Hampton Roads Transit

Southside Facility Economic Analysis

January 2025

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EXECUTIVE SUMMARY

Hampton Roads Transit (HRT) is investing in a new Southside Bus Operating Facility (Southside Facility) in Virginia Beach that will enable service improvements that are made possible and funded by the Hampton Roads Regional Transit Fund (HRRTF). The Southside Facility will be a state-of-the-art vehicle repair and maintenance facility that can accommodate up to 100 buses and 16 seasonal trolleys. The Southside Facility is crucial for the implementation of HRT's Regional Transit System (RTS), an initiative that will implement 15-minute peak service on 13 routes (referred to as the Regional Backbone) as well as the Metro Area Express (MAX) and Peninsula Commuter Service (PCS) routes. The Regional Backbone, MAX, and PCS routes are branded under the 757 Express umbrella. Together, the capital investment in the Southside Facility and the service improvements that depend on the new facility, will make significant economic contributions to the Hampton Roads region.

The Southside Facility will replace HRT's existing Parks Avenue Maintenance Facility. The Parks Avenue Maintenance Facility is at capacity and cannot accommodate standard bus maintenance functions, with only enough space for trolley fleet maintenance at present. The new Southside Facility will provide needed operating capacity and will improve the efficiency of HRT's operations by reducing the need for routes operating in Virginia Beach and parts of Chesapeake to travel (outside revenue hours) back to HRT's existing facility (18th Street garage) in Norfolk. Table 1-1

Methodology

The Analysis incorporates an economic benefits assessment and economic impact analysis to capture the economic impacts of the Southside Facility and associated service improvements for HRT riders and the wider Hampton Roads region. The economic benefits assessment includes a cost analysis to compare the anticipated benefits of the Project with the associated Project costs, providing a comprehensive overview of the Project's overall return on investment.

The economic benefits assessment is conducted using the U.S. Department of Transportation's (USDOT) Benefit-Cost Analysis Guidance for Discretionary Grant Programs (BCA Guidance), updated in November 2024, as a guide for preferred methods and monetized values. The benefits are expressed in constant 2024 dollars, which avoids forecasting future inflation and escalating future values for benefits and costs accordingly. The economic benefits assessment represents the benefits following the implementation of the Project over a 20-year analysis period, between the first full opening calendar year of 2030 to 2049.

The economic impact analysis uses multipliers from the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System II (RIMS II). Economic impact analyses,

also known as input-output analyses, assess the interdependencies between different sectors of the economy by measuring the effect of a change in spending on employment and earnings.

Economic Benefits Findings

The Southside Facility and associated service improvements will deliver economic benefits through improved safety, emissions avoided, travel time savings, reductions in the marginal external costs of pavement wear maintenance, congestion, and noise pollution, improved trip reliability, and operating cost savings for HRT. Table ES- 1 summarizes the benefits resulting from the implementation of the Project. The associated benefits would amount to $475.4 million over the analysis period.

Table ES- 1: Summary of Economic Benefits

Economic Benefits Summary	Nominal Value (2024$, millions)
Safety	
Reduced Pedestrian and Cyclist Crashes - Injuries and Fatalities	$19.9
Reduced Car Crashes - Property Damage	$4.4
Reduced Car Crashes - Injuries and Fatalities	$135.8
Subtotal	**$160.1**
Environmental Sustainability	
Car Air Pollution Benefits	$6.9
CO2 emissions avoided	$45.4
Subtotal	**$52.3**
Quality of Life	
Reduced Noise Pollution	$0.8
Subtotal	**$0.8**
Economic Competitiveness and Opportunity	
Reduced Congestion	$59.6
Travel Time - Current Riders	$92.5
Travel Time - New Riders	$114.7
Avoided Operating Costs - Deadhead Miles	$17.5
and Facility Repair Costs Avoided	$29.6
Value of a trip not taken	$64.8
Subtotal	**$378.7**
State of Good Repair	
Reduced VMTs - Road Maintenance Costs	$12.5
Reduced VMTs - Vehicle Operating Costs	$235.1
Subtotal	**$247.6**
Total Benefits	**$839.5**
Operations and Maintenance Costs - service expansion (disbenefit)	($364.1)
Total Net Benefits	**$475.4**

HRT will invest $135.7 million into the construction of the Southside Facility. After accounting for the future effects of inflation, the benefit-cost ratio for the Project is 2.2. This can be translated as every $1 spent on the Project, HRT and its partner cities would see a $2.20 return in benefits.

Economic Impact Analysis Findings

The economic impact analysis for this Project measures the increase in jobs and earnings associated with the short-term capital investment to construct the Southside Facility and long-term operations investments to sustain the enhanced service improvements. The Analysis further includes a long-term economic impact analysis associated with the improved business productivity and transportation cost savings for households and the economic impacts of tourist additional spending that is directly attributed to the Project.

The construction of the Southside Facility and associated service improvements will support the increase of jobs and earnings in the Virginia Beach–Chesapeake–Norfolk, VA-NC, metropolitan area. In total, the construction, operations and maintenance, and user benefits associated with the Project would result in 1,350 short-term jobs and 11,150 long-term jobs. These jobs would generate $81.9 million in short-term earnings and $514.2 million in long-term earnings. Table ES- 2 summarizes the total economic impacts generated by the Project.

Table ES- 2: Total Economic Impacts Generated by the Project

Industry	Employment Impacts (Job-Years)			Earnings Impacts (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Short-Term Employment and Earnings Impact						
Construction of Southside Facility	1,120	630	490	$65.5	$40.3	$25.2
Professional Services for Construction of Southside Facility	230	110	120	$16.4	$10.4	$6.0
Total	**1,350**	**740**	**610**	**$81.9**	**$50.7**	**$31.2**
Long-Term Employment and Earnings Impact						
Long-Term Operations and Maintenance Activities at Southside Facility	5,180	3,210	1,970	$250.8	$149.6	$101.2
Improved Business Productivity from Transportation Improvements	830	490	330	$41.0	$24.3	$16.7
Additional Household Disposable Income from Transportation Improvements	3,720	-	-	$169.8	-	-
Tourist Spending from Transportation Improvements	1,420	980	440	$52.6	$31.6	$21.0
Total	**11,150**	**4,680**	**2,740**	**$514.2**	**$205.5**	**$138.9**

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

Conclusion

The Southside Facility and associated service improvements would lead to travel time savings and a reduction in vehicle miles traveled, which bring a host of additional benefits including vehicle operating cost savings, emissions reductions, and a reduction in the marginal social cost of pavement wear, congestion, and noise pollution. For every $1 spent on the Project, HRT and its partner cities would see a $2.20 return in benefits.

Further, the construction of the Southside Facility would create jobs for the Virginia Beach–Chesapeake–Norfolk, VA-NC, metropolitan area, resulting in:

- 1,350 short-term jobs and $81.9 million in earnings impacts
- 5,180 long-term jobs and $250.8 million (2024) in earnings impacts

The associated service improvements would increase household disposable income and business productivity for the HRT service area, resulting in:

- 4,550 long-term jobs and $210.8 million in earnings impacts

Tourist spending associated with the service improvements would increase spending in businesses in the HRT service area, resulting in:

- 1,420 long-term jobs and $52.6 million in earnings impacts

1 INTRODUCTION

Public transportation plays a vital role in enhancing access to employment opportunities, improving community connectivity, and facilitating mobility for both residents and visitors, thereby providing essential services to the regions it serves. According to the American Public Transportation Association (APTA), increased investments in public transportation can deliver significant economic benefits both resulting from the short-term stimulus impact of public transportation expenditures and from the cumulative impact of improved economic productivity (APTA, 2020).[1] Transportation investments that result in reductions of vehicle hours traveled (VHT) and vehicle miles traveled (VMT) deliver an array of economic benefits, including safety benefits, travel time savings, emissions avoided, reductions in the social cost of congestion, pavement wear, and noise pollution, and vehicle operating costs (VOC) avoided.

Hampton Roads Transit (HRT) is investing in a new Southside Bus Operating Facility (Southside Facility) in Virginia Beach that will enable service improvements that are made possible and funded by the Hampton Roads Regional Transit Fund (HRRTF). Together, the capital investment in the Southside Facility and the service improvements that depend on the new facility will make significant economic contributions to the Hampton Roads region. According to the HRT Transit Strategic Plan for FY2025-2034 (HRT TSP FY25-FY34), by Fiscal Year (FY) 2034, HRT's bus system will operate 35 percent more revenue hours than currently offered and achieve a 32 percent increase in annual ridership over 2019.[2] This increase in service and resulting ridership growth is contingent upon the new Southside Facility.

This Southside Facility Economic Analysis (Analysis) examines the following:

- The economic (user) benefits associated with the expanded bus operations of HRT's new Southside Bus Operating Facility in Virginia Beach and the associated economic impacts.
- The economic impacts of construction and operations and maintenance of the Southside Facility and the associated increase in service.
- The economic impacts of increased tourist spending from the expanded bus operations that are supported by HRT's new Southside Bus Operating Facility in Virginia Beach.

[1] APTA. Economic Impact of Public Transit. Retrieved https://www.apta.com/wp-content/uploads/APTA-Economic-Impact-Public-Transit-2020.pdf.
[2] Hampton Roads Transit. FY2025 to FY2034 Transit Strategic Plan. December 2023. Retrieved https://gohrt.com/wp-content/uploads/2024/07/Final-FY25-FY34-TSP_AllChapters.pdf.

1.1 Hampton Roads Transit Context

The HRT service area covers 438-square miles and is of composed six member cities: Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Virginia Beach. The James River divides the service area; the service area south of the James River is referred to as the Southside and consists of Chesapeake, Norfolk, Portsmouth, and Virginia Beach. The service area north of the James River consists of Hampton and Newport News, which is referred to as the Northside or Peninsula (Peninsula).

HRT provides five primary transit services:

- Bus (including local, limited-stop, regional express, and seasonal bus (trolley)
- Light rail
- Passenger ferry
- Demand response paratransit
- Transportation demand management vanpools

HRT currently operates out of four facilities:

- Northside Facility in Hampton (bus operations, maintenance, and administration)
- Southside Facility in Norfolk (bus operations, maintenance, and administration)
- Norfolk Tide Facility in Norfolk (light rail maintenance and operations)
- Virginia Beach Trolley Facility (seasonal trolley base)

HRT Bus Service
34 local fixed routes
757 Express Umbrella, including:

- 13 Regional Backbone Routes
- 10 Metro Area Express
- 5 Peninsula Commuter Service Routes

HRT operates 34 routes of local fixed-route service, which includes 22 routes on the Southside and 12 routes on the Peninsula (HRT TSP FY25-FY34). Further, HRT operates the 757 Express service, a regional bus service with 13 Regional Backbone routes traveling across jurisdictions (HRT TSP FY25-FY34). The 757 Express umbrella also includes 10 commuter routes that were formerly known as Metro Area Express (MAX) and the five Peninsula Commuter Service (PCS) routes (HRT TSP FY25-FY34). The PCS is a limited stop bus service that serves major employers on the Peninsula.

1.2 Hampton Roads Regional Transit Program

The Virginia General Assembly passed legislation that requires the establishment of the Hampton Roads Regional Transit Program (HRRTP) to define and supply resources for the development, operating, and capital needs for both expansion and state of good repair of reliable regional transit operations (HRT TSP FY25-FY34). The goal of the HRRTP is “to provide a modern, safe, and efficient core network of transit services across the Hampton Roads region (HRT TSP FY25-FY34).”

The HRRTP defines the operating side of the Program as the Regional Transit System (RTS), which includes the 13 Regional Backbone routes as well as the MAX and PCS services, branded under the 757 Express umbrella. In addition to authorizing the Program, the new Code of Virginia Section § 33.2-2600.1 also establishes the Hampton Roads Regional Transit Fund to provide capital and operating funding necessary to support HRT's Regional Backbone network of bus services (HRT TSP FY25-FY34).

The Regional Backbone, the core of the RTS, includes 13 routes that traverse major commuting corridors that connect the highest densities of people and jobs in the region and feature more direct service than other route classifications, making them simple to understand and more efficiency, saving travel time and operating costs compared to more circuitous routes. These routes serve key employment centers, educational institutions, medical facilities, military installations, and other key businesses. Outlined in the HRT TSP FY25-FY34, which the Transportation District Commission of Hampton Roads (TDCHR) adopted in June 2020, the 13 Regional Backbone routes will have increased service frequencies and expanded spans of service which will be standardized across the region. The Southside Facility will support service enhancements for 11 routes; 10 of the 13Table 1-1 Regional Backbone routes, as displayed in Table 1-1, which also lists the jurisdictions they serve under existing and planned service improvements and Route 960. The Analysis refers to these routes as the Southside Facility routes.

Table 1-1: Summary of the Routes Dispatched from the Southside Facility

Service Classification	Route	Jurisdictions	
		Existing	Planned
Regional Backbone	1	Norfolk, Virginia Beach	Norfolk
Regional Backbone	2	Norfolk	Norfolk
Regional Backbone	3	Norfolk	Norfolk
Regional Backbone	8	Norfolk	Norfolk
Regional Backbone	15	Chesapeake, Norfolk, Virginia Beach	Chesapeake, Norfolk, Virginia Beach
Regional Backbone*	20	Norfolk, Virginia Beach	Norfolk, Virginia Beach
Regional Backbone	21	Norfolk	Norfolk
Regional Backbone	36	Virginia Beach	Virginia Beach
Regional Backbone	45	Norfolk, Portsmouth	Suffolk, Chesapeake, Norfolk, Portsmouth
Regional Backbone	47	Suffolk, Portsmouth	Suffolk, Portsmouth
Limited/ Express	960	Norfolk, Virginia Beach	Norfolk, Virginia Beach

Notes: Service improvements to Route 20 have been implemented. The Regional Backbone includes Routes 101, 112, and 114. Because these are Peninsula Routes, they are not included in this analysis.

HRT began the implementation of improvements of the Regional Backbone routes in FY 2023. Due to the current shortage of operator availability, HRT is implementing non-weekday and non-peak improvements gradually. Service improvements to all Regional

Backbone routes will be implemented by FY 2033. Table 1-2 displays the Regional Backbone service design standards. The increased service frequency will result in reduced headways (the time between buses arriving at a stop) and associated travel time savings.

Table 1-2: Regional Backbone Service Design Standards

Service Headway			Span of Service	
Weekday	Peak	6:00 am - 9:00 am 3:00 pm - 6:00 pm	15 minutes	5:00 am - 1:00 am
	Midday	9:00 am - 3:00 pm	30 minutes	
	Evening	6:00 pm - 9:00 pm	30 minutes	
Weekend	Base	8:00 am - 6:00 pm	30 minutes	6:00 am - 12:00 am
	Non-base	6:00 am - 8:00 am 6:00 pm - 9:00 pm	30 minutes	

1.3 Project Understanding

HRT is constructing the Southside Facility, a state-of-the-art vehicle operation and maintenance facility to maintain and store HRT's fleet of buses and trolleys for the RTS program. The new facility will accommodate up to of 100 buses and 16 seasonal trolleys.

The Project will replace HRT's Parks Avenue Maintenance Facility. Opened in 1984, the Parks Avenue Maintenance Facility is approaching the end of its useful life (Hampton Roads Transit, 2023).[3] In addition, The Parks Avenue Maintenance Facility is at capacity and cannot accommodate standard bus maintenance functions, having enough space for trolley fleet maintenance only.

The Project will provide needed operating capacity and improve the efficiency of HRT's operations by reducing the need for routes operating in Virginia Beach and parts of Chesapeake to travel (outside revenue hours) back to HRT's existing Southside Facility (18th Street garage) in Norfolk. This is referred to as deadhead miles.

The Project is anticipated to be completed by calendar year 2029; with 2030 being the first full year of operations.

2 ECONOMIC ANALYSIS FRAMEWORK

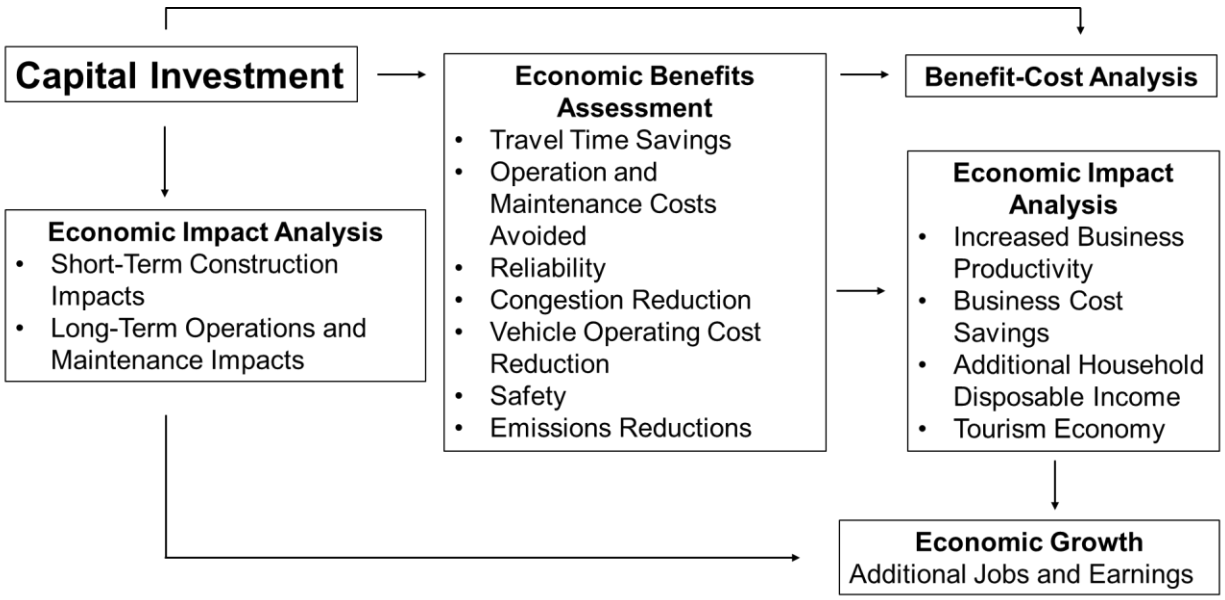
This economic analysis includes an economic benefits assessment and economic impact analysis. The economic benefits assessment includes a cost analysis to compare the anticipated benefits of the Project with the associated Project costs, providing a comprehensive overview of the Project's overall return on investment. An

[3] Hampton Roads Transit, Hampton Roads Transit receives $25 million for new Southside Bus Operating Facility, 2023. Retrieved https://gohrt.com/2023/06/hampton-roads-transit-receives-25-million-for-new-southside-bus-operating-facility/#:~:text=Hampton%20Roads%20Transit%20receives%20%2425%20million%20for%20new%20Southside%20Bus%20Operating%20Facility,-Norfolk%2C%20VA%20%E2%80%93%20Today

economic impact analyses, also known as input-output analyses, assess the interdependencies between different sectors of the economy by measuring the effect of a change in spending on employment and earnings.

The economic benefits assessment was conducted using the U.S. Department of Transportation's (USDOT) Benefit-Cost Analysis Guidance for Discretionary Grant Programs (BCA Guidance), updated in November 2024, as a guide for preferred methods and monetized values. The economic impact analysis used multipliers from the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System II (RIMS II). Figure 1 outlines the economic analysis framework, demonstrating the transportation benefits and economic linkages associated with the Project.

Figure 1: Economic Analysis Framework



To assess the economic benefits and impacts of the Project, the theoretical baseline condition, where the Project does not exist is defined and is compared to the 'build' condition, where the Project is implemented. The baseline and build conditions are defined below.

2.1 Baseline Condition

The baseline condition assumes the Project will not be constructed and that HRT would continue to operate as it does in the current condition. As a result, HRT would not have the storage and maintenance capacity to implement the expanded RTS services.

2.2 Build Condition

Under the build condition, HRT would be able to operate 100 buses and 16 seasonal trolleys from the new Southside Facility in Virginia Beach. The Project will allow for the implementation of the RTS, expanding bus frequencies during peak hours, connecting

major commuting corridors leading to travel time savings, operating cost savings, and wider societal and environmental benefits associated in the Hampton Roads region. The location of the new facility would reduce deadhead bus miles by 91,000 annually. The Project is critical to support service enhancements for the following 11 routes: Routes 1, 2, 3, 8, 15, 20, 21, 36, 45, 47, and 960 (all but 960 are Regional Backbone).

3 RIDERSHIP FORECASTS

Ridership forecasts for the impacted RTS bus routes were developed as part of the HRT TSP FY 2025-2034.[4] This change in ridership and corresponding change in Vehicle Miles of Travel (VMT) and Vehicle Hours of Travel (VHT) forms the basis of the economic benefits assessment. The HRT TSP FY25-FY34 uses route-level observed ridership data from 2019 to forecast ridership to 2033. Because the analysis period of this study extends to 2049, beyond the 2033 forecasted ridership, a compounded annual growth rate (CAGR) between 2019 to 2033 was used to extrapolate annual ridership projections through 2049.

Under the baseline condition, the Analysis assumes a portion of HRT's ridership increase would reflect the general population growth of the HRT service area. Using the average population growth rate of the HRT service area from 2020 to 2022 per the US Census, HRT's ridership is projected to continue to grow 0.9 percent annually under the baseline condition throughout the analysis period. In the build condition, the Analysis considers the additional projected ridership beyond the 0.9 percent annual growth to be the increased ridership from the implementation of the Project.

Because the ridership projections were developed in 2019 based on pre-pandemic ridership conditions, the Analysis also considers the impact of Covid-19 on the ridership forecasts. Based on HRT's systemwide annual ridership data, bus ridership has rebounded from 2022 to 2024, with the average monthly ridership in 2024 reaching 75 percent of pre-pandemic ridership.[5] The Analysis assumes this recovery trend would continue, and that HRT ridership would return to 100% pre-pandemic levels by 2027.

Table 3-1 summarizes the annual ridership under the baseline and build conditions.

Table 3-1: Annual Ridership for Baseline and Build Condition

Year	Baseline Annual Ridership	Build Annual Ridership	Ridership Increase from Project
2030	6,054,000	7,128,000	1,074,000
2031	6,107,000	7,298,000	1,191,000
2032	6,160,000	7,473,000	1,313,000
2033	6,214,000	7,652,000	1,438,000

[4] Hampton Roads Transit. FY2025 to FY2034 Transit Strategic Plan, Appendix C: Estimated Ridership Methodology and Results. December 2023. Retrieved https://gohrt.com/wp-content/uploads/2024/07/Final-FY25-FY34-TSP_Appendices.pdf
[5] Hampton Roads Transit. Ridership All Modes- Data, Transit Bus. 2020-2024. Retrieved https://gohrt.com/agency/accountability-center/ridership/

Year	Baseline Annual Ridership	Build Annual Ridership	Ridership Increase from Project
2034	6,268,000	7,835,000	1,567,000
2035	6,322,000	8,022,000	1,700,000
2036	6,378,000	8,216,000	1,838,000
2037	6,433,000	8,412,000	1,979,000
2038	6,489,000	8,614,000	2,125,000
2039	6,546,000	8,822,000	2,276,000
2040	6,603,000	9,034,000	2,431,000
2041	6,661,000	9,252,000	2,591,000
2042	6,719,000	9,475,000	2,756,000
2043	6,777,000	9,703,000	2,926,000
2044	6,836,000	9,937,000	3,101,000
2045	6,896,000	10,178,000	3,282,000
2046	6,956,000	10,424,000	3,468,000
2047	7,017,000	10,676,000	3,659,000
2048	7,078,000	10,935,000	3,857,000
2049	7,140,000	11,200,000	4,060,000
Total	**131,654,000**	**180,286,000**	**48,632,000**

3.1 Mode Shift

The Analysis uses HRT's 2016 Origin-Destination (OD) Survey and Census data on the means of transportation for the HRT service area to estimate mode shift factors for the increased ridership in the build condition. To model the mode shift from personal vehicles to public transit following the implementation of the Project, the Analysis takes the average of the two data sources; the proportion of HRT's service area population that drives (per US census data), and the share of survey respondents that have access to a personal vehicle (per the HRT's 2016 OD Survey). This results in a mode shift factor of 44 percent.

The Analysis assumes that the remaining 56 percent of new riders previously walked or biked to complete the trip, split evenly amongst the two modes. Table 3-2 displays the mode shift factors used in the Analysis.

Table 3-2: Mode Shift Factors

Mode Shift	Percentage
Previously Driven	44%
Previously Walked	28%
Previously Bicycled	28%

Table 3-3 summarizes the mode-shift of new riders associated with the Project over the analysis period.

Table 3-3: New Riders that Previously Drove, Walked, and Biked

Year	New Riders- Previously Driven	New Riders- Previously Walked	New Riders- Previously Biked
2030	469,000	303,000	303,000
2031	520,000	336,000	336,000
2032	573,000	370,000	370,000
2033	628,000	405,000	405,000
2034	684,000	442,000	442,000
2035	742,000	479,000	479,000
2036	802,000	518,000	518,000
2037	864,000	558,000	558,000
2038	927,000	599,000	599,000
2039	993,000	641,000	641,000
2040	1,061,000	685,000	685,000
2041	1,131,000	730,000	730,000
2042	1,203,000	777,000	777,000
2043	1,277,000	825,000	825,000
2044	1,353,000	874,000	874,000
2045	1,432,000	925,000	925,000
2046	1,513,000	977,000	977,000
2047	1,597,000	1,031,000	1,031,000
2048	1,683,000	1,087,000	1,087,000
2049	1,772,000	1,144,000	1,144,000
Total	21,224,000	13,706,000	13,706,000

3.2 Vehicle Miles Traveled Avoided

To estimate VMT avoided, the Analysis calculates average trip distance using the Bureau of Transportation Statistics (BTS) 2023 Trips by Distance, which provides data on total trips and total miles traveled by county. Table 3-4 summarizes the BTS trip data, which states that in 2023, all trips in the HRT service area totaled 142 million with 1.6 billion vehicle miles traveled; the Analysis uses this to derive the average trip distance of 12 miles per vehicle trip.

Table 3-4: Average Trip Distance (one-way) in the HRT Service Area

Region	Total Vehicle Trips in HRT Service Area (2023)	Total Vehicle Miles Traveled (2023)	Average One-Way Trip Distance (miles)
HRT Service Area	141,756,000	1,642,295,000	12

Source: Bureau of Transportation Statistics (BTS). Retrieved https://data.bts.gov/Research-and-Statistics/Trips-by-Distance/w96p-f2qv/about_data

The Analysis applies a vehicle occupancy rate of 1.18 for weekday trips and a vehicle occupancy rate of 1.3 for weekend trips, per data sourced from the Virginia

Transportation Research Council, to calculate vehicle trips avoided from the modal diversion to transit following implementation of the Project.[6]

The Analysis multiplies the one-way vehicle trip distance by two to account for the round-trip. The Analysis further multiplies the annual increase in ridership in the build condition that previously driven from

Table 3-3 to quantify total VMT avoided for the analysis period. Table 3-5 displays the total VMT avoided resulting from the Project over the analysis period.

Table 3-5: Total VMT Avoided

Year	Total VMT Avoided (miles)
2030	9,034,000
2031	10,023,000
2032	11,043,000
2033	12,095,000
2034	13,181,000
2035	14,300,000
2036	15,455,000
2037	16,645,000
2038	17,872,000
2039	19,137,000
2040	20,441,000
2041	21,785,000
2042	23,171,000
2043	24,598,000
2044	26,068,000
2045	27,584,000
2046	29,145,000
2047	30,753,000
2048	32,409,000
2049	34,115,000
Total	408,854,000

3.3 Travel Time Savings

The Project would generate travel time savings for two distinct groups of individuals--existing riders that currently use HRT's services and new riders that previously walked or biked.

3.3.1 Travel Time Savings for Existing HRT Riders

As part of HRT's service improvements, key routes will arrive more frequently, reducing wait time for riders which results in travel time savings. The improved headways

[6] Virginia Transportation Research Council, Development of Guidance for a Vehicle Occupancy Rate Data Collection Program, 2022. Retrieved https://vtrc.virginia.gov/media/vtrc/vtrc-pdf/vtrc-pdf/23-R5.pdf

resulting from the Project will reduce travel times for existing riders by 2.8 million hours over the analysis period.

3.3.2 Travel Time Savings for New HRT Riders

The Analysis assumes that new riders that previously walked or biked will realize travel time savings by shifting to public transit. The Analysis does not capture travel time savings for riders that previously drove. The Analysis considers that not all riders always wait for the entire headway time between buses. Some riders will experience all or some of the efficiency benefits, while other riders will be able to schedule and plan around headways or receive little to no travel time savings from reduced headways. As such, for riders on impacted routes, the Analysis assumes 50 percent of existing riders experience a time-saving benefit. To estimate travel time savings for trips that previously walked, the Analysis calculates the difference in travel time between walking and bus to the national walking average commute trip length of 1.28 miles.[7] Passengers that previously walked and now take the bus will save 0.4 hours per trip. Over the 20-year analysis period, the Project would reduce travel times for riders that previously walked by 9.7 million hours.

To estimate travel time savings for trips that previously biked, the Analysis calculates the difference in travel time between biking and bus to the national biking trip length of 2.5 miles.[8] Passengers that previously biked and now take the bus will save 0.04 hours per trip. Over the 20-year analysis period, the Project would reduce travel times for new that previously biked by 1.0 million hours.

4 ECONOMIC BENEFITS ASSESSMENT

The Project would allow HRT to provide improved service that would change travel patterns in the region. The changes in travel patterns and associated reductions in VMT and VHT, as described in Section 3, deliver significant economic benefits for users and nonusers of HRT's system. The Project will deliver economic benefits in the form of travel time savings, improved job access, vehicle operating cost avoided, emissions avoided, health benefits, reductions in the marginal external costs of pavement wear maintenance, congestion, and noise pollution, safety benefits, and improved trip reliability. The Analysis monetizes benefits using the BCA Guidance as a guide for preferred methods and monetized values (November 2024).

Operational benefits are estimated by comparing the build condition following implementation of the Project to the baseline condition. Under the baseline condition, the Project would not be implemented, current traffic conditions would continue, and

[7] National Household Travel Survey. Average Commute Trip Length (Miles) Walking 2022- Table 7.4 Summary of Travel Trends: 2022. Retrieved https://nhts.ornl.gov/assets/2022/pub/2022_NHTS_Summary_Travel_Trends.pdf
[8] National Household Travel Survey. Derived from the Number of Person Trips by Mode and the Number of Personal Miles Traveled. 2022. Retrieved https://nhts.ornl.gov/person-trips

HRT's ability to implement the RTS would be constrained. The baseline condition has no benefits or costs associated. The benefits are expressed in constant 2024 dollars, which avoids forecasting future inflation and escalating future values for benefits and costs accordingly. The economic benefits assessment represents the benefits following the implementation of the Project over a 20-year analysis period, between the first full opening year of 2030 and 2049.

The economic benefits analysis organizes benefits through the following:

- Safety
- Environmental Sustainability
- Quality of Life
- Mobility and Community Connectivity
- Economic Competitiveness and Opportunity
- State of Good Repair.

4.1 Safety

The Project would result in safety benefits from reductions in pedestrian and bicyclist crashes and reductions in vehicular accidents.

4.1.1 Reduced Vehicular Crashes

On average, public transit is a safer mode compared to passenger vehicles.[9] The Project would encourage a shift from personal vehicles to public transit, reducing VMT in the Hampton Roads region which in turn would reduce vehicle accidents, injuries, and fatalities. The Analysis calculates the total reduction in vehicle incidents associated with the Project by applying the national average of fatalities, injured persons, and crashes per 100 million miles to total VMT avoided from Table 3-5. Per the Bureau of Transportation Statistics (BTS), in 2022 (the latest year in which data is available) for every 100 million miles traveled, there were 1.33 fatalities, 75 injuries, and 186 property damage only (PDO) crashes.[10] Based on these statistics, the Project would result in the reduction of 5 fatalities and 307 injuries, and 411 PDO crashes.

The Analysis monetizes the safety reduction in vehicular crashes using the total incidents avoided to the value of accidents and injuries per the BCA Guidance. The total safety benefits from the reduction in vehicular crashes would amount to $140.2 million over the analysis period.

[9] American Public Transportation Association. Public Transit's Safety Benefits, 2024. Retrieved https://www.apta.com/research-technical-resources/research-reports/public-transit-is-key-strategy-in-advancing-vision-zero/
[10] Bureau of Transportation Statistics. Motor Vehicle Safety Data Table 2-17. 2023. Retrieved https://www.bts.gov/content/motor-vehicle-safety-data

4.2 Reduction in Vehicle Emissions

As fewer vehicle miles are traveled on roads, society would benefit from the reduced exposure to air pollutants that would produce climate-related and other environmental benefits. The reduction in VMT and the associated reduction in fuel usage would reduce the emissions of a number of air pollutants, including sulfur dioxide (SO2), carbon monoxide (CO), nitrogen oxide (NOx), particulate matter (PM2.5), and carbon dioxide (CO2).. The Analysis estimates the total reduction in emissions associated with the Project by multiplying the total VMT avoided from Table 3-5 to the emissions rates per mile provided by the BTS 2024 national average vehicle emission rates.[11] Table 4-1 summarizes the total reduction of emissions associated with the Project.

Table 4-1: Emissions Reductions (tons)

Operational Emissions	Pollution Reduction (Tons)
SO2	45
CO	119
NOx	66
PM2.5	2
CO2	139,000
Non-operational Emissions	
Brake Wear - PM2.5	1
Tire Wear - PM2.5	0.4

The Analysis monetizes the reduction in emissions from personal vehicles by multiplying the total reduction in emissions from Table 4-1 to the costs for emissions per metric ton from the BCA Guidance. The total personal vehicle emissions avoided benefits would amount to $52.3 million over the analysis period.

4.2.1 Reduced Pedestrian and Bicyclist Crashes

The Analysis calculates the reduction in pedestrian and cyclist miles resulting from the mode shift by multiplying the annual ridership increase of riders that previously walked and biked to the average trip length as stated in Section 3.3. The Project would result in a reduction of 31.7 million pedestrian miles of travel and 58.4 million bicycle miles of travel, for a total reduction of 90.1 million active mobility miles of travel. The Analysis uses the national pedestrian accidents average of 17 non-fatal injuries and 1 fatality per 70-million-person miles traveled to calculate the total reduction in pedestrian and cyclist incidents over the analysis period.[12] Based on these averages, the Project would result in the prevention of 1 fatality and 22 non-fatal injuries to walkers and cyclists over the analysis period.

[11] Bureau of Transportation Statistics. Estimated U.S. Average Vehicle Emissions Rates per Vehicle, by Vehicle Type Using Gasoline and Diesel. 2024. Retrieved https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and

[12] USDOT National Highway Traffic Safety Administration. National Pedestrian Crash Report. 2008. Retrieved https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/810968

The Analysis monetizes the reduction in pedestrian and cyclist crashes using the total incidents avoided the value of accidents and injuries per the BCA Guidance. The total safety benefits from the reduction in pedestrian and bicyclist crashes would amount to $19.9 million over the analysis period.

4.3 Reduced Noise Pollution

The reduction in VMT would reduce noise associated with vehicle engines, horns, and tire friction. The Analysis multiplies the total VMT avoided from Table 3-5 to the reduction in noise cost per mile per the BCA Guidance. The total reduced congestion benefits would amount to $0.8 million over the analysis period.

4.4 Economic Competitiveness and Opportunity

The Project would improve mobility, connectivity, and travel options for the Hampton Roads region. The improved availability of HRT service would result in travel time savings for existing and new riders as well as reduce congestion for all roadway users in the region. The Project would also save operations and maintenance (O&M) costs for HRT through the reduction in deadhead miles and facility repair costs.

4.4.1 Reduced Congestion

The reduction in VMT would alleviate traffic congestion, allowing all roadway users to travel more efficiently. The Analysis multiplies total VMT avoided from Table 3-5 to the congestion cost per mile per the BCA Guidance to monetize the reduction in congestion. The total reduced congestion benefits would amount to $59.6 million over the analysis period.

4.4.2 Travel Time Savings

The Project is expected to improve headway on many key routes, which would directly reducing travel time for existing and new riders of HRT. The Analysis monetizes travel time savings by applying the total hours saved for existing and new riders, summarized in Section 3.3, to the value of time per the BCA Guidance. The total travel time savings benefits for new and existing riders would amount to $207.2 million over the analysis period.

4.4.3 O&M Costs Avoided

The new facility will introduce fewer operating costs to HRT operations as compared to the existing facility. Absent the Project, HRT would continue to incur O&M costs of the existing facility at $4.3 million annually. The implementation of the Project would provide cost savings from avoided maintenance, repair, and rehabilitation of the current facility. The expected O&M costs for the new Southside Facility is estimated at $2.8 million annually. The Analysis considers the net O&M costs avoided from the Project. The O&M costs avoided would amount to $29.6 million over the analysis period.

Further, the new facility would significantly reduce non-revenue (deadhead) miles, which would in turn reduce operational costs. The new facility is estimated to reduce deadhead miles by 91,000 miles annually. The Analysis uses HRT's average bus operating cost per vehicle revenue mile of $9.61[13] to monetize O&M costs avoided from deadhead miles reduced. These operating cost savings would amount to $17.5 million over the analysis period.

4.4.4 Value of a Trip Not Taken

The creation of the new mode of travel is expected to generate induced demand. In economic theory, induced demand occurs when an increase of supply (transportation) results in an increase in consumption (ridership). Findings from the "Economic and Societal Impact of Hampton Roads Transit", prepared for HRT by the Economic Development Research Group in 2016, reveal that if HRT services were unavailable, 27 percent of HRT riders would forgo their trips. The Analysis assumes that without the Project, 27 percent of new riders, primarily commuters, would forego their transit trips.

According to HRT's Regional OD Study 2023 survey results, 54 percent of trips on the Southside Routes make up trips to and from work. The Analysis applies the 27 percent of foregone trips to the 54 percent of commute trips. The Analysis uses the hourly rate of access to a new mode of $1.81[14] to monetize value of a trip not taken. In accordance with FTA guidance, the Analysis applies a delay time of 12 hours in circumstances where there is no service to take passengers to their destination, as is the case in the baseline condition.[15] The value of a trip not taken would amount to $64.8 million over the analysis period.

4.5 State of Good Repair

The Project would reduce annual VMT, which would reduce roadway maintenance costs and vehicle operating costs.

4.5.1 Road Maintenance Costs Avoided

The reduction in VMT would reduce the wear and tear on roadway infrastructure resulting in cost savings associated with maintaining roads. The Analysis multiplies the reduction in VMT over the analysis period to the road maintenance cost per mile provided in the BCA Guidance. The total reduced congestion benefits would amount to $12.5 million over the analysis period.

[13] National Transit Database. Hampton Roads Transit 2023 Annual Agency Profile. Retrieved https://www.transit.dot.gov/sites/fta.dot.gov/files/transit_agency_profile_doc/2023/30083.pdf.
[14] American Public Transportation Association (APTA), Economic Impact of Public Transportation Investment, April 2020. Retrieved https://www.apta.com/wp-content/uploads/APTA-Economic-Impact-Public-Transit-2020.pdf
[15] Federal Transit Administration, How to Use the FTA HMCA Tool User Guide, January 2014. Retrieved https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA-User_Guide-final.pdf

4.5.2 Vehicle Operating Costs Avoided

Vehicle owners that use public transit instead of personal vehicles will realize a savings in vehicle operating costs including insurance, license, registration, taxes, and financing charges.[16] The Analysis multiplies the reduction in VMT over the analysis period to the reduction in vehicle operating cost per mile of as provided in the BCA Guidance. The total reduced congestion benefits amount to $235.1 million over the analysis period.

4.6 Additional Operating Cost- Service Expansion (Disbenefit)

The Analysis includes the additional O&M costs associated with the additional revenue hours from the implementation of the RTS. HRT will expand the level of service of the affected routes to 15-minute peak frequencies, resulting in 153,000 annual hours over the analysis period. The Analysis uses HRT's cost per revenue hour in FY 2024 of $119.58 per hour to calculate additional O&M from additional revenue hours. The O&M costs of the service expansion amount to $364.1 million and are considered disbenefits in the Analysis.

4.7 Summary of Economic Benefits

Table 4-2 summarizes the benefits resulting from the implementation of the Project. In total, the Project would deliver $475.4 million in benefits over the analysis period.

Table 4-2: Summary of Economic Benefits

Economic Benefits Summary	Nominal Value (2024$, millions)
Safety	
Reduced Pedestrian and Cyclist Crashes - Injuries and Fatalities	$19.9
Reduced Car Crashes - Property Damage	$4.4
Reduced Car Crashes - Injuries and Fatalities	$135.8
Subtotal	**$160.1**
Environmental Sustainability	
Car Air Pollution Benefits	$6.9
CO2 emissions avoided	$45.4
Subtotal	**$52.3**
Quality of Life	
Reduced Noise Pollution	$0.8
Subtotal	**$0.8**
Economic Competitiveness and Opportunity	
Reduced Congestion	$59.6
Travel Time - Current Riders	$92.5
Travel Time - New Riders	$114.7
Avoided Operating Costs - Deadhead Miles	$17.5

[16] US Department of Transportation, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, November 2024. Retrieved https://www.transportation.gov/sites/dot.gov/files/2024-11/Benefit%20Cost%20Analysis%20Guidance%202025%20Update%20%28Final%29.pdf

Economic Benefits Summary	Nominal Value (2024$, millions)
and Facility Repair Costs Avoided	$29.6
Value of a trip not taken	$64.8
Subtotal	**$378.7**
State of Good Repair	
Reduced VMTs - Road Maintenance Costs	$12.5
Reduced VMTs - Vehicle Operating Costs	$235.1
Subtotal	**$247.6**
Total Benefits	**$839.5**
Operations and Maintenance Costs - service expansion (disbenefit)	($364.1)
Total Net Benefits	**$475.4**

4.8 Benefit- Cost Analysis

The benefit-cost analysis measures the benefits created by the Project against the cost of the Project using a benefit-cost ratio (BCR). The BCR is the total benefits divided by the total cost.

The Project's capital costs include planning, design, construction managements, and construction. The design and construction of the Southside Facility timeline is from 2021 to 2029, with the planning and engineering design period between 2021 to 2025 and construction beginning 2026 and concluding in 2029. The total cost of the Project is $135.7 million (2024$).

Prior to calculating the BCR, the Analysis adjusts total costs and benefits from Table 4-2 to account for the effects of inflation. This is referred to as 'discounting', which converts future costs and benefits into the equivalent value today. The Analysis applies 3.1-percent per year to discount total costs and benefits to 2024 dollars, with the exception of carbon dioxide (CO2) emissions, which is discounted at 2-percent.[17]

The BCR for the Project is 2.2, which can be translated as every $1 spent on the Project, HRT and its partner cities would see a $2.20 return in benefits.

4.8.1 Summary of Benefit-Cost Analysis

Table 4-3 summarizes the discounted benefits and costs in 2024 dollars associated with the Project.

[17] The discount rate is in accordance with the Office of Management and Budget Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. Retrieved https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a94/a094.pdf.

Table 4-3: Benefit-Cost Analysis Summary

Economic Benefits Summary	Discounted 3.1% (2024$, millions)
Safety	
Reduced Pedestrian and Cyclist Crashes - Injuries and Fatalities	$11.7
Reduced Car Crashes - Property Damage	$2.6
Reduced Car Crashes - Injuries and Fatalities	$80.4
Subtotal	**$94.7**
Environmental Sustainability	
Car Air Pollution Benefits	$4.1
CO2 emissions avoided	$31.9
Subtotal	**$36.0**
Quality of Life	
Reduced Noise Pollution	$0.5
Subtotal	**$0.5**
Economic Competitiveness and Opportunity	
Reduced Congestion	$35.3
Travel Time - Current Riders	$57.0
Travel Time - New Riders	$67.9
Avoided Operating Costs - Deadhead Miles	$11.1
and Facility Repair Costs Avoided	$18.7
Value of a trip not taken	$38.4
Subtotal	**$228.4**
State of Good Repair	
Reduced VMTs - Road Maintenance Costs	$7.4
Reduced VMTs - Vehicle Operating Costs	$139.1
Subtotal	**$146.50**
Total Benefits	**$506.1**
Operations and Maintenance Costs - service expansion (disbenefit)	($229.8)
Total Net Benefits	**$276.3**
Total Cost	**$126.3**
Benefit-Cost Ratio (BCR)	**2.2**

5 ECONOMIC IMPACT ANALYSIS

Economic impact analyses describe the effects associated with a change in expenditures resulting from the purchasing and consumption of goods and services by households and businesses. In economic impact analyses, this change in expenditures is known as a final-demand change. The economic impact analysis for this Project measures the increase in jobs and earnings associated with the following final-demand changes:

- **Capital investment and operations:** costs necessary to construct the Southside Facility and sustain the service improvements.
- **User benefits:** the service improvements resulting from the Southside Facility would lead to transportation benefits associated with reduced VMT and VHT, that lead to improved business productivity and transportation cost savings for households.
- **Tourist spending:** the economic impacts of tourist additional spending that is directly attributed to HRT service improvements associated with the operation of the Southside Facility.

Economic impacts, which include employment and earnings impacts, are measured in terms of direct, indirect, and induced impacts. These are defined as follows:

> The economic impact analysis measures the effects of an investment on jobs and earnings for a given region.
>
> **Jobs** are defined as the total change in number of jobs (full- and part-time) that occurs in all industries for each additional one million dollars of output.
>
> **Earnings** are defined as the total dollar change in earnings of households employed by all industries for each additional dollar of output.

- **Direct impacts:** impacts on industries that are directly purchased because of a final-demand change. In the context of the Project, direct impacts include construction workers hired and equipment necessary to build the Project.
- **Indirect impacts:** impacts on supporting industries that supply goods and services to the industries directly impacted by the final-demand change. In the context of the Project, indirect impacts include raw materials necessary to build the facility and the associated workers necessary to produce the equipment.
- **Induced impacts:** impacts that result from the increased employment and wages associated with direct and indirect impacts as they ripple through the economy. For instance, the spending of construction workers on meals and consumer goods resulting from their employment constitutes an induced impact.

The economic impact analysis uses multipliers from the BEA RIMS II model. The model produces jobs (full- and part-time) and earnings multipliers by industry to demonstrate the linkages between an economic activity and the production of goods and services.

BEA RIMS II multipliers are constructed to reflect the structure of economies in the defined economic impact area. To conduct an economic impact analysis, the economic impact area must be defined. The Analysis includes two economic impact areas:

- A capital investment and operations economic impact area to quantify the economic impacts associated with constructing the Southside Facility; and
- An economic impact area to quantity economic impacts associated with user benefits and tourist spending.

These economic impact areas defined in the following section.

5.1 Economic Impact Area

The economic impact area, also known as the final-demand region, consists of the geographic area in which the total impact of a final-demand change is measured. The economic impact area should cover where most of the earnings would be spent.

The economic impact areas from the capital investment and operations and the economic impact area from the user benefits and tourist spending are defined in the following sub-sections. The borders of the economic impact areas differ because while the construction and operations of the Southside Facility would result in the hiring of construction workers and personnel from the greater metropolitan region, the service improvements would result in expenditures at businesses in the immediate HRT service area.

5.1.1 Capital Investment and Operations Economic Impact Area

For the purposes of the economic impact analysis of capital investments and operations, the economic impact area is defined as the Virginia Beach–Chesapeake–Norfolk, VA-NC, metropolitan area. Table 5-1Table 5-1Table 5-1 identifies the jurisdictions in the economic impact area associated with the construction of the Southside Facility.

Table 5-1: Jurisdictions in the Economic Impact Area

State	Jurisdiction	Name
Virginia	County	James City
	County	York
	County	Isle of Wight
	County	Gloucester
	County	Mathews
	County	Surry
	City	Virginia Beach
	City	Norfolk
	City	Chesapeake
	City	Newport News
	City	Hampton
	City	Portsmouth
	City	Suffolk
	City	Williamsburg
	City	Poquoson
North Carolina	County	Camden
	County	Currituck
	County	Gates

The economic impact area for the economic impact analysis of capital investments and operations extends beyond the jurisdictions in HRT's service area because the

construction and operations of the Southside Facility is expected to increase demand for goods and services beyond HRT's service area.

5.1.2 User Benefits and Tourist Spending Economic Impact Area

The economic impact area for the economic impact analysis of user benefits and tourist spending consists of the Hampton Roads region: Isle of Wight, Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk, Virginia Beach, James City, Williamsburg, York, and Poquoson. Table 5-2 identifies the jurisdictions in the economic impact area associated with the benefits from HRT's service improvements and tourist spending associated with the Project.

Table 5-2: Jurisdictions in the Economic Impact Area

State	Jurisdiction	Name
Virginia	County	James City
	County	York
	County	Isle of Wight
	City	Virginia Beach
	City	Norfolk
	City	Chesapeake
	City	Newport News
	City	Hampton
	City	Portsmouth
	City	Suffolk
	City	Poquoson

5.1.3 Capital Investment and Operations

Implementation of the Project would lead to economic growth from short-term investment of the construction of the Southside Facility and the long-term O&M associated with the facility and additional revenue hours accompanied from HRT's expanded services.

5.1.4 Short-Term Impacts

Table 5-3 summarizes the short-term construction impacts resulting from the $135.7 million capital investment of the new facility. The costs associated with construction of the Southside Facility would result in 1,120 construction jobs and $65.5 million in earnings. The costs associated with professional services would result in 230 professional services jobs and $16.4 million in earnings.

Table 5-3: Short-Term Construction Impacts

Industry	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Construction	1,120	630	490	$65.5	$40.3	$25.2

Industry	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Professional Services	230	110	120	$16.4	$10.4	$6.0
Total	**1,350**	**740**	**610**	**$81.9**	**$50.7**	**$31.2**

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.1.5 Long-Term Operations and Maintenance Impacts

The Project would support jobs and earnings from ongoing annual O&M expenditures from the additional revenue hours associated with HRT's expanded RTS.

Table 5-4 summarizes the additional revenue hours and associated O&M costs over the 20-year analysis period. The Analysis uses the HRT Cost per Revenue Hours for FY 2024 of $119.58 to derive the additional O&M costs associated with the Project.

Table 5-4: Additional Revenue Hours and O&M Costs

Year (FY)	Additional Revenue Hours	Additional O&M Costs (2024$)*
Total (2030-2049)	3,043,000	$363,826,000

Source: HRT TSP FY2025-2034, *Rounded to the nearest thousand

Table 5-5 displays the long-term economic impacts of O&M from the additional revenue hours required to maintain the service expansion and facility over the 20-year analysis period. The $363.8 million (2024) in O&M costs would result in 5,120 jobs and $250.8 million in earnings.

Table 5-5: Long-Term Economic Impacts of O&M

Industry	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Operations and Maintenance	5,180	3,210	1,970	$250.8	$149.6	$101.2

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.1.6 Summary of Economic Impacts from Capital Investment and Operations

Table 5-6 summarizes the short-term and long-term employment and earnings impacts from the construction (short-term) and operations and maintenance (long-term) activities associated with the Project.

Table 5-6: Short-Term and Long-Term Economic Impacts from Capital Investment and Operations

Industry	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Short-Term Employment and Earnings Impacts from Construction Activities						
Construction	1,120	630	490	$65.5	$40.3	$25.2
Professional Services	230	110	120	$16.4	$10.4	$6.0
Total	**1,350**	**740**	**610**	**$81.9**	**$50.7**	**$31.2**
Long-Term Employment and Earnings Impacts from Operations and Maintenance Activities						
Operations and Maintenance	5,180	3,210	1,970	$250.8	$149.6	$101.2

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.2 User Benefits

When a region is faced with heavy congestion and unreliable travel times that lead to higher congestion, transportation costs, and vehicular safety incidents, these transportation costs are borne by businesses and households.

The Analysis converts the transportation user benefits of the Project from Table 4-2 to calculate the effects of changes in business productivity and household disposable income, which impacts jobs and earnings. Table 5-7 displays the user benefits included in the economic impact analysis.

Table 5-7: Total User Benefits borne by Businesses and Households

User Benefit	Value (2024$ millions)
Safety	$160.1
Reduced Congestion	$59.6
Travel Time Savings	$207.2
Vehicle Operating Cost Savings	$235.1
Total	$662.0

The total user benefits amount to $662.0 million over the 20-year analysis period.

5.2.1 Business Impacts

Improvements to travel time savings and reliable trips can enhance business productivity in two ways; savings from costs associated with business or ‘on-the-clock’ trips (e.g., vehicle operating costs, fuel, hourly wages) and workforce productivity gains from workers spending less time traveling between home and work or for business-purposes. The Analysis splits attributes user benefits to businesses using trip purpose data from the HRT Regional 2023 OD Survey. Based on the survey, 2 percent of trips were made for business-travel purposes and 24 percent of trips were for commuting.

While all costs associated with business trips are passed directly to businesses, however, only half of commuter travel costs are passed directly to businesses.[18]

Thus, the analysis assumes that 13 percent of benefits are attributed to businesses, amounting to $87.2 million in benefits.

The Analysis applies the direct spending of business impacts of $87.2 million to the RIMS II model, distributed according to the industry breakdown of the economic impact area. Table 5-8 presents the total economic impacts from improved business productivity resulting from improved user benefits of the Project. The total benefits associated with business productivity would result in 830 total jobs and $41.0 million earnings, as displayed in Table 5-8.

Table 5-8: Economic Impacts from Improved Business Productivity

Impact	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Improved Business Productivity	830	490	330	$41.0	$24.3	$16.7

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.2.2 Household Impacts

Households would benefit from the reduction in congestion, vehicle ownership cost savings, and travel time savings. These benefits would be realized as increased household disposable income, leading to a change in spending patterns that contribute to economic growth. The Analysis considers that the remaining 87 percent of benefits are attributed to household benefits, amounting to $574.8 million.

The Analysis applies the household impact benefits of $574.8 million as inputs to the RIMS II model to the household industry multipliers. Per the RIMS II User Guide, only final-demand multipliers are available for households because households do not produce output. Table 5-9 shows the jobs and earnings associated with the additional disposable household income accrued resulting from the benefits of the Project. The $574.8 million in household impacts would result in 3,720 jobs and $169.8 million in earnings.

Table 5-9: Economic Impacts from Additional Household Disposable Income

[18] American Public Transportation Association. Economic Impact of Public Transportation Investment. 2014. Retrieved https://www.apta.com/wp-content/uploads/Resources/resources/reportsandpublications/Documents/Economic-Impact-Public-Transportation-Investment-APTA.pdf

Impact	Total Jobs (job-years)	Total Earnings (2024$ millions)
Additional Household Disposable Income	3,720	$169.8

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.2.3 Summary of Economic Impacts from User Benefits

Table 5-10 displays the total economic impacts of user benefits from improved business productivity and additional household disposable income. The total user benefits would result in 4,550 jobs and $210.8 million in earnings.

Table 5-10: Summary of Economic Impacts from User Benefits

Impact	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Improved Business Productivity	830	490	330	$41.0	$24.3	$16.7
Additional Household Disposable Income	3,720	-	-	$169.8	-	-
Total	4,550	490	330	$210.8	$24.3	$16.7

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.3 Tourist Spending

Affordable and accessible transit services not only benefit tourists from enhanced mobility options, but also benefits businesses that realize increased tourism spending. HRT provides an alternative mode of travel for tourists, connecting visitors to key destinations in the Hampton Roads region, in particular Virginia Beach, which welcomed 14.1 million visitors in 2023 (City of Virginia Beach 2023), or 38,600 per day, on average. Visitors spent $1.6 billion in industries that are supported by transit in 2023, resulting in an average expenditure of $112.3 per tourist per day.

Using HRT's Regional OD Study from 2023 proportion of weekday and weekend visitors, the Analysis assumes that as HRT expands service, the share of visitor ridership would remain constant as total ridership increase. Over the 20-year analysis period, spending from tourists that use HRT would increase by $99.1 million. The

Analysis applies this increase in spending to the RIMS II model to calculate jobs and earnings. As displayed in Table 5-11, increased tourist spending associated with the Project would result in an additional 1,420 jobs and $52.6 million in earnings.

Table 5-11Table 5-11: Economic Impacts from Tourist Spending

Industry	Jobs (job-years)			Earnings (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Food and Beverage	880	610	270	$33.2	$20.5	$12.7
Retail	240	160	80	$8.5	$4.8	$3.7
Recreation	300	210	90	$10.9	$6.3	$4.6
Total	**1,420**	**980**	**440**	**$52.6**	**$31.6**	**$21.0**

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.

5.4 Summary of Economic Impacts

The total economic impacts of the Project generated from the construction of the Southside Facility, user benefits, and tourist spending amount to 1,350 short-term jobs and 11,150 long-term jobs. The economic impact area would benefit from an increase of $81.9 million in short-term earnings and $514.2 million in long-term earnings.

Table 5-12 summarizes the total economic impacts generated by the Project.

Table 5-12: Total Economic Impacts Generated by the Project

Industry	Employment Impacts (Job-Years)			Earnings Impacts (2024$ millions)		
	Total	Direct	Indirect & Induced	Total	Direct	Indirect & Induced
Short-Term Employment and Earnings Impact						
Construction of Southside Facility	1,120	630	490	$65.5	$40.3	$25.2
Professional Services for Construction of Southside Facility	230	110	120	$16.4	$10.4	$6.0
Total	**1,350**	**740**	**610**	**$81.9**	**$50.7**	**$31.2**
Long-Term Employment and Earnings Impact						
Long-Term Operations and Maintenance Activities at Southside Facility	5,180	3,210	1,970	$250.8	$149.6	$101.2
Improved Business Productivity from Transportation Improvements	830	490	330	$41.0	$24.3	$16.7
Additional Household Disposable Income from Transportation Improvements	3,720	-	-	$169.8	-	-
Tourist Spending from Transportation Improvements	1,420	980	440	$52.6	$31.6	$21.0
Total	**11,150**	**4,680**	**2,740**	**$514.2**	**$205.5**	**$138.9**

Note: Jobs rounded to nearest 10. Job-year is defined as one job for one person for one year.