THE GATEWAY PROGRAM

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Abstract
The Gateway Program is a set of strategic rail infrastructure improvement projects designed to improve service and create new capacity that will allow the doubling of passenger trains between New Jersey and Manhattan. The program will increase track, tunnel, bridge, and station capacity, creating four mainline tracks between Newark, NJ, and Penn Station, New York, including two new double track high level fixed bridges replacing a double track swing bridge across the Hackensack River, a new two track Hudson River tunnel, and expansion of Penn Station with additional platforms and station tracks.

The program also includes improvements to existing infrastructure, including the electric traction system that supplies power to 450 weekday trains using this segment of the Northeast Corridor, and rehabilitation of the existing century-old Hudson River tunnel, which was inundated and damaged by sea water during Super Storm Sandy.

Amtrak has directed more than $300 million to the Gateway Program since 2012. This includes $74 million for planning, design, and pre-construction work and $235 million for construction of concrete casings to preserve the right of way under the Hudson Yards Development for the additional two track access to Penn Station. In 2016 Amtrak will begin Preliminary Engineering and New Jersey Transit will begin the Environmental Impact Study for the Hudson River Tunnel Project. The Gateway Program is expected to take 15 years to complete, at an estimated cost magnitude of $20-24 billion.

The Challenge Facing the NEC

The Northeast Corridor (NEC) is one of the most complex corridors in the world with over 2,200 daily trains between Washington, DC and Boston, MA. In addition to Amtrak intercity trains, the NEC also provides service to eight commuter railroads and six freight operators. The Northeast Corridor Infrastructure Master Plan, prepared by Amtrak and representatives of 12 northeastern states was released in Spring 2010 projecting a significant increase in both passenger ridership and Amtrak and NJ Transit train service across the Hudson River by the year 2030.

The NEC narrows to two tracks between Newark, NJ and Penn Station, NY and accommodates 450 train movements a day. This “bottleneck” limits the ability to increase capacity in this already congested area with current infrastructure and configuration of Penn Station NY. In this area in particular, the NEC is supported by century-old assets in critical condition. Add to this the impacts of Superstorm Sandy. On October 29, 2012 Amtrak suffered extensive damage to portions of its Northeast Corridor (NEC) transportation infrastructure, particularly the infrastructure in and around New York City and northern New Jersey. Superstorm Sandy led to significant damage to Amtrak’s existing Hudson River tunnel, resulting in the cessation of all Amtrak NEC intercity passenger rail and New Jersey Transit service into New York City for several days, affecting thousands of daily riders and causing substantial economic harm. This event highlighted the need for improvements of vital elements to harden the existing tunnel system from future such emergencies and to create redundant capacity into Penn Station, the nation’s busiest rail terminal. Superstorm Sandy exposed the risks of solely relying on a system of two single-track 100-year-old tubes for rail access into New York City.
The Gateway Program Overview

Amtrak’s solution to these challenges facing the NEC is the Gateway Program. The Gateway Program is a proposed multi-billion dollar set of strategic rail infrastructure improvements designed to preserve existing service, improve reliability and increase capacity. The program will increase track, tunnel, bridge and station capacity, eventually creating four mainline tracks from Newark, NJ to Penn Station, NY. (See Figure 1)

The initial focus of the Gateway Program is to preserve existing service and improve reliability. As highlighted in blue in Figure 1, the resiliency projects included in this subset include:

- **Hudson Yards Concrete Casing:** Construction of a concrete casing between 10th and 12th Avenues to support Hudson Yards redevelopment while preserving the rail alignment necessary to link the proposed Hudson Tunnel to Penn Station New York.

- **“Hudson Tunnel Project:** Includes the construction of a new, two-track Hudson River rail tunnel connecting directly to Penn Station, New York, and the rehabilitation of the existing two-track North River Tunnel once the new tunnel is constructed and commissioned.

- **Portal North Bridge:** The new high-level 2-track fixed span bridge will replace the current 100-year-old Portal Swing Bridge over the Hackensack River between Kearny and Secaucus, New Jersey.

- **Highline State of Good Repair:** Includes State of Good Repair (SOGR) from Dock Interlocking to Bergen Interlocking along NEC in New Jersey. Work will include replacement of short span bridges, new catenary, aerial structures, transmission lines, Dock bridge electrical and mechanical overhaul, and pedestrian improvements at Newark Penn Station.

- **“Sawtooth” Bridges:** Construct new 4-track bridge structures to replace distressed "Sawtooth" bridge structures crossing over New Jersey Transit, Conrail, and PATH tracks.

As the work on the elements above moves forward Amtrak is continuing with planning and design on the elements that will allow for increased capacity. Although the Hudson Tunnel Project once complete will provide for four tubes under the Hudson River, the true capacity of those tubes will not be realized until the following capacity improvement elements are complete:

- **Penn Station South:** Expansion of Penn Station southward with 6-8 new tracks and new concourse with direct connections to existing Penn Station and future Moynihan Station

- **Improvements at Secaucus Station:** Construction of loop track at Secaucus Junction to allow one-seat connection to Port Jervis, Pascack Valley, Main-Bergen NJT services. Additional expansion on south side of Secaucus station to support doubling of train movements through this territory.

- **Portal South Bridge:** A second 2-track fixed span bridge over the Hackensack River between Kearny and Secaucus, New Jersey to complete four-track right-of-way through this area

- **Rail Yard and Operation Support Facilities** to be construction at a location to be determined in New Jersey.
• **High Line Expansion**: Includes State expansion of Highline from Dock Interlocking to Bergen Interlocking along NEC to provide four-track right-of-way.

• **4th Track at Harrison**: Construction of approximately 2000 feet of new embankment, track, signals and electric traction systems through Harrison, NJ to enable relocation of the PATH westbound track to a new alignment. When this phase is completed, it will allow Amtrak to construct a new fourth main track through the same territory using the former PATH track alignment.
Feasibility Study
Following the release of the previously mentioned Northeast Corridor Infrastructure Master Plan, Amtrak initiated a feasibility study to investigate initial alignment and design considerations to allow Amtrak to be better informed on issues to further define the Gateway Program. The scope of work performed by Parsons Brinckerhoff under this feasibility study did not extend beyond basic conceptual level of engineering, e.g., no survey data, systems elements were not considered, and train and passenger capacity and station usage were not considered.

Following is a summary of work performed under the Feasibility Study:

Phase 1 – Section 1: Included preliminary track design for two new tubes from 1000ft west of the Hudson River bulkhead on the New York side to 9th Avenue, making a connection to existing tracks in “A” Yard with the proposed extension of the “I” Ladder.

Phase 1 – Section 2A: Included preliminary design for tracks and turnouts from “A” Yard east to a proposed new eight track terminal (four additional platforms) within the area bound by 9th Avenue and 6th Avenues, 30th Street and 31st Street (Blocks 754, 780, and 806).

Phase 1 – Section 2B: Evaluated feasibility of an additional/alternative alignment utilizing track turnouts from the Section 1 study alignment described above. The two tracks would continue eastward to a six-track High Speed Rail (HSR) station in the vicinity of 30th and 31st Streets, directly below the additional tracks and associated platforms that would be constructed under the Section 2A initiative. This study included the feasibility of constructing station caverns, their potential location, and passenger connections to Moynihan Station, existing PSNY, existing MTA-NYCT subway stations in Penn Station area, and the proposed Block 780 rail station.

Phase 1 – Section 3: Included conceptual track alignment designs from 1000ft west of the Hudson River Bulkhead (western limit of Section 1) to the Palisades tunnel portal just south of the existing North River Tunnel portal.

Phase 1 – Section 4: Evaluated surface alignments westward from the Palisades tunnel portal (western limit of Section 3) making connections to the existing Northeast Corridor (NEC) and onward to the proposed Portal South Bridge.

System Level Design:
While the feasibility study developed engineering configurations, this prior phase was limited to defining a civil and track configuration which was feasible and functional. Amtrak initiated additional work under System Level Design. Under this contract, Gateway Trans Hudson Partnership (GTHP), a joint-venture of Parsons Brinckerhoff, AECOM and STV, focused on advancing the Gateway Program further by developing integrated design concepts for typical rail systems, including signalization / train control, routine and emergency ventilation, system safety and security, and rolling stock integration.

The scope of this work also explored integration of new Hudson Tunnel track connections with Penn Station/ Moynihan Station and the proposed Penn South Station; development of multi-railroad preliminary operating plans, quantification of operational benefits; improvements to support discussions with stakeholder railroads; refinement of program development strategies that will examine environmental review and permitting requirements; order of magnitude costs, project phasing and scheduling, and; an examination of the feasibility of an eastward expansion from Penn South Station.
Using the documents developed under System Level Design as a basis for the Gateway Program, Amtrak along with GTHP progressed a series of tasks under the Program Development phase of Gateway. The System Level Design Final Report identified the following Key Findings:

1. **Need to Phase Gateway Projects**
   The initial Gateway Project will be focused on tunnel resiliency essential reducing the risk associated with dependency on the 105+ year old North River Tunnel designed and built to early 20th century standards. Once the new Hudson Tunnel is commissioned, the existing North River Tunnel will be rehabilitated in compliance with current engineering and safety standards providing significant resiliency improvements against natural and man-made threats. This tunnel resiliency project will be followed by a number of other independent projects which will address Trans-Hudson capacity improvements. The phasing, partnering and funding strategies for these independent projects will be developed with the commuter railroads, their governing authorities and other regional stakeholders.

2. **Requirements for Expediting the Environmental Review Process**
   An expedited National Environmental Policy Act (NEPA) environmental review for the Gateway Tunnel resiliency project could be completed in approximately 2-3 years. This includes preparation of an Environmental Impact Statement (EIS)/ Record of Decision (ROD). An additional 1.5 to 2 years for the environmental permitting process will be required. Critical “next steps” in support of achieving an expedited environmental review included the following:
   - Meet with Federal Railroad Administration (FRA) officials to gain concurrence on advancing a Gateway Tunnel and North River Tunnels resiliency project independent of the NEC FUTURE Program;
   - Develop a strategy for inclusion of the Gateway Tunnels onto the President’s federal permitting dashboard for expedited agency reviews and concurrent NEPA/404 review with USACE;
   - Develop a Problem Statement and start documenting alternatives considered to date.
   - Initiate early consultation and outreach to federal, state/ local environmental regulatory agencies to introduce them to the project, alternatives considered, obtain their feedback on permit and mitigation requirements including the level of engineering design that will be required to complete the permitting process;
   - Prepare Request for Proposal (RFP) documents and supporting materials for the NEPA process

3. **No Fatal Flaws for Integration of Rail Systems**
   A multidisciplinary team of Amtrak staff and their engineering consultant examined systems integration through a series of nine technical workshops. Rail systems can be integrated to the tunnel alignment in a manner that generates significant improvements in resiliency, redundancy and reliability improvements; and in a manner which does not preclude future potential projects from increasing existing levels of Trans-Hudson capacity.

4. **Potential Identified for Improved Operational Benefits**
   A multi-railroad preliminary Concept of Operations (CONOPS) had been developed for the purpose of quantification of potential operational benefits. The preliminary CONOPS
was developed without external participation and should be considered a “straw-man” for stakeholder engagement with the region’s commuter railroads. The preliminary CONOPS considers Amtrak’s future operations in support of the Moynihan Station project, future increases in Acela and regional services, future high speed rail projects, and improvements for existing and new commuter rail operations.

5. **Potential for Eastern Alignment Extension**
   Through multiple workshops, eastern alignment extension options were studied extending tracks east of Penn South to address future high speed rail, regional and commuter rail services and facility expansions. While the eastern alignment study involves numerous engineering challenges and property acquisition, the study concluded that the concept is feasible and potentially beneficial to other stakeholders.

6. **Integration of Penn South with Penn Station and Moynihan Station**
   Forecasted passenger growth was assessed for Amtrak and NJ TRANSIT at Penn Station with the introduction of two Gateway Tunnels and Penn South. An architectural concept was developed that holds potential for a high degree of integration between Penn South, Penn Station, Moynihan Station, surrounding NYCT subways and PATH.

7. **Integration of Gateway Systems Designs with Alternative Project Delivery Concepts**
   Alternative service delivery opportunities may exist for all or a portion of the future Penn Station complex to be operated and maintained by new public entities, private sector entities, and/or public private partnerships. The preliminary rail system designs have been developed with this in mind creating station spaces and rail systems that are capable of autonomous operation while still being fully integrated into the larger Penn Station complex. Preliminary rail systems designs (track, signals, catenary and substations, communications) are also being developed with demarcation boundaries that allow a clean transfer of responsibility from one territory to another.

8. **Portal Bridge**
   A future Portal South Bridge and additional tracks through Secaucus are essential to realizing the capacity improvements afforded by Gateway and Penn South. Realizing the ultimate objective of four tracks from Newark to New York also depends on additional tracks over the Hackensack River. The Team evaluated numerous track and bridge configurations, confirming that a four-track bridge system is necessary to achieve targeted capacity goals.

9. **Penn West Configuration and I-Ladder Extension**
   A means of improving the eastbound peak period operation into Penn Station via configuration changes of the west end of Penn Station switching complex (A Tower), has been sought after for a sometime. Gateway will introduce modified operating patterns, particularly during the extended periods of time while the existing North River Tunnel is being rehabilitated, presumably one at a time.

10. **Gateway Program Planning Concept**
    The Gateway Program is an immensely transformational program with many stakeholders that will take place over a period of 15 to 20+ years. There is a need to develop a conceptual order of project deployment overlaid with the associated estimated conceptual costs and funding requirements. An aggressive conceptual order of deployment had been developed and has been performed. A fundamental way to ensure that Gateway delivers its greatest potential value and is able to be sustained to completion is to create and measure the independent utility of the individual projects within the broader context of the entire program.
ONGOING WORK

Right of Way Preservation
With funding from Congress and the Federal Railroad Administration, Amtrak is constructing a concrete casing at the Hudson Yards in Midtown Manhattan to preserve an underground right-of-way that could serve as the future alignment for a new rail tunnel under the Hudson River connecting to Penn Station, New York. The concrete casing will maintain the ability to preserve existing passenger rail service in and out of New York City by building a new Hudson River tunnel that connects with Penn Station, as envisioned in the Hudson Tunnel Project. It also preserves the ability to meet strong growth in rail travel demand west of the Hudson and throughout the Northeast Region, by expanding rail capacity as envisioned in the Gateway Program. Without the preservation of this right-of-way, the opportunity to expand rail service into Penn Station from under the Hudson River would never be possible.

Figure 2 provides an overview of the work included in the Right of Way Preservation:

- Phase 1 - to protect the future rail right-of-way through the Hudson Yards, Phase 1 of the concrete casing was built underground extending 800 feet from 10th to 11th Avenues between 31st and 33rd Streets. The construction began in August 2013 and was completed about a year later. Craig Rolwood presented a paper on this project at the 2015 AREMA Conference.
- Phase 2, Segment 2 is currently under construction. This segment of the concrete casing extended the project west another 105 feet under the 11th Avenue viaduct in Manhattan.
- Phase 2 Segment 3 is currently in final design. This segment of the concrete casing between 11th and 12th Avenue is anticipated to begin construction in early part of 2017.
Hudson Tunnel Project
The Hudson Tunnel Project includes the design and construction a new Hudson River rail tunnel serving Penn Station, New York, and the rehabilitation and modernization of the existing Hudson River Tunnel. Approximately 200,000 daily passenger trips travel through the existing Hudson River Tunnel, which was built by the Pennsylvania Railroad and completed in 1910. The tunnel consists of two single-track tubes which provide the only passenger rail connections between Manhattan and New Jersey, and the rest of the Northeast Corridor to the south. In October 2012 the tunnel was inundated with millions of gallons of salt water during Super Storm Sandy, leaving behind corrosive sulfides and chlorides, which continue to damage the concrete tunnel liner and bench walls, which house critical electrical and signaling systems that support train operations in the tunnel. Taking one of two tubes out of service for necessary repairs would reduce total capacity for Amtrak and NJ TRANSIT from 24 trains per hour to 6 trains per hour in the peak direction. This very significant reduction in capacity would have a devastating effect on New York and New Jersey commuters who cross the Hudson on a daily basis, Amtrak passengers, and the regional and national economy. The current scope of this project would design and construct the new two tube tunnel and once in operation would allow for one existing tubes to be taken out of service one at a time to perform the rehabilitation which is expected to take 1.5 – 2 years per tube. The construction of the new tunnel is necessary to preserve existing Amtrak and NJ TRANSIT service during the rehabilitation of the existing tunnel, which will be completed one track at a time. The completed project will bring the existing tunnel to a state of good repair, increase resiliency, enhance operating flexibility, and improve reliability of existing rail service. It also includes the completion of right-of-way preservation through Manhattan to connect to Penn Station, New York, including fitting out the concrete casing at Hudson Yards with railroad systems and infrastructure.

In March of this year, NJ Transit awarded the Hudson Tunnel NEPA services contract to AKRF and Amtrak awarded the Hudson Tunnel Preliminary Engineering to GTHP. Together with the support of USDOT, PANYNJ and NY and NJ, there is a commitment to work toward an expedited environmental process and goal of obtaining a Record of Decision (ROD) within 24 months.

Figure 3 – Hudson Tunnel Project Study Area

Engineering Challenges
Generally, river crossing tunnels are constructed with a ground cover not less than equivalent of one to one and half tunnel diameters above the tunnel crown to the river bed. Ground cover less than one diameter raises a number of technical issues and increases construction risks that should be mitigated. Based on preliminary calculations during the feasibility study, a soil cover of approximately 10 feet is required to counterbalance buoyancy. Based on preliminary findings, the
minimum soil cover along the proposed alignment is approximately 14 feet. The length of tunnel section with this low cover is approximately 500 feet. As shown in Figure 4 below, the Hudson Tunnel profile varies from that of the proposed ARC alignment as the Hudson Tunnel needs to connect to existing Penn Station and maintain a 2.1% effective grade. Particular technical issues with shallow cover tunneling under the Hudson River in very weak soils are: tunnel face stability, potential loss of pressure of the pressurized-face, potential tunnel blowouts, tunnel buoyancy issues, bearing capacity, TBM steering difficulties, subsurface obstructions, external hazards such as vessel anchors, and sinking vessels.

There are several methodologies available to mitigate the low tunnel cover issues. These methods will be evaluated for their impacts on the environment, the river, permitting issues, construction schedule and construction cost. Some possible methods are tremie concrete cover, ground improvement by jet grouting and pre-excavation grouting ahead of the TBM face (done from inside the tunnel) and could provide solutions to mitigate the shallow tunnel cover.
The 330-foot length of tunnel (from the shaft edge to a point in the river that clears the Hudson River bulkhead (Manhattan bulkhead) as shown in Figure 5 and Figure 6 would present difficult construction conditions.

Figure 5 – Ground Stabilizing Profile

Figure 6 – Manhattan Bulkhead

It is an area covered by fills underlain with deep, highly compressible soft weak clays/silts. Initially this area was part of the Hudson River and with time the area was reclaimed by fills. There were intermediate advances of the filling and parts of landside of this area were formerly piers or bulkheads that have been abandoned and covered. More recently, the former elevated Westside Highway ran through the area in what is now Route 9A. Abandoned piles from the latter highway are buried in the area.

There are numerous utilities, including gas/water mains and pile supported sewers. The Hudson River bulkhead is comprised of large granite blocks over a timber crib filled with cobbles. The entire structure is supported on a matrix of piles including some that are battered. The pile tip depths are unknown but are expected to extend below the tunnel alignment. The piles will need to be cut and supported during excavation.
Horizontal freezing as a ground modification is proposed for this section of tunnel. Once frozen, the section would be excavated and supported as a Sequential Excavation Method (SEM) tunnel. Once the SEM tunnel reaches the final terminal point in the river, the entire tunnel would be filled with low density concrete. Later, the Tunnel Boring Machine (TBM) would mine easily through the concrete and provide permanent support with its standard precast concrete segments. The general temporary ground support in this section would be with shotcrete and lattice girders. However, under the Hudson River bulkhead, it is proposed to switch to steel ribs and shotcrete.

**Portal North Bridge**

The new high-level 2-track fixed span Portal North Bridge (Figure 7) will replace the current 100-year-old Portal Swing Bridge over the Hackensack River between Kearny and Secaucus, New Jersey. The bridge will be approximately 1 ½ miles in length, backwall to backwall, and will feature three (3) 400 LF Network Tied Arch spans crossing the Hackensack River. This will be the first application of a Network Tied Arch Railroad Bridge design in North America.

Portal North Bridge has record of decision (ROD) from FRA and has completed final design. The estimated $1.3 billion project expects to begin construction by the end of 2016. New Jersey Transit was awarded a $16M TIGER grant which will be used to fund an Early Action Contract for relocation of utilities and other civil work in preparation for the large construction contracts to begin as funding is identified.

![Figure 7 – Rendering of Portal North Bridge](image)

**Next Steps**

Amtrak will continue to work with the Gateway Program partners including New Jersey Transit, Port Authority of NY and NJ, and USDOT as they work to establish the Gateway Development Corporation (GDC), an entity that will serve as the coordinating, developing, operating, financing, managing and ownership vehicle to effectuate the proposed Gateway Program.
The Gateway Program

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NEC passenger growth will continue; how much depends on the level of investment.

Penn Station NY
429,000 average weekday passenger trips (FY 2014)
- Long Island Railroad - 226,000 trips
- NJ Transit - 174,000
- Metro-North - 28,000

PLUS NYC Transit
356,000 average weekday trips at Penn Station (FY 2014)
- 1/2/3 - 185,000 trips
- A/C/E - 171,000 trips

Total station trips have doubled since formation of commuter agencies.

The NEC narrows to two tracks between Newark, NJ and Penn Station, NY - and accommodates 450 train movements a day.

Super Storm Sandy Impacts

- Super Storm Sandy forced ~4-day closure of the NEC:
  - Inundated substations
  - Inundated East River and Hudson River Tunnel systems
- Ongoing damage to internal components requires complete renewal.
- Tunnel reconstruction requires closure of each tube for outages of >1 year.
- Rebuilding of the existing Hudson River Tunnel cannot begin until the new Hudson Tunnel Project is completed.
**Gateway Program Principles**

**Service Preservation and Resiliency**
- Preserve existing service to Penn Station NY
- Rebuild existing infrastructure
- Provide resiliency / storm protection
- Bring to State of Good Repair

**Capacity**
- 100% increase Trans-Hudson River
- Expansion of Penn Station NY
- Improve reliability and enhance redundancy

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**R.O.W. Preservation - Hudson Yards**

Are Amtrak began construction in August 2013 to preserve the future pathway of the Hudson tunnel through Hudson Yards – or risk losing Penn Station access forever.

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**Connection to Penn Station**

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**R.O.W. Preservation – Phase 1**
R.O.W. Preservation – Phase 2 Segment 2

Box Girder Supporting 11th Ave Superstructure

Hudson Tunnel Project

- New 2-track Alignment from Allied Interlocking to A Yard – approximately 4 miles *
- New Tunnel from Tonnelle Avenue to A Yard – each tube approximately 2.6 miles *
- Tunnel Bore is 28 feet diameter (to be verified during PE)
- 2 construction access shafts
- Ventilation and Cross Passages in accordance with NFPA 130
- Proposed Construction Method
  - Hard rock TBM tunneling (Palisades)
  - Soft ground Earth Pressure Balance Machine (EPBM) (Hudson River)
  - Sequential Excavation Method (SEM) under 12th Ave and Manhattan Bulkhead
  - Open Cut from Manhattan Shaft to West Rail Yard
- Rehabilitation of existing tunnel includes bench wall replacement, liner repairs, installation of direct fixation track, and systems
  *(to be finalized during NEPA process)*

Hudson Tunnel Project Study Area

- Hudson Tunnel Project includes rehabilitation of existing tunnel
- Two Year for NEPA Environmental Review and Preliminary Engineering
- FRA is Federal Lead Agency
- NJ Transit is NEPA Lead
- Amtrak is Engineering Lead

Hudson Tunnel Project & ARC Profile

Hudson Tunnel Project Preliminary Timeline

- Portal North Bridge has record of decision (ROD) from FRA and has completed final design.
- Approximately $1.5 billion construction cost over 5 years.
- Early Action Contract for relocation of utilities and civil work to be funded by $16 M TIGER grant to NJ Transit
- Funding sources for remainder of costs yet to be determined
Capacity Improvements – Portal Bridge South

A second 2-track fixed span bridge over the Hackensack River between Kearny and Secaucus, New Jersey to complete four-track right-of-way through this area.

Capacity Improvement – Penn Station South

- Expand Penn Station to the South adding new tracks and platforms (yellow)
- Preserve access to future deep cavern HSR station (blue)
- Preserve ability to extend tracks to the East

Gateway Program Partners

- USDOT
- Amtrak
- NJ Transit
- The Port Authority of NY & NJ
- State of New Jersey
- State of New York

- Gateway Development Corporation
  - Governance
  - Funding and Finance
  - Real Estate
  - Engineering & Construction

Thank You.

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