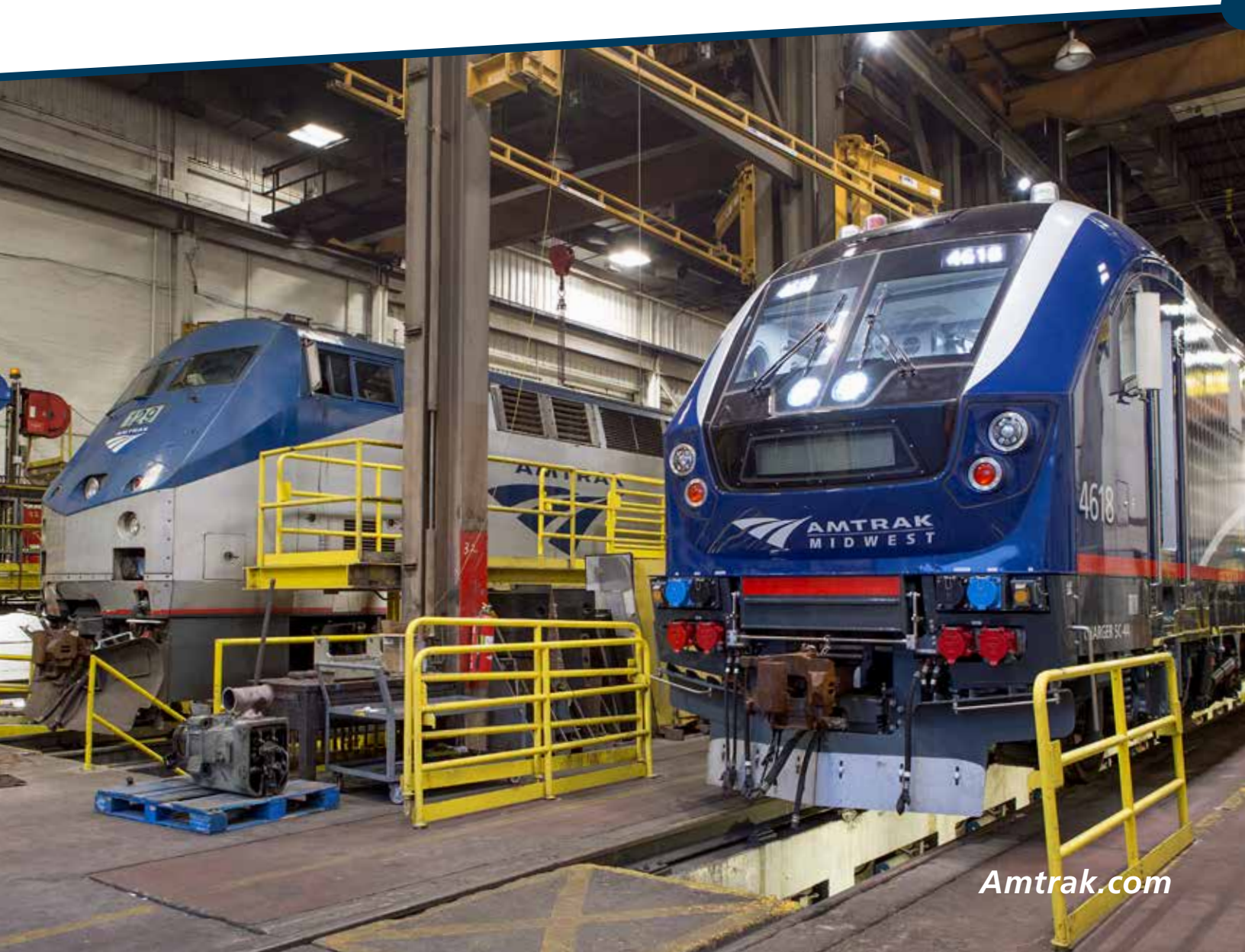
AMTRAK

Amtrak Five-Year
Asset Line Plans

Fiscal Years 2020–2025 (Base + Five-Year Strategic Plan)



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AMTRAK


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Introduction

Amtrak's Five-Year Plans support the account structure and improvements to accounting methods required by Fixing America's Surface Transportation (FAST) Act to promote efficient use and stewardship of Amtrak funds and enhance transparency. The account structure is designed around the service lines which each have distinct missions, customers, and revenue profiles.

Amtrak's Asset Lines support Service Lines by providing the resources necessary to produce revenue and support our mission and goals. The FAST Act established four asset lines:

Equipment

Amtrak-controlled rolling stock, locomotives, and mechanical shop facilities that are used to maintain and overhaul equipment.

Infrastructure

All Amtrak-controlled Northeast Corridor infrastructure assets and other Amtrak controlled infrastructure, along with the associated facilities that support the operation, maintenance, and improvement of those assets.

Stations

All passenger rail stations served by Amtrak trains, with a focus on Amtrak-controlled stations and elements of other stations for which Amtrak has legal responsibility or where it intends to make capital investments.

National Assets and Corporate Services (NACS)

Cross-cutting assets such as systems for reservations, security, training, training centers, and others associated with Amtrak's national rail passenger transportation system. Corporate Services include company-wide functions such as legal, finance, government affairs, human resources, and information technology.

FRA and Amtrak believed it was necessary to establish a fifth asset line—Transportation. Transportation refers to aspects related to the operation and movement of the trains, on-board services and amenities. In addition to its core functions, each service and asset line requires strategic and operational leadership, management, and administrative support to carry out their functions.

Plan Contents and Organization

FY 2019 was the first year that Amtrak provided Asset Line Plans as required under the FAST Act. This year, we are updating those plans and combining the asset line plans into a consolidated document to better integrate the narratives and connections among the asset lines, which generally include activities that are cross-cutting.

This document includes discussion of asset line strategies, asset inventories, and our five-year capital plan to show how we are prioritizing investments to maintain and improve our assets to provide safe and reliable services.

Strategies

Asset line strategies include goals, objectives, performance metrics, and any relevant statutory/regulatory issues. Information on strategies for Equipment, Infrastructure, and Stations Asset Lines is provided in the following sections of this report. Strategies related to Transportation and the National Assets and Corporate Services Asset Lines, which frequently involve broad multi-functional efforts, are addressed in context of the relevant initiative with corresponding service line plans and later in this introductory section.

Asset Inventories

Asset inventories provide information on existing Amtrak capital assets with information on shared ownership. Information for the Equipment, Infrastructure, and Stations Asset Lines is summarized in the following sections of this plan with additional detail provided in separate appendices or internal information systems. Many of the functions that support the NACS asset line do not directly own or maintain physical assets. A summary of identified NACS assets are provided below.

Information Technology (IT). IT owns few physical assets. Our strategy is to own less hardware and software and move to a managed service, cloud and software subscription model. The majority of our hardware is contracted for under either a managed service contract or with our cloud vendors. Many of our software titles are contracted for using a SaaS (software as a service) model for an annual subscription fee. Amtrak benefits from using this IT model by moving quickly to set up new solutions and having well supported, up to date versions/patches, and a secure software environment.

Amtrak Police Department (APD). Amtrak has its own police department, responsible for safeguarding Amtrak employees, customers, patrons and infrastructure through partnerships and best practices. For security reasons, only summarized information regarding APD assets is included. Asset types include:

- Facilities in more than 20 locations;
- Police vehicles;
- Tactical equipment such as training simulators, multimode threat detectors, thermal imaging cameras, explosive trace detectors and communication devices (e.g. police radios);
- Canine (K-9) detection dogs with supporting facilities (e.g., kennels, vehicle cages).

Human Resources. Our Human Resources organization supports technical skills training for employees, as well as providing core training programs that ensure compliance with regulatory training mandates and improve employee performance. Training and Development staff are located at various facilities, with training provided at locations including Amtrak stations and other facilities.

Five-Year Capital Plans

The final section of this plan combines the capital plans for the asset lines. Information in the capital plan is fiscally constrained for the base year (FY 2020) plus the five plan years (FY 2021–2025). The final section provides an overview of the five-year capital plan for each asset line based on the FAST Act account structure format, a summary of key programs and projects, and a discussion of projects that could advance if additional funding were available.

APD K9 team Ken Wolf and Teddy oversee the boarding of the Coast Starlight.

Stakeholder Coordination

The development of these plans includes consultation with the service lines to ensure alignment and with outside entities contributing funding. Amtrak maintains regular communication with our state, commuter and host railroad partners on a bilateral basis and through our membership in the Northeast Corridor Commission and the State-Amtrak Intercity Passenger Rail Committee (SAIPRC). We are also in continual communication with the federal government through the Federal Railroad Administration's (FRA) management of our NEC and National Network grants and its membership in both the Commission and SAIPRC. We also communicate regularly with Congress regarding current and planned activities. Ongoing efforts to improve or maintain Amtrak's assets that involve collaboration with stakeholders include Amtrak's fleet acquisition process and managing investment in shared-use infrastructure on the Northeast Corridor.

Coordination on Fleet Acquisition with FRA and SAIPRC

The modernization of Amtrak's fleet includes both Amtrak and state-owned equipment and initiatives.

We reached the conclusion that our current fleet will need large-scale replacement in coming years with the help of external stakeholders such as the FRA and engineering firms, whose commissioned technical studies included the Amfleet I Life Extension Study that set forth the process for Amfleet replacement. Additionally, we have engaged our state partners to determine their preferences regarding new equipment capacities, features and other key components.

Our fleet acquisition process involves outreach to the global vendor marketplace through a Request for Information (RFI) to gain an understanding of products and features available for re-fleeting, followed by a Request for Proposal (RFP) and selection of a vendor. So far, we've engaged vendors through the RFI and RFP process for *Acela* replacement High Speed Trainsets, diesel locomotive replacement units and Amfleet I replacement trainsets. Midwest and California state partners have also placed an order for 137 Siemens single level railcars which will equip most Midwest state corridors as well as California's *San Joaquin* service. These state partners, along with Washington State DOT, have also taken delivery of 63 Siemens SC-44 Charger diesel locomotives. As a result, our fleet modernization effort includes both Amtrak and state-owned equipment and initiatives.

Coordination on Investments in Northeast Corridor Infrastructure

The FAST Act requires that stakeholders are consulted in plan development. Amtrak engaged both the Federal Railroad Administration and the Northeast Corridor Commission in developing the Infrastructure Asset Line Plan (IALP). We are continuing efforts to improve alignment between the IALP and Commission's Capital Investment Plan (CIP). We continue to work with the Northeast Corridor Commission to renew the cost allocation policy and to create a more inclusive process for plan development and review.

Recent Accomplishments and Key Plan Highlights

Amtrak continued to increase its capital investments in FY 2019 with $1.6 billion—9.4% higher than last year's record investment—including SOGR work, equipment refreshes and station upgrades. Accomplishments from FY 2019 and key highlights from our five-year plan for Amtrak's asset lines include the following.

Transportation

In FY 2019 we implemented a comprehensive Safety Management System, resulting in improvements in a broad range of safety metrics. We completed PTC implementation on all Amtrak-owned and controlled track, except for less than one mile of slow-speed track in the complex Chicago terminal area.

We also collaborated with our state partners to expand the Amtrak network, including: launch of the *Valley Flyer* (a new state-supported service in Western Massachusetts); adjusted the *San Joaquins'* schedule to accommodate weekend leisure travelers better; increased schedules on the *Northeast Regional* to Norfolk, Virginia, and the *Downeaster*; and added a new Green Bay-Milwaukee Amtrak Thruway Bus Service connecting with the *Hiawatha* trains.

Above: Track Inspector monitors Positive Train Control system on Northeast Corridor.

Equipment

We invested $437 million in FY 2019 to modernize and refresh the Amtrak fleet. We also progressed manufacturing of the new *Acela* fleet currently underway in Hornell, New York, awarded a contract to purchase 75 new passenger diesel locomotives from Siemens to replace some of our aging National Network locomotive fleet, and issued an RFP for a new fleet of single-level passenger rail vehicles to replace Amfleet I cars.

Our five-year plan continues efforts to renew and expand our fleet and will:

- **Replace at least 352 aging units** with at least 570 new units on order for Amtrak or its state partners to be operated by Amtrak. Additional replacements will continue beyond the five-year plan horizon.
- **Launch dual-power (catenary/diesel) service** on the NEC substantially reducing dwell time in Washington.
- **Result in modernized facilities for equipment maintenance.**

Stations

In FY 2019, we invested $143 million to improve the customer experience at several stations throughout the network, including: the installation of a state-of-the-art digital board at William H. Gray III 30th Street Station; enhanced Metropolitan Lounges in Washington Union Station, Boston South Station, Gray 30th Street Station, and the Great Hall at Chicago Union Station; upgraded stations to enhance the customer experience through the Customer Now program; reached commercial close for $90 million of improvements at Baltimore Penn Station; and returned service to the historic Springfield (MA) Union Station, which included new passenger amenities.

Below: Waiting room inside Seattle King Street Station.

Additional investments included in the five-year plan will modernize and improve our stations. The Stations Asset Line is focused on key initiatives at Amtrak stations including Major Stations and Customer Now initiatives, as well as stations components of the *Acela* program.

Infrastructure

In FY 2019, we invested $713 million in infrastructure projects throughout the country that were completed safely, on time, and within budget to improve overall reliability and performance. These state-of-good-repair projects included repair or replacement of 24,080 feet of catenary hardware, 79,985 concrete ties, 784 bridge ties and 283 miles of high-speed surfacing. We initiated the RFP process for major maintenance-of-way equipment acquisition which will dramatically improve state-of-good-repair production rates.

The Penn Station Sectionalizing Switch Renewal project successfully replaced 15 catenary sectionalizing switches located on Walk Over 28 in Penn Station. The project was planned as a $1.2 million effort scheduled to end in August of 2019. The overall project was completed under budget and final testing and commissioning finished in October. The switches are now in a state of good repair with modernized components and can be operated remotely by the Power Directors. This is a great improvement to both safety and efficiency, as Linemen do not have to traverse the station or climb while de-energizing the catenary for planned work. It also helps the Power Directors during power incidents as they have the flexibility from their desks to operate 20% of the trolley network in Penn Station. An additional switch replacement project is underway for FY 2020 to replace all 17 switches on Walk Overs 36 and 45.

The five-year plan for infrastructure continues state-of-good repair work, while advancing critical infrastructure projects such as the Susquehanna River Bridge Replacement, Baltimore and Potomac Tunnel Replacement, and key elements of the Gateway program including the Hudson Tunnel Project and Portal North Bridge.

National Assets and Corporate Services

All of Amtrak's sustainability goals were achieved for FY 2019. We exceeded or met all annual energy, fuel, recycling, and greenhouse gas emissions targets, with the support of all employees. Efforts such as lighting upgrades, reduced idling, and a focused recycling program helped Amtrak meet these targets and save money. Since 2010, we have reduced greenhouse gas emissions by 17%.

We invested more than $110 million in technology, including an updated customer mobile app to make bookings and travel management faster and easier than ever before. We also improved the on-board experience by offering assigned seating for customers traveling in *Acela* First class and started developing an omnichannel strategy to enable customers to easily complete purchases, access information and engage in transactions across multiple channels.

2019 CAPITAL INVESTMENTS

$1.6B

Record total capital investments, up 9.4% from 2018

$437M

Modernizing and refreshing the Amtrak fleet

$143M

Improving the customer experience at stations throughout Amtrak's network

$713M

Investing in infrastructure and state-of-good repair projects to improve overall reliability and performance

$110M

Investing in technology, including an updated customer mobile app

Corporate Initiatives

The Transportation Asset Line and National Assets and Corporate Services Asset Lines are focused on more immediate time frames and are generally cross cutting efforts. Several initiatives involving management and development of Amtrak assets impact multiple service and asset lines.

Project Management

At Amtrak, project managers are required to follow industry standards for Project and Program Management as outlined in the Project Management Body of Knowledge.

Good project management is critical to our ability to deliver the improvements articulated in our plans for all asset lines. Amtrak uses a project management methodology that is scalable to the project size, cost complexity and organizational impact. Our methodology aligns with globally recognized project management standards and best practices, while allowing for reasonable flexibility in the project management practices to meet the specific needs unique to rail projects. Amtrak's methodology draws on our organizational project management experience as well as best practices and standards including:

1. Project Management Institute PMBOK
2. U.S. Department of Transportation (DOT) Project Management Guides and Processes
3. Practices learned from industry conferences, groups, and forums
4. Benchmarking against industry peers
5. Practices, manuals, policies, and tools employed by various groups within the organization

At Amtrak, project managers are required to follow industry standards for Project and Program Management as outlined in the Project Management Body of Knowledge (PMBOK®) Sixth Edition, and they must establish appropriate project management structures with applicable management controls. Amtrak project managers are also subject to Amtrak's Enterprise Project Management policy and standards. Projects at Amtrak are required to have appropriate governance and controls, and project teams are accountable for work performance. Project documentation used by project managers includes, but is not limited to, a project charter, a project schedule, a risk register, a stakeholder register, project management plan (PMP), and regular project status reports.

All Amtrak projects must complete a monthly Project Status Report including the following information:

- YTD and PTD Actual Project Cost
- Current Approved Project Funding
- Forecast to Completion
- Progress of work
- Status of Project Change Requests
- Schedule status for key milestones (Schedule Status, Look Ahead, Critical Path Analysis, Schedule Risk Analysis)
- Risk Register and Mitigation Plan
- Proposed changes and impacts to schedule and resource allocations
- Disposition of approved Change Requests

Enterprise Asset Management

Amtrak launched the Enterprise Asset Management (EAM) initiative to transform the way we manage our assets and thus execute our operating model. It is crucial that EAM process changes align with Amtrak's future state operating model and that the organization is organized to support these changes. Therefore, we are beginning an important initiative to identify how Amtrak will operate in the future to improve the effectiveness of our asset management system, our asset management practices and approaches, and to identify any organizational changes needed to successfully move us to that future state. This effort will determine the key steps and decisions needed to develop a highly effective Enterprise Asset Management practice at Amtrak.

Safety

Amtrak is committed to leading the industry in the implementation and operation of a Safety Management System (SMS), a recognized foundational safety process that many companies and industries have adopted either voluntarily or through regulation. Recently, we submitted our SMS Program Plan to the FRA. Over the past year we have been implementing the SMS Plan, including a new safety policy, new safety metrics, new risk assessment tools, voluntary safety program enhancements and safety assurance processes. A key focus will be on integrating more simulators for training employees, increasing focus on voluntary safety reporting, and an emphasis on building a Just Culture[1] that encourages and supports employee self-reporting of safety efforts.

1. A Just Culture focuses on making the distinction among honest mistakes associated with human error, behaviors that put us at risk for an incident, and reckless behavior that reflects an intentional disregard for safety.

Above: Employees from Amtrak's Electric Traction department are at work in Philadelphia's University City neighborhood.

Technology Planning

Amtrak accelerated on its journey to become a world class technology organization during FY 2019 delivering products and services which enable business outcomes. Over the next five years, we expect to maintain the service owner-led Service Oriented Organization (SOO) operating model and make minor adjustments as needed based on changes within business and operational efficiencies.

We will continue our investments in core technology skill sets through focused hiring in Technology Strategy, Architecture, and Platforms, Information Security among others. We will also refine our resource management approach to ensure that IT's capacity to deliver services continually aligns to demand and budget, and evolves with the changing needs of Amtrak. Technology capital planning and management has the following strategic and operational focus:

- **Heightened focus on the "Top 10 Technology Initiatives".** We will deliver these high-priority initiatives before taking on any new major body of work.
- **Improve financial management and forecasts.** For capital projects we intend to drive the goal of projects staying within +/- 10% of forecast every month.
- **Smaller, projects with shorter time to value.**
- **Improve business cases.** We will work with our business partners to ensure our projects claim more realistic benefits, helping us to more effectively prioritize our portfolio.
- **Project Governance.** All new development will be managed through the capital project process.

> *In FY 2019 we heightened our focus on the top 10 technology prioritized initiatives which are transformational in nature and are essential for Amtrak's overall success. All top 10 technology initiatives have continual releases of capabilities during FY 2020.*

For each of these initiatives we are taking an agile and iterative approach to business value delivery with work broken down into smaller increments, with release of business capabilities every three to four months. We are also focused on ensuring the overall initiative and the multiple sub-projects are in complete alignment with the overall scope, schedule and budget.

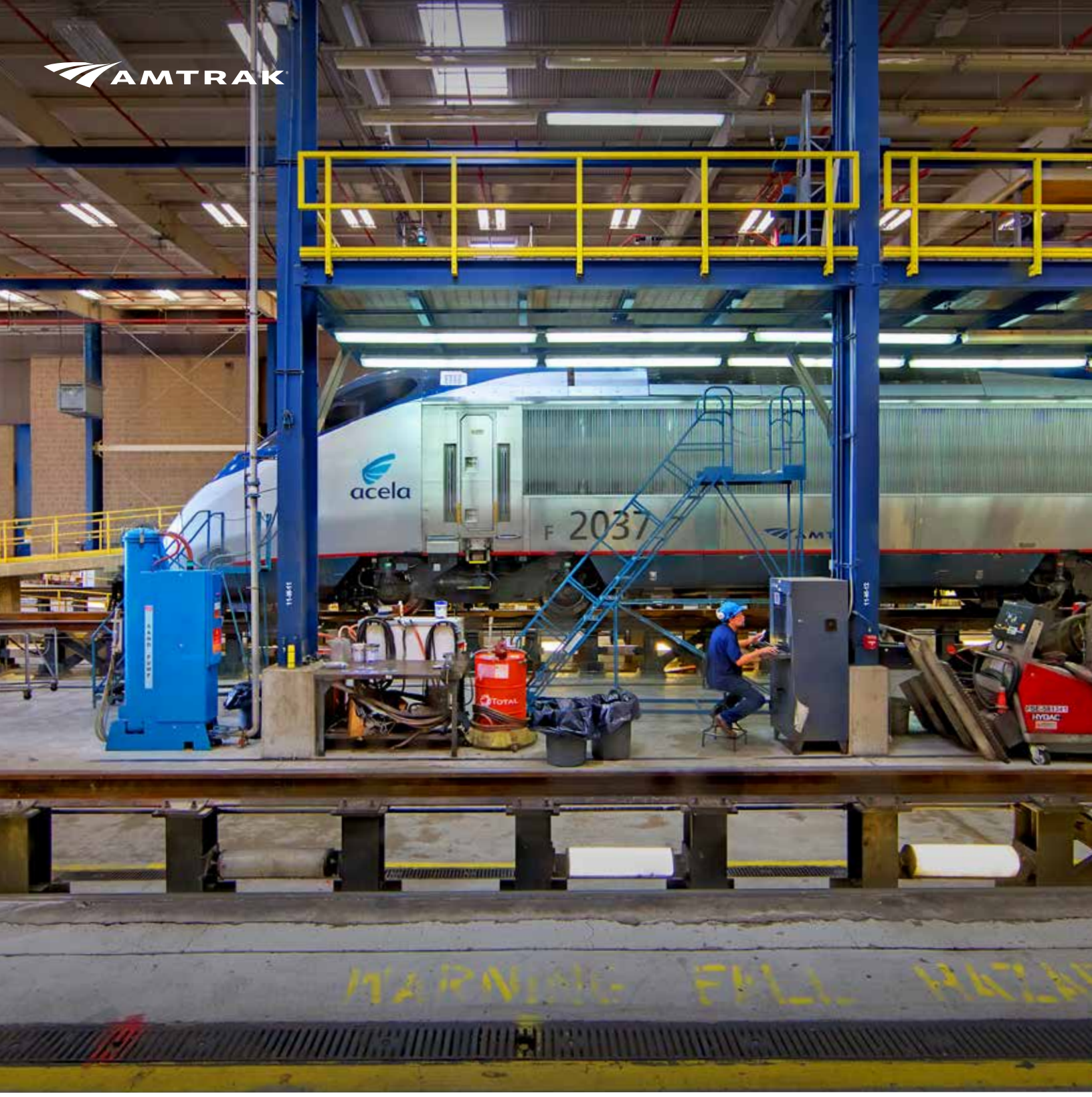
THE CURRENT TOP 10 TECHNOLOGY INITIATIVES ARE:

1. **Customer Digital and Mobile.** Provide a modern, seamless and consistent digital experience for customers across all channels.
2. **Customer Communications and Notifications.** Provide timely, accurate and consistent service status update to customers throughout their travel journey.
3. **Next Generation Kiosks.** Replace existing Quik-Trak kiosks with a new customer self-service platform.
4. **Customer Data Hub.** Build a single source of Amtrak customer related information and leverage the information across all customer channels.
5. **Food and Beverage Point of Sale System.** Implement a modern Point of Sale system across Amtrak network.
6. **Customer On board Wi-Fi.** Provide reliable Wi-Fi service for Amtrak customers on board our trains.
7. **Integrated Labor Management System (iLMS).** Provide unified technology platform for executing different business processes across Train Operations.
8. **Enterprise Asset Management (EAM).** Implement a unified asset management platform across Engineering, Mechanical, Stations, Facilities, Properties and Accessibility groups at Amtrak.
9. **Enterprise Time Keeping.** Implement a modern, unified time keeping system across Amtrak.
10. **Safety and Security.** Multiple initiatives focused around driving a culture of continuous security and zero cyber security breaches across Amtrak eco system.

Above left: Quick-Trak kiosks inside Chicago Union Station. Above right: Amtrak customers rely on our mobile app for a seamless travel experience.

Document Organization

The following sections with the corresponding responsible officials noted provide further context and information each of the asset lines.



Equipment Asset Line

Equipment Asset Line

Amtrak's Equipment Asset Line includes our fleet of passenger locomotives, railcars and trainsets. The equipment is used to carry customers on the railroad's three intercity rail passenger service lines: the Northeast Corridor, State Supported and Long Distance.

Overview

At this time, we operate a fleet of predominantly custom-built equipment, a significant portion of which is at or nearing the end of its useful service life. At the start of FY 2020, our active fleet for intercity rail passenger service includes some 230 road diesel locomotives owned or leased, 66 electric locomotives (plus an additional 15 in reserve status), 1,413 railcars and 20 high-speed trainsets.

Additionally, we operate fleets of seven Talgo trainsets and 49 Alstom Surfliner railcars, with ownership split at the railcar level between us and our state partners. We also operate 202 locomotives and railcars owned by our state partners. The average passenger railcar we own or lease is nearing 34 years of age, while the average locomotive or trainset unit is over 20 years of age.

At left: An Amtrak P-42 diesel locomotive in between trips at Amtrak's Chicago locomotive shop.

Strategy

As most passenger railcars operating in North America are retired between 30 and 50 years of age and most high-speed trainsets around the world replaced in an even shorter time frame, it is time for a large-scale refleeting. As a result, we have embarked on a comprehensive, multi-year strategy to modernize our locomotive and passenger car roster.

> *Eleven separate initiatives are either underway or planned to rebuild, retire or replace our locomotive, railcar and trainset fleets so that we can deliver safer, more reliable rail travel to a growing number of passengers in the future.*

These initiatives include:

1. Imminent **retirement of Talgo VI equipment** currently used in Amtrak Cascades Service.
2. Delivery of **new Siemens single level railcars** for state partner services in the Midwest and California.
3. Completion of the **Viewliner II Railcar Procurement.**
4. Delivery of **new *Acela* High-Speed Trainsets,** to replace current *Acela* equipment.
5. Delivery of **new diesel locomotives** (ALC-42s), to replace aging P-42s on Long Distance routes.
6. **Replacement of Amfleet I equipment.**
7. **Dual-power equipment** for trains which operate both on and off the Northeast Corridor.
8. Development of a Multi-Level (*i.e.,* Superliner) and Amfleet-II long distance fleet renewal strategy.
9. **Refresh of the existing passenger fleets.**
10. **Disposal of equipment** which we no longer use.
11. **Development of a Facility Strategy** to complement the maintenance needs of the new fleet.

Our Equipment Asset Line Plan supports Amtrak's three intercity service lines: the Northeast Corridor Service Line, the State Supported Service Line and the Long Distance Service Line. Fleet types and quantities are intended to support the product mix and service structures of each service line. For example, the Northeast Corridor Service Line Plan reflects the pending delivery of 28 Avelia Liberty High Speed Trainsets for *Acela* service, which are included as one of the strategic initiatives in this Equipment Asset Line Plan. After the introduction of new *Acela* equipment and the relaunch of *Acela* service, the Northeast Corridor Service Line expects to relaunch *Northeast Regional* using new dual-power equipment, a key recommendation in this plan. The Long Distance Service Line identifies future goals of re-fleeting and refresh of its existing fleet in its service plan.

Our Equipment Asset Line Plan initiatives supports our FY 2020 pillars and strategic Blueprint.

Safety and Operations

New equipment provides an opportunity to provide generational safety, reliability and performance enhancements in equipment. New equipment constructed to the latest federal new-build requirements, maintained with vendor agreements containing higher reliability standards, will help prevent accidents, injuries and delays.

Customer Impact

A new fleet provides a once-in-a-generation opportunity to reinvent the product we provide the public. Re-fleeting also allows us to introduce amenities desired by customers but hard to retrofit on existing equipment. Additional seating capacity to meet ridership growth, faster and more reliable equipment and a refreshed and modernized appearance will support our ridership growth and customer satisfaction goals.

Strategy

The completion of this and other Asset Line Plans satisfies one of our strategic goals for FY 2020; other strategic goals are accommodated in this asset line plan's recommendations, including *Acela* goals related to the new trainset acquisition and investment in the National Network through a modernized fleet.

Assets

One of our FY 2020 goals is to advance the Amfleet I replacement / Intercity Trainset initiative outlined in this Equipment Asset Line Plan. Other initiatives and goals will also enhance Amtrak's equipment assets.

People

We have a history of employee engagement in developing the requirements for new equipment and planning for its introduction into service. At this time, we are working with vendors regarding the design and layout of new equipment to address employee-identified issues with equipment in addition to customer and corporate needs and desires.

Financial Stewardship

A new fleet will invariably have significant impacts on our operating and capital expenses, as well as revenue opportunities. As we continue progress toward the purchase of Amfleet replacement equipment, more detailed operating revenue and cost forecasting is planned to ascertain both the potential for revenue growth as well as the opportunity for operating cost reductions related to the features of new equipment which better meets customer needs while presenting cost savings opportunities.

The body shell of the café car, being fitted at the Alstom facility in Hornell, NY, shows off the outline of the new livery.

Project Milestones

Many of the key initiatives proposed in this plan are already underway. Current milestones and recent accomplishments include:

- **We have received most of the 130 Viewliner II railcars** on order and should have all cars by the end of 2020.
- **The next-generation *Acela* prototype trainset has been completed,** and testing of the first trainsets should commence in 2020 for a 2021 launch of service.
- **Proposals have been received** from the vendor marketplace for the Amfleet I Replacement/ Intercity Trainset RFP; an award is expected later in 2020.
- **Refresh of equipment** is complete for nearly 600 Amfleet I and *Acela* cars, and is rapidly nearing completion for our fleets of 92 Horizon cars and 138 Amfleet II cars.
- **We have sold over 200 pieces of equipment** which we no longer use, generating some $4 million in residual income while clearing space in our railyards to stage future fleet retirements.

Our fleet plan is an ambitious one, which requires the execution of several major modernization programs in relatively quick succession. However, the reward of such a program will be worth the challenges.

> *By the end of this plan's five-year outlook, nearly all of Amtrak's passengers nationwide will ride equipment that is either brand-new or has been recently refreshed.*

We will be well underway in reaping the efficiencies and benefits of a greater use of Technical Services & Spares Supply Agreements (TSSSAs) and Life Cycle Preventive Maintenance (LCPM) for maintenance, and will be in the process of re-configuring facilities for a next generation of newer, more efficient equipment. More regional corridors will make use of the greater turnaround efficiencies which come from the use of double-ended consists, while *Northeast Regional* and most state corridors which feed it will reap the benefits of faster, seamless travel thanks to dual power equipment and the elimination of engine changes.

At left: An Amtrak Mechanical employee performing railcar maintenance.

Asset Inventory

Amtrak's Fleet Today

Our passenger locomotive, railcar and trainset fleets generally consist of custom-built equipment nearing the end of its useful service life. Our active fleet (owned and lease) includes some 230 road diesel locomotives, 66 electric locomotives (plus an additional 15 in reserve), 1,413 railcars and 20 high-speed trainsets. Additionally, we operate fleets of seven Talgo trainsets and 49 Alstom Surfliner railcars, with ownership split at the railcar level with our state partners. We also operate 202 locomotives and railcars owned by our state partners.

At the start of FY 2020, our fleet of active owned and leased passenger train equipment from prior procurements is:

- **General Electric P-40/P-42 diesel locomotives (195 units) and P32ACDM dual-mode locomotives (18),** built 1993-2001. P-40/42 locomotives and used nationwide on long-distance and state-supported routes while P32ACDM units are primarily used on services between New York City, Albany-Rensselaer, NY, Niagara Falls, NY and Rutland, VT.
- **Siemens ACS-64 electric locomotives (66),** built between 2013 and 2016, used to haul *Northeast Regional*, *Keystone* service and select long-distance trains in electrified territory.
- **Budd Amfleet I (457) and ex-*Metroliner* (16) railcars,** built 1975-1977 (1967 for the ex-*Metroliner* units), are the workhorse of *Northeast Regional*, Northeast state corridors and some Midwest corridor routes.
- **Budd Amfleet II coaches and lounge cars (138),** built 1981-1983, used on all long-distance routes which serve New York, as well as the state-supported *Adirondack, Maple Leaf* and *Pennsylvanian*.
- **Superliner I railcars (241), built 1979-1981 by Pullman-Standard, and Superliner II railcars (184)** built 1993-1995 by Bombardier, used on all long-distance routes except those which serve New York, plus the state-supported *Pere Marquette*, *Heartland Flyer* and California corridors.
- **Horizon railcars (93),** built 1989-1990 by Bombardier; used on Midwest and California state corridors; these units will soon be substituted for state-owned Siemens Viaggio equipment and can thus be re-deployed.
- **Viewliner I sleeping cars (49),** built by Morrison-Knudsen/Amerail in the mid-1990s and used on long-distance routes serving New York; one Viewliner I diner prototype also operates.
- **Talgo trainsets (totaling 95 car units)** used on Amtrak Cascades service. Ownership of the first five trainsets (built 1998) is split between Amtrak and Washington; two newer Cascades Talgo sets are owned by Oregon.
- ***Acela* trainsets (20),** built 1999-2001 by Alstom & Bombardier; these trainsets will be retired following the delivery of Alstom Avelia Liberty trainsets.
- **Surfliner cars (49),** built by Alstom in 1999-2001 for *Pacific Surfliner* service, jointly owned by Amtrak and California.
- **80 *Auto Train* Auto Carriers,** built in 2006 by the Johnstown Corporation of America, used to haul passenger automobiles on *Auto Train*.

Deliveries conclude in 2020 for the order of 130 Viewliner II baggage, sleeping, dining and baggage-dorm cars from Construcciones y Auxiliar de Ferrocarriles (CAF) USA. The first 103 cars from this order were active at the start of FY 2020. These cars are used for long-distance routes.

The table below summarizes our fleet types, their ages and quantities; a full inventory of passenger fleet assets, including unit-level in-service status and ownership as of the start of FY 2020 is included as Appendix A.

AMTRAK'S ACTIVE FLEET OF OPERATED PASSENGER EQUIPMENT, START OF FY 2020 (FALL 2019)

Active counts based on October 2019 query of Amtrak's Operations Maintenance Systems (OMS) and subsequent review by System Operations and Finance.

Fleet Type	Ownership Status	Active Fleet	Ave. Yr. Built	Ave. Unit Age (Yrs)	Notes
AMTRAK-OWNED/LEASED LOCOMOTIVE FLEETS					
GE P-42 (Diesel)	Amtrak-owned	182	1998	21	
Former F40PH Diesel	Amtrak-owned	1	1977	42	One unit retains HEP Generator and is used as an NPCU
GE P32-8 Diesel	Amtrak-owned	17	1991	28	
P32ACDM Dual Mode	Amtrak-owned	18	1996	23	
GE P-40 Diesel	Amtrak-owned	13	1993	26	
Siemens ACS-64 (Electric)	Amtrak-owned	66	2014	5	
HHP-8 (Electric)	Amtrak-leased	15	2000	19	15 units placed in reserve status through end of leases
AMTRAK-OWNED/LEASED RAILCAR FLEETS					
Heritage	Amtrak	25	1954	65	
Amfleet I	Amtrak	457	1976	43	
Amfleet II	Amtrak	138	1982	37	
Ex-Metroliner	Amtrak	16	1967	52	
Horizon	Amtrak	93	1989	30	
Superliner I	Mix of Owned and Leased	241	1980	39	Plus 25 inactive units. Of total, 138 are Amtrak-owned while 128 are Amtrak-leased
Superliner II	Amtrak	184	1995	24	
Viewliner I	Amtrak	50	1996	23	
Viewliner II	Amtrak	103	2015	4	
NPCU (former F40PH)	Amtrak	20	1977	42	F40PH locomotives built 1977 and rebuilt into NPCUs
Auto Carrier	Amtrak	80	2005	14	
TRAINSET FLEET OWNED/LEASED BY AMTRAK					
Acela	19 sets leased, 1 owned	160	1999	20	Does not include Acela Inspection Car (non-passenger equipment)
STATE-OWNED FLEETS OPERATED BY AMTRAK					
California Cars	California	92	1996	23	Most cars are California I built in 1996, also includes Comets (1968) and California II (2002)
Oregon NPCU Units	Oregon	2	1977	42	Subfleet of Amtrak NPCU fleet with an average build date as F40PHs in 1977
NCDOT Railcar	NCDOT	20	1961	58	
NCDOT F59/F59PHI	NCDOT	8	1991	28	
F59PHI / P32-8 (Caltrans)	California	17	1996	23	
Siemens SC-44 Charger	WSDOT, IDOT, California	63	2017	2	Of 63 total units, 8 are owned by WA, 20 owned by CA, 33 owned by IDOT
TRAINSET AND RAILCAR FLEETS WITH OWNERSHIP SPLIT BETWEEN AMTRAK AND STATE PARTNERS AT THE UNIT LEVEL					
Surfliner	Amtrak, California	49	2000	19	Amtrak owns 39 units, California 10 units
Talgo	Amtrak, WSDOT, ODOT	95	2004	15	Plus 12 inactive units. Of total, Amtrak owns 43 units, ODOT 26 units, WSDOT 38 units.

Total Amtrak-Operated Units:	**2,225**	**Avg. Age:**	**28.1 Years**
Amtrak-owned railcar fleets:	1,407	**Avg. age:**	33.6 Years
Amtrak-owned trainset fleets:	160	**Avg. age:**	20.0 Years
Amtrak-owned/leased diesel locomotive fleets:	231	**Avg. age:**	22.0 Years
Amtrak owned/leased electric locomotive fleets:	81	**Avg. age:**	7.6 Years
State or split-ownership fleets:	346	**Avg. age:**	18.7 Years

Our aged fleet impacts our operation every day. Insufficient equipment has caused some state partners to look elsewhere for cars and locomotives to support ridership growth. Road diesel locomotives suffer from mechanical challenges due to their age and condition, which can cause train delays resulting in passenger inconvenience and dissatisfaction.

Other drawbacks include the lack of amenities such as manufacturer-installed Wi-Fi and changing tables; the small windows and limited toilet retention tank capacity of Amfleet I cars also negatively impact customer experience. Furthermore, the dated layout of restroom modules on Amfleet and Superliner equipment hinders our ability to keep cars clean, further degrading customer satisfaction.

Transformational technical changes such as dual-power consists could completely eliminate lengthy (and unreliable) engine changes from *Northeast Regional, Carolinian, Pennsylvanian, Vermonter* and other services. Dual-ended consists, achieved through the use of trainsets, cab control cars or other means, have also become common in other parts of the world and result in dramatic reductions in turnaround time at key terminals; these units only see limited application on our network.

Now Arriving: Fleet Renewal

We have historically defined our equipment as having a *useful* life of 30 years for locomotives and 40 years for railcars. Additionally, we've historically found railcars to have a useful *commercial* life of 30 years, and 20-25 years for locomotives, before key factors which govern a locomotive or car fleet come into play:

- **Maintainability.** Cost and obsolescence of routine maintenance on equipment.
- **Availability.** Quantities and types of cars required versus evolving service needs.
- **Technical capability.** Capacity to meet service requirements.
- **Customer acceptance.** Appeal of the equipment to passengers, to the extent where ridership can be influenced.
- **Capital availability.** Ability to fund fleet replacements, which may not come for several years after a technical need for new equipment is identified.

By any measure, much of our fleet needs replacement. As new equipment typically takes four or more years from contract award to reliably enter service, Amfleet and Superliner I equipment will operate for well over 40 years of service by the time replacements are manufactured, tested and delivered. The first P-40/P-42 locomotives entered service in 1993; even with the planned replacement of these units, the oldest units may approach 30 years of age before retirement.

Therefore, we have embarked on an ambitious plan to modernize our fleet. In the next five years, we expect to receive 28 new high-speed trainsets, at least 75 new ALC-42 diesel locomotives, completion of the 130-car Viewliner II long-distance single-level railcar acquisition and the first of at least 75 trainset consists (or railcar equivalents) to replace Amfleet equipment on *Northeast Regional* and several state corridor routes. Order options for diesel locomotives and trainsets provide us with the ability to equip future growth over and above the fleet modernization of our existing services. Over the next five years, we also plan to develop a strategy for addressing the aging bi-level Superliner and single-level Amfleet II fleets. We also plan to enter Technical Services and Spares Supply Agreements (TSSSAs) with vendors to support new equipment, refresh any operational legacy equipment, assess and modify our mix and capabilities at shops and terminals to support the new fleet and dispose of aged equipment.

In 2020 we anticipate testing the new *Acela* trainsets and the first of our state partners' new Siemens single level cars, completion of the Viewliner II railcar order, the contract award to replace Amfleet I, ex-*Metroliner* and Talgo VI equipment, and continued progress towards delivery of the ALC-42 diesel locomotive fleet. The following sections provide greater detail on all of our fleet initiatives. We have started an evolution of our fleet that will ultimately result in nearly every Amtrak customer being able to enjoy the benefits of modernized, state-of-the-art rail equipment.

By the end of 2025, with *Acela*, most P-42s and Talgo equipment retired, and the first Amfleet replacements entering service, we anticipate our average fleet age to decrease by up to five years. Significant further reductions are planned through the remainder of the 2020s; the exact figure will depend on the quantity of Amfleet replacement trainset options ordered, Superliner/Amfleet II replacement quantities, and delivery timing.

Equipment Asset Line Plan Leadership

Initiatives are managed through close coordination between teams. Mechanical work, from refresh through heavy overhauls and wreck repair, and the development of specifications for equipment acquisitions, is managed by Chief Mechanical Officer Charlie King. Fleet planning work, including route/service needs and fleet sizing needs, are managed under Vice President, Corporate Planning Byron Comati. New equipment acquisition initiatives, including Requests for Proposal (RFPs), Financial and Technical evaluation work, are conducted by a cross-functional team under Vice President, Procurement Mark Vierlilng.

Amtrak's Mechanical Facilities and Capabilities

We operate facilities nationwide where various levels of car, locomotive and trainset maintenance occur, and manage a maintenance program that includes facilities operated by contractors or owned by state partners.

Work ranges from simple overnight or midday turnaround of equipment between trips to restoring wreck-damaged equipment and heavy overhauls on equipment no longer in production by manufacturers.

Between now and the FY 2025 horizon of this plan, we plan to spend approximately $1.5 billion on capital work to maintain our fleet in a state of good repair through overhauls, wreck rebuilds, refresh and other key projects, in addition to costs related to upcoming fleet replacements and facility needs.

Facilities Overview

The fleet is maintained in over 60 locations nationwide, ranging from rail yards where basic cleaning and light servicing work is done to back shops where heavy overhauls and rebuilds of wrecked equipment are performed. All high-speed trainset maintenance for *Acela* trainsets takes place at three purpose-built facilities in Boston, New York and Washington.

Three major back shops deal with conventional equipment and are located in Wilmington, Delaware (and specializing in locomotives), Bear, Delaware (specializing in Amfleet I equipment) and Beech Grove, Indiana (specializing in equipment which operates predominantly outside the Northeast). Other programmed mechanical work and repairs take place in over a dozen other facilities located throughout the country, while servicing work between trips takes place at approximately three dozen field locations where trains turn around; this basic work is often performed by contractors.

The tables on the following pages show the various Amtrak mechanical bases, the types of equipment they service, and the type of work performed at each facility.

Railcar overhaul work at Amtrak's Bear, DE Back Shop.

MAINTENANCE FACILITIES: AMTRAK AND STATE PARTNER-CONTRACTED FACILITIES

				Services Performed				
City/State	Facility Name (If not identified by city/state)	Staffed By	Equipment Serviced	Turn-around/ Layover Servicing	Periodic Mainte-nance	LCPM/ Frag-mented Overhaul Work	Overhauls	Wreck rebuilds
AMTRAK MAINTENANCE FACILITIES								
Bear, DE	Amfleet Back Shop	Amtrak	Amfleet, ex-Metroliner, Acela				X	X
Beech Grove, IN	Back Shop	Amtrak	Superliner, Horizon, Surfliner, Viewliner, NPCU, P-40/P-42				X	X
Boston, MA	Southampton Street Yard	Amtrak	Amfleet, Viewliner, ACS-64, P-42, P-40, NPCU, MP-15	X	X			
Boston, MA	Southampton Street High-Speed	Amtrak	Acela	X	X	X		
Chicago, IL	16th Street	Amtrak	P-42, NPCU, P-40, SC44		X	X		
Chicago, IL	14th Street (Service & Inspection)	Amtrak	Superliner, Horizon, Amfleet, P-42	X				
Chicago, IL	Brighton Park	Amtrak	Superliner, Horizon, Amfleet	X	X	X		
Hialeah, FL		Amtrak	Amfleet, Viewliner, P-42	X	X	X		
Los Angeles, CA		Amtrak	Superliner, Surfliner, Horizon, SC44, P-42	X	X	X		
New Haven, CT	Parcel G	Amtrak	Amfleet, ex-Metroliner, ACS-64, P-40, P-42, GP 40, MP-15	X	X			
New Orleans, LA		Amtrak	Superliner, Amfleet, Viewliner, P-42	X	X	X		
New York, NY	Sunnyside Yard	Amtrak	Amfleet, Viewliner, ACS-64, P32ACDM, NJ TRANSIT Equipment, ex-Metroliner	X	X			
New York, NY	Sunnyside High-Speed	Amtrak	Acela	X	X	X		
Oakland, CA		Amtrak	Superliner, California, Comet, F59, P-42, SC44	X	X			
Philadelphia, PA	Penn Coach Yard	Amtrak	Ex-Metroliner, Amfleet, P-42, ACS-64	X	X			
Rennselaer, NY	Albany-Rensselaer	Amtrak	Amfleet, P32ACDM, P-42, P-40, NPCU	X	X	X		X
Sanford, FL	Auto Train Facility	Amtrak	Superliner, P-40, P32, SunRail, Auto Carrier	X	X	X		
Seattle, WA		Amtrak	SC44, P-42, Superliner, Talgo, Sounder	X	X			
Washington, DC	Ivy City	Amtrak	Amfleet, ACS-64, P-42, MARC, Superliner	X	X	X		
Washington, DC	Ivy City High-Speed	Amtrak	Acela	X	X	X		
Wilmington, DE	Locomotive Shop	Amtrak	ACS-64				X	X
STATE PARTNER-CONTRACTED MAINTENANCE FACILITIES								
Brunswick, ME	Brunswick Maintenance Facility (State owned)	Contractor	Amfleet I, NPCU, P-40, P-42	X	X			
New Haven, CT	CDOT (facility state owned)	Amtrak	P-40, GP-40, Mafersa, MBB	X	X			X
Baltimore, MD	Baltimore Penn Station	Amtrak	MARC equipment (HHP-8, MP36, SC44, Kawasaki/Nippon Sharyo/ Bombardier Cars)	X				
Raleigh, NC	Capitol Yard	Contractor	State-Owned	X	X			

Note: SC44, MARC, Mafersa, MBB, California and Comet fleets are owned by our State and Commuter partners.

Asset Inventory (Continued)

MAINTENANCE FACILITIES: TURNAROUND LOCATIONS

City/State	Staffed By	Equipment Serviced	Services Performed				
			Turn-around/ Layover Servicing	Periodic Mainte-nance	LCPM/ Frag-mented Overhaul Work	Overhauls	Wreck rebuilds
TURNAROUND MAINTENANCE LOCATIONS							
Bakersfield, CA	Contractor	California, Comet, Horizon, F59, SC44	X				
Carbondale, IL	Contractor	Amfleet, Horizon, SC44	X				
Charlotte, NC	Contractor	Amfleet, Viewliner, P-42	X				
Eugene, OR	Contractor	Talgo, SC44	X				
Fort Worth, TX	Amtrak	Superliner, P-42	X				
Goleta, CA	Contractor	Surfliner, Horizon, SC44	X				
Harrisburg, PA	Amtrak	Amfleet, ex-Metroliner, ACS-64, P-42	X	X			
Indianapolis, IN	Amtrak	Amfleet, Horizon, P-42	X				
Kansas City, MO	Amtrak	Amfleet, Horizon, SC44	X				
Montreal, QC	Contractor	Amfleet, P-42	X				
Newport News, VA	Amtrak	Amfleet, P-42	X				
Niagara Falls, NY	Amtrak	Amfleet, P32ACDM, P-42, P-40, MP15, GP (various models)	X				
Norfolk, VA	Contractor	Amfleet, P-42	X				
Oklahoma City, OK	Contractor	Superliner, P-42	X				
Pittsburgh, PA	Amtrak	Amfleet, P-42	X				
Pontiac, MI	Amtrak	Amfleet, Horizon, SC44	X				
Port Huron, MI	Amtrak	Amfleet, Horizon, SC44	X				
Portland, OR	Contractor	Talgo, Superliner, P-42, SC44	X				
Richmond, VA	Amtrak	Amfleet, P-42	X				
Roanoke, VA	Contractor	Amfleet, P-42	X				
Rutland, VT	Contractor	Amfleet, P32ACDM	X				
Sacramento, CA	Contractor	California, Comet, Horizon, F59, SC44	X				
San Antonio, TX	Amtrak	Superliner, P-42	X				
San Diego, CA	Amtrak	Surfliner, Horizon, SC44	X				
San Luis Obispo, CA	Contractor	Surfliner, Horizon, SC44	X				
Savannah, GA	Contractor	Amfleet, Viewliner II, P-42	X				
Springfield, MA	Amtrak	Amfleet, P-40, P-42, Ex-Metroliner	X				
St. Albans, VT	Contractor	Amfleet, P-40, P-42	X				
St. Louis, MO	Amtrak	Amfleet, Horizon, SC44	X				
Toronto, ON	Contractor	Amfleet, P-42	X				
Vancouver, BC	Contractor	Talgo, SC44	X				
Lorton, VA	Amtrak	P-40, Auto Carrier, Superliner	X				
West Quincy, MO	Contractor	Amfleet, Horizon, SC44	X				

Maintenance Capabilities

Turnaround and Layover Servicing

The most basic type of train maintenance is turnaround and layover servicing. Typical servicing tasks include: Daily federally mandated inspections of equipment; emptying toilets; refueling, restocking paper goods and other consumables; and rectifying minor mechanical issues which may develop over the course of a train's route (minor bad order repairs). More extensive repairs can typically be carried out at the larger turnaround end point facilities, of which most routes have one, although repairs often require equipment to be taken out of service and substituted for several days.

Amtrak's Office of Inspector General (OIG) recently issued a report recommending changes to some tasks and locations where certain turnaround and preventive maintenance tasks are performed. We have begun to implement the recommended changes.

Periodic Inspections, Preventive and Corrective Maintenance

Equipment has a periodic inspection schedule to address regulatory requirements and mechanical issues. This work may also be supplemented with preventive maintenance. Typically, equipment is deadheaded to a separate facility in the same city for work, which typically takes several days to a week. Tasks during a periodic inspection include a deeper cleaning of equipment, repair of critical and non-critical issues which may require additional tools or staff time/expertise to rectify, application of small-scale modifications to equipment, and any mandatory 92 or 184-day inspection procedures.

For *Acela*, a different continuous maintenance approach has allowed up to 17 trainsets (of a fleet of 20) to operate in revenue service on a given day, reducing the spare ratio for the fleet and increasing revenue for the service. This approach has also been adapted for ACS-64 fleet, which fragments the traditional 92/184-day periodic and preventive maintenance tasks into weekly or bi-weekly periods. All units receive the same work tasks each period.

The enhanced fleet availability that comes from Amtrak's shift away from the historic maintenance practices and towards fragmented maintenance with vendor support through a TSSSA has yielded measurable results to Amtrak. Enhanced *Acela* fleet availability, for instance, has enabled the addition of a 16th New York-Washington round trip in 2013 and the launch of Acela Nonstop in late 2019, in addition to enhanced weekend service.

> *In the first quarter of FY 2020, additional Acela service enabled by enhanced trainset availability generated nearly $7 million in passenger revenue.*

The P-42 fleet aligns its 92-day periodic inspections with 184/368-day tasks divided into the quarterly periods. This program is identified as Synchronized Quarterly Periodic Maintenance (SQPM). All units receive the same work for the quarterly period allowing for more efficient labor and material planning.

Overhaul

The centerpiece of the heavy mechanical work program for Amtrak's existing fleet is the overhaul cycle.

- **Level I (Every 4 years):** The lightest overhaul includes complete rebuilding of trucks, HVAC units, brake valves, door operators and system critical components as well as heavy cleaning of carpeted surfaces and seat cushion replacement.
- **Level II (Every 8 years):** A Level I overhaul that also includes a complete replacement of all major components such as seats, diaphragms, windows and 480V trainline cabling.
- **Level III (As needed):** A Level II overhaul in addition to a complete interior upgrade or reconfiguration, including bathroom modules and any required modifications.

Going forward, we are shifting to Reliability Centered Maintenance (RCM). Rather than performing all heavy maintenance work on a locomotive, railcar or trainset in an extended outage once every four years, components are evaluated and replaced individually on rotating schedules aligned with periodic inspections or other maintenance periods which may better match the replacement cycles of individual parts based on failure rate experience.

Asset Inventory (Continued)

For P-42 locomotives, Amtrak entered into a Life Cycle Preventive Maintenance (LCPM) agreement with original equipment manufacturer General Electric to perform larger component replacement work as part of the routine preventive maintenance inspections which occur to each unit four times each year, reducing the need for heavy four-year overhauls. We committed to this new approach towards heavy maintenance of equipment with the recent ACS-64 acquisition and will implement similar programs with the new *Acela* high speed trainsets and Amfleet replacement equipment.

Modifications and Field Alterations (Including Refresh)

In FY 2018 we refreshed the Amfleet I equipment and installed new seat cushions, new carpets, restroom air fresheners and made other soft goods changes on nearly 370 coach and business class cars.

The refresh program expanded to include the 20 *Acela* trainsets to include new seat cushions, new business/first class carpet and bistro car flooring improvements, armrests, and a deep cleaning of both passenger cabins and restrooms befitting our premium product.

Our refresh program continues with 9 Horizon and 138 Amfleet II cars completing refresh by the end of FY 2020. Superliner and Viewliner I equipment is slated for refresh next, with plans for their refresh being completed at this time.

Above: Employees at the Bear Heavy Maintenance Facility in Delaware are primarily responsible for the overhaul and wreck repair of Amfleet I and II cars, as well as the overhaul of maintenance-of-way equipment and rolling stock.

Rebuild

The Beech Grove and Bear shops perform restorations of damaged equipment that is deemed economically repairable, and converts equipment from one configuration to another as business needs evolve. Restoration of wreck-damaged equipment is critical to the continuation of Amtrak service throughout the lifespan of a generation of equipment. As the original equipment manufacturers have exited the railcar business, and with our historic record of acquiring custom-built fleets of equipment, replacement cars to combat attrition are not realistic in most cases. Specific quantities of cars and locomotives to be repaired in a given year vary as the scope of work necessary to rebuild a wreck-damaged car varies widely on a unit-by-unit basis.

In addition to the wreck rebuild work, the shops also rebuild cars and locomotives into new configurations to support changes to business needs.

Other Capabilities

ROLLING STOCK ENGINEERING (RSE)

Expert capabilities in all areas of specialized passenger equipment engineering, design and maintenance process development, including high speed rail equipment in the U.S. Our expertise in this technical discipline creates value for Amtrak and can create value for state and commuter partners. The diverse specialists within the RSE group have more than 500 years of combined experience working with nearly every industry supplier.

POSITIVE TRAIN CONTROL (PTC) IMPLEMENTATION

We have led the way in North America by designing, developing, installing and operating the first PTC system in high-speed territory in the country. Amtrak's installation of the Advanced Civil Speed Enforcement System (ACSES) on the Northeast Corridor set the benchmark for PTC technology and we have the expertise to assist industry partners with any PTC implementation.

ROOT CAUSE ANALYSIS

We can diagnose the causes of en-route failures, identify chronic equipment problems and develop maintenance remedies.

CONTINUOUS MAINTENANCE

This formal process streamlines scheduling of preventive maintenance tasks, enabling better equipment utilization.

MANAGEMENT TRAINING

We have developed effective facility supervisor training programs to increase operational effectiveness.

EQUIPMENT PAINTING AND TRIM WORK

Skilled craftsmen keep rolling stock looking its best, supporting a positive image to contribute to customer satisfaction.

TECHNICAL AND ADVISORY SERVICES

Including oversight of other contracted mechanical services and technical field support.

PARTICIPATION IN INDUSTRY-LEADING TECHNICAL AND REGULATORY COMMITTEES

Amtrak employees at Ivy City Mechanical facility install new seats and floor rugs on Amfleet car.

Equipment Strategy

We plan significant modernization of our railcar, locomotive and trainset fleets and related facilities in the next five years, along with continued capital renewal work (such as overhauls and refresh) as necessary on all existing fleet assets. Fleet investments include new rolling stock, locomotive and trainset acquisition initiatives, as well as non-acquisition strategic initiatives and ongoing overhaul and rebuild program work.

AMTRAK'S ACTIVE FLEET (OWNED & LEASED)

230
Road diesel locomotives

66
Electric locomotives (Plus 15 in reserve)

1,413
Railcars

20
High-speed trainsets

Fleet Acquisition Initiatives

Amtrak Cascades Talgo VI Retirement and Interim Fleet Solution

On May 21, 2019, the National Transportation Safety Board (NTSB) issued its findings regarding the December 18, 2017 accident involving Train 501 at DuPont, WA. The NTSB recommended that the FRA remove the car design waiver which allows the Talgo VI fleet to operate on Amtrak Cascades.

Subsequently, we developed a plan with our Washington state partner to retire Talgo VI equipment, used on all but two trainset assignments for the Amtrak Cascades service. This plan includes substituting non-Talgo VI equipment on Amtrak Cascades service until new equipment arrives to permanently replace the retired Talgo VI trainsets.

In the short term, we are reviewing locations where more efficient utilization of Horizon and/or Amfleet equipment may free up railcars for use on Amtrak Cascades. Additionally, we are reviewing the feasibility of leasing additional equipment, such as unused, newer Talgo 8 trainsets (which do not require the car design waivers in question), to supplement cars shifted from other corridors. In the longer term, Washington State is likely to participate in Amtrak's Amfleet I replacement / Intercity Trainset order of equipment. Between now and the likely delivery of new equipment, additional Horizon and Amfleet equipment will be shifted from service in the Midwest and California thanks to the procurement of 137 new Siemens single level cars by our state partners, increasing the availability of other Amtrak fleet types which can be used for substitutions.

Equipment Strategy (Continued)

CALIDOT / Midwest & California State Partner Railcar Acquisition; Re-Deployment of Amtrak's Horizon Fleet and Midwest Amfleet Equipment

Midwest and California state partners will receive 137 single-level Siemens single level railcars, a derivative of the Siemens Viaggio product family. Cars of this general design have received FRA certification and are in service on Brightline/Virgin Trains USA services in Florida. The new cars are currently forecast to arrive between FY 2021 and FY 2023.

Specifically, the 137-car base order includes:

- **Seven 7-car semi-permanently coupled trainsets,** with cab control coach on one end, business class, and checked baggage, for use in California on the *San Joaquins* corridor.
- **Twenty single coaches** for use on Midwest corridor routes.
- **Seventeen married pairs consisting of one coach and one business class/coach combination car** for use on Midwest corridor routes.
- **Seventeen married pairs consisting of one coach and one café/coach combination car** for use on Midwest corridor routes.

In addition to the 137 cars under manufacture for the original order, the Wisconsin state partner was awarded a federal discretionary grant to acquire nine additional cars for *Hiawatha* service. This acquisition includes six coaches and three cab control coaches to supplement the Midwest railcar order.

The delivery of Siemens single level cars for the Midwest and California will replace most of our Horizon Fleet and about two dozen Amfleet I railcars currently in Midwest state corridor service. We plan to re-deploy these railcars to other state corridors to facilitate growth until sufficient Intercity Trainsets / Amfleet Replacement equipment enters service in the mid-to-late 2020s.

The introduction of seven Siemens single level trainsets for *San Joaquin* service enables the re-deployment of some single level and bi-level equipment currently used on the route. Additional single-level corridor coaches will also likely remain available for re-deployment even after equipping the nationwide service expansions outlined above. We anticipate collaboration with our state partners in California over the next year to determine how available equipment can best be re-deployed to accommodate planned growth over the next decade, including the following proposed initiatives from the state's 2018 Rail Plan:

- Proposed *Coast Daylight* service (San Francisco–Los Angeles–San Diego)
- Proposed Los Angeles–Coachella Valley service
- *Capitol Corridor* service improvements (Roseville, Salinas, and core frequency increases)
- *San Joaquins* improvements (Natomas, added frequencies, integration with High-Speed project)
- *Pacific Surfliner* service improvements (more frequent service corridor-wide)

Viewliner II Order

By the end of 2020, we anticipate receipt of the $300 million Viewliner II single-level railcar order for long-distance routes, including 70 baggage cars, 10 baggage-dorm cars, 25 dining cars and 25 sleeping cars. These cars were ordered from Construcciones y Auxiliar de Ferrocarriles USA (CAF USA) in 2010. Deliveries were affected by several delays prior to production, leading to the decade-long span from when the contract was awarded until completion of the 130-car order.

DINING CARS

In the decade since the Viewliner II order was placed, our business needs for single-level long-distance routes have changed, particularly the food service format offered. The *Silver Star's* dining car was removed in 2016, and we announced the conversion of all single-level long-distance routes to new Flexible Dining service in 2019. Flexible Dining dispenses with lengthy meal periods and offers customers the option to dine in-room. By relying on offboard meal preparation, less meal preparation space and kitchen equipment is required. The result is a different use of the car's food preparation area, which if built new, would require significantly less space than our legacy dining car format still in use on western Superliner long-distance trains and for sleeping car passengers on *Auto Train*.

To address these food service changes, we are evaluating potential modifications to the Viewliner dining car fleet within the five-year life of this plan. Such modifications would allow one car to provide both Flexible Dining and café lounge car service, allowing for a single food service car to operate on several eastern long-distance routes. A modified car will also allow us to economically upgrade from Amfleet II Diner-Lounge equipment to Viewliner II food service cars on the *Silver Star* and *Cardinal*. These routes offer Flexible Dining and café service with an Amfleet II diner lounge today; to prevent additional operating expenses, Viewliner II cars must be modified to support a dual-capable role before they can be used on these routes.

SLEEPING CARS

We plan to use the 25 Viewliner II sleeping cars to increase capacity on various long-distance routes, as well as a potential deployment to *Northeast Regional* Trains 65/67 and 66. To avoid confusion with older Viewliner I equipment, which offers a different number of rooms per car and restroom set-up, we envision deployment of Viewliner II sleeping cars on separate routes from trains operating with Viewliner I sleeping cars. Specific initial route assignments and deployment timing will be determined by demand trends observed when sufficient sleeping cars are ready for service.

BAGGAGE CARS AND BAGGAGE DORM CARS

Our 70 Viewliner Baggage Cars will continue to operate primarily on long-distance routes, plus the state-supported *Carolinian, Pennsylvanian* and *Northeast Regional* Trains 66 and 67 through the five-year lifespan of this plan. The evolution of our business needs may result in a reduction in baggage car needs over the long term. In particular, the conversion of the *Carolinian, Pennsylvanian* and *Northeast Regional* trains to new integrated trainsets may preclude the operation of individual baggage cars on these routes. Furthermore, any changes to our long-distance route network required by Congress through the upcoming reauthorization may result in changes to the number of baggage cars and baggage dorms needed for service. Any changes will be included in future plans once identified.

At right: Amtrak's first Viewliner II cars were 70 baggage cars (shown), used on most long-distance routes, plus the Carolinian and Northeast Regional Trains 65, 66 and 67.

Artist's rendering of the Avelia Liberty high-speed trainset which will replace the current Acela fleet beginning in 2021.

New Acela *Trainset Acquisition*

We eagerly anticipate the launch of our new *Acela* high-speed trainsets in 2021. This acquisition includes 28 high-speed trainsets which will provide additional capacity on our highest-revenue, high-speed service. Each trainset will have 378 seats, compared to 299 seats on *Acela* today. The trainsets are based on Alstom's Avelia product line, which has proven itself with reliable high-speed equipment in France and Italy. The increase from 20 to 28 trainsets will also enable us to add *Acela* frequencies where market demand can support the added departures. We anticipate that all current first-generation *Acela* trainsets will be replaced by early 2022.

The new trainsets are primarily funded through a $2.45 billion Railroad Rehabilitation and Investment Financing (RRIF) loan from the FRA. The loan will be repaid using the incremental net revenues generated through increased *Acela* ridership and ticket sales.

The new *Acela* trainsets will provide enhanced seating availability from the additional capacity and enhanced Wi-Fi equipment and feature on-board information systems for delivering real time announcements and locational information. These state-of-the-art information systems will be the first in our NEC fleet. Additional new features on these trainsets include USB ports, outlets and lights in the seats, an increased focus on sustainability via use of materials like e-leather and reduced packaging. The new trainsets will initially operate at speeds of up to 160 miles per hour on upgraded sections of the NEC as track projects in New Jersey are completed. The new trainsets will be maintained under a TSSSA with Alstom.

The first new *Acela* prototype starts testing at the test track in Pueblo, CO in early 2020. A second prototype trainset will begin testing on the NEC in mid-2020.

Rendering of Siemens' Charger locomotive pulling a bilevel passenger train. Based on the Charger platform, Amtrak has ordered 75 new ALC-42 diesel locomotives to will replace the aging P-42 equipment on long-distance routes.

ALC-42 Diesel Locomotives

In December 2018, we entered into a contract with Siemens for 75 new ALC-42 diesel locomotives, including options for up to 100 additional units. These locomotives, based on Siemens' Charger platform, will replace aging General Electric P-42 equipment on long-distance routes, with options for additional long-distance units or to equip state corridor routes if necessary. Execution of locomotive options will depend on at least two key factors impacting future fleet needs:

- Whether the product chosen for the Amfleet I Replacement/Intercity Trainset procurement will require new diesel locomotives for motive power outside the NEC.
- Whether any changes to Amtrak's National Network of long-distance routes occurs as a result of Amtrak's reauthorization.

The first unit is scheduled to enter revenue service in the summer of 2021 and all 75 base units scheduled to enter service by 2024. The base order total cost is $850 million, which includes the purchase price, warranty, technical support and spare parts through a multi-year TSSSA. These units are being funded through a combination of our cash reserves and our National Network grant.

The ALC-42 represents a significant generational enhancement over current power; benefits include:

Better Performance. The ALC-42 can operate at speeds up to 125 MPH (15 MPH faster than the P-42) and accelerate 30 percent faster. While both unit types are rated at 4,200 horsepower, the ALC-42 generates head-end power (HEP) for on-board lights, climate control and appliances more efficiently via inverters. This allows an ALC-42-powered consist to provide HEP to more passenger cars than the current P-42, which may allow for additional Superliners to operate on *Auto Train*. Fuel range will improve over both the P-42 and SC-44 Charger ordered by our state partners, with the ALC-42 featuring 2,200 gallon fuel tanks.

Environmental Benefits. The ALC-42s will meet EPA Tier IV standards for emissions, with reductions of up to 90 percent in various emission types versus the Tier 0 General Electric P-42 units they replace. The units will also be about 10 percent more fuel efficient, helping us reduce our carbon footprint.

Safety and Reliability Benefits. The ALC-42 feature several reliability improvements over the P-42. Scheduled maintenance will require two events per year instead of four, reducing programmed downtime in locomotive shops. The units will feature on-board diagnostics which will allow for both our Mechanical team and Siemens technical staff to monitor and diagnose unit conditions in real time. The ALC-42's TSSSA provides stiff penalties for Siemens if the new units do not achieve significant reductions in both the frequency of en route failures as well as in the time necessary to receive spare parts. The ALC-42 will also contain several enhancements over the SC-44 Charger locomotives produced for our state partners, including enhanced winterization/weatherproofing and a bolt-on nose cone for easy replacement in the event of a grade crossing accident. All units will come equipped with necessary equipment for Positive Train Control.

Amfleet I Replacement / Intercity Trainset Procurement; Acquisition of Dual-Power Equipment

In January 2019, we issued a Request for Proposals (RFP) for 75 new trainsets (or railcar equivalents) to replace our fleet of 458 Amfleet I railcars, 16 ex-*Metroliner* railcars, and five Talgo VI trainsets jointly owned by us and the Washington state partner. The RFP also called for up to 50 additional trainsets as options. Bids have been received and are being evaluated. An award is expected later in 2020.

The new trainsets are slated to operate on *Northeast Regional*, the long-distance *Palmetto* and a series of state corridors, including Amtrak Cascades, *Northeast Regional* Virginia extensions, *Keystone Service, Empire Service, Downeaster, Pennsylvanian, Carolinian, Adirondack, Vermonter, Ethan Allen Express,* and New Haven-Springfield trains. As nearly half of our nationwide ridership occurs on these routes, we are enthusiastic about this once-in-a-generation opportunity to significantly improve both train performance and customer experience. Additionally, options to the base equipment order are intended to equip service growth on state corridors into the 2030s and can be used to replace the Horizon fleet.

We seek equipment of a common trainset product family which can come in varying consist capacities and with varying propulsion types including diesel, catenary-electric and dual-power propulsion for both diesel-catenary and diesel-third rail environments. Dual power, catenary-electric consists will enable us to eliminate engine changes in Washington, DC, Philadelphia, PA and New Haven, CT. Eliminating engine changes will bring several benefits for our customers, including:

- **Speeding up passenger trips** through Washington through the removal of engine change time from train schedules between the NEC and stations on state corridors (and the *Palmetto*).
- **Eliminating delays** in Washington Terminal through reduced platform dwell time utilization for existing frequencies, elimination of light engine movements in the First Street Tunnel, and a reduction in station-to-yard light engine movements before and after engine changes.
- **Continuous operation of on-board lighting, climate control and restrooms,** all of which are disrupted during engine changes today.

On-board the trains, we seek improvements to reliability, performance and customer experience. Double-ended consists will reduce requirements for turnaround time on some *Northeast Regional, Empire Service* and other corridor trains which currently do not have engineer's cabs on both ends of the train, providing redundancy in case of a failure in one cab through the use of a wye or loop track. Well-known problem areas for customer satisfaction and mechanical reliability such as restrooms, vestibules, HVAC systems and door systems will be addressed through new design and configuration. Semi-permanent couplings between trainset units are under consideration and would provide an additional layer of reliability for train-wide systems (such as public address systems) and climate control when passing through cars. The new equipment would be fully compliant with Americans with Disabilities Act (ADA) requirements for new-build equipment rather than grandfathered equipment, providing a better experience for customers with disabilities. We also seek a TSSSA as part of this trainset procurement which, similar to the agreement in place for ALC-42 units, would provide for stiff penalties unless a material reduction in en route failures and ready availability of spare parts are achieved.

Since the Amfleet railcar order was placed nearly fifty years ago, most nations with advanced rail passenger networks have migrated away from individual rail cars in favor of integrated, double-ended trainsets with hardened connections between cars. Maintenance is performed at the trainset level as opposed to the individual car level, and often in modern facilities as opposed to open rail yards. Trainset units are now constructed for modular replacement; a critical failure to any one component in a railcar can be addressed through removal and replacement of that component (e.g., crane replacement of overhead HVAC unit) during an overnight servicing, instead of having to "set out" an individual railcar for days. Tasks historically assigned to major multi-year overhauls are instead performed one-at-a-time as add-ons to shorter, scheduled maintenance tasks at outlying maintenance facilities. This "continuous maintenance" program yielded positive results when we applied it to our *Acela* trainsets; continuous maintenance decreased downtime, allowing us to extend *Acela* service later on weeknights in January 2013, expand weekend *Acela* service in April 2017, and introduce *Acela* Nonstop on top of a full hourly pattern of weekday service in September 2019. As a result of this generational evolution in trainset maintenance, mechanical facilities and servicing schedules are being reviewed as part of the operational and technical evaluations of vendor bids underway.

Funding for the trainsets will come from a variety of sources, including cash reserves, NEC operating surpluses (which can be reinvested for NEC capital uses, such as *Northeast Regional* fleet replacement), and state partner funding under the PRIIA 209 Equipment Capital Use Charge. We also collaborate with our state partners on applications for federal discretionary grants (such as Federal-State Partnership grants) for portions of the procurement.

We anticipate the new base order of equipment to start entering service in the mid-2020s, with any options trainsets coming online in the late 2020s.

Acela high-speed trainset departs New York's Penn Station for Washington, DC.

Superliner and Amfleet II Long-Distance Equipment

Our Superliner fleet provides the backbone of equipment on the long-distance C*oast Starlight, Empire Builder, California Zephyr, Southwest Chief, Texas Eagle, Sunset Limited* and *City of New Orleans, Capitol Limited* and *Auto Train*, along with supporting some state corridors. The Superliner fleet consists of two generations of equipment: Superliner I cars which were built 1979-1981, of which 241 are active;, and Superliner II cars built 1993-1996, of which 184 are active. The older generation of Superliners is nearing the end of a typical service life and will require a replacement or rebuild decision.

Our Amfleet II long-distance fleet includes 114 active coaches and 24 active diner/lounge cars. These units were built in the early 1980s and are used primarily on long-distance routes serving New York, such as the *Silver Star, Silver Meteor, Crescent, Lake Shore Limited, Cardinal* and *Palmetto*, along with a handful of state corridor routes where they support Amfleet I consists.

As we complete work pertaining to the procurements of next-generation *Acela*, ALC-42 diesel locomotive and Amfleet I Replacement/Intercity Trainsets, we will shift focus to developing a long-term equipment solution for the work currently performed by aging Superliner and Amfleet II equipment.

Several key elements which will drive our long-distance refleeting initiative remain outstanding and will become clearer over the next 12-18 months. These include:

- **Changes to our planned route network following reauthorization.** Some long-distance routes today may be better-served by daylight services which can use corridor trainsets; the *Palmetto* is already a candidate for conversion to Amfleet I replacement trainsets. The upcoming reauthorization will provide guidance to Amtrak from Congress regarding the future National Network, and thus the route network which the new long-distance fleet must support.

- **Results of the Superliner Life Extension Study.** The results of this study will better inform us as to whether replacement or rebuild of this fleet is the most cost-effective solution.

- **Compatibility of Amfleet I replacement equipment with Amfleet II replacement.** The Amfleet II car design is based largely on Amfleet I equipment, with similarities in carbodies and several internal systems. Once we determine the best replacement option for the far larger Amfleet I replacement order, we can then determine whether the chosen design is also suitable as an Amfleet II replacement railcar.

- **Fleet Procurement Plans for our California State Partners.** Our California state partners use over 100 state-owned and jointly-owned multilevel railcars which are used with Superliners on California state corridor routes. Over the next decade, California plans for aggressive growth along its routes, which will require additional equipment beyond the cars on order from Siemens. We must discuss fleet strategy with California to determine whether any Superliner replacement could coincide with a California procurement for additional railcars to obtain the greatest possible economy of scale.

Amtrak Keystone train using aging Amfleet and ex-Metroliner equipment arriving at Elizabethtown, PA.

Non Acquisition Initiatives

Fleet Refresh

As new fleet acquisitions take years from development through delivery, we are enhancing the passenger experience through a refresh of the customer-facing, interior components of existing railcars. We have successfully completed refreshes of nearly 500 Amfleet I and ex-*Metroliner* railcars, along with all 20 *Acela* trainsets. Refresh of our Horizon and Amfleet II fleets is underway; completion of work on these fleets is anticipated to occur this year.

We then anticipate commencing refresh of the Superliner and Viewliner fleets. A scope of work, refresh sites and other such planning activities are being determined at this time, and we plan to have work begin on these fleets in FY 2021. Some $27 million has been included for Refresh projects through FY 2025.

Equipment Disposal

In FY 2019 we sold locomotive and railcar units for which we had no further use. In most cases, this equipment was either wreck-damaged and deemed uneconomical to repair, or was of a retired fleet type—in fact, some cars sold this year left revenue service nearly 20 years ago.

Disposal of these units is important for several reasons:

- For retired and damaged equipment which has no further use, realizing the **residual value** of a sale, even for scrap, is the most economic option.
- Removal of these units from our property frees up **yard space** to stage disposition of over 1,000 *Acela*, Amfleet I, Amfleet II, Horizon, P-42 and potentially Superliner units as these fleets are retired over the next decade.
- Sale of these units provides an opportunity for us to once again become familiar with the **wholesale disposition** of hundreds of railcar assets within a single fiscal year, as such a pace of sales will become necessary to clear our yards of retired equipment in the coming decade.

Our FY 2019 equipment sales totaled 202 units, which together brought in over $4 million in residual revenue. These units will free up approximately three linear miles track in our rail yards.

Maintenance Facility Strategy

Our maintenance facilities will undergo significant changes as a result of refleeting in the coming decade, as well as changes currently underway in how we maintain equipment. Today, most modern equipment is maintained through continuous maintenance and/or life cycle preventive maintenance (LCPM), where the tasks of a major overhaul program are applied one-at-a-time, over time, during shorter outages in outlying facilities. Our *Acela* trainset and P-42 diesel locomotive fleets have transitioned to continuous maintenance and LCPM over the years, and our ACS-64 electric locomotive and ALC-42 diesel locomotive orders were designed with continuous maintenance in mind.

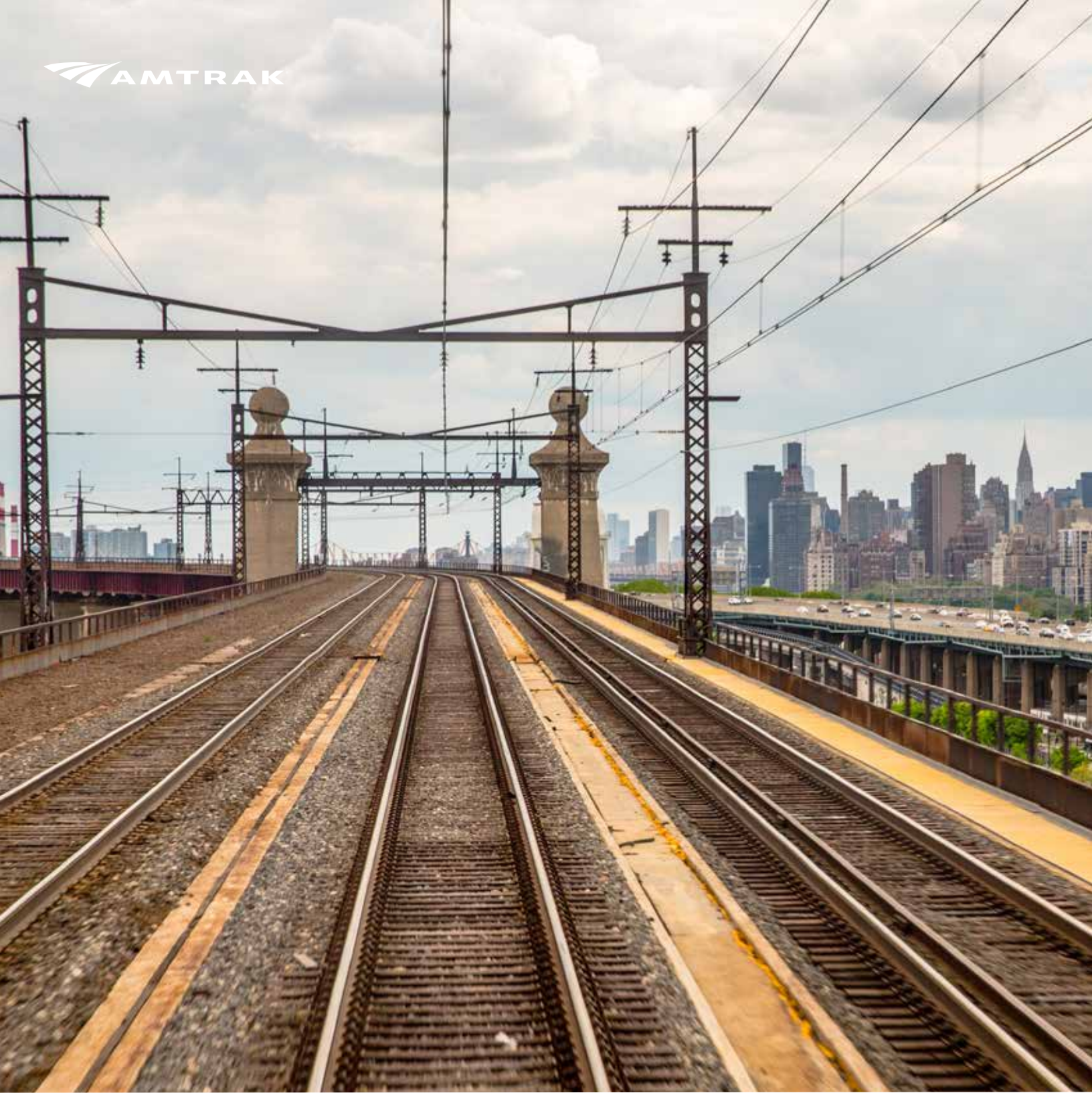
We can now take advantage of TSSSAs, which ensure a timely delivery of spare parts to negotiated locations throughout our network as well as technical support provided by vendor staff, who assist our own mechanical staff when problems arise with equipment.

Our maintenance facilities have already begun to evolve. At our Beech Grove, Indiana facility, management and labor have recently collaborated to respond to recommendations from Amtrak's Office of the Inspector General regarding cost-effective use of the facility's footprint. As a result, maintenance activities are being consolidated into fewer buildings, with a second shift doing more work in the same remaining spaces while maintaining production rates. We forecast a reduction of up to 35 percent in the dwell time for units being serviced by the shop, and a forecast savings of approximately $566,000 per year due to a reduction in utilities and building maintenance expenses. Beech Grove's primary work includes the overhaul of Superliner, Horizon and other non-NEC, non-LCPM equipment, the repair of wreck-damaged locomotives and railcars which can be restored to service, and overhauls and repairs components which are then shipped to outlying facilities for installation under LCPM.

Our high-speed maintenance facilities will transition from maintenance of the current *Acela* trainsets to the new trainsets on order. Over the next five years, our Boston, New York and Washington high-speed trainset servicing locations will be modified to serve an expanded fleet of higher-capacity high-speed trainsets.

We anticipate the Amfleet I replacement / intercity trainset procurement will also result in a shift in maintenance facility requirements, particularly for major terminals near and within the NEC. We will determine what modifications, additions or other changes to key facilities around the NEC will be necessary as it reviews the specifications of vendor offerings through the procurement process.

Amtrak ACS-64 locomotive departing New York Penn Station. Designed with continuous maintenance in mind, the ACS-64 is the current workhorse of Amtrak's electric locomotive fleet.



Infrastructure Asset Line


THINK
SAFETY

Infrastructure Asset Line

The 2020 Infrastructure Asset Line Plan (IALP2020) includes all Amtrak-owned or maintained assets: track, communications and signals, electric traction, bridges and buildings, and maintenance of way equipment. The Infrastructure Asset Line Plan effort is led by the Engineering Department with contributions from Safety, Operations and Corporate Planning.

Overview

Amtrak—America's Railroad—is dedicated to safe and reliable mobility as the nation's intercity passenger rail service provider and its high-speed rail operator. The infrastructure we own and maintain is largely located in the northeast—including 1,154 track miles of main-line on the Northeast Corridor (NEC) between Washington, DC, and New Rochelle, NY and between New Haven, CT and the Rhode Island-Massachusetts border. Our infrastructure on the NEC is used by over 2,100 passenger trains and 60 freight trains each day, at speeds up to 150 mph (241 kph). We own infrastructure nationwide, as well as manage infrastructure on behalf of the States of Michigan and New York. We provide efficient and effective intercity passenger rail mobility, connecting more than 500 destinations in 46 states that is trip-time competitive with other intercity travel options.

The Infrastructure Asset Line Plan (IALP) establishes a State of Good Repair backlog, which may be deemed useful as a macro financial measure, but it does not reflect the value that good management brings to maintaining a safe, reliable infrastructure. As Engineering implements new work processes and critical resource adjustments are made, new management tools are emerging. Principal among these tools is information. Engineering has made significant improvement in the quality of information on which to make decisions allowing resources to be effectively deployed to mitigate asset deterioration and avoid failure.

For purposes of consistency, the gap between current state and state of good repair continues to be calculated here as it has been in prior editions of the Plan. This deficiency is generally driven by large individual assets whose generational replacement will likely fall outside the annual capital appropriation process through which Engineering receives funding to perform steady state or normalized replacement. It is the effectiveness of the steady state program that delivers near-term reliable infrastructure. Replacing assets in line with steady state counts is the goal of the annual capital program; however, selecting which assets to replace is the key to ensuring a viable infrastructure.

The Infrastructure Asset Line Plan sets out the strategies by which Amtrak manages the infrastructure. The methodology used to calculate the state of good repair backlog and improvements to the data behind condition parameters are addressed in the IALP. Of equal importance in judging the near-term view of the infrastructure is how Engineering is using its scarce resources of manpower, track possession and equipment in combination with decision-focused information including root cause analysis and the emerging Infrastructure Asset Management System to maximize the return on invested capital for the benefit of Amtrak and other users of the infrastructure.

Responsible Officials

Pursuant to 49 CFR § 625.5 (as required in 49 U.S.C § 24904) the Accountable Executive with responsibility for carrying out infrastructure asset management practices is:

- **Gerhard Williams, Vice President Chief Engineer**
  Amtrak Engineering

Pursuant to 49 U.S.C. § 24320(c)(3)(c) the following individuals are responsible for Amtrak owned and/or managed assets in each asset category (referred to as the Asset Manager):

- **Steven Humes, Deputy Chief Engineer - Track**
  Track Infrastructure Assets
- **Paul DelSignore, Deputy Chief Engineer - Structures**
  Bridges and Buildings Assets
- **Raymond Verrelle, Assistant Vice President - Engineering & Design**
  Electric Traction Assets
- **Nicholas J. Croce, Deputy Chief Engineer - Communications and Signals**
  Communications and Signals Asset
- **Kevin Jurgelewicz, Deputy Chief Engineer - Production**
  Equipment Assets

Objectives

This Infrastructure Asset Line Plan (IALP2020) includes both the NEC infrastructure as well as infrastructure owned and/or managed by Amtrak nationally.

The plan satisfies US Federal FAST Act requirements for asset plans—49 U.S.C § 24320(c)—as follows:

- **Asset Strategy.** Establishes a strategic plan for each asset class that lays out the goals, objectives, any relevant performance metrics, and statute requirements or regulatory actions affecting the assets. It also establishes the lifecycle management strategies necessary to move to normalized or steady state lifecycle replacement.
- **Asset Inventory.** Summarizes the NEC and national infrastructure assets—including type, extent, age, condition and information on ownership.
- **Prioritized Investments.** Five-year capital program
- **Unfunded Needs.** Establishes the unfunded needs based on assessment of the infrastructure state of good repair (SOGR) backlog and production rates necessary for normalized or steady state replacement.

In addition, the Infrastructure Appendix A sets out our Asset Management Plan—satisfying US Federal FAST Act requirements for an asset management plan—49 U.S.C § 24904—as follows:

- **Asset Management Policy.** States the guiding principles by which Amtrak implements its asset management capabilities.
- **Asset Management Practices.** Documents the key processes, organization and technology tools that enable effective infrastructure management.
- **Improvement Plan.** Establishes action plans for improving Amtrak's approach to asset management activities.

Asset Inventory

Amtrak is responsible for 2,364 track miles of track, 1,291 undergrade bridges, 1,467 track miles of electric traction, 208 signaling interlockings nationwide. This includes 1,154 track miles of main-line infrastructure along the Northeast corridor—the nation's highest speed rail line.

Overview

Amtrak owns and/or manages infrastructure nationwide with an estimated replacement value of $65.1 billion. The infrastructure is largely located on the Northeast Corridor (NEC) between Washington, DC; Philadelphia, PA; New York, NY; and Massachusetts/Rhode Island border. Outside of the NEC, the majority is located on the Michigan line in Illinois and Michigan.

NEC Main Line

Amtrak owns and operates 1,154 track miles of main-line infrastructure on the NEC main line connecting Washington D.C.; Philadelphia, PA; New York, NY; and up to the Massachusetts/Rhode Island border (see Figure 1).

The corridor is largely built to operate as an FRA class 7 railroad with passenger speeds up to 125 mph. There are a limited number of track segments classified at a special 'class 8' status for 150 mph.

NEC Branch Lines

In addition to the main-line assets described above, Amtrak also own branch lines which are considered part of the NEC in several contexts. These include:

- The 260 *track* miles of infrastructure up to 110mph track along the *Keystone* Corridor from Philadelphia, PA to Harrisburg, PA.
- The 106 *track* miles of the Springfield Line from New Haven, CT to Springfield, MA, which includes 19.5 miles of main-line track added in 2018, as part of the Springfield double-track program.
- The 19 *track* miles of the West Side Connection from New York Penn Station to Spuyten Duyvil, NY.
- The 12 *track* miles of infrastructure on the Post Road Branch from Post Road Junction to Rensselaer, NY.

FIGURE 1: NEC MAIN LINE AND BRANCH LINES – ACCOUNTABILITIES

Depicted below, dark blue lines are owned and managed by Amtrak; light Blue lines are managed by Amtrak and owned by others; orange lines are owned and managed by others.

The NEC branch lines are largely built to operate as an FRA class 6 railroad with passenger speeds up to 110mph.

In addition to the main-line, Amtrak maintains 66 track miles of sidings along the NEC Branch-lines.

STATE OF NEW YORK SUPPORTED ASSETS

Amtrak is the responsible infrastructure manager for the long-term leased infrastructure[1] on the 95 track miles Empire Corridor on the Hudson Line between Poughkeepsie, NY and Hoffmans (near Schenectady, NY), and owns outright two short segments of the Hudson Line in New York City and the Schenectady areas.

The State of New York contributes to the capital and operating expense of portions of this infrastructure.

1. Amtrak entered into a lease agreement with owners CSX in 2012.

National Rail Network

While 72% of the miles traveled by Amtrak trains are on tracks owned by other railroads, Amtrak is also responsible for track infrastructure assets nationwide, including:

- Owning and operating 96 *track* miles of up to 110 mph track from Porter, Ind. to Kalamazoo, MI., along with 17.8 track miles of sidings.
- Owning and operating 55 *track* miles of yard tracks and sidings in Chicago, Los Angeles, New Orleans, New York City, Oakland (Kirkham Street Yard), Orlando, Portland, Saint Paul and Seattle.
- Maintaining and operating 7 *track* miles of yard tracks in Hialeah, near Miami, Florida, leased from the State of Florida.

STATE OF MICHIGAN SUPPORTED ASSETS

Amtrak is responsible for maintaining and operating the 181 *track* miles of infrastructure from Kalamazoo, MI to Dearborn, MI owned by the state of Michigan, along with 41 *track* miles of sidings. The Michigan Line (Chicago-Detroit Line) has been upgraded to operate as an FRA class 6 railroad with speeds up to 110 mph.

FIGURE 2: NATIONAL NETWORK INFRASTRUCTURE - ACCOUNTABILITIES

Depicted below, dark blue lines are owned and managed by Amtrak; light Blue lines are managed by Amtrak and owned by others; orange lines are owned and managed by others.

Inventory Improvement Actions

The development of the 2019 Infrastructure Asset Line Plan highlighted the need to improve the confidence in infrastructure asset information—including the completeness, consistency and accuracy of the records held about the infrastructure Amtrak Engineering is responsible for. Good quality information will enable engineering analysis to address asset performance issues and improve efficient planning of capital investments.

Amtrak Engineering has undertaken an initiative to establish a robust information set to support asset decisions and management actions. The scope of this initiative includes defining the asset information requirements, designing an inventory management application, collating information from existing sources and undertaking a program of field verification, where necessary, to improve the confidence in asset information—resulting in a complete data set, that is consistent and accurate.

Further key improvement actions are described in the Improvement Plan section of Infrastructure Appendix A.

Asset Inventory

Amtrak's Engineering Department organizes the infrastructure assets into four asset classes – Table 1 provides a summary. Further details are provided in the asset class plans in the Infrastructure Appendices.

TABLE 1: AMTRAK INFRASTRUCTURE ASSETS - SUMMARIZED BY ROUTE/OWNERSHIP

Track	Bridges and Buildings	Electric Traction	Communications and Signals
NEC MAIN LINE			
• 1,323 track miles of Rail main and siding • 1,883 Turnouts • 354,651 Wood ties • 2,623,447 Concrete ties	• 10 Movable bridges • 435 Signal bridges • 785 Undergrade bridges • 20,103 Bridge ties • 488 Culverts • 96,173 Linear feet of tunnel	Two systems: • 371 track miles 60 Hz constant tension in the north • 818.5 track miles 25 Hz fixed tension in the south • 23.5 track miles 60 Hz constant tension in the south	• 124 Interlockings • 2,042 Switch machines • 1,217 Switch heaters • 1,797 Signals • 2,355 Track circuits • 124 Central Instrument Houses (CIH) • 1,595 miles of PTC
NEC BRANCH LINE			
• 453 track miles of Rail main and siding • 394 Turnouts • 856,624 Wood ties • 252,588 Concrete ties	• 1 Movable bridge • 87 Signal bridges • 280 Undergrade bridges • 2,202 Bridge ties • 349 Culverts • 2,681 Linear feet of tunnel	254 track mile 25Hz fixed tension on the Harrisburg line	• 43 Interlockings • 379 Switch machines • 193 Switch heaters • 397 Signals • 497 Track circuits • 43 CIH • 366 miles of PTC
Infrastructure owned by the State of New York and maintained and operated by Amtrak			
• 189 track miles of Rail main and siding • 69 Turnouts • 204,341 Wood ties • 44,782 Concrete ties	• 1 Movable bridge • 13 Signal bridges • 114 Undergrade bridges • 3,031 Bridge ties • 58 Culverts • 57 Linear feet of tunnel	There are no electric traction assets off the NEC corridor.	• 124 Interlockings • 2,042 Switch machines • 1,217 Switch heaters • 1,797 Signals • 2,355 Track circuits • 124 Central Instrument Houses (CIH) • 1,595 miles of PTC
NATIONAL NETWORK			
• 177 track miles of rail main and siding • 558 turnouts • 399,555 wood ties • 2,957 concrete ties	• 2 Movable bridges • 4 Signal bridges • 52 Undergrade bridges • 0 Bridge ties • 0 Culverts • 0 Linear feet of tunnel	There are no electric traction assets off the NEC corridor.	• 9 Interlocking • 319 Switch machines • 0 Switch heaters • 55 Signals • 76 Track circuits • 9 CIH • 0 miles of PTC
Infrastructure owned by the State of Michigan and maintained and operated by Amtrak			
• 222 track miles of rail main and siding • 136 turnouts • 651,517 wood ties • 2,112 concrete ties	• 0 Movable bridges • 0 Signal bridges • 60 Undergrade bridges • 0 Bridge Ties • 4 Culverts • 0 Linear feet of tunnel		• 17 Interlocking • 96 Switch machines • 0 Switch heaters • 51 Signals • 121 Track circuits • 17 CIH • 0 miles of PTC

Asset Condition

Current Condition Monitoring (Inspection) Approaches

Amtrak currently conducts extensive condition monitoring (inspection) programs of its infrastructure assets, as further described in the Asset Class Strategies (Infrastructure Appendices B-F). The monitoring activities—many of which are federally mandated—ensure day-to-day safe operation of the railroad. They are used to identify faults and potential faults which result in prioritized and scheduled maintenance.

Asset Condition Assessment

Except for structures (bridges and tunnels), a challenge across all asset classes is that there, historically, has been little done to assess the long-term condition of the asset. This limits the level of predictive analysis to determine future investment needs based on the state of good repair of the asset.

In 2018, Amtrak Engineering developed and introduced an asset condition assessment framework which was designed to provide an indicator of long-term trends in the state of good repair (SOGR) of the asset. The guidelines will be used to inform capital replacement decisions and investment prioritization.

The asset condition assessment framework results in an assessed SOGR index for each asset. Separate condition assessment guidelines have been developed for each of the major asset classes. Within each asset class, the 'parent level' to assess condition has been determined based on the intervention activity options. For each parent asset type, a condition assessment matrix has been produced that considers *one or more* of the following five factors:

1. **Age (or cumulative level of use):** Estimate based on the share of an asset's useful life elapsed.
2. **Visual Condition:** Assessment based on visually identifiable signs of asset wear or deterioration.
3. **Reliability:** Assessment based on an asset's ability to meet the required technical level of service .
4. **Measured Condition:** Assessment based on automatic, equipment-based, or manual measurement of one or more specific asset characteristics, which are indicative of the asset's overall condition.
5. **Maintenance Condition:** Assessment based on ability to maintain condition using planned maintenance activities, and the number of outstanding maintenance activities that exist within the system requiring unplanned interventions outside of routine maintenance.

For each factor, a grading system has been developed for the parent asset type that ranges from zero (asset is non-operable) through five (asset is new or nearly new). An assigned condition index has then been derived from a review of the above factors.

The Electric Traction Department will be utilizing this methodology as part of the catenary structure assessment commencing in FY 2020. A helicopter will perform an aerial flight assessment of Amtrak's catenary, signal and transmission system structures, electrical lines, and components and system assets along the Right of Way. Qualified personnel will review the baseline assessment and identify defects as well as assign a condition rating based on the above scoring model. These defects will be created as work orders in Amtrak's enterprise asset management system for actioning by the appropriate division personnel. This initiative will result in reliability centered maintenance regimes and improved capital planning for catenary structure renewal or replacement.

Asset Condition (Continued)

Asset Condition Improvement Actions

The development of asset class condition assessment guidelines was identified as an improvement action in I-AMP2017. These have largely been completed and an implementation program is progressing. This approach will continue to be implemented across asset classes throughout the plan period. Key improvement actions are described in the Improvement Plan section of Infrastructure Appendix A.

Defining State of Good Repair (SOGR)

Amtrak considers an asset to be in SOGR when it satisfies the following:

- **It is in a condition where it can continue to meet and perform the functional requirements for which it was designed.**
- **The use of the asset in its current condition does not pose a safety risk.**
- **The lifecycle investment needs of the asset have been met including all scheduled maintenance and where no backlog of capital needs exist.**

Amtrak grades an asset in SOGR if it scores 2.5 on its updated condition assessment framework.

IALP2020 – Condition Assessment Approach

In the absence of comprehensive condition assessment information, for IALP2020 Amtrak has adopted age as a proxy for asset condition in assessing SOGR. The following score ranges are provided for guidance:

- ***Score 5:*** Asset is new or nearly new; 76% to 100% of expected useful life benchmarks remaining.
- ***Score 4:*** Asset is at or nearing its midlife point; 50% to 75% of expected useful life benchmarks remaining.
- ***Score 3:*** Asset has passed its midlife point; 25% to 49% of expected useful life benchmarks remaining.
- ***Score 2:*** Asset is nearing the end of its useful life; 0% to 24% of expected useful life benchmarks remaining.
- ***Score 1:*** Asset is beyond its useful life; 0% of expected useful life benchmarks remaining.
- ***Score 0:*** Asset is non-operable.

Assessed Asset Condition

Table 2 (below) provides a summary of assessed condition by asset class, route and ownership. The replacement value of infrastructure with a condition rating below 2.5 is considered to be Amtrak's SOGR backlog for infrastructure and is estimated to be $33.9 billion in 2019 dollars.

It should be noted that this is the estimated value of assets that are past their useful life and which need replacement. It is not the forecast project costs associated with replacing these assets. The total value of the SOGR backlog is based on unit rates developed as part of the NEC Commission's Cost Allocation Policy update and confirmed by the Deputy Chief Engineers responsible for each asset class. Many of the highest priorities for SOGR are also identified as opportunities for network performance improvement (for example infrastructure assets under the Gateway Program). The SOGR backlog figure considers the refurbishment of the existing asset only and does not consider the proposed project costs of these capital improvement programs.

TABLE 2: SUMMARY ASSESSED CONDITION – BY ASSET CLASS, ROUTE AND OWNERSHIP

Asset Class	NEC Main Line		NEC Branch Line		National Network	
	Average SOGR Score	% Not in SOGR	Average SOGR Score	% Not in SOGR	Average SOGR Score	% Not in SOGR
ASSETS OWNED BY AMTRAK						
Track	3.14	32.8%	3.10	34.7%	3.15	38.9%
Bridges and Buildings	2.16	55.8%	2.03	69.5%	2.33	53.0%
Electric Traction	2.55	48.3%	1.05	98.7%	-	-
Comms and Signals	3.04	11.8%	2.28	77.1%	2.21	47.7%
ASSETS MAINTAINED AND OPERATED BY AMTRAK – OWNED BY OTHERS			**LEASED FROM CSX, CAPITAL FUNDED BY STATE OF NEW YORK**		**OWNED BY STATE OF MICHIGAN**	
Track			3.24	13.0%	3.18	38.6%
Bridges and Buildings			2.23	70.7%	2.15	66.8%
Comms and Signals			2.25	77.4%	2.30	36.4%

Note: Average SOGR's are weighted based on replacement value of the asset – not the proposed project value which could include additional improvements. The average SOGR score and the % not in SOGR are not directly proportional. Average SOGR scores are weighted based on replacement cost, so assets with higher replacement costs have greater impact on the values presented in the table above. Amtrak is working on asset information initiatives to improve the estimation of average SOGR scores.

Asset Condition (Continued)

Figure 3 and Figure 4 (below) present the backlog by line and asset class. 92% of the total backlog or $31.0 billion is on the NEC main line and branch lines. About three quarters of the backlog is B&B, with ET and Track making up most of the remaining quarter. C&S accounts for a very small proportion of the overall SOGR backlog.

FIGURE 3: ASSESSED STATE OF GOOD REPAIR BACKLOG BY LINE

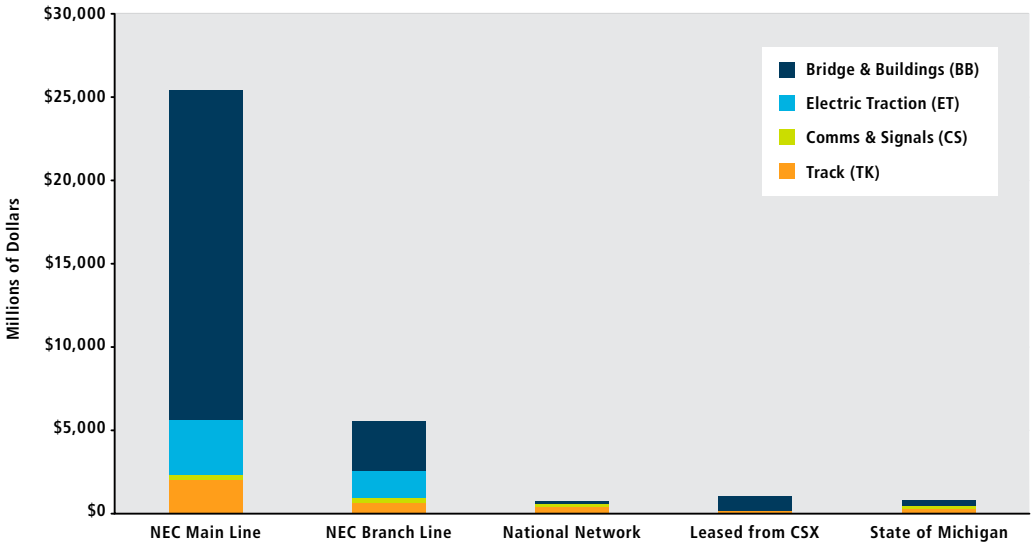
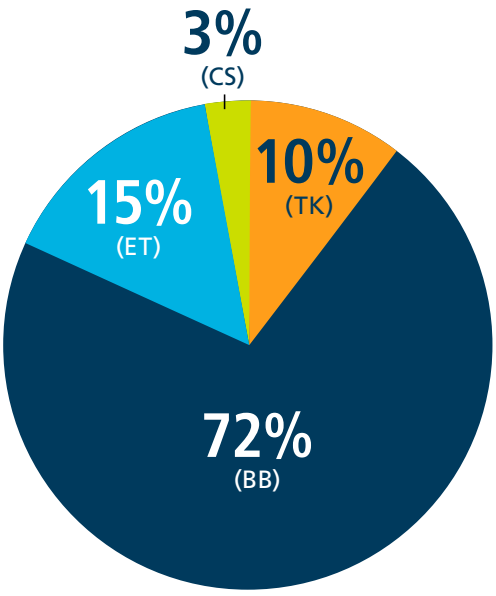


FIGURE 4: ASSESSED STATE OF GOOD REPAIR BACKLOG BY ASSET CLASS

- **Bridge & Buildings (BB) Backlog: $24.31M**
- **Electric Traction (ET) Backlog: $5.16M**
- **Comms & Signals (CS) Backlog: $0.94M**
- **Track (TK) Backlog: $3.51M**

$33.9B

Total Assessed Value of State of Good Repair Backlog



Asset Strategies

Amtrak Engineering's asset strategies center on using information that will ensure normalized steady state activities deliver the best investment opportunities in the near term and work towards a SOGR in the longer term that is able to support a safe, efficient and sustainable railroad.

Overview

Amtrak Engineering is driving a plan to ensure the continued viability of the infrastructure with a longer view on achieving a state of good repair (SOGR) across infrastructure assets. With the introduction of the Steady State Program in 2017 and Construction Program Procedure in 2018, there has been a renewed focus on capital maintenance. Moreover, capital improvement projects which contribute to the replacement or renewal of aging infrastructure are prioritized higher than those projects which provide little to no SOGR benefits. The Steady State Program identifies the count of units to replace annually to maintain a SOGR.

Current Asset Strategies

In I-AMP2017, Amtrak Engineering commenced a review of the asset strategies for all infrastructure assets to develop the long-term infrastructure maintenance and improvement programs to reach SOGR. These asset strategies were updated during 2019 and are included in the Infrastructure Appendices (B-F).

For 2020, the plan takes advantage of emergent asset management tools in addressing the on-going condition of the infrastructure while beginning to address the SOGR backlog. It is recognized that the long-term strategy will continue to be developed—particularly related to changes in asset configuration to improve performance and reliability. This work will therefore continue through the asset plan period.

Our current strategies can be summarized as follows:

Core Funding

- **Inspection/monitoring** activities to confirm the asset can function in its required state and provide a safe operational environment.
- **Preventive maintenance** activities to achieve a required level of asset performance and maintain a safe operational environment.
- **Corrective maintenance** activities to return the asset to its required function.

Capital Funding

- **Capital maintenance** to restore the asset to an operational design standard and maintain performance.
- **Capital replacement** to renew the asset and maintain performance.
- **Capital improvement** to replace the asset and improve performance or network capability.

Inspection/Monitoring Activities

Amtrak's Engineering standards set out the requirements for inspection and monitoring of assets to ensure safe infrastructure performance. With the exception of ET assets, these are aligned to FRA mandated inspections, and in some areas (including track and movable bridges for example) go beyond FRA requirements. Inspection and monitoring programs drive corrective and capital maintenance programs.

Maintenance (Preventive, Corrective and Capital) Activities

Historically, asset maintenance strategies could be summarized as run-to-fail (where fail exceeds a maintenance defined limit, and not a failed asset that is unsafe). Currently, data is being developed utilizing root cause analysis to identify high impact assets and introduce preventive maintenance replacement cycles. Corrective actions are typically assigned following an inspection. These are a mix of addressing identified faults and poor conditions which will lead to an asset failure, either through a corrective maintenance action or through a capital maintenance action.

Capital Replacement and Improvement Activities

Tools are in use that allow for a more consistent approach in the use of manpower, track possession and equipment resources. Historically, the capital replacement of assets was determined by engineering judgment—including conditions, safety and reliability, funding availability and track access.

In 2018, to address performance issues, Amtrak Engineering introduced reliability analysis to better inform replacement decisions. This included identifying assets with repeat failures or assets types which maybe prone to failures.

In 2019, significant steps were taken to advance root cause analysis. Each failure work order was linked to the asset that failed, the minutes of Amtrak and commuter train delay and an enhanced problem, cause, remedy structure designed by the technical departments. Furthermore, in development is the system that links asset design with asset maintenance—the technical organization with the maintenance organization. The outcome will be standard asset classes for quicker construction, a material view specific to the asset maintained and failure data returned to asset design to improve performance. These tools and others reflect a desire on the part of Engineering to use the latest asset management techniques to improve asset performance and expected economic life within the resources available to the Department.

ESTABLISHING CAPITAL INVESTMENT PRIORITIES

FY 2019 Capital Prioritization

A revised capital prioritization process was introduced in 2018 and applied to the FY 2019 construction plan. Prioritization of projects was based on three factors: Safety, Customer Service, and Financial Excellence. The 0 to 5 score in each area was determined with the following criteria.

- **Customer Service.** A score of "5" would include projects which significantly improve OTP, ride quality or reliability of the asset (i.e. without this project, the asset will be taken out of service).
- **Financial Excellence.** A score of "5" would include projects that contribute to the Steady State Program and /or will result in a quantifiable return on investment.
- **Safety.** A score of "5" indicates an immediate safety concern for either our customers or employees. If there are measures that can mitigate risks to safety (i.e. reducing speeds), a "5" is not warranted.

In most cases, there should be a correlation between Customer Service and Financial Excellence.

FY 2020-2025 Capital Prioritization

For the FY 2020 construction plan the prioritization process has been further developed to align fully to Amtrak's Strategic Pillars to demonstrate how each project supports our corporate strategic objectives. This was further refined for the FY 2021 construction program process. The approach is presented in Table 3 on page 56.

TABLE 3: FY 2021 INFRASTRUCTURE CAPITAL INVESTMENT PRIORITIZATION APPROACH

Amtrak Strategic Pillar	Engineering Category and Definition	Infrastructure Capital Investment Prioritization - Rating					
		0	1	2	3	4	5
Excellence in Safety and Operations	**Safety:** Unsafe condition for employees or customers	No improvements to overall safety	Minimal improvements to overall safety	<->	Safety measures can be put in place to mitigate risk	<->	No measures can be put in place to mitigate addressed safety risk
Positive Customer Impact	**Customer Impact:** Significantly improve OTP, ride quality or reliability of the asset	No positive impact to OTP, ride quality or reliability	Minimal positive impact to OTP, ride quality or reliability	<->	Positive impact to OTP, ride quality, and/or reliability	<->	If project not completed, asset will be taken out of service with negative customer impact
Integrated Strategy	**Non-Strategic Requirements:** Strong external requirements which may not align with Amtrak Strategic Pillars	Project aligns with an Amtrak Strategic Pillar (Already factored into priority ranking)	Project has external pressure for completion but is only in planning and/or initiation phase	<->	Project has external pressure for completion but does not have to be completed in upcoming fiscal year	<->	Project has significant external pressure for completion and must be completed in upcoming fiscal year
Invest in our Assets	**Steady State Contribution:** Work completed will achieve steady state unit contribution	No Steady State improvements achieved	Minimal Steady State improvements achieved	<->	Steady State unit replacement contributes to annual required levels	<->	Steady State unit replacement significantly contributes to annual required levels
Excellence in Financial Stewardship	**Financial Stewardship:** Project will have a positive return on investment	Project has no financial impact or a negative return on investment	Project has minimal financial impact or a low return on investment	<->	Projects return on investment will break even	<->	Project is funded by external resources or will result in positive return on investment

Moving Towards Normalized or Steady State Maintenance

Revised Asset Strategies

In I-AMP2017, Amtrak Engineering commenced a review of the asset strategies for all infrastructure assets to develop the long-term infrastructure maintenance and improvement programs to reach a state of good repair. These asset strategies were updated during 2019.

There are four key elements to the revised lifecycle management strategies presented in the asset plans in the appendices. These are as follows:

Achieve SOGR	The primary objective of this strategy is to bring the infrastructure assets to a state of good repair and then maintain them in a steady state to ensure sufficient capability to meet operational needs.
Prevent Insidious Decline	While Amtrak progresses towards SOGR, introduction of an enhanced assessment regime will guard against the insidious decline in the condition of any individual assets and ensure that they remain in a safe operational state.
Maintain Performance	The implementation of the steady state strategy is through a program that is prioritized to ensure that the infrastructure assets can function in their required state, thus minimizing performance loss due to asset faults and failures.
Support Network Capability Improvement	The program is also designed to ensure that the infrastructure assets contribute to capability targets established through the Amtrak Service Plans, including enabling higher speed operations.

Useful Life Benchmarks

The approach taken has been to establish useful life benchmarks (ULBs) to define a program of steady state or normalized levels of capital replacement necessary to move to a sustained state of good repair. Useful life benchmarks have been established through several sources, including:

- **Previous SOGR reports** and studies conducted in the last five years.
- **Engineering review** and judgement of typical asset lifecycles on Amtrak property.
- **Independent review** by outside parties .
- **International benchmarking** against comparable rail networks including those in the United Kingdom and Europe.

Transition Strategy

The concept of a useful life benchmark supports the development of a work-bank, but it is not an asset management strategy. This is because the transition to steady state maintenance requires SOGR backlog needs to be addressed first. To address this, Engineering has identified a series of delivery strategies which must be fully implemented to effectively move to a steady state maintenance strategy. These are described in the following six sections.

REDUCING EXPENDITURE

More efficient delivery of work in the long-term reduces the funding needed and ensures that steady state maintenance is affordable. To achieve this, we need to invest in our equipment—high-output plant delivering maintenance efficiently; invest in our people—so we have qualified and experienced staff delivering the work; and invest in our asset management approaches—so we have the right information to inform our decisions, so our assets are performing to the right service levels.

TRACK TIME AVAILABILITY

Obtaining sufficient track time for maintenance work is a challenge for all railroads. The optimal solution to delivering increased steady state production while minimizing the impact on train service is to reduce track possession time in a given block. This requires more efficient production equipment, improved planning and access to resources.

Presently Engineering has four 24/7 footprints on the NEC: two Undercutters, one Track Laying System (TLS), and the New Jersey High Speed Rail Program.

New equipment will enable Engineering to cut its footprint in half. The new Track Laying System (TLS) will be placed on two successive three day, 12-hour shifts, with a weekly work schedule of 72 hours versus the current 40 hours. While this approach is new, we believe it has a high likelihood of success based on a two-block-possession. This will require additional freight and motive power capacity. The 80 percent increase in work time will produce a 50 percent increase in steady state units. The TLS will complete the annual steady state units in nine weeks. At the end of nine weeks the two gangs will shift to the Undercutter for 28 weeks. The second Undercutter will utilize the same 72-hour two shift scenario for the entire production season.

Further, the two-block-possession approach allows Engineering to "blitz" the infrastructure by adding electric traction, bridges and buildings, and communication and signal work to the outage thereby closing the gap between the current condition and the state-of-good repair for non-track assets.

AVAILABILITY OF QUALIFIED PERSONNEL

Historical lack of qualified personnel will be partially mitigated through a steady year-round work schedule. Presently, three 100-person gangs are employed between the TLS and two Undercutters. While a 72-hour work week where the TLS and Undercutter work sequentially requires the addition of one 100-person gang, it eliminates the full duplication of workforce that would result from the TLS and Undercutter operating in parallel.

The production benefits of this change are outlined in Table 4. The benefits of a fixed workforce employed year-round are also significant, such as stability in key positions and the effectiveness derived from familiarity of tasks using productive, reliable equipment. Additionally, Engineering and Labor Relations are in discussions with the BMWE to eliminate specific work rules that interfere with holding qualified individuals in specific jobs (operators, foreman, ET, welders, etc.).

TABLE 4: ANNUAL PRODUCTION CAPABILITY FOR EXISTING AND NEW EQUIPMENT/GANGS

Production	Existing		Proposed Strategy	
	Units	Gang	Units	Gang
TLS (Ties & Rail)	110,000 Each	1	288,000 Each	2
Undercutting	50 Tk Miles	1	100 Tk Miles	4
Surfacing	300 Tk Miles	3	500 Tk Miles	5
Wood Tie Gang	47,520 Each	2	47,520 Each	2
Switch Exchange	50 Each	2	50 Each	2

Equipment Availability

New equipment is required to address the Northeast Corridor's concrete tie condition. The NEC has over two and a half million concrete ties which are projected to have a 45-year life; one million Santa Fe San Vel concrete ties were installed between 1978 and 1982 and thus are on the verge of needing replacement.

Furthermore, during the 1990's, Amtrak installed 1.4 million Rocla concrete ties which began failing at an accelerated rate in 2004, requiring replacement well before the end of the projected life cycle. To date, 1.3 million of these ties have been replaced. The remaining 100,000 ties cannot be replaced with the Track Laying System efficiently or effectively.

The NEC and branch lines have over one million wood ties, a significant portion of which were planned for conversion to concrete when the Rocla issue developed and diverted resources. This Plan presumes resuming replacing wood ties with concrete ties to provide speed increases on the NEC and branch lines as well as improved geometry, ride quality and lower maintenance costs. The current equipment cannot support the production levels required to achieve and maintain a state of good repair.

The Equipment Asset Strategy in Appendix F sets out our proposed acquisition plan which includes one new TLS for ties and rail replacement, two new undercutters for ballast cleaning and replacement and five new high-speed tampers for track geometry maintenance. The acquisition of these equipment assets during the plan period is critical to enabling Amtrak's strategy to achieve SOGR and transition to steady state maintenance.

Improving our Strategies and Plans

As we move to a steady state replacement cycle, we acknowledge that the first iteration needs to be staged (prioritized) such that the ongoing work program is manageable year-over-year. The asset plans in the appendices therefore propose replacement cycles and implementation strategies. This work will be further developed, refined and implemented through the asset plan period. Our Asset Management Improvement Plan (see appendix A) provides further details on our planned improvement actions.

Addressing Funding

The backlog identified is significant ($33.9 billion). A robust and consistent funding stream needs to be established.

An implementable shared funding strategy to address the full SOGR backlog remains a work-in-progress, with work at the NEC Commission to finalize a method for cost-sharing and mutual obligation still underway and a need for consistent, reliable Federal funding for this work not yet fulfilled.

Acela crossing the Bush River Bridge.

Moving Towards Steady State and Addressing SOGR Backlog

A principal goal of IALP2020 is to continue the implementation of a transition strategy to move to normalized investment levels to maintain SOGR. To achieve this, it is necessary to address the SOGR backlog.

Steady State Capital Replacement

Maintaining a SOGR is accomplished by replacing capital components at the end of their useful life—which are defined in the asset strategies in the asset class appendices (B-F). For planning purposes, replacement units are calculated by taking the number of assets in the system and dividing them by their useful life. This is what we define as normalized capital replacement—or steady state.

Based on the analysis presented in the asset strategies in the appendices, the steady state program is estimated at $928 million annually. This represents a $0.26 billion increase over the current FY 2020 authorized capital plan for infrastructure (Amtrak received $0.93 billion for FY 2020 infrastructure, of which $0.65 billion is for Engineering projects).

SOGR Backlog

The ability to maintain infrastructure assets in a reliable state, or State of Good Repair, with a steady state maintenance approach is only possible if the backlog is first addressed. To determine the SOGR backlog Amtrak has assessed the backlog of infrastructure investment, using age as a proxy for condition. Amtrak Engineering acknowledges that the physical condition of an asset and its ability to deliver safe and reliable service is determined by more than just its age. In this plan period, we will continue to implement a program of comprehensive asset condition assessments. The purpose of which is to improve our planning and prioritization capability, with future SOGR programs being derived on an improved understanding of asset condition and the deterioration of condition through asset operation.

Amtrak Engineering has assessed the SOGR backlog at $33.9 billion for infrastructure nationally.

Amtrak Engineering has assessed the SOGR backlog at $33.9 billion for infrastructure nationally. Given the advancing age of the infrastructure, historical underinvestment and the precipitous end of life facing major asset classes Amtrak Engineering have set a target of ten years to eliminate the SOGR backlog.

While achieving a 10-year schedule for all asset types would likely require more support resources (manpower, equipment and track outages) than are realistically available, Amtrak is confident that some assets such as Track, can be accomplished in this period if adequate funding is available.

Additionally, we've set this aggressive goal because the longer we delay our SOGR efforts, the greater the gap to steady state and risk to reliable service for our customer.

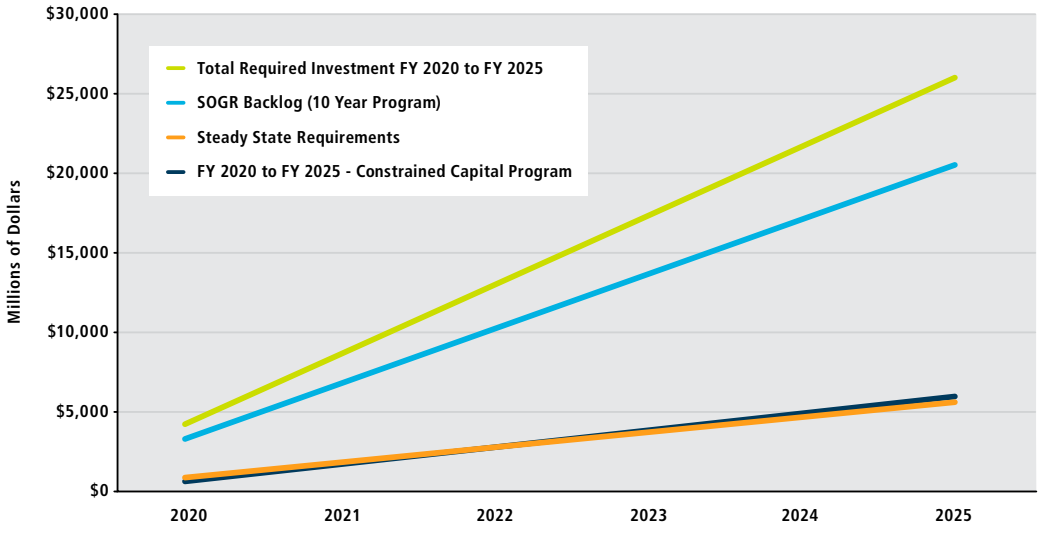
This 10-year SOGR strategy now allows us to define the funding requirements. As a result of this analysis, we have determined we will require $3.39 billion per year to address SOGR across all the asset categories in this 10-year window. When assessing our forecast FY 2020 to FY 2025 capital funding there is a $14.8 billion shortfall in funding to ***begin*** to address SOGR.

If full funding to achieve SOGR were available, Amtrak Engineering and Operations would be able to provide a complete analysis for the resource levels needed to deliver this work. Certain events, such as track outages, would enable construction and maintenance. But they also would limit train operations. Operators that use Amtrak's assets (including Amtrak) would need to develop a joint work plan if we are to maintain desired service levels.

It should be acknowledged, however, that the amount to address SOGR backlog is in addition to the necessary $928 million annual steady state investment required to prevent further infrastructure deterioration. Therefore, the backlog over the 6-year planning period to transition to SOGR is $20.3 billion.

Figure 7 presents a comparison of the budgeted capital program against a normalized steady state level of investment and the level of investment needed to address the SOGR backlog. We have also provided the total requirement to transition to SOGR (which includes steady state and 6 of the 10-year SOGR backlog program). It should also be noted that the 6-year forecast program includes both SOGR and network performance improvement projects. This analysis will be further reviewed and developed in future versions of this asset plan.

FIGURE 7: COMPARISON OF AMTRAK'S SIX-YEAR FORECAST CAPITAL PROGRAM FY 2020-FY 2025 AND ESTIMATED STEADY STATE PROGRAM AND ESTIMATED SOGR BACKLOG RECOVERY PROGRAM (10 YEAR)



Stations Asset Line

Stations Asset Line

The Stations Asset Line includes all Amtrak-controlled passenger rail stations and elements of other stations for which Amtrak has legal responsibility or intends to make capital investments.

Introduction

The Stations Asset Line is led by the Stations, Facilities, Properties and Accessibilities Team within Amtrak's Administration Organization. The team partners with many other parts of Amtrak including Information Technology, Operations, Finance, Commercial, Engineering, Law, Procurement, Mechanical, Government Affairs and the Enterprise Project Management Office. Key highlights for Amtrak's Station Asset Line include a focus on identifying ways to improve customer experience at stations, implementing customer focused near term improvements, and continuing development of Amtrak's Major Stations Program.

Below: A passenger boards the Missouri River Runner in St. Louis with his bicycle.

Strategy

Overview

Amtrak plays an important role in the national transportation network by providing travelers with a safe, efficient and reliable alternative to highway and airline travel. The Amtrak network is currently made up of over 500 stations across 46 states, the District of Columbia, and three Canadian provinces. Each station is unique to the community served, spanning small towns to the nation's largest metropolitan areas, and provides the point of entry, resources and support to Amtrak's Northeast Corridor and National Network services, along with other transportation service.

Amtrak's success depends on ever-improving safety performance, committed and well-trained employees, excellent operating capabilities, sound planning, and modern, efficient and reliable equipment and infrastructure.

We are investing in critical projects that will enhance the passenger experience, sustain the national passenger network, provide much-needed additional capacity and improve reliability and safety. Each initiative we undertake at our stations fits within one or more of these six strategic pillars: Safety and Operations, Customer Impact, Strategy, Assets, People and Financial Stewardship.

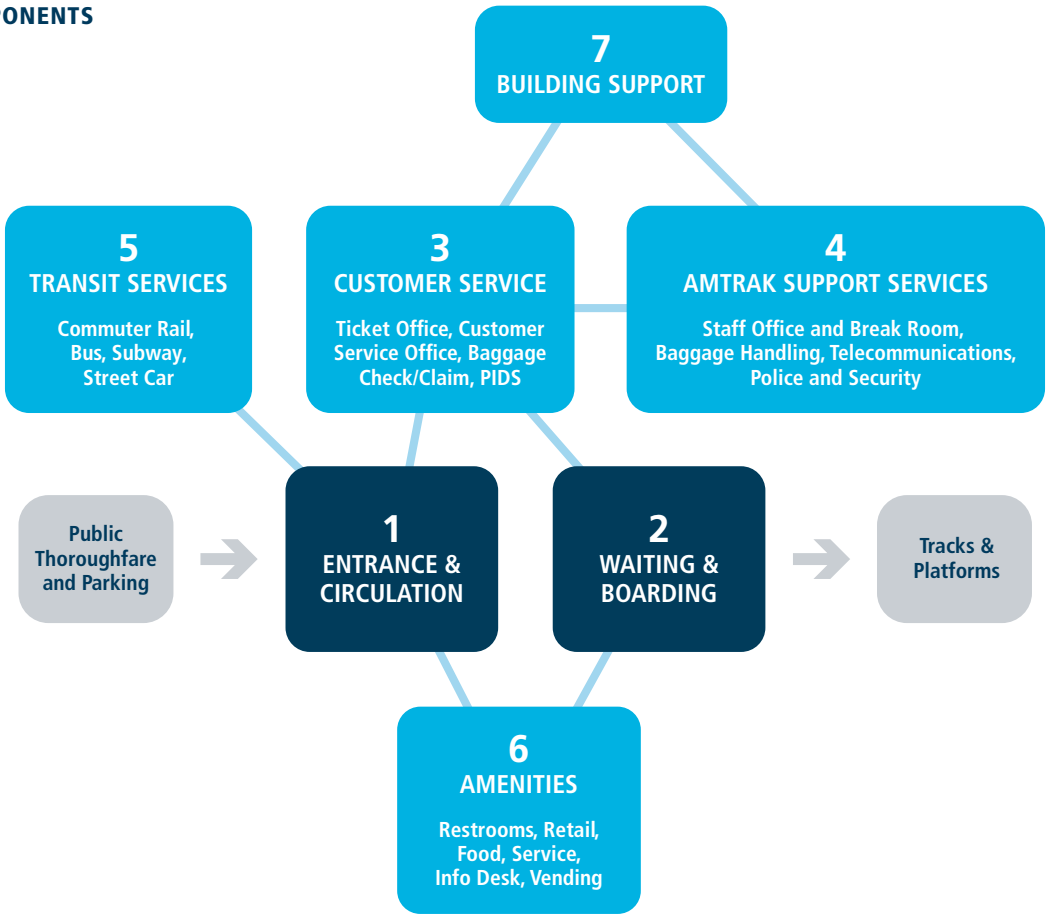
Among the challenges in developing a plan to manage station assets are: working with other stakeholders, such as states, cities and host railroads that own many of the stations we utilize, and state DOTs and commuter agencies that either own or utilize stations served by Amtrak and have their own service goals; making improvements that align with new Amtrak guidelines for station aspects such as branding and signage so as to provide consistent and recognizable products and services; managing station roll-outs of technological updates such as ticketing and baggage handling upgrades; and coordinating station management plans with our asset development and monetization initiatives.

Customer Experience

The station experience has two components, departure and arrival. Departures start when a customer approaches a station and finishes when they are seated on the train. Arrivals start as the train pulls into the station and finishes as the passengers moves onward to their final destination. What the customer encounters during this experience varies by station type. The core components of every station includes the entry/circulation/ticketing/waiting/boarding sequence. The differences among station sizes relate primarily to scale, with small stations having minimal customer service, Amtrak support spaces or amenities while large stations have a full range of these components.

Key variances in station characteristics include architecture, ridership, amenities, transit services, and proximity to urban areas. Most of these station characteristics are out of our control and tend to present challenges when designing the station experience. In addition to varying structural properties and offerings, management of stations at the local level has sometimes resulted in inconsistent application of current policies and procedures. We have already begun making bold moves to standardize and organize the station experience through enterprise alignment and pilot programs and plans to continue with strategic improvements to the overall experience in conjunction with evolving industry trends.

STATION COMPONENTS



Key objectives for customer experience include:

- **Deliver consistency in station image and behavior across the network.** A customer should recognize Amtrak's presence in a station through consistent branding, furnishings, and customer service no matter what location. Signage, restroom and interior cleanliness/condition, seating, access, lighting, and structural weaknesses are the fundamental elements of what a customer can see and interact with at every station.
- **Offer personalized and connected services.** A customer wants to feel known and recognized by the brand in which they buy products or receive services. The experience for the customer in the station can be enhanced to offer personalized touches through push notifications and custom coupons or upgrades. This enables the company to have a full picture of the customer journey to better understand patterns and preferences for future trips.
- **Mobilize and empower station employees.** Amtrak's front-line station employees should be continuously interacting with customers who are visibly lost or need assistance. Empowering station employees to help customers in the moment will improve overall customer satisfaction related to station experience.
- **Reduce operational inefficiencies.** Manual and inefficient procedures result in lost productivity for employees and frustration for customers. Operational practices will be improved through process re-engineering and automation where possible, including ticket sales, baggage handling, wayfinding, and boarding.
- **Drive revenue through retail partnerships.** Aligned to offering personalized and connected services, partnering with retail providers in stations through easy to use coupons or discounts will drive revenue for Amtrak.

We have several efforts underway focused on improving customer experience at stations including the Customer Now, Station Signage, Station Seating, and Metropolitan Lounge initiatives. Additionally, we are developing near-term and longer-term Pilot Projects to test concepts aimed at improving the customer experience. We measure and track customer experience using a Customer Satisfaction Index (CSI). In addition to overall CSI goals for Amtrak routes, Amtrak reports on CSI at individual stations on a quarterly basis. The CSI for stations usually orient around the boarding station based on customer feedback regarding:

- Accuracy of information received about the train trip prior to boarding the train.
- Friendliness/helpfulness of station personnel at boarding station.
- Availability of station signage/announcements at boarding station.
- Clarity of station signage/announcements at boarding station.
- Personal safety at boarding station.
- Ease of train boarding process.
- Overall cleanliness of the boarding station.
- Overall condition of the train platform and boarding area.
- Overall station experience at the boarding station.

Below: The Metropolitan Lounge is a premium lounge space where customers can relax and enjoy comfortable seating, expanded food and beverage offerings, private restrooms, complimentary Wi-Fi, a dedicated family sitting area, and access to a business center and executive conference center. Dedicated Customer Service Agents are available to assist with reservations, ticketing, baggage and local information. Metropolitan Lounge guests receive priority boarding.

Strategy (Continued)

Customer Now

The purpose of the Customer Now initiative is to deliver improvements that will enhance customer experience at Amtrak stations. The Customer Now initiative has been rolled into the Stations and Facilities ongoing program. The Station Refresh Program, which is focused on the 25 stations with the highest ridership (Top 25 Stations) by ridership will continue until the final close out of current projects and the Adopt-a-Station Program, which is focused on the 100 Stations with the highest ridership (Top 100 Stations) will expand to all 174 staffed stations. An overarching objective is to fund significant, near-term attainable projects that will deliver the greatest customer impact.

Station Refresh (Top 25 Stations)

The Station Refresh Program for the Top 25 stations includes eight customer-facing improvements at Baltimore, Chicago, New York, Philadelphia, and Washington. The improvements are organized by six distinct categories: 1) Waiting Areas; 2) Restrooms; 3) Stairs; 4) Elevators/Escalators; 5) Platforms; and 6) Lighting and Signage. The program for remaining stations includes thirty-six customer-facing improvements organized by eight distinct categories: 1) Waiting Areas; 2) Customer Service Areas; 3) Restrooms; 4) Stairs; 5) Elevators/Escalators; 6) Platforms; 7) Lighting and Signage; and 8) Site.

In FY 2020, projects will continue at the Top 5 major stations and continue at other stations such as Albany, Lancaster, Boston South and New Haven.

Executive Audit (Top 174 Stations)

The Adopt- a-Station program will expand from the top 100 stations to include all staffed stations. Executives and senior managers will be tasked with each adopting several stations on list and auditing them. Audits will be completed on a rolling basis throughout the year and will be entered a newly designed data and work management system. This new system allows District Station Managers, and others involved in the program, to enter new, review existing, and close-out completed maintenance deficiencies on display dashboards within their respective territories.

The Executive Audit Program is intended to transform audit notes and findings into customer-facing improvement programs and projects at 174 staffed stations. Programs and projects are organized by the following categories:

- Approach to the Station
- Parking Area
- Site/Station Structure Exterior
- Station Structure Interior: Waiting Room, Restrooms, Ticketing/Baggage Areas, and Retail
- Platform and Track Area

AMTRAK'S TOP 25 STATIONS

1. *New York Penn Station*
2. *Washington Union Station*
3. *Philadelphia William H. Gray III 30th Street Station*
4. *Chicago Union Station*
5. *Los Angeles Union Station*
6. *Boston South Station*
7. *Sacramento Valley Station*
8. *Baltimore Penn Station*
9. *Albany-Rensselaer Station*
10. *Santa Fe Depot Station*
11. *Providence Station*
12. *Wilmington Station*
13. *BWI Rail Station*
14. *Newark Penn Station*
15. *King Street Station*
16. *New Haven Union Station*
17. *Milwaukee Intermodal Station*
18. *Boston Back Bay Station*
19. *Portland Union Station*
20. *Emeryville Station*
21. *Lancaster Station*
22. *Harrisburg Transportation Center*
23. *Bakersfield Station*
24. *Irvine Transportation Center*
25. *Route 128 Station*

Updated PIDS at Minot, ND station.

Strategy (Continued)

Station Signage

A Station Signage program has been established to replace damaged and missing signs, as well as fabricate and install replacements for outdated or functionally deficient signage, at stations and related operational facilities (such as crew bases, commissaries, etc.). Starting in FY 2020, we will begin a focused initiative on branding for the Top 100 stations. This initiative will access station signage and propose needed signage improvements in four key areas: building signage, monumental signage, ticket counter signage, and hours of operation. While the scope of work will vary from station to station, the key objective will be to provide focus and quick signage improvements using pre-determined signage standards.

Station Seating

A Station Seating program will replace damaged, outdated or functionally deficient seating. These system-wide programs will begin with the Top 25 Stations and then progress to the other Top 100 Stations, in alignment with ongoing Customer Now initiatives.

Metropolitan Lounge

Amtrak Metropolitan Lounges began in the early 1990s as an enhancement for first class passengers. The goal was to provide an elevated and welcoming experience for these high-value customers. ClubAcela was launched in the NEC to coincide with the launch of *Acela*. Amtrak lounges/clubs today provide an elevated service experience for our highest value customers. It is important to bring consistency to club offerings by:

- Phasing out the ClubAcela name in favor of Amtrak Metropolitan Lounge for nationwide consistency and familiarity.
- Defining the minimum requirements for functionality and amenities for an Amtrak Metropolitan Lounge.
- Enforcing the use and compliance of Metropolitan Lounge Design Principles in effort to provide a consistent planning principle and guidelines for appropriate space utilization, space types, color pallets and consistent branded experience.

Through the design and execution of these unique customer spaces we aim to:

- **Provide an elevated and welcoming experience** for high-value customers that helps us compete with other modes of travel.
- **Create a relaxing environment** as a component of the pre/post customer journey.
- **Provide a comfortable space** to help customers do what they want/like while traveling.
- **Ensure the care and safety** of our customers and employees.
- **Deliver unexpected benefits** to customers and communities across the country.

Strategy (Continued)

Pilot Projects

A portfolio of new pilot projects have been identified to achieve the outlined objectives and measures of the overall program. Efforts have been coordinated with the Market Research team to conduct focus groups and surveys to gather customer insights into station experience. These projects often integrate with other initiatives and efforts as appropriate. Results will influence the design and deployment of the full portfolio. As initiatives are identified policies and procedures will be updated or created to reflect the new direction. Pilots associated with improving operational efficiencies of boarding align to the leading practices of maximizing the use of physical space, establishing a customer-friendly process and communicating clearly with customers.

Station image project

The project will address structural and visual weaknesses, help control passenger flow with clear directional signage, and enhance queue management with mobile, friendly station staff. Efforts will focus on the following criteria: signage (logo, location, and language), restroom and station interior condition/cleanliness, seating (condition, location, and standardization), access (clear path from curb to platform), lighting, and structural and visual weaknesses (e.g., leaks, paint, etc.). The station image project includes implementation of audits against image and behavior standards.

Mobile customer service representatives

This will equip customer service representatives to provide enhanced customer service by walking around the station with a handheld device to proactively engage customers. The mobile representatives will greet customers upon arrival at stations, assist while waiting for departure, and have the ability to modify existing reservations or create a new reservation.

Develop simulation model and design to enhance pedestrian flows through stations

This requires a current state analysis to understand customer flow and simulation variables. Major stations by type will be observed to capture customer flow data. The data will identify choke-points for scenarios most frequently experienced in today's environment. Once understood, the simulation model will digitally test elimination of those choke-points and predict performance in the real world through redesign of boarding areas.

An Amtrak Ambassador chats with a customer.

Pilot future pedestrian flow in one major station

Given leading practices and ongoing initiatives, the design is likely to have the following features:

- Strategically placed, clear directional signage.
- Attention grabbing waiting spaces.
- Time regulated entry through sequential boarding.
- Self-serve boarding through full automation.

Customer offers & customization

Today, the FindYourWay app provides assistance to customers at New York Penn Station. New functionality will add customized retail coupons and capture customer location data. This will enable Amtrak to predict passenger flow through the station based on redeemed offers, customer searches and GPS location.

Major Station Planning and Development

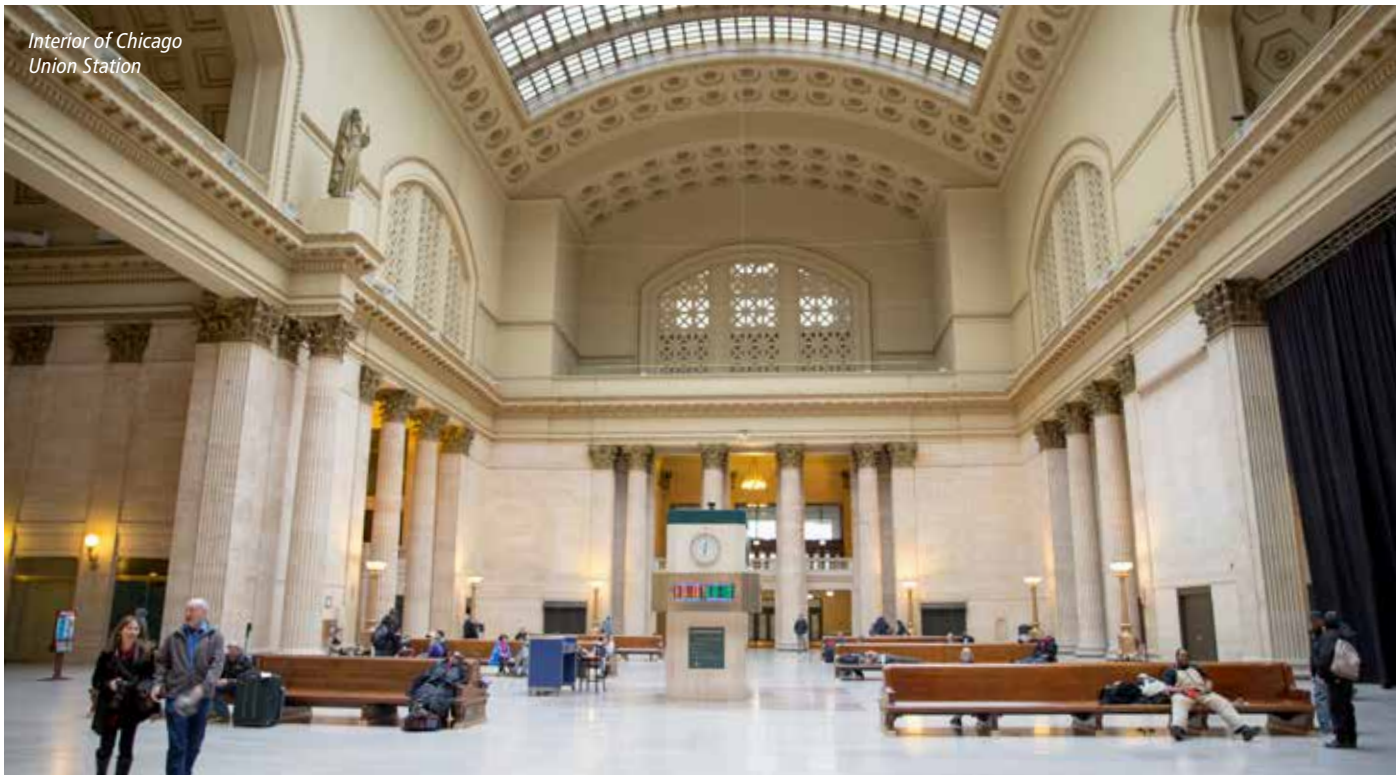
Amtrak is the owner and manager of a nationwide portfolio of assets including over eight million square feet of station and maintenance facilities and five of our top 10 busiest stations. The asset portfolio is aging, suffers from decades of deterioration and is in need of modernization to meet growing demands.

Despite these challenges, Amtrak's stations are community hubs and the surrounding markets present opportunities to extract value from our assets from commercial real estate development or partnerships with area institutions and the private sector. A strategic asset management and development program can improve the performance and value of Amtrak's asset portfolio by:

- **Addressing our facility state of good repair** and modernization needs;
- **Making key investments** that will have a positive impact on the customer experience;
- **Taking a sustainable approach** to life cycle asset maintenance and preservation;
- **Ensuring sufficient near- and long-term capacity** for ridership growth;
- **Optimizing utilization** of our assets for Amtrak rail and business operations;
- **Producing revenue**, such as retail or advertising revenue, for reinvestment back into critical infrastructure and operational improvements; and
- **Capturing commercial development opportunities** from underutilized or non-core assets.

At the five Amtrak-owned stations with the highest ridership (Major Stations)—New York Penn Station (#1 in ridership), Washington Union Station (#2), Philadelphia William H. Gray III 30th Street Station (#3) (Philadelphia 30th Street Station), Chicago Union Station (#4), and Baltimore Penn Station (#8)—we have commenced Major Station Asset Development Programs. In these major urban markets, the challenges and opportunities facing Amtrak's asset portfolio are heightened. Projected ridership growth and regional economic growth create a substantial and increasing demand on Major Stations that will only exacerbate state of good repair needs. However, there is high potential to attract investment for transit-oriented development that enhances intermodal connections and integrates stations with surrounding neighborhoods to create an exceptional station experience, one which will retain and grow a loyal customer base.

The Major Station asset development programs rely on three primary strategies: master plans, strategic partnerships, and master developments.


Interior of Chicago Union Station

Master Plans

Master planning activities identify near- and long-term station needs. Master planning also identifies opportunities for improvements for intermodal connections and connectivity to the surrounding neighborhoods and opportunities for commercial development of Amtrak assets. Master plans serve as the aspirational vision for the future, but also serve as roadmaps for planned capital investments by Amtrak and our partners for concourse improvement and expansion, track and platform improvements, and site improvements such as plaza, customer parking facilities, and intermodal connections. Master plans have been completed either by Amtrak or in partnership with key area institutions for New York Penn Station, Washington Union Station, Philadelphia 30th Street Station and Chicago Union Station. A master planning process is currently underway for Baltimore Penn Station and will be completed in 2020.

Strategic Partnerships

Strategic partnerships with local and regional government entities, commuter rail and transit providers, area institutions, and the private sector are necessary to advance Major Stations asset development programs. In some cases, funding partnerships raise the capital needed to complete design and construction of critical projects. In other cases, collaboration partnerships are necessary to coordinate financing, design and construction activities at the stations.

Master Developments

Master developments are a specific type of strategic partnership where Amtrak seeks to partner with the private sector to advance station improvements and generate economic developments in the areas surrounding each station to support passenger rail growth. Beyond funding and financing support, these master developers bring project delivery, asset management and commercial development expertise to the table to help Amtrak cultivate a first-class customer experience, while maximizing the performance and value of our Major Stations. After a competitive search, we selected Riverside Investment & Development, Inc. as its master developer partner for Chicago Union Station and Penn Station Partners as its master developer partner for Baltimore Penn Station in 2017. A master developer solicitation was initiated for Philadelphia William H. Gray III 30th Street Station in 2018 and a selection is anticipated by Summer 2020.

Intermodal Connections

Amtrak stations are often transportation hubs for their respective cities, serving multiple modes of transportation including commuter rail, bus, subway, bike, non-auto options (water taxi, private commuter shuttles, and buses) and pedestrians.

However, with poor transportation integration, multiple barriers (such as highways, waterways, infrastructure and incomplete street networks) and the fact that many of our stations sit on islands, accessing stations can be difficult. Some projects at Major Stations that are providing access to other modes include:

Chicago

In Chicago, through the CUS Master Plan and the more recent Master Developer agreement we are working to make the following improvements.

- The nearest CTA rail ("L") station (Blue Line Clinton St.) is 2 blocks away. The CUS Master Plan proposes a direct connection between CUS and the Clinton St. Station. Through Amtrak's recent agreement with a Master Developer at CUS, an office tower built on former Amtrak property across the street will accommodate the first block of this 2 block pedway connection.
- The CUS Master Plan includes numerous platform improvements, including additional platform access and egress points that will improve access and walkability to, from, and around the station.
- As part of the agreement with the Master Developer, the selected Developer will implement corner curb extensions at crosswalks; a new mid-block pedestrian crossing to a new Union Station access point; and other public way improvements for pedestrians.
- The increased transit oriented development (residential and office) implemented through the Master Development agreement—surrounding, connected to, and in some cases within the station—will reduce the need for passengers to connect to other modes of transport.

New York

In New York, where non-auto access is the preferred travel choice for Penn Station, we are working with partner railroads New Jersey Transit and MTA Long Island Rail Road to develop a unified facility wayfinding plan and customer feedback survey. The customer feedback survey will be used to look at the customer groups in their totality versus by railroad in an attempt to plan out capital projects that benefit all. In addition, our wayfinding app called FindYourWay, assists customers in navigating through Penn Station and to multimodal connections.

Philadelphia

In Philadelphia, we continue to advance activities to improve the 30th Street Station District. The master development project, currently in procurement, includes a future connection to create a safe, welcoming, and easy to navigate pedestrian path between 30th Street Station and SEPTA's Subway/Trolley Station. The expansion would allow for additional amenities and growth opportunities to complement the South Concourse retail program and provide access to the Station from the exterior "patio" by adding new entry points along the south and west side of the Station.

The master development project also includes the Market Street Plaza, which will address the critical functions and primary uses of the plaza surrounding the station. Plaza improvements will expand the outdoor space, develop functionality in anticipation of future growth and increased foot traffic, while complimenting the overall goal of improving the customer experience though station moderation and enhancements.

Baltimore

In Baltimore, we are developing a comprehensive multimodal approach to station planning and design with our selected developer that incorporates all modes and retains the flexibility needed for future changes in mobility.

Washington

In Washington, we are working with the FRA to advance the Washington Union Station Expansion Project to transform this vital transportation hub while preserving the iconic historic station building. The proposed Project is intended to provide a reliably high-quality customer experience, with improved access to increased rail service.

Benefits include:

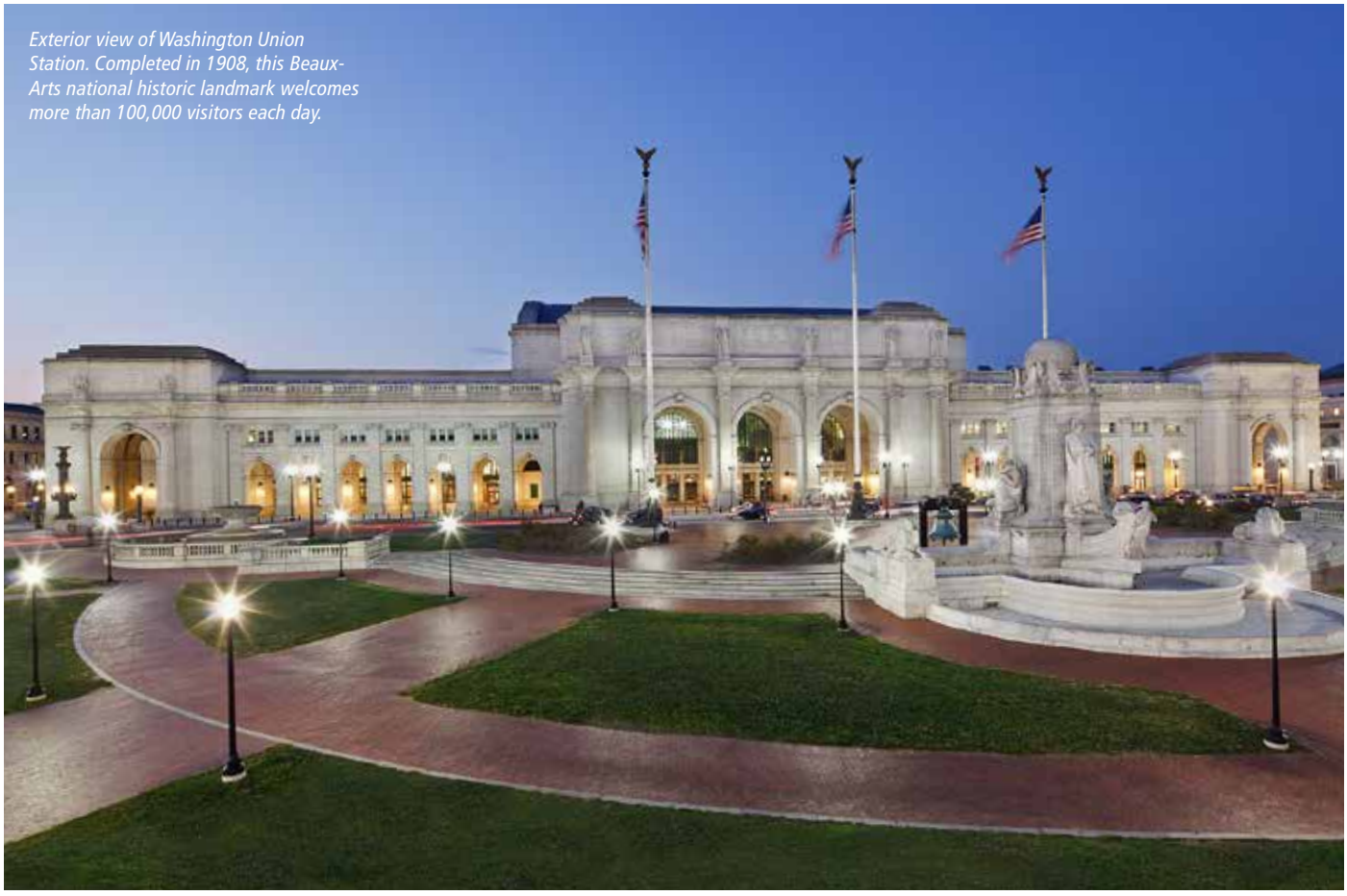
- **New concourse space** to improve connections for station users;
- **New tracks and platforms** to allow for additional capacity;
- **New train hall** to provide light and air over the tracks
- **New bus and parking facilities;**
- **Improved pedestrian spaces** and additional entrances;
- **Additional bicycle facilities;**
- **Improved vehicular circulation** and pick-up/drop-off areas;

In Summary

Some key takeaways include:

- Good connections are critical to capture value at multimodal and development hubs.
- Implementing a thru-ticketing or integrated ticketing system with other modes will be extremely valuable.
- Major transportation hubs can induce substantial private development.

Partnering is required. Infrastructure in all its forms is one system with many different elements. These elements must be harmonized to achieve mobility and connectivity for the entire rail system.



Exterior view of Washington Union Station. Completed in 1908, this Beaux-Arts national historic landmark welcomes more than 100,000 visitors each day.

Customer Accessibility

The goal and objective of the Americans with Disabilities Act (ADA) Stations Program is to bring all Amtrak-served stations for which Amtrak has ADA responsibility into compliance with the ADA.

Amtrak initiated the ADA Stations Program in 2009 as a comprehensive program to make its stations ADA compliant and accessible.

In coordination with the FRA, we have developed the ADA priorities and work necessary to bring stations with existing accessibility deficiencies into compliance. The five-year strategic plan will be used to bring stations with known or potential accessibility deficiencies in certain key areas into compliance with the ADA within the plan period.

Stations that are listed as the highest priority include stations with known or potential: 1) train access deficiencies, 2) Passenger Information Display Systems (PIDS) deficiencies, and 3) station access and/or key amenity deficiencies. Additional priorities include adding level boarding platforms where required by law, and pursuing more integrated boarding solutions (based on Amtrak's Platform Design Policy) where level boarding is not required by law due to the presence of existing freight traffic adjacent to the platform. Platform projects, which may include level boarding platform projects and low-level platform projects, will be funded after these three priorities have been funded and advanced to the greatest extent possible and as remaining budget is available. Additional information on the ADA program is included in the Stations Appendices.

Chicago Union Station

Strategy (Continued)

Safety and Security

While customer safety and satisfaction are among our highest priorities, both of those are based in security. Amtrak stations adhere to standard design criteria and minimum specifications for a variety of security systems to protect Amtrak employees, customers, and facilities. Amtrak's Emergency Management and Corporate Security (EMCS) provides design guidance, practices and recommendations to cover all physical protection system components, integrates Amtrak Engineering Department Standards, and corresponds to security counter measures. Protection includes implementing target hardening solutions to Amtrak facility vulnerabilities that are identified through a local assessment of risk to Amtrak employees, customers and facilities. Several categories of security systems applicable to Amtrak stations system-wide, including:

- Fencing and Gates
- Site Hardening Barriers
- Access Control Devices
- Intrusion Detection Systems
- Chemical, Biological, Radiological, and Nuclear Detection Equipment
- Video Surveillance Systems
- Emergency Communications
- Public Notification, Alert, and Signage
- Security Lighting
- Blast Containers

Capital funding for safety and security is included in the National Assets and Corporate Services (NACS) category under the FAST Act Account Structure.

Station Technology

Amtrak's Information Technology department (IT) established a dedicated Service Owner Organization (SOO) for Stations, Facilities, Properties and Accessibility. This group is responsible for all aspects of planning through deployment and transition to maintenance of IT products and services, in accordance with Amtrak IT standards, for all priorities, programs and projects for Stations, Facilities, Properties and Accessibility. The SOO is collaborating with the stations team to refine the technology standards that correlate to IT products and services and plan for future improvements. Many of these projects are attributable to the NACS asset line.

Asset Inventory

We began a five-year cycle of comprehensive condition assessments for Amtrak stations in 2017. Condition assessments identify deficiencies and prioritize improvements at stations. Amtrak has completed comprehensive condition assessments for Amtrak owned or maintained stations in the southeast division. We are currently assessing all stations with Amtrak service in the southwest division. Going forward over the plan timeframe, Amtrak will continue assessments at stations for the Northeast, Northwest and Central divisions. These comprehensive condition assessments will be captured within the asset inventory.

Once we have a clear sense of the nature and conditions of our stations, we can develop an asset management plan that is aligned to our service line plans and overall corporate goals, and one that defines a clear path for decision-making.

The basic cornerstones of developing a good asset management policy, as described in the baseline Infrastructure Asset Management Plan, can be applied to stations. These are:

- Aligning asset management activities with the **customer services** we strive to deliver.
- Enabling asset management **decision-making** informed by data, supported by technology and implemented through consistent business processes.
- Knowing what assets we have and **understanding each asset's condition.**
- **Driving efficiency** in how we manage our assets.
- **Reducing uncertainty** by having a plan that considers all types of risks: asset-based, organizational, governmental and financial.
- Moving towards steady state by developing lifecycle strategies and **addressing SOGR backlog** for each asset class.
- Developing work plans for necessary **network improvements.**

This effort will also be aligned and integrated with existing information systems and processes. The Real Estate Development department maintains the company's Real Property Inventory Management Information System (RPIMIS) using IBM's Maximo database. As the property system of record, Maximo contains high-level asset management data including address and ownership information. For stations Amtrak serves, Maximo stores additional information on ridership, revenue, business line, ADA responsible party, etc. to be used for reporting purposes.

Real Estate's RPIMIS is part of a larger effort to move from paper record-keeping to digital record-keeping of real estate information. Four linked platforms—Maximo (database), Documentum (digital file repository), EsriGIS (geographic information system), and an office space management software platform—are under development and will be used to more efficiently manage Amtrak's property holdings and respond more quickly to the property inquiries of other departments who need to understand our property rights, responsibilities, and encumbrances.

Amtrak Stations and ADA Responsibility

During FY 2019, we provided rail service to 525 stations across the U.S. and Canada. Five stations were rebuilt or completely renovated—Springfield, MA; Schenectady, NY (Amtrak-owned); North Charleston, SC; Memphis, TN; and Cincinnati, OH—replacing outdated facilities with ADA-compliant facilities. An ADA-compliant platform replacement project was completed in Clemson, SC. As of September 2019, ADA responsibility for the 517 stations required to meet ADA accessibility requirements is noted at right.

Amtrak has either sole or shared ADA responsibility at 386 stations. These 386 stations are included in the ADA Stations Program. During FY 2019 we completed its reclassification of former flag stops, which are now classified as regular station stops.

A list of all 525 stations served by Amtrak with ownership and ADA responsibility identified by component is provided in the Stations Appendices. This list also notes where Amtrak service is reimbursed by partner agencies under PRIIA. The Stations Appendices contains supplemental information about Amtrak-served stations including station type, staffing, and FY 2019 total ridership.

AMTRAK'S ADA RESPONSIBILITY

143
Stations where Amtrak has ***Sole ADA Responsibility***

243
Stations where Amtrak has ***Shared ADA Responsibility***

130
Stations where Amtrak has ***No ADA Responsibility***

At left: Amtrak moved into the North Charleston Intermodal Center in December 2018 following a year and a half of construction. It brings together various transportation modes—including Amtrak, Charleston Area Rapid Transit Authority (CARTA) buses and intercity buses—in one convenient location. Amtrak relocated to the intermodal center from the adjacent 1956 Atlantic Coast Line (ACL) depot, which was subsequently demolished.

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Five-Year Capital Plan

Five-Year Capital Plan

Amtrak's five-year capital plan includes substantial investments in the NEC and National Network. The five-year capital plan for the NEC is driven by investments in Infrastructure upgrades and maintenance, *Acela* improvements, stations master plan and other facilities improvements, and Gateway related activities.

The five-year capital plan for the National Network is driven by fleet overhauls, stations and facilities improvements, along with investments in infrastructure upgrades and maintenance. Other significant investments included in the five-year capital plan timeframe include fleet acquisitions for new diesel locomotives and Amfleet I trainset replacements.

Overview

The total forecast capital spend is $2.3 billion in FY 2020 and $18.7 billion over the plan timeframe, which includes the FY 2020 base plus five-year horizon. The Equipment and Infrastructure Asset Lines account for approximately 83% of the total over the plan period. Capital spend for the Equipment Asset Line is $893.8 million in FY 2020 and $6.9 billion for the plan period. The Infrastructure Asset Line capital spend includes $929 million in FY 2020 and $8.5 billion over than plan period. Capital spend for Stations is $290.6 million in FY 2020 and $2.1 billion over the plan period. Capital spend for Train Operations includes $113.3 million in FY 2020 and $419.7 million over the plan time frame. Remaining capital spend for the National Assets and Corporate Services (NACS) Asset Line includes $120.1 million in FY 2020 and $709.9 million over the plan period.

The following sections provide an overview of the five-year capital plan for each asset line based on the FAST Act Account Structure format, a summary of key programs and projects that are built into the plan, and a discussion of projects that could advance if additional funding were available.

CAPITAL SPEND BY ASSET LINE, FY 2020-2025

($ in Millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Train Operations	$113.3	$77.9	$61.3	$56.3	$55.2	$55.7	**$419.7**
Equipment	893.8	1,324.9	1,472.3	1,168.3	988.5	1,096.3	**6,944.1**
Infrastructure	929.0	1,710.2	1,345.2	1,486.9	1,523.7	1,503.4	**8,498.5**
Stations	290.6	432.6	378.8	306.3	331.2	353.2	**2,092.8**
NACS	120.4	115.2	122.8	123.1	121.4	106.9	**709.9**
Total Capital Spend	**$2,347.1**	**$3,660.8**	**$3,380.4**	**$3,140.9**	**$3,020.0**	**$3,115.7**	**$18,664.9**

Constrained Plan by Asset Line

Transportation

The total forecast capital spend for the Transportation Asset Line is $113.3 million in FY 2020 and $419.7 million over the plan timeframe. Capital spend for Technology & Systems is $40.5 million in FY 2020 and $210.1 million for the plan period. Capital spend for Facilities includes $41.3 million in FY 2020 and $125.5 million over than plan period. Remaining spend for Operations Equipment is $8.9 million in FY 2020 and $48.4 million over the plan period.

CAPITAL SPEND FOR TRAIN OPERATIONS, FY 2020-2025

($ in Millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Service Line Management/Property Acquisitions	$22.5	$13.1	-	-	-	-	**$35.6**
Technology & Systems	40.5	35.8	34.3	31.4	33.9	34.0	**210.1**
Facilities	41.3	21.5	19.3	17.0	13.1	13.4	**125.5**
Operations Equipment	8.9	7.5	7.7	7.9	8.1	8.3	**48.4**
Train Operations Capital Spend	**$113.3**	**$77.9**	**$61.3**	**$56.3**	**$55.2**	**$55.7**	**$419.7**

Components of the Transportation Capital Plan

Service Line Management/Property Acquisitions. Includes investments in asset technologies and property acquisitions.

Technology & Systems. Includes investments in CETC systems, on-board Wi-Fi, Food and Beverage Next Generation Point of Sale system, Moynihan Train Hall IT Network, and *Acela* program technology components.

Facilities. Investments include State of Good Repair improvements, Ivy City Potable Water System Replacement, Oakland Administrative and Commissary, REA Garage & Terrace Water Remediation, Conestoga Substation, and *Acela* program components (Southampton Street Yard Maintenance facility improvements).

Operations Equipment. Includes Vehicle Acquisition, Drive-Cam fleet recorder program, and Food & Beverage replacement equipment.

At right: Customers enjoying the Wi-Fi at Baltimore Union Station

Equipment

The total forecast capital spend for the Equipment asset line is $893.7 million in FY 2020 and $6.9 billion over the plan timeframe. The largest component of the capital spend is for new/replacement equipment which includes $507.9 million in FY 2020 and $3.3 billion over than plan period. Capital spend for overhauls is $261.4 million in FY 2020 and $1.4 billion for the plan period. Capital spend for mechanical facilities is $84.8 million in FY 2020 and $2.2 billion over the plan period. Remaining capital spend for the Equipment Asset Line includes projects for LCPM, and other train capital.

CAPITAL SPEND FOR EQUIPMENT ASSET LINE, FY 2020-2025

($ in Millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Overhauls	$261.4	$272.4	$237.9	$204.2	$200.5	$173.8	**$1,350.1**
New/Replacement Equipment	507.9	710.2	845.3	492.8	441.5	279.0	**3,276.8**
Facilities	84.8	312.5	367.8	454.9	333.2	634.4	**2,187.6**
LCPM	28.8	22.5	16.6	13.9	11.2	9.2	**102.2**
Other Train Capital	10.9	7.3	4.7	2.5	2.0	-	**27.3**
Equipment Capital Spend	**$893.8**	**$1,324.9**	**$1,472.3**	**$1,168.3**	**$988.5**	**$1,096.3**	**$6,944.1**

Components of the Equipment Capital Plan

Facilities. Includes projects for repair of existing facilities and modification or construction of new facilities, such as new *Acela* trainset-related improvements to Sunnyside Yard and necessary modifications as Amtrak transitions from Amfleet cars to new equipment. Future year facilities estimates beyond FY 2020 are subject to change as Amtrak's Amfleet replacement Intercity trainset vendor is chosen and more details on the timing and scope of facility improvements are known.

New/Replacement Equipment. Includes investments for Amfleet replacement Intercity trainsets, new *Acela* trainsets, ALC-42 new diesel locomotives, Viewliner II long distance single level railcars, and non-passenger rolling stock (maintenance and inspection equipment). Future year estimates beyond FY 2020 are subject to change as Amtrak's Amfleet replacement Intercity trainset vendor is chosen, and Amtrak further develops a strategy and timeline to address aging Superliner and Amfleet II equipment.

Overhauls. Costs for overhauls consists of projects for Amfleet, Horizon, Superliner, Viewliner, *Acela* and locomotive fleets, as well as all other overhauls.

Other Train Capital. Consists of materials for interior refreshes of the Amfleet II, Horizon and Superliner railcars, Positive Train Control, and ADA compliant restrooms for Superliner coaches.

Life Cycle Progressive Maintenance (LCPM). Covers program costs at multiple locations. The LCPM program reduces the cost of P-42, P-40 and P32ACDM (Dual Mode) locomotive overhauls by replacing major components at the end of their useful life cycle based on the OEM recommendations. Fourteen major components are replaced at intervals of two to 14 years.

Infrastructure

The total forecast capital spend for the Infrastructure Asset Line is $929 million in FY 2020 and $8.5 billion over the plan timeframe. The largest component of the capital spend is for normalized replacement which includes $509.3 million in FY 2020 and $3.6 billion over than plan period. Capital spend for major backlog projects is $50.6 million in FY 2020 and $1.3 billion for the plan period. Capital spend for improvements is $294.9 million in FY 2020 and $3.3 billion over the plan period, which includes real estate acquisition costs for the Gateway program. Remaining capital spend for the Infrastructure Asset Line includes projects for safety & mandates, environmental remediation, and program management.

INFRASTRUCTURE ASSET LINE CAPITAL SPEND, FY 2020-2025

($ in Millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Normalized Replacement	$509.3	634.8	$604.9	$638.0	$615.1	$593.0	**$3,595.1**
Safety & Mandates	46.0	56.0	5.8	5.9	6.0	4.7	**124.5**
Major Backlog	50.6	69.8	104.7	232.8	372.3	464.8	**1,294.9**
Improvements	294.9	922.2	601.2	588.0	508.5	421.7	**3,336.5**
Environmental Remediation	17.6	16.7	17.5	10.8	10.1	7.3	**80.0**
Program Management	10.5	10.8	11.1	11.4	11.7	12.0	**67.6**
Infrastructure Capital Spend	**$929.0**	**$1,710.2**	**$1,345.2**	**$1,486.9**	**$1,523.7**	**$1,503.4**	**$8,498.5**

Components of the Infrastructure Capital Plan

Normalized Replacement. Includes projects involving replacement of assets on a regular schedule to maintain components and facilities within lifecycle to sustain a state-of-good-repair (SOGR). The SOGR work advances near-term and long-term improvements that address critical state of good repair needs; improve the customer experience; ensure capacity for ridership growth; and leverage opportunities for financial efficiencies by progressing SOGR work in tandem with other major projects at these locations with one workforce mobilization.

Safety and Mandates. Includes projects focusing on ADA compliance that are generally required by law or regulation or to protect public health.

Major Backlog. Includes large projects necessary to return assets to a state-of-good repair that are not undertaken on a routine basis, such as rehabilitation or replacement of major assets. These projects may include improvement elements where in-kind replacement is impossible or undesirable.

Improvements. Includes projects that bring assets above and beyond existing conditions to improve reliability, increase capacity, reduce travel time, or improve the customer experience. Real estate acquisition costs for the Gateway Program are also included.

Environmental Remediation. Includes projects related to cleaning, remediation, wastewater treatment, abatement, and facility upgrades.

Program Management. Includes costs related to capital project and program management, as well as costs related to asset management.

Stations

The total forecast capital spend for the Stations Asset Line is $290.6 million in FY 2020 and $2.1 billion over the plan timeframe. Capital spend for normalized replacement includes $60.4 million in FY 2020 and $533.5 million over than plan period. Capital spend for safety and mandates includes $86.0 million in FY 2020 and $683.3 million over the plan timeframe. Capital spend for major backlog projects is $7.5 million in FY 2020 and $62.2 million for the plan period. Capital spend for improvements is $136.7 million in FY 2020 and $813.8 million over the plan period. A large portion of the capital investments are directed towards work at Amtrak's major stations at Baltimore, Philadelphia, Chicago, Washington, New York Penn, and Moynihan Station. Work at many stations and facilities falls within more than one of these categories.

STATION ASSET LINE CAPITAL SPEND, FY 2020-2025

($ in Millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Normalized Replacement	$60.4	$76.9	$79.4	$81.5	$124.7	$110.7	**$533.5**
Safety & Mandates	86.0	122.8	116.1	109.6	128.5	120.3	**683.3**
Major Backlog	7.5	20.4	16.0	6.0	6.1	6.3	**62.2**
Improvements	136.7	212.6	167.3	109.3	71.9	115.9	**813.8**
Stations Capital Spend	**$290.6**	**$432.6**	**$378.8**	**$306.3**	**$331.2**	**$353.2**	**$2,092.8**

Components of the Stations Capital Plan

Facilities. Includes projects involving replacement of assets on a regular schedule to maintain components and facilities within lifecycle to sustain a state-of-good-repair (SOGR). The SOGR work advances near-term and long-term improvements that address critical state of good repair needs; improve the customer experience; ensure capacity for ridership growth; and leverage opportunities for financial efficiencies by progressing SOGR work in tandem with other major projects at these locations with one workforce mobilization.

Safety and Mandates. Includes projects focusing on ADA compliance, platforms, and Passenger Information Systems (PIDS). These are projects generally required by law or regulation or to protect public health. Further information about Amtrak's ADA program is provided in the Stations Asset Line Appendix.

Major Backlog. Includes large projects necessary to return assets to a state-of-good repair that are not undertaken on a routine basis, such as rehabilitation or replacement of major assets. These projects may include improvement elements where in-kind replacement is impossible or undesirable.

Improvements. Includes projects that bring assets above and beyond existing conditions to improve reliability, increase capacity, reduce travel time, or improve the customer experience.

National Assets and Corporate Services

The total capital spend for the NACS asset line is $120.5 million in FY 2020 and $709.9 million over the plan timeframe. The largest component of the capital spend is for Corporate Services which includes $68.6 million in FY 2020 and $452.6 million over than plan period. Capital spend for Information Technology is $36.9 million in FY 2020 and $176.1 million for the plan period. Capital spend for Police and Emergency Management is $14.1 million in FY 2020 and $76.2 million for the plan period. Capital spend for Station & Facility Protection is $0.9 million in FY 2020 and $5.1 million over the plan period.

Because of its technology focus, NACS's plan has a more immediate focus compared to other lines, which may involve longer planning time frames. As such, there may be potential NACS project needs in the later years of the plan time frame that have not yet been identified, which may be updated in future plans.

CAPITAL SPEND FOR NATIONAL ASSETS AND CORPORATE SERVICES, FY 2020-2025

($ in Millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Information Technology (IT)	$36.9	$28.8	$27.6	$ 27.6	$27.6	$27.6	**$176.1**
Police and Emergency Management	14.1	11.8	12.1	12.4	12.7	13.0	**76.2**
Stations and Facility Protection	0.9	0.9	0.9	0.9	0.9	0.9	**5.1**
Corporate Services	68.6	73.8	82.2	82.3	80.3	65.4	**452.6**
NACS Capital Spend	**$120.5**	**$115.3**	**$122.8**	**$123.1**	**$121.4**	**$106.9**	**$709.9**

Components of the NACS Capital Plan

Information Technology. Includes projects providing cross-cutting benefits to Amtrak and improvements to systems and support, IT modernization, cyber security, and technology infrastructure.

Police and Emergency Management. Includes projects for infrastructure protection, station, and facility protection, and the RAILSAFE program.

Corporate Services. Primarily includes information technology in support of specific functions for Sales and Marketing, Operations, Customer Facing Technology, and Finance.

At right: Amtrak employee at the Chicago Control Center.

Key Highlights

Amtrak's five-year capital plan is largely driven by continued investments in our infrastructure and real estate state of good repair programs, fleet related overhauls and safety & reliability initiatives and building-out our capabilities for the new *Acela* trainsets, Stations Master Plans strategy, and advancing the Gateway program. Other spend includes continued technology enhancements, maintaining positive momentum for ADA compliance activities, and support activity for corporate security and Amtrak Police.

Infrastructure

For FY 2020-2025 our primary focus is addressing track and structures on the NEC. A summary of major program elements and the strategic initiatives addressed during this planning period are presented.

Track Program

Major track capital investments include the following:

Track Ballast. Perform work to progress the ballast assets towards a state of good repair. Examples of work performed under this program are replacement through spot undercutting, removal of mud-spots, system undercutting to improve track geometry and preserve ties and rail, and shoulder cleaning where total replacements are not needed.

Track Drainage. Renew and replace track drainage assets currently not in a state of good repair. If not corrected, poor drainage will result in slow orders and higher maintenance costs associated with the accelerated degradation of track geometry. Examples of work performed under this program include the utilization of the slot-train, the Badger ditcher, and conventional earth moving equipment to re-profile existing drainage ditches and establish new ones.

Tie Replacement Program. Utilization of Track Laying System (TLS) for the complete replacement of wood tie track with concrete cross ties and replacement of concrete ties that have been found to be defective or exceeded their useful life. This replacement program will reduce maintenance costs, potential slow orders and provide for an increase in on-time performance.

Timber Program. Replace crosstie and track timber along the NEC which will reduce train delays, track geometry degradation, FRA track defects, and switch failures. Examples of work performed under this program include the installation of timber underneath turnouts in yards and block tie replacement at specific locations.

Track Geometry. Surfacing, realignment and re-profiling of track surface as required to meet FRA Track Safety standards, maintain ride quality standards and extend the life of track components.

Track Turnouts. Replacement of standard wood turnouts and associated components not currently in a state of good repair. Associated components include frogs, switch points, and wood and concrete switch timbers and other Track turnout material.

Track Rail Replacement. Replacement of rail that is currently not in a state of good repair. Amtrak replaces an average of 35 miles of rail per year. Useful service life of rail has been exceeded once horizontal or vertical wear limits, internal defect rates, or surface conditions are approaching safety limits. This program will help to reduce maintenance costs and slow orders.

Insulated Joint Repair. Repair of defective rail ends to maintain the insulated rail joints.

Joint Elimination Program. Program replacement of joint elimination to improve operational performance.

Interlocking Renewal. Total renewal of the existing track structure within interlocking limits with new advanced technology; updates include repair or replacement of turnouts, concrete switch ties, movable point frogs, and switches. These interlocking renewal projects will move the railroad towards a state of good repair by eliminating failures and reducing maintenance costs.

Section Improvements. Section upgrade and improvement through replacement of track infrastructure to improve ride quality, increase speed and improve reliability.

Bridges and Buildings Program

Major Bridges and Buildings capital investments include the following:

Movable Bridges. Funding to progress Amtrak's movable bridges towards a state of good repair. Some of the bridges will be brought to a state of good repair through selective component replacement while others require complete replacement of movable structure, mechanical and electrical systems.

Undergrade Bridges. This program is to address undergrade bridges currently not in a state of good repair including conversion of open deck undergrade bridges to ballast deck for improved train performance. Some of the undergrade bridges can be brought to a state of good repair through selective component replacement and others will require complete replacement.

Culverts. A program aimed at rehabilitating or replacing culverts currently not in a state of good repair. Projects will improve the right of way drainage for improved reliability.

Bridge Timber Replacement. Replacement of bridge timbers. Replacement of aging and deteriorated timbers will address SOGR needs, improve safety, efficiency and operational reliability.

Tunnels. To progress tunnels towards a state of good repair. This will be accomplished primarily through component replacement or through complete replacement of the tunnel under extreme circumstances.

Transportation Facility Upgrades. Upgrades to Transportation Facilities to address SOGR needs, improve safety, efficiency and security.

Retaining Wall Replacement. Rehabilitation or replacement of retaining walls to address SOGR needs and backlog repair. Projects will improve safety and reliability.

Major Bridge Special Projects. Address major bridges currently not in a state of good repair for improved train performance, eliminating slow orders that Amtrak must impose when bridge components fail and disrupt the train traffic. While some of the major bridges can be brought to a state of good repair through selective component replacement, most will require complete replacement such as for the Portal Bridges. Two new Portal Bridges known as Portal North and Portal South will replace the obsolete 100-year old movable Portal Bridge over the Hackensack River between Kearny and Secaucus, New Jersey, expanding capacity from two to four tracks at one of the busiest points on the Northeast Corridor.

An Acela train crosses the Portal Bridge.

Key Highlights (Continued)

Electric Traction Program

Major Electric Traction capital investments include the following:

Catenary. The replacement and renewal of catenary wire, insulators and hardware currently not in a state of good repair. Elements of this program include not only replacement of components that are beyond their useful life, but also the replacement of wire that is beyond the allowable wear percentages.

Catenary Pole. Many of the catenary poles are over 90 years old and are beyond their designed service life. Replacement of the poles will provide physical support to the power transmission and catenary systems.

Transmission. The replacement of traction power transmission cable and associated hardware currently not in a state of good repair. Much of the existing cable has been in service for over 70 years and has far exceeded its useful life. Examples of work performed under this program include the design, purchase and installation of new solid dielectric cable, replacement of transmission lines, demolition of the existing duct bank and construction of a new duct bank, terminations, splices and testing of the new cable.

Substations and Frequency Converters. Improvements made to the electric traction and substations along the Northeast Corridor. Some examples of work performed under this program are: replacement of rotary traction power frequency converters, replacement or renewal of existing power machine, and renewal of substation components such as power transformers, circuit breakers and control cables. The reliable operation of these assets is critical to on-time performance.

Employee Arc Flash Protection. Assessment of the arc-flash requirements for Amtrak's Electric Traction system and the associated substations, converter stations and signal locations to determine minimum arc flash boundaries and the required personal protective equipment when entering/performing duties at these locations.

Signal Power Upgrades. Replacement and renewal of the existing rotary signal power machines that generate the 6,900 volts for the signal transmission lines. This equipment runs 24 hours a day, seven days a week, has many rotating parts and requires extensive maintenance. Another example of work provided under this program includes the upgrade of the open signal power wire to insulated cable at key locations.

Communications & Signals Program

Major Communications & Signals capital investments include the following:

ABS. ABS component failures have been identified as a major contributor to train delay. Signal upgrades will address SOGR needs and improve railroad safety, on-time performance and reliability for all users.

ACSES. ACSES is the PTC system used on the NEC. This program includes upgrades to Central Instrument House, radio transmission equipment and wayside interface units. For interoperability with freight carriers operating on the NEC, Amtrak will install I-ETMS overlay that will allow freight trains and some commuter trains to operate on the NEC without ACSES equipment. See the Positive Train Control section of this document for additional detail. ACSES was mandated by the FRA for high speed operation.

Interlocking – C&S. This program is to address interlocking signal system components not currently in a SOGR. Upgrade signal systems at interlockings to eliminate equipment failures and reduce maintenance costs. This program involves conversion of air switch machines to electric machines, automation of manual towers and replacement of obsolete interlocking signal-system components.

Grade Crossings. Upgrade highway crossing detection devices for more reliable operation of warning systems and enhance grade crossing system safety while reducing maintenance costs. Examples of work included under this program include the renewal of ties, rail, and crossing material at road crossings as well as concrete tie installation at grade crossings.

Centralized Electrification and Traffic Control (CETC). Replace centralized traffic control equipment in CETC locations with modern server-based systems. The existing locations do not have back-up capability. Server-based systems will allow for simplified back up in case of a disaster.

Radio Upgrades. With the conversion to FCC required narrow banding, radio coverage will become an issue as signal strength is restricted by bandwidth. Engineering work (including a coverage study) and design are needed to insure adequate coverage along the right of way. As a part of maintaining adequate radio coverage C&S will needs to add additional and replace the existing analog radio voters (quality signal selector) with state-of-the-art voters on the North East Corridor.

Comms Equipment Housing. Replacement of communication equipment houses to address SOGR needs. Procure and install new equipment houses and move existing equipment and cabling into new houses.

Infrastructure Initiatives and Improvements

While much of our infrastructure capital investment focuses on urgent SOGR backlog and normalized capital replacement, Amtrak is committed to infrastructure investments necessary to support the business in the near and long-term. The following sections provide examples of strategic initiatives and improvements which are currently being progressed during FY 2020 to FY 2025.

***Acela*: Next Generation High Speed Fleet Infrastructure.** This investment is necessary to run trains at maximum authorized speeds of 160 mph. Current surfacing methods are outdated and cannot be sustained on a true high-speed railroad. We plan to develop a Reference Surfacing Data Management System, undertake a baseline survey and purchase 3 sets of Surfacing Equipment. Each set will include a GPS-enabled tamper, a BMS, and a stabilizer. The expected result of this project is that maintenance practices will be reliable and repeatable. The time between tamping maintenance will increase and the wear and tear on track and vehicle components will decrease. This will result in desired track geometry and therefore higher ride quality and passenger comfort.

Delaware South Third Track. Construction of a third main track from Ragan interlocking to Brandy interlocking which will result in improved SEPTA on-time performance and increased service frequency south of Wilmington, DE. This will also allow for increased *Acela* service frequency and OTP.

Key Highlights (Continued)

Fitter Interlocking. Construction of a new, wired universal interlocking in Clinton, CT that would split the current 16-mile long block between Guilford and View interlockings. This would increase the flexibility of Shore Line East and Amtrak operations and enable Amtrak and SLE to expand services while reducing train conflicts and their resulting delays.

Veltri Interlocking – New England. Construction of a new interlocking that splits an 18-mile block between Groton interlocking and High Street interlocking. This will facilitate track outages to increase Engineering work efficiency and provide Engineering a location to test the new advanced technology 60 mph turnout design.

MBTA Territory of NEC. Construction of Readville to Route 128 track 3 extension to improve Amtrak and MBTA OTP as well as increasing line capacity.

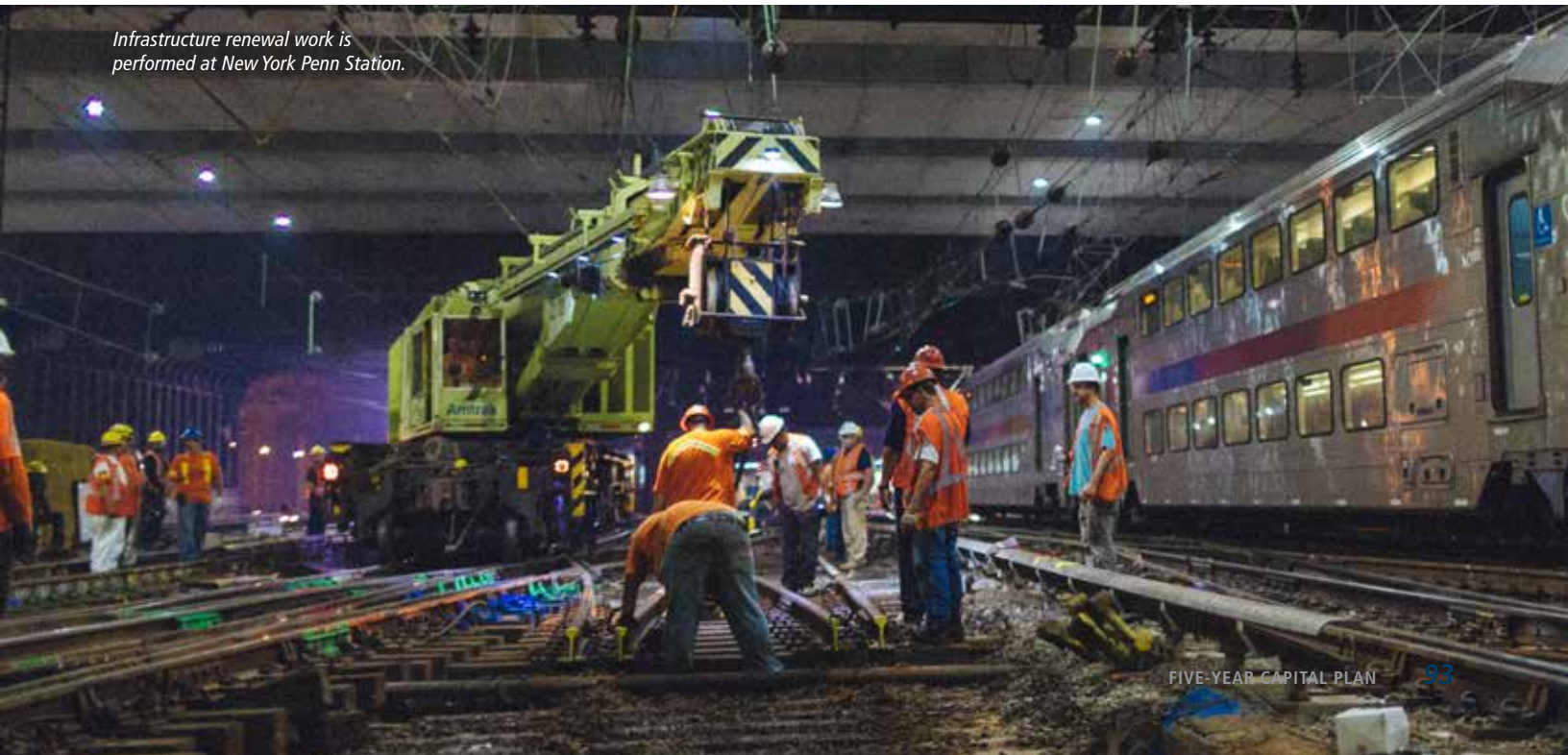
Holly Interlocking to Landlith Interlocking. Renewal of Landlith interlocking and re-configure Bell and Holly interlockings, resulting in reduction of delay minutes at 22% and beneficial to Amtrak, SEPTA and Delaware Transit Corporation

Reliability Maryland Section Improvements. Upgrade 30 miles of existing track 1 infrastructure and associated signal system upgrades for higher speed operations. This section of the NEC operates at or near capacity today and is not able to reliably absorb increases in service without additional infrastructure improvements. This project targets reductions in congestion-related delays and provides new overtake capacity between different classes of service (high-speed, conventional, and commuter), allowing the faster, high-speed trains to pass slower trains. These improvements, along with structural and operational changes, optimize use of this infrastructure and provide the necessary capacity to meet the Service Plan requirements.

BWI Station Signals Improvement. Improvements to the signal system around BWI station to improve capacity due to the station being located on the longest signal block on the NEC.

North Penn Interlocking to Clearfield Interlocking OTP and Speed Improvements. Re-configuration of North Penn interlocking through to Clearfield interlocking to improve connections, improve ride quality, reduce maintenance costs, reduce running time and provide on-time-performance benefits to Amtrak, SEPTA, NJ Transit.

Empire Corridor South – Albany Line (With Partners NYSDOTR and MNR). Institute a program of reference surfacing along the Albany line to improve ride quality, facilitate curve geometry improvements that could increase speeds and improve production efficiency. In addition, construction of Poughkeepsie terminal improvements that includes high capacity signal upgrades and higher speed turnouts to improve on-time-performance for both MNR and Amtrak services.



Infrastructure renewal work is performed at New York Penn Station.

Key Highlights (Continued)

Harrisburg Line. Institute a program of reference surfacing to improve ride quality, facilitate curve geometry improvements that could increase speeds and improve production efficiency. In addition, undertake interlocking improvements between Philadelphia and SEPTA Frazer yard, that results in improved speed and on-time performance of *Keystone* and inbound SEPTA services.

Springfield Line. Institute a program of reference surfacing to improve ride quality, facilitate curve geometry improvements that could increase speeds and improve production efficiency.

Michigan Line. Connecting sidings Kalamazoo to Niles, will result in Michigan west capacity enhancements to support improved state supported, *Wolverine*, *Blue Water* and Michigan high speed services.

Hudson Tunnel Project. Construction of a new two-track rail tunnel beneath the Hudson River and rehabilitation and modernization of the existing two-track North River Tunnel, which was inundated with corrosive salt water during Superstorm Sandy and continues to deteriorate without comprehensive rehabilitation. When complete, the project will provide increased reliability and operational flexibility for Amtrak and NJ Transit on the NEC. Additional funding is required for construction. The project has been accepted by the FTA into project development for its Capital Investment Grant program.

Hudson Yards - Phase 3. Construction of an underground concrete casing to protect the future potential right-of-way of a Hudson River rail tunnel that would connect the NEC in New Jersey to Penn Station, NY. The project extends west from 10th Avenue in Manhattan, under 11th Avenue, to its termination point at 30th Street in the vicinity of 12th Avenue. This project protects the only viable right-of-way for the future Hudson River rail tunnel that will connect the NEC in New Jersey to Penn Station, New York, which runs directly under the Hudson Yards development project, where a private developer is constructing millions of square feet of commercial and residential properties.

Portal North Bridge. Replacement of the century-old swing-span Portal Bridge over the Hackensack River with a new two-track, fixed-span bridge, allowing a modest expansion of capacity. Amtrak and NJ TRANSIT have completed final design and environmental review. The project has been accepted by the FTA into project development for its Capital Investment Grant - Core Capacity grant program but still requires funding for construction. The existing Portal Bridge is a major bottleneck and source of delay of train traffic. It has limited vertical clearance and must routinely be opened for maritime traffic. The bridge is functionally obsolete and experiences frequent mechanical failures, resulting in a single point-of-failure on the NEC and substantial delays.

Key Highlights (Continued)

New Jersey HSR Improvement Program. With $450 million in funding from the U.S. Department of Transportation, Amtrak is upgrading its rail infrastructure to support more frequent high-speed rail service and to improve the reliability of current service between New York and Washington. This will support faster, more reliable and more frequent service for all NEC users. Modern infrastructure will allow *Acela* services to reach 160 mph, their highest speed anywhere on the NEC.

East River Tunnel Rehabilitation. This project would rehabilitate East River Tunnel tubes 1 and 2 which connect Penn Station, NY to Queens, NY. Each tunnel is approximately 13,000 feet in length. Through this project, both tunnel tubes will be demolished down to the concrete liner and entirely rebuilt with new bench walls, communication systems, and modern electrical and signaling conduit. The tunnel renovations will also be designed to improve the safety and security (to the greatest extent practicable) in the tunnels. Some funding is available through FRA Superstorm Sandy recovery grants, but a significant funding gap remains.

Baltimore and Potomac (B&P) Tunnel Replacement. This project would replace the aging B&P Tunnel (circa 1873), a key chokepoint where the right-of-way is reduced from four to two tracks and the tunnel's tight curvature require trains to reduce speeds to 30 mph. Within the period covered by this plan the scope of works includes preliminary design and initiating construction.

Susquehanna River Bridge Replacement. In order to address SOGR and to increase capacity necessary for HSR services between Philadelphia and Washington, DC, this project would replace the existing two-track movable Susquehanna River Bridge with two modern high-level, fixed structures, each with two tracks. Within the period covered by this plan the scope of works includes completing final design and enabling projects and initiating construction.

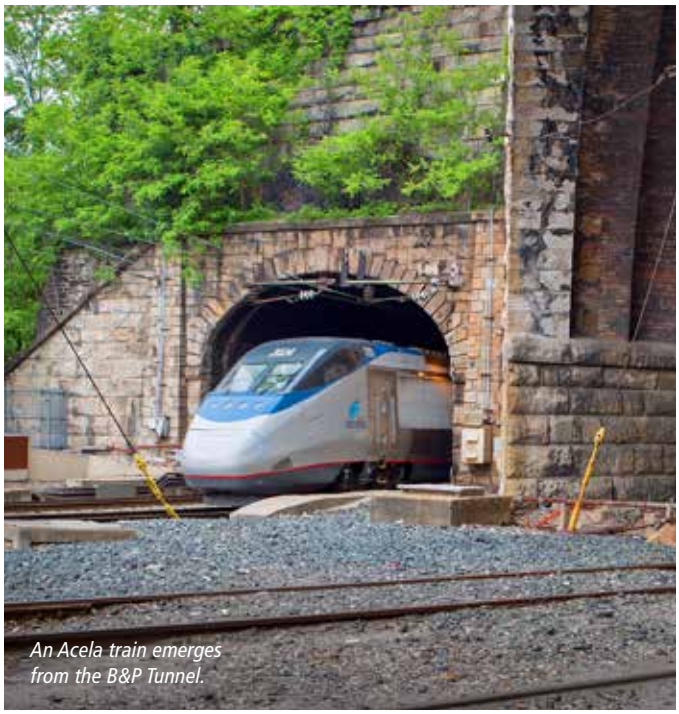
Connecticut River Bridge Replacement. This project would replace the Connecticut River Bridge between Old Saybrook and Old Lyme, CT that carries Amtrak and Shore Line East trains. FRA completed NEPA and issued a Finding of No Significant Impact (FONSI) for this project in January 2017. Preliminary design is underway. Within the period covered by this plan the scope of works includes completion of preliminary design and initiating construction.

Pelham Bay Bridge Replacement. This project would replace the over 100-year-old Pelham Bay Bridge which spans the Hutchinson River in New York. The current bridge is an outdated, lift style, moveable bridge that is required to open multiple times per day. The deteriorated overall condition restricts the speed of trains passing over the bridge.

Sawtooth Bridge Replacement. This project would replace the Sawtooth Bridge which allows the NEC to pass over the Hoboken Terminal lines. The replacement of Sawtooth bridge is one of the multiple bridge replacements under the scope of the Gateway Program.

Bush River Bridge Replacement. This project would replace the half-mile long Bush River Bridge connecting Edgewood and Perryman, Maryland. Within the period covered by this plan the scope of works includes completion of feasibility studies, conceptual design, preliminary engineering and NEPA work.

Gunpowder River Bridge Replacement. This project would replace the Gunpowder River Bridge, an approximately one-mile long crossing between Chase and Joppa, MD. Within the period covered by this plan the scope of works includes completion of feasibility studies, conceptual design, preliminary engineering and NEPA work.



An Acela train emerges from the B&P Tunnel.

Gateway Program

The Plan for the Gateway Program will advance the various Gateway Program project elements along their respective paths through planning, environmental review, design, contract packaging, procurement, and construction. The coming year includes the launch of preliminary engineering for two important projects, the Sawtooth Bridge Replacement Project and Harrison Fourth Track. As these projects get off the ground, Amtrak will continue to work with its Gateway Program Partners to position the two initial major projects—Hudson Tunnel and Portal North Bridge Projects—for construction readiness. The partners have submitted strengthened and updated financial plans for these two projects to the Federal Transit Administration (FTA). More information on the Gateway program is included in the Infrastructure Access Service Line plan, while individual Gateway projects are discussed in the preceding section on Infrastructure Initiatives and Improvements.

Fleet

Amtrak plans significant modernization of its railcar, locomotive and trainset fleets and related facilities in the next five years, along with continued capital renewal work (such as overhauls and refresh) as necessary on all existing fleet assets. Fleet investments include new rolling stock, locomotive and trainset acquisition initiatives, non-acquisition strategic initiatives and Amtrak's ongoing overhaul and rebuild program work.

New Rolling Stock Initiatives

Amtrak has a number of rolling stock initiatives planned for the FY 2020-2025 period, during which Amtrak currently forecasts some $3.3 billion in fleet replacement spend. These include:

Completion of the Viewliner II acquisition of long-distance single-level equipment. Amtrak anticipates receiving the last of its 130 Viewliner II long-distance single-level sleeping cars and baggage dormitory cars in FY 2020-2025; bringing an end to a much-delayed $300 million new railcar acquisition first announced in FY 2010; the majority of funds for which have already been expended. Route-specific deployments of sleeping and baggage dormitory cars will be announced as sufficient cars become available for capacity expansion and will enable Amtrak to provide additional sleeping car capacity on routes where the incremental revenue from added capacity can recover the additional cost of sleeping car operation.

New *Acela* Trainsets. Amtrak anticipates the FY 2021 commercial launch of the first of 28 new *Acela* trainsets to expand and modernize NEC premium service. Additional trainsets will allow Amtrak to both add approximately 25-30 percent more capacity to existing frequencies, but also to expand Boston-New York service frequency to hourly, and New York-Washington frequency to half hourly during peak business travel periods. The new trainsets feature modernized seating and amenities and are being funded through a $2.45 billion Railroad Rehabilitation and Investment Financing (RRIF) loan from the FRA. The loan will be repaid using the incremental net revenues generated through increased *Acela* ridership and ticket sales.

Artist's rendering of new Acela Avelia Liberty high-speed trainset.

Artist's rendering of the new Amtrak Siemens ALC-42 diesel locomotive, currently on order to replace existing diesel motive power on long-distance routes.

New ALC-42 Diesel Locomotives. Amtrak awarded a contract to Siemens in late CY 2018 for a base order of 75 new ALC-42 diesel locomotives. These units, based on the vendor's Charger platform with enhancements for winter operation, long-distance operation and reliability, are forecast to enter service starting in late CY 2021 and are intended primarily for use on long-distance routes, where they will replace aging and increasingly unreliable P-42 motive power. Amtrak has options for up to 100 additional ALC-42 locomotives, the execution of which will depend on the nature of Amtrak's long-distance route structure following the FY 2020 Reauthorization and the selection of a vendor product for Amfleet I Replacement Trainsets and dual power solution (see below). The total cost of the base order is $850 million, which includes the purchase price, warranty, technical support and spare parts through a multi-year Technical Services & Spares Supply Agreement (TSSSA). These units are being funded through a combination of our cash reserves and our National Network grant.

Amfleet I Replacement Trainsets / Initiation of Dual Power Operations on NEC/State Corridor Through Trains. In January 2019, Amtrak released a Request for Proposal (RFP) for a base order of 75 trainsets or their railcar equivalents to replace approximately 470 aging Amfleet I and ex-Metroliner railcars, plus five Talgo VI trainsets which have been operating in Amtrak Cascades service. Amtrak is evaluating both replacement of Amfleet, ex-*Metroliner* and Talgo VI passenger capacity and modernization of motive power as part of this procurement, including the ability to eliminate time-consuming engine changes for trains which operate through from the NEC to points outside of electrified territory. Vendor responses were received in November 2019 and are currently being evaluated by cross-functional Technical and Financial teams at Amtrak, with input from state partners. Amtrak anticipates a contract award in FY 2020. At this time, Amtrak anticipates a placeholder $2.0-2.6 billion for the acquisition cost of the equipment plus related motive power. This range will be narrowed down to a specific vendor price and timeline by contract award time and will be communicated to the FRA through the Amfleet I Replacement Trainset Business Case; the final figures will be included in future year Asset Line Plans. Funding for the trainsets will come from a variety of sources, including our own cash reserves, NEC operating surpluses (which can be reinvested for NEC capital uses, such as Northeast Regional fleet replacement), and state partner funding under the PRIIA 209 Equipment Capital Use Charge. Amtrak also collaborates with state partners on applications for Federal discretionary grants (such as Federal-State Partnership grants) for portions of the procurement.

Fleet Renewal/Modernization - Superliner and Amfleet II Long-Distance Routes. Amtrak also acknowledges the need to address aging Superliner and Amfleet II equipment used in long-distance service. Amtrak intends to explore options for addressing these fleets as a "next step" to fleet modernization following the award of a contract for Amfleet I replacement trainsets or railcar equivalents and related motive power. The scope and related funding need to modernize equipment on current Superliner and Amfleet II routes will depend on several outstanding factors, including the nature of Amtrak's long-distance route structure following the FY 2020 Reauthorization, the outcome of a Superliner Life-Extension Study currently underway, compatibility of chosen Amfleet I Replacement products with Amfleet II replacement needs, and the fleet plans for our California state partner who also owns a significant fleet of Superliner-compatible bilevel equipment.

The project costs mentioned in these initiatives exceed the $3.1 billion figure provided for fleet renewals over the FY 2020-2025 lifespan of this plan; the difference is due to the project totals described covering all project costs, including expenditures outside of the FY 2020-2025 window. For instance, nearly the entire $300 million Viewliner II acquisition was paid prior to FY 2020, furthermore, many Amfleet I replacement trainset payments, as well as Superliner and Amfleet II expenses, will be due beyond FY 2025. Most TSSSA-related costs for ALC-42 diesel locomotives will be spread throughout the lifespan of the TSSSA.

Non-Acquisition Strategic Initiatives

Amtrak has a number of other initiatives underway for fleet modernization which go beyond the acquisition of new equipment. These include:

Refresh of existing fleet. Amtrak has completed refresh of the 470-car Amfleet I and ex-*Metroliner* fleets as well as the 20 *Acela* Express trainsets, and is rapidly nearing completion of refresh for the 92-car Horizon fleet and 138-car Amfleet II railcar fleet. Amtrak is currently developing plans for a forthcoming refresh of Superliner and Viewliner equipment. As refresh primarily focuses on replacement of soft goods (seat cushions, carpets, etc.) and changes to the type of components which are already regularly replaced within a railcar (light fixtures, etc.), the incremental capital cost of refresh is not as high as many other fleet-related capital initiatives. Refresh expenses are included in the Other Train Capital section of Amtrak's Equipment Asset Line Financial Outlook, with some $27 million in forecast expenses during the FY 2020-2025 period.

Disposal of Units that have been Retired or are Wreck-Damaged Beyond Economic Repair. Amtrak has auctioned over 200 pieces of equipment it no longer operates in revenue service in FY 2019, earning a gross $4 million in residual revenue for the company. This disposal of equipment that has been retired or damaged beyond economic repair not only allowed for the realization of residual revenue, it reduced the rail yard footprint necessary to store equipment which no longer created value for the railroad while enabling Amtrak's Finance, Procurement and Mechanical teams to prepare for the upcoming retirements and necessary disposition of approximately 1,000 locomotives and railcars over the coming decade.

Facilities Modernization. Amtrak equipment maintenance is currently in transition from the historic practice of moving equipment to back shops every four years for heavy overhauls, to the modern practice of performing overhaul tasks on an ongoing basis at major terminals, with the back shop serving as the central facility from which new and rebuilt components are fabricated. To that end, the Beech Grove, Indiana facility is currently shifting its building utilization footprint, implementing cost-saving strategies identified by Amtrak's Inspector General. Over the next five years, work will also be completed on changes to *Acela* maintenance facilities in Boston, New York and Washington to support the new *Acela* trainsets, and work will also begin on any and all changes necessary to transition Amfleet maintenance facilities to maintain Amfleet replacement equipment instead. To this end, Amtrak has budgeted an ambitious $2.188 billion for facilities modernization between FY 2020 and FY 2025, over half of which ($1.319 billion) is dedicated towards new and retrofitted facilities for Amfleet replacement equipment. This figure will be adjusted pending the selection of a vendor and technology for Amfleet replacement equipment, once specific tooling, servicing, train length and storage requirements are known.

Ongoing overhaul and rebuild work

Despite the forthcoming fleet modernization changes, Amtrak will need to continue overhaul and rebuild work on the existing fleet for some time to come. Between FY 2020 and FY 2025 Amtrak plans to spend $1.35 billion on equipment overhauls, and $103 million on Lifecycle Preventive Maintenance programs for 2,298 overhauls (or equivalents) on existing Amfleet, Superliner, Viewliner, Horizon and P-40/P-42 locomotive fleets, although the annual totals for these figures taper downward by FY 2025 to reflect the forthcoming retirement of P-40/P-42 units. Further refinements to these overhaul schedules and budgets are possible in next year's Equipment Asset Line Plan as Amtrak finalizes a contract for Amfleet I replacement and can budget around a delivery schedule for new units/Amfleet retirements accordingly.

Impact of State-Owned Fleet Renewal

Amtrak's state partners are also underway with parallel efforts to modernize their respective owned and financed fleets. At this time some 137 Siemens single level cars and trainset units are currently under construction, for entry into service from FY 2021 on Amtrak routes throughout

the Midwest plus the *San Joaquins*. Deployment of the new equipment to these routes will allow for existing Amtrak equipment, such as refreshed Horizon cars, to be re-deployed to support growth in state corridor services elsewhere throughout the coming decade. Federal discretionary grant funding has been awarded to several state partners for additional fleet replacement initiatives, including Wisconsin, North Carolina, and Washington State.

In the more immediate term, Amtrak and the Washington state partner are working on the lease of Talgo 8 equipment which was originally intended for delivery to Wisconsin in the early 2010s for use on Amtrak Cascades service. The introduction of additional Talgo 8 trainsets in this corridor will allow Amtrak and Washington state to accelerate the retirements of Talgo VI trainsets. Imminent Talgo VI retirement is based on the National Transportation Safety Board (NTSB) recommendation that the FRA remove the car design waiver which allows the Talgo VI fleet to operate on Amtrak Cascades.

Acela Relaunch

FY 2020 is a pivotal year for the *Acela* trainset program. In FY 2020, trainset prototypes begin testing and engineering projects start construction. This testing will further inform the trainset delivery expectations and equipment transition planning. The *Acela* program includes several infrastructure projects associated with inspection, servicing, and storage of a new and augmented fleet: Facility Improvements, Safety, operating additional trains on the NEC (Maryland Section Improvements), and improving the customer experience (Ride Quality, Moynihan and Union Station Concourse). Much of this work will continue to progress, with several elements in construction during FY 2020.

The focus for FY 2020 will be advancing the testing and development of trainsets, key design and construction related work for Stations, Track & Ride Quality improvements, Safety activities, and IT development. Station improvements at four stations (Moynihan, Baltimore Penn, New Carrollton, and Washington Union Station) and at all three NEC Service and Inspection (S&I) Facilities. The plan also includes technology investments for Moynihan Train Hall network build-out and the new train sets (on-board info system, Wi-Fi, etc.) and integration into the existing infrastructure (enterprise asset management, safety, seat assignment, etc.).

Stations and Real Estate

Investments will provide numerous benefits to Amtrak and customers by modernizing and improving Amtrak's stations. The Stations Asset Line is focused on key initiatives at Amtrak stations including Amtrak's Major Stations and Customer Now initiatives, as well as stations components of the Acela 2021 program. The purpose of the Major Stations Master Planning and Development initiatives in New York, Baltimore, Philadelphia, Chicago, and Washington is to advance near-term and long-term improvements that address critical state of good repair needs, improve the customer experience, ensure capacity for ridership growth and leverage opportunities for commercial development of Amtrak-owned real estate assets at and near the stations. Within these projects, there are common risk themes such as master plan partner negotiations, Amtrak and partner funding and regulatory approvals (NEPA). Some projects associated with station major stations are included under normalized replacement and major backlog with additional work included in the customer now initiative.

New York Penn Station

New York Penn Station is the busiest rail station in America and by far the most important in Amtrak's national intercity network. Amtrak leases space in the station to the Long Island Rail Road (LIRR) and New Jersey Transit (NJT), two of the nation's busiest commuter rail systems for which Penn Station is also the most important station. Even with today's crowded conditions, Penn Station ridership is increasing and is projected to expand substantially by 2040. Increased passenger volumes will further stress the station's inadequate capacity on concourses and for customer circulation, retail and back-of-house facilities. Amtrak is continuing a series of short-term, customer-focused capital improvements at New York Penn Station; beginning the transformation of Penn Station facilities related to the relocation of major Amtrak passenger-facing and back-of-house services to the Moynihan Train Hall, opening in 2021. In early 2020, Amtrak in partnership with Metropolitan Transportation Authority (MTA) and NJT will launch a New York Penn Station Master Plan effort to re-envision the station in the long-term. Also longer-term, Penn Station must be expanded to provide additional tracks and platforms. The track and platform expansion for Penn Station is included in the Gateway Program's terminal expansion phase.

Philadelphia William H. Gray III 30th Street Station Master Plan Rendering

Baltimore Penn Station

The multi-year development and state of good repair program addresses critical structural and building system repairs (including roof and building envelope); improves the customer experience with improvements to amenities, better ADA access and security; ensure capacity for ridership growth; and facilitates development of Amtrak-owned real estate assets at and near the station. Amtrak executed an agreement with Penn Station Partners (PSP) in April 2019 as its master developer partner to implement the program. The scope of the master development project includes the creation of a master plan, critical state of good repair of the historic headhouse, commercial development of the upper vacant floors of the headhouse, station expansion needed to meet passenger growth, a mixed-use development of adjacent Amtrak-owned parcels, and ongoing life cycle and asset preservation maintenance of the headhouse and station expansion areas.


Baltimore Penn Station

Philadelphia William H. Gray 30th Street Station

The development and state of good repair program will improve the customer experience and make the station future-ready by addressing station modernization and infrastructure needs while facilitating redevelopment of valuable assets at the station, including the retail concourse and office towers. In June 2016, Amtrak completed a master plan known as the 30th Street Station District Plan which envisions station improvements that will double its capacity and improve station amenities and develop 10 million square feet at the station and above the adjacent rail yards. Amtrak initiated a search for a master developer partner to undertake redevelopment of the station in 2018 and is in the final stages of the procurement. The master development project includes Station modernization and SOGR improvements, ongoing life cycle and asset preservation maintenance of the station building, office redevelopment, retail renovation, and operations and maintenance (O&M) management as near-term priorities, with concourse expansion and plaza improvements as potential future phases. Amtrak anticipates selection of the Best Value Proposer in May 2020.

Chicago Union Station Master Plan

The purpose of the multi-year Chicago Union Station Master Plan program (Program) is to advance near-term improvements to address the most demanding of station capacity, accessibility, service, and safety issues. This Program is informed by the Chicago Union Station Master Plan led by Chicago Department of Transportation (CDOT) in 2012, and was developed further under the Master Plan Phase 1A work led by Amtrak, with support from CDOT, Metra, and the Regional Transportation Authority (RTA) (Project Partners) that has advanced design development and planning across a suite of projects. The Project Partners are currently working together to establish a cost-sharing methodology and to identify funding to complete final design.

Chicago Union Station Master Development

The Chicago Union Station Master Development scope of work includes execution of agreements with Amtrak's master developer partner, Riverside Investment & Development, LLC. (Riverside), and integration of the master developer plans with Master Plan and other projects within and adjacent to the station. The first phase sub-program is the redevelopment of the former Amtrak parking garage site, currently under construction. The value captured from the parking garage redevelopment has enabled Amtrak to partner with the City of Chicago to undertake a suite of Headhouse Concourse improvements, including a new entrance and façade restoration, interior restoration, new mezzanine and stairs, and the reactivation of the former Fred Harvey restaurant space into a Food Hall. Completion of these improvements is anticipated by late 2020.

Washington Union Station

The Washington Union Station 2nd Century Program (2nd Century Program) will improve state of good repair, increase passenger and rail capacity, improve the passenger experience to sustain a loyal, existing customer base and attract new riders, create a safe and secure facility for all users, and integrate a new air rights development above the rail terminal at Amtrak's second busiest station. In the near term (FY 2019 to FY 2026), the 2nd Century Program will redesign and expand passenger concourses, increase capacity, and improve operations in the station. Specifically, the near-term work will deliver a modernized and reconfigured concourse, improved station support spaces, as well as address key life safety issues. It will also advance construction of improvements to tracks and associated infrastructure and support facilities in the rail terminal.

In the longer term (FY 2026 and beyond), the 2nd Century Program will provide for new tracks and platforms integrated into an expanded station with development above to accommodate future demand and capture associated ticket revenues, while also addressing state of good repair, accessibility and life safety issues. Currently the long-term program is advancing the on-going Union Station Expansion Project Environmental Impact Statement (EIS) in coordination with the project sponsor, USRC, as well as related studies for the long-term expansion and reconstruction of the station.

Customer Now

The Customer Now initiative delivers station improvements that will enhance the customer experience at stations system-wide. The initiative consists of two programs: The Station Refresh Program, which is focused on the Top 25 Stations by ridership, and the Adopt-a-Station Program, which is focused on the Top 174 Stations by ridership. An overarching objective is to fund significant, near-term attainable projects that will deliver the greatest customer impact. Since the program is focused on near-term improvements, additional projects for future years may be identified on an ongoing basis and updated in future plans.

Information Technology

The Information Technology capital plan is apportioned across business units based on historical performance, capacity and customer demand, with projects fall into five technology themes, customer, employee, safety, train operations, and other creating a balanced and strategic portfolio supporting business goals.

Customer Technology

Omni Channel. Three projects related to deploying and enhancing Amtrak's booking engine, which is currently built on siloed legacy platforms. These projects deploy an integrated hybrid omni-channel platform for an efficient, reliable, cost effective, and seamless customer experience.

Customer Data Hub. Create a unified platform to collect, organize and leverage internal and external data for a single source of truth regarding customer profiles for marketing analytics, advertisement, segmentation and field service personnel.

Self-Service Kiosk. Design, procure and deploy the next generation ADA and PCI compliant kiosk for use in Amtrak stations nationwide.

CSI - Service Change Management. Create a single source-of-truth for service and event notifications. Continue to modernize our infrastructure to deliver relevant, timely and accurate pre-trip and en-route customer communications.

Customer Onboard Wi-Fi. Deliver reliable, high-performing Wi-Fi service across the customer journey on the NEC, building on several years of onboard Wi-Fi infrastructure upgrades.

Food & Beverage Enhancements. Three projects to deploy and enhance a state-of-the-art enterprise Food & Beverage Point-of-Sale system for café, lounge and dining cars, and a dynamic product selection engine to enable customers the to select and or order meals or food in advance of their trips. These projects improve the customer experience, reduce costs and provide decision analytics to optimize sales.

Key Highlights (Continued)

Employee Technology

Financial Timekeeping. A project to consolidate our timekeeping systems into a single commercial product that supports multiple needs, addresses inadequate controls in our system and retires outdated and unsupported technology.

Safety Technology

AWARE Alert Tool. Develop and deploy a mobile application that uses GPS location, speed, and speed tables to provide notification to onboard staff during train operations which will aid situational awareness on non-PTC-compliant tracks.

Safety Management System. Develop a cohesive enterprise safety management system (policies/processes/software) to achieve enterprise safety goals.

SPARTN Enhancements. SPARTN is the repository for Operational Test and Inspection (OTI) data, Train Safety Index Tier 2 (major operating rule violation) data, and conductor/engineer certification information. SPARTN Enhancements will deliver requirements that are critical to meeting regulatory requirements and improving functionality.

Mobile Document Delivery. Deploy an application to deliver federally required documentation to employees that allows supervisors to track employees' review of documentation, allows the Safety Compliance team to manage existing documentation, and enables Amtrak to maintain compliance with regulatory statutes.

Train Operations Technology

Maximo. Currently Amtrak uses an aging, highly-customized, unsupported EAM product with limited capabilities that do not meet our requirements. We have chosen Maximo as the EAM platform, with a multi-year enterprise rollout effort.

iLMS. Four projects that implement, support and enhance a flexible, rules-based enterprise labor management solution to replace the existing aging Labor Management System—a new platform solution that integrates with Amtrak's SAP modules.

Additional Funding Needs

Additional funding needs beyond what are included in Amtrak's constrained five-year capital plan are outlined in Amtrak's General and Legislative Annual Report & Fiscal Year 2021 Grant Request. The additional funding needs includes a list of projects that could advance if additional funding were made available.

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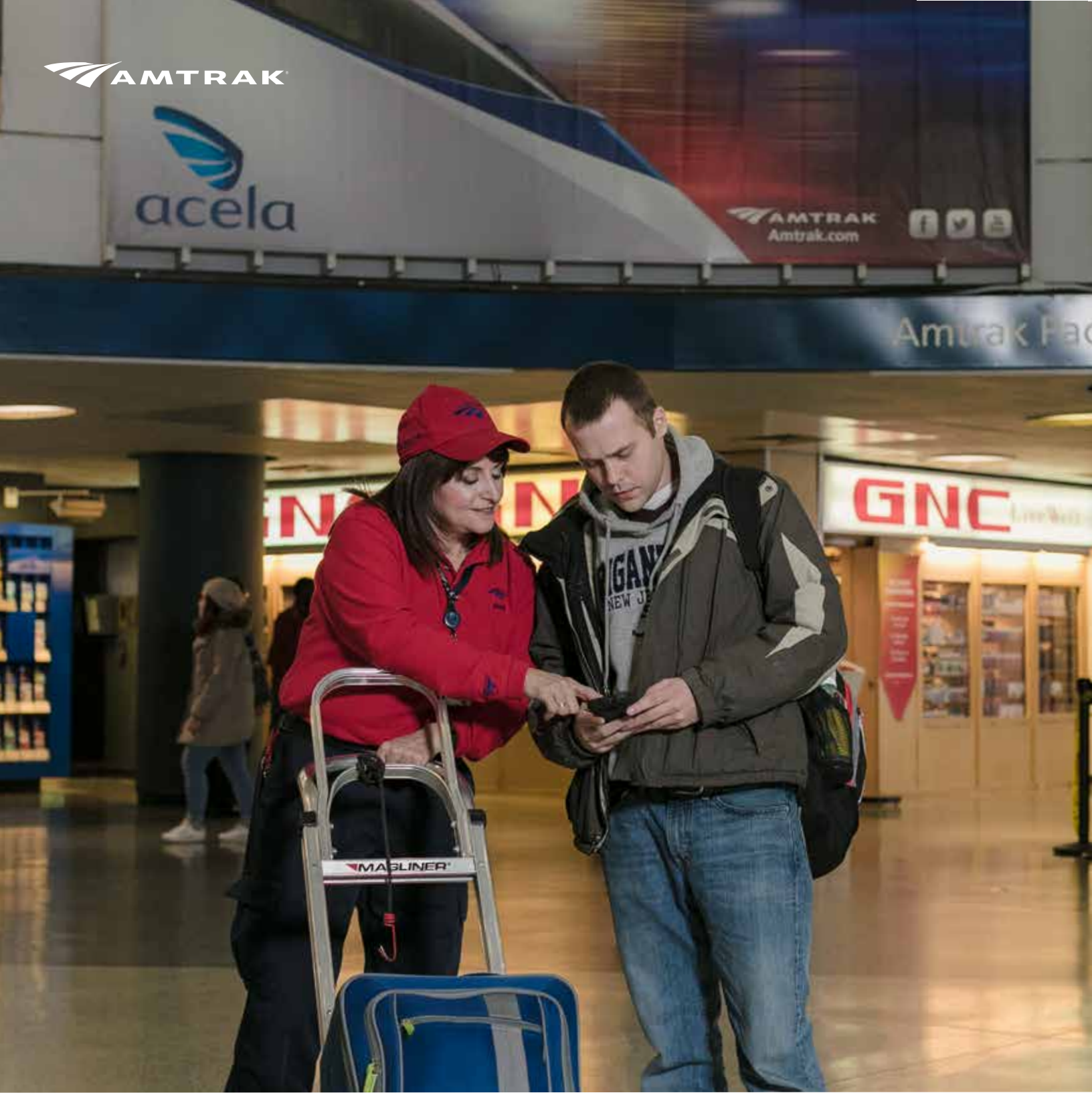

Financial Uses Tables

Financial Uses Tables

Equipment Asset Line Financial Uses (FY 2020–FY 2025)

($s in Thousands)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2020-2025
Financial Uses (Operating):							
Terminal Yard Operations	36,199	37,587	38,714	39,876	41,072	42,304	235,753
Car & Locomotive Maintenance and Turnaround	528,686	515,170	532,558	561,880	594,891	622,832	3,356,017
MOE Supervision Training and Overhead (Less Backshops)	63,964	91,835	93,223	94,631	96,060	97,511	537,225
Yard Operations - Mechanical Support	38,857	39,804	41,014	42,260	43,543	44,866	250,343
Mechanical Backshops	18,571	18,175	18,474	18,779	19,087	19,401	112,487
On Board Passenger Technology	5,996	6,086	6,177	6,270	6,364	6,459	37,352
Fleet Strategy	1,327	1,321	6,341	21,361	36,382	41,402	108,135
Total Operating Uses	**693,602**	**709,977**	**736,501**	**785,056**	**837,400**	**874,775**	**4,637,312**
Financial Uses (Debt Service Payments):							
Debt Service (Legacy & RRIF)	168,308	171,138	155,408	217,327	151,288	150,792	1,014,262
Total Debt Service Payments	**168,308**	**171,138**	**155,408**	**217,327**	**151,288**	**150,792**	**1,014,262**
Overhauls	261,383	272,351	237,910	204,247	200,500	173,751	1,350,142
New/Replacement Equipment	507,911	710,222	845,334	492,813	441,547	279,003	3,276,831
Facilities	84,816	312,503	367,779	454,865	333,206	634,419	2,187,589
LCPM	28,794	22,510	16,608	13,871	11,199	9,172	102,154
Other Train Capital	10,860	7,280	4,700	2,500	2,000	-	27,340
Total Capital Uses	**893,764**	**1,324,866**	**1,472,332**	**1,168,297**	**988,453**	**1,096,344**	**6,944,056**
Total Equipment Spend	**$1,755,675**	**$2,205,981**	**$2,364,241**	**$2,170,680**	**$1,977,140**	**$2,121,912**	**$12,595,630**

Financial Uses Tables (Continued)

Transportation Asset Line Financial Uses (FY 2020–FY 2025)

($s in Thousands)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2020-2025
Financial Uses (Operating):							
Service Line Management	27,695	27,370	27,870	27,870	27,870	27,870	166,544
Train and Engine Crew Labor	444,925	433,218	450,308	471,522	492,676	510,461	2,803,109
On Board Service Labor	171,420	175,919	181,844	188,553	197,284	206,278	1,121,298
T&E Overhead and Operations Management	100,391	94,383	95,892	97,424	98,978	100,556	587,623
Commissary Operations	104,669	106,102	110,296	120,300	123,132	124,480	688,978
Connecting Motor Coach	41,912	42,541	43,179	43,827	44,484	45,151	261,093
Host RR, MOW and Performance Incentives	144,038	146,198	148,391	155,617	157,976	160,371	912,592
Dispatching	45,906	46,875	47,578	48,292	49,016	49,752	287,420
Fuel and Power	230,313	248,938	268,074	279,701	290,616	305,903	1,623,545
Commissions	1,448	1,470	1,492	1,514	1,537	1,560	9,020
Passenger Inconvenience & Claims	18,495	18,773	19,054	19,340	19,630	19,925	115,218
Total Operating Uses	**1,331,213**	**1,341,786**	**1,393,977**	**1,453,959**	**1,503,199**	**1,552,306**	**8,576,440**
Financial Uses (Debt Service Payments):							
Debt Service (Legacy & RRIF)	1,229	1,250	1,135	1,587	1,105	1,101	7,406
Total Debt Service Payments	**1,229**	**1,250**	**1,135**	**1,587**	**1,105**	**1,101**	**7,406**
Service Line Management	22,503	13,103	-	-	-	-	35,606
Technology & Systems	40,546	35,762	34,349	31,442	33,938	34,037	210,074
Facilities	41,291	21,542	19,291	16,953	13,094	13,372	125,542
Operations Equipment	8,911	7,475	7,688	7,906	8,131	8,335	48,446
Total Capital Uses	**113,251**	**77,881**	**61,327**	**56,302**	**55,164**	**55,743**	**419,669**
Total Transportation Spend	**$1,445,692**	**$1,420,917**	**$1,456,439**	**$1,511,848**	**$1,559,468**	**$1,609,150**	**$9,003,514**

Infrastructure Asset Line Financial Uses (FY 2020–FY 2025)

($s in Thousands)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2020-2025
Financial Uses (Operating):							
Maintenance of Way	298,470	307,259	313,848	323,480	328,478	333,566	1,905,101
Engineering Management Support	53,647	54,303	55,118	55,945	56,784	57,635	333,432
Total Operating Uses	**352,117**	**361,562**	**368,966**	**379,424**	**385,261**	**391,201**	**2,238,532**
Financial Uses (Debt Service Payments):							
Debt Service (Legacy & RRIF)	23,044	23,431	21,278	29,755	20,714	20,646	138,868
Total Debt Service Payments	**23,044**	**23,431**	**21,278**	**29,755**	**20,714**	**20,646**	**138,868**
Normalized Replacement	509,278	634,849	604,939	637,953	615,074	592,976	3,595,067
Safety & Mandates	46,029	55,957	5,829	5,937	6,049	4,663	124,464
Major Backlog	50,639	69,753	104,663	232,762	372,286	464,774	1,294,877
Improvements	294,947	922,165	601,217	588,000	508,497	421,688	3,336,514
Environmental Remediation	17,603	16,700	17,450	10,800	10,100	7,300	79,953
Program Management	10,500	10,798	11,103	11,418	11,742	12,036	67,597
Total Capital Uses	**928,996**	**1,710,221**	**1,345,200**	**1,486,871**	**1,523,748**	**1,503,436**	**8,498,472**
Total Infrastructure Spend	**$1,304,157**	**$2,095,214**	**$1,735,444**	**$1,896,050**	**$1,929,723**	**$1,915,283**	**$10,875,871**

Financial Uses Tables (Continued)

Stations Asset Line Financial Uses (FY 2020–FY 2025)

($s in Thousands)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2020-2025
Financial Uses (Operating):							
Station Staffing	168,485	172,900	178,148	183,553	189,120	194,854	1,087,059
Station Facility Operations	79,270	80,422	81,629	82,853	84,096	85,357	493,627
Total Operating Uses	**247,755**	**253,323**	**259,776**	**266,406**	**273,215**	**280,211**	**1,580,686**
Financial Uses (Debt Service Payments):							
Debt Service (Legacy & RRIF)	13,794	14,026	12,737	17,811	12,399	12,358	83,126
Total Debt Service Payments	**13,794**	**14,026**	**12,737**	**17,811**	**12,399**	**12,358**	**83,126**
Normalized Replacement	60,377	76,872	79,382	81,486	124,681	110,704	533,503
Safety & Mandates	86,000	122,783	116,094	109,557	128,520	120,349	683,302
Major Backlog	7,534	20,372	15,989	5,959	6,108	6,261	62,224
Improvements	136,717	212,587	167,318	109,334	71,922	115,923	813,800
Total Capital Uses	**290,628**	**432,613**	**378,783**	**306,336**	**331,232**	**353,237**	**2,092,829**
Total Station Spend	**$552,177**	**$699,962**	**$651,296**	**$590,554**	**$616,846**	**$645,806**	**$3,756,641**

NACS Asset Line Financial Uses (FY 2020–FY 2025)

($s in Thousands)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2020-2025
Financial Uses (Operating):							
Regional/Local Police	51,425	53,395	54,997	56,647	58,347	60,097	334,909
National Police and Safety	26,056	26,460	31,857	37,260	52,669	53,084	227,387
Non-Passenger Claims	10,300	10,455	10,611	10,770	10,932	11,096	64,164
Information Technology (IT)	186,062	185,711	185,315	183,064	179,599	180,915	1,100,666
Training and Training Centers	17,098	20,122	22,579	28,240	42,905	43,173	174,117
Insurance	100,340	98,845	100,372	101,923	103,497	105,094	610,071
Environmental	9,187	9,207	9,345	9,485	9,628	9,772	56,624
Real Estate & Lease Costs	-	21,200	14,100	13,050	13,407	13,771	75,528
Reservations & Call Centers	58,808	57,956	58,855	59,768	60,695	61,635	357,717
Corporate Operations	336,783	326,960	351,857	376,834	388,941	395,343	2,176,719
Total Operating Uses	**796,059**	**810,311**	**839,890**	**877,043**	**920,619**	**933,980**	**5,177,903**
Financial Uses (Debt Service Payments):							
Debt Service (Legacy & RRIF)	-	-	-	-	-	-	-
Total Debt Service Payments	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Information Technology (IT)	36,855	28,800	27,600	27,600	27,600	27,600	176,055
Infrastructure protection	14,106	11,814	12,109	12,412	12,722	13,040	76,204
Station & Facility protection	850	850	850	850	850	850	5,100
Corporate Operations	68,638	73,786	82,230	82,250	80,250	65,400	452,554
Total Capital Uses	**120,449**	**115,250**	**122,789**	**123,112**	**121,422**	**106,890**	**709,913**
Total National Assets & Corporate Services Spend	**$916,509**	**$925,561**	**$962,679**	**$1,000,155**	**$1,042,041**	**$1,040,871**	**$5,887,816**

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