

CHAPTER 4

Implementation Plan





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4. Implementation Plan

4.1. Asset Management

HRT is a Tier 1 agency in the Commonwealth and has developed its own Transit Asset Management (TAM) Plan. Adopted in August 2018, it is based on the HRT's asset inventory and condition assessments through May 2018. The TAM Plan's overarching purpose is to guide HRT in maintaining its assets in a state of good repair as well as developing a timeline and process for replacing those assets that are past their useful lifespans. The elements of the TAM plan are established by the Federal Transit Administration. The TAM Plan must include an asset inventory, a condition assessment of each of those assets, an analytic decision process or tools to prioritize and estimate capital needs, TAM and state of good repair policies, an implementation plan, a list of activities that occur in each year of the plan's horizon timeline, a list of resources required to carry out the TAM plan, and a description of how the TAM plan will be monitored and updated over time.¹ HRT's TAM plan will be reviewed and updated at least every four years to ensure that the asset inventory is accurate and that an attainable asset replacement schedule is being implemented.

According to the 2018 TAM Plan, HRT has over 5,600 individual assets. An asset is defined as being a revenue vehicle, a non-revenue vehicle or a support vehicle worth \$50,000 in acquisition value; a facility or facility component including integral facility equipment worth more than \$10,000; or bus, light rail, and/or ferry passenger amenities.

4.1.1. Fleet Policies

HRT's revenue fleet includes buses, light rail vehicles, ferries, and paratransit vehicles. HRT uses the Transit Economic Requirements Model (TERM) to assess the condition of non-facility assets such as revenue fleet vehicles. Through this process, each asset is assigned a numerical value from five (representing an asset in excellent or near new condition) to one (representing an asset that is past the end of its useful life and in need of prioritized replacement or repair). An asset receiving a score of 2.5 or less is considered to be past the end of its useful life.²

Revenue Fleet

As outlined in the agency's Fleet Plan from the FY 2021 Capital Improvement Plan, HRT aims to replace its 29-foot buses after 12 years of service and larger buses after 14 years of service. Due to the lead time associated with procurement, this means HRT needs to initiate procurement at 10 or 12 years respectively. The agency conducts mid-life repowers after six to seven years of service to improve vehicle reliability in the second half of its useful life. HRT updates its fleet plan each year as part of the agency's Capital Improvement Plan (CIP), which includes a replacement and rehabilitation schedule. This plan will lower the average age of the revenue fleet over time, prolong the life of its vehicle assets, and improve service reliability. HRT targets a 20 percent spare ratio for its fleet.

HRT strives to achieve an optimum fleet mix based on ridership and the required number of vehicles and vehicle size for each route and regularly reassessed needs based on changes to service and demand. HRT assesses the appropriate vehicle size by route by determining the number of seats that are available on each route and the number of passengers that utilize them. The vehicle size is determined by percentage of seats to passengers.

HRT aims to replace the paratransit vehicles it directly owns after four years of service or 100,000 miles.

HRT's light rail and ferry boat fleet have useful lives beyond the timeframe of the TSP. Starting in FY 2022, HRT will initiate its mid-life overhauls of light rail trains. The overhaul process will be spread over seven years to ensure HRT has a suitable light rail fleet availability. Ferries also undergo major overhauls during their life, however HRT recently purchased two new ferry vessels, so the ferries are not in need of major overhauls during the timeframe of this TSP.

¹ 49 CFR 625.25 Parts C and D

² While asset conditions are integers, condition assessments can be combined to yield fractional, weighted average values.

Non-Revenue Fleet

HRT's Fleet Plan from the FY 2021 Capital Improvement Plan uses a useful life benchmark for non-revenue fleet vehicles of between 85,000 and 110,000 miles depending on vehicle type. The agency has several vehicles beyond their useful life and the Capital Implementation Plan outlines a schedule for replacing non-revenue vehicles over the next ten years. In replacing non-revenue vehicles, HRT prioritizes replacing any vehicles critical for service delivery such as vehicles for field supervisors and bus maintenance.

4.1.2. Facilities

HRT has developed a Facility Asset Management Plan and maintains a set of Facilities Maintenance Policies and Procedures for achieving a state of good repair on its facility assets. The mission of Facility Maintenance is to "Affect a high-quality agency-wide infrastructure that is safe, functional, attractive, clean, sustainable, and sensitive the needs of [HRT's] customers". These policies outline procedures for:

- Reporting and managing facility maintenance work orders
- Centralizing and coordinating the acquisition of all furniture and the modification of HRT facilities
- Conducting required preventative maintenance in accordance with manufacturers recommendations and other regulatory requirements on facility assets.

Since 2016 the agency has been conducting annual condition assessments on all HRT facility assets. The primary purpose of this assessment is to identify existing and expected asset deficiencies that need to be addressed and funded, notably over the next 10 years. For longer-term needs, HRT relies on its TERM Lite database to forecast facility investment needs over a 20-year timeframe.

HRT's Facilities Asset Management Plan identifies a specific target service life, rehabilitation policy, and maintenance policy for each major facility type and their components. The rehabilitation and replacement of facility assets is regularly assessed based on observed physical asset conditions. The useful life of major asset types are outlined in **Table 4-1**. The Facility Asset Management Plan provides additional detail by asset type and component, including maintenance schedules.

Table 4-1: Useful Life by Asset Type

Asset Type	Useful Life
Buildings/ Renovation	10-50 years
Bus shelters & Signs	5-20 years
Shop & garage equipment	10-30 years
Security Equipment/Surveillances Equipment	3-10 years
Furniture & fixtures	3-7 years
Computer equipment	3-5 years
Money room equipment	10 years
Radio/Communication Equipment	3-8 Years
Ferry Docks	20-40 Years
Bridges	10-75 Years

Administrative and Operating Facilities

HRT owns seven operations and maintenance facilities, one administration facility, and two operator restrooms.³ Of these facilities, only one maintenance facility, the Virginia Beach Trolley Base (Parks Avenue facility), had a condition assessment score of two or less, indicating the facility is due for refurbishment or replacement. HRT

³ In addition to these facilities, HRT leases one facility.

utilizes its TERM Lite database to identify future facility maintenance needs. To determine future needs, the agency looks at both existing condition as well as building useful life.

HRT's Facility Asset Management Plan details the useful life of facility assets. HRT's useful life benchmarks for buildings is between 40 and 50 years, however many individual components within the interior and exterior of buildings have shorter useful lives. Major rehabilitation projects for buildings should be planned every 10 to 15 years to ensure fixtures, flooring, walls, ceilings, and mechanical systems are in a state of good repair.

Passenger Facilities, Infrastructure, and Amenities Policies

HRT's TAM Plan lists three park and ride lots, four transit centers, four ferry docks, eleven light rail stations, and five light rail bridges in the asset inventory, along with individual passenger amenity bus stops. All of these facilities have a current condition rating of three or better (as of May 2020).

HRT's Facility Asset Management Plan and Passenger Amenities Policy outlines procedures for the installation, maintenance and replacement of passenger facilities and amenities. Maintenance procedures and useful life benchmarks for components of transit centers mirrors that of HRT's operations and administrative facilities. Passenger facilities such as light rail stations and bus transfer stations are subject to different useful life benchmarks based on the assets that exist at specific locations. For example, light rail stations have a benchmark of 40-50 years for major components like platforms, elevators, and stair towers. Other station components such as shelter and benches require more frequent replacement depending on asset.

HRT determines the appropriate level of investment in passenger amenities based on a location's daily boardings, service type (e.g. fixed-guideway) and the number of routes serviced. Transit stops with greater than 25 boardings a day are candidates for enhanced amenities such as benches and trash cans. Bus shelters are prioritized for locations with 40 or more boardings a day. Transfer centers are locations with between five and nine connecting routes and are often located off of the public right of way and are candidates for restrooms, landscaping, lighting, and signage in addition to bus stop amenities like shelters and seating. Transit centers are implemented only at locations with ten or more connecting routes and may feature fully enclosed spaces with indoor seating, air conditioning, passenger information areas, and restrooms, among other features.

4.1.3. Non-Facility Assets Policies

HRT plans to refurbish and replace non-facility assets based on the useful life of these assets as well as their condition. Non-facility assets are defined in the TAM Plan as those assets that were not included in the onsite facility inspections conducted during the development of the TAM Plan. These include facilities-related equipment, storage yard, guideway, structures, and communications, electrification, and revenue collection systems. The results show that 80 percent of HRT's non-facility assets are in adequate or better condition (by replacement value), with vehicle assets comprising the majority of non-facility assets in less than adequate condition based on age in relation to useful life.

4.1.4. Technology and ITS Policies (Verify with Technology)

HRT aims to replace its ITS and technology assets when they are no longer supported by the vendor, they come to the end of their useful life, and/or the technology no longer integrates with other related systems. HRT's most recent TAM Plan does not include a full inventory of technology assets. Compared to other asset classes like vehicles and facilities, technology assets need more frequent replacement. Technology obsolescence, changing requirements, lack of vendor support, and wear and tear all impact the frequency of replacement. Much of the hardware and software HRT relies on requires replacement every four to six years.

4.2. Capital Implementation Plan

4.2.1. Background

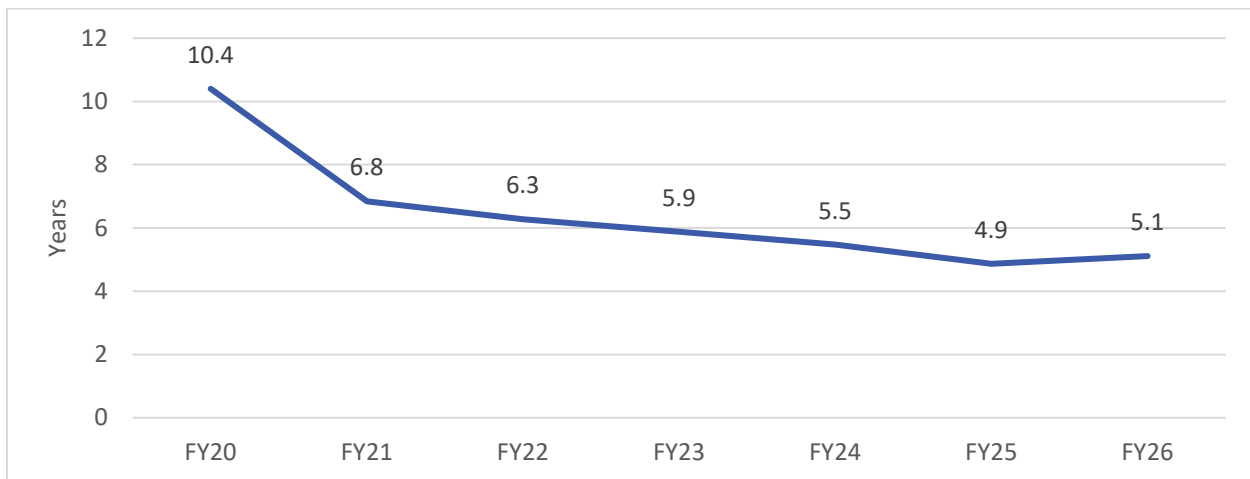
From buses and buildings to technology and transit centers, HRT relies on a wide range of capital assets to support daily operations. To help plan for and prioritize capital needs, every year the agency prepares a six-year Capital Improvement Plan (CIP). The most recent CIP covers the years FY 2021 to FY 2026 and was endorsed by the TDCHR in December 2019. The CIP is fiscally constrained and developed collaboratively across the agency’s departments. Capital needs are prioritized based on metrics falling into four criteria: service delivery, operational efficiency, state of good repair, and risk reduction.

The Capital Implementation Plan outlines the capital investments necessary to maintain HRT’s existing assets and implement the fiscally constrained recommendations outlined in **Chapter 3**. The TSP covers a 10-year time frame, compared to six years for the agency’s annual CIP. The approved CIP remains the basis of the Capital Implementation Plan, notably the list of short- and mid-term investments. For the years beyond FY 2026, this implementation plan outlines any additional investments, such as fleet replacements, needed to implement or maintain the service recommendations in **Chapter 3**. HRT expects to further refine its capital needs as part of its annual CIP process. The financial model in **Chapter 5** projects expenses and revenue for Years 7 to 10 and beyond, which are beyond the SYIP and the CIP horizon, based on averages in line with previous years.

4.2.2. Revenue Fleet

HRT’s revenue fleet has an average age of 10.4 years, shown in **Figure 4-1**. The agency is currently in the midst of a major bus fleet overhaul and expects its average fleet age to decline substantially over the next four years.

Figure 4-1: Average Bus Age



For the operations and services over the 10 years outlined in **Chapter 3**, which do not include improvements under the Hampton Roads Regional Transit Program documented in **Chapter 6**, HRT plans to replace 172 buses, conduct mid-life repowers on 242 buses, and expand the fleet by 17 vehicles (**Table 4-2**). A large portion of HRT’s fleet is over eight years old today, and the agency will need to replace the majority of its buses over the next four years. This wave of replacements will be followed by substantial repower needs as buses reach their mid-life six years later.

In line with the increase in peak vehicle needs that are linked to the improvements detailed in **Chapter 3**, HRT has programmed 17 expansion buses in FY 2025 and FY 2026 in its constrained CIP. These 17 vehicles are intended to meet the TSP recommendations and spare-ratio requirements. As operating funds have yet to be identified for the TSP’s long-term recommendations (that is, under the phased and constrained 10-year plan in **Chapter 3**), the proposed fleet expansion will be reevaluated under HRT’s annual capital planning process. HRT’s existing operating facilities in Norfolk and Hampton are sufficient to accommodate the proposed increase in fleet size in the

constrained plan. Moreover, HRT plans to replace its Parks Avenue garage in Virginia Beach with a larger facility, further expanding HRT's fleet capacity.

Table 4-2: Number of Planned Replacement, Expansion and Repowers by Year

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Replace	30	27	22	22	15	8	0	33	2	13
Expansion	-	-	-	-	5	12	-	-	-	-
Repower	14	7	34	-	1	28	79	30	27	22

In addition to buses, HRT will need to procure 158 new paratransit vehicles over the next 10 years to maintain its existing fleet (**Table 4-3**). These replacements are intended to keep the fleet in a state of good repair and will not result in an increase in fleet size.

Table 4-3: Paratransit Replacement Schedule

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Replacement	14	-	-	-	65	13	1	-	-	65

4.2.3. Non-Revenue Fleet

HRT's non-revenue fleet consists of the support vehicles necessary for keeping the transit system running. For capital planning purposes, the fleet is divided into seven categories:

- General Administration
- Light Rail
- Bus Operations
- Bus Maintenance
- Facilities
- Radio-Revenue
- Safety

The six-year CIP identified funding for all classes of non-revenue vehicles except for General Administration. These 85 vehicles include commercial vehicles, trucks, and passenger cars (**Table 4-4**). The agency can meet General Administration needs in the short-term by re-assigning retired vehicles to administrative functions.

Table 4-4: Non-Revenue Fleet Replacement Needs

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Unfunded										
General Administration	15	2	0	0	1	0	0	1	2	4
Funded										
Light Rail	0	12	0	1	2	0	1	4	1	5
Bus Operations	17	0	0	0	0	0	0	6	2	1
Bus Maintenance	5	0	0	0	1	0	1	3	1	1
Facilities	1	0	0	0	1	0	0	1	0	0
Radio-Revenue			6	0	0	0	0	2	1	0
Safety		1	5	0	0	0	0	1	2	0
Funded Sub-Total	23	13	11	1	4	0	2	17	7	7

4.2.4. Operations and Maintenance Facilities

Funded Investments

HRT has identified funding in the constrained CIP for five operating and maintenance facility projects over the next 10 years. All these projects maintain or replace an existing facility and are needed to support the current system. The recommendations in **Chapter 3** do not impact these needs; no additional facilities would be needed to accommodate the cost-constrained recommendations in the TSP. All the projects, with the exception of the Norfolk Transit Center Foundation Repairs, will be initiated in the next three years.

- **Hampton Facility Renovation:** HRT is undertaking the final phase of renovations at its 3400 Victoria Boulevard facility in Hampton. These renovations are upgrading the administrative and maintenance spaces. The project is fully funded in FY 2021.
- **18th Street GFI Vault Relocation:** This project will relocate the loading lanes and vault for revenue fare collection at the 18th Street facility in Norfolk. The relocation will improve the flow of vehicles through the space and eliminate conflicts with the nearby bus wash. The project is funded in FY 2021.
- **Gate Replacement Program:** The gates securing HRT's operating facilities need replacement. The project is funded in FY 2021.
- **Parks Avenue Replacement:** The relocation and replacement of the Virginia Beach garage at Parks Avenue is the largest facility investment included in HRT's constrained capital plan. The existing facility only operates during the peak season and does not provide adequate space for vehicle storage and maintenance. The new facility would allow HRT to permanently house some of its fleet in Virginia Beach, reducing the need for lengthy deadheading to Norfolk. HRT plans to initiate planning and design for the facility in FY 2021 and would like to commence the construction phase of work by FY 2024.
- **Norfolk Tide Facility (NTF) Foundation Repair:** The foundation at the NTF is suffering from ground subsistence. HRT anticipates it will need to repair the foundation over the next six years. Funding for repair work is programmed in FY 2024.

Unfunded Facility Projects

HRT's Capital Improvement Plan includes five unfunded operations and maintenance facility projects. These facilities would expand the capabilities of HRT but are not needed to implement any particular TSP recommendations.

4.2.5. Passenger Facilities, Infrastructure, and Amenities

The TSP recommendations do not require any new investments in passenger facilities, infrastructure, and amenities beyond what is already planned for in HRT's annual capital plan. The agency has allocated funding toward five critical passenger facilities projects. With the exception of Newport News Transit Center and Hampton Transit Center, the remaining projects are expected to be completed in the mid-term (FY 2024 to FY 2026).

- **Newport News and Hampton Transit Center:** These two facilities are the main hubs for transit service on HRT's Northside. Utilizing SmartScale funding, the two facilities are undergoing a park and ride expansion. Additional funding is allocated to simultaneously implement state-of-good repair investments. HRT would like to accelerate planned renovations of these facilities to coincide with the SmartScale funded work in FY 2021.
- **Robert Hall Transfer Center Replacement:** This project would replace the Robert Hall Transfer with a new facility that will function as a hub for bus service in Chesapeake. Funding is assigned to this project in FY 2025.
- **Wards Corner Transfer Center Replacement:** This project will replace the Wards Corner facility as the transfer center reaches the end of its useful life. While the project is scheduled in the CIP to be initiated in FY 2022, the building is still in good repair and the agency plans to move back replacement of the facility to FY 2026 in the next annual capital plan.
- **Evelyn T. Butts Transfer Center:** Evelyn T. Butts is one of HRT's busiest transfer locations, however the current on-street facility is poorly located and has limited passenger amenities. The agency has assigned funding in FY 2024 to begin planning for its replacement, with full construction funded by FY 2026.

In addition to transfer center projects, HRT plans to continue applying for Federal Transportation Alternatives Program (TAP) funding to support investment in bus stop amenities and ADA access. Finally, HRT has several capital projects related to the maintenance of Tide Light Rail right-of-way and stations. These projects are scheduled to be funded and completed based on asset condition and recommended useful life.

Unfunded Needs

HRT has several passenger facility and amenity projects that are not funded within the FY 2021 to FY 2026 timeframe. None of the TSP recommendations are contingent on these long-term investments but these projects would enhance the experience for HRT's riders. The agency is continuing to explore ways to fund these investments. These projects include:

- Renovations and upgrades at the **Silverleaf, Reon Drive, and Greenbrier Mall**, passenger facilities/park and rides.
- Construction of a new transfer center at **Warwick and Elmhurst** and a replacement/relocation of **Net Center**.
- Expansion of HRT's **Bus Stop Amenity Program**.
- Installation of **Passenger Information Displays** at Light Rail stations and major bus transfer centers

4.2.6. Technology and ITS

HRT has several IT investments planned, including upgrades to passenger-facing and back-end technology. These investments are needed independent of the TSP recommendations but would be critical in supporting the implementation of new services. Most of the major IT investments are slated to occur over the next three years. Mid- and long-term investments are focused on upgrading and replacing existing software and hardware systems as they reach the end of their useful life. These projects include:

- Implement **Mobile Fare Payment** across the system in FY 2021 - FY 2022.
- Initiate planned upgrades of **Human Services Software** in FY 2021.
- Upgrade **Automatic Passenger Counters** on HRT's Light Rail fleet and backend systems in FY 2021.
- Replacement of **Video Recording Equipment** aboard HRT buses and trains in FY 2021 and FY 2022.
- Upgrading **HASTUS**, HRT's scheduling software, to the latest version in FY 2022.
- Replace **CAD/AVL** equipment systemwide by FY 2022. These onboard systems allow HRT to track the location of its vehicles and are necessary for providing accurate real-time arrival information to passengers.
- Complete upgrades of HRT's **Large Technology Infrastructure** and **Mobile and Network Hardware** such as fiber optic cables, switches, and servers. These investments are necessary to support future technology improvements and keep pace with growing bandwidth needs at the agency. The project is funded in FY 2022.
- Upgrade the agencies **Audio Monitoring System** used to monitor activity in HRT's control rooms and customer service phone line. Project funded in FY 2022.
- Implement a **Transportation Statistics Database** (funded in FY 2024) for streamlined reporting of performance data within the agency and to State and Federal partners.
- Procure a **Bus Operator Driving Simulator** to assist with driver training by FY 2024.
- Upgrade systems providing **real-time bus arrival information** to customers by FY 2025.
- Conduct additional routine upgrades to software and hardware systems at recommended intervals (typically every four or five years).

Unfunded Needs

There are several technology investments that remain unfunded in HRT's Capital Plan. While HRT is continuing to pursue additional funding opportunities, without additional revenue, these investments will not occur until sometime after FY 2026. They include:

- Replacement of **Ticket Vending Machines** systemwide.
- Implementation of an emergency **Mass Notification System**.
- Investment in a replacement **Time Collection** system for HRT staff.

- Funding for a **Technology Planning Initiative** that would allow HRT to dedicate resources toward investigating and planning for technological innovations.

4.2.7. Light Rail Infrastructure

HRT has planned investments for the Tide Light Rail in each of the next 10 years. These investments will maintain light rail in a state of good repair. Planned investments include:

- State-of-good-repair investments in light rail systems, vehicles, radio, and SCADA infrastructure (FY 2021).
- Embed tracks at HRT's Norfolk Tide Operating Facility in FY 2021.
- LRT light rail vehicle overhauls (FY 2022 to FY 2029).
- Initiate final upgrades to SCADA system for LRT by FY 2022.
- Purchase two V-plows for Light Rail winter maintenance (FY 2023).
- Upgrade the LRT operations control center emergency power source system in FY 2023.
- Fund state-of-good repair maintenance to the Smith Creek Bridge in FY 2023.
- Replace the LRT systems wayside advance warning system in FY 2023.
- Initiate 15-year renovations of LRT stations by FY 2025.