T12	T23	T9	T7	T8
Riverdale	5:51				-								7:04
<i>JD</i>	5:55				6:19								7:08
<i>Georgetown Jct.</i>				6:01				6:18				6:47	
Silver Spring				6:03				6:20				6:49	
<i>QN Tower</i>				6:15				6:32				7:01	
<i>MP 128</i>			6:12						6:41	6:49	6:58		
<i>C</i>	6:00		6:16	6:18	6:24			6:35	6:45	6:53	7:02	7:04	7:13
West Yard													
Ivy City Yard						6:15	6:25						
Coach Yard													
Wedge Yard													
<i>K</i>	6:04		6:20	6:22	6:28	6:29	6:39	6:39	6:49	6:57	7:06	7:08	7:17
Arr. Washington Union	6:05		6:21	6:23	6:29	6:30	6:40	6:40	6:50	6:58	7:07	7:09	7:18
Dep. Washington Union		6:25								7:30			
<i>A</i>		6:26								7:31			
<i>CP Virginia</i>		6:31								7:34			
L'Enfant Station		6:33								-			
Crystal City		6:40								-			
Alexandria		6:42								7:48			
<i>AF</i>		6:43								7:52			
<i>Cameron Run (CR)</i>		6:45											
Franconia										-			
<i>Ravensworth</i>										8:02			

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Southbound Train ID	M511	AEQ 2158	M874	M847	M413	VEQ 323	AEQ 184	M892	M415	M517	M876	A151	M849
<i>From</i>						V326							
<i>To</i>	MEQ 511	A2158	MEQ 874	M846	M612		A184	MEQ 892	MEQ 415	MEQ 517	M412	AEQ 151	M424
<i># of Locomotives</i>	1	2	1	1	1	1	1	1	1	1	1	1	1
<i># of Coaches</i>	7	6	6	4	6	8	7	5	6	8	5	8	5
<i>Train Class</i>	MARC P	ACELA NR	MARC B	MARC C	MARC P	VRE M	REG NR	MARC B	MARC P	MARC P	MARC B	REG	MARC C
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T9	T17	T13	T8	T9	T26	T13	T9	T12	T8	T11	T12	T8
Riverdale				7:28									-
<i>JD</i>				7:34									8:11
<i>Georgetown Jct.</i>			7:11					7:33			7:54		
Silver Spring			7:13					7:35			7:56		
<i>QN Tower</i>			7:25					7:47			8:08		
<i>MP 128</i>	7:16				7:35				7:50	7:57		8:06	
<i>C</i>	7:20		7:30	7:39	7:39			7:51	7:54	8:01	8:10	8:10	8:16
West Yard													
Ivy City Yard		7:15					7:35						
Coach Yard													
Wedge Yard													
<i>K</i>	7:24	7:29	7:34	7:43	7:43		7:49	7:55	7:58	8:05	8:14	8:14	8:20
Arr. Washington Union	7:25	7:30	7:35	7:44	7:44		7:50	7:56	7:59	8:06	8:15	8:15	8:21
Dep. Washington Union						7:50							
<i>A</i>						7:51							
<i>CP Virginia</i>						7:56							
L'Enfant Station						7:58							
Crystal City						8:05							
Alexandria						8:07							
<i>AF</i>						8:08							
<i>Cameron Run (CR)</i>						8:10							
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	AEQ 2160	M878	M419	A111	A2103	M894	M421	M851	M880	A89	A181	A2107	M523
<i>From</i>													
<i>To</i>	A2160	M414	MEQ 419	AEQ 111	A2110	M418	MEQ 421	M416	MEQ 880		AEQ 181	A2164	MEQ 523
<i># of Locomotives</i>	2	1	1	1	2	1	1	1	1	1	1	2	1
<i># of Coaches</i>	6	5	7	8	6	3	7	3	5	7	8	6	6
<i>Train Class</i>	ACELA NR	MARC B	MARC P	REG	ACELA	MARC B	MARC P	MARC C	MARC B	LD	REG	ACELA	MARC P
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	T18	T9	T9	T14	T19	T8	T9	T11	T11	T25	T13	T17	T12
Riverdale								9:01					
<i>JD</i>								9:02					
<i>Georgetown Jct.</i>		8:07				8:30			8:59				
Silver Spring		8:09				8:32			9:01				
<i>QN Tower</i>		8:21				8:44			9:13				
<i>MP 128</i>			8:27	8:36	8:41		8:58			9:21	9:35	9:38	9:55
<i>C</i>		8:27	8:31	8:40	8:45	8:47	9:02	9:07	9:16	9:25	9:39	9:42	9:59
West Yard													
Ivy City Yard	8:15												
Coach Yard													
Wedge Yard													
<i>K</i>	8:29	8:31	8:35	8:44	8:49	8:51	9:06	9:11	9:20	9:29	9:43	9:46	10:03
Arr. Washington Union	8:30	8:32	8:36	8:45	8:50	8:52	9:07	9:12	9:21	9:30	9:44	9:47	10:04
Dep. Washington Union										10:00			
<i>A</i>										10:01			
<i>CP Virginia</i>										10:04			
L'Enfant Station										-			
Crystal City										-			
Alexandria										10:18			
<i>AF</i>										10:22			
<i>Cameron Run (CR)</i>													
Franconia										-			
<i>Ravensworth</i>										10:33			

Notes

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Southbound Train ID	M425	A79	A51	A183	A2109	M427	A185	AEQ 186	A2151	M429	A2153	V301	A141
<i>From</i>													
<i>To</i>	M873			AEQ 183	A2166	M520	AEQ 185	A186	A2168	M428	A2170		AEQ 141
<i># of Locomotives</i>	1	1	1	1	2	1	1	1	2	1	2	1	1
<i># of Coaches</i>	4	7	6	8	6	5	9	8	6	5	6	4	9
<i>Train Class</i>	MARC P	LD	LD	REG	ACELA	MARC P	REG	REG NR	ACELA	MARC P	ACELA	VRE F	REG
<i>Operational Notes</i>		*	*										
<i>WUS Track Assignment</i>	T9	T25	T26	T14	T18	T9	T13	T12	T19	T11	T17	T26	T14
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	10:11	10:24	10:26	10:31	10:36	11:10	11:21		11:38	12:20	12:36		12:51
<i>C</i>	10:15	10:28	10:30	10:35	10:40	11:14	11:25		11:42	12:24	12:40		12:55
West Yard													
Ivy City Yard													
Coach Yard								11:22				12:43	
Wedge Yard													
<i>K</i>	10:19	10:32	10:34	10:39	10:44	11:18	11:29	11:31	11:46	12:28	12:44	12:48	12:59
Arr. Washington Union	10:20	10:33	10:35	10:40	10:45	11:19	11:30	11:32	11:47	12:29	12:45	~	13:00
Dep. Washington Union		10:53	11:05									12:55	
<i>A</i>		10:54	11:06									12:56	
<i>CP Virginia</i>		10:57	11:09									13:01	
L'Enfant Station		-	-									13:03	
Crystal City		-	-									13:10	
Alexandria		11:10	11:24									13:18	
<i>AF</i>		11:14	11:28									13:19	
<i>Cameron Run (CR)</i>			11:30										
Franconia		-										13:29	
<i>Ravensworth</i>		11:25										13:30	

Notes

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- Italics indicate interlocking passing times for which the train does not stop

Southbound Train ID	V325	A30	MEQ 871	M431	AEQ 148	A2155	A95	M433	AEQ 178	AEQ 29	A91	A2117	V303
<i>From</i>													
<i>To</i>		AEQ 30	M871	M848	A148	A2172		M895	A178	A29		A2122	
<i># of Locomotives</i>	1	2	1	1	1	2	1	1	1	2	2	2	1
<i># of Coaches</i>	8	9	4	3	8	6	8	3	8	9	9	6	7
<i>Train Class</i>	VRE M	LD	MARC NR	MARC P	REG NR	ACELA	REGR	MARC P	REG NR	LD NR	LD	ACELA	VRE F
<i>Operational Notes</i>							*				*		
<i>WUS Track Assignment</i>	T25	T26	T8	T11	T13	T18	T25	T12	T14	T26	T24	T19	T27
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>		12:44	12:58										
Silver Spring		-	-										
<i>QN Tower</i>		12:58	13:12										
<i>MP 128</i>				13:20		13:36	13:51	14:20			14:26	14:36	
<i>C</i>		13:05	13:15	13:24		13:40	13:55	14:24			14:30	14:40	
West Yard													
Ivy City Yard						13:17				14:20			
Coach Yard	13:03								14:22				14:58
Wedge Yard													
<i>K</i>	13:08	13:09	13:19	13:28	13:31	13:44	13:59	14:28	14:31	14:34	14:34	14:44	15:03
Arr. Washington Union	~	13:10	13:20	13:29	13:32	13:45	14:00	14:29	14:32	14:35	14:35	14:45	~
Dep. Washington Union	13:15						14:30				15:05		15:10
<i>A</i>	13:16						14:31				15:06		15:11
<i>CP Virginia</i>	13:21						14:34				15:09		15:16
L'Enfant Station	13:23						-				-		15:18
Crystal City	13:30						-				-		15:25
Alexandria	13:38						14:48				15:23		15:33
<i>AF</i>	13:39						14:52				15:27		15:34
<i>Cameron Run (CR)</i>	13:41												
Franconia							-				-		15:44
<i>Ravensworth</i>							15:02				15:38		15:45

Notes

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Southbound Train ID	A125	MEQ 426	V305	M435	AEQ 196	MEQ 891	V327	A2159	MEQ 850	V307	M537	MEQ 430	MEQ 532
<i>From</i>													
<i>To</i>		<i>M426</i>		<i>M881</i>	<i>A196</i>	<i>M891</i>		<i>A2124</i>	<i>M850</i>		<i>M877</i>	<i>M430</i>	<i>M532</i>
<i># of Locomotives</i>	1	1	1	1	1	1	1	2	1	1	1	1	1
<i># of Coaches</i>	8	6	6	4	9	3	8	6	7	7	5	6	7
<i>Train Class</i>	<i>REGR</i>	<i>MARC NR</i>	<i>VRE F</i>	<i>MARC P</i>	<i>REG NR</i>	<i>MARC NR</i>	<i>VRE M</i>	<i>ACELA</i>	<i>MARC NR</i>	<i>VRE F</i>	<i>MARC P</i>	<i>MARC NR</i>	<i>MARC NR</i>
<i>Operational Notes</i>	*												
<i>WUS Track Assignment</i>	<i>T23</i>	<i>T9</i>	<i>T27</i>	<i>T12</i>	<i>T13</i>	<i>T7</i>	<i>T27</i>	<i>T17</i>	<i>T8</i>	<i>T25</i>	<i>T9</i>	<i>T9</i>	<i>T10</i>
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	<i>14:56</i>			<i>15:20</i>				<i>15:36</i>			<i>15:58</i>		
<i>C</i>	<i>15:00</i>			<i>15:24</i>				<i>15:40</i>			<i>16:02</i>		
West Yard		15:03											
Ivy City Yard													
Coach Yard			15:13		15:25		15:33			15:58			
Wedge Yard						15:25			15:53			16:00	16:05
<i>K</i>	<i>15:04</i>	<i>15:12</i>	<i>15:18</i>	<i>15:28</i>	<i>15:34</i>	<i>15:34</i>	<i>15:38</i>	<i>15:44</i>	<i>16:01</i>	<i>16:03</i>	<i>16:06</i>	<i>16:09</i>	<i>16:14</i>
Arr. Washington Union	15:05	15:13	~	15:29	15:35	15:35	~	15:45	16:03	~	16:07	16:10	16:15
Dep. Washington Union	15:55		15:25				15:45			16:10			
<i>A</i>	<i>15:56</i>		<i>15:26</i>				<i>15:46</i>			<i>16:11</i>			
<i>CP Virginia</i>	<i>15:59</i>		<i>15:31</i>				<i>15:51</i>			<i>16:16</i>			
L'Enfant Station	16:03		15:33				15:53			16:18			
Crystal City	-		15:40				16:00			16:25			
Alexandria	16:14		15:48				16:08			16:33			
<i>AF</i>	<i>16:18</i>		<i>15:49</i>				<i>16:09</i>			<i>16:34</i>			
<i>Cameron Run (CR)</i>							<i>16:11</i>						
Franconia	-		15:59							16:44			
<i>Ravensworth</i>	<i>16:28</i>		<i>16:00</i>							<i>16:45</i>			

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Southbound Train ID	MEQ 875	A171	V329	A133	MEQ 634	MEQ 852	V309	AEQ 138	M439	A2121	M853	V331	MEQ 536
<i>From</i>			V336									VEQ 320	
<i>To</i>	M875			AEQ 133	M634	M852		A138	M879	A2126	M438		M536
<i># of Locomotives</i>	1	1	1	1	1	1	1	1	1	2	1	1	1
<i># of Coaches</i>	6	8	8	8	6	5	8	9	5	6	4	8	8
<i>Train Class</i>	MARC NR	REGR	VRE M	REG	MARC NR	MARC NR	VRE F	REG NR	MARC P	ACELA	MARC C	VRE M	MARC NR
<i>Operational Notes</i>		*											
<i>WUS Track Assignment</i>	T11	T24	T27	T14	T10	T9	T27	T11	T8	T18	T10	T27	T9
Riverdale											-		
<i>JD</i>											16:40		
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	16:06	16:09		16:16					16:30	16:36			
<i>C</i>	16:10	16:13		16:20					16:34	16:40	16:45		
West Yard													
Ivy City Yard													
Coach Yard							16:28	16:25					
Wedge Yard					16:20	16:23							16:50
<i>K</i>	16:14	16:17		16:24	16:29	16:32	16:33	16:34	16:38	16:44	16:49		16:59
Arr. Washington Union	16:15	16:18		16:25	16:30	16:33	~	16:35	16:39	16:45	16:50		17:00
Dep. Washington Union		16:50	16:25				16:40					17:05	
<i>A</i>		16:51	16:26				16:41					17:06	
<i>CP Virginia</i>		16:54	16:31				16:46					17:11	
L'Enfant Station		16:58	16:33				16:48					17:13	
Crystal City		-	16:40				16:55					17:20	
Alexandria		17:11	16:48				17:03					17:28	
<i>AF</i>		17:15	16:49				17:04					17:29	
<i>Cameron Run (CR)</i>		17:17	16:51									17:31	
Franconia							17:14						
<i>Ravensworth</i>							17:15						

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Southbound Train ID	M641	V311	MEQ 893	MEQ 854	A83	V333	M855	MEQ 642	M443	AEQ 188	A2163	V313	A19
<i>From</i>													
<i>To</i>	M440		M893	M854			M856	M642	M544	A188	AEQ 2163		
<i># of Locomotives</i>	1	1	1	1	1	1	1	1	1	1	2	1	2
<i># of Coaches</i>	6	6	5	4	8	6	4	7	6	8	6	5	9
<i>Train Class</i>	MARC P	VRE F	MARC NR	MARC NR	REGR	VRE M	MARC C	MARC NR	MARC P	REG NR	ACELA	VRE F	LD
<i>Operational Notes</i>					*								*
<i>WUS Track Assignment</i>	T8	T25	T13	T7	T23	T27	T9	T9	T10	T13	T19	T27	T24
Riverdale				-			-						
<i>JD</i>				17:02			17:20						
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	16:59				17:06				17:31		17:36		17:51
<i>C</i>	17:03			17:07	17:10		17:25		17:35		17:40		17:55
West Yard								17:30					
Ivy City Yard													
Coach Yard		17:03				17:18				17:30		17:48	
Wedge Yard			17:00										
<i>K</i>	17:07	17:08	17:09	17:11	17:14	17:23	17:29	17:39	17:39	17:39	17:44	17:53	17:59
Arr. Washington Union	17:08	~	17:10	17:12	17:15	~	17:30	17:40	17:40	17:40	17:45	~	18:00
Dep. Washington Union		17:15			17:50	17:30						18:00	18:30
<i>A</i>		17:16			17:51	17:31						18:01	18:31
<i>CP Virginia</i>		17:21			17:54	17:36						18:06	18:34
L'Enfant Station		17:23			17:58	17:38						18:08	-
Crystal City		17:30			-	17:45						18:15	-
Alexandria		17:38			18:09	17:53						18:23	18:49
<i>AF</i>		17:39			18:13	17:54						18:24	18:53
<i>Cameron Run (CR)</i>						17:56							18:55
Franconia		17:49			-							18:34	
<i>Ravensworth</i>		17:50			18:23							18:35	

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Southbound Train ID	V335	M445	A85	M857	V315	M447	V337	A173	A2165	A97	M449	AEQ 198	M859
<i>From</i>							V338						
<i>To</i>		M446		M858		M883		AEQ 173	A2128		M448	A198	M860
<i># of Locomotives</i>	1	1	1	1	1	1	1	1	2	2	1	1	1
<i># of Coaches</i>	6	6	6	4	6	5	7	8	6	11	7	8	4
<i>Train Class</i>	VRE M	MARC P	REGR	MARC C	VRE F	MARC P	VRE M	REG	ACELA	LD	MARC P	REG NR	MARC C
<i>Operational Notes</i>			*							*			
<i>WUS Track Assignment</i>	T26	T9	T23	T7	T26	T10	T27	T14	T17	T24	T11	T13	T8
Riverdale				18:13									19:08
<i>JD</i>				18:18									19:13
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>		18:11	18:16			18:26		18:38	18:40	18:46	19:06		
<i>C</i>		18:15	18:20	18:23		18:30		18:42	18:44	18:50	19:10		19:18
<i>West Yard</i>													
<i>Ivy City Yard</i>													
<i>Coach Yard</i>	17:58				18:28							19:05	
<i>Wedge Yard</i>													
<i>K</i>	18:03	18:19	18:24	18:27	18:33	18:34		18:46	18:48	18:54	19:14	19:14	19:22
Arr. Washington Union	~	18:20	18:25	18:28	~	18:35		18:47	18:49	18:55	19:15	19:15	19:23
Dep. Washington Union	18:10		19:05		18:40		18:50			19:25			
<i>A</i>	18:11		19:06		18:41		18:51			19:26			
<i>CP Virginia</i>	18:16		19:09		18:46		18:56			19:29			
L'Enfant Station	18:18		-		18:48		18:58			-			
Crystal City	18:25		-		18:55		19:05			-			
Alexandria	18:33		19:22		19:03		19:13			19:44			
<i>AF</i>	18:34		19:26		19:04		19:14			19:48			
<i>Cameron Run (CR)</i>	18:36						19:16						
Franconia			-		19:14					-			
<i>Ravensworth</i>			19:36		19:15					19:59			

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Southbound Train ID	A127	A2167	A129	M451	A2119	A193	A137	A2171	A55	M453	A175	A2173	A2175
<i>From</i>													
<i>To</i>	AEQ 127	AEQ 2167	AEQ 129	M548	AEQ 2119	AEQ 193	AEQ 137	AEQ 2171	AEQ 55	M452	AEQ 175	AEQ 2173	AEQ 2175
<i># of Locomotives</i>	1	2	1	1	2	1	1	2	1	1	1	2	2
<i># of Coaches</i>	8	6	7	7	6	7	8	6	5	6	8	6	6
<i>Train Class</i>	REG	ACELA	REG	MARC P	ACELA	REG	REG	ACELA	REG	MARC P	REG	ACELA	ACELA
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T12	T19	T14	T9	T18	T13	T14	T17	T11	T10	T13	T19	T17
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	19:16	19:36	19:56	20:18	20:36	20:56	21:36	21:38	21:50	22:06	22:51	23:01	23:50
<i>C</i>	19:20	19:40	20:00	20:22	20:40	21:00	21:40	21:42	21:54	22:10	22:55	23:05	23:54
West Yard													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	19:24	19:44	20:04	20:26	20:44	21:04	21:44	21:46	21:58	22:14	22:59	23:09	23:58
Arr. Washington Union	19:25	19:45	20:05	20:27	20:45	21:05	21:45	21:47	21:59	22:15	23:00	23:10	23:59
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

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Northbound Train ID	AEQ 175	AEQ 2173	AEQ 2175	AEQ 187	AEQ 177	A190	A110	A170	A2150	A180	M400	A2100	M502
<i>From</i>	<i>A175</i>	<i>A2173</i>	<i>A2175</i>	<i>A187</i>	<i>A177</i>	<i>AEQ 190</i>	<i>AEQ 110</i>	<i>AEQ 170</i>	<i>AEQ 2150</i>	<i>AEQ 180</i>	<i>M401</i>	<i>AEQ 2100</i>	<i>M403</i>
<i>To</i>													
<i># of Locomotives</i>	1	2	2	1	1	1	1	1	2	1	1	2	1
<i># of Coaches</i>	8	6	6	8	8	8	7	8	6	7	6	6	6
<i>Train Class</i>	REG NR	ACELA NR	ACELA NR	REG NR	REG NR	REG	REG	REG	ACELA	REG	MARC P	ACELA	MARC P
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T13	T19	T17	T11	T12	T11	T12	T11	T17	T13	T11	T18	T11
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>													
<i>AF</i>													
Alexandria													
Crystal City													
L'Enfant Station													
<i>CP Virginia</i>													
<i>A</i>													
Arr. Washington Union													
Dep. Washington Union	0:00	0:10	0:59	1:35	2:25	3:15	4:00	4:52	5:00	5:30	5:50	6:00	6:15
<i>K</i>	<i>0:01</i>	<i>0:11</i>	<i>1:00</i>	<i>1:36</i>	<i>2:26</i>	<i>3:16</i>	<i>4:01</i>	<i>4:53</i>	<i>5:01</i>	<i>5:31</i>	<i>5:51</i>	<i>6:01</i>	<i>6:16</i>
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>	0:15	0:25	1:14	1:50	2:40								
<i>West Yard</i>													
<i>C</i>						3:20	4:05	4:57	5:05	5:35	5:55	6:05	6:20
<i>MP 128</i>						3:24	4:09	5:01	5:09	5:39	5:59	6:09	6:24
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

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Northbound Train ID	A130	V322	M840	M404	V300	MEQ 890	V302	A2154	M842	V324	M406	V304	M408
<i>From</i>	AEQ 130		M841	M505		M890		AEQ 2154	M843		M870		M409
<i>To</i>		V321											
<i># of Locomotives</i>	1	1	1	1	1	1	1	2	1	1	1	1	1
<i># of Coaches</i>	7	6	3	7	5	3	6	6	3	6	4	8	7
<i>Train Class</i>	REG	VRE M	MARC C	MARC P	VRE F	MARC NR	VRE F	ACELA	MARC C	VRE M	MARC P	VRE F	MARC P
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T12	T25	T7	T11	T25	T7	T25	T17	T8	T26	T8	T26	T9
<i>Ravensworth</i>					5:55		6:10					6:26	
<i>Franconia</i>					5:56		6:11					6:27	
<i>Cameron Run (CR)</i>		5:55								6:25			
<i>AF</i>		5:57			6:05		6:21			6:27		6:37	
<i>Alexandria</i>		5:59			6:07		6:23			6:29		6:39	
<i>Crystal City</i>		6:08			6:16		6:32			6:38		6:48	
<i>L'Enfant Station</i>		6:16			6:24		6:40			6:46		6:56	
<i>CP Virginia</i>		6:19			6:27		6:43			6:49		6:59	
<i>A</i>		6:23			6:31		6:47			6:53		7:03	
Arr. Washington Union		6:24			6:32		6:48			6:54		7:04	
Dep. Washington Union	6:30		6:32	6:35	~	6:52	~	7:00	7:00	~	7:10	~	7:20
<i>K</i>	6:31		6:33	6:36	6:39	6:53	6:55	7:01	7:01	7:01	7:11	7:11	7:21
<i>Wedge Yard</i>													
<i>Coach Yard</i>					6:44		7:00			7:06		7:16	
<i>Ivy City Yard</i>													
<i>West Yard</i>						7:02							
<i>C</i>	6:35		6:37	6:40				7:05	7:05		7:15		7:25
<i>MP 128</i>	6:39			6:44				7:09			7:19		7:29
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>			6:40						7:08				
Riverdale			6:42						7:10				

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Northbound Train ID	V306	A172	A98	MEQ 511	V326	M844	MEQ 874	V308	M610	A2104	M846	V328	MEQ 892
<i>From</i>		AEQ 172		M511		M845	M874		M407	AEQ 2104	M847		M892
<i>To</i>					VEQ 323								
<i># of Locomotives</i>	1	1	2	1	1	1	1	1	1	2	1	1	1
<i># of Coaches</i>	7	8	11	7	8	4	6	7	6	6	4	8	5
<i>Train Class</i>	VRE F	REG	LD	MARC NR	VRE M	MARC C	MARC NR	VRE F	MARC P	ACELA	MARC C	VRE M	MARC NR
<i>Operational Notes</i>			*										
<i>WUS Track Assignment</i>	T26	T13	T25	T9	T26	T8	T13	T25	T12	T18	T8	T25	T9
<i>Ravensworth</i>	6:40		6:23					7:06					
<i>Franconia</i>	6:41		-					7:07					
<i>Cameron Run (CR)</i>					7:05							7:25	
<i>AF</i>	6:51		6:33		7:07			7:17				7:27	
<i>Alexandria</i>	6:53		6:36		7:09			7:19				7:29	
<i>Crystal City</i>	7:02		-		7:18			7:28				7:38	
<i>L'Enfant Station</i>	7:10		-		7:26			7:36				7:46	
<i>CP Virginia</i>	7:13		6:53		7:29			7:39				7:49	
<i>A</i>	7:17		6:55		7:33			7:43				7:53	
Arr. Washington Union	7:18		7:07		7:34			7:44				7:54	
Dep. Washington Union	~	7:26	7:37	7:37		7:40	7:47	~	7:50	8:00	8:00	~	8:08
<i>K</i>	7:25	7:27	7:38	7:38		7:41	7:48	7:51	7:51	8:01	8:01	8:01	8:09
<i>Wedge Yard</i>							7:57						8:18
<i>Coach Yard</i>	7:30							7:56				8:06	
<i>Ivy City Yard</i>													
<i>West Yard</i>				7:47									
<i>C</i>		7:31	7:41			7:45			7:55	8:05	8:05		
<i>MP 128</i>		7:35	7:45						7:59	8:09			
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>						7:48					8:08		
Riverdale						-					-		

Notes

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Northbound Train ID	A56	V310	MEQ 415	MEQ 517	M612	A86	V330	MEQ 419	V312	A2158	M412	V332	AEQ 151
<i>From</i>	AEQ 56		M415	M517	M413			M419		AEQ 2158	M876		A151
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	1	1	1	1	1	2	1	1	1
<i># of Coaches</i>	5	6	6	8	6	7	7	7	4	6	5	6	8
<i>Train Class</i>	REG	VRE F	MARC NR	MARC NR	MARC P	REGR	VRE M	MARC NR	VRE F	ACELA	MARC P	VRE M	REG NR
<i>Operational Notes</i>						*							
<i>WUS Track Assignment</i>	T11	T26	T12	T8	T9	T23	T25	T9	T26	T17	T11	T25	T12
<i>Ravensworth</i>		7:26				7:39			8:11				
<i>Franconia</i>		7:27				-			8:12				
<i>Cameron Run (CR)</i>							8:10					8:38	
<i>AF</i>		7:37				7:49	8:12		8:22			8:40	
<i>Alexandria</i>		7:39				7:52	8:14		8:24			8:42	
<i>Crystal City</i>		7:48				-	8:23		8:33			8:51	
<i>L'Enfant Station</i>		7:56				8:07	8:31		8:41			8:59	
<i>CP Virginia</i>		7:59				8:09	8:34		8:44			9:02	
<i>A</i>		8:03				8:11	8:38		8:48			9:06	
Arr. Washington Union		8:04				8:15	8:39		8:49			9:07	
Dep. Washington Union	8:10	~	8:11	8:18	8:20	8:40	~	8:48	~	9:00	9:05	~	9:15
<i>K</i>	8:11	8:11	8:12	8:19	8:21	8:41	8:46	8:49	8:56	9:01	9:06	9:14	9:16
<i>Wedge Yard</i>				8:28				8:58					
<i>Coach Yard</i>		8:16					8:51		9:01			9:19	9:25
<i>Ivy City Yard</i>													
<i>West Yard</i>			8:21										
<i>C</i>	8:15				8:25	8:44				9:05	9:10		
<i>MP 128</i>	8:19				8:29	8:48				9:09	9:14		
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

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Northbound Train ID	MEQ 421	A184	V314	A174	M414	MEQ 880	AEQ 111	A2160	MEQ 523	A20	M416	AEQ 181	A2110
<i>From</i>	M421	AEQ 184			M878	M880	A111	AEQ 2160	M523		M851	A181	A2103
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	1	1	1	2	1	2	1	1	2
<i># of Coaches</i>	7	7	6	8	5	5	8	6	6	9	3	8	6
<i>Train Class</i>	MARC NR	REG	VRE F	REGR	MARC P	MARC NR	REG NR	ACELA	MARC NR	LD	MARC P	REG NR	ACELA
<i>Operational Notes</i>				*						*			
<i>WUS Track Assignment</i>	T9	T13	T26	T23	T9	T11	T14	T18	T12	T26	T11	T13	T19
<i>Ravensworth</i>			8:39	8:23									
<i>Franconia</i>			8:40	-									
<i>Cameron Run (CR)</i>										9:22			
<i>AF</i>			8:50	8:33						9:24			
<i>Alexandria</i>			8:52	8:36						9:32			
<i>Crystal City</i>			9:01	-						-			
<i>L'Enfant Station</i>			9:09	8:51						-			
<i>CP Virginia</i>			9:12	8:53						9:49			
<i>A</i>			9:16	8:55						9:51			
Arr. Washington Union			9:17	9:00						9:53			
Dep. Washington Union	9:19	9:20	~	9:25	9:30	9:33	9:45	10:00	10:16	10:23	10:30	10:44	11:00
<i>K</i>	9:20	9:21	9:24	9:26	9:31	9:34	9:46	10:01	10:17	10:24	10:31	10:45	11:01
<i>Wedge Yard</i>	9:29					9:43							
<i>Coach Yard</i>			9:29									10:54	
<i>Ivy City Yard</i>							10:00						
<i>West Yard</i>									10:26				
<i>C</i>		9:25		9:29	9:35			10:05		10:27	10:35		11:05
<i>MP 128</i>		9:29		9:33	9:39			10:09		10:31	10:39		11:09
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

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Northbound Train ID	A84	M418	AEQ 183	A2164	A176	M520	AEQ 185	A2166	A186	M422	M871	AEQ 141	A2168
<i>From</i>		M894	A183	A2107		M427	A185	A2109	AEQ 186	M872	MEQ 871	A141	A2151
<i>To</i>													
<i># of Locomotives</i>	1	1	1	2	1	1	1	2	1	1	1	1	2
<i># of Coaches</i>	7	3	8	6	8	5	9	6	8	4	4	9	6
<i>Train Class</i>	REGR	MARC P	REG NR	ACELA	REGR	MARC P	REG NR	ACELA	REG	MARC P	MARC B	REG NR	ACELA
<i>Operational Notes</i>	*				*								
<i>WUS Track Assignment</i>	T23	T8	T14	T17	T25	T9	T13	T18	T12	T7	T8	T14	T19
Ravensworth	10:02												
Franconia	-												
<i>Cameron Run (CR)</i>					10:55								
<i>AF</i>	10:12				10:57								
Alexandria	10:15				11:05								
Crystal City	-				-								
L'Enfant Station	-				-								
<i>CP Virginia</i>	10:32				11:22								
<i>A</i>	10:34				11:24								
Arr. Washington Union	10:39				11:20								
Dep. Washington Union	11:02	11:20	11:40	12:00	12:02	12:20	12:30	13:00	13:02	13:20	13:30	14:00	14:00
<i>K</i>	11:03	11:21	11:41	12:01	12:03	12:21	12:31	13:01	13:03	13:21	13:31	14:01	14:01
Wedge Yard													
Coach Yard			11:50				12:40					14:10	
Ivy City Yard													
West Yard													
<i>C</i>	11:06	11:25		12:05	12:06	12:25		13:05	13:07	13:25	13:35		14:05
<i>MP 128</i>	11:10	11:29		12:09	12:10	12:29		13:09	13:11	13:29			14:09
<i>QN Tower</i>											13:38		
Silver Spring											13:43		
<i>Georgetown Jct.</i>											13:45		
<i>JD</i>													
Riverdale													

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Northbound Train ID	A94	AEQ 30	M424	A2170	A148	A92	M426	M873	M848	A134	M891	A2172	V336
<i>From</i>		A30	M849	A2153	AEQ 148		MEQ 426	M425	M431	AEQ 134	MEQ 891	A2155	
<i>To</i>													V329
<i># of Locomotives</i>	1	2	1	2	1	2	1	1	1	1	1	2	1
<i># of Coaches</i>	8	9	5	6	8	10	6	4	3	6	3	6	8
<i>Train Class</i>	REGR	LD NR	MARC P	ACELA	REG	LD	MARC P	MARC B	MARC C	REG	MARC B	ACELA	VRE M
<i>Operational Notes</i>	*					*							
<i>WUS Track Assignment</i>	T23	T26	T8	T17	T13	T25	T9	T9	T11	#N/A	T7	T18	T27
<i>Ravensworth</i>	12:54					13:51							
<i>Franconia</i>	-					-							
<i>Cameron Run (CR)</i>													15:26
<i>AF</i>	13:04					14:01							15:28
<i>Alexandria</i>	13:07					14:04							15:30
<i>Crystal City</i>	-					-							15:39
<i>L'Enfant Station</i>	-					-							15:47
<i>CP Virginia</i>	13:24					14:21							15:50
<i>A</i>	13:26					14:23							15:54
<i>Arr. Washington Union</i>	13:35					14:38							15:55
<i>Dep. Washington Union</i>	14:02	14:10	14:20	15:00	15:02	15:08	15:23	15:30	15:30	15:30	15:45	16:00	
<i>K</i>	14:03	14:11	14:21	15:01	15:03	15:09	15:24	15:31	15:31	15:31	15:46	16:01	
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>		14:25											
<i>West Yard</i>													
<i>C</i>	14:06		14:25	15:05	15:07	15:12	15:28	15:35	15:35	15:35	15:50	16:05	
<i>MP 128</i>	14:10		14:29	15:09	15:11	15:16	15:32			15:39		16:09	
<i>QN Tower</i>								15:38			15:53		
<i>Silver Spring</i>								15:44			15:59		
<i>Georgetown Jct.</i>								15:46			16:01		
<i>JD</i>									15:38				
<i>Riverdale</i>									-				

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Northbound Train ID	A178	A29	M428	M850	M430	M875	M532	M634	M852	M877	A80	A2122	A196
<i>From</i>	AEQ 178	AEQ 29	M429	MEQ 850	MEQ 430	MEQ 875	MEQ 532	MEQ 634	M439	M537		A2117	AEQ 196
<i>To</i>													
<i># of Locomotives</i>	1	2	1	1	1	1	1	1	1	1	1	2	1
<i># of Coaches</i>	8	9	5	7	6	6	7	6	5	5	7	6	9
<i>Train Class</i>	REG	LD	MARC P	MARC C	MARC P	MARC B	MARC P	MARC P	MARC C	MARC B	LD	ACELA	REG
<i>Operational Notes</i>											*		
<i>WUS Track Assignment</i>	T14	T26	T11	T8	T9	T11	T10	T10	T9	T9	T26	T19	T13
<i>Ravensworth</i>											15:49		
<i>Franconia</i>											-		
<i>Cameron Run (CR)</i>													
<i>AF</i>											15:59		
<i>Alexandria</i>											16:02		
<i>Crystal City</i>											-		
<i>L'Enfant Station</i>											-		
<i>CP Virginia</i>											16:19		
<i>A</i>											16:21		
<i>Arr. Washington Union</i>											16:29		
<i>Dep. Washington Union</i>	16:02	16:05	16:10	16:13	16:20	16:25	16:25	16:40	16:43	16:55	16:59	17:00	17:05
<i>K</i>	16:03	16:06	16:11	16:14	16:21	16:26	16:26	16:41	16:44	16:56	17:00	17:01	17:06
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>													
<i>West Yard</i>													
<i>C</i>	16:07	16:10	16:15	16:18	16:25	16:30	16:30	16:45	16:48	17:00	17:03	17:05	17:10
<i>MP 128</i>	16:11		16:19		16:29		16:34	16:49			17:07	17:09	17:14
<i>QN Tower</i>		16:13				16:33				17:03			
<i>Silver Spring</i>		-				16:39				17:09			
<i>Georgetown Jct.</i>		16:22				16:41				17:11			
<i>JD</i>				16:21					16:51				
<i>Riverdale</i>				-					16:53				

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Northbound Train ID	VEQ 320	M536	M893	M438	M854	M440	AEQ 133	M879	M642	M856	A2124	A138	M881
<i>From</i>		<i>MEQ 536</i>	<i>MEQ 893</i>	<i>M853</i>	<i>MEQ 854</i>	<i>M641</i>	<i>A133</i>	<i>M439</i>	<i>MEQ 642</i>	<i>M855</i>	<i>A2159</i>	<i>AEQ 138</i>	<i>M435</i>
<i>To</i>	V331												
<i># of Locomotives</i>	1	1	1	1	1	1	1	1	1	1	2	1	1
<i># of Coaches</i>	6	8	5	7	4	6	8	5	7	4	6	9	4
<i>Train Class</i>	VRE M	MARC P	MARC B	MARC P	MARC C	MARC P	REG NR	MARC B	MARC P	MARC C	ACELA	REG	MARC B
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T27	T9	T13	T10	T7	T8	T14	T8	T9	T9	T17	T11	T12
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>	16:31												
<i>AF</i>	16:33												
Alexandria	16:35												
Crystal City	16:44												
L'Enfant Station	16:52												
<i>CP Virginia</i>	16:55												
<i>A</i>	16:59												
Arr. Washington Union	17:00												
Dep. Washington Union		17:10	17:20	17:20	17:22	17:25	17:25	17:40	17:50	17:53	18:00	18:05	18:20
<i>K</i>		17:11	17:21	17:21	17:23	17:26	17:26	17:41	17:51	17:54	18:01	18:06	18:21
<i>Wedge Yard</i>													
<i>Coach Yard</i>							17:35						
<i>Ivy City Yard</i>													
<i>West Yard</i>													
<i>C</i>		17:15	17:25	17:25	17:27	17:30		17:45	17:55	17:58	18:05	18:10	18:25
<i>MP 128</i>		17:19		17:29		17:34			17:59		18:09	18:14	
<i>QN Tower</i>			17:28					17:48					18:28
Silver Spring			17:34					17:54					18:34
<i>Georgetown Jct.</i>			17:36					17:56					18:36
<i>JD</i>					17:30					18:01			
Riverdale					17:32					-			

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Northbound Train ID	M544	V338	M895	M446	AEQ 2163	A50	M858	A2126	A188	M883	M448	M860	AEQ 173
<i>From</i>	M443		M433	M445	A2163		M857	A2121	AEQ 188	M447	M449	M860	A173
<i>To</i>		V337											
<i># of Locomotives</i>	1	1	1	1	2	1	1	2	1	1	1	1	1
<i># of Coaches</i>	6	7	3	6	6	6	4	6	8	5	7	4	8
<i>Train Class</i>	MARC P	VRE M	MARC B	MARC P	ACELA NR	LD	MARC C	ACELA	REG	MARC B	MARC P	MARC C	REG NR
<i>Operational Notes</i>						*							
<i>WUS Track Assignment</i>	T10	T27	T12	T9	T19	T25	T7	T18	T13	T10	T11	T8	T14
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>		17:48				17:49							
<i>AF</i>		17:50				17:51							
Alexandria		17:52				17:59							
Crystal City		18:01				-							
L'Enfant Station		18:09				-							
<i>CP Virginia</i>		18:12				18:16							
<i>A</i>		18:24				18:18							
Arr. Washington Union		18:25				18:19							
Dep. Washington Union	18:23		18:40	18:40	18:45	18:49	18:55	19:00	19:10	19:25	19:40	19:45	19:47
<i>K</i>	18:24		18:41	18:41	18:46	18:50	18:56	19:01	19:11	19:26	19:41	19:46	19:48
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>					19:00								20:02
<i>West Yard</i>													
<i>C</i>	18:28		18:45	18:45		18:53	19:00	19:05	19:15	19:30	19:45	19:50	
<i>MP 128</i>	18:32			18:49		18:57		19:09	19:19		19:49		
<i>QN Tower</i>			18:48							19:33			
Silver Spring			18:53							19:37			
<i>Georgetown Jct.</i>			18:55							19:39			
<i>JD</i>							19:03					19:53	
Riverdale							19:05					19:55	

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Northbound Train ID	A2128	A90	AEQ 127	AEQ 2167	A198	M548	AEQ 129	AEQ 2119	AEQ 193	A66	M452	AEQ 137	AEQ 2171
<i>From</i>	A2165		A127	A2167	AEQ 198	M451	A129	A2119	A193		M453	A137	A2171
<i>To</i>													
<i># of Locomotives</i>	2	1	1	2	1	1	1	2	1	1	1	1	2
<i># of Coaches</i>	6	7	8	6	8	7	7	6	7	6	6	8	6
<i>Train Class</i>	ACELA	LD	REG NR	ACELA NR	REG	MARC P	REG NR	ACELA NR	REG NR	REGR	MARC P	REG NR	ACELA NR
<i>Operational Notes</i>		*								*			
<i>WUS Track Assignment</i>	T17	T26	T12	T19	T13	T9	T14	T18	T13	T25	T10	T14	T17
<i>Ravensworth</i>		18:54								20:42			
<i>Franconia</i>		-								-			
<i>Cameron Run (CR)</i>													
<i>AF</i>		19:04								20:52			
<i>Alexandria</i>		19:07								20:55			
<i>Crystal City</i>		-								-			
<i>L'Enfant Station</i>		-								-			
<i>CP Virginia</i>		19:24								21:12			
<i>A</i>		19:26								21:14			
<i>Arr. Washington Union</i>		19:42								21:20			
<i>Dep. Washington Union</i>	20:00	20:12	20:25	20:45	20:45	21:00	21:05	21:45	22:05	22:10	22:30	22:45	22:47
<i>K</i>	20:01	20:13	20:26	20:46	20:46	21:01	21:06	21:46	22:06	22:11	22:31	22:46	22:48
<i>Wedge Yard</i>													
<i>Coach Yard</i>			20:35										
<i>Ivy City Yard</i>				21:00			21:20	22:00	22:20			23:00	23:02
<i>West Yard</i>													
<i>C</i>	20:05	20:16			20:50	21:05				22:14	22:35		
<i>MP 128</i>	20:09	20:20			20:54	21:09				22:18	22:39		
<i>QN Tower</i>													
<i>Silver Spring</i>													
<i>Georgetown Jct.</i>													
<i>JD</i>													
<i>Riverdale</i>													

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Northbound Train ID	AEQ 55
<i>From</i>	A55
<i>To</i>	
<i># of Locomotives</i>	1
<i># of Coaches</i>	5
<i>Train Class</i>	REG NR
<i>Operational Notes</i>	
<i>WUS Track Assignment</i>	T11
<i>Ravensworth</i>	
Franconia	
<i>Cameron Run (CR)</i>	
<i>AF</i>	
Alexandria	
Crystal City	
L'Enfant Station	
<i>CP Virginia</i>	
<i>A</i>	
Arr. Washington Union	
Dep. Washington Union	22:59
<i>K</i>	23:00
Wedge Yard	
Coach Yard	
Ivy City Yard	23:14
West Yard	
<i>C</i>	
<i>MP 128</i>	
<i>QN Tower</i>	
Silver Spring	
<i>Georgetown Jct.</i>	
<i>JD</i>	
Riverdale	

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Italics indicate interlocking passing times for which the train does not stop

* Requires engine change at WUS

Appendix B: 2030+ Operating Plan

Southbound Train ID	A2175	A177	A189	AEQ 190	AEQ 170	AEQ 2202	AEQ 110	AEQ 2150	AEQ 140	AEQ 2302	AEQ 2204	AEQ 130	AEQ 2152
<i>From</i>													
<i>To</i>	AEQ 2175	AEQ 177	AEQ 189	A190	A170	A2202	A110	A2150	A140	A2302	A2204	A130	A2152
<i># of Locomotives</i>	0	1	1	1	1	0	1	0	1	0	0	1	0
<i># of Coaches</i>	8	10	10	10	10	8	10	8	10	8	8	10	8
<i>Train Class</i>	ACELA	REG	REG	REG NR	REG NR	ACELA NR	REG NR	ACELA NR	REG NR	ACELA NR	ACELA NR	REG NR	ACELA NR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T7	T4	T4	T7	T4	T8	T5	T10	T7	T9	T12	T4	T11
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	0:01	0:28	1:43										
<i>C</i>	0:05	0:32	1:47										
VRE Midday Storage													
Ivy City Yard						3:30		3:55		4:15	4:30		4:55
Coach Yard				2:15	3:05		3:45		4:05			4:45	
Wedge Yard													
<i>K</i>	0:09	0:36	1:51	2:24	3:14	3:44	3:54	4:09	4:14	4:29	4:44	4:54	5:09
Arr. Washington Union	0:10	0:37	1:52	2:25	3:15	3:45	3:55	4:10	4:15	4:30	4:45	4:55	5:10
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	AEQ 172	M401	AEQ 2304	A3611	AEQ 2206	M403	M841	AEQ 2154	AEQ 56	M505	M870	M9905	M843
<i>From</i>													
<i>To</i>	A172	M400	A2304		A2206	M502	M840	A2154	A56	M404	M408	MEQ 9905	M842
<i># of Locomotives</i>	1	1	0	2	0	1	1	0	1	1	1	1	1
<i># of Coaches</i>	10	8	8	10	8	8	4	8	10	5	5	7	4
<i>Train Class</i>	REG NR	MARC P	ACELA NR	SEHSR	ACELA NR	MARC P	MARC C	ACELA NR	REG NR	MARC P	MARC B	MARC P	MARC C
<i>Operational Notes</i>				*									
<i>WUS Track Assignment</i>	T6	T5	T8	T22	T10	T5	T3	T9	T7	T1	T5	T2	T4
Riverdale							5:53						6:19
<i>JD</i>							5:55						6:21
<i>Georgetown Jct.</i>											6:01		
Silver Spring											6:03		
<i>QN Tower</i>											6:15		
<i>MP 128</i>		5:20				5:50				6:10		6:15	
<i>C</i>		5:24				5:54	5:58			6:14	6:18	6:19	6:24
VRE Midday Storage													
Ivy City Yard			5:15	5:25	5:30			5:55					
Coach Yard	5:05								6:05				
Wedge Yard													
<i>K</i>	5:14	5:28	5:29	5:39	5:44	5:58	6:02	6:09	6:14	6:18	6:22	6:23	6:28
Arr. Washington Union	5:15	5:29	5:30	5:40	5:45	5:59	6:03	6:10	6:15	6:19	6:23	6:24	6:29
Dep. Washington Union				6:10									
<i>A</i>				6:11									
<i>CP Virginia</i>				6:14									
L'Enfant Station				-									
Crystal City				-									
Alexandria				6:24									
<i>AF</i>				6:25									
<i>Cameron Run (CR)</i>													
Franconia				-									
<i>Ravensworth</i>				6:36									

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Southbound Train ID	AEQ 2306	V501	M890	A67	AEQ 2208	V401	M407	V503	M872	AEQ 2156	M409	V403	M845
<i>From</i>		V500				V400		V502				V402	
<i>To</i>	A2306		MEQ 890		A2208		M406		M412	A2156	MEQ 409		M844
<i># of Locomotives</i>	0	1	1	2	0	1	1	1	1	0	1	1	1
<i># of Coaches</i>	8	7	4	10	8	8	8	9	5	8	8	8	5
<i>Train Class</i>	ACELA NR	VRE F	MARC B	REGR	ACELA NR	VRE M	MARC P	VRE F	MARC B	ACELA NR	MARC P	VRE M	MARC C
<i>Operational Notes</i>				*									
<i>WUS Track Assignment</i>	T12	T26	T4	T22	T11	T27	T3	T26	T4	T8	T6	T27	T2
Riverdale													7:08
<i>JD</i>													7:10
<i>Georgetown Jct.</i>			6:18						6:47				
Silver Spring			6:20						6:49				
<i>QN Tower</i>			6:32						7:01				
<i>MP 128</i>				6:33			6:40				7:05		
<i>C</i>			6:35	6:37			6:44		7:04		7:09		7:13
VRE Midday Storage													
<i>Ivy City Yard</i>	6:15				6:30					6:55			
<i>Coach Yard</i>													
<i>Wedge Yard</i>													
<i>K</i>	6:29		6:39	6:41	6:44		6:48		7:08	7:09	7:13		7:17
Arr. Washington Union	6:30		6:40	6:42	6:45		6:49		7:09	7:10	7:14		7:18
Dep. Washington Union		6:40		7:15		6:55		7:10				7:25	
<i>A</i>		6:41		7:16		6:56		7:11				7:26	
<i>CP Virginia</i>		6:44		7:19		6:59		7:14				7:29	
L'Enfant Station		6:48		-		7:01		7:18				7:31	
Crystal City		6:55		-		7:06		7:25				7:36	
Alexandria		7:02		7:29		7:14		7:32				7:44	
<i>AF</i>		7:03		7:30		7:15		7:33				7:45	
<i>Cameron Run (CR)</i>						7:17						7:47	
Franconia		7:13		-				7:43					
<i>Ravensworth</i>		7:14		7:41				7:44					

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Southbound Train ID	M511	M9911	AEQ 2308	V505	M874	A151	M413	M847	AEQ 2210	V405	M415	M892	M517
<i>From</i>				V506						V406			
<i>To</i>	M610	MEQ 9911	A2308		M897		M612	MEQ 847	A2210		MEQ 415	MEQ 892	MEQ 517
<i># of Locomotives</i>	1	1	0	1	1	2	1	1	0	1	1	1	1
<i># of Coaches</i>	8	8	8	9	7	10	8	5	8	9	7	6	7
<i>Train Class</i>	MARC P	MARC P	ACELA NR	VRE F	MARC B	SEHSR	MARC P	MARC C	ACELA NR	VRE M	MARC P	MARC B	MARC P
<i>Operational Notes</i>						*							
<i>WUS Track Assignment</i>	T5	T3	T10	T26	T1	T22	T6	T4	T9	T27	T3	T5	T7
Riverdale								7:34					
<i>JD</i>								7:36					
<i>Georgetown Jct.</i>					7:13							7:34	
Silver Spring					7:15							7:36	
<i>QN Tower</i>					7:27							7:48	
<i>MP 128</i>	7:15	7:20				7:28	7:35				7:40		7:50
<i>C</i>	7:19	7:24			7:30	7:32	7:39	7:39			7:44	7:51	7:54
VRE Midday Storage													
Ivy City Yard			7:15						7:30				
Coach Yard													
Wedge Yard													
<i>K</i>	7:23	7:28	7:29		7:34	7:36	7:43	7:43	7:44		7:48	7:55	7:58
Arr. Washington Union	7:24	7:29	7:30		7:35	7:37	7:44	7:44	7:45		7:49	7:56	7:59
Dep. Washington Union				7:40		8:10				7:55			
<i>A</i>				7:41		8:11				7:56			
<i>CP Virginia</i>				7:44		8:14				7:59			
L'Enfant Station				7:48		-				8:01			
Crystal City				7:55		-				8:06			
Alexandria				8:02		8:24				8:14			
<i>AF</i>				8:03		8:25				8:15			
<i>Cameron Run (CR)</i>										8:17			
Franconia				8:13		-							
<i>Ravensworth</i>				8:14		8:36							

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Southbound Train ID	V507	M9917	A2201	M876	V407	M419	AEQ 2310	M878	V509	A181	A2203	M9919	V409
<i>From</i>	V508				V408				V512				V410
<i>To</i>		M858	A2158	MEQ 876		MEQ 419	A2310	M424			A2212	MEQ 9919	
<i># of Locomotives</i>	1	1	0	1	1	1	0	1	1	2	0	1	1
<i># of Coaches</i>	9	6	8	6	9	7	8	7	8	10	8	8	9
<i>Train Class</i>	VRE F	MARC P	ACELA	MARC B	VRE M	MARC P	ACELA NR	MARC B	VRE F	SEHSR	ACELA	MARC P	VRE M
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	T26	T3	T12	T4	T27	T5	T11	T2	T27	T22	T7	T6	T26
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>				7:53				8:10					
Silver Spring				7:55				8:12					
<i>QN Tower</i>				8:07				8:24					
<i>MP 128</i>		7:55	8:01			8:15				8:26	8:29	8:35	
<i>C</i>		7:59	8:05	8:10		8:19		8:27		8:30	8:33	8:39	
VRE Midday Storage													
Ivy City Yard							8:15						
Coach Yard													
Wedge Yard													
<i>K</i>		8:03	8:09	8:14		8:23	8:29	8:31		8:34	8:37	8:43	
Arr. Washington Union		8:04	8:10	8:15		8:24	8:30	8:32		8:35	8:38	8:44	
Dep. Washington Union	8:10				8:25				8:40	9:10			8:55
<i>A</i>	8:11				8:26				8:41	9:11			8:56
<i>CP Virginia</i>	8:14				8:29				8:44	9:14			8:59
L'Enfant Station	8:18				8:31				8:48	-			9:01
Crystal City	8:25				8:36				8:55	-			9:06
Alexandria	8:32				8:44				9:02	9:24			9:14
<i>AF</i>	8:33				8:45				9:03	9:25			9:15
<i>Cameron Run (CR)</i>					8:47								9:17
Franconia	8:43								9:13	-			
<i>Ravensworth</i>	8:44								9:14	9:36			

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Southbound Train ID	M894	M421	V511	A2205	M851	V411	M880	A89	MEQ 414	A2301	M9921	A3111	A2207
<i>From</i>			V514			V414							
<i>To</i>	M416	MEQ 421		A2160	M418		MEQ 880		M414	A2312	M9916		A2214
<i># of Locomotives</i>	1	1	1	0	1	1	1	2	1	0	1	2	0
<i># of Coaches</i>	4	4	7	8	4	7	7	7	6	8	6	10	8
<i>Train Class</i>	MARC B	MARC P	VRE F	ACELA	MARC C	VRE M	MARC B	LD	MARC NR	ACELA	MARC P	REGR	ACELA
<i>Operational Notes</i>								*				*	
<i>WUS Track Assignment</i>	T3	T5	T27	T10	T4	T26	T1	T22	T6	T9	T4	T24	T12
Riverdale					9:02								
<i>JD</i>					9:04								
<i>Georgetown Jct.</i>	8:30						8:59						
Silver Spring	8:32						9:01						
<i>QN Tower</i>	8:44						9:13						
<i>MP 128</i>		8:51		9:01				9:15		9:18	9:24	9:31	9:34
<i>C</i>	8:47	8:55		9:05	9:07			9:16	9:19	9:22	9:28	9:35	9:38
VRE Midday Storage													
Ivy City Yard													
Coach Yard									9:15				
Wedge Yard													
<i>K</i>	8:51	8:59		9:09	9:11			9:20	9:23	9:24	9:26	9:32	9:39
Arr. Washington Union	8:52	9:00		9:10	9:12			9:21	9:24	9:25	9:27	9:33	9:40
Dep. Washington Union			9:10			9:25		10:00				10:12	
<i>A</i>			9:11			9:26		10:01				10:13	
<i>CP Virginia</i>			9:14			9:29		10:04				10:16	
L'Enfant Station			9:18			9:31		-				-	
Crystal City			9:25			9:36		-				-	
Alexandria			9:32			9:44		10:16				10:28	
<i>AF</i>			9:33			9:45		10:17				10:29	
<i>Cameron Run (CR)</i>						9:47						10:31	
Franconia			9:43					-					
<i>Ravensworth</i>			9:44					10:28					

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Southbound Train ID	M898	V413	M523	A51	A187	A2209	A2303	M425	V515	A183	A2211	M9927	V415
<i>From</i>		V418							V520				V420
<i>To</i>	MEQ 898		MEQ 523		AEQ 187	A2162	A2314	MEQ 425			A2216	M9918	
<i># of Locomotives</i>	1	1	1	2	1	0	0	1	1	2	0	1	1
<i># of Coaches</i>	6	6	7	6	10	8	8	4	8	10	8	6	8
<i>Train Class</i>	MARC B	VRE M	MARC P	LD	REG	ACELA	ACELA	MARC P	VRE F	SEHSR	ACELA	MARC P	VRE M
<i>Operational Notes</i>				*						*			
<i>WUS Track Assignment</i>	T1	T26	T5	T22	T6	T11	T8	T3	T27	T24	T10	T5	T26
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>	9:23												
Silver Spring	9:25												
<i>QN Tower</i>	9:37												
<i>MP 128</i>			9:50	9:53	9:58	10:01	10:18	10:23		10:31	10:34	10:50	
<i>C</i>	9:40		9:54	9:57	10:02	10:05	10:22	10:27		10:35	10:38	10:54	
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	9:44		9:58	10:01	10:06	10:09	10:26	10:31		10:39	10:42	10:58	
Arr. Washington Union	9:45		9:59	10:02	10:07	10:10	10:27	10:32		10:40	10:43	10:59	
Dep. Washington Union		9:55		10:40					10:40	11:10			11:10
<i>A</i>		9:56		10:41					10:41	11:11			11:11
<i>CP Virginia</i>		9:59		10:44					10:44	11:14			11:14
L'Enfant Station		10:01		-					10:48	-			11:16
Crystal City		10:06		-					10:55	-			11:21
Alexandria		10:14		10:56					11:02	11:24			11:29
<i>AF</i>		10:15		10:57					11:03	11:25			11:30
<i>Cameron Run (CR)</i>		10:17		10:59									11:32
Franconia									11:13	-			
<i>Ravensworth</i>									11:14	11:36			

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Southbound Train ID	A2149	A2305	M427	V517	A185	A2213	A3079	V417	M9929	A2151	A2307	M429	V519
<i>From</i>				V522				V422					V524
<i>To</i>	A2164	A2316	M520			A2218			M9920	A2166	A2318	M871	
<i># of Locomotives</i>	0	0	1	1	2	0	2	1	1	0	0	1	1
<i># of Coaches</i>	8	8	6	9	10	8	10	9	6	8	8	6	8
<i>Train Class</i>	ACELA	ACELA	MARC P	VRE F	SEHSR	ACELA	REGR	VRE M	MARC P	ACELA	ACELA	MARC P	VRE F
<i>Operational Notes</i>					*		*						
<i>WUS Track Assignment</i>	T9	T12	T3	T27	T24	T11	T25	T26	T4	T7	T10	T3	T27
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	11:01	11:18	11:23		11:31	11:34	11:53		11:57	12:01	12:18	12:23	
<i>C</i>	11:05	11:22	11:27		11:35	11:38	11:57		12:01	12:05	12:22	12:27	
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	11:09	11:26	11:31		11:39	11:42	12:01		12:05	12:09	12:26	12:31	
Arr. Washington Union	11:10	11:27	11:32		11:40	11:43	12:02		12:06	12:10	12:27	12:32	
Dep. Washington Union				11:40	12:10		12:35	12:10					12:40
<i>A</i>				11:41	12:11		12:36	12:11					12:41
<i>CP Virginia</i>				11:44	12:14		12:39	12:14					12:44
L'Enfant Station				11:48	-		-	12:16					12:48
Crystal City				11:55	-		-	12:21					12:55
Alexandria				12:02	12:24		12:49	12:29					13:02
<i>AF</i>				12:03	12:25		12:50	12:30					13:03
<i>Cameron Run (CR)</i>								12:32					
Franconia				12:13	-		-						13:13
<i>Ravensworth</i>				12:14	12:36		13:01						13:14

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Southbound Train ID	A141	A2215	MEQ 422	M9931	V419	A2153	A30	A2309	M431	V521	A95	A2217	M9933
<i>From</i>					V424					V526			
<i>To</i>		A2220	M422	M9922		A2168	AEQ 30	A2320	MEQ 431			A2222	M9924
<i># of Locomotives</i>	2	0	1	1	1	0	2	0	1	1	2	0	1
<i># of Coaches</i>	10	8	5	6	7	8	10	8	4	7	10	8	6
<i>Train Class</i>	SEHSR	ACELA	MARC NR	MARC P	VRE M	ACELA	LD	ACELA	MARC P	VRE F	REGR	ACELA	MARC P
<i>Operational Notes</i>	*										*		
<i>WUS Track Assignment</i>	T25	T9	T6	T5	T26	T8	T28	T12	T4	T27	T25	T11	T6
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>							12:44						
Silver Spring							-						
<i>QN Tower</i>							12:58						
<i>MP 128</i>	12:31	12:34		12:50		13:01	13:01	13:18	13:23		13:31	13:34	13:50
<i>C</i>	12:35	12:38		12:54		13:05	13:05	13:22	13:27		13:35	13:38	13:54
VRE Midday Storage													
Ivy City Yard													
Coach Yard			12:43										
Wedge Yard													
<i>K</i>	12:39	12:42	12:52	12:58		13:09	13:09	13:26	13:31		13:39	13:42	13:58
Arr. Washington Union	12:40	12:43	12:53	12:59		13:10	13:10	13:27	13:32		13:40	13:43	13:59
Dep. Washington Union	13:10				13:10					13:40	14:10		
<i>A</i>	13:11				13:11					13:41	14:11		
<i>CP Virginia</i>	13:14				13:14					13:44	14:14		
L'Enfant Station	-				13:16					13:48	-		
Crystal City	-				13:21					13:55	-		
Alexandria	13:24				13:29					14:02	14:24		
<i>AF</i>	13:25				13:30					14:03	14:25		
<i>Cameron Run (CR)</i>					13:32								
Franconia	-									14:13	-		
<i>Ravensworth</i>	13:36									14:14	14:36		

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Southbound Train ID	V421	A3011	A2155	AEQ 148	A91	A2311	M433	V523	AEQ 29	A2219	MEQ 426	M9935	V423
<i>From</i>	V426							V528					V428
<i>To</i>		AEQ 3011	A2170	A148		A2322	M848		A29	A2224	M426	M9930	
<i># of Locomotives</i>	1	1	0	1	2	0	1	1	2	0	1	1	1
<i># of Coaches</i>	6	10	8	10	10	8	4	8	10	8	7	6	8
<i>Train Class</i>	VRE M	REG	ACELA	REG NR	LD	ACELA	MARC P	VRE F	LD NR	ACELA	MARC NR	MARC P	VRE M
<i>Operational Notes</i>					*								
<i>WUS Track Assignment</i>	T26	T5	T10	T4	T22	T9	T7	T27	T26	T8	T3	T6	T28
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>		13:55	14:01		14:12	14:18	14:23			14:34		14:50	
<i>C</i>		13:59	14:05		14:16	14:22	14:27			14:38		14:54	
VRE Midday Storage													
Ivy City Yard				14:00									
Coach Yard									14:25		14:45		
Wedge Yard													
<i>K</i>		14:03	14:09	14:14	14:20	14:26	14:31		14:34	14:42	14:54	14:58	
Arr. Washington Union		14:04	14:10	14:15	14:21	14:27	14:32		14:35	14:43	14:55	14:59	
Dep. Washington Union	14:10				15:00			14:40					15:10
<i>A</i>	14:11				15:01			14:41					15:11
<i>CP Virginia</i>	14:14				15:04			14:44					15:14
L'Enfant Station	14:16				-			14:48					15:16
Crystal City	14:21				-			14:55					15:21
Alexandria	14:29				15:16			15:02					15:29
<i>AF</i>	14:30				15:17			15:03					15:30
<i>Cameron Run (CR)</i>	14:32												15:32
Franconia					-			15:13					
<i>Ravensworth</i>					15:28			15:14					

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Southbound Train ID	A2157	MEQ 873	MEQ 428	MEQ 8XXa	A2313	M435	V525	MEQ 891	A171	A2221	AEQ 196	V498	M679
<i>From</i>							V530						
<i>To</i>	A2172	M873	M428	M8XXa	A2324	M846		M891		A2226	A196		M9934
<i># of Locomotives</i>	0	1	1	1	0	1	1	1	2	0	1	1	1
<i># of Coaches</i>	8	4	7	6	8	5	9	4	10	8	10	10	7
<i>Train Class</i>	ACELA	MARC NR	MARC NR	MARC NR	ACELA	MARC P	VRE F	MARC NR	REGR	ACELA	REG NR	VRE M	MARC P
<i>Operational Notes</i>									*				
<i>WUS Track Assignment</i>	T12	T1	T5	T2	T11	T3	T27	T1	T25	T10	T5	T27	T4
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	15:01				15:18	15:23			15:31	15:34			15:47
<i>C</i>	15:05				15:22	15:27			15:35	15:38			15:51
VRE Midday Storage												15:36	
Ivy City Yard											15:33		
Coach Yard		15:08	15:15	15:15				15:25					
Wedge Yard													
<i>K</i>	15:09	15:17	15:24	15:24	15:26	15:31		15:34	15:39	15:42	15:47	15:51	15:55
Arr. Washington Union	15:10	15:18	15:25	15:25	15:27	15:32		15:35	15:40	15:43	15:48	~	15:56
Dep. Washington Union							15:40		16:10			16:00	
<i>A</i>							15:41		16:11			16:01	
<i>CP Virginia</i>							15:44		16:14			16:04	
L'Enfant Station							15:48		16:16			16:06	
Crystal City							15:55		-			16:11	
Alexandria							16:02		16:26			16:19	
<i>AF</i>							16:03		16:27			16:20	
<i>Cameron Run (CR)</i>									16:29			16:22	
Franconia							16:13						
<i>Ravensworth</i>							16:14						

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Southbound Train ID	M9937	A3083	V425	MEQ 430	A2159	MEQ 532	M861	V527	V427	A2315	M537	V529	A93
<i>From</i>			V430					V532					
<i>To</i>	M634			M430	A2174	M532	M875			A2326	M893		
<i># of Locomotives</i>	1	2	1	1	0	1	1	1	1	0	1	1	2
<i># of Coaches</i>	8	10	9	7	8	7	6	8	10	8	6	9	10
<i>Train Class</i>	MARC P	SEHSR	VRE M	MARC NR	ACELA	MARC NR	MARC C	VRE F	VRE M	ACELA	MARC P	VRE F	REGR
<i>Operational Notes</i>		*											*
<i>WUS Track Assignment</i>	T2	T24	T28	T1	T9	T7	T6	T26	T26	T8	T3	T26	T24
Riverdale							16:00						
<i>JD</i>							16:02						
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	15:50	15:53			16:01					16:18	16:23		16:31
<i>C</i>	15:54	15:57			16:05		16:05			16:22	16:27		16:35
VRE Midday Storage									16:06			16:21	
Ivy City Yard													
Coach Yard				15:55		16:00							
Wedge Yard													
<i>K</i>	15:58	16:01		16:04	16:09	16:09	16:09		16:21	16:26	16:31	16:36	16:39
Arr. Washington Union	15:59	16:02		16:05	16:10	16:10	16:10		~	16:27	16:32	~	16:40
Dep. Washington Union		16:35	16:10					16:20	16:30			16:45	17:10
<i>A</i>		16:36	16:11					16:21	16:31			16:46	17:11
<i>CP Virginia</i>		16:39	16:14					16:24	16:34			16:49	17:14
L'Enfant Station		-	16:16					16:28	16:36			16:53	17:16
Crystal City		-	16:21					16:35	16:41			17:00	-
Alexandria		16:49	16:29					16:42	16:49			17:07	17:26
<i>AF</i>		16:50	16:30					16:43	16:50			17:08	17:27
<i>Cameron Run (CR)</i>			16:32						16:52				
Franconia		-						16:53				17:18	-
<i>Ravensworth</i>		17:01						16:54				17:19	17:38

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Southbound Train ID	M853	V429	A2223	MEQ 877	MEQ 536	MEQ 9936	M439	M884	V431	M8XXb	MEQ 438	A2161	V533
<i>From</i>		V432							V434				V536
<i>To</i>	M850		A2228	M877	M536	M9936	M879	M881		M9942	M438	A2176	
<i># of Locomotives</i>	1	1	0	1	1	1	1	1	1	1	1	0	1
<i># of Coaches</i>	5	7	8	6	7	8	6	5	8	6	4	8	7
<i>Train Class</i>	MARC C	VRE M	ACELA	MARC NR	MARC NR	MARC NR	MARC P	MARC B	VRE M	MARC C	MARC NR	ACELA	VRE F
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T1	T27	T12	T2	T6	T2	T4	T7	T27	T7	T4	T11	T26
Riverdale	16:30									16:55			
<i>JD</i>	16:32									16:57			
<i>Georgetown Jct.</i>								16:38					
Silver Spring								16:40					
<i>QN Tower</i>								16:52					
<i>MP 128</i>			16:34				16:50					17:01	
<i>C</i>	16:35		16:38				16:54	16:55		17:00		17:05	
VRE Midday Storage													
Ivy City Yard													
Coach Yard					16:43								
Wedge Yard				16:33		16:48					16:58		
<i>K</i>	16:39		16:42	16:42	16:52	16:57	16:58	16:59		17:04	17:07	17:09	
Arr. Washington Union	16:40		16:43	16:43	16:53	16:58	16:59	17:00		17:05	17:08	17:10	
Dep. Washington Union		16:50							17:10				17:20
<i>A</i>		16:51							17:11				17:21
<i>CP Virginia</i>		16:54							17:14				17:24
L'Enfant Station		16:56							17:16				17:28
Crystal City		17:01							17:21				17:35
Alexandria		17:09							17:29				17:42
<i>AF</i>		17:10							17:30				17:43
<i>Cameron Run (CR)</i>		17:12							17:32				
Franconia													17:53
<i>Ravensworth</i>													17:54

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Southbound Train ID	AEQ 138	MEQ 440	V433	MEQ 9940	A2317	M902	M641	V535	A145	V435	A2225	V537	A19
<i>From</i>										V436		V538	
<i>To</i>	A138	M440		M9940	A2328	M901	M642				A2230		
<i># of Locomotives</i>	1	1	1	1	0	1	1	1	2	1	0	1	2
<i># of Coaches</i>	10	8	10	7	8	6	6	9	10	6	8	9	10
<i>Train Class</i>	REG NR	MARC NR	VRE M	MARC NR	ACELA	MARC B	MARC P	VRE F	REGR	VRE M	ACELA	VRE F	LD
<i>Operational Notes</i>									*				*
<i>WUS Track Assignment</i>	T6	T2	T26	T3	T10	T2	T5	T26	T23	T27	T9	T28	T22
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>						17:08							
Silver Spring						17:10							
<i>QN Tower</i>						17:22							
<i>MP 128</i>					17:18		17:23		17:31		17:34		17:45
<i>C</i>					17:22	17:25	17:27		17:35		17:38		17:49
<i>VRE Midday Storage</i>			17:06					17:16					
<i>Ivy City Yard</i>	17:00												
<i>Coach Yard</i>													
<i>Wedge Yard</i>		17:05		17:13									
<i>K</i>	17:14	17:14	17:21	17:22	17:26	17:29	17:31	17:31	17:39		17:42		17:53
Arr. Washington Union	17:15	17:15	~	17:23	17:27	17:30	17:32	~	17:40		17:43		17:54
Dep. Washington Union			17:30					17:40	18:10	17:50		18:00	18:30
<i>A</i>			17:31					17:41	18:11	17:51		18:01	18:31
<i>CP Virginia</i>			17:34					17:44	18:14	17:54		18:04	18:34
L'Enfant Station			17:36					17:48	18:16	17:56		18:08	-
Crystal City			17:41					17:55	-	18:01		18:15	-
Alexandria			17:49					18:02	18:26	18:09		18:22	18:44
<i>AF</i>			17:50					18:03	18:27	18:10		18:23	18:45
<i>Cameron Run (CR)</i>			17:52							18:12			18:47
Franconia								18:13	-			18:33	
<i>Ravensworth</i>								18:14	18:38			18:34	

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Southbound Train ID	V437	M443	MEQ 544	A3085	A2163	V539	AEQ 188	V439	A2319	M855	MEQ 895	M445	V541
<i>From</i>	V438					V540							
<i>To</i>		M9944	M544		A2232		A188		A2234	M854	M895	M446	
<i># of Locomotives</i>	1	1	1	2	0	1	1	1	0	1	1	1	1
<i># of Coaches</i>	9	5	8	10	8	8	10	10	8	4	4	8	6
<i>Train Class</i>	VRE M	MARC P	MARC NR	SEHSR	ACELA	VRE F	REG NR	VRE M	ACELA	MARC C	MARC NR	MARC P	VRE F
<i>Operational Notes</i>				*									
<i>WUS Track Assignment</i>	T26	T3	T4	T25	T8	T27	T5	T27	T12	T1	T2	T4	T27
Riverdale										18:18			
<i>JD</i>										18:20			
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>		17:50		17:53	18:01				18:18			18:23	
<i>C</i>		17:54		17:57	18:05				18:22	18:23		18:27	
VRE Midday Storage								18:06					18:16
Ivy City Yard							18:00						
Coach Yard			17:50										
Wedge Yard											18:18		
<i>K</i>		17:58	17:59	18:01	18:09		18:14	18:21	18:26	18:27	18:27	18:31	18:31
Arr. Washington Union		17:59	18:00	18:02	18:10		18:15	~	18:27	18:28	18:28	18:32	~
Dep. Washington Union	18:06			18:35		18:20		18:30					18:40
<i>A</i>	18:07			18:36		18:21		18:31					18:41
<i>CP Virginia</i>	18:10			18:39		18:24		18:34					18:44
L'Enfant Station	18:12			-		18:28		18:36					18:48
Crystal City	18:17			-		18:35		18:41					18:55
Alexandria	18:25			18:49		18:42		18:49					19:02
<i>AF</i>	18:26			18:50		18:43		18:50					19:03
<i>Cameron Run (CR)</i>	18:28							18:52					
Franconia				-		18:53							19:13
<i>Ravensworth</i>				19:01		18:54							19:14

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Southbound Train ID	A173	V441	A2227	A97	M447	A127	A2165	M857	A2321	M449	A2229	M451	A2167
<i>From</i>		V440											
<i>To</i>			AEQ 2227		M883	AEQ 127	AEQ 2165	M856	AEQ 2321	M448	AEQ 2229	M548	AEQ 2167
<i># of Locomotives</i>	2	1	0	2	1	1	0	1	0	1	0	1	0
<i># of Coaches</i>	10	8	8	11	6	10	8	4	8	8	8	8	8
<i>Train Class</i>	REGR	VRE M	ACELA	LD	MARC P	REG	ACELA	MARC C	ACELA	MARC P	ACELA	MARC P	ACELA
<i>Operational Notes</i>	*			*									
<i>WUS Track Assignment</i>	T25	T26	T11	T22	T3	T6	T10	T2	T9	T4	T7	T3	T11
Riverdale								19:13					
<i>JD</i>								19:15					
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	18:31		18:34	18:45	18:50	18:56	19:01		19:18	19:23	19:34	19:50	19:57
<i>C</i>	18:35		18:38	18:49	18:54	19:00	19:05	19:18	19:22	19:27	19:38	19:54	20:01
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	18:39		18:42	18:53	18:58	19:04	19:09	19:22	19:26	19:31	19:42	19:58	20:05
Arr. Washington Union	18:40		18:43	18:54	18:59	19:05	19:10	19:23	19:27	19:32	19:43	19:59	20:06
Dep. Washington Union	19:10	18:50		19:25									
<i>A</i>	19:11	18:51		19:26									
<i>CP Virginia</i>	19:14	18:54		19:29									
L'Enfant Station	-	18:56		-									
Crystal City	-	19:01		-									
Alexandria	19:24	19:09		19:41									
<i>AF</i>	19:25	19:10		19:42									
<i>Cameron Run (CR)</i>		19:12											
Franconia	-			-									
<i>Ravensworth</i>	19:36			19:53									

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Southbound Train ID	A2323	A137	A2231	A193	A2169	A2325	A55	A2233	M453	A2171	A175	A2235	A2173
<i>From</i>													
<i>To</i>	AEQ 2323		AEQ 2231	AEQ 193	AEQ 2169	AEQ 2325	AEQ 55	AEQ 2233	M452	AEQ 2171	AEQ 175	AEQ 2235	AEQ 2173
<i># of Locomotives</i>	0	2	0	1	0	0	1	0	1	0	1	0	0
<i># of Coaches</i>	8	10	8	10	8	8	10	8	7	8	10	8	8
<i>Train Class</i>	ACELA	SEHSR	ACELA	REG	ACELA	ACELA	REG	ACELA	MARC P	ACELA	REG	ACELA	ACELA
<i>Operational Notes</i>		*											
<i>WUS Track Assignment</i>	T10	T25	T9	T5	T11	T12	T6	T10	T4	T9	T5	T11	T12
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 128</i>	20:18	20:31	20:34	20:52	21:01	21:18	21:31	21:34	21:58	22:01	22:29	22:34	23:01
<i>C</i>	20:22	20:35	20:38	20:56	21:05	21:22	21:35	21:38	22:02	22:05	22:33	22:38	23:05
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	20:26	20:39	20:42	21:00	21:09	21:26	21:39	21:42	22:06	22:09	22:37	22:42	23:09
Arr. Washington Union	20:27	20:40	20:43	21:01	21:10	21:27	21:40	21:43	22:07	22:10	22:38	22:43	23:10
Dep. Washington Union		21:10											
<i>A</i>		21:11											
<i>CP Virginia</i>		21:14											
L'Enfant Station		-											
Crystal City		-											
Alexandria		21:24											
<i>AF</i>		21:25											
<i>Cameron Run (CR)</i>													
Franconia		-											
<i>Ravensworth</i>		21:36											

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Southbound Train ID	A147
<i>From</i>	
<i>To</i>	AEQ 147
<i># of Locomotives</i>	1
<i># of Coaches</i>	10
<i>Train Class</i>	REG
<i>Operational Notes</i>	
<i>WUS Track Assignment</i>	T6
Riverdale	
<i>JD</i>	
<i>Georgetown Jct.</i>	
Silver Spring	
<i>QN Tower</i>	
<i>MP 128</i>	23:28
<i>C</i>	23:32
VRE Midday Storage	
Ivy City Yard	
Coach Yard	
Wedge Yard	
<i>K</i>	23:36
Arr. Washington Union	23:37
Dep. Washington Union	
<i>A</i>	
<i>CP Virginia</i>	
L'Enfant Station	
Crystal City	
Alexandria	
<i>AF</i>	
<i>Cameron Run (CR)</i>	
Franconia	
<i>Ravensworth</i>	

Notes

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Northbound Train ID	AEQ 147	AEQ 2175	AEQ 177	AEQ 189	A190	A170	A2202	A110	A2150	A140	M400	A2302	A2204
<i>From</i>	A147	A2175	A177	A189	AEQ 190	AEQ 170	AEQ A2202	AEQ 110	AEQ 2150	AEQ 140	M401	AEQ A2302	AEQ A2204
<i>To</i>													
<i># of Locomotives</i>	1	0	1	1	1	1	0	1	0	1	1	0	0
<i># of Coaches</i>	10	8	10	10	10	10	8	10	8	10	8	8	8
<i>Train Class</i>	REG NR	ACELA NR	REG NR	REG NR	REG	REG	ACELA	REG	ACELA	REG	MARC P	ACELA	ACELA
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T6	T7	T4	T4	T7	T4	T8	T5	T10	T7	T5	T9	T12
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>													
<i>AF</i>													
Alexandria													
Crystal City													
L'Enfant Station													
<i>CP Virginia</i>													
<i>A</i>													
Arr. Washington Union													
Dep. Washington Union	0:37	1:10	1:37	2:52	3:55	4:45	5:15	5:25	5:40	5:45	5:50	6:00	6:15
<i>K</i>	0:38	1:11	1:38	2:53	3:56	4:46	5:16	5:26	5:41	5:46	5:51	6:01	6:16
<i>Wedge Yard</i>													
<i>Coach Yard</i>	0:47		1:47	3:02									
<i>Ivy City Yard</i>		1:25											
<i>VRE Midday Storage</i>													
<i>C</i>					4:00	4:50	5:20	5:30	5:45	5:50	5:55	6:05	6:20
<i>MP 128</i>					4:04	4:54	5:24	5:34	5:49	5:54	5:59	6:09	6:24
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

Notes

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Northbound Train ID	M502	A130	V499	M840	MEQ 9905	V500	A2152	M404	A172	V400	MEQ 890	V502	A2304
<i>From</i>	M403	AEQ 130		M841	M9905	V501	AEQ 2152	M505	AEQ 172	V401	M890	V503	AEQ A2304
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	1	1	0	1	1	1	1	1	0
<i># of Coaches</i>	8	10	10	4	7	7	8	5	10	8	4	9	8
<i>Train Class</i>	MARC P	REG	VRE M	MARC C	MARC NR	VRE F	ACELA	MARC P	REG	VRE M	MARC NR	VRE F	ACELA
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T5	T4	T26	T3	T2	T26	T11	T1	T6	T27	T4	T26	T8
<i>Ravensworth</i>						5:53						6:13	
Franconia						-						6:14	
<i>Cameron Run (CR)</i>			5:49							6:09			
<i>AF</i>			5:51			6:04				6:11		6:24	
Alexandria			5:53			6:06				6:13		6:26	
Crystal City			6:03			6:15				6:23		6:35	
L'Enfant Station			6:13			6:23				6:33		6:43	
<i>CP Virginia</i>			6:16			6:26				6:36		6:46	
<i>A</i>			6:19			6:29				6:39		6:49	
Arr. Washington Union			6:20			6:30				6:40		6:50	
Dep. Washington Union	6:18	6:25	~	6:32	6:36		6:40	6:42	6:45		6:50		7:00
<i>K</i>	6:19	6:26	6:29	6:33	6:37		6:41	6:43	6:46		6:51		7:01
<i>Wedge Yard</i>											7:00		
<i>Coach Yard</i>					6:46								
<i>Ivy City Yard</i>													
<i>VRE Midday Storage</i>			6:44										
<i>C</i>	6:23	6:30		6:37			6:44	6:47	6:50				7:05
<i>MP 128</i>	6:27	6:34					6:49	6:51	6:54				7:09
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>				6:40									
Riverdale				6:42									

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Northbound Train ID	M842	V402	M408	A2206	M406	V504	MEQ 409	V404	V506	MEQ 9911	A2154	A56	V406
<i>From</i>	M843	V403	M870	AEQ A2206	M407		M409		V505	M9911	AEQ 2154	AEQ 56	V405
<i>To</i>													
<i># of Locomotives</i>	1	1	1	0	1	1	1	1	1	1	0	1	1
<i># of Coaches</i>	4	8	5	8	8	9	8	10	9	8	8	10	9
<i>Train Class</i>	MARC C	VRE M	MARC P	ACELA	MARC P	VRE F	MARC NR	VRE M	VRE F	MARC NR	ACELA	REG	VRE M
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T4	T27	T5	T10	T3	T28	T6	T26	T26	T3	T9	T7	T27
<i>Ravensworth</i>						6:33			6:53				
Franconia						6:34			6:54				
<i>Cameron Run (CR)</i>		6:29						6:49					7:09
<i>AF</i>		6:31				6:44		6:51	7:04				7:11
Alexandria		6:33				6:46		6:53	7:06				7:13
Crystal City		6:43				6:55		7:03	7:15				7:23
L'Enfant Station		6:53				7:03		7:13	7:23				7:33
<i>CP Virginia</i>		6:56				7:06		7:16	7:26				7:36
<i>A</i>		6:59				7:09		7:19	7:29				7:39
Arr. Washington Union		7:00				7:10		7:20	7:30				7:40
Dep. Washington Union	7:00		7:10	7:15	7:18	~	7:24	~		7:39	7:40	7:45	
<i>K</i>	7:01		7:11	7:16	7:19	7:19	7:25	7:29		7:40	7:41	7:46	
Wedge Yard							7:34			7:49			
Coach Yard													
Ivy City Yard													
VRE Midday Storage						7:34		7:44					
<i>C</i>	7:05		7:15	7:20	7:23						7:45	7:50	
<i>MP 128</i>			7:19	7:24	7:27						7:49	7:54	
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>	7:08												
Riverdale	7:10												

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Northbound Train ID	M610	MEQ 847	V508	MEQ 415	A2306	M844	V408	MEQ 892	MEQ 517	A2208	M897	V510	A98
<i>From</i>	M511	M847	V507	M415	AEQ A2306	M845	V407	M892	M517	AEQ A2208	M874		
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	0	1	1	1	1	0	1	1	2
<i># of Coaches</i>	8	5	9	7	8	5	9	6	7	8	7	9	11
<i>Train Class</i>	MARC P	MARC NR	VRE F	MARC NR	ACELA	MARC C	VRE M	MARC NR	MARC NR	ACELA	MARC B	VRE F	LD
<i>Operational Notes</i>													*
<i>WUS Track Assignment</i>	T5	T4	T26	T3	T12	T2	T27	T5	T7	T11	T1	T28	T23
<i>Ravensworth</i>			7:13									7:33	7:09
Franconia			7:14									7:34	-
<i>Cameron Run (CR)</i>							7:29						
<i>AF</i>			7:24				7:31					7:44	7:20
Alexandria			7:26				7:33					7:46	7:22
Crystal City			7:35				7:43					7:55	-
L'Enfant Station			7:43				7:53					8:03	-
<i>CP Virginia</i>			7:46				7:56					8:06	7:36
<i>A</i>			7:49				7:59					8:09	7:39
Arr. Washington Union			7:50				8:00					8:10	7:40
Dep. Washington Union	7:50	7:54		7:59	8:00	8:00		8:08	8:09	8:15	8:15	~	8:18
<i>K</i>	7:51	7:55		8:00	8:01	8:01		8:09	8:10	8:16	8:16	8:19	8:19
<i>Wedge Yard</i>				8:09									
<i>Coach Yard</i>		8:04						8:18	8:19				
<i>Ivy City Yard</i>													
<i>VRE Midday Storage</i>												8:34	
<i>C</i>	7:55				8:05	8:05				8:20	8:20		8:23
<i>MP 128</i>	7:59				8:09					8:24			8:27
<i>QN Tower</i>											8:23		
Silver Spring											8:35		
<i>Georgetown Jct.</i>											8:37		
<i>JD</i>						8:08							
Riverdale						8:10							

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Northbound Train ID	M612	MEQ 876	V410	M858	MEQ 419	V512	A2156	A86	V412	MEQ 9919	V514	A2308	M412
<i>From</i>	M413	M876	V409	M9917	M419	V509	AEQ 2156			M9919	V511	AEQ A2308	M872
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	1	1	0	2	1	1	1	0	1
<i># of Coaches</i>	8	6	9	6	7	8	8	10	10	8	7	8	5
<i>Train Class</i>	MARC P	MARC NR	VRE M	MARC C	MARC NR	VRE F	ACELA	REGR	VRE M	MARC NR	VRE F	ACELA	MARC P
<i>Operational Notes</i>								*					
<i>WUS Track Assignment</i>	T6	T4	T26	T3	T5	T27	T8	T23	T28	T6	T27	T10	T4
<i>Ravensworth</i>						7:53		7:47			8:13		
Franconia						7:54		-			8:14		
<i>Cameron Run (CR)</i>			7:49						8:11				
<i>AF</i>			7:51			8:04		7:58	8:13		8:24		
Alexandria			7:53			8:06		8:00	8:15		8:26		
Crystal City			8:03			8:15		-	8:25		8:35		
L'Enfant Station			8:13			8:23		8:09	8:35		8:43		
<i>CP Virginia</i>			8:16			8:26		8:16	8:38		8:46		
<i>A</i>			8:19			8:29		8:19	8:41		8:49		
Arr. Washington Union			8:20			8:30		8:20	8:42		8:50		
Dep. Washington Union	8:25	8:25		8:30	8:36		8:40	8:45	~	8:56		9:00	9:05
<i>K</i>	8:26	8:26		8:31	8:37		8:41	8:46	8:51	8:57		9:01	9:06
<i>Wedge Yard</i>		8:35											
<i>Coach Yard</i>					8:46					9:06			
<i>Ivy City Yard</i>													
<i>VRE Midday Storage</i>									9:06				
<i>C</i>	8:30			8:35			8:45	8:50				9:05	9:10
<i>MP 128</i>	8:34						8:49	8:54				9:09	9:14
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>				8:38									
Riverdale				8:40									

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Northbound Train ID	V414	MEQ 421	A2210	V516	V416	MEQ 880	M414	A2158	A142	V418	MEQ 898	A2310	M416
<i>From</i>	V411	M421	AEQ A2210			M880	MEQ 414	AEQ 2201		V413	M898	AEQ A2310	M894
<i>To</i>													
<i># of Locomotives</i>	1	1	0	1	1	1	1	0	2	1	1	0	1
<i># of Coaches</i>	7	4	8	6	6	7	6	8	10	6	6	8	4
<i>Train Class</i>	VRE M	MARC NR	ACELA	VRE F	VRE M	MARC NR	MARC P	ACELA	REGR	VRE M	MARC NR	ACELA	MARC P
<i>Operational Notes</i>									*				
<i>WUS Track Assignment</i>	T26	T5	T9	T28	T27	T1	T6	T12	T23	T26	T1	T11	T3
<i>Ravensworth</i>				8:33					8:47				
Franconia				8:34					-				
<i>Cameron Run (CR)</i>	8:29				8:49					9:09			
<i>AF</i>	8:31			8:44	8:51				8:58	9:11			
Alexandria	8:33			8:46	8:53				9:00	9:13			
Crystal City	8:43			8:55	9:03				-	9:23			
L'Enfant Station	8:53			9:03	9:13				9:09	9:33			
<i>CP Virginia</i>	8:56			9:06	9:16				9:16	9:36			
<i>A</i>	8:59			9:09	9:19				9:19	9:39			
Arr. Washington Union	9:00			9:10	9:20				9:20	9:40			
Dep. Washington Union		9:10	9:15	~	~	9:33	9:35	9:40	9:45		9:57	10:00	10:05
<i>K</i>		9:11	9:16	9:19	9:29	9:34	9:36	9:41	9:46		9:58	10:01	10:06
<i>Wedge Yard</i>		9:20											
<i>Coach Yard</i>						9:43					10:07		
<i>Ivy City Yard</i>													
<i>VRE Midday Storage</i>				9:34	9:44								
<i>C</i>			9:20				9:40	9:45	9:50			10:05	10:10
<i>MP 128</i>			9:24				9:44	9:49	9:54			10:09	10:14
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

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Northbound Train ID	MEQ 523	A2212	V520	A20	M9916	A2160	MEQ 425	A174	V420	A2312	M418	AEQ 187	A2214
<i>From</i>	<i>M523</i>	<i>A2203</i>	<i>V515</i>		<i>M9921</i>	<i>AEQ 2205</i>	<i>M425</i>		<i>V415</i>	<i>A2301</i>	<i>M851</i>	<i>A187</i>	<i>A2207</i>
<i>To</i>													
<i># of Locomotives</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>0</i>
<i># of Coaches</i>	<i>7</i>	<i>8</i>	<i>8</i>	<i>10</i>	<i>6</i>	<i>8</i>	<i>4</i>	<i>10</i>	<i>8</i>	<i>8</i>	<i>4</i>	<i>10</i>	<i>8</i>
<i>Train Class</i>	<i>MARC NR</i>	<i>ACELA</i>	<i>VRE F</i>	<i>LD</i>	<i>MARC P</i>	<i>ACELA</i>	<i>MARC NR</i>	<i>REGR</i>	<i>VRE M</i>	<i>ACELA</i>	<i>MARC P</i>	<i>REG NR</i>	<i>ACELA</i>
<i>Operational Notes</i>				*				*					
<i>WUS Track Assignment</i>	<i>T5</i>	<i>T7</i>	<i>T27</i>	<i>T25</i>	<i>T4</i>	<i>T10</i>	<i>T3</i>	<i>T25</i>	<i>T26</i>	<i>T9</i>	<i>T4</i>	<i>T6</i>	<i>T12</i>
<i>Ravensworth</i>			<i>9:33</i>					<i>9:49</i>					
Franconia			<i>9:34</i>	-				-					
<i>Cameron Run (CR)</i>				<i>9:18</i>					<i>10:09</i>				
<i>AF</i>			<i>9:44</i>	<i>9:20</i>				<i>10:00</i>	<i>10:11</i>				
Alexandria			<i>9:46</i>	<i>9:22</i>				<i>10:02</i>	<i>10:13</i>				
Crystal City			<i>9:55</i>	-				-	<i>10:23</i>				
L'Enfant Station			<i>10:03</i>	-				-	<i>10:33</i>				
<i>CP Virginia</i>			<i>10:06</i>	<i>9:36</i>				<i>10:15</i>	<i>10:36</i>				
<i>A</i>			<i>10:09</i>	<i>9:39</i>				<i>10:18</i>	<i>10:39</i>				
Arr. Washington Union			<i>10:10</i>	<i>9:40</i>				<i>10:20</i>	<i>10:40</i>				
Dep. Washington Union	<i>10:11</i>	<i>10:15</i>		<i>10:18</i>	<i>10:35</i>	<i>10:40</i>	<i>10:42</i>	<i>10:45</i>		<i>11:00</i>	<i>11:05</i>	<i>11:07</i>	<i>11:15</i>
<i>K</i>	<i>10:12</i>	<i>10:16</i>		<i>10:19</i>	<i>10:36</i>	<i>10:41</i>	<i>10:43</i>	<i>10:46</i>		<i>11:01</i>	<i>11:06</i>	<i>11:08</i>	<i>11:16</i>
Wedge Yard													
Coach Yard	<i>10:21</i>						<i>10:52</i>						
Ivy City Yard												<i>11:22</i>	
VRE Midday Storage													
<i>C</i>		<i>10:20</i>		<i>10:23</i>	<i>10:40</i>	<i>10:45</i>		<i>10:50</i>		<i>11:05</i>	<i>11:10</i>		<i>11:20</i>
<i>MP 128</i>		<i>10:24</i>		<i>10:27</i>	<i>10:44</i>	<i>10:49</i>		<i>10:54</i>		<i>11:09</i>	<i>11:14</i>		<i>11:24</i>
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

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Northbound Train ID	V522	M9918	A2162	A144	V422	A2314	M520	A2216	V524	A3080	M9920	A2164	A176
<i>From</i>	V517	M9927	AEQ 2209		V417	A2303	M427	A2211	V519		M9929	A2149	
<i>To</i>													
<i># of Locomotives</i>	1	1	0	2	1	0	1	0	1	2	1	0	2
<i># of Coaches</i>	9	6	8	10	9	8	6	8	8	10	6	8	10
<i>Train Class</i>	VRE F	MARC P	ACELA	REGR	VRE M	ACELA	MARC P	ACELA	VRE F	SEHSR	MARC P	ACELA	REGR
<i>Operational Notes</i>				*						*			*
<i>WUS Track Assignment</i>	T27	T5	T11	T25	T26	T8	T3	T10	T27	T23	T4	T9	T24
<i>Ravensworth</i>	10:33			10:49					11:33	11:34			
<i>Franconia</i>	10:34			-					11:34	-			-
<i>Cameron Run (CR)</i>					11:09								11:56
<i>AF</i>	10:44			11:00	11:11				11:44	11:45			11:58
<i>Alexandria</i>	10:46			11:02	11:13				11:46	11:47			12:00
<i>Crystal City</i>	10:55			-	11:23				11:55	-			-
<i>L'Enfant Station</i>	11:03			-	11:33				12:03	-			12:09
<i>CP Virginia</i>	11:06			11:16	11:36				12:06	12:01			12:16
<i>A</i>	11:09			11:19	11:39				12:09	12:04			12:19
<i>Arr. Washington Union</i>	11:10			11:20	11:40				12:10	12:05			12:20
<i>Dep. Washington Union</i>		11:35	11:40	11:45		12:00	12:05	12:15		12:30	12:35	12:40	12:45
<i>K</i>		11:36	11:41	11:46		12:01	12:06	12:16		12:31	12:36	12:41	12:46
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>													
<i>VRE Midday Storage</i>													
<i>C</i>		11:40	11:45	11:50		12:05	12:10	12:20		12:35	12:40	12:45	12:50
<i>MP 128</i>		11:44	11:49	11:54		12:09	12:14	12:24		12:39	12:44	12:49	12:54
<i>QN Tower</i>													
<i>Silver Spring</i>													
<i>Georgetown Jct.</i>													
<i>JD</i>													
<i>Riverdale</i>													

Notes

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* Requires engine change at WUS

Northbound Train ID	V424	A2316	M422	A2218	V526	M871	M9922	A2166	MEQ 431	V426	A2318	M424	AEQ 30
<i>From</i>	V419	A2305	MEQ 422	A2213	V521	M429	M9931	A2151	M431	V421	A2307	M878	A30
<i>To</i>													
<i># of Locomotives</i>	1	0	1	0	1	1	1	0	1	1	0	1	1
<i># of Coaches</i>	7	8	5	8	7	6	6	8	4	6	8	7	10
<i>Train Class</i>	VRE M	ACELA	MARC P	ACELA	VRE F	MARC B	MARC P	ACELA	MARC NR	VRE M	ACELA	MARC P	LD NR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T26	T12	T6	T11	T27	T3	T5	T7	T4	T26	T10	T2	T28
<i>Ravensworth</i>					12:33								
Franconia					12:34								
<i>Cameron Run (CR)</i>	12:09									13:09			
<i>AF</i>	12:11				12:44					13:11			
Alexandria	12:13				12:46					13:13			
Crystal City	12:23				12:55					13:23			
L'Enfant Station	12:33				13:03					13:33			
<i>CP Virginia</i>	12:36				13:06					13:36			
<i>A</i>	12:39				13:09					13:39			
Arr. Washington Union	12:40				13:10					13:40			
Dep. Washington Union		13:00	13:05	13:15		13:30	13:35	13:40	13:44		14:00	14:05	14:10
<i>K</i>		13:01	13:06	13:16		13:31	13:36	13:41	13:45		14:01	14:06	14:11
Wedge Yard													
Coach Yard									13:54				14:20
Ivy City Yard													
VRE Midday Storage													
<i>C</i>		13:05	13:10	13:20		13:35	13:40	13:45			14:05	14:10	
<i>MP 128</i>		13:09	13:14	13:24			13:44	13:49			14:09	14:14	
<i>QN Tower</i>						13:38							
Silver Spring						13:50							
<i>Georgetown Jct.</i>						13:52							
<i>JD</i>													
Riverdale													

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Northbound Train ID	A2220	V528	M9924	A2168	A94	V428	A2320	AEQ 3011	M426	A2222	V530	A92	A3082
<i>From</i>	A2215	V523	M9933	A2153		V423	A2309	A3011	MEQ 426	A2217	V525		
<i>To</i>													
<i># of Locomotives</i>	0	1	1	0	2	1	0	1	1	0	1	2	2
<i># of Coaches</i>	8	8	6	8	10	8	8	10	7	8	9	10	10
<i>Train Class</i>	ACELA	VRE F	MARC P	ACELA	SEHSR	VRE M	ACELA	REG NR	MARC P	ACELA	VRE F	LD	SEHSR
<i>Operational Notes</i>					*							*	*
<i>WUS Track Assignment</i>	T9	T27	T6	T8	T25	T28	T12	T5	T3	T11	T27	T23	T24
<i>Ravensworth</i>		13:33			13:49						14:33	14:14	14:34
<i>Franconia</i>		13:34			-						14:34	-	-
<i>Cameron Run (CR)</i>						14:09							
<i>AF</i>		13:44			14:00	14:11					14:34	14:25	14:45
<i>Alexandria</i>		13:46			14:02	14:13					14:36	14:27	14:47
<i>Crystal City</i>		13:55			-	14:23					14:55	-	-
<i>L'Enfant Station</i>		14:03			-	14:33					15:03	-	-
<i>CP Virginia</i>		14:06			14:15	14:36					15:06	14:41	15:01
<i>A</i>		14:09			14:18	14:39					15:09	14:44	15:04
<i>Arr. Washington Union</i>		14:10			14:20	14:40					15:10	14:45	15:05
<i>Dep. Washington Union</i>	14:15		14:35	14:40	14:45		15:00	15:04	15:05	15:15		15:18	15:30
<i>K</i>	14:16		14:36	14:41	14:46		15:01	15:05	15:06	15:16		15:19	15:31
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>								15:19					
<i>VRE Midday Storage</i>													
<i>C</i>	14:20		14:40	14:45	14:50		15:05		15:10	15:20		15:23	15:35
<i>MP 128</i>	14:24		14:44	14:49	14:54		15:09		15:14	15:24		15:27	15:39
<i>QN Tower</i>													
<i>Silver Spring</i>													
<i>Georgetown Jct.</i>													
<i>JD</i>													
<i>Riverdale</i>													

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Northbound Train ID	M873	M428	M8XXa	A2170	A148	M891	V430	A2322	M9930	A29	M846	A2224	M430
<i>From</i>	MEQ 873	MEQ 428	MEQ 8XXa	A2155	AEQ 148	MEQ 891	V425	A2311	M9935	AEQ 29	M435	A2219	MEQ 430
<i>To</i>													
<i># of Locomotives</i>	1	1	1	0	1	1	1	0	1	1	1	0	1
<i># of Coaches</i>	4	7	6	8	10	4	9	8	6	10	5	8	7
<i>Train Class</i>	MARC B	MARC P	MARC C	ACELA	REG	MARC B	VRE M	ACELA	MARC P	LD	MARC C	ACELA	MARC P
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	T1	T5	T2	T10	T4	T1	T28	T9	T6	T26	T3	T8	T1
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>							15:09						
<i>AF</i>							15:11						
Alexandria							15:13						
Crystal City							15:23						
L'Enfant Station							15:33						
<i>CP Virginia</i>							15:36						
<i>A</i>							15:39						
Arr. Washington Union							15:40						
Dep. Washington Union	15:30	15:35	15:35	15:40	15:45	15:45		16:00	16:05	16:05	16:13	16:15	16:18
<i>K</i>	15:31	15:36	15:36	15:41	15:46	15:46		16:01	16:06	16:06	16:14	16:16	16:19
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>													
<i>VRE Midday Storage</i>													
<i>C</i>	15:35	15:40	15:40	15:45	15:50	15:50		16:05	16:10	16:10	16:18	16:20	16:23
<i>MP 128</i>		15:44		15:49	15:54			16:09	16:14			16:24	16:27
<i>QN Tower</i>	15:38					15:53				16:13			
Silver Spring	15:50					16:05				16:25			
<i>Georgetown Jct.</i>	15:52					16:07				16:27			
<i>JD</i>			15:43								16:21		
Riverdale			15:45								16:23		

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Northbound Train ID	V532	M532	M875	V432	M634	A2172	M848	A178	M9934	M877	A2324	V434	M536
<i>From</i>	V527	MEQ 532	M861	V429	M9937	A2157	M433		M679	MEQ 877	A2313	V431	MEQ 536
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	1	0	1	2	1	1	0	1	1
<i># of Coaches</i>	8	7	6	7	8	8	4	10	7	6	8	8	7
<i>Train Class</i>	VRE F	MARC P	MARC B	VRE M	MARC P	ACELA	MARC C	SEHSR	MARC P	MARC B	ACELA	VRE M	MARC P
<i>Operational Notes</i>								*					
<i>WUS Track Assignment</i>	T26	T7	T6	T27	T2	T12	T7	T25	T4	T2	T11	T27	T6
<i>Ravensworth</i>	15:33							15:49					
Franconia	15:34							-					
<i>Cameron Run (CR)</i>				15:54								16:24	
<i>AF</i>	15:34			15:56				16:00				16:26	
Alexandria	15:36			15:58				16:02				16:28	
Crystal City	15:55			16:08				-				16:38	
L'Enfant Station	16:03			16:18				-				16:48	
<i>CP Virginia</i>	16:06			16:21				16:15				16:51	
<i>A</i>	16:09			16:24				16:18				16:54	
Arr. Washington Union	16:10			16:25				16:20				16:55	
Dep. Washington Union		16:21	16:25		16:35	16:40	16:43	16:45	16:50	16:55	17:00		17:05
<i>K</i>		16:22	16:26		16:36	16:41	16:44	16:46	16:51	16:56	17:01		17:06
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>		16:26	16:30		16:40	16:45	16:48	16:50	16:55	17:00	17:05		17:10
<i>MP 128</i>		16:30			16:44	16:49		16:54	16:59		17:09		17:14
<i>QN Tower</i>			16:33							17:03			
Silver Spring			16:45							17:15			
<i>Georgetown Jct.</i>			16:47							17:17			
<i>JD</i>							16:51						
Riverdale							16:53						

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Northbound Train ID	M9936	A2226	A196	V536	M438	M893	M850	M440	V436	M9940	A2174	M879	A3190
<i>From</i>	MEQ 9936	A2221	AEQ 196	V533	MEQ 438	M537	M853	MEQ 440	V435	MEQ 9940	A2159	M439	
<i>To</i>													
<i># of Locomotives</i>	1	0	1	1	1	1	1	1	1	1	0	1	2
<i># of Coaches</i>	8	8	10	7	4	6	5	8	6	7	8	6	10
<i>Train Class</i>	MARC P	ACELA	REG	VRE F	MARC P	MARC B	MARC C	MARC P	VRE M	MARC P	ACELA	MARC B	SEHSR
<i>Operational Notes</i>													*
<i>WUS Track Assignment</i>	T2	T10	T5	T26	T4	T3	T1	T2	T27	T3	T9	T4	T25
<i>Ravensworth</i>				16:33									16:49
Franconia				16:34									-
<i>Cameron Run (CR)</i>									16:54				
<i>AF</i>				16:44					16:56				17:00
Alexandria				16:46					16:58				17:02
Crystal City				16:55					17:08				-
L'Enfant Station				17:03					17:18				-
<i>CP Virginia</i>				17:06					17:21				17:16
<i>A</i>				17:09					17:24				17:19
Arr. Washington Union				17:10					17:25				17:20
Dep. Washington Union	17:10	17:15	17:18		17:20	17:20	17:22	17:25		17:35	17:40	17:40	17:45
<i>K</i>	17:11	17:16	17:19		17:21	17:21	17:23	17:26		17:36	17:41	17:41	17:46
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	17:15	17:20	17:23		17:26	17:25	17:27	17:30		17:40	17:45	17:45	17:50
<i>MP 128</i>	17:19	17:24	17:27		17:30			17:34		17:44	17:49		17:54
<i>QN Tower</i>						17:28						17:48	
Silver Spring						17:40						18:00	
<i>Georgetown Jct.</i>						17:42						18:02	
<i>JD</i>							17:30						
Riverdale							17:32						

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Northbound Train ID	V538	M642	M9942	V438	A2326	M901	M544	A2228	V540	M881	A3084	V440	M9944
<i>From</i>	V537	M641	M8XXb	V437	A2315	M902	MEQ 544	A2223	V539	M884		V441	M443
<i>To</i>													
<i># of Locomotives</i>	1	1	1	1	0	1	1	0	1	1	2	1	1
<i># of Coaches</i>	9	6	6	9	8	6	8	8	8	5	10	8	5
<i>Train Class</i>	VRE F	MARC P	MARC P	VRE M	ACELA	MARC B	MARC P	ACELA	VRE F	MARC B	SEHSR	VRE M	MARC P
<i>Operational Notes</i>											*		
<i>WUS Track Assignment</i>	T28	T5	T7	T26	T8	T2	T4	T12	T27	T7	T24	T26	T3
<i>Ravensworth</i>	17:03								17:33		17:34		
Franconia	17:04								17:34		-		
<i>Cameron Run (CR)</i>				17:20								17:54	
<i>AF</i>	17:14			17:22					17:44		17:45	17:56	
Alexandria	17:16			17:24					17:46		17:47	17:58	
Crystal City	17:25			17:34					17:55		-	18:08	
L'Enfant Station	17:33			17:44					18:03		-	18:18	
<i>CP Virginia</i>	17:36			17:47					18:06		18:01	18:21	
<i>A</i>	17:39			17:50					18:09		18:04	18:24	
Arr. Washington Union	17:40			17:51					18:10		18:05	18:25	
Dep. Washington Union		17:50	17:55		18:00	18:00	18:10	18:15		18:20	18:30		18:35
<i>K</i>		17:51	17:56		18:01	18:01	18:11	18:16		18:21	18:31		18:36
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>		17:55	18:00		18:05	18:05	18:15	18:20		18:25	18:35		18:40
<i>MP 128</i>		17:59	18:04		18:09		18:19	18:24			18:39		18:44
<i>QN Tower</i>						18:08				18:28			
Silver Spring						18:20				18:40			
<i>Georgetown Jct.</i>						18:22				18:42			
<i>JD</i>													
Riverdale													

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Northbound Train ID	A2176	M895	A50	A138	M446	M854	A2328	A2230	A3160	M883	AEQ 2227	A188	M856
<i>From</i>	A2161	MEQ 895		AEQ 138	M445	M855	A2317	A2225		M447	A2227	AEQ 188	M857
<i>To</i>													
<i># of Locomotives</i>	0	1	2	1	1	1	0	0	2	1	0	1	1
<i># of Coaches</i>	8	4	6	10	8	4	8	8	10	6	8	10	4
<i>Train Class</i>	ACELA	MARC B	LD	REG	MARC P	MARC C	ACELA	ACELA	REGR	MARC B	ACELA NR	REG	MARC C
<i>Operational Notes</i>			*						*				
<i>WUS Track Assignment</i>	T11	T2	T28	T6	T4	T1	T10	T9	T24	T3	T11	T5	T2
<i>Ravensworth</i>													
Franconia			-						-				
<i>Cameron Run (CR)</i>			17:48						18:33				
<i>AF</i>			17:50						18:35				
Alexandria			17:52						18:37				
Crystal City			-						-				
L'Enfant Station			-						-				
<i>CP Virginia</i>			18:06						18:51				
<i>A</i>			18:09						18:54				
Arr. Washington Union			18:10						18:55				
Dep. Washington Union	18:40	18:40	18:42	18:45	18:55	18:55	19:00	19:15	19:20	19:25	19:43	19:45	19:45
<i>K</i>	18:41	18:41	18:43	18:46	18:56	18:56	19:01	19:16	19:21	19:26	19:44	19:46	19:46
<i>Wedge Yard</i>													
<i>Coach Yard</i>													
<i>Ivy City Yard</i>											19:58		
<i>VRE Midday Storage</i>													
<i>C</i>	18:44	18:45	18:47	18:50	19:00	19:00	19:05	19:20	19:25	19:30		19:50	19:50
<i>MP 128</i>	18:49		18:51	18:54	19:04		19:09	19:24	19:29			19:54	
<i>QN Tower</i>		18:48								19:33			
Silver Spring		19:00								19:45			
<i>Georgetown Jct.</i>		19:02								19:47			
<i>JD</i>						19:03							19:53
Riverdale						19:05							19:55

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Northbound Train ID	M448	A2232	AEQ 127	A90	AEQ 2165	A80	AEQ 2321	AEQ 2229	A198	M548	A2234	AEQ 2167	A3086
<i>From</i>	M449	A2163	A127		A2165		A2321	A2229		M451	A2319	A2167	
<i>To</i>													
<i># of Locomotives</i>	1	0	1	2	0	2	0	0	2	1	0	0	2
<i># of Coaches</i>	8	8	10	7	8	10	8	8	10	8	8	8	10
<i>Train Class</i>	MARC P	ACELA	REG NR	LD	ACELA NR	REGR	ACELA NR	ACELA NR	SEHSR	MARC P	ACELA	ACELA NR	SEHSR
<i>Operational Notes</i>				*		*			*				*
<i>WUS Track Assignment</i>	T4	T8	T6	T22	T10	T25	T9	T7	T24	T3	T12	T11	T23
<i>Ravensworth</i>				19:09		19:24			19:49				20:24
Franconia				-		-			-				-
<i>Cameron Run (CR)</i>													
<i>AF</i>				19:20		19:35			20:00				20:35
Alexandria				19:22		19:37			20:02				20:37
Crystal City				-		-			-				-
L'Enfant Station				-		-			-				-
<i>CP Virginia</i>				19:36		19:51			20:16				20:51
<i>A</i>				19:39		19:54			20:19				20:54
Arr. Washington Union				19:40		19:55			20:20				20:55
Dep. Washington Union	19:55	20:00	20:05	20:05	20:10	20:20	20:27	20:43	20:45	20:55	21:00	21:06	21:20
<i>K</i>	19:56	20:01	20:06	20:06	20:11	20:21	20:28	20:44	20:46	20:56	21:01	21:07	21:21
<i>Wedge Yard</i>													
<i>Coach Yard</i>			20:15										
<i>Ivy City Yard</i>					20:25		20:42	20:58				21:21	
<i>VRE Midday Storage</i>													
<i>C</i>	20:00	20:05		20:10		20:25			20:50	21:00	21:05		21:25
<i>MP 128</i>	20:04	20:09		20:14		20:29			20:54	21:04	21:09		21:29
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

Notes

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Northbound Train ID	AEQ 2323	AEQ 2231	AEQ 193	AEQ 2169	A66	AEQ 2325	M452	AEQ 55	AEQ 2233	AEQ 2171	AEQ 175	AEQ 2235	AEQ 2173
<i>From</i>	A2323	A2231	A193	A2169		A2325	M453	A55	A2233	A2171	A175	A2235	A2173
<i>To</i>													
<i># of Locomotives</i>	0	0	1	0	2	0	1	1	0	0	1	0	0
<i># of Coaches</i>	8	8	10	8	10	8	7	10	8	8	10	8	8
<i>Train Class</i>	ACELA NR	ACELA NR	REG NR	ACELA NR	REGR	ACELA NR	MARC P	REG NR	ACELA NR	ACELA NR	REG NR	ACELA NR	ACELA NR
<i>Operational Notes</i>					*								
<i>WUS Track Assignment</i>	T10	T9	T5	T11	T25	T12	T4	T6	T10	T9	T5	T11	T12
<i>Ravensworth</i>					21:24								
Franconia					-								
<i>Cameron Run (CR)</i>													
<i>AF</i>					21:35								
Alexandria					21:37								
Crystal City					-								
L'Enfant Station					-								
<i>CP Virginia</i>					21:51								
<i>A</i>					21:54								
Arr. Washington Union					21:55								
Dep. Washington Union	21:27	21:43	22:01	22:10	22:20	22:27	22:30	22:40	22:43	23:10	23:38	23:43	23:58
<i>K</i>	21:28	21:44	22:02	22:11	22:21	22:28	22:31	22:41	22:44	23:11	23:39	23:44	23:59
<i>Wedge Yard</i>													
<i>Coach Yard</i>			22:11					22:50			23:48		
<i>Ivy City Yard</i>	21:42	21:58		22:25		22:42			22:58	23:25		23:58	0:13
<i>VRE Midday Storage</i>													
<i>C</i>					22:25		22:35						
<i>MP 128</i>					22:29		22:39						
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>													
Riverdale													

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Northbound Train ID	A3612
<i>From</i>	
<i>To</i>	
<i># of Locomotives</i>	2
<i># of Coaches</i>	10
<i>Train Class</i>	SEHSR
<i>Operational Notes</i>	
<i>WUS Track Assignment</i>	T25
<i>Ravensworth</i>	22:49
Franconia	-
<i>Cameron Run (CR)</i>	
<i>AF</i>	23:00
Alexandria	23:02
Crystal City	-
L'Enfant Station	-
<i>CP Virginia</i>	23:16
<i>A</i>	23:19
Arr. Washington Union	23:20
Dep. Washington Union	23:30
<i>K</i>	23:31
Wedge Yard	
Coach Yard	
Ivy City Yard	23:45
VRE Midday Storage	
<i>C</i>	
<i>MP 128</i>	
<i>QN Tower</i>	
Silver Spring	
<i>Georgetown Jct.</i>	
<i>JD</i>	
Riverdale	

Notes

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Appendix C: 2040 NEC FUTURE Operating Plan

Southbound Notes:

82 MARC Penn Line trains were reduced to 57 MARC Penn Line trains for this plan, including 7 tph peak

All Metropolitan Trips are truncated to terminate/originate at WUS and have had their scheduled times adjusted to meet 20 minute WUS turn times.

Only 18 Intercity Trips were included in the FRA schedule. 5 Additional intercity trips were added to reach this number and fill clockface headway holes.

A105	Fredericksburg Line
A115	Fredericksburg Line
A117	Manassas Line
A133	Manassas Line
A137	Fredericksburg Line

All IC trips have one locomotive north of WUS and two locomotives south of WUS

VRE trip V528 was shifted 8 minutes earlier to fit all trains into WUS

Northbound Notes:

Some Trips have been added to the NEC FUTURE Schedule to bring train counts up to the levels specified

The trips added were as follows:

MET686	22:03
MET578	22:54
MET688	23:03
EXP1072	20:23

Trips A128 and A144 are not supposed to operate south of Washington, they originate in DC
This has been adjusted from the NEC FUTURE Schedule

57 MARC Penn Line trains were developed based on matching the 57 Penn Line trains retained for the SB plan, including 7 tph

All Metropolitan Trips are truncated to terminate/originate at WUS and have had their scheduled times adjusted to meet 20 minute WUS turn times.

Only 18 Intercity Trips were included in the FRA schedule. 5 Additional intercity trips were added to reach this number and fill clockface headway holes.

A122	Fredericksburg Line
A130	Fredericksburg Line
A132	Manassas Line
A136	Manassas Line
A150	Fredericksburg Line

VRE/MARC run-through trip V542-M542 was adjusted later by 5 minutes than scheduled by VRE to fit all trains into WUS on-time

All IC trips have one locomotive north of WUS and two locomotives south of WUS

Southbound Train ID	A1067	A165	T567	A2069	A169	T571	TEQ 510	AEQ 110	AEQ 1010	AEQ 2014	AEQ 2016	TEQ 622	M201
<i>From</i>													
<i>To</i>	AEQ 1067	AEQ 165	TEQ 567	AEQ 2069	AEQ 169	TEQ 571	T510	A110	A1010	A2014	A2016	T622	M202
<i># of Locomotives</i>	0	1	0	0	1	0	0	1	0	0	0	0	1
<i># of Coaches</i>	8	12	12	8	12	12	12	12	8	8	8	12	8
<i>Train Class</i>	EXP	IC	MET	EXP	IC	MET	MET	IC NR	EXP NR	EXP NR	EXP NR	MET	MARC B
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	12	8	4	11	8	4	4	8	12	11	10	4	6
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>													5:12
Silver Spring													5:14
<i>QN Tower</i>													5:26
<i>MP 138</i>	0:01	0:13	0:25	0:27	1:13	1:25							
<i>C</i>	0:05	0:17	0:29	0:31	1:17	1:29							5:29
VRE Midday Storage													
Ivy City Yard								4:21	4:24	4:28	4:58		
Coach Yard							4:24					5:16	
Wedge Yard													
<i>K</i>	0:09	0:21	0:33	0:35	1:21	1:33	4:33	4:35	4:38	4:42	5:12	5:25	5:33
Arr. Washington Union	0:10	0:22	0:34	0:36	1:22	1:34	4:34	4:36	4:39	4:43	5:13	5:26	5:34
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	TEQ 514	AEQ 114	AEQ 1014	AEQ 2018	TEQ 624	M001	M105	TEQ 516	AEQ 1016	M203	AEQ 2020	M107	M003
<i>From</i>													
<i>To</i>	T514	A114	A1014	A2018	T624	M000	M104	T516	A1016	M204	A2020	M106	MEQ 003
<i># of Locomotives</i>	0	1	0	0	0	1	1	0	0	1	0	1	1
<i># of Coaches</i>	12	12	8	8	12	8	6	12	8	8	8	6	8
<i>Train Class</i>	MET	IC NR	EXP NR	EXP NR	MET	MARC P	MARC C	MET	EXP NR	MARC B	EXP NR	MARC C	MARC P
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	5	8	12	11	5	3	6	4	10	1	9	2	3
Riverdale							5:50					6:05	
<i>JD</i>							5:52					6:07	
<i>Georgetown Jct.</i>										5:49			
Silver Spring										5:51			
<i>QN Tower</i>										6:03			
<i>MP 138</i>						5:50							6:10
<i>C</i>						5:54	5:55			6:06		6:10	6:14
VRE Midday Storage													
Ivy City Yard		5:51	5:24	5:28					5:54		5:58		
Coach Yard	5:24				5:46			5:54					
Wedge Yard													
<i>K</i>	5:33	6:05	5:38	5:42	5:55	5:58	5:59	6:03	6:08	6:10	6:12	6:14	6:18
Arr. Washington Union	5:34	5:36	5:39	5:43	5:56	5:59	6:00	6:04	6:09	6:11	6:13	6:15	6:19
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	TEQ 626	M005	M501	M205	TEQ 518	AEQ 1018	AEQ 2022	M207	M401	V501	TEQ 628	T601	V401
<i>From</i>										M501			M401
<i>To</i>	T626	MEQ 005	V501	M206	T518	A1018	A2022	MEQ 207	V401		T628	T520	
<i># of Locomotives</i>	0	1	1	1	0	0	0	1	1	1	0	0	1
<i># of Coaches</i>	12	8	7	8	12	8	8	8	9	7	12	12	9
<i>Train Class</i>	MET	MARC P	MARC PR	MARC B	MET	EXP NR	EXP NR	MARC B	MARC PR	VRE FR	MET	MET	VRE MR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	4	6	22	3	5	12	11	2	23	22	5	4	23
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>				6:12				6:27					
Silver Spring				6:14				6:29					
<i>QN Tower</i>				6:26				6:41					
<i>MP 138</i>		6:20	6:22						6:40			6:47	
<i>C</i>		6:24	6:26	6:29				6:44	6:44			6:51	
VRE Midday Storage													
Ivy City Yard						6:24	6:28						
Coach Yard	6:16				6:24						6:46		
Wedge Yard													
<i>K</i>	6:25	6:28	6:30	6:33	6:33	6:38	6:42	6:48	6:48		6:55	6:55	
Arr. Washington Union	6:26	6:29	6:31	6:34	6:34	6:39	6:43	6:49	6:49		6:56	6:56	
Dep. Washington Union										6:50			6:58
<i>A</i>										6:51			6:59
<i>CP Virginia</i>										6:54			7:02
L'Enfant Station										6:58			7:04
Crystal City										7:05			7:09
Alexandria										7:12			7:17
<i>AF</i>										7:13			7:18
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													7:20
Franconia										7:23			
<i>Ravensworth</i>										7:24			

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Southbound Train ID	M007	M113	M503	M209	AEQ 120	AEQ 1020	M211	AEQ 2024	M009	M115	M213	M403	V503
<i>From</i>													M503
<i>To</i>	MEQ 007	M112	V503	MEQ 209	A120	A1020	MEQ 211	A2024	MEQ 009	M114	MEQ 213	V403	
<i># of Locomotives</i>	1	1	1	1	1	0	1	0	1	1	1	1	1
<i># of Coaches</i>	8	6	7	8	12	8	8	8	8	6	8	9	7
<i>Train Class</i>	MARC P	MARC C	MARC PR	MARC B	IC NR	EXP NR	MARC B	EXP NR	MARC P	MARC C	MARC B	MARC PR	VRE FR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	6	1	22	2	8	10	3	9	6	7	2	23	22
Riverdale		6:50								7:05			
<i>JD</i>		6:52								7:07			
<i>Georgetown Jct.</i>				6:42			6:49				6:57		
Silver Spring				6:44			6:51				6:59		
<i>QN Tower</i>				6:56			7:03				7:11		
<i>MP 138</i>	6:50		6:52						7:05			7:10	
<i>C</i>	6:54	6:55	6:56	6:59			7:06		7:09	7:10	7:14	7:14	
VRE Midday Storage													
Ivy City Yard					7:21	6:54		6:58					
Coach Yard													
Wedge Yard													
<i>K</i>	6:58	6:59	7:00	7:03	7:35	7:08	7:10	7:12	7:13	7:14	7:18	7:18	
Arr. Washington Union	6:59	7:00	7:01	7:04	7:06	7:09	7:11	7:13	7:14	7:15	7:19	7:19	
Dep. Washington Union													7:20
<i>A</i>													7:21
<i>CP Virginia</i>													7:24
L'Enfant Station													7:28
Crystal City													7:35
Alexandria													7:42
<i>AF</i>													7:43
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia													7:53
<i>Ravensworth</i>													7:54

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Southbound Train ID	T603	V403	M011	M117	M505	M215	A2001	AEQ 1022	M217	M119	M405	M219	V505
<i>From</i>		M403											M505
<i>To</i>	T630		MEQ 011	MEQ 117	V505	M212	A2026	A1022	MEQ 217	M116	V405	M216	
<i># of Locomotives</i>	0	1	1	1	1	1	0	0	1	1	1	1	1
<i># of Coaches</i>	12	9	8	6	7	8	8	8	8	6	6	8	7
<i>Train Class</i>	MET	VRE MR	MARC P	MARC C	MARC PR	MARC B	EXP	EXP NR	MARC B	MARC C	MARC PR	MARC B	VRE FR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	4	23	6	1	22	3	12	11	2	1	23	6	22
Riverdale				7:20						7:35			
<i>JD</i>				7:22						7:37			
<i>Georgetown Jct.</i>						7:12			7:19			7:27	
Silver Spring						7:14			7:21			7:29	
<i>QN Tower</i>						7:26			7:33			7:41	
<i>MP 138</i>	7:17		7:20		7:22		7:27				7:37		
<i>C</i>	7:21		7:24	7:25	7:26	7:29	7:31		7:36	7:40	7:41	7:44	
VRE Midday Storage													
Ivy City Yard								7:24					
Coach Yard													
Wedge Yard													
<i>K</i>	7:25		7:28	7:29	7:30	7:33	7:35	7:38	7:40	7:44	7:45	7:48	
Arr. Washington Union	7:26		7:29	7:30	7:31	7:34	7:36	7:39	7:41	7:45	7:46	7:49	
Dep. Washington Union		7:28											7:50
<i>A</i>		7:29											7:51
<i>CP Virginia</i>		7:32											7:54
L'Enfant Station		7:34											7:58
Crystal City		7:39											8:05
Alexandria		7:47											8:12
<i>AF</i>		7:48											8:13
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>		7:50											
Franconia													8:23
<i>Ravensworth</i>													8:24

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Southbound Train ID	T605	V405	M013	M121	M507	M221	A2003	A1003	M223	M015	M123	M407	V507
<i>From</i>		<i>M405</i>											<i>M507</i>
<i>To</i>	<i>T522</i>		<i>MEQ 013</i>	<i>M118</i>	<i>V507</i>	<i>MEQ 221</i>	<i>A1024</i>	<i>A2028</i>	<i>MEQ 223</i>	<i>MEQ 015</i>	<i>MEQ 123</i>	<i>V407</i>	
<i># of Locomotives</i>	0	1	1	1	1	1	0	0	1	1	1	1	1
<i># of Coaches</i>	12	6	8	6	8	8	8	8	8	8	6	6	8
<i>Train Class</i>	<i>MET</i>	<i>VRE MR</i>	<i>MARC P</i>	<i>MARC C</i>	<i>MARC PR</i>	<i>MARC B</i>	<i>EXP</i>	<i>EXP</i>	<i>MARC B</i>	<i>MARC P</i>	<i>MARC C</i>	<i>MARC PR</i>	<i>VRE FR</i>
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	5	23	3	2	22	8	10	9	1	3	6	24	22
Riverdale				7:50							8:05		
<i>JD</i>				7:52							8:07		
<i>Georgetown Jct.</i>						7:42			7:49				
Silver Spring						7:44			7:51				
<i>QN Tower</i>						7:56			8:03				
<i>MP 138</i>	7:47		7:50		7:52		7:57	8:01		8:05		8:10	
<i>C</i>	7:51		7:54	7:55	7:56	7:59	8:01	8:05	8:06	8:09	8:10	8:14	
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	7:55		7:58	7:59	8:00	8:03	8:05	8:09	8:10	8:13	8:14	8:18	
Arr. Washington Union	7:56		7:59	8:00	8:01	8:04	8:06	8:10	8:11	8:14	8:15	8:19	
Dep. Washington Union		7:58											8:20
<i>A</i>		7:59											8:21
<i>CP Virginia</i>		8:02											8:24
L'Enfant Station		8:04											8:28
Crystal City		8:09											8:35
Alexandria		8:17											8:42
<i>AF</i>		8:18											8:43
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>		8:20											
Franconia													8:53
<i>Ravensworth</i>													8:54

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Southbound Train ID	A101	M225	T607	V407	M017	M125	M509	M227	T503	A2005	A1005	M229	M127
<i>From</i>				M407									
<i>To</i>		MEQ 225	T632		MEQ 017	M120	V509	M222	T524	A1026	A2030	MEQ 229	MEQ 127
<i># of Locomotives</i>	2	1	0	1	1	1	1	1	0	0	0	1	1
<i># of Coaches</i>	12	8	12	6	8	6	7	8	12	8	8	8	6
<i>Train Class</i>	IC	MARC B	MET	VRE MR	MARC P	MARC C	MARC PR	MARC B	MET	EXP	EXP	MARC B	MARC C
<i>Operational Notes</i>	*												
<i>WUS Track Assignment</i>	22	1	4	24	6	3	25	7	5	11	12	2	6
Riverdale						8:20							8:35
<i>JD</i>						8:22							8:37
<i>Georgetown Jct.</i>		8:03						8:12				8:19	
Silver Spring		8:05						8:14				8:21	
<i>QN Tower</i>		8:17						8:26				8:33	
<i>MP 138</i>	8:13		8:17		8:20		8:22		8:25	8:27	8:31		
<i>C</i>	8:17	8:20	8:21		8:24	8:25	8:26	8:29	8:29	8:31	8:35	8:36	8:40
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	8:21	8:24	8:25		8:28	8:29	8:30	8:33	8:33	8:35	8:39	8:40	8:44
Arr. Washington Union	8:22	8:25	8:26		8:29	8:30	8:31	8:34	8:34	8:36	8:40	8:41	8:45
Dep. Washington Union	8:46			8:28									
<i>A</i>	8:47			8:29									
<i>CP Virginia</i>	8:50			8:32									
L'Enfant Station	8:51			8:34									
Crystal City	8:56			8:39									
Alexandria	9:01			8:47									
<i>AF</i>	9:02			8:48									
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>				8:50									
Franconia	-												
<i>Ravensworth</i>	9:13												

Notes

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Southbound Train ID	M409	M231	V509	A103	T609	V409	M019	M101	M021	M249	T505	A2007	AEQ 128
<i>From</i>			<i>M509</i>			<i>M409</i>							
<i>To</i>	<i>V409</i>	<i>M226</i>			<i>T634</i>		<i>M030</i>	<i>M102</i>	<i>M002</i>	<i>MEQ 249</i>	<i>T526</i>	<i>A2032</i>	<i>A128</i>
<i># of Locomotives</i>	1	1	1	2	0	1	1	1	1	1	0	0	1
<i># of Coaches</i>	7	8	7	12	12	7	8	6	8	8	12	8	12
<i>Train Class</i>	MARC PR	MARC B	VRE FR	IC	MET	VRE MR	MARC P	MARC C	MARC P	MARC B	MET	EXP	IC NR
<i>Operational Notes</i>				*									
<i>WUS Track Assignment</i>	27	1	25	22	5	27	6	2	8	7	4	10	9
Riverdale								8:50					
<i>JD</i>								8:52					
<i>Georgetown Jct.</i>		8:27								8:42			
Silver Spring		8:29								8:44			
<i>QN Tower</i>		8:41								8:56			
<i>MP 138</i>	8:37			8:43	8:47		8:50		8:52		8:55	8:57	
<i>C</i>	8:41	8:44		8:47	8:51		8:54	8:55	8:56	8:59	8:59	9:01	
VRE Midday Storage													
Ivy City Yard													9:21
Coach Yard													
Wedge Yard													
<i>K</i>	8:45	8:48		8:51	8:55		8:58	8:59	9:00	9:03	9:03	9:05	9:35
Arr. Washington Union	8:46	8:49		8:52	8:56		8:59	9:00	9:01	9:04	9:04	9:06	9:06
Dep. Washington Union			8:50	9:16		8:58							
<i>A</i>			8:51	9:17		8:59							
<i>CP Virginia</i>			8:54	9:20		9:02							
L'Enfant Station			8:58	9:21		9:04							
Crystal City			9:05	9:26		9:09							
Alexandria			9:12	9:31		9:17							
<i>AF</i>			9:13	9:32		9:18							
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>				9:34		9:20							
Franconia			9:23										
<i>Ravensworth</i>			9:24										

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Southbound Train ID	A1007	M129	M023	M233	V511	A105	T611	V411	M025	M027	M253	T507	A2009
<i>From</i>					V520			V420					
<i>To</i>	A1030	M122	M004	M228			T636		M032	M034	MEQ 253	T638	A2034
<i># of Locomotives</i>	0	1	1	1	1	1	0	1	1	1	1	0	0
<i># of Coaches</i>	8	6	8	8	7	12	12	7	8	8	8	12	8
<i>Train Class</i>	EXP	MARC C	MARC P	MARC B	VRE F	IC	MET	VRE M	MARC P	MARC P	MARC B	MET	EXP
<i>Operational Notes</i>						*							
<i>WUS Track Assignment</i>	3	1	8	5	28	23	12	26	7	2	4	11	5
Riverdale		9:05											
<i>JD</i>		9:07											
<i>Georgetown Jct.</i>				8:57							9:12		
Silver Spring				8:59							9:14		
<i>QN Tower</i>				9:11							9:26		
<i>MP 138</i>	9:01		9:10			9:13	9:17		9:20	9:22		9:25	9:27
<i>C</i>	9:05	9:10	9:14	9:14		9:17	9:21		9:24	9:26	9:29	9:29	9:31
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	9:09	9:14	9:18	9:18		9:21	9:25		9:28	9:30	9:33	9:33	9:35
Arr. Washington Union	9:10	9:15	9:19	9:19		9:22	9:26		9:29	9:31	9:34	9:34	9:36
Dep. Washington Union					9:20	9:46		9:28					
<i>A</i>					9:21	9:47		9:29					
<i>CP Virginia</i>					9:24	9:50		9:32					
L'Enfant Station					9:28	9:51		9:34					
Crystal City					9:35	9:56		9:39					
Alexandria					9:42	10:01		9:47					
<i>AF</i>					9:43	10:02		9:48					
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>								9:50					
Franconia					9:53	-							
<i>Ravensworth</i>					9:54	10:13							

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Southbound Train ID	A1009	M029	M235	V513	A107	T613	V413	M031	T509	A2011	A1011	M131	M033
<i>From</i>				V522			V422						
<i>To</i>	AEQ 1009	M036	MEQ 235			T530		M006	T640	A2036	A1034	M124	M008
<i># of Locomotives</i>	0	1	1	1	2	0	1	1	0	0	0	1	1
<i># of Coaches</i>	8	8	8	8	12	12	9	8	12	8	8	6	8
<i>Train Class</i>	EXP	MARC P	MARC B	VRE F	IC	MET	VRE M	MARC P	MET	EXP	EXP	MARC C	MARC P
<i>Operational Notes</i>					*								
<i>WUS Track Assignment</i>	9	8	7	26	22	4	28	2	12	10	11	1	4
Riverdale												10:05	
<i>JD</i>												10:07	
<i>Georgetown Jct.</i>			9:27										
Silver Spring			9:29										
<i>QN Tower</i>			9:41										
<i>MP 138</i>	9:31	9:40			9:43	9:47		9:50	9:55	9:57	10:01		10:10
<i>C</i>	9:35	9:44	9:44		9:47	9:51		9:54	9:59	10:01	10:05	10:10	10:14
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	9:39	9:48	9:48		9:51	9:55		9:58	10:03	10:05	10:09	10:14	10:18
Arr. Washington Union	9:40	9:49	9:49		9:52	9:56		9:59	10:04	10:06	10:10	10:15	10:19
Dep. Washington Union				9:50	10:16		9:58						
<i>A</i>				9:51	10:17		9:59						
<i>CP Virginia</i>				9:54	10:20		10:02						
L'Enfant Station				9:58	10:21		10:04						
Crystal City				10:05	10:26		10:09						
Alexandria				10:12	10:31		10:17						
<i>AF</i>				10:13	10:32		10:18						
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>							10:20						
Franconia				10:23	-								
<i>Ravensworth</i>				10:24	10:43								

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Southbound Train ID	M237	A109	T615	V415	T511	A2013	A1013	V515	A111	T617	M035	A2015	A1015
<i>From</i>				V424				V524					
<i>To</i>	M230		T642		T534	A2038	AEQ 1013			T644	M010	A2040	A1038
<i># of Locomotives</i>	1	2	0	1	0	0	0	1	2	0	1	0	0
<i># of Coaches</i>	8	12	12	9	12	8	8	7	12	12	8	8	8
<i>Train Class</i>	MARC B	IC	MET	VRE M	MET	EXP	EXP	VRE F	IC	MET	MARC P	EXP	EXP
<i>Operational Notes</i>		*							*				
<i>WUS Track Assignment</i>	2	23	5	26	9	12	3	28	22	4	2	10	9
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>	9:57												
Silver Spring	9:59												
<i>QN Tower</i>	10:11												
<i>MP 138</i>		10:13	10:17		10:25	10:27	10:31		10:43	10:47	10:50	10:57	11:01
<i>C</i>	10:14	10:17	10:21		10:29	10:31	10:35		10:47	10:51	10:54	11:01	11:05
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	10:18	10:21	10:25		10:33	10:35	10:39		10:51	10:55	10:58	11:05	11:09
Arr. Washington Union	10:19	10:22	10:26		10:34	10:36	10:40		10:52	10:56	10:59	11:06	11:10
Dep. Washington Union		10:46		10:28				10:50	11:16				
<i>A</i>		10:47		10:29				10:51	11:17				
<i>CP Virginia</i>		10:50		10:32				10:54	11:20				
L'Enfant Station		10:51		10:34				10:58	11:21				
Crystal City		10:56		10:39				11:05	11:26				
Alexandria		11:01		10:47				11:12	11:31				
<i>AF</i>		11:02		10:48				11:13	11:32				
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>				10:50					11:34				
Franconia								11:23					
<i>Ravensworth</i>		11:13						11:24					

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Southbound Train ID	M133	M037	M239	A113	T619	V417	T515	A2017	V517	A115	T621	M039	A2019
<i>From</i>						V426			V526				
<i>To</i>	M126	M012	M232		T646		T538	A2042			T648	M014	A2044
<i># of Locomotives</i>	1	1	1	2	0	1	0	0	1	1	0	1	0
<i># of Coaches</i>	6	8	8	12	12	6	12	8	7	12	12	8	8
<i>Train Class</i>	MARC C	MARC P	MARC B	IC	MET	VRE M	MET	EXP	VRE F	IC	MET	MARC P	EXP
<i>Operational Notes</i>				*						*			
<i>WUS Track Assignment</i>	1	5	2	23	4	26	11	12	28	22	5	3	10
Riverdale	11:05												
<i>JD</i>	11:07												
<i>Georgetown Jct.</i>			10:57										
Silver Spring			10:59										
<i>QN Tower</i>			11:11										
<i>MP 138</i>		11:10		11:13	11:17		11:25	11:27		11:43	11:47	11:50	11:57
<i>C</i>	11:10	11:14	11:14	11:17	11:21		11:29	11:31		11:47	11:51	11:54	12:01
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	11:14	11:18	11:18	11:21	11:25		11:33	11:35		11:51	11:55	11:58	12:05
Arr. Washington Union	11:15	11:19	11:19	11:22	11:26		11:34	11:36		11:52	11:56	11:59	12:06
Dep. Washington Union				11:46		11:28			11:50	12:16			
<i>A</i>				11:47		11:29			11:51	12:17			
<i>CP Virginia</i>				11:50		11:32			11:54	12:20			
L'Enfant Station				11:51		11:34			11:58	12:21			
Crystal City				11:56		11:39			12:05	12:26			
Alexandria				12:01		11:47			12:12	12:31			
<i>AF</i>				12:02		11:48			12:13	12:32			
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>						11:50							
Franconia				-					12:23	-			
<i>Ravensworth</i>				12:13					12:24	12:43			

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Southbound Train ID	A1019	M135	M041	M241	A117	T623	V419	T519	A2021	V519	A119	T625	M043
<i>From</i>							V428			V528			
<i>To</i>	A1042	M128	M016	M234		T650		T542	A2046			T652	M018
<i># of Locomotives</i>	0	1	1	1	1	0	1	0	0	1	2	0	1
<i># of Coaches</i>	8	6	8	8	12	12	7	12	8	7	12	12	8
<i>Train Class</i>	EXP	MARC C	MARC P	MARC B	IC	MET	VRE M	MET	EXP	VRE F	IC	MET	MARC P
<i>Operational Notes</i>					*						*		
<i>WUS Track Assignment</i>	11	2	3	1	23	4	26	5	9	28	22	5	3
Riverdale		12:05											
<i>JD</i>		12:07											
<i>Georgetown Jct.</i>				11:57									
Silver Spring				11:59									
<i>QN Tower</i>				12:11									
<i>MP 138</i>	12:01		12:10		12:13	12:17		12:25	12:27		12:43	12:47	12:50
<i>C</i>	12:05	12:10	12:14	12:14	12:17	12:21		12:29	12:31		12:47	12:51	12:54
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	12:09	12:14	12:18	12:18	12:21	12:25		12:33	12:35		12:51	12:55	12:58
Arr. Washington Union	12:10	12:15	12:19	12:19	12:22	12:26		12:34	12:36		12:52	12:56	12:59
Dep. Washington Union					12:46		12:28			12:50	13:16		
<i>A</i>					12:47		12:29			12:51	13:17		
<i>CP Virginia</i>					12:50		12:32			12:54	13:20		
L'Enfant Station					12:51		12:34			12:58	13:21		
Crystal City					12:56		12:39			13:05	13:26		
Alexandria					13:01		12:47			13:12	13:31		
<i>AF</i>					13:02		12:48			13:13	13:32		
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>					13:04		12:50						
Franconia										13:23	-		
<i>Ravensworth</i>										13:24	13:43		

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Southbound Train ID	A2023	AEQ 144	A1023	M137	M045	M243	A30	T627	V421	T523	A2025	V521	A123
<i>From</i>									V430			V530	
<i>To</i>	A2048	A144	A1046	M130	M020	M236	AEQ 30	T654		T546	A2050		
<i># of Locomotives</i>	0	1	0	1	1	1	1	0	1	0	0	1	2
<i># of Coaches</i>	8	12	8	6	8	8	10	12	9	12	8	8	12
<i>Train Class</i>	EXP	IC NR	EXP	MARC C	MARC P	MARC B	IC	MET	VRE M	MET	EXP	VRE F	IC
<i>Operational Notes</i>													*
<i>WUS Track Assignment</i>	12	4	10	1	3	2	28	5	26	11	9	26	23
Riverdale				13:05									
<i>JD</i>				13:07									
<i>Georgetown Jct.</i>						12:57							
Silver Spring						12:59							
<i>QN Tower</i>						13:11							
<i>MP 138</i>	12:57		13:01		13:10		13:13	13:17		13:25	13:27		13:43
<i>C</i>	13:01		13:05	13:10	13:14	13:14	13:17	13:21		13:29	13:31		13:47
VRE Midday Storage													
Ivy City Yard		13:21											
Coach Yard													
Wedge Yard													
<i>K</i>	13:05	13:35	13:09	13:14	13:18	13:18	13:21	13:25		13:33	13:35		13:51
Arr. Washington Union	13:06	13:06	13:10	13:15	13:19	13:19	13:22	13:26		13:34	13:36		13:52
Dep. Washington Union									13:28			13:50	14:16
<i>A</i>									13:29			13:51	14:17
<i>CP Virginia</i>									13:32			13:54	14:20
L'Enfant Station									13:34			13:58	14:21
Crystal City									13:39			14:05	14:26
Alexandria									13:47			14:12	14:31
<i>AF</i>									13:48			14:13	14:32
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>									13:50				
Franconia												14:23	-
<i>Ravensworth</i>												14:24	14:43

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Southbound Train ID	T629	M047	A2027	A1027	M139	M049	M245	A125	T631	V423	T527	A2029	V523
<i>From</i>										V432			V532
<i>To</i>	T656	M022	A2052	A1050	M132	M024	M238		T658		T550	A2054	
<i># of Locomotives</i>	0	1	0	0	1	1	1	2	0	1	0	0	1
<i># of Coaches</i>	12	8	8	8	6	8	8	12	12	9	12	8	7
<i>Train Class</i>	MET	MARC P	EXP	EXP	MARC C	MARC P	MARC B	IC	MET	VRE M	MET	EXP	VRE F
<i>Operational Notes</i>								*					
<i>WUS Track Assignment</i>	4	3	12	11	2	3	1	22	5	26	4	10	28
Riverdale					14:05								
<i>JD</i>					14:07								
<i>Georgetown Jct.</i>							13:57						
Silver Spring							13:59						
<i>QN Tower</i>							14:11						
<i>MP 138</i>	13:47	13:50	13:57	14:01		14:10		14:13	14:17		14:25	14:27	
<i>C</i>	13:51	13:54	14:01	14:05	14:10	14:14	14:14	14:17	14:21		14:29	14:31	
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	13:55	13:58	14:05	14:09	14:14	14:18	14:18	14:21	14:25		14:33	14:35	
Arr. Washington Union	13:56	13:59	14:06	14:10	14:15	14:19	14:19	14:22	14:26		14:34	14:36	
Dep. Washington Union								14:46		14:28			14:50
<i>A</i>								14:47		14:29			14:51
<i>CP Virginia</i>								14:50		14:32			14:54
L'Enfant Station								14:51		14:34			14:58
Crystal City								14:56		14:39			15:05
Alexandria								15:01		14:47			15:12
<i>AF</i>								15:02		14:48			15:13
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>										14:50			
Franconia								-					15:23
<i>Ravensworth</i>								15:13					15:24

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Southbound Train ID	AEQ 29	T633	M051	A2031	AEQ 1052	A1031	M141	M053	M247	A129	T635	V425	T531
<i>From</i>												V434	
<i>To</i>	A29	T660	M026	A2056	A1052	A1054	M136	M028	M242		T662		T554
<i># of Locomotives</i>	1	0	1	0	0	0	1	1	1	2	0	1	0
<i># of Coaches</i>	10	12	8	8	8	8	6	8	8	12	12	6	12
<i>Train Class</i>	IC	MET	MARC P	EXP	EXP NR	EXP	MARC C	MARC P	MARC B	IC	MET	VRE M	MET
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	26	4	3	9	12	5	1	3	2	23	4	28	11
Riverdale							15:05						
<i>JD</i>							15:07						
<i>Georgetown Jct.</i>									14:57				
Silver Spring									14:59				
<i>QN Tower</i>									15:11				
<i>MP 138</i>	14:43	14:47	14:50	14:57		15:01		15:10		15:13	15:17		15:25
<i>C</i>	14:47	14:51	14:54	15:01		15:05	15:10	15:14	15:14	15:17	15:21		15:29
VRE Midday Storage													
Ivy City Yard					14:54								
Coach Yard													
Wedge Yard													
<i>K</i>	14:51	14:55	14:58	15:05	15:08	15:09	15:14	15:18	15:18	15:21	15:25		15:33
Arr. Washington Union	14:52	14:56	14:59	15:06	15:09	15:10	15:15	15:19	15:19	15:22	15:26		15:34
Dep. Washington Union										15:46		15:28	
<i>A</i>										15:47		15:29	
<i>CP Virginia</i>										15:50		15:32	
L'Enfant Station										15:51		15:34	
Crystal City										15:56		15:39	
Alexandria										16:01		15:47	
<i>AF</i>										16:02		15:48	
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>												15:50	
Franconia										-			
<i>Ravensworth</i>										16:13			

Notes

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Southbound Train ID	A2033	V525	A131	MEQ 244	T637	M527	A2035	AEQ 1056	A1035	M143	MEQ 248	V529	M427
<i>From</i>		V534											
<i>To</i>	A2058			M244	T664	V527	A2060	A1056	A1058	M140	M248		V427
<i># of Locomotives</i>	0	1	2	1	0	1	0	0	0	1	1	1	1
<i># of Coaches</i>	8	7	12	8	12	7	8	8	8	6	8	8	7
<i>Train Class</i>	EXP	VRE F	IC	MARC NR	MET	MARC PR	EXP	EXP NR	EXP	MARC C	MARC NR	VRE F	MARC PR
<i>Operational Notes</i>			*										
<i>WUS Track Assignment</i>	10	28	22	2	4	23	12	9	11	3	6	27	22
Riverdale										16:05			
<i>JD</i>										16:07			
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 138</i>	15:27		15:43		15:47	15:50	15:57		16:01				16:10
<i>C</i>	15:31		15:47		15:51	15:54	16:01		16:05	16:10			16:14
<i>VRE Midday Storage</i>												16:02	
<i>Ivy City Yard</i>								15:54					
<i>Coach Yard</i>											16:06		
<i>Wedge Yard</i>				15:44									
<i>K</i>	15:35		15:51	15:53	15:55	15:58	16:05	16:08	16:09	16:14	16:15	16:17	16:18
Arr. Washington Union	15:36		15:52	15:54	15:56	15:59	16:06	16:09	16:10	16:15	16:16	16:18	16:19
Dep. Washington Union		15:50	16:16									16:28	
<i>A</i>		15:51	16:17									16:29	
<i>CP Virginia</i>		15:54	16:20									16:32	
L'Enfant Station		15:58	16:21									16:36	
Crystal City		16:05	16:26									16:43	
Alexandria		16:12	16:31									16:50	
<i>AF</i>		16:13	16:32									16:51	
<i>Alexandria Storage Yard</i>													
<i>Cameron Run (CR)</i>													
Franconia		16:23	-									17:01	
<i>Ravensworth</i>		16:24	16:43									17:02	

Notes

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* Requires engine change at WUS

Southbound Train ID	V527	A133	M251	T639	V427	M531	M431	V429	T535	A2037	V531	M147	MEQ 254
<i>From</i>	M527				M427						M531		
<i>To</i>			M252	T666		V531	V431		T558	A2062		M144	M254
<i># of Locomotives</i>	1	1	1	0	1	1	1	1	0	0	1	1	1
<i># of Coaches</i>	7	12	8	12	7	7	9	6	12	8	7	6	8
<i>Train Class</i>	VRE FR	IC	MARC B	MET	VRE MR	MARC PR	MARC PR	VRE M	MET	EXP	VRE FR	MARC C	MARC NR
<i>Operational Notes</i>		*											
<i>WUS Track Assignment</i>	23	23	2	5	22	22	28	27	4	10	22	6	1
Riverdale												16:35	
<i>JD</i>												16:37	
<i>Georgetown Jct.</i>			16:02										
Silver Spring			16:04										
<i>QN Tower</i>			16:16										
<i>MP 138</i>		16:13		16:17		16:20	16:22		16:25	16:27			
<i>C</i>		16:17	16:19	16:21		16:24	16:26		16:29	16:31		16:40	
VRE Midday Storage								16:17					
Ivy City Yard													
Coach Yard													16:36
Wedge Yard													
<i>K</i>		16:21	16:23	16:25		16:28	16:30	16:32	16:33	16:35		16:44	16:45
Arr. Washington Union		16:22	16:24	16:26		16:29	16:31	16:33	16:34	16:36		16:45	16:46
Dep. Washington Union	16:20	16:46			16:28			16:43			16:45		
<i>A</i>	16:21	16:47			16:29			16:44			16:46		
<i>CP Virginia</i>	16:24	16:50			16:32			16:47			16:49		
L'Enfant Station	16:28	16:51			16:34			16:49			16:53		
Crystal City	16:35	16:56			16:39			16:54			7:00		
Alexandria	16:42	17:01			16:47			17:02			17:07		
<i>AF</i>	16:43	17:02			16:48			17:03			17:08		
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>					16:50			17:05					
Franconia	16:53	-									17:18		
<i>Ravensworth</i>	16:54	17:13									17:19		

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Southbound Train ID	M257	A135	V533	T641	V431	M535	V433	T643	A2039	MEQ 258	A1039	MEQ 146	M149
<i>From</i>					M431								
<i>To</i>	M256			T668		V535		T560	A1060	M258	A2064	M146	M148
<i># of Locomotives</i>	1	2	1	0	1	1	1	0	0	1	0	1	1
<i># of Coaches</i>	8	12	7	12	9	8	10	12	8	8	8	6	6
<i>Train Class</i>	MARC B	IC	VRE F	MET	VRE MR	MARC PR	VRE M	MET	EXP	MARC NR	EXP	MARC NR	MARC C
<i>Operational Notes</i>		*											
<i>WUS Track Assignment</i>	3	23	27	4	28	22	26	5	9	2	12	1	6
Riverdale													17:05
<i>JD</i>													17:07
<i>Georgetown Jct.</i>	16:27												
Silver Spring	16:29												
<i>QN Tower</i>	16:41												
<i>MP 138</i>		16:43		16:47		16:50		16:55	16:57		17:01		
<i>C</i>	16:44	16:47		16:51		16:54		16:59	17:01		17:05		17:10
<i>VRE Midday Storage</i>			16:39				16:47						
<i>Ivy City Yard</i>													
<i>Coach Yard</i>												17:03	
<i>Wedge Yard</i>										16:59			
<i>K</i>	16:48	16:51	16:54	16:55		16:58	17:02	17:03	17:05	17:08	17:09	17:12	17:14
Arr. Washington Union	16:49	16:52	16:55	16:56		16:59	17:03	17:04	17:06	17:09	17:10	17:13	17:15
Dep. Washington Union		17:16	17:05		16:58		17:13						
<i>A</i>		17:17	17:06		16:59		17:14						
<i>CP Virginia</i>		17:20	17:09		17:02		17:17						
L'Enfant Station		17:21	17:13		17:04		17:19						
Crystal City		17:26	17:20		17:09		17:24						
Alexandria		17:31	17:27		17:17		17:32						
<i>AF</i>		17:32	17:28		17:18		17:33						
<i>Alexandria Storage Yard</i>													
<i>Cameron Run (CR)</i>		17:34			17:20		17:35						
Franconia			17:38										
<i>Ravensworth</i>			17:39										

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Southbound Train ID	MEQ 038	MEQ 260	M261	M435	V535	A137	V537	T539	V435	M539	M151	M439	V437
<i>From</i>					M535				M435				
<i>To</i>	M038	M260	M262	V435				T670		V539	M150	V439	
<i># of Locomotives</i>	1	1	1	1	1	1	1	0	1	1	1	1	1
<i># of Coaches</i>	8	8	8	9	8	12	8	12	9	8	6	9	10
<i>Train Class</i>	MARC NR	MARC NR	MARC B	MARC PR	VRE FR	IC	VRE F	MET	VRE MR	MARC PR	MARC C	MARC PR	VRE M
<i>Operational Notes</i>						*							
<i>WUS Track Assignment</i>	3	7	8	23	22	22	26	5	23	23	2	24	28
Riverdale											17:20		
<i>JD</i>											17:22		
<i>Georgetown Jct.</i>			16:57										
Silver Spring			16:59										
<i>QN Tower</i>			17:11										
<i>MP 138</i>				17:10		17:13		17:17		17:20		17:22	
<i>C</i>			17:14	17:14		17:17		17:21		17:24	17:25	17:26	
<i>VRE Midday Storage</i>							17:09						17:17
<i>Ivy City Yard</i>													
<i>Coach Yard</i>	17:05	17:06											
<i>Wedge Yard</i>													
<i>K</i>	17:14	17:15	17:18	17:18		17:21	17:24	17:25		19:28	17:29	17:30	17:32
Arr. Washington Union	17:15	17:16	17:19	17:19		17:22	17:25	17:26		17:29	17:30	17:31	17:33
Dep. Washington Union					17:20	17:46	17:35		17:28				17:43
<i>A</i>					17:21	17:47	17:36		17:29				17:44
<i>CP Virginia</i>					17:24	17:50	17:39		17:32				17:47
L'Enfant Station					17:28	17:51	17:43		17:34				17:49
Crystal City					17:35	17:56	17:50		17:39				17:54
Alexandria					17:42	18:01	17:57		17:47				18:02
<i>AF</i>					17:43	18:02	17:58		17:48				18:03
<i>Alexandria Storage Yard</i>													
<i>Cameron Run (CR)</i>						18:04			17:50				18:05
Franconia					17:53		18:08						
<i>Ravensworth</i>					17:54		18:09						

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Southbound Train ID	T645	A2041	MEQ 264	A1041	V539	MEQ 152	MEQ 040	MEQ 266	M267	A139	MEQ 042	V541	T541
<i>From</i>					M539								
<i>To</i>	T562	A1062	M264	A2066		M152	M040	M266	M268		M042		T672
<i># of Locomotives</i>	0	0	1	0	1	1	1	1	1	2	1	1	0
<i># of Coaches</i>	12	8	8	8	8	6	8	8	8	12	8	7	12
<i>Train Class</i>	MET	EXP	MARC NR	EXP	VRE FR	MARC NR	MARC NR	MARC NR	MARC B	IC	MARC NR	VRE F	MET
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	4	11	1	10	23	6	3	7	8	22	2	26	4
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>									17:27				
Silver Spring									17:29				
<i>QN Tower</i>									17:41				
<i>MP 138</i>	17:25	17:27		17:31						17:43			17:47
<i>C</i>	17:29	17:31		17:35					17:44	17:47			17:51
VRE Midday Storage												17:39	
Ivy City Yard													
Coach Yard							17:35	17:36			17:45		
Wedge Yard			17:29			17:35							
<i>K</i>	17:33	17:35	17:38	17:39		17:44	17:44	17:45	17:48	17:51	17:54	17:54	17:55
Arr. Washington Union	17:34	17:36	17:39	17:40		17:45	17:45	17:46	17:49	17:52	17:55	17:55	17:56
Dep. Washington Union					17:45					18:16		18:05	
<i>A</i>					17:46					18:17		18:06	
<i>CP Virginia</i>					17:49					18:20		18:09	
L'Enfant Station					17:53					18:21		18:13	
Crystal City					18:00					18:26		18:20	
Alexandria					18:07					18:31		18:27	
<i>AF</i>					18:08					18:32		18:28	
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia					18:18					-		18:38	
<i>Ravensworth</i>					18:19					18:43		18:39	

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Southbound Train ID	V439	M543	M103	V441	M269	T647	A2043	A1043	MEQ 044	MEQ 208	M271	M443	V543
<i>From</i>	M439												M543
<i>To</i>		V543	M108		M270	T564	A1064	A2068	M044	M208	M272	V443	
<i># of Locomotives</i>	1	1	1	1	1	0	0	0	1	1	1	1	1
<i># of Coaches</i>	9	7	6	10	8	12	8	8	8	8	8	6	7
<i>Train Class</i>	VRE MR	MARC PR	MARC C	VRE M	MARC B	MET	EXP	EXP	MARC NR	MARC NR	MARC B	MARC PR	VRE FR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	24	23	1	27	3	5	9	12	6	2	7	22	23
Riverdale			17:50										
<i>JD</i>			17:52										
<i>Georgetown Jct.</i>					17:42						17:57		
Silver Spring					17:44						17:59		
<i>QN Tower</i>					17:56						18:11		
<i>MP 138</i>		17:50				17:55	17:57	18:01				18:10	
<i>C</i>		17:54	17:55		17:59	17:59	18:01	18:05			18:14	18:14	
VRE Midday Storage				17:47									
Ivy City Yard													
Coach Yard									18:05	18:06			
Wedge Yard													
<i>K</i>		17:58	17:59	18:02	18:03	18:03	18:05	18:09	18:14	18:15	18:18	18:18	
Arr. Washington Union		17:59	18:00	18:03	18:04	18:04	18:06	18:10	18:15	18:16	18:19	18:19	
Dep. Washington Union	17:58			18:13									18:20
<i>A</i>	17:59			18:14									18:21
<i>CP Virginia</i>	18:02			18:17									18:24
L'Enfant Station	18:04			18:19									18:28
Crystal City	18:09			18:24									18:35
Alexandria	18:17			18:32									18:42
<i>AF</i>	18:18			18:33									18:43
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>	18:20			18:35									
Franconia													18:53
<i>Ravensworth</i>													18:54

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Southbound Train ID	A141	MEQ 046	V545	T543	V443	MEQ 154	M109	M055	V445	T649	A2045	MEQ 210	A1045
<i>From</i>					M443								
<i>To</i>		M046		T674		M154	M110	M048		T566	A1066	M210	A2070
<i># of Locomotives</i>	2	1	1	0	1	1	1	1	1	0	0	1	0
<i># of Coaches</i>	12	8	7	12	6	6	6	8	6	12	8	8	8
<i>Train Class</i>	IC	MARC NR	VRE F	MET	VRE MR	MARC NR	MARC C	MARC P	VRE M	MET	EXP	MARC NR	EXP
<i>Operational Notes</i>	*												
<i>WUS Track Assignment</i>	23	3	26	5	22	2	6	8	27	4	11	1	10
Riverdale							18:20						
<i>JD</i>							18:22						
<i>Georgetown Jct.</i>													
Silver Spring													
<i>QN Tower</i>													
<i>MP 138</i>	18:13			18:17				18:22		18:25	18:27		18:31
<i>C</i>	18:17			18:21			18:25	18:26		18:29	18:31		18:35
<i>VRE Midday Storage</i>			18:09						18:17				
<i>Ivy City Yard</i>													
<i>Coach Yard</i>		18:15					18:18					18:29	
<i>Wedge Yard</i>													
<i>K</i>	18:21	18:24	18:24	18:25		18:27	18:29	18:30	18:32	18:33	18:35	18:38	18:39
Arr. Washington Union	18:22	18:25	18:25	18:26		18:28	18:30	18:31	18:33	18:34	18:36	18:39	18:40
Dep. Washington Union	18:46		18:35		18:28				18:43				
<i>A</i>	18:47		18:36		18:29				18:44				
<i>CP Virginia</i>	18:50		18:39		18:32				18:47				
L'Enfant Station	18:51		18:43		18:34				18:49				
Crystal City	18:56		18:50		18:39				18:54				
Alexandria	19:01		18:57		18:47				19:02				
<i>AF</i>	19:02		18:58		18:48				19:03				
<i>Alexandria Storage Yard</i>													
<i>Cameron Run (CR)</i>					18:50				19:05				
Franconia	-		19:08										
<i>Ravensworth</i>	19:13		19:09										

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Southbound Train ID	MEQ 050	MEQ 214	A143	MEQ 218	MEQ 052	T545	M057	M111	M255	A2047	A1047	M157	MEQ 056
<i>From</i>													
<i>To</i>	M050	M214		M218	M052	T676	M054	M156	M220	A2072	A1070	M158	M056
<i># of Locomotives</i>	1	1	2	1	1	0	1	1	1	0	0	1	1
<i># of Coaches</i>	8	8	12	8	8	12	8	6	8	8	8	6	8
<i>Train Class</i>	MARC NR	MARC NR	IC	MARC NR	MARC NR	MET	MARC P	MARC C	MARC B	EXP	EXP	MARC C	MARC NR
<i>Operational Notes</i>			*										
<i>WUS Track Assignment</i>	3	2	22	1	6	4	3	2	7	9	12	1	6
Riverdale								18:50				19:05	
<i>JD</i>								18:52				19:07	
<i>Georgetown Jct.</i>									18:42				
Silver Spring									18:44				
<i>QN Tower</i>									18:56				
<i>MP 138</i>			18:43			18:47	18:50			18:57	19:01		
<i>C</i>			18:47			18:51	18:54	18:55	18:59	19:01	19:05	19:10	
VRE Midday Storage													
Ivy City Yard													
Coach Yard	18:35	18:36		18:44	18:45								19:05
Wedge Yard													
<i>K</i>	18:44	18:45	18:51	18:53	18:54	18:55	18:58	18:59	19:03	19:05	19:09	19:14	19:14
Arr. Washington Union	18:45	18:46	18:52	18:54	18:55	18:56	18:59	19:00	19:04	19:06	19:10	19:15	19:15
Dep. Washington Union			19:16										
<i>A</i>			19:17										
<i>CP Virginia</i>			19:20										
L'Enfant Station			19:21										
Crystal City			19:26										
Alexandria			19:31										
<i>AF</i>			19:32										
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>			19:34										
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	M059	M273	A145	T651	M061	T547	A2049	A1049	MEQ 224	A147	T653	M063	T549
<i>From</i>													
<i>To</i>	M058	M274		T678	M060	T570	A1072	AEQ 1049	M224		T680	M062	TEQ 549
<i># of Locomotives</i>	1	1	2	0	1	0	0	0	1	2	0	1	0
<i># of Coaches</i>	8	8	12	12	8	12	8	8	8	12	12	8	12
<i>Train Class</i>	MARC P	MARC B	IC	MET	MARC P	MET	EXP	EXP	MARC NR	IC	MET	MARC P	MET
<i>Operational Notes</i>			*							*			
<i>WUS Track Assignment</i>	3	8	23	5	6	4	11	10	2	22	4	3	5
Riverdale													
<i>JD</i>													
<i>Georgetown Jct.</i>		18:57											
Silver Spring		18:59											
<i>QN Tower</i>		19:11											
<i>MP 138</i>	19:10		19:13	19:17	19:20	19:25	19:27	19:31		19:43	19:47	19:52	19:55
<i>C</i>	19:14	19:14	19:17	19:21	19:24	19:29	19:31	19:35		19:47	19:51	19:56	19:59
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard									19:36				
<i>K</i>	19:18	19:18	19:21	19:25	19:28	19:33	19:35	19:39	19:45	19:51	19:55	20:00	20:03
Arr. Washington Union	19:19	19:19	19:22	19:26	19:29	19:34	19:36	19:40	19:46	19:52	19:56	20:01	20:04
Dep. Washington Union			19:46							20:16			
<i>A</i>			19:47							20:17			
<i>CP Virginia</i>			19:50							20:20			
L'Enfant Station			19:51							20:21			
Crystal City			19:56							20:26			
Alexandria			20:01							20:31			
<i>AF</i>			20:02							20:32			
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia			-							-			
<i>Ravensworth</i>			20:13							20:43			

Notes

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Southbound Train ID	A2051	A1051	M159	M065	M275	A155	T655	T551	A2053	A1053	T657	A2055	A1055
<i>From</i>													
<i>To</i>	A2076	AEQ 1051	M160	M064	M276	AEQ 155	T682	T574	A1074	A2080	T684	AEQ 2055	AEQ 1055
<i># of Locomotives</i>	0	0	1	1	1	1	0	0	0	0	0	0	0
<i># of Coaches</i>	8	8	6	8	8	12	12	12	8	8	12	8	8
<i>Train Class</i>	EXP	EXP	MARC C	MARC P	MARC B	IC	MET	MET	EXP	EXP	MET	EXP	EXP
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	9	7	1	6	2	8	5	4	12	10	4	11	9
Riverdale			20:05										
<i>JD</i>			20:07										
<i>Georgetown Jct.</i>					19:57								
Silver Spring					19:59								
<i>QN Tower</i>					20:11								
<i>MP 138</i>	19:57	20:01	20:10	20:10	20:13	20:17	20:25	20:27	20:31	20:47	20:57	21:01	
<i>C</i>	20:01	20:05	20:10	20:14	20:14	20:17	20:21	20:29	20:31	20:35	20:51	21:01	21:05
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	20:05	20:09	20:14	20:18	20:18	20:21	20:25	20:33	20:35	20:39	20:55	21:05	21:09
Arr. Washington Union	20:06	20:10	20:15	20:19	20:19	20:22	20:26	20:34	20:36	20:40	20:56	21:06	21:10
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	M145	M067	M259	A153	T659	T555	A2057	T661	M069	A2059	A1059	M153	M263
<i>From</i>													
<i>To</i>	M134	M066	M240		TEQ 659	T576	AEQ 2057	T686	M068	AEQ 2059	AEQ 1059	M138	M246
<i># of Locomotives</i>	1	1	1	2	0	0	0	0	1	0	0	1	1
<i># of Coaches</i>	6	8	8	12	12	12	8	12	8	8	8	6	8
<i>Train Class</i>	MARC C	MARC P	MARC B	IC	MET	MET	EXP	MET	MARC P	EXP	EXP	MARC C	MARC B
<i>Operational Notes</i>				*									
<i>WUS Track Assignment</i>	3	6	2	23	5	4	12	4	6	11	9	1	2
Riverdale	21:05											22:05	
<i>JD</i>	21:07											22:07	
<i>Georgetown Jct.</i>			20:57										21:57
Silver Spring			20:59										21:59
<i>QN Tower</i>			21:11										22:11
<i>MP 138</i>		21:10		21:13	21:17	21:25	21:27	21:47	21:50	21:57	22:01		
<i>C</i>	21:10	21:14	21:14	21:17	21:21	21:29	21:31	21:51	21:54	22:01	22:05	22:10	22:14
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	21:14	21:18	21:18	21:21	21:25	21:33	21:35	21:55	21:58	22:05	22:09	22:14	22:18
Arr. Washington Union	21:15	21:19	21:19	21:22	21:26	21:34	21:36	21:56	21:59	22:06	22:10	22:15	22:19
Dep. Washington Union				21:46									
<i>A</i>				21:47									
<i>CP Virginia</i>				21:50									
L'Enfant Station				21:51									
Crystal City				21:56									
Alexandria				22:01									
<i>AF</i>				22:02									
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia				-									
<i>Ravensworth</i>				22:13									

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Southbound Train ID	A157	T663	T559	A2061	T665	M071	A1063	M155	M265	A159	T667	T563	A2065
<i>From</i>													
<i>To</i>	AEQ 157	TEQ 663	T578	AEQ 2061	T688	M070	AEQ 1063	M142	M250	AEQ 159	TEQ 667	TEQ 563	AEQ 2065
<i># of Locomotives</i>	1	0	0	0	0	1	0	1	1	1	0	0	0
<i># of Coaches</i>	12	12	12	8	12	8	8	6	8	12	12	12	8
<i>Train Class</i>	IC	MET	MET	EXP	MET	MARC P	EXP	MARC C	MARC B	IC	MET	MET	EXP
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	7	5	4	10	4	3	12	6	2	8	5	4	11
Riverdale								23:05					
<i>JD</i>								23:07					
<i>Georgetown Jct.</i>									22:57				
Silver Spring									22:59				
<i>QN Tower</i>									23:11				
<i>MP 138</i>	22:13	22:17	22:25	22:27	22:47	22:50	23:01			23:13	23:17	23:25	23:27
<i>C</i>	22:17	22:21	22:29	22:31	22:51	22:54	23:05	23:10	23:14	23:17	23:21	23:29	23:31
VRE Midday Storage													
Ivy City Yard													
Coach Yard													
Wedge Yard													
<i>K</i>	22:21	22:25	22:33	22:35	22:55	22:58	23:09	23:14	23:18	23:21	23:25	23:33	23:35
Arr. Washington Union	22:22	22:26	22:34	22:36	22:56	22:59	23:10	23:15	23:19	23:22	23:26	23:34	23:36
Dep. Washington Union													
<i>A</i>													
<i>CP Virginia</i>													
L'Enfant Station													
Crystal City													
Alexandria													
<i>AF</i>													
Alexandria Storage Yard													
<i>Cameron Run (CR)</i>													
Franconia													
<i>Ravensworth</i>													

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Southbound Train ID	T669	M073
<i>From</i>		
<i>To</i>	TEQ 669	M072
<i># of Locomotives</i>	0	1
<i># of Coaches</i>	12	8
<i>Train Class</i>	MET	MARC P
<i>Operational Notes</i>		
<i>WUS Track Assignment</i>	4	6
Riverdale		
<i>JD</i>		
<i>Georgetown Jct.</i>		
Silver Spring		
<i>QN Tower</i>		
<i>MP 138</i>	23:47	23:51
<i>C</i>	23:51	23:55
VRE Midday Storage		
Ivy City Yard		
Coach Yard		
Wedge Yard		
<i>K</i>	23:55	23:59
Arr. Washington Union	23:56	0:00
Dep. Washington Union		
<i>A</i>		
<i>CP Virginia</i>		
L'Enfant Station		
Crystal City		
Alexandria		
<i>AF</i>		
Alexandria Storage Yard		
<i>Cameron Run (CR)</i>		
Franconia		
<i>Ravensworth</i>		

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Northbound Train ID	AEQ 165	TEQ 567	AEQ 169	TEQ 571	T510	A110	A1010	A2014	T622	M202	A2016	T514	A114
<i>From</i>	<i>A165</i>	<i>T567</i>	<i>A169</i>	<i>T571</i>	<i>TEQ 510</i>	<i>AEQ 110</i>	<i>AEQ 1010</i>	<i>AEQ 2014</i>	<i>TEQ 622</i>	<i>M201</i>	<i>AEQ 2016</i>	<i>TEQ 514</i>	<i>AEQ 114</i>
<i>To</i>													
<i># of Locomotives</i>	1	0	1	0	0	1	0	0	0	1	0	0	1
<i># of Coaches</i>	12	12	12	12	12	12	8	8	12	8	8	12	12
<i>Train Class</i>	IC NR	MET	IC NR	MET	MET	IC	EXP	EXP	MET	MARC B	EXP	MET	IC
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	8	4	8	4	4	8	12	11	4	6	10	5	8
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
AF													
Alexandria													
Crystal City													
L'Enfant Station													
<i>CP Virginia</i>													
A													
Arr. Washington Union													
Dep. Washington Union	0:52	0:54	1:52	1:54	4:54	5:06	5:19	5:23	5:46	5:49	5:53	5:54	6:06
<i>K</i>	<i>0:53</i>	<i>0:55</i>	<i>1:53</i>	<i>1:55</i>	<i>4:55</i>	<i>5:07</i>	<i>5:20</i>	<i>5:24</i>	<i>5:47</i>	<i>5:50</i>	<i>5:54</i>	<i>5:55</i>	<i>6:07</i>
Wedge Yard													
Coach Yard		1:04		2:04									
Ivy City Yard	1:07		2:07										
VRE Midday Storage													
<i>C</i>					4:59	5:11	5:24	5:28	5:51	5:54	5:58	5:59	6:11
<i>MP 138</i>					5:03	5:15	5:28	5:32	5:55		6:02	6:03	6:15
<i>QN Tower</i>										5:57			
Silver Spring										6:09			
<i>Georgetown Jct.</i>										6:11			
<i>JD</i>													
Riverdale													

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Northbound Train ID	M000	T624	A1014	A2018	M104	T516	V500	MEQ 003	V400	M106	M500	MEQ 005	T626
<i>From</i>	M001	TEQ 624	AEQ 1014	AEQ 2018	M105	TEQ 516		M003		M107	V500	M005	TEQ 626
<i>To</i>							M500		M400				
<i># of Locomotives</i>	1	0	0	0	1	0	1	1	1	1	1	1	0
<i># of Coaches</i>	8	12	8	8	6	12	7	8	9	6	7	8	12
<i>Train Class</i>	MARC P	MET	EXP	EXP	MARC C	MET	VRE FR	MARC NR	VRE MR	MARC C	MARC PR	MARC NR	MET
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	3	5	12	11	6	4	25	3	24	2	25	6	4
<i>Ravensworth</i>							5:53						
Franconia							-						
<i>Cameron Run (CR)</i>									6:06				
Alexandria Storage Yard													
<i>AF</i>							6:03		6:08				
Alexandria							6:06		6:11				
Crystal City							6:15		6:21				
L'Enfant Station							6:23		6:31				
<i>CP Virginia</i>							6:26		6:34				
<i>A</i>							6:29		6:37				
Arr. Washington Union							6:30		6:38				
Dep. Washington Union	6:15	6:16	6:19	6:23	6:23	6:24		6:31		6:38	6:40	6:41	6:46
<i>K</i>	6:16	6:17	6:20	6:24	6:24	6:25		6:32		6:39	6:41	6:42	6:47
Wedge Yard													
Coach Yard								6:41				6:51	
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	6:20	6:21	6:24	6:28	6:28	6:29				6:43	6:45		6:51
<i>MP 138</i>	6:24	6:25	6:28	6:32		6:33					6:49		6:55
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>					6:31					6:46			
Riverdale					6:33					6:48			

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Northbound Train ID	A1016	M204	M400	A2020	T518	V502	V504	MEQ 207	V402	M206	A120	V404	MEQ 007
<i>From</i>	AEQ 1016	M203	V400	AEQ 2020	TEQ 518			M207		M205	AEQ 120		M007
<i>To</i>							M504					M404	
<i># of Locomotives</i>	0	1	1	0	0	1	1	1	1	1	1	1	1
<i># of Coaches</i>	8	8	9	8	12	8	7	8	10	8	12	9	8
<i>Train Class</i>	EXP	MARC B	MARC PR	EXP	MET	VRE F	VRE FR	MARC NR	VRE M	MARC B	IC	VRE MR	MARC NR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	10	1	24	9	5	28	25	2	27	3	8	24	6
<i>Ravensworth</i>						6:08	6:23						
Franconia						6:09	6:24						
<i>Cameron Run (CR)</i>									6:21			6:36	
Alexandria Storage Yard													
<i>AF</i>						6:18	6:33		6:23			6:38	
Alexandria						6:21	6:36		6:26			6:41	
Crystal City						6:30	6:45		6:36			6:51	
L'Enfant Station						6:38	6:53		6:46			7:01	
<i>CP Virginia</i>						6:41	6:56		6:49			7:04	
<i>A</i>						6:44	6:59		6:52			7:07	
Arr. Washington Union						6:45	7:00		6:53			7:08	
Dep. Washington Union	6:49	6:49	6:50	6:53	6:54	6:55		7:01	7:03	7:04	7:06		7:11
<i>K</i>	6:50	6:50	6:51	6:54	6:55	6:56		7:02	7:04	7:05	7:07		7:12
Wedge Yard													
Coach Yard								7:11					7:21
Ivy City Yard													
VRE Midday Storage						7:11			7:19				
<i>C</i>	6:54	6:54	6:55	6:58	6:59					7:09	7:11		
<i>MP 138</i>	6:58		6:59	7:02	7:03						7:15		
<i>QN Tower</i>		6:57								7:12			
Silver Spring		7:09								7:24			
<i>Georgetown Jct.</i>		7:11								7:26			
<i>JD</i>													
Riverdale													

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Northbound Train ID	M504	T628	MEQ 209	A1018	M404	A2022	M112	MEQ 211	T520	V506	MEQ 009	V508	MEQ 213
<i>From</i>	V504	TEQ 628	M209	AEQ 1018	V404	AEQ 2022	M113	M211	T601		M009		M213
<i>To</i>												M508	
<i># of Locomotives</i>	1	0	1	0	1	0	1	1	0	1	1	1	1
<i># of Coaches</i>	7	12	8	8	9	8	6	8	12	7	8	7	8
<i>Train Class</i>	MARC PR	MET	MARC NR	EXP	MARC PR	EXP	MARC C	MARC NR	MET	VRE F	MARC NR	VRE FR	MARC NR
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	25	5	2	12	24	11	1	3	4	28	6	25	2
<i>Ravensworth</i>										6:38		6:53	
Franconia										6:39		6:54	
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
AF										6:48		7:03	
Alexandria										6:51		7:06	
Crystal City										7:00		7:15	
L'Enfant Station										7:08		7:23	
<i>CP Virginia</i>										7:11		7:26	
A										7:14		7:29	
Arr. Washington Union										7:15		7:30	
Dep. Washington Union	7:15	7:16	7:16	7:19	7:20	7:23	7:23	7:23	7:24	7:25	7:26		7:31
K	7:16	7:17	7:17	7:20	7:21	7:24	7:24	7:24	7:25	7:26	7:27		7:32
Wedge Yard			7:26										7:41
Coach Yard								7:33			7:36		
Ivy City Yard													
VRE Midday Storage										7:41			
C	7:20	7:21		7:24	7:25	7:28	7:28		7:29				
MP 138	7:24	7:25		7:28	7:29	7:32			7:33				
QN Tower													
Silver Spring													
<i>Georgetown Jct.</i>													
JD							7:31						
Riverdale							7:33						

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Northbound Train ID	V406	V408	M114	M508	MEQ 011	MEQ 117	T630	A1020	M212	M408	A2024	MEQ 217	V510
<i>From</i>			M115	V508	M011	M117	T603	AEQ 1020	M215	V408	AEQ 2024	M217	
<i>To</i>		M408											
<i># of Locomotives</i>	1	1	1	1	1	1	0	0	1	1	0	1	1
<i># of Coaches</i>	6	6	6	7	8	6	12	8	8	6	8	8	8
<i>Train Class</i>	VRE M	VRE MR	MARC C	MARC PR	MARC NR	MARC NR	MET	EXP	MARC B	MARC PR	EXP	MARC NR	VRE F
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	27	24	7	25	6	1	4	10	3	24	9	2	28
<i>Ravensworth</i>													7:08
Franconia													7:09
<i>Cameron Run (CR)</i>	6:51	7:06											
Alexandria Storage Yard													
<i>AF</i>	6:53	7:08											7:18
Alexandria	6:56	7:11											7:21
Crystal City	7:06	7:21											7:30
L'Enfant Station	7:16	7:31											7:38
<i>CP Virginia</i>	7:19	7:34											7:41
<i>A</i>	7:22	7:37											7:44
Arr. Washington Union	7:23	7:38											7:45
Dep. Washington Union	7:33		7:38	7:40	7:41	7:42	7:46	7:49	7:49	7:50	7:53	7:53	7:55
<i>K</i>	7:34		7:39	7:41	7:42	7:43	7:47	7:50	7:50	7:51	7:54	7:54	7:56
Wedge Yard												8:03	
Coach Yard					7:51	7:52							
Ivy City Yard													
VRE Midday Storage	7:49												8:11
<i>C</i>			7:43	7:45			7:51	7:54	7:54	7:55	7:58		
<i>MP 138</i>				7:49			7:55	7:58		7:59	8:02		
<i>QN Tower</i>									7:57				
Silver Spring									8:09				
<i>Georgetown Jct.</i>									8:11				
<i>JD</i>			7:46										
Riverdale			7:48										

Notes

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Northbound Train ID	V512	V410	M216	A122	V412	M116	MEQ 013	M512	MEQ 221	T522	A1022	M412	A2026
<i>From</i>			M219			M119	M013	V512	M221	T605	AEQ 1022	V412	A2001
<i>To</i>	M512				M412								
<i># of Locomotives</i>	1	1	1	1	1	1	1	1	1	0	0	1	0
<i># of Coaches</i>	8	10	8	12	6	6	8	8	8	12	8	6	8
<i>Train Class</i>	VRE FR	VRE M	MARC B	IC	VRE MR	MARC C	MARC NR	MARC PR	MARC NR	MET	EXP	MARC PR	EXP
<i>Operational Notes</i>				*									
<i>WUS Track Assignment</i>	24	27	6	25	25	1	3	24	8	5	11	25	12
<i>Ravensworth</i>	7:23			7:15									
Franconia	7:24			-									
<i>Cameron Run (CR)</i>		7:21			7:36								
Alexandria Storage Yard													
<i>AF</i>	7:33	7:23		7:26	7:38								
Alexandria	7:36	7:26		7:27	7:41								
Crystal City	7:45	7:36		7:32	7:51								
L'Enfant Station	7:53	7:46		7:37	8:01								
<i>CP Virginia</i>	7:56	7:49		7:38	8:04								
<i>A</i>	7:59	7:52		7:41	8:07								
Arr. Washington Union	8:00	7:53		7:42	8:08								
Dep. Washington Union		8:03	8:04	8:06		8:08	8:11	8:15	8:16	8:16	8:19	8:20	8:23
<i>K</i>		8:04	8:05	8:07		8:09	8:12	8:16	8:17	8:17	8:20	8:21	8:24
Wedge Yard													
Coach Yard							8:21		8:26				
Ivy City Yard													
VRE Midday Storage		8:19											
<i>C</i>			8:09	8:11		8:13		8:20		8:21	8:24	8:25	8:28
<i>MP 138</i>				8:15				8:24		8:25	8:28	8:29	8:32
<i>QN Tower</i>			8:12										
Silver Spring			8:24										
<i>Georgetown Jct.</i>			8:26										
<i>JD</i>						8:16							
Riverdale						8:18							

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Northbound Train ID	MEQ 223	V514	MEQ 015	MEQ 123	V516	V414	A124	MEQ 225	V416	M118	M516	MEQ 017	T632
<i>From</i>	M223		M015	M123				M225		M121	V516	M017	T607
<i>To</i>					M516				M416				
<i># of Locomotives</i>	1	1	1	1	1	1	2	1	1	1	1	1	0
<i># of Coaches</i>	8	7	8	6	7	6	12	8	7	6	7	8	12
<i>Train Class</i>	MARC NR	VRE F	MARC NR	MARC NR	VRE FR	VRE M	IC	MARC NR	VRE MR	MARC C	MARC PR	MARC NR	MET
<i>Operational Notes</i>							*						
<i>WUS Track Assignment</i>	1	28	3	6	24	27	23	1	23	2	24	6	4
<i>Ravensworth</i>		7:38			7:53		7:43						
Franconia		7:39			7:54		-						
<i>Cameron Run (CR)</i>						7:51			8:06				
Alexandria Storage Yard													
<i>AF</i>		7:48			8:03	7:53	7:54		8:08				
Alexandria		7:51			8:06	7:56	7:57		8:11				
Crystal City		8:00			8:15	8:06	8:02		8:21				
L'Enfant Station		8:08			8:16	8:04	8:07		8:23				
<i>CP Virginia</i>		8:11			8:26	8:19	8:08		8:34				
<i>A</i>		8:14			8:29	8:22	8:11		8:37				
Arr. Washington Union		8:15			8:30	8:23	8:12		8:38				
Dep. Washington Union	8:23	8:25	8:26	8:27		8:33	8:36	8:37		8:38	8:40	8:41	8:46
<i>K</i>	8:24	8:26	8:27	8:28		8:34	8:37	8:38		8:39	8:41	8:42	8:47
Wedge Yard													
Coach Yard	8:33		8:36	8:37				8:47				8:51	
Ivy City Yard													
VRE Midday Storage		8:41				8:49							
<i>C</i>							8:41			8:43	8:45		8:51
<i>MP 138</i>							8:45				8:49		8:55
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>										8:46			
Riverdale										8:48			

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Northbound Train ID	A1024	M222	M416	A2028	MEQ 229	T524	V518	MEQ 127	V520	V418	A126	V420	M120
<i>From</i>	A2003	M227	V416	A1003	M229	T503		M127					M125
<i>To</i>									V511			V411	
<i># of Locomotives</i>	0	1	1	0	1	0	1	1	1	1	2	1	1
<i># of Coaches</i>	8	8	7	8	8	12	7	6	7	10	12	7	6
<i>Train Class</i>	EXP	MARC B	MARC PR	EXP	MARC NR	MET	VRE F	MARC NR	VRE F	VRE M	IC	VRE M	MARC C
<i>Operational Notes</i>											*		
<i>WUS Track Assignment</i>	10	7	23	9	2	5	28	6	28	26	24	26	3
<i>Ravensworth</i>							8:08		8:23		8:13		
Franconia							8:09		8:24		-		
<i>Cameron Run (CR)</i>										8:21		8:36	
Alexandria Storage Yard													
<i>AF</i>							8:18		8:33	8:23	8:24	8:38	
Alexandria							8:21		8:36	8:26	8:27	8:41	
Crystal City							8:30		8:45	8:36	8:32	8:51	
L'Enfant Station							8:31		8:46	8:38	8:37	8:53	
<i>CP Virginia</i>							8:41		8:56	8:49	8:38	9:04	
<i>A</i>							8:44		8:59	8:52	8:41	9:07	
Arr. Washington Union							8:45		9:00	8:53	8:42	9:08	
Dep. Washington Union	8:49	8:49	8:50	8:53	8:53	8:54	8:55	8:57		9:03	9:06		9:08
<i>K</i>	8:50	8:50	8:51	8:54	8:54	8:55	8:56	8:58		9:04	9:07		9:09
Wedge Yard								9:07					
Coach Yard					9:03								
Ivy City Yard													
VRE Midday Storage							9:11			9:19			
<i>C</i>	8:54	8:54	8:55	8:58		8:59					9:11		9:13
<i>MP 138</i>	8:58		8:59	9:02		9:03					9:15		
<i>QN Tower</i>		8:57											
Silver Spring		9:09											
<i>Georgetown Jct.</i>		9:11											
<i>JD</i>													9:16
Riverdale													9:18

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Northbound Train ID	M226	M002	MEQ 249	T634	A1026	A2030	M102	T526	V522	M228	M004	A128	V422
<i>From</i>	M231	M021	M249	T609	A2005	A1005	M101	T505		M233	M023	AEQ 128	
<i>To</i>									V513				V413
<i># of Locomotives</i>	1	1	1	0	0	0	1	0	1	1	1	1	1
<i># of Coaches</i>	8	8	8	12	8	8	6	12	8	8	8	12	9
<i>Train Class</i>	MARC B	MARC P	MARC NR	MET	EXP	EXP	MARC C	MET	VRE F	MARC B	MARC P	IC	VRE M
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	1	8	7	5	11	12	2	4	26	5	8	9	28
<i>Ravensworth</i>									8:53				
Franconia									8:54				
<i>Cameron Run (CR)</i>													9:06
Alexandria Storage Yard													
AF									9:03				9:08
Alexandria									9:06				9:11
Crystal City									9:15				9:21
L'Enfant Station									9:01				9:23
<i>CP Virginia</i>									9:26				9:34
A									9:29				9:37
Arr. Washington Union									9:30				9:38
Dep. Washington Union	9:10	9:16	9:16	9:16	9:19	9:23	9:23	9:24		9:34	9:35	9:36	
K	9:11	9:17	9:17	9:17	9:20	9:24	9:24	9:25		9:35	9:36	9:37	
Wedge Yard													
Coach Yard			9:26										
Ivy City Yard													
VRE Midday Storage													
C	9:15	9:21		9:21	9:24	9:28	9:28	9:29		9:39	9:40	9:41	
MP 138		9:25		9:25	9:28	9:32		9:33			9:44	9:45	
QN Tower	9:18									9:42			
Silver Spring	9:30									9:54			
<i>Georgetown Jct.</i>	9:32									9:56			
JD							9:31						
Riverdale							9:33						

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Northbound Train ID	MEQ 253	T636	A2032	T638	MEQ 235	A130	M122	V424	M006	T530	A1030	AEQ 1009	A2034
<i>From</i>	M253	T611	A2007	T507	M235		M129		M031	T613	A1007	A1009	A2009
<i>To</i>								V415					
<i># of Locomotives</i>	1	0	0	0	1	1	1	1	1	0	0	0	0
<i># of Coaches</i>	8	12	8	12	8	12	6	9	8	12	8	8	8
<i>Train Class</i>	MARC NR	MET	EXP	MET	MARC NR	IC	MARC C	VRE M	MARC P	MET	EXP	EXP NR	EXP
<i>Operational Notes</i>						*							
<i>WUS Track Assignment</i>	4	12	10	11	7	25	1	26	2	4	3	9	5
<i>Ravensworth</i>						9:15							
Franconia						-							
<i>Cameron Run (CR)</i>								9:36					
Alexandria Storage Yard													
<i>AF</i>						9:26		9:38					
Alexandria						9:27		9:41					
Crystal City						9:32		9:51					
L'Enfant Station						9:37		9:31					
<i>CP Virginia</i>						9:38		10:04					
<i>A</i>						9:41		10:07					
Arr. Washington Union						9:42		10:08					
Dep. Washington Union	9:46	9:46	9:53	9:54	10:01	10:06	10:08		10:15	10:16	10:19	10:20	10:23
<i>K</i>	9:47	9:47	9:54	9:55	10:02	10:07	10:09		10:16	10:17	10:20	10:21	10:24
Wedge Yard					10:11								
Coach Yard	9:56												
Ivy City Yard												10:35	
VRE Midday Storage													
<i>C</i>		9:51	9:58	9:59		10:11	10:13		10:20	10:21	10:24		10:28
<i>MP 138</i>		9:55	10:02	10:03		10:15			10:24	10:25	10:28		10:32
<i>QN Tower</i>													
Silver Spring													
<i>Georgetown Jct.</i>													
<i>JD</i>							10:16						
Riverdale							10:18						

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Northbound Train ID	T640	V524	M230	M008	A132	T642	A2036	T534	A134	V426	M124	M010	T644
<i>From</i>	T509		M237	M033		T615	A2011	T511			M131	M035	T617
<i>To</i>		V515								V417			
<i># of Locomotives</i>	0	1	1	1	1	0	0	0	2	1	1	1	0
<i># of Coaches</i>	12	7	8	8	12	12	8	12	12	6	6	8	12
<i>Train Class</i>	MET	VRE F	MARC B	MARC P	IC	MET	EXP	MET	IC	VRE M	MARC C	MARC P	MET
<i>Operational Notes</i>					*				*				
<i>WUS Track Assignment</i>	12	28	2	4	24	5	10	9	25	26	1	2	4
<i>Ravensworth</i>		9:53							10:23				
Franconia		9:54							-				
<i>Cameron Run (CR)</i>					9:54					10:36			
Alexandria Storage Yard													
AF		10:03			9:56				10:24	10:38			
Alexandria		10:06			9:57				10:27	10:41			
Crystal City		10:15			10:02				10:32	10:51			
L'Enfant Station		10:01			10:07				10:37	10:23			
<i>CP Virginia</i>		10:26			10:08				10:38	11:04			
A		10:29			10:11				10:41	11:07			
Arr. Washington Union		10:30			10:12				10:42	11:08			
Dep. Washington Union	10:24		10:34	10:35	10:36	10:46	10:53	10:54	11:06		11:08	11:15	11:16
K	10:25		10:35	10:36	10:37	10:47	10:54	10:55	11:07		11:09	11:16	11:17
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
C	10:29		10:39	10:40	10:41	10:51	10:58	10:59	11:11		11:13	11:20	11:21
MP 138	10:33			10:44	10:45	10:55	11:02	11:03	11:15			11:24	11:25
<i>QN Tower</i>			10:42										
Silver Spring			10:54										
<i>Georgetown Jct.</i>			10:56										
JD											11:16		
Riverdale											11:18		

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Northbound Train ID	A1034	AEQ 1013	A2038	V526	M232	M012	A136	T646	A2040	T538	A138	M126	V428
<i>From</i>	A1011	A1013	A2013		M239	M037		T619	A2015	T515		M133	
<i>To</i>				V517									V419
<i># of Locomotives</i>	0	0	0	1	1	1	1	0	0	0	2	1	1
<i># of Coaches</i>	8	8	8	7	8	8	12	12	8	12	12	6	7
<i>Train Class</i>	EXP	EXP NR	EXP	VRE F	MARC B	MARC P	IC	MET	EXP	MET	IC	MARC C	VRE M
<i>Operational Notes</i>							*				*		
<i>WUS Track Assignment</i>	11	3	12	28	2	5	24	4	10	11	25	1	26
<i>Ravensworth</i>				10:53			10:45				11:13		
Franconia				10:54			-				-		
<i>Cameron Run (CR)</i>													11:36
Alexandria Storage Yard													
<i>AF</i>				11:03			10:56				11:24		11:38
Alexandria				11:06			10:57				11:27		11:41
Crystal City				11:15			11:02				11:32		11:51
L'Enfant Station				11:01			11:07				11:37		1:32
<i>CP Virginia</i>				11:26			11:08				11:38		12:04
<i>A</i>				11:29			11:11				11:41		12:07
Arr. Washington Union				11:30			11:12				11:42		12:08
Dep. Washington Union	11:19	11:20	11:23		11:34	11:35	11:36	11:46	11:53	11:54	12:06	12:08	
<i>K</i>	11:20	11:21	11:24		11:35	11:36	11:37	11:47	11:54	11:55	12:07	12:09	
Wedge Yard													
Coach Yard													
Ivy City Yard		11:35											
VRE Midday Storage													
<i>C</i>	11:24		11:28		11:39	11:40	11:41	11:51	11:58	11:59	12:11	12:13	
<i>MP 138</i>	11:28		11:32			11:44	11:45	11:55	12:02	12:03	12:15		
<i>QN Tower</i>					11:42								
Silver Spring					11:54								
<i>Georgetown Jct.</i>					11:56								
<i>JD</i>												12:16	
Riverdale												12:18	

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Northbound Train ID	M014	T648	A1038	A2042	V528	M234	M016	A140	T650	A2044	T542	A142	V430
<i>From</i>	M039	T621	A1015	A2017		M241	M041		T623	A2019	T519		
<i>To</i>					V519								V421
<i># of Locomotives</i>	1	0	0	0	1	1	1	2	0	0	0	2	1
<i># of Coaches</i>	8	12	8	8	7	8	8	12	12	8	12	12	9
<i>Train Class</i>	MARC P	MET	EXP	EXP	VRE F	MARC B	MARC P	IC	MET	EXP	MET	IC	VRE M
<i>Operational Notes</i>								*				*	
<i>WUS Track Assignment</i>	3	5	9	12	28	1	3	24	4	10	5	25	26
<i>Ravensworth</i>					11:53			11:43					
Franconia					11:54			-					
<i>Cameron Run (CR)</i>												12:22	12:36
Alexandria Storage Yard													
AF					12:03			11:54				12:24	12:38
Alexandria					12:06			11:57				12:27	12:41
Crystal City					12:15			12:02				12:32	12:51
L'Enfant Station					12:23			12:07				12:37	13:01
<i>CP Virginia</i>					12:26			12:08				12:38	13:04
A					12:29			12:11				12:41	13:07
Arr. Washington Union					12:30			12:12				12:42	13:08
Dep. Washington Union	12:15	12:16	12:19	12:23		12:34	12:35	12:36	12:46	12:53	12:54	13:06	
K	12:16	12:17	12:20	12:24		12:35	12:36	12:37	12:47	12:54	12:55	13:07	
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
C	12:20	12:21	12:24	12:28		12:39	12:40	12:41	12:51	12:58	12:59	13:11	
MP 138	12:24	12:25	12:28	12:32			12:44	12:45	12:55	13:02	13:03	13:15	
<i>QN Tower</i>							12:42						
Silver Spring							12:54						
<i>Georgetown Jct.</i>							12:56						
JD													
Riverdale													

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Northbound Train ID	M128	M018	T652	A1042	A2046	V530	M236	M020	A144	T654	A2048	T546	AEQ 30
<i>From</i>	M135	M043	T625	A1019	A2021		M243	M045	AEQ 144	T627	A2023	T523	A30
<i>To</i>						V521							
<i># of Locomotives</i>	1	1	0	0	0	1	1	1	1	0	0	0	1
<i># of Coaches</i>	6	8	12	8	8	8	8	8	12	12	8	12	10
<i>Train Class</i>	MARC C	MARC P	MET	EXP	EXP	VRE F	MARC B	MARC P	IC	MET	EXP	MET	IC
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	2	3	5	11	9	26	2	3	4	5	12	11	28
<i>Ravensworth</i>						12:53							
Franconia						12:54							
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
<i>AF</i>						13:03							
Alexandria						13:06							
Crystal City						13:15							
L'Enfant Station						13:23							
<i>CP Virginia</i>						13:26							
<i>A</i>						13:29							
Arr. Washington Union						13:30							
Dep. Washington Union	13:08	13:15	13:16	13:19	13:23		13:34	13:35	13:36	13:46	13:53	13:54	14:06
<i>K</i>	13:09	13:16	13:17	13:20	13:24		13:35	13:36	13:37	13:47	13:54	13:55	14:07
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	13:13	13:20	13:21	13:24	13:28		13:39	13:40	13:41	13:51	13:58	13:59	14:11
<i>MP 138</i>		13:24	13:25	13:28	13:32			13:44	13:45	13:55	14:02	14:03	14:15
<i>QN Tower</i>							13:42						
Silver Spring							13:54						
<i>Georgetown Jct.</i>							13:56						
<i>JD</i>	13:16												
Riverdale	13:18												

Notes

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Northbound Train ID	M130	V432	M022	T656	A1046	A2050	V532	M238	M024	A148	T658	A2052	T550
<i>From</i>	M137		M047	T629	A1023	A2025		M245	M049		T631	A2027	T527
<i>To</i>		V423					V523						
<i># of Locomotives</i>	1	1	1	0	0	0	1	1	1	2	0	0	0
<i># of Coaches</i>	6	9	8	12	8	8	7	8	8	12	12	8	12
<i>Train Class</i>	MARC C	VRE M	MARC P	MET	EXP	EXP	VRE F	MARC B	MARC P	IC	MET	EXP	MET
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	1	26	3	4	10	9	28	1	3	24	5	12	4
<i>Ravensworth</i>							13:53			13:43			
Franconia							13:54			-			
<i>Cameron Run (CR)</i>		13:36											
Alexandria Storage Yard													
<i>AF</i>		13:38					14:03			13:54			
Alexandria		13:41					14:06			13:57			
Crystal City		13:51					14:15			14:02			
L'Enfant Station		14:01					14:23			14:07			
<i>CP Virginia</i>		14:04					14:26			14:08			
<i>A</i>		14:07					14:29			14:11			
Arr. Washington Union		14:08					14:30			14:12			
Dep. Washington Union	14:08		14:15	14:16	14:19	14:23		14:34	14:35	14:36	14:46	14:53	14:54
<i>K</i>	14:09		14:16	14:17	14:20	14:24		14:35	14:36	14:37	14:47	14:54	14:55
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	14:13		14:20	14:21	14:24	14:28		14:39	14:40	14:41	14:51	14:58	14:59
<i>MP 138</i>			14:24	14:25	14:28	14:32			14:44	14:45	14:55	15:02	15:03
<i>QN Tower</i>								14:42					
Silver Spring								14:54					
<i>Georgetown Jct.</i>								14:56					
<i>JD</i>	14:16												
Riverdale	14:18												

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Northbound Train ID	A150	M132	V434	M026	T660	A1050	A2054	V534	M242	M028	A152	T662	A1052
<i>From</i>		<i>M139</i>		<i>M051</i>	<i>T633</i>	<i>A1027</i>	<i>A2029</i>		<i>M247</i>	<i>M053</i>		<i>T635</i>	<i>AEQ 1052</i>
<i>To</i>			<i>V425</i>					<i>V525</i>					
<i># of Locomotives</i>	1	1	1	1	0	0	0	1	1	1	2	0	0
<i># of Coaches</i>	12	6	6	8	12	8	8	7	8	8	12	12	8
<i>Train Class</i>	<i>IC</i>	<i>MARC C</i>	<i>VRE M</i>	<i>MARC P</i>	<i>MET</i>	<i>EXP</i>	<i>EXP</i>	<i>VRE F</i>	<i>MARC B</i>	<i>MARC P</i>	<i>IC</i>	<i>MET</i>	<i>EXP</i>
<i>Operational Notes</i>	*										*		
<i>WUS Track Assignment</i>	25	2	28	3	4	11	10	28	2	3	24	4	12
<i>Ravensworth</i>								14:53			14:43		
Franconia								14:54			-		
<i>Cameron Run (CR)</i>	14:24		14:36										
Alexandria Storage Yard													
<i>AF</i>	14:26		14:38					15:03			14:54		
Alexandria	14:27		14:41					15:06			14:57		
Crystal City	14:32		14:51					15:15			15:02		
L'Enfant Station	14:37		15:01					15:23			15:07		
<i>CP Virginia</i>	14:38		15:04					15:26			15:08		
<i>A</i>	14:41		15:07					15:29			15:11		
Arr. Washington Union	14:42		15:08					15:30			15:12		
Dep. Washington Union	15:06	15:08		15:15	15:16	15:19	15:23		15:34	15:35	15:36	15:46	15:49
<i>K</i>	15:07	15:09		15:16	15:17	15:20	15:24		15:35	15:36	15:37	15:47	15:50
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	15:11	15:13		15:20	15:21	15:24	15:28		15:39	15:40	15:41	15:51	15:54
<i>MP 138</i>	15:15			15:24	15:25	15:28	15:32			15:44	15:45	15:55	15:58
<i>QN Tower</i>									15:42				
Silver Spring									15:54				
<i>Georgetown Jct.</i>									15:56				
<i>JD</i>		15:16											
Riverdale		15:18											

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Northbound Train ID	A2056	T554	M030	V536	M244	M032	A154	V436	M136	M536	T664	A1054	M436
<i>From</i>	A2031	T531	M019		MEQ 244	M025			M141	V536	T637	A1031	V436
<i>To</i>				M536				M436					
<i># of Locomotives</i>	0	0	1	1	1	1	2	1	1	1	0	0	1
<i># of Coaches</i>	8	12	8	7	8	8	12	7	6	7	12	8	7
<i>Train Class</i>	EXP	MET	MARC P	VRE FR	MARC B	MARC P	IC	VRE MR	MARC C	MARC PR	MET	EXP	MARC PR
<i>Operational Notes</i>							*						
<i>WUS Track Assignment</i>	9	11	6	24	2	7	25	25	1	24	4	5	25
<i>Ravensworth</i>				15:23			15:13						
Franconia				15:24			-						
<i>Cameron Run (CR)</i>								15:36					
Alexandria Storage Yard													
<i>AF</i>				15:33			15:24	15:38					
Alexandria				15:36			15:27	15:41					
Crystal City				15:45			15:32	15:51					
L'Enfant Station				15:53			15:37	16:01					
<i>CP Virginia</i>				15:56			15:38	16:04					
<i>A</i>				15:59			15:41	16:07					
Arr. Washington Union				16:00			15:42	16:08					
Dep. Washington Union	15:53	15:54	15:55		16:04	16:05	16:06		16:08	16:10	16:16	16:19	16:20
<i>K</i>	15:54	15:55	15:56		16:05	16:06	16:07		16:09	16:11	16:17	16:20	16:21
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	15:58	15:59	16:00		16:09	16:10	16:11		16:13	16:15	16:21	16:24	16:25
<i>MP 138</i>	16:02	16:03	16:04			16:14	16:15			16:19	16:25	16:28	16:29
<i>QN Tower</i>					16:12								
Silver Spring					16:24								
<i>Georgetown Jct.</i>					16:26								
<i>JD</i>									16:16				
Riverdale									16:18				

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Northbound Train ID	A2058	M248	V438	M034	A29	M140	V538	M438	T666	A1056	M252	A2060	T558
<i>From</i>	A2033	MEQ 248		M027	AEQ 29	M143		V438	T639	AEQ 1056	M251	A2035	T535
<i>To</i>			M438				M538						
<i># of Locomotives</i>	0	1	1	1	1	1	1	1	0	0	1	0	0
<i># of Coaches</i>	8	8	9	8	10	6	7	9	12	8	8	8	12
<i>Train Class</i>	EXP	MARC B	VRE MR	MARC P	IC	MARC C	VRE FR	MARC PR	MET	EXP	MARC B	EXP	MET
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	10	6	24	1	26	3	26	24	5	9	2	12	4
<i>Ravensworth</i>							16:02						
Franconia							16:03						
<i>Cameron Run (CR)</i>			15:57										
Alexandria Storage Yard													
<i>AF</i>			15:59				16:12						
Alexandria			16:02				16:15						
Crystal City			16:12				16:24						
L'Enfant Station			16:22				16:32						
<i>CP Virginia</i>			16:25				16:35						
<i>A</i>			16:28				16:38						
Arr. Washington Union			16:29				16:39						
Dep. Washington Union	16:23	16:26		16:35	16:36	16:38		16:45	16:46	16:49	16:49	16:53	16:54
<i>K</i>	16:24	16:27		16:36	16:37	16:39		16:46	16:47	16:50	16:50	16:54	16:55
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	16:28	16:31		16:40	16:41	16:43		16:50	16:51	16:54	16:54	16:58	16:59
<i>MP 138</i>	16:32			16:44	16:45			16:54	16:55	16:58		17:02	17:03
<i>QN Tower</i>		16:34									16:57		
Silver Spring		16:46									17:09		
<i>Georgetown Jct.</i>		16:48									17:11		
<i>JD</i>						16:46							
Riverdale						16:48							

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Northbound Train ID	M538	M254	V440	M256	M036	V540	A158	M144	M440	M540	T668	A1058	M258
<i>From</i>	V538	MEQ 254		M257	M029			M147	V440	V540	T641	A1035	MEQ 258
<i>To</i>			M440			M540							
<i># of Locomotives</i>	1	1	1	1	1	1	2	1	1	1	0	0	1
<i># of Coaches</i>	7	8	9	8	8	8	12	6	9	8	12	8	8
<i>Train Class</i>	MARC PR	MARC B	VRE MR	MARC B	MARC P	VRE FR	IC	MARC C	MARC PR	MARC PR	MET	EXP	MARC B
<i>Operational Notes</i>							*						
<i>WUS Track Assignment</i>	26	1	24	3	8	28	25	6	24	28	4	11	2
<i>Ravensworth</i>						16:28	16:13						
Franconia						16:29	-						
<i>Cameron Run (CR)</i>			16:31										
Alexandria Storage Yard													
<i>AF</i>			16:33			16:38	16:24						
Alexandria			16:36			16:41	16:27						
Crystal City			16:46			16:50	16:32						
L'Enfant Station			16:56			16:58	16:37						
<i>CP Virginia</i>			16:59			17:01	16:38						
<i>A</i>			17:02			17:04	16:41						
Arr. Washington Union			17:03			17:05	16:42						
Dep. Washington Union	16:55	16:56		17:04	17:05		17:06	17:08	17:12	17:15	17:16	17:19	17:19
<i>K</i>	16:56	16:57		17:05	17:06		17:07	17:09	17:13	17:16	17:17	17:20	17:20
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	17:00	17:01		17:09	17:10		17:11	17:13	17:17	17:20	17:21	17:24	17:24
<i>MP 138</i>	17:04				17:14		17:15		17:21	17:24	17:25	17:28	
<i>QN Tower</i>		17:04		17:12									17:27
Silver Spring		17:16		17:24									17:39
<i>Georgetown Jct.</i>		17:18		17:26									17:41
<i>JD</i>								17:16					
Riverdale								17:18					

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Northbound Train ID	A2062	M146	T560	M038	M260	V442	M262	A160	M148	V542	M442	T670	M264
<i>From</i>	A2037	MEQ 146	T643	MEQ 038	MEQ 260		M261		M149		V442	T539	MEQ 264
<i>To</i>						M442				M542			
<i># of Locomotives</i>	0	1	0	1	1	1	1	2	1	1	1	0	1
<i># of Coaches</i>	8	6	12	8	8	9	8	12	6	8	9	12	8
<i>Train Class</i>	EXP	MARC C	MET	MARC P	MARC B	VRE MR	MARC B	IC	MARC C	VRE FR	MARC PR	MET	MARC B
<i>Operational Notes</i>								*					
<i>WUS Track Assignment</i>	10	1	5	3	7	27	8	25	6	26	27	5	1
<i>Ravensworth</i>										17:03			
Franconia										17:04			
<i>Cameron Run (CR)</i>						17:01		16:52					
Alexandria Storage Yard													
<i>AF</i>						17:03		16:54		17:13			
Alexandria						17:06		16:57		17:16			
Crystal City						17:16		17:02		17:25			
L'Enfant Station						17:26		17:07		17:33			
<i>CP Virginia</i>						17:29		17:08		17:36			
<i>A</i>						17:32		17:11		17:39			
Arr. Washington Union						17:33		17:12		17:40			
Dep. Washington Union	17:23	17:23	17:24	17:25	17:26		17:34	17:36	17:38		17:42	17:46	17:49
<i>K</i>	17:24	17:24	17:25	17:26	17:27		17:35	17:37	17:39		17:43	17:47	17:50
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	17:28	17:28	17:29	17:30	17:31		17:39	17:41	17:43		17:47	17:51	17:54
<i>MP 138</i>	17:32		17:33	17:34				17:45			17:51	17:55	
<i>QN Tower</i>					17:34		17:42						17:57
Silver Spring					17:46		17:54						18:09
<i>Georgetown Jct.</i>					17:48		17:56						18:11
<i>JD</i>		17:31							17:46				
Riverdale		17:33							17:48				

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Northbound Train ID	A1060	M542	A2064	M150	T562	M040	M266	V444	M268	V544	M042	A162	M152
<i>From</i>	A2039	V542	A1039	M151	T645	MEQ 040	MEQ 266		M267		MEQ 042		MEQ 152
<i>To</i>								M444		M544			
<i># of Locomotives</i>	0	1	0	1	0	1	1	1	1	1	1	2	1
<i># of Coaches</i>	8	8	8	6	12	8	8	6	8	7	8	12	6
<i>Train Class</i>	EXP	MARC PR	EXP	MARC C	MET	MARC P	MARC B	VRE MR	MARC B	VRE FR	MARC P	IC	MARC C
<i>Operational Notes</i>												*	
<i>WUS Track Assignment</i>	9	26	12	2	4	3	7	24	8	28	2	25	6
<i>Ravensworth</i>										17:28		17:13	
Franconia										17:29		-	
<i>Cameron Run (CR)</i>								17:31					
Alexandria Storage Yard													
<i>AF</i>								17:33		17:38		17:24	
Alexandria								17:36		17:41		17:27	
Crystal City								17:46		17:50		17:32	
L'Enfant Station								17:56		17:58		17:37	
<i>CP Virginia</i>								17:59		18:01		17:38	
<i>A</i>								18:02		18:04		17:41	
Arr. Washington Union								18:03		18:05		17:42	
Dep. Washington Union	17:49	17:50	17:53	17:53	17:54	17:55	17:56		18:04		18:05	18:06	18:08
<i>K</i>	17:50	17:51	17:54	17:54	17:55	17:56	17:57		18:05		18:06	18:07	18:09
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	17:54	17:55	17:58	17:58	17:59	18:00	18:01		18:09		18:10	18:11	18:13
<i>MP 138</i>	17:58	17:59	18:02		18:03	18:04					18:14	18:15	
<i>QN Tower</i>							18:04		18:12				
Silver Spring							18:16		18:24				
<i>Georgetown Jct.</i>							18:18		18:26				
<i>JD</i>				18:01									18:16
Riverdale				18:03									18:18

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Northbound Train ID	M444	M544	T672	A1062	M270	A2066	M108	T564	M044	M208	M272	M046	A164
<i>From</i>	V444	V544	T541	A2041	M269	A1041	M103	T647	MEQ 044	MEQ 208	M271	MEQ 046	
<i>To</i>													
<i># of Locomotives</i>	1	1	0	0	1	0	1	0	1	1	1	1	2
<i># of Coaches</i>	6	7	12	8	8	8	6	12	8	8	8	8	12
<i>Train Class</i>	MARC PR	MARC PR	MET	EXP	MARC B	EXP	MARC C	MET	MARC P	MARC B	MARC B	MARC P	IC
<i>Operational Notes</i>													*
<i>WUS Track Assignment</i>	24	28	4	11	3	10	1	5	6	2	7	3	25
<i>Ravensworth</i>													17:43
Franconia													-
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
AF													17:54
Alexandria													17:57
Crystal City													18:02
L'Enfant Station													18:07
<i>CP Virginia</i>													18:08
A													18:11
Arr. Washington Union													18:12
Dep. Washington Union	18:12	18:15	18:16	18:19	18:19	18:23	18:23	18:24	18:25	18:26	18:34	18:35	18:36
K	18:13	18:16	18:17	18:20	18:20	18:24	18:24	18:25	18:26	18:27	18:35	18:36	18:37
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
C	18:17	18:20	18:21	18:24	18:24	18:28	18:28	18:29	18:30	18:31	18:39	18:40	18:41
MP 138	18:21	18:24	18:25	18:28		18:32		18:33	18:34			18:44	18:45
<i>QN Tower</i>					18:27					18:34	18:42		
Silver Spring					18:39					18:46	18:54		
<i>Georgetown Jct.</i>					18:41					18:48	18:56		
JD							18:31						
Riverdale							18:33						

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Northbound Train ID	M154	M048	T674	A1064	M210	A2068	M110	T566	M050	M214	M218	M052	A166
<i>From</i>	MEQ 154	M055	T543	A2043	MEQ 210	A1043	M109	T649	MEQ 050	MEQ 214	MEQ 218	MEQ 052	
<i>To</i>													
<i># of Locomotives</i>	1	1	0	0	1	0	1	0	1	1	1	1	2
<i># of Coaches</i>	6	8	12	8	8	8	6	12	8	8	8	8	12
<i>Train Class</i>	MARC C	MARC P	MET	EXP	MARC B	EXP	MARC C	MET	MARC P	MARC B	MARC B	MARC P	IC
<i>Operational Notes</i>													*
<i>WUS Track Assignment</i>	2	8	5	9	1	12	6	4	3	2	1	6	24
<i>Ravensworth</i>													18:13
Franconia													-
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
AF													18:24
Alexandria													18:27
Crystal City													18:32
L'Enfant Station													18:37
<i>CP Virginia</i>													18:38
A													18:41
Arr. Washington Union													18:42
Dep. Washington Union	18:38	18:46	18:46	18:49	18:49	18:53	18:53	18:54	18:55	18:56	19:04	19:05	19:06
K	18:39	18:47	18:47	18:50	18:50	18:54	18:54	18:55	18:56	18:57	19:05	19:06	19:07
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
C	18:43	18:51	18:51	18:54	18:54	18:58	18:58	18:59	19:00	19:01	19:09	19:10	19:11
MP 138		18:55	18:55	18:58		19:02		19:03	19:04			19:14	19:15
<i>QN Tower</i>					18:57					19:04	19:12		
Silver Spring					19:09					19:16	19:24		
<i>Georgetown Jct.</i>					19:11					19:18	19:26		
JD	18:46						19:01						
Riverdale	18:48						19:03						

Notes

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* Requires engine change at WUS

Northbound Train ID	M054	T676	A1066	M220	A2070	M156	M056	M274	M058	A168	M158	T678	A2072
<i>From</i>	M057	T545	A2045	M255	A1045	M111	MEQ 056	M273	M059		M157	T651	A2047
<i>To</i>													
<i># of Locomotives</i>	1	0	0	1	0	1	1	1	1	2	1	0	0
<i># of Coaches</i>	8	12	8	8	8	6	8	8	8	12	6	12	8
<i>Train Class</i>	MARC P	MET	EXP	MARC B	EXP	MARC C	MARC P	MARC B	MARC P	IC	MARC C	MET	EXP
<i>Operational Notes</i>										*			
<i>WUS Track Assignment</i>	3	4	11	7	10	2	6	8	3	25	1	5	9
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>										18:52			
Alexandria Storage Yard													
<i>AF</i>										18:54			
Alexandria										18:57			
Crystal City										19:02			
L'Enfant Station										19:07			
<i>CP Virginia</i>										19:08			
<i>A</i>										19:11			
Arr. Washington Union										19:12			
Dep. Washington Union	19:15	19:16	19:19	19:19	19:23	19:23	19:25	19:34	19:35	19:36	19:38	19:46	19:53
<i>K</i>	19:16	19:17	19:20	19:20	19:24	19:24	19:26	19:35	19:36	19:37	19:39	19:47	19:54
Wedge Yard													
Coach Yard													
Ivy City Yard													
VRE Midday Storage													
<i>C</i>	19:20	19:21	19:24	19:24	19:28	19:28	19:30	19:39	19:40	19:41	19:43	19:51	19:58
<i>MP 138</i>	19:24	19:25	19:28		19:32		19:34		19:44	19:45		19:55	20:02
<i>QN Tower</i>				19:27				19:42					
Silver Spring				19:39				19:54					
<i>Georgetown Jct.</i>				19:41				19:56					
<i>JD</i>						19:31					19:46		
Riverdale						19:33					19:48		

Notes

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* Requires engine change at WUS

Northbound Train ID	T570	M060	M224	M062	T680	A1070	AEQ 1049	A1072	TEQ 549	M276	M064	A172	M160
<i>From</i>	T547	M061	MEQ 224	M063	T653	A1047	A1049	A2049	T549	M275	M065		M159
<i>To</i>													
<i># of Locomotives</i>	0	1	1	1	0	0	0	0	0	1	1	2	1
<i># of Coaches</i>	12	8	8	8	12	8	8	8	12	8	8	12	6
<i>Train Class</i>	MET	MARC P	MARC B	MARC P	MET	EXP	EXP NR	EXP	MET	MARC B	MARC P	IC	MARC C
<i>Operational Notes</i>												*	
<i>WUS Track Assignment</i>	4	6	2	3	4	12	10	11	5	2	6	24	1
<i>Ravensworth</i>												19:43	
Franconia												-	
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
<i>AF</i>												19:54	
Alexandria												19:57	
Crystal City												20:02	
L'Enfant Station												20:07	
<i>CP Virginia</i>												20:08	
<i>A</i>												20:11	
Arr. Washington Union												20:12	
Dep. Washington Union	19:54	19:55	19:56	20:16	20:16	20:19	20:20	20:23	20:24	20:34	20:35	20:36	20:38
<i>K</i>	19:55	19:56	19:57	20:17	20:17	20:20	20:21	20:24	20:25	20:35	20:36	20:37	20:39
Wedge Yard													
Coach Yard									20:34				
Ivy City Yard							20:35						
VRE Midday Storage													
<i>C</i>	19:59	20:00	20:01	20:21	20:21	20:24		20:28		20:39	20:40	20:41	20:43
<i>MP 138</i>	20:03	20:04		20:25	20:25	20:28		20:32			20:44	20:45	
<i>QN Tower</i>			20:04							20:42			
Silver Spring			20:16							20:54			
<i>Georgetown Jct.</i>			20:18							20:56			
<i>JD</i>													20:46
Riverdale													20:48

Notes

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* Requires engine change at WUS

Northbound Train ID	T682	AEQ 1051	A2076	T574	T684	A1074	M240	M066	A176	M134	TEQ 659	AEQ 2055	AEQ 1055
<i>From</i>	T655	A1051	A2051	T551	T657	A2053	M259	M067		M145	T659	A2055	A1055
<i>To</i>													
<i># of Locomotives</i>	0	0	0	0	0	0	1	1	2	1	0	0	0
<i># of Coaches</i>	12	8	8	12	12	8	8	8	12	6	12	8	8
<i>Train Class</i>	MET	EXP NR	EXP	MET	MET	EXP	MARC B	MARC P	IC	MARC C	MET	EXP NR	EXP NR
<i>Operational Notes</i>									*				
<i>WUS Track Assignment</i>	5	7	9	4	4	12	2	6	25	3	5	11	9
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>									20:52				
Alexandria Storage Yard													
AF									20:54				
Alexandria									20:57				
Crystal City									21:02				
L'Enfant Station									21:07				
<i>CP Virginia</i>									21:08				
A									21:11				
Arr. Washington Union									21:12				
Dep. Washington Union	20:46	20:50	20:53	20:54	21:16	21:19	21:34	21:35	21:36	21:38	21:46	21:46	21:50
K	20:47	20:51	20:54	20:55	21:17	21:20	21:35	21:36	21:37	21:39	21:47	21:47	21:51
Wedge Yard													
Coach Yard											21:56		
Ivy City Yard		21:05										22:01	22:05
VRE Midday Storage													
C	20:51		20:58	20:59	21:21	21:24	21:39	21:40	21:41	21:43			
MP 138	20:55		21:02	21:03	21:25	21:28		21:44	21:45				
QN Tower							21:42						
Silver Spring							21:54						
<i>Georgetown Jct.</i>							21:56						
JD										21:46			
Riverdale										21:48			

Notes

Interlocking Passing times are approximations only
 "-" Indicates a station at which the given train does not stop
 "~" indicates that the train does not have a scheduled departure time at Washington
 Blank cells indicate that the train does not pass through that location
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* Requires engine change at WUS

Northbound Train ID	A2080	T576	M068	T686	AEQ 2057	AEQ 155	M246	A180	M138	TEQ 663	AEQ 2059	AEQ 1059	AEQ 157
<i>From</i>	A1053	T555	M069	T661	A2057	A155	M263		M153	T663	A2059	A1059	A157
<i>To</i>													
<i># of Locomotives</i>	0	0	1	0	0	1	1	2	1	0	0	0	1
<i># of Coaches</i>	8	12	8	12	8	12	8	12	6	12	8	8	12
<i>Train Class</i>	EXP	MET	MARC P	MET	EXP NR	IC NR	MARC B	IC	MARC C	MET	EXP NR	EXP NR	IC NR
<i>Operational Notes</i>								*					
<i>WUS Track Assignment</i>	10	4	6	4	12	8	2	24	1	5	11	9	7
<i>Ravensworth</i>								21:43					
Franconia								-					
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
<i>AF</i>								21:54					
Alexandria								21:57					
Crystal City								22:02					
L'Enfant Station								22:07					
<i>CP Virginia</i>								22:08					
<i>A</i>								22:11					
Arr. Washington Union								22:12					
Dep. Washington Union	21:53	21:54	22:15	22:16	22:16	22:22	22:34	22:36	22:38	22:46	22:46	22:50	22:52
<i>K</i>	21:54	21:55	22:16	22:17	22:17	22:23	22:35	22:37	22:39	22:47	22:47	22:51	22:53
Wedge Yard													
Coach Yard										22:56			
Ivy City Yard					22:31	22:37					23:01	23:05	23:07
VRE Midday Storage													
<i>C</i>	21:58	21:59	22:20	22:21			22:39	22:41	22:43				
<i>MP 138</i>	22:02	22:03	22:24	22:25				22:45					
<i>QN Tower</i>							22:42						
Silver Spring							22:54						
<i>Georgetown Jct.</i>							22:56						
<i>JD</i>									22:46				
Riverdale									22:48				

Notes

Interlocking Passing times are approximations only
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* Requires engine change at WUS

Northbound Train ID	T578	M070	T688	AEQ 2061	AEQ 159	M250	M142	TEQ 667	AEQ 1063	TEQ 563	M072	AEQ 2065	TEQ 669
<i>From</i>	<i>T559</i>	<i>M071</i>	<i>T665</i>	<i>A2061</i>	<i>A159</i>	<i>M265</i>	<i>M155</i>	<i>T667</i>	<i>A1063</i>	<i>T563</i>	<i>M073</i>	<i>A2065</i>	<i>T669</i>
<i>To</i>													
<i># of Locomotives</i>	0	1	0	0	1	1	1	0	0	0	1	0	0
<i># of Coaches</i>	12	8	12	8	12	8	6	12	8	12	8	8	12
<i>Train Class</i>	MET	MARC P	MET	EXP NR	IC NR	MARC B	MARC C	MET	EXP NR	MET	MARC P	EXP NR	MET
<i>Operational Notes</i>													
<i>WUS Track Assignment</i>	4	3	4	10	8	2	6	5	12	4	6	11	4
<i>Ravensworth</i>													
Franconia													
<i>Cameron Run (CR)</i>													
Alexandria Storage Yard													
AF													
Alexandria													
Crystal City													
L'Enfant Station													
CP Virginia													
A													
Arr. Washington Union													
Dep. Washington Union	22:54	23:15	23:16	23:16	23:22	23:34	23:38	23:46	23:50	23:54	0:15	0:16	0:16
K	22:55	23:16	23:17	23:17	23:23	23:35	23:39	23:47	23:51	23:55	0:16	0:17	0:17
Wedge Yard													
Coach Yard								23:56		0:04			0:26
Ivy City Yard				23:31	23:37				0:05			0:31	
VRE Midday Storage													
C	22:59	23:20	23:21			23:39	23:43				0:20		
MP 138	23:03	23:24	23:25								0:24		
QN Tower						23:42							
Silver Spring						23:54							
Georgetown Jct.						23:56							
JD							23:46						
Riverdale							23:48						

Notes

Interlocking Passing times are approximations only
 "-" Indicates a station at which the given train does not stop
 "~" indicates that the train does not have a scheduled departure time at Washington
 Blank cells indicate that the train does not pass through that location
 Italics indicate interlocking passing times for which the train does not stop

* Requires engine change at WUS

Northbound Train ID	AEQ 1067	AEQ 2069
<i>From</i>	A1067	A2069
<i>To</i>		
<i># of Locomotives</i>	0	0
<i># of Coaches</i>	8	8
<i>Train Class</i>	EXP NR	EXP NR
<i>Operational Notes</i>		
<i>WUS Track Assignment</i>	12	11
<i>Ravensworth</i>		
Franconia		
<i>Cameron Run (CR)</i>		
Alexandria Storage Yard		
AF		
Alexandria		
Crystal City		
L'Enfant Station		
<i>CP Virginia</i>		
A		
Arr. Washington Union		
Dep. Washington Union	0:50	1:16
<i>K</i>	<i>0:51</i>	<i>1:17</i>
Wedge Yard		
Coach Yard		
Ivy City Yard	1:05	1:31
VRE Midday Storage		
C		
<i>MP 138</i>		
<i>QN Tower</i>		
Silver Spring		
<i>Georgetown Jct.</i>		
<i>JD</i>		
Riverdale		

Notes

Interlocking Passing times are approximations only

"-" Indicates a station at which the given train does not stop

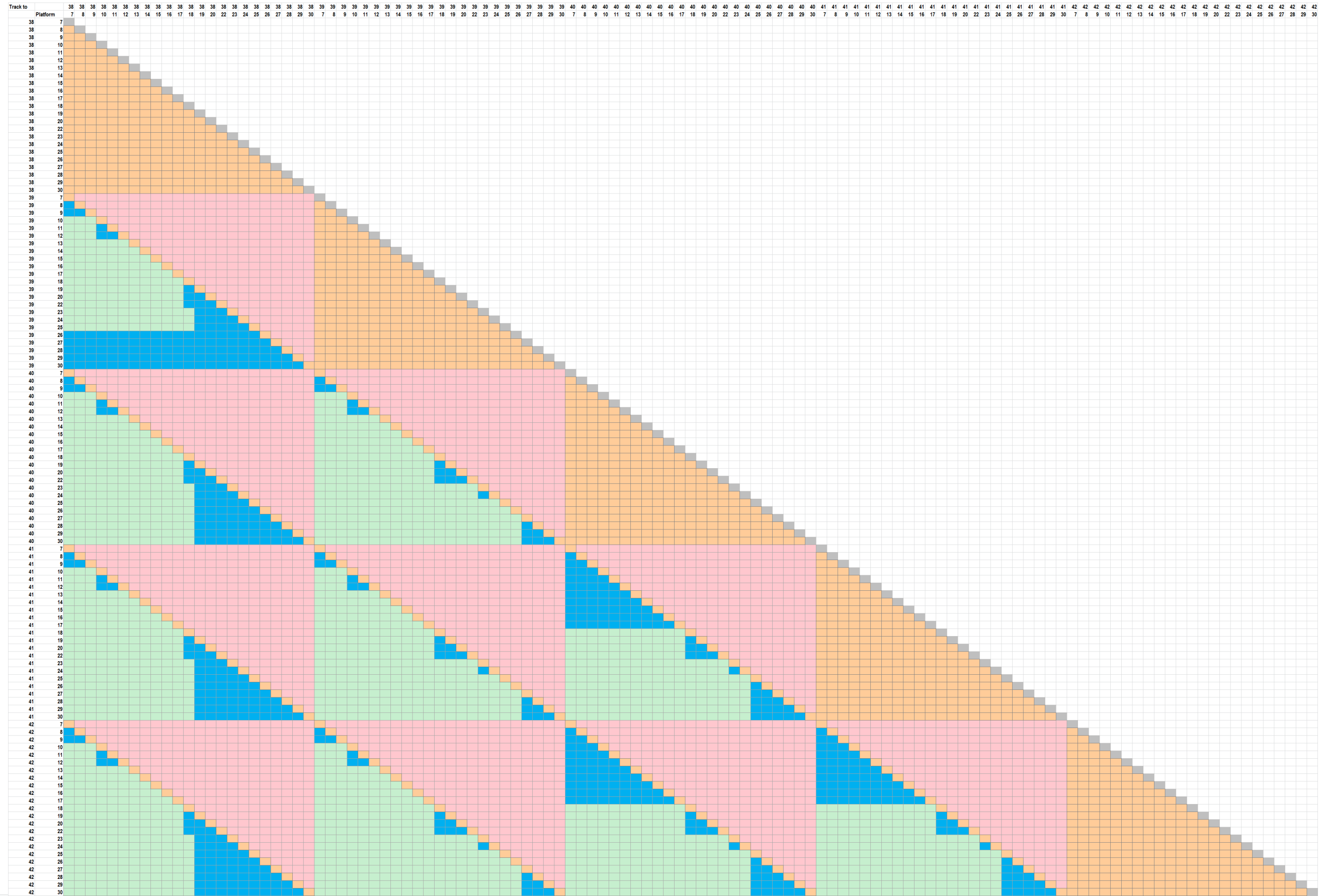
"~" indicates that the train does not have a scheduled departure time at Washington

Blank cells indicate that the train does not pass through that location

Italics indicate interlocking passing times for which the train does not stop

* Requires engine change at WUS

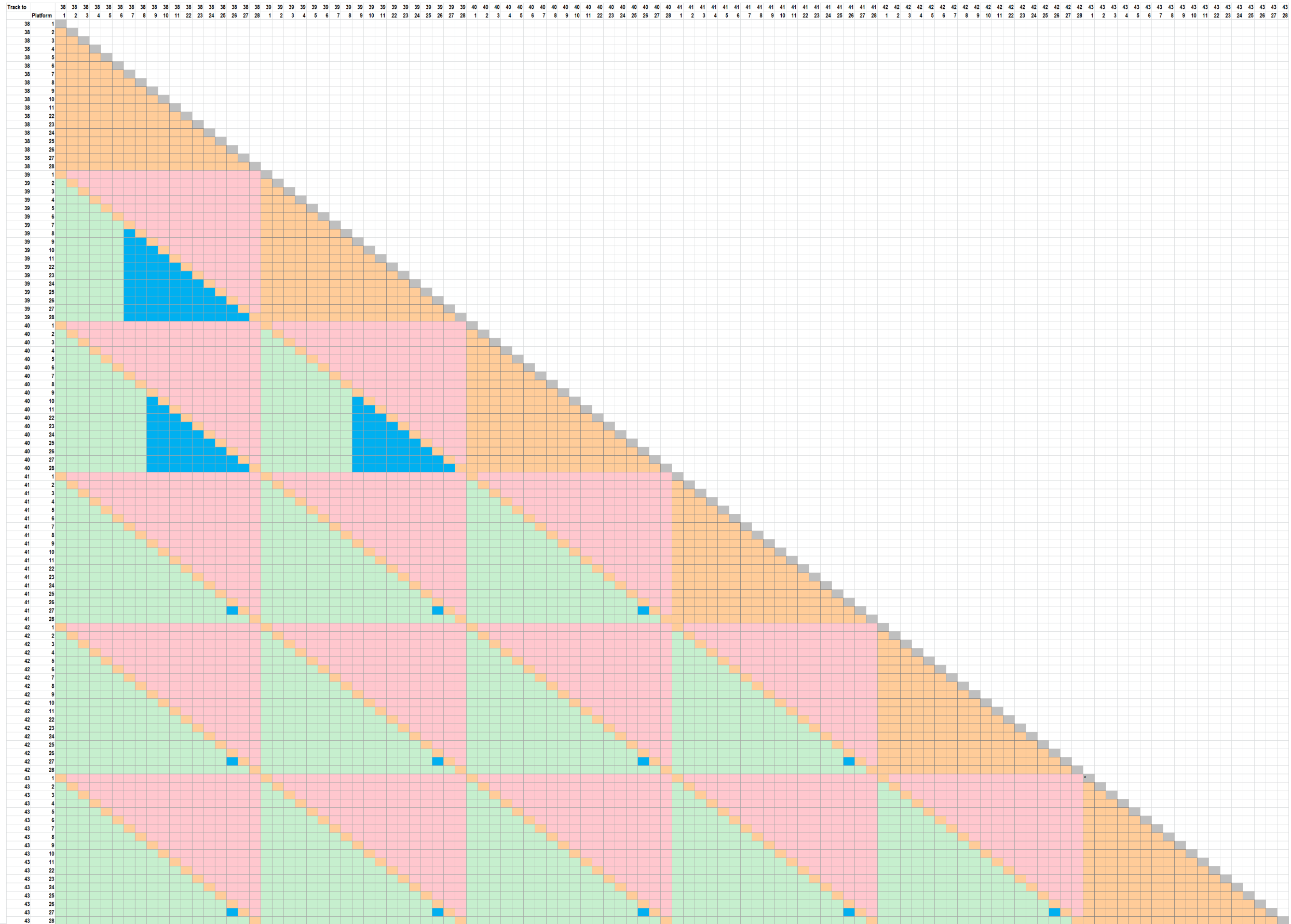
Appendix D: Existing Parallel Moves Chart



Crossing conflict (physically impossible)	2530
Merging conflict (physically impossible)	1495
Possible parallel move (not supported by design)	604
Possible parallel move (supported by design)	1926

Appendix D: Existing Parallel Moves Chart

Appendix E: Option 14 Parallel Moves Chart



Crossing conflict (physically impossible)	2295
Merging conflict (physically impossible)	1188
Possible parallel move (not supported by design)	168
Possible parallel move (supported by design)	2127

*All Entrance Exit Possibilities are possible except for Lead 43 to Track 1

Appendix E: Option 14 Parallel Moves Chart

Appendix D Presentation: Review of 2025 Operating Plan for Constructability

Washington Union Station Terminal Infrastructure

*Construction Phasing
Operations Analysis*

Presentation to MARC and VRE

April 5, 2018



***CONSTRUCTABILITY:
RAIL OPERATIONS***

- LTK Track Assignment Utility was used to determine if trips could be accommodated in WUS in the variable cases
- The Utility takes trips in chronological order and assigns them to available tracks backed on platform occupancy and characteristics
- The Utility understands trip entry and exit routes, double berthing, platform lengths and heights, and any track restrictions
- The Utility allows a buffer for each train to clear a track before the next train arrives
- The Utility does not simulate the interlocking characteristics or train interactions therein
- The Utility does not check for clear or parallel routes into or out of the station

For Construction Phasing, a 2025 Operating Plan is assumed Developed through Amtrak projections and collaborations with MARC and VRE

**Operating Plan Comparison:
Number of Revenue Trips at Washington Union Station***

	Existing	2025
VRE	32	34
MARC Brunswick	19	24
MARC Camden	21	24
MARC Penn	55	58
Long Distance	28	24
Regional Through	24	28
Regional Orig/Term	32	32
Acela	32	60
Total Revenue Trips	243	284

* Revenue run-through trips are counted twice, once as an arrival and once as a departure

2025 Construction Phasing Dwell Times by Type of Operation

Type of Service and Operation	Minimum Scheduled Dwell Time - minutes
Acela Southbound Termination	60
Acela Northbound Origination	60
Acela Midday Turn on Platform	60
Regional Southbound Termination	60
Regional Northbound Origination	90
Regional Through Train, no engine change	10
Regional Through Train, with engine change	25
Long Distance: Through Train, no engine change	10
Long Distance: Through Train, with engine change	25
MARC: Revenue to Revenue Turn	15
MARC: Revenue to Non-Revenue Turn	12
MARC: Non-Revenue to Revenue Turn	10
VRE: Discharge only, same-direction move to yard	6
VRE: Pick up only, same-direction move to yard	10
VRE: Station Turn	10

- Previously referred to as “Strategy A”
 - This is the only strategy evaluated with variable operations
- The following alterations to normal 2025 operations are made
 - Run-through engine changes not at WUS
 - Likely in Philadelphia
 - Dual mode locomotives may be preferred over engine changes at PHL; this does not affect track assignments
 - Acela trips retained at the expense of other services
 - This affects which trips may be cancelled or altered in the non-variable baseline
 - MARC Brunswick and Camden Lines operate to WUS
 - No significant changes to MARC service

- Two Diesel Locomotives can provide electric equivalent operational performance on the NEC between WUS and Philadelphia,
- No impact to Acela, Regionals or commuter trips.

Simulated Regional Trip Travel Times – 30th Street to WUS

Locomotive	Southbound	Northbound
Scheduled	1:50:00	1:52:00
ACS-64	1:44:01	1:46:58
1 P42	2:01:28	1:57:37
2 P42s	1:44:58	1:47:56

Simulated Silver Star Travel Times – 30th Street to WUS

Locomotive	Southbound	Northbound
Scheduled	2:00:00	1:56:00
ACS-64	1:40:12	1:40:57
1 P42	1:53:04	1:55:12
2 P42s	1:41:15	1:41:59



- Private Cars are stored off-site for all phases for which stub-end station tracks are out of service
- Run-through Amtrak trains with engine changes not at WUS have 10 minute Amtrak dwells at WUS
 - Locations south of WUS retain their unaltered schedules
- All MARC trains dwelling for more than 45 minutes are sent to Coach Yard during phases for which stub-end station tracks are out of service
- Each phase is the most operationally restrictive version of the various configurations of its sub-phases
- Terminating and originating trips are allowed to utilize the run-through tracks to single and double berth

Amtrak Run-through Regional Trains

- Truncate north of WUS
- Truncate south of WUS
- Reschedule but use same hourly slot, one or two hours earlier or later

Amtrak Long Distance Trains

- Reschedule but use same hourly slot, one or two hours earlier or later
- Combine trains an hour apart northbound at Richmond
- Truncate northward trips at WUS, originate southward trips at WUS (instead of New York)

VRE and MARC Trains

- Only train cancellations considered (rescheduling is not feasible given close scheduled headways and many system capacity constraints)

Four Phase Strategy

- Phase 1:
 - Tracks 25-30 closed
- Phase 2:
 - Tracks 16-25 closed
 - New Tracks 26-28 open
- Phase 3:
 - Tracks 13-20 closed
 - New Tracks 22-28 open
- Phase 4:
 - New Tracks 10-12 and 22-28 open
 - All other Tracks closed

Number of Trips Cancelled or Altered per Phase

	Description		Phase 1	Phase 2	Phase 3	Phase 4
Strategy A	Acela pref., All MARC to WUS, loco changes not at WUS	Amtrak Altered	0	2	0	1
		Amtrak Cancelled	0	0	0	0
		MARC Cancelled	0	4	0	4
		VRE Cancelled	2	2	0	0
		Total	2	8	0	5

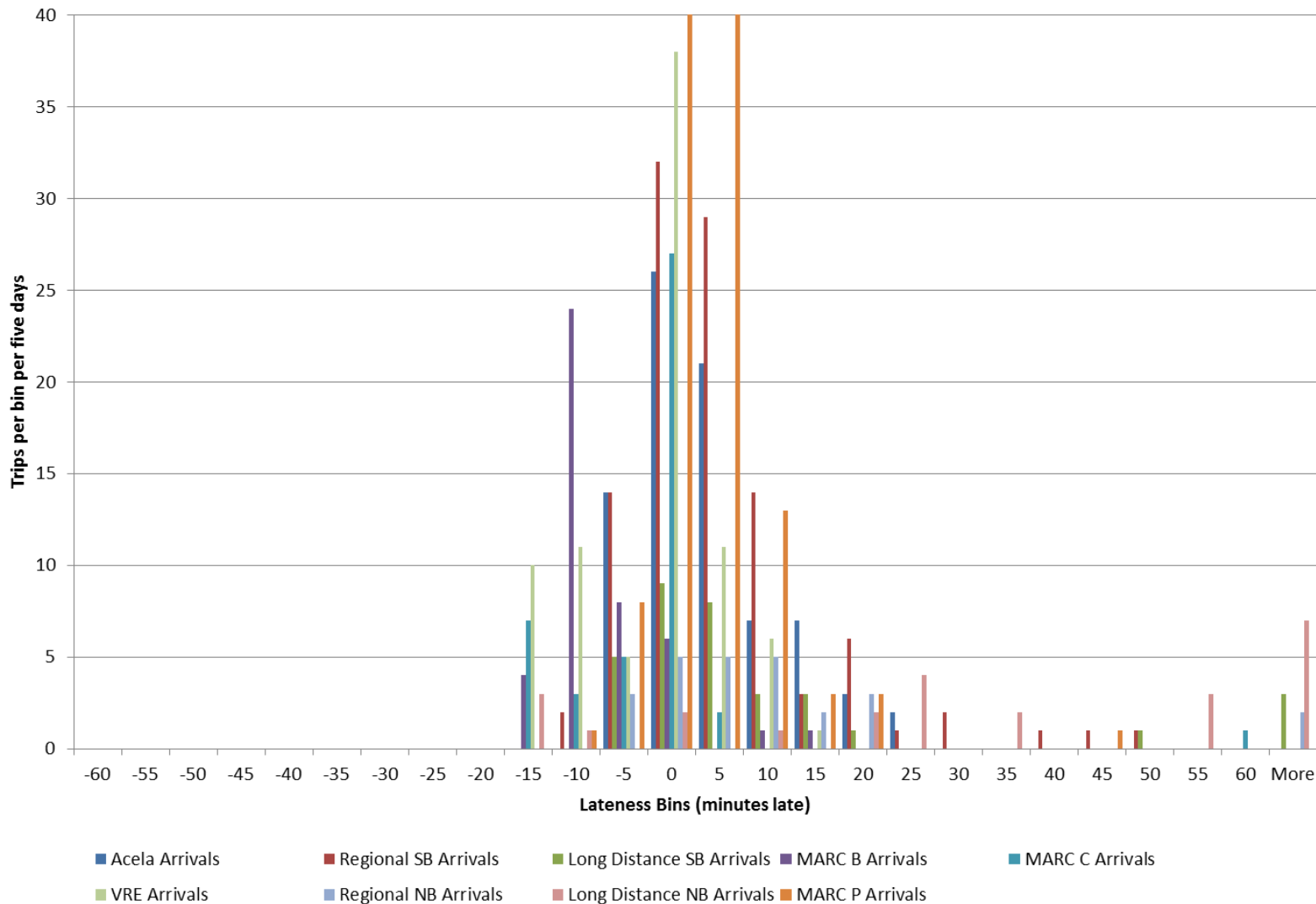
- These trips will be cancelled or altered in their respective phase for all days of variable operations simulated
- They represent the changes required to make the baseline ideal case work without delays

No MARC or VRE trip schedules altered due to close-headway scheduled operations.

Creation of Variable Operating Plans

- Existing Variability data was collected from “K” Tower sheets for a week in November 2017
- “K” Tower Lateness from each day was applied to the respective service in the 2025 plan
- This created 5 separate days of variable 2025 operations
- Multiple plans provide a more comprehensive understanding of how day to day variations may affect delays caused by construction phasing track closures

Lateness Histograms for November 2017 WUS Services based on "K" Tower Data



- Each Construction Phase's infrastructure layout was tested using the track assignment utility for all five days of variable operations generated
- Following the Phasing Scenario as described yields a complete set of 20 track assignment results
- For each phase and day, trips which could not be fit into the station at their variably scheduled arrival times were delayed until they had space to enter the station
- These delays were accounted for, and summed to give delay maximums and ranges for the four phases

Delays Incurred by Phase for Each Randomized Day by Service (MM:SS)

Phase	Description	Service	Day 1	Day 2	Day 3	Day 4	Day 5
Phase 1	Tracks 25-30 closed	Acela Delayed	-	-	-	-	-
		Regional Delayed	-	-	-	-	-
		Long Distance Delayed	-	-	02:00	-	08:00
		MARC Delayed	-	-	-	-	-
		VRE Delayed	-	-	-	09:00	02:00
		Total Delay	00:00	00:00	02:00	09:00	10:00
Phase 2	Tracks 16-25 closed New Tracks 26-28 open	Acela Delayed	02:00	03:00	06:00	-	-
		Regional Delayed	06:00	03:00	-	-	04:00
		Long Distance Delayed	07:00	25:00	-	-	-
		MARC Delayed	14:00	-	06:00	-	-
		VRE Delayed	-	03:00	-	-	14:00
		Total	29:00	34:00	12:00	00:00	18:00
Phase 3	Tracks 13-20 closed New Tracks 22-28 open	Acela Delayed	-	-	-	-	-
		Regional Delayed	07:00	-	-	-	-
		Long Distance Delayed	-	-	-	-	-
		MARC Delayed	-	-	-	-	-
		VRE Delayed	-	-	-	-	-
		Total	07:00	00:00	00:00	00:00	00:00
Phase 4	New Tracks 10-12 and 22-28 open	Acela Delayed	11:00		06:00		
		Regional Delayed					
		Long Distance Delayed			02:00		
		MARC Delayed				03:00	
		VRE Delayed	03:00			06:00	
		Total	14:00	00:00	08:00	09:00	00:00

*Shading indicates value is sum of multiple trains' delays

Delays Incurred by Phase for Each Randomized Day by Service: Longest Delayed Train (MM:SS)

Phase	Description	Service	Day 1	Day 2	Day 3	Day 4	Day 5
Phase 1	Tracks 25-30 closed	Acela Delayed	-	-	-	-	-
		Regional Delayed	-	-	-	-	-
		Long Distance Delayed	-	-	02:00	-	05:00
		MARC Delayed	-	-	-	-	-
		VRE Delayed	-	-	-	09:00	02:00
Phase 2	Tracks 16-25 closed New Tracks 26-28 open	Acela Delayed	02:00	03:00	06:00	-	-
		Regional Delayed	06:00	03:00	-	-	04:00
		Long Distance Delayed	07:00	20:00	-	-	-
		MARC Delayed	06:00	-	04:00	-	-
		VRE Delayed	-	03:00	-	-	14:00
Phase 3	Tracks 13-20 closed New Tracks 22-28 open	Acela Delayed	-	-	-	-	-
		Regional Delayed	07:00	-	-	-	-
		Long Distance Delayed	-	-	-	-	-
		MARC Delayed	-	-	-	-	-
		VRE Delayed	-	-	-	-	-
Phase 4	New Tracks 10-12 and 22-28 open	Acela Delayed	11:00	-	06:00	-	-
		Regional Delayed	-	-	-	-	-
		Long Distance Delayed	-	-	02:00	-	-
		MARC Delayed	-	-	-	03:00	-
		VRE Delayed	03:00	-	-	06:00	-

Delay Summary for Variable Construction Phasing Track Assignment

	Delay Range (MM:SS)	Average Total Delay (MM:SS, All Trains Per Day)
Phase 1	00:00 – 10:00	04:12
Phase 2	00:00 – 34:00	18:36
Phase 3	00:00 – 07:00	01:24
Phase 4	00:00 – 14:00	06:12

- Average Delays and Ranges based on 5 days of variable operating plans
- Phase 2 is the most restrictive and causes the most delays
- Delays to individual trains range from 2 to 25 minutes (the longest delay on the most variable day)

- **Without operating variability** considered, 3 of the 4 WUS construction phases require some train cancellations.
- Phase 2 requires 8 daily train cancellations or alterations (2 Amtrak, 4 MARC, 2 VRE), which represents a small percentage of overall service. Other phases require no or fewer cancellations and alterations.
- **With operating variability**, no additional train cancellations are recommended.
- Phase 2 is the most restrictive and causes the most delays with individual train delays ranging from 2 to 25 minutes due to lack of platform capacity at “peak of the peak” times on the most variable day tested.
- Overall, variability has little additional impact on the feasibility of the four phase plan, with average total station hold-outs being a total of 4 minutes (Phase 1), 19 minutes (Phase 2), 1 minute (Phase 3) and 6 minutes (Phase 4) for all trains operating each weekday.

Washington Union Station Terminal Infrastructure Project

**East-to-West
Column Removal
Phasing Analysis**

March 2020

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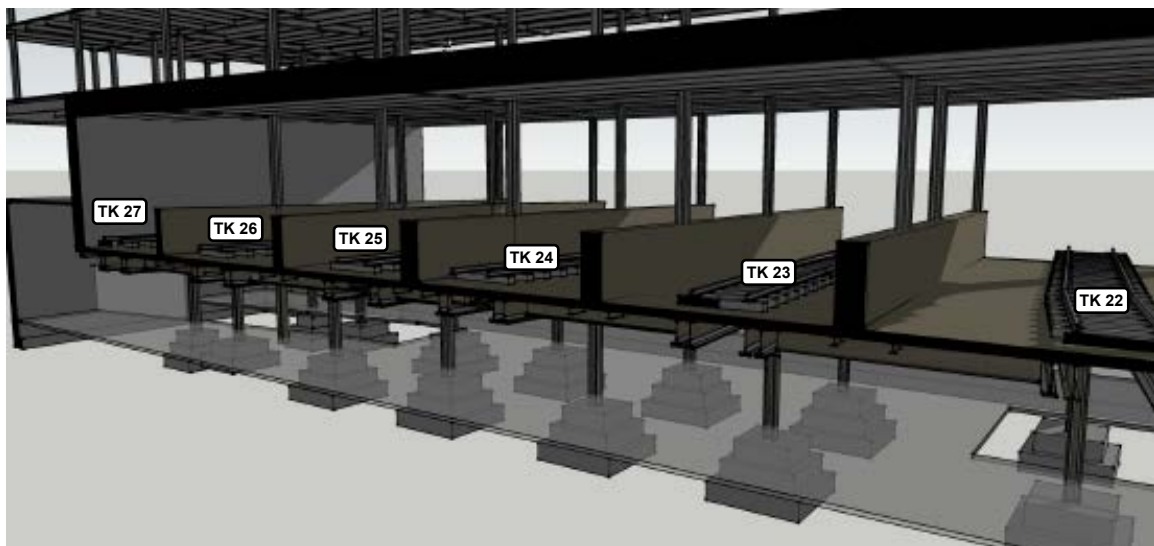
I. Purpose

The purpose of this Report is to evaluate the impacts to the schedule for reconfiguration of the 1st Street Tunnel columns subsequent to the rehabilitation of the existing subbasement columns. The potential impact is assessed with the assumption that the structural work within the Tunnel will be concurrent with the existing East-to-West phasing approach for the remainder of the work of the Washington Union Station (WUS) Terminal Infrastructure (TI) Project.

II. Introduction

Originally functioning in 1908 as a Terminal Station for three independent railroads, the need existed for the efficient transfer of mail and baggage off trains from the north and south. To accommodate this critical function in a way that minimized disruption to passengers and operations in the terminal, access was provided from beneath the 1st Street Tunnel on the east all the way across to the west side of WUS. That passageway eventually became known as the Subbasement (approximately 66' wide) and is currently used as a corridor for utilities and a storage area. The existing subbasement track slab structure, girders and support columns are in need of significant structural repair (to be conducted in a separate effort) and that work must be coordinated with the 1st Street Tunnel above to avoid disrupting train service between Washington and points south. As part of the planned Station Expansion Program (SEP) work which includes the TI Project, there is a need to modify the existing columns at track level that support the historic passenger concourse. The conceptual design of the TI Project requires realignment of some of the tracks in the 1st Street Tunnel in order to support the rail transit capacity improvements planned by Amtrak, MARC and VRE. However, the existing configuration of the tunnel columns and crash walls prevents any adjustments to track alignment for future modifications. The implementation of the TI Project will, therefore, require the removal and/or modification of several existing columns and crash walls. Beams above and below the tunnel tracks must be strengthened or replaced by new transfer girders in order to ensure the structural integrity of the tunnel and the structure above the tunnel.

Figure 1: Existing 1st Street Tunnel and subbasement configuration (looking south)



The Federal Railroad Administration (FRA) determined that track level column removal should be part of the SEP to accommodate the TI Project's Option 14 track reconfiguration scheme. In that scheme, the work to realign track(s) in the tunnel would be preceded by the structural efforts to strengthen and/or replace the overhead beams and coordinate the demolition and reconstruction of

the tunnel columns and crash walls to provide the lateral clearances required for the proposed track reconfiguration.

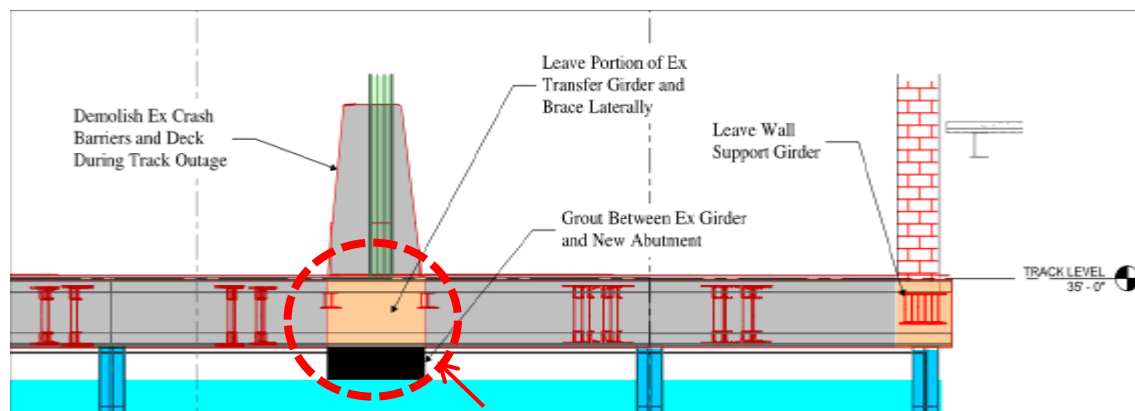
The proposed reconfiguration of the 1st Street Tunnel area is shown in Figure 2 below. This work will be performed in two independent, but coordinated, construction efforts: the Subbasement Structural Replacement Project, presently in design, and the TI Project. The Subbasement Structural Replacement Project will focus on the deck that forms the “floor” of the 1st Street Tunnel and the structural elements beneath it, including the subbasement columns.

Figure 2: Proposed reconfiguration of 1st Street Tunnel (looking south)



However, since the proposed TI Option 14 track alignment requires realignment and repositioning of several existing tracks and crash walls, the Subbasement Structural Replacement Project cannot completely modify the portions of the deck and subbasement structure that are immediately below the existing crash walls and existing columns. That work will be performed as part of the Phase 1 work of the TI Project. The diagram in Figure 3 below shows a potential approach to the deck and structure below the tracks by the Subbasement Structural Replacement Project.

Figure 3: Potential combined tunnel deck replacement efforts



Work to be performed by TI Project (approximate zone of influence)

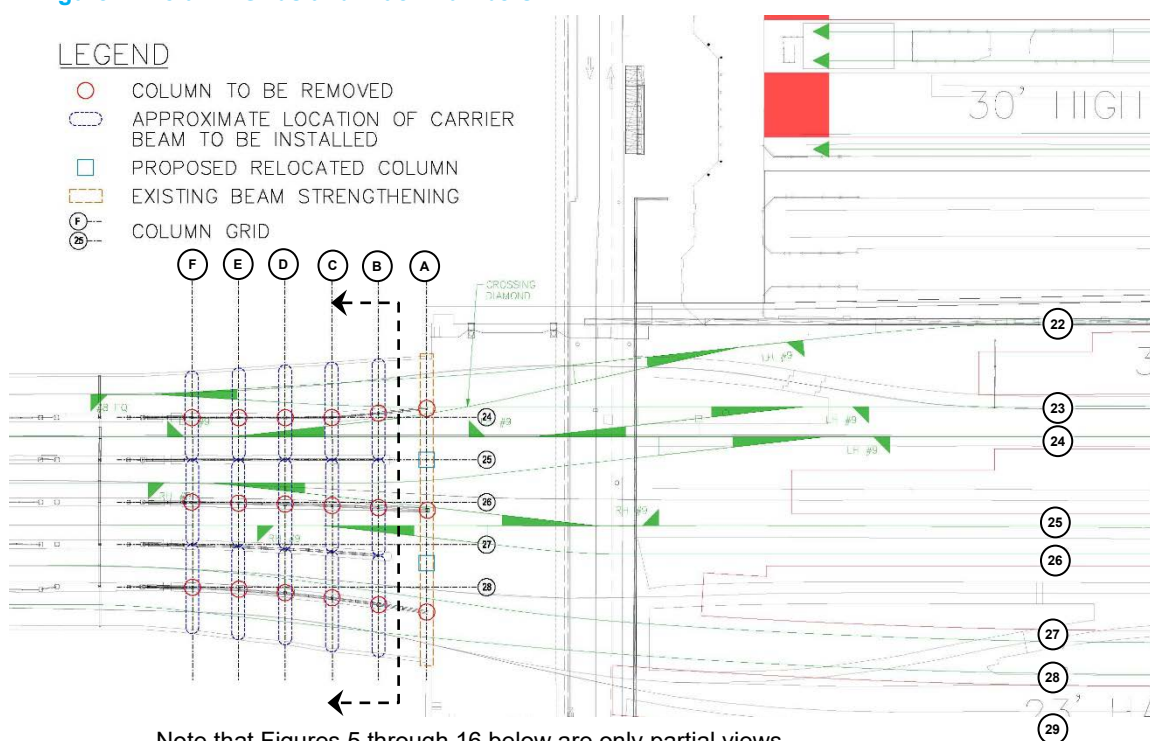
Note that the reconfiguration of the columns and crash walls at the track level shown in Figure 3 is a simple representation of how the structure elements will be replaced before the realignment of the track in the tunnel. The Subbasement Structural Replacement design is presently at the concept design level. The current design approach was reviewed in light of the existing proposed sequence of work developed for the TI Project (see the separate *Washington Union Station Terminal Infrastructure Project, Constructability Report* dated November 2019), and the track-level structure assumptions were developed accordingly.

III. Column Removal/Strengthening: TI Phasing

The column removal and installation of the tunnel roof's transverse beams will commence during Phase 1 and continue through Phase 2 of the TI Project. There will be new a TI Project Intermediate Phase between the first two previously identified TI Project phases, which will extend the total duration of the project. The Intermediate Phase will be necessary since, without it, the track configuration at the end of Phase 1 will not be able to provide the three low-level platform edges required to provide requisite revenue operations for VRE and Amtrak long-distance trains. The Intermediate Phase will ensure that rail operations can be continuous throughout the Project phases. The three phases: Phase 1, Intermediate Phase, and Phase 2, all follow similar East to West construction process and sequence. See Figure 18 at the end of this Report for additional schedule information.

The following shows the configuration of the existing and proposed track alignments superimposed on the Column Lines and Grid Lines in the area of the subbasement columns.

Figure 4: Column Grids and Track Numbers



Note that Figures 5 through 16 below are only partial views of the tunnel, and do not show Column Lines A, E, and F

Figure 5 below shows the existing run through tunnel structural system of Tracks 22 through 28 before any reconfiguration. This is the area where these tracks converge into the station, and where the column removal construction is needed while rail operations stay in service. Additionally, this shows the deep foundation construction already completed. The foundation construction is not considered on the overall column removal schedule since this foundation work for column lines A.1 thru D is assumed to have been completed as part of the Subbasement Structural Replacement Project before any track level column removal begins. Column removal work that TI is analyzing should most likely only need to be conducted at track level. There may need some foundation work at column lines E and F.

At the outset of the TI Project, the structural improvements of the subbasement columns included in the Subbasement Structural Replacement Project will be completed with the exception of the areas immediately beneath the existing crash walls, as show in Figure 3. The approach to the reconfiguration of the tracks will generally follow the same pattern of work elements:

- Strengthen and modify the structural connections of the tunnel columns that will be maintained,
- **Brace and strengthen the existing Station Structural walls and flooring system whether temporarily or permanently,**
- **Install temporary shoring and jacking structures if required,**
- **Install all monitoring & instrumentation devices for Historic Station**
- Strengthen or replace the overhead tunnel roof beams to span across the “gaps” in the structure that will be created by the removal and replacement of the existing columns and crash walls,
- Remove select existing tunnel columns and crash walls,
- Finalize the tunnel deck substructure improvements in the areas where the Subbasement Structural Replacement Project couldn’t gain access previously,
- Shift track

The work will progress from the TI Project Phase 1 into the new Intermediate Phase and then into Phase 2, with revenue service being restored at the end of each phase of the work as originally planned in the TI Project documents. These phases are shown in Figures 6 through 16 below.

Figure 5: Existing 1st Street Tunnel Configuration (looking south)

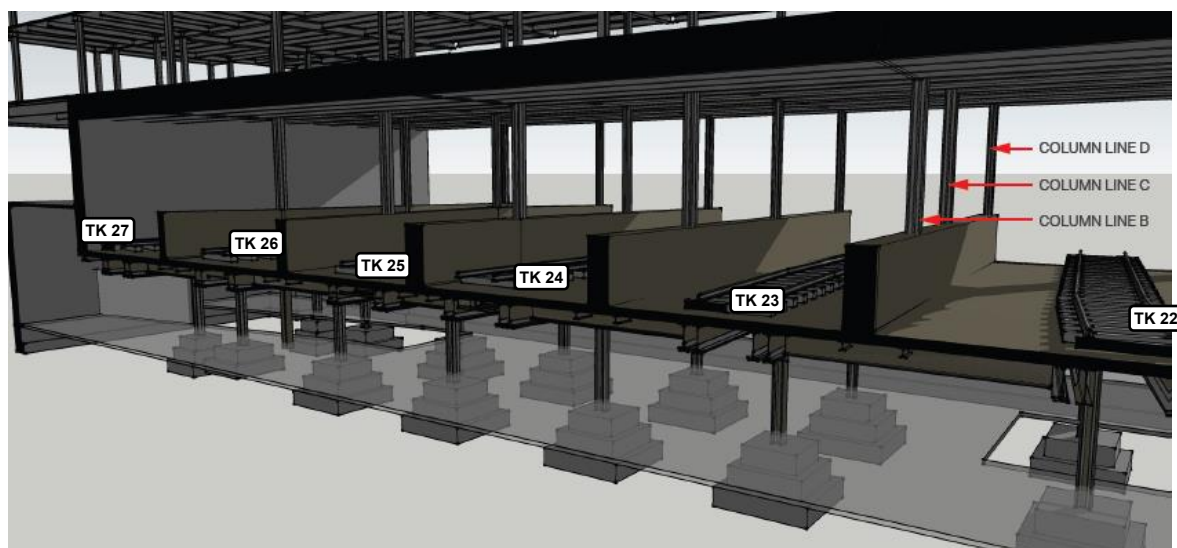


Figure 6 below demonstrates the start of the crash wall reconfiguration that occurs during Phase 1. That begins with strengthening the columns between existing Tracks 25 and 26. Strengthening these columns will either require bracing/reinforcing or reconstructing the columns themselves as required. Additionally, the 12' high tunnel or crash wall will be constructed here. At that time Tracks 25 through 30 will be removed from service and demolished.

Figure 6: Strengthening of Columns & Installation of Crash Wall, Phase 1

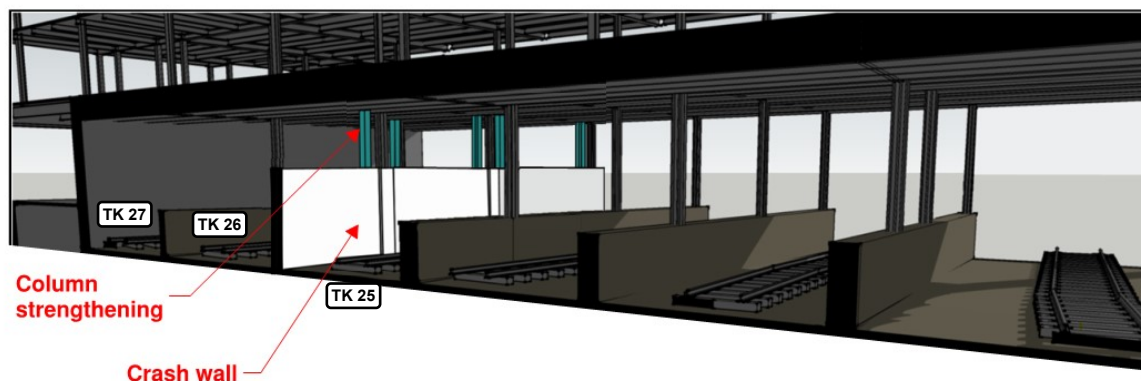
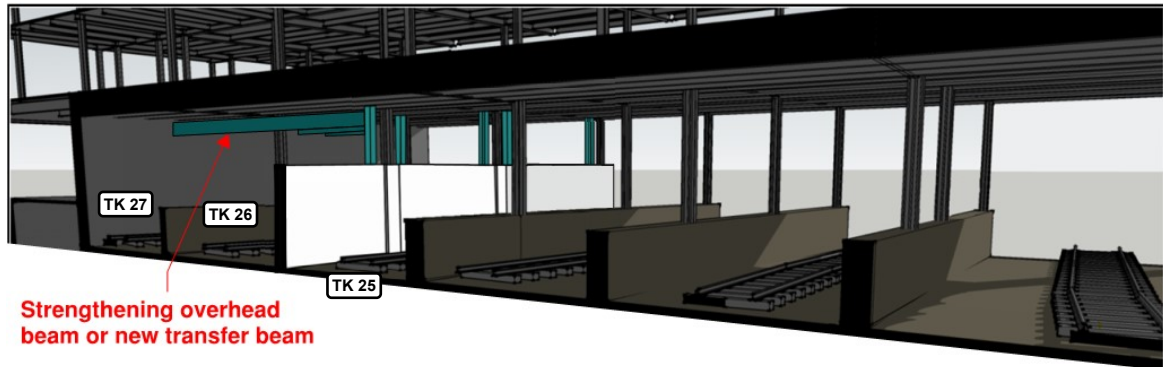


Figure 7 below shows the strengthening of the beams overhead. Strengthening the existing beams may be difficult, however, and the existing beams may be replaced with new transfer beams in their place. The strengthening and/or installation of new transfer beams is required to allow for the removal of the columns between Tracks 26 and 27 in a following sub-Phase of the work. **The area**

Figure 7: Strengthening of Overhead Beams, Phase 1



above the beam strengthening are the regions of the existing historic station that need to be strengthened or braced as well be determined in final design.

The removal of the columns and the crash wall between Tracks 26 and 27 is the next step (see Figure 8 below), noting that the deck and girders is assumed to have been reconstructed as part of the Subbasement Structural Replacement Project. In addition, the east tunnel wall is brick and has cracking and would need to be reconstructed or strengthened to support the load of new transfer girders.

Figure 8: Removal of Existing Columns & Crash Wall, Phase 1

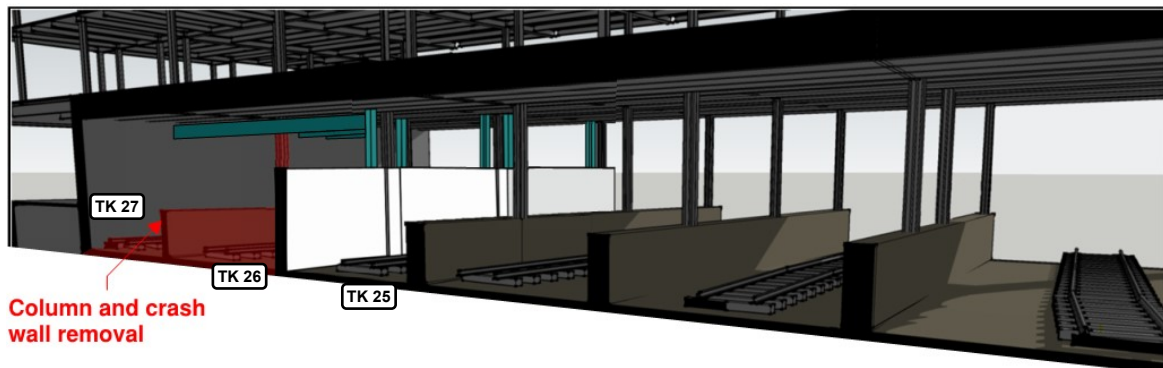
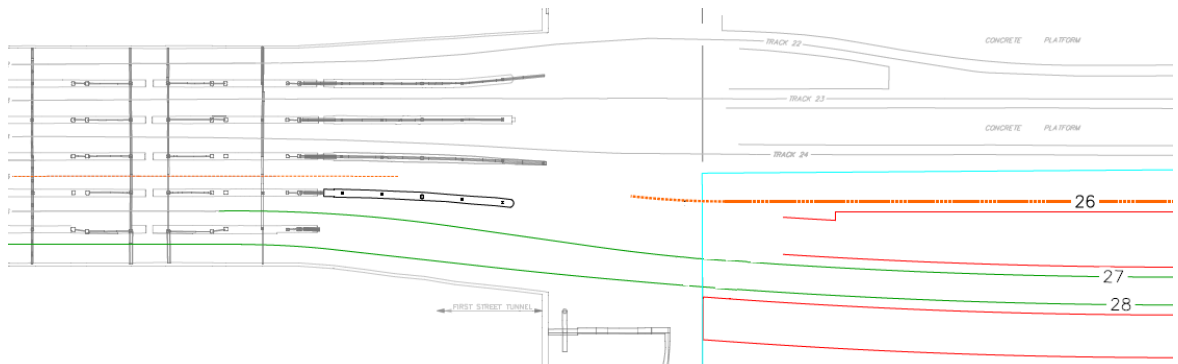


Figure 9 and Figure 10 below show the reconstruction of the work in the next step in the TI Project, Phase 1 efforts. It must be remembered that during TI Phase 1D, Track 26 is temporarily terminated, Track 27 shifts to the former Track 26 alignment in the tunnel and Track 28 is shifted to the former alignment of Track 27 in the tunnel. With the track is reconfigured, Tracks 27 and 28

Figure 9: TI, Phase 1D Track Realignment



could be restored and Phase 1 is completed, while Track 26 would remain out of service for the next phase.

Figure 10: Restore Track, Phase 1

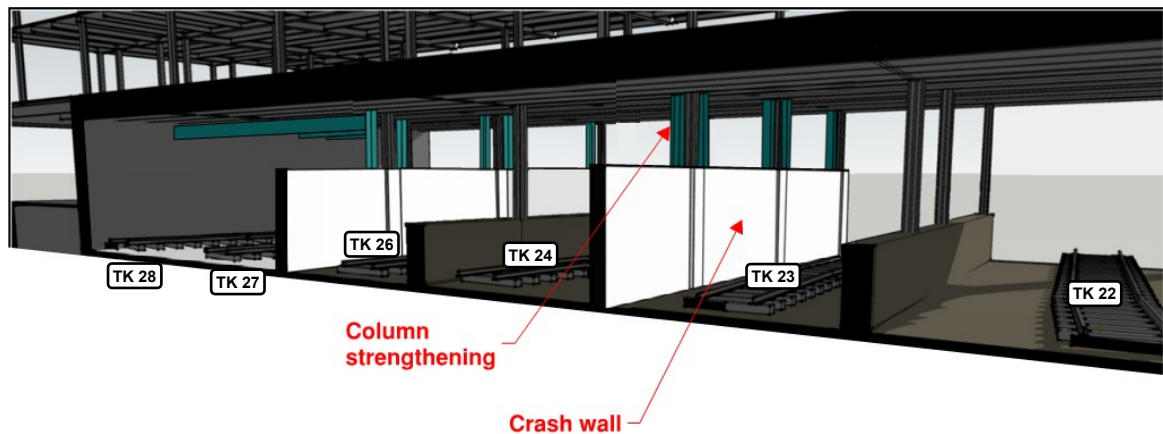


The work shown in Figure 11 below reflects the start of the Intermediate Phase. That phase directly affects, and lengthens, the overall TI Project construction schedule, since the work in the Intermediate Phase could not be constructed during any of the originally scheduled phases. The Intermediate Phase consists of all work between two existing crash walls.

The TI Project track realignment in the Intermediate Phase will have Track 25 temporarily terminated, a new turnout installed, and Track 26 will be aligned through the diverging route of that turnout and into the “bay” in the tunnel previously occupied by Track 25. However, Track 26 cannot be in service until the existing crash wall is completed and the transfer beam installation is completed (after Figure 13).

In this phase Tracks 23 and 24 are removed from service. Columns between them can be strengthened and the second of the 12’ high tunnel or crash wall can be constructed.

Figure 11: Strengthening of Columns & Installation of a Crash Wall, Intermediate Phase



The strengthening of the overhead beams (or their replacement with new transfer beams) that was begun in Phase 1 continues westward in the next sub-phase (see Figure 12 below). The overhead beam work would allow for the removal of the columns between Tracks 24 and 26 in the following stage of the work.

Figure 12: Strengthening of Overhead Beams, Intermediate Phase

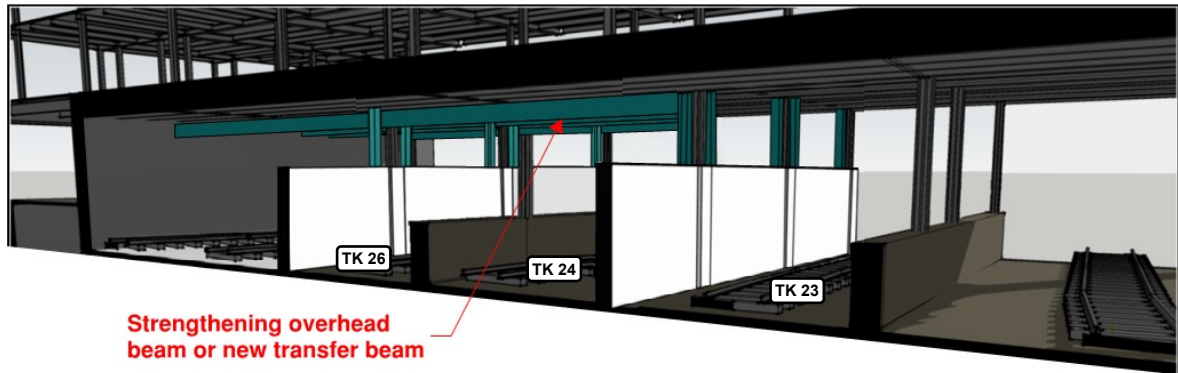
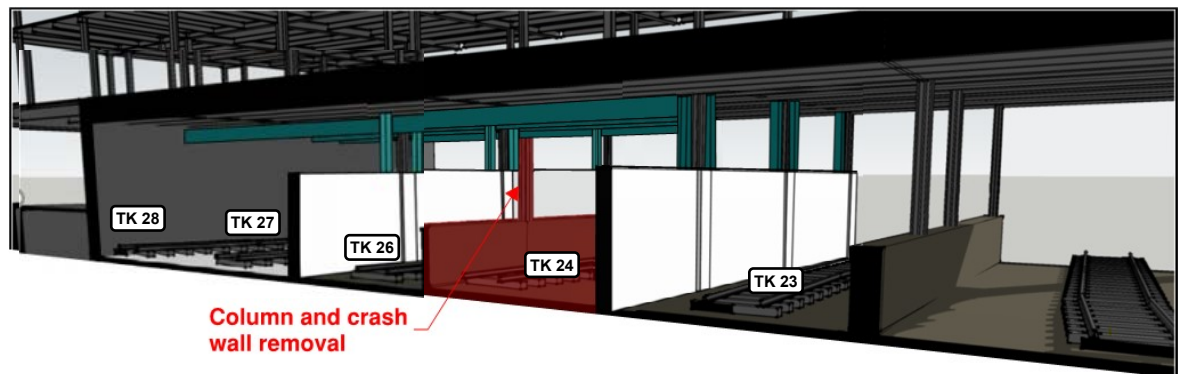


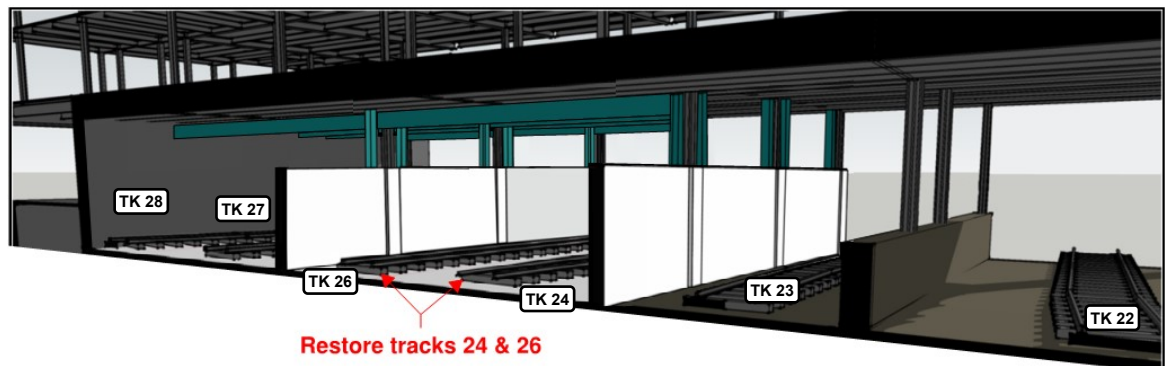
Figure 13 below depicts that, with the strengthening of another section of the tunnel overhead structure, the removal of the columns between Tracks 24 and 26 and the strengthening of the subbasement columns substructure (per Figure 3) could be achieved.

Figure 13: Removal of Existing Columns & Crash Wall, Intermediate Phase



The completion of the work of the Intermediate Phase is shown in Figure 14 below. With that work, all proposed new crash walls would be constructed. With that work completed, Track 26 can be restored and the Intermediate Phase is completed.

Figure 14: Completed Intermediate Phase



Phase 2 commences (see Figure 15 below) with the strengthening or replacement of the overhead beams. There are no columns to be strengthened or crash wall construction in this phase. The strengthening of the overhead beams would allow for the removal of the columns between Tracks 22 and 23.

Figure 15: Strengthening of Overhead Beams, Phase 2

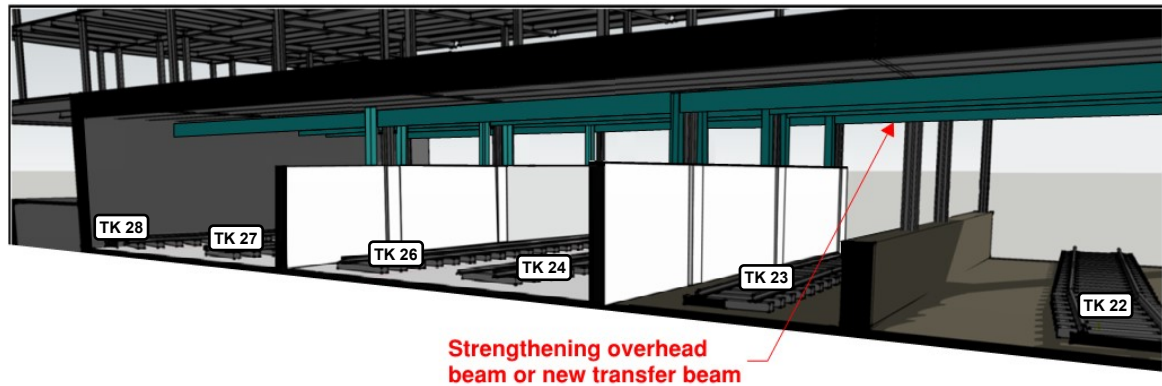


Figure 16 below shows the removal of the columns and the existing crash wall between Tracks 22 and 23, which is key to the ability to reconfigure and enhance the special trackwork in the mouth of the tunnel portal. That special trackwork is key to providing the operational flexibility desired for future revenue service.

Figure 16: Removal of Existing Columns and Crash Wall, Phase 2

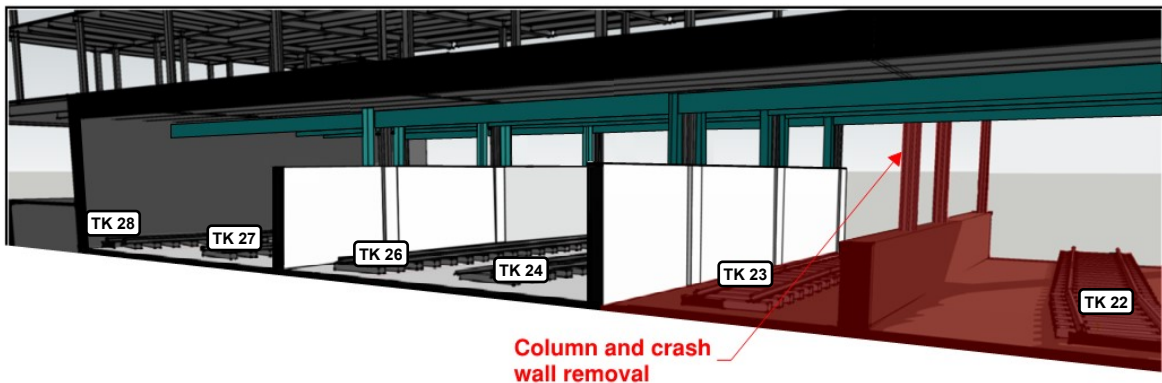
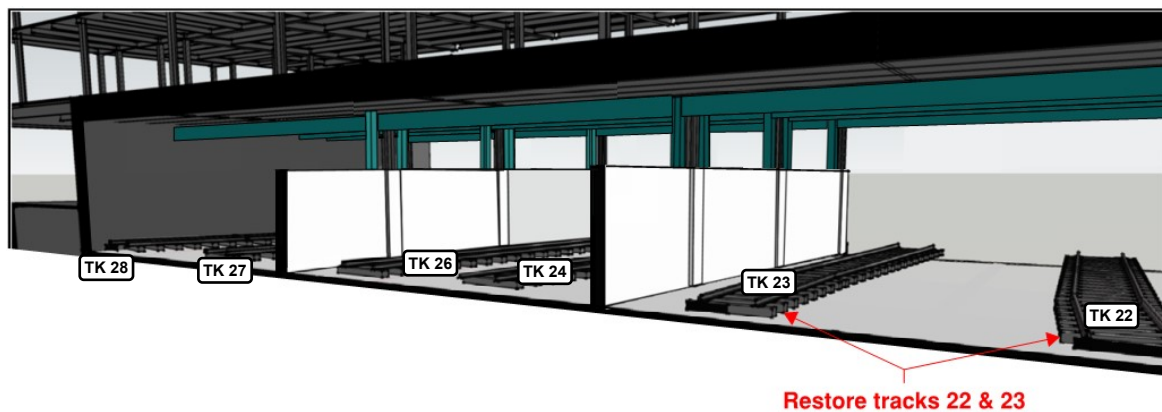


Figure 17 below shows the completed work for the reconfiguration of the 1st Street Tunnel.

Figure 17: Completion of Work, Phase 2



IV. Estimated Quantities and Estimated Schedule

A. Estimated Quantities

Table 1 below shows the quantities for each of the three phases. This illustrates all the work and quantities of the work that needs to be performed, and what was considered for the duration of the schedule. As shown from the table, these phases are all assumed to be approximately divided evenly.

Subbasement Construction Element	Phase 1	Intermediate Phase	Phase 2	Total	
Strengthen Columns	5	5	0	10	EA
Install New Columns	1	0	1	2	EA
Tunnel or Crash Walls	120	120	120	240	LF
Install New Transfer Beams	6	6	6	18	LOC ¹
Remove Existing Columns	6	6	6	18	EA
Install Ballast	2,960	2,960	2,960	8,880	SF
Track Restored	2	1	3	6	EA

Table 1: Subbasement Quantities

¹ Note: "LOC" in this instance is a "location" that represents a column line, A through F. The number of the new transfer beams will include both the larger transfer beams at the column lines and the smaller beams that will be placed between the existing jack arches. The actual number of beams installed will be determined as part of the design of the work.

B. Estimated Schedule

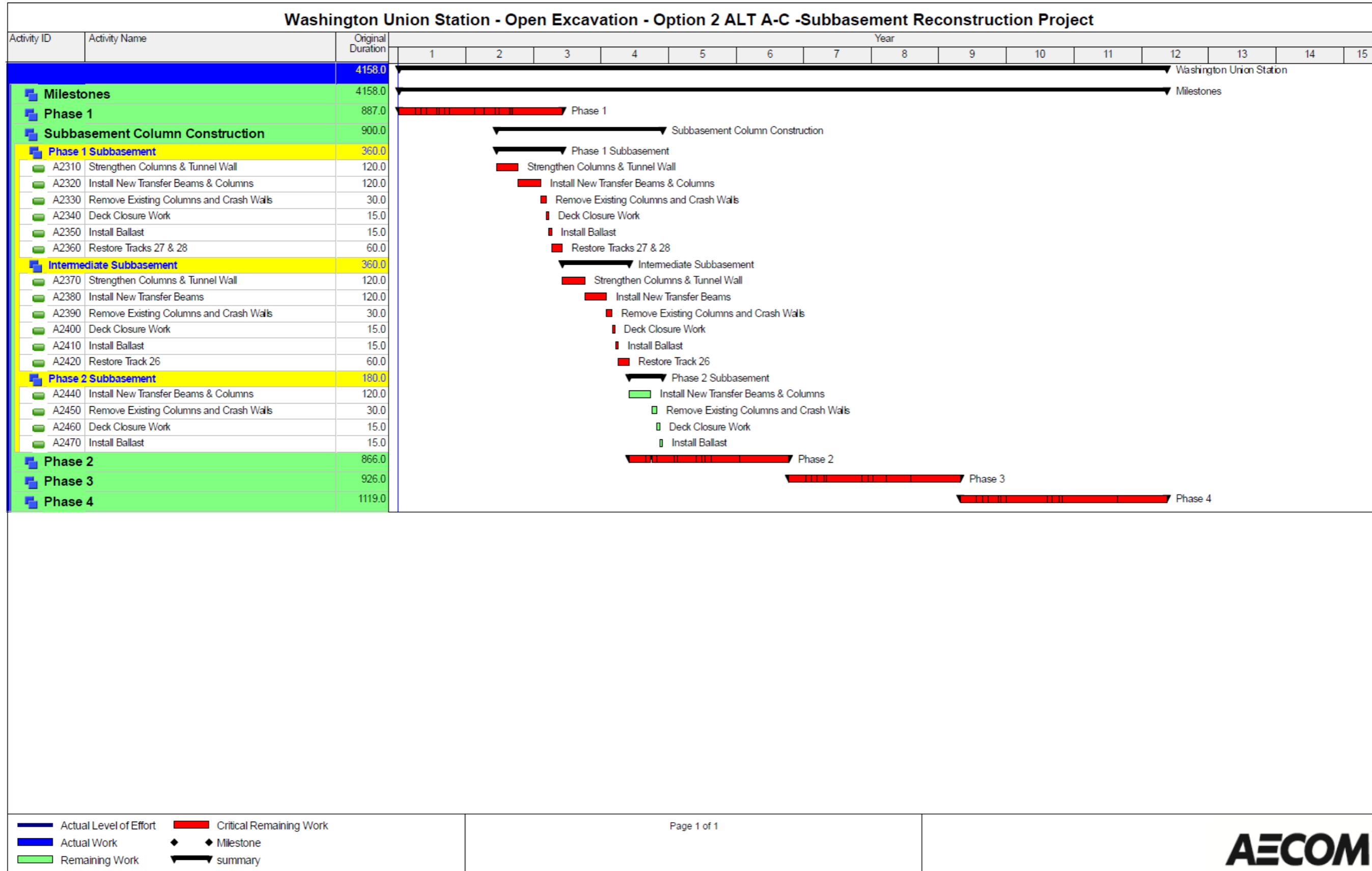
The track level column and crash wall removals are on the critical path of the TI Project schedule since the removal and replacement of columns, and the completion of the final subbasement track slab work beneath the existing crash walls (per Figure 3) must end before the other construction work in order to move onto the next phase of the TI Project. Even though the subbasement column work will be completed before the TI Project begins, the need to modify and strengthen the tunnel, the efforts for the structural reconfiguration of the 1st Street Tunnel components are anticipated to extend the overall TI Project schedule by approximately 12 months. While the total column construction is approximately 30 months, the only phase that affects the overall duration of the TI Project schedule is the Intermediate Construction Phase because several portions of the 1st Street Tunnel column work can be constructed concurrent with other TI work.

Phase 1 column and overhead beams work can be constructed concurrently with the overall Phase 1 construction of other TI work for the Project. However, the next phase, the Intermediate Subbasement Phase, will extend the overall TI Project schedule since that work must be completed after the TI Project Phase 1 construction and prior to the work of the overall TI Project Phase 2. Like the column and overhead beam work in Phase 1, the column and overhead beam work for Phase 2 is not on the critical path of the TI Project schedule since this duration is much less than the overall TI Project Phase 2 construction and can be performed in parallel with other TI Project work as long as the column and crash wall work finishes before the TI Project Phase 2 construction finished.

Figure 18 below demonstrates the overall schedule for Alternative A-C (SOE Option #2), which shows how the Column Reconstruction will affect the overall TI Project schedule. It should be noted that the duration in days is not measured in work days, but by calendar days.

The beam removal work will be concurrent with the remainder of the TI work elsewhere. Like that work, the beam replacement will be performed in two, 10-hours shifts per calendar day, six days per week. Therefore, each day identified for “Install New Transfer Beams & Columns” represents 20 work hours.

Figure 18: Subbasement Reconstruction Schedule (Alternative A-C SOE #2)



V. Conclusion

Ultimately the reconstruction of the subbasement and the 1st Street Tunnel structural system is necessary as part of the TI portion of the SEP. The column and overhead beam work will maintain safe and reliable train operations through the area while safeguarding the tunnel and historic station above the subbasement. A key consideration along with the strengthening of the structural components in the 1st Street Tunnel will be the bracing and strengthening/shoring of the historic Station Building.

The tunnel column and beam work is estimated to take 30 months, and will add an additional 12 months to the existing estimated schedule of the Terminal Infrastructure Project. The three phases of the 1st Street Tunnel column and beam work all have approximately the same type and quantity of work to be constructed. Since the tunnel-related Phase 1 and Phase 2 work can be done concurrent with the main construction of the TI Project, only the second phase of the column and overhead beam work, the Intermediate Phase, would be expected to extend the overall TI Project schedule by 12 months.