

Economic Benefits of High-Performance Rail

March 2021



SOUTHEAST
CORRIDOR

Purpose

New and improved rail infrastructure **will help transport goods, reduce highway congestion, improve safety, reduce emissions, and expand connectivity for passengers and freight throughout the Southeast.**

Improvements in rail capacity through Washington, DC, will **enhance connectivity between the Southeast and major urban centers along the Northeast Corridor.** High-performance rail is defined for this study as a rail network with variable maximum speeds up to 125 miles per hour (MPH) and improved infrastructure that facilitates fewer delays by reducing interference between passenger and freight trains.

Who was engaged?

To capture a balanced perspective on the benefits of high-performance rail development, stakeholders from each state represented on the Southeast Corridor Commission and the region's operating railroads provided input on the development of two geographic scenarios and four operating scenarios for comparison of benefits.

Jurisdiction Stakeholders



Private Partner Stakeholders



Federal Partner



U.S. Department
of Transportation

**Federal Railroad
Administration**

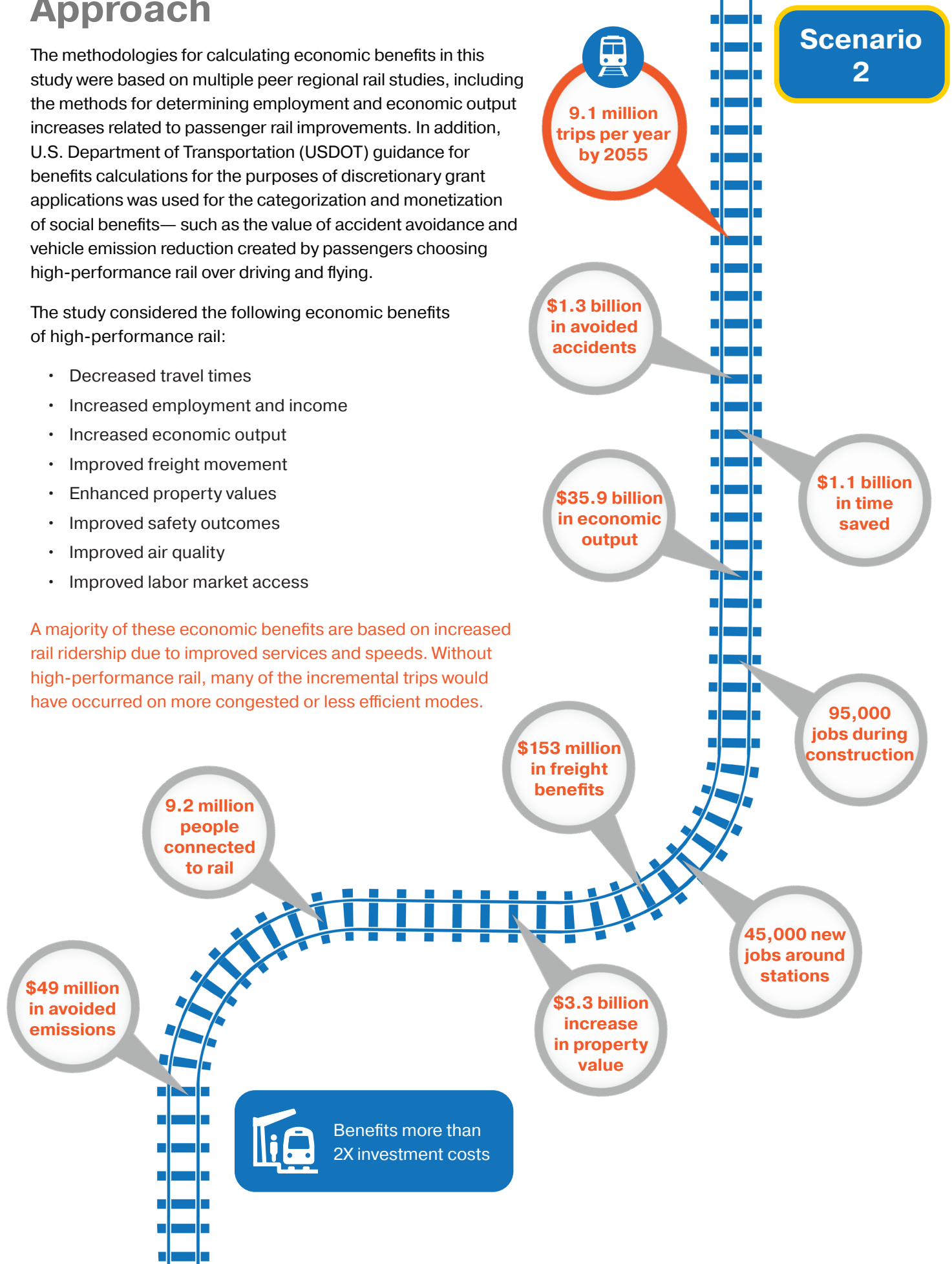
Approach

The methodologies for calculating economic benefits in this study were based on multiple peer regional rail studies, including the methods for determining employment and economic output increases related to passenger rail improvements. In addition, U.S. Department of Transportation (USDOT) guidance for benefits calculations for the purposes of discretionary grant applications was used for the categorization and monetization of social benefits— such as the value of accident avoidance and vehicle emission reduction created by passengers choosing high-performance rail over driving and flying.

The study considered the following economic benefits of high-performance rail:

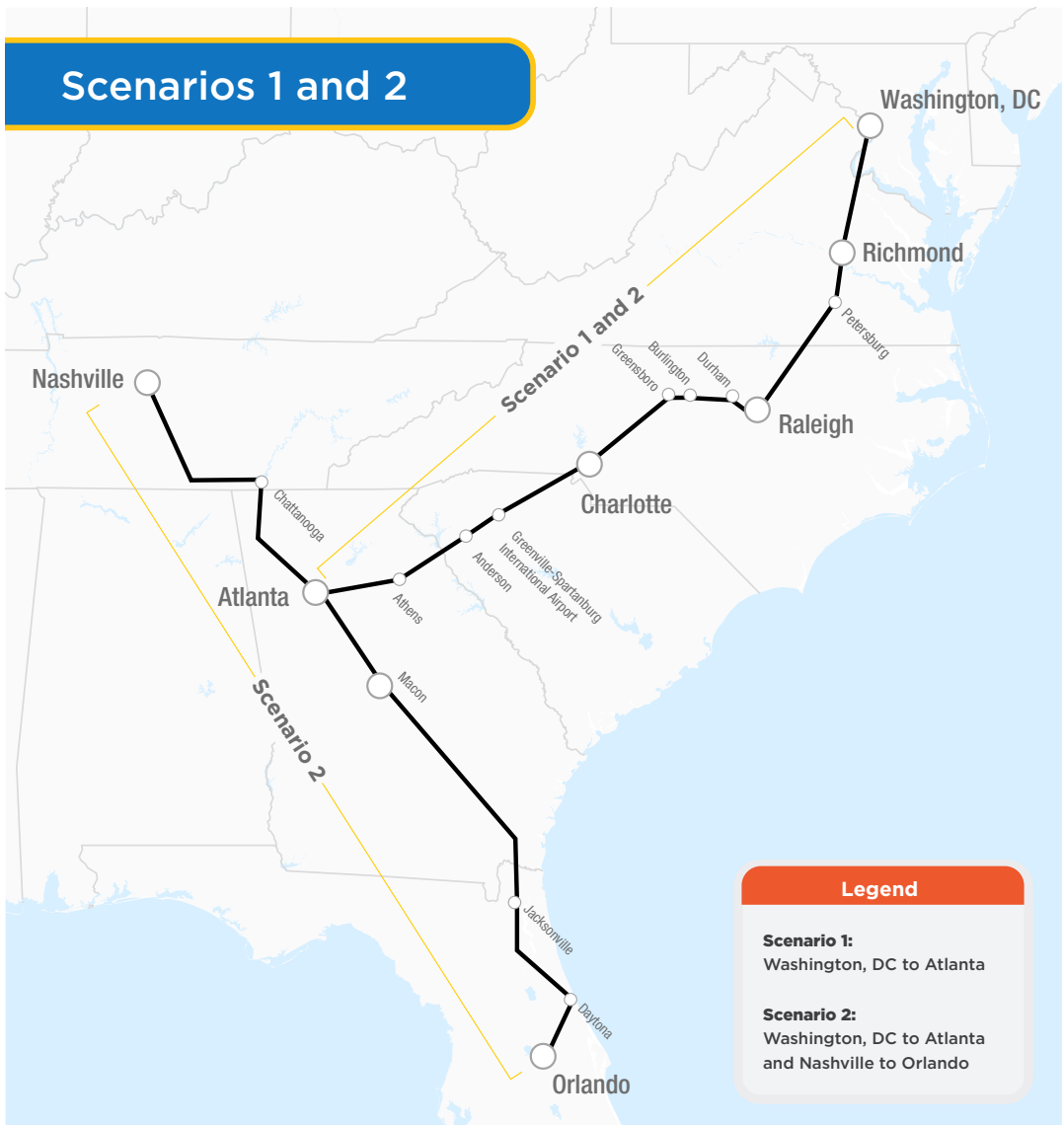
- Decreased travel times
- Increased employment and income
- Increased economic output
- Improved freight movement
- Enhanced property values
- Improved safety outcomes
- Improved air quality
- Improved labor market access

A majority of these economic benefits are based on increased rail ridership due to improved services and speeds. Without high-performance rail, many of the incremental trips would have occurred on more congested or less efficient modes.



Scenarios

The Economic Benefits study evaluated scenarios that focused on the development of the “backbone” of the Southeast Corridor and the opportunities for high-performance rail connections to major metropolitan areas. The recently completed *Southeast Regional Rail Planning Study* provides a long-term vision for passenger rail and defines the backbone of the Southeast Network from Washington, DC, to Atlanta, GA, and south to Orlando, FL. For the purposes of this study the first scenario includes a majority of the backbone from Washington, DC, to Atlanta, GA. The second scenario includes the entire backbone of the corridor to Orlando and includes the segment from Nashville, TN, to Atlanta, GA. Within each scenario, two operating alternatives were evaluated with different maximum speeds in segments where a preferred alternative has not been identified. These operating alternatives were designated as A and B and provide a range of impacts for each scenario. The benefits reported in this summary document represent planned maximum speeds along most of the corridor. *Where plans do not prescribe a maximum speed, higher operating speeds that align with high-speed rail maximums are represented here.*



Total Capital Costs, 2025–2055 (PV in \$ millions)	
Scenario 1	\$10,838
Scenario 2	\$18,723

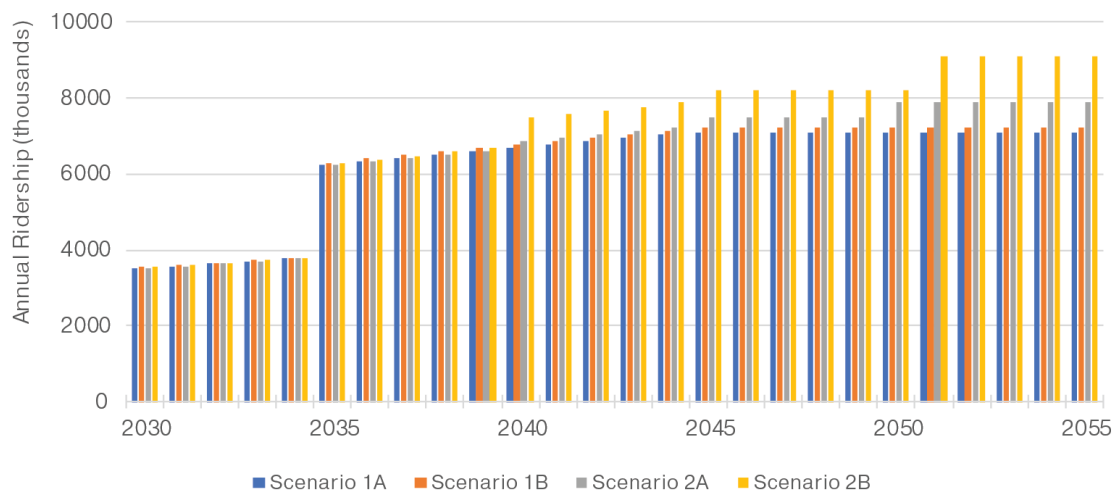
Phasing of Benefits

The Southeast Corridor rail improvements captured in these scenarios will not be achieved quickly or simultaneously. To be realistic, the opening of improved rail segments was phased over the course of the study period, with construction starting in 2025 and staggered operations starting between 2030 and 2050. Stakeholders provided input into the phasing of rail improvements to deliver the ultimate high-performance corridors under each scenario.

Summary of Economic Benefits

Increased Rail Ridership

Annual rail ridership is estimated in each year to 2055 based on new segments opening. In the final year of analysis ridership reaches between approximately 7 and 9 million passenger rail trips per year. It should be noted that ridership benefits underpin many of the other measures, and therefore are not monetized to avoid double counting in the aggregation of benefits



The present value (PV) of benefits for each scenario are provided below in millions of 2020 dollars. PVs are expressed as the current value of a future sum of money or cash flow given a stated rate of return. Future cash flows are discounted at a 7% discount rate.




When compared to the present value of capital costs, these benefits are **2.2 to 2.5 times higher** than the upfront investment costs.

Estimated Monetized Value of Benefits, 2025–2055 (in millions of PV dollars)	Scenario 1	Scenario 2
Travel Time Savings	\$1,103	\$1,101
Safety	\$1,260	\$1,336
Emissions	\$46	\$49
Economic Output	\$22,639	\$35,934
Property Value	\$2,088	\$3,255
Improved Freight	\$153	\$153
Total Benefits	\$27,290	\$41,829

Travel Time Savings

Travel time savings are calculated based on the shift in trips from highway, buses, other rail modes, and air travel to high-performance rail trips. Time differences are aggregated across all of these mode shifts and valued based on the relative value of time from USDOT guidance.



Both scenarios result in time savings of \$1.1 billion over the course of 30 years of phased operations.

Increased Employment and Income

Implementing high-performance rail according to the two study scenarios will result in about 41,000 to 95,000 new jobs in the region during construction. More jobs will also be created during operations to support rail services, though the number of new operations and maintenance jobs were not calculated as part of this study. Once operating, the enhanced rail services will also sustain between 77,000 to 142,000 new jobs in the region due to station area developments; of those jobs between about 28,000 and 45,000 will be new to the region.

Estimated Total of New Jobs	Scenario 1	Scenario 2
During Construction	40,660	94,760
New Regional Base Jobs	27,600	44,500

Increased Economic Output

Regional economic output will grow in terms of increased spending power and expenditures flowing through the supply chains and to employees. Investment in high-performance rail in the Southeast will result in a PV increase in economic output between \$22 and \$35 billion.

Economic output (PV millions)	Scenario 1	Scenario 2
Direct	\$10,892	\$17,302
Indirect	\$5,575	\$8,868
Induced	\$6,172	\$9,765
Total	\$22,639	\$35,934



Enhanced Property Value

Previous studies have shown the positive impact that rail stations have on surrounding property values due to improved livability and accessibility. These improvements range from 5 to 42 percent for commercial properties, and 3 to 40 percent for residential properties. This study applies a very conservative approach based on new stations increasing property values by only 5 to 10 percent, and existing station improvements providing only a 2.5 percent increase. The property value increases range from \$2.1 to \$3.3 billion.

Increased Property Value (PV millions)	Scenario 1	Scenario 2
Residential	\$451	\$654
Non-Residential	\$1,638	\$2,602
Total	\$2,088	\$3,256

Improved Safety Outcomes

The number of total crashes avoided is a function of vehicle miles diverted from modes and with higher incident rates than intercity rail. To estimate diverted vehicle miles, passenger trip modal diversion data for each core-based statistical area pair was multiplied by the corresponding route length. Passenger miles were converted to vehicle miles using average occupancy rates of 1.67 and 21.18 for auto and bus, respectively, based on USDOT guidance. Air miles diverted do not result in a known safety benefit.

Estimated Annual Crashes Avoided 2055	Scenario 1 - Auto	Scenario 1 - Bus	Scenario 2 - Auto	Scenario 2 - Bus
Fatality	6.5	0.01	7.8	0.02
Injury	677.9	2.6	818.4	4.8
Property Damage Only	1,111.4	N/A	1,341.8	N/A



Under both scenarios the number of accidents per year is significantly reduced, resulting in \$1.3 billion in safety benefits over the 30 years of phased operations.



Improved Air Quality and Reduced Emissions

Air quality improvements occur when trips shift to rail from automobile, bus, and air travel, which are generally less efficient and rely heavily on fossil fuel-burning technology. The benefits for diverted automobile and bus travel is based on diverted vehicle miles while passenger miles is generally a better predictor of air travel emissions than vehicle miles because it tracks more closely with vehicle size. The value per unit of emissions avoided are calculated based on USDOT guidance.

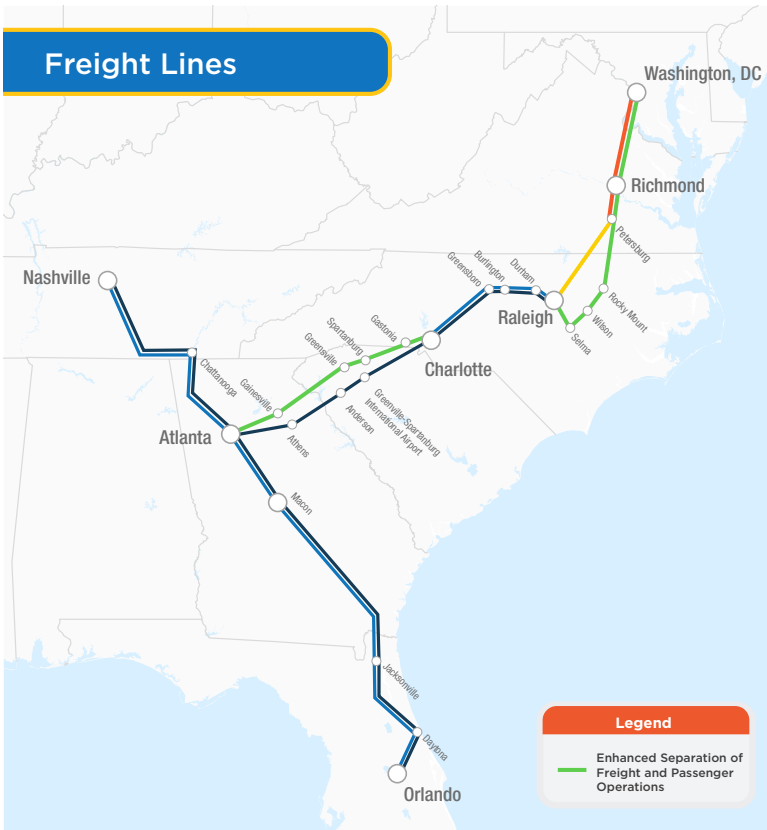


Approximately 13 to 15 million metric tons of carbon dioxide emissions are avoided under these high-performance rail scenarios.

Emissions Reduction Benefits (PV millions)	Scenario 1	Scenario 2
Carbon Dioxide	\$5.6	\$6.0
VOX	\$1.6	\$1.7
NOX	\$5.3	\$5.7
PM2.5	\$32.9	\$35.0
Sulfur Dioxide	\$1.0	\$1.1
Total	\$46.3	\$49.4

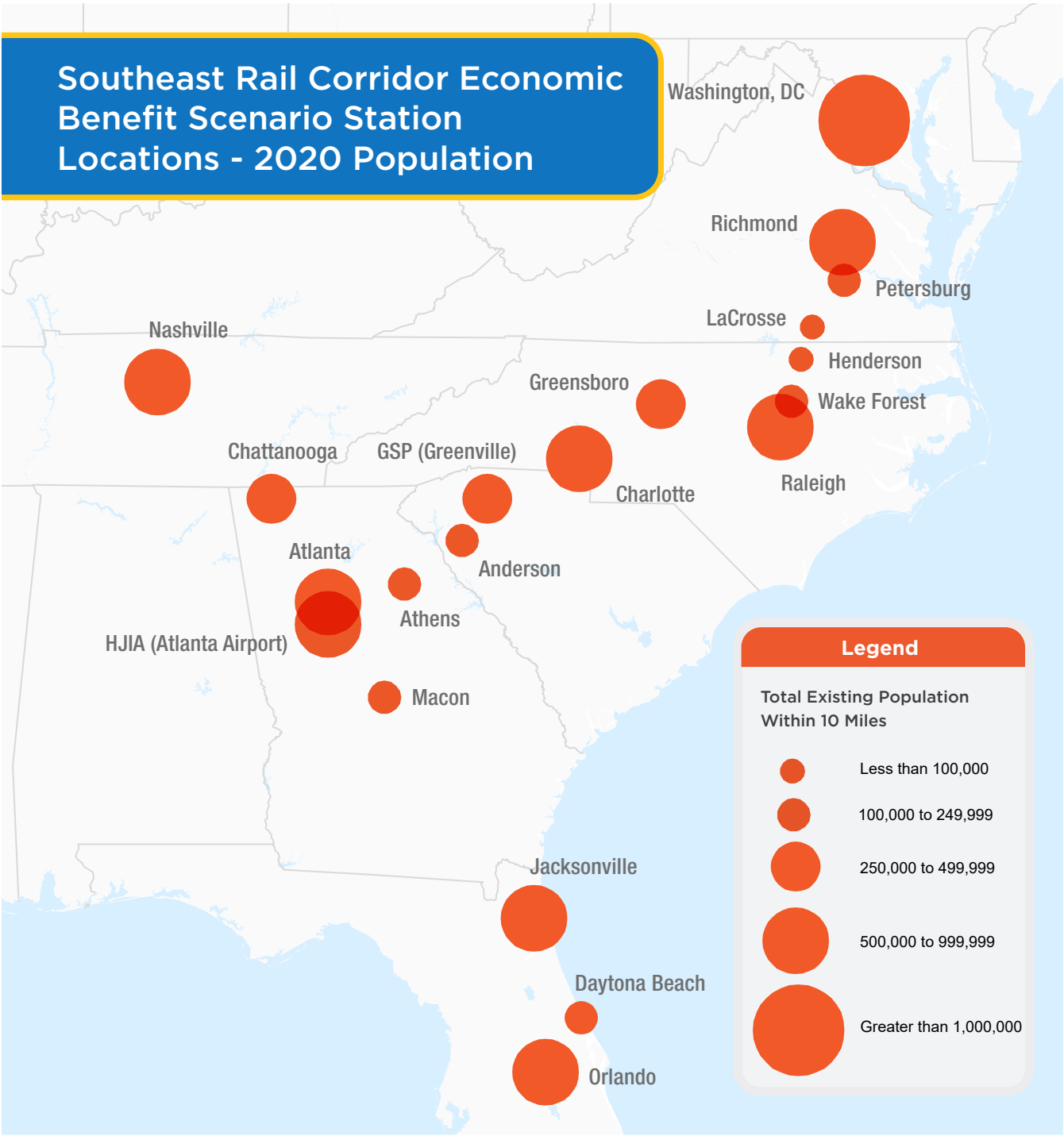
Freight Benefits

There are three segments along the Southeast Corridor where plans include adding a significant amount of capacity or new right-of-way for passenger rail services. This added capacity will serve to reduce passenger and freight train interference and provide resiliency to the freight network. Reduced freight delays due to these improvements are estimated to total \$153 million in both scenarios.

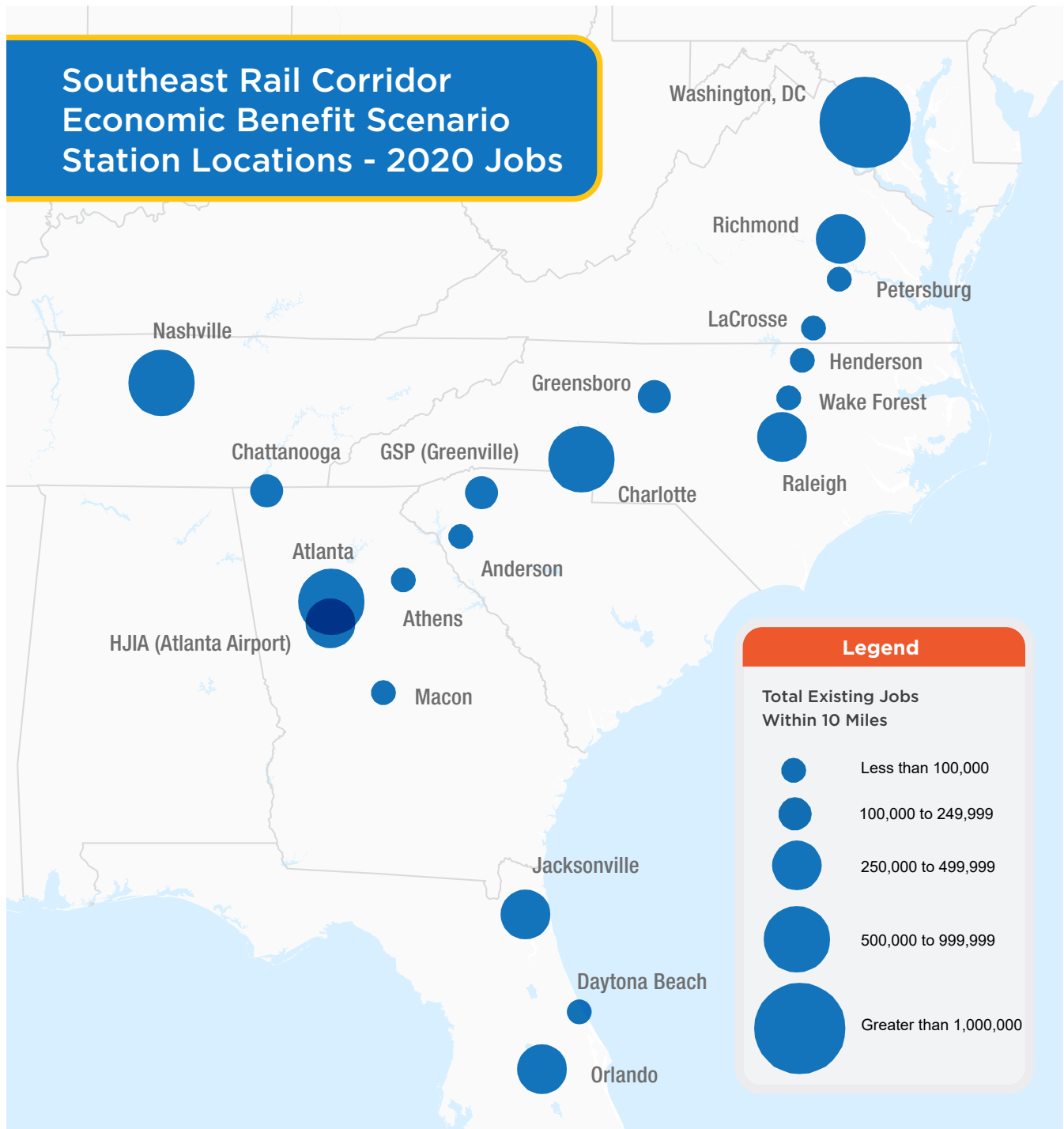


Improved Labor Market Access

Development of these rail scenarios in the Southeast will provide 5 to 9 million residents access to high-performance rail services and connect 3 to 6 million jobs to high-performance rail stations.



Southeast Rail Corridor Economic Benefit Scenario Station Locations - 2020 Jobs



SOUTHEAST CORRIDOR

