MACROECONOMIC ANALYSIS OF FLORIDA'S TRANSPORTATION INVESTMENTS

Fiscal Year 2024-2028 Work Program

Florida Department of Transportation
Systems Forecasting and Trends Office

December 2024

Executive Summary

Purpose

The Florida legislature requires that the Florida Department of Transportation (FDOT) evaluate the economic benefits of its five-year Work Program. FDOT conducts this analysis approximately twice per decade. This macroeconomic analysis estimates the effect of transportation investments on the state's economic competitiveness and compares the overall benefits and costs of FDOT's transportation investments.

The FDOT Work Program is made up of plans and budgets for five years of transportation projects and is developed collaboratively with metropolitan planning organizations and local governments in Florida. The Work Program includes transportation investments in highway, transit, rail, seaports and waterways, airports, spaceports, and related infrastructure.

Methodology

This analysis estimates the impact of investments made by the FDOT Work Program covering Fiscal Years 2023-2024 through 2027-2028. The macroeconomic analysis includes costs for both implementing transportation projects and for additional necessary support functions such as planning, operations, maintenance, and administration.

This analysis considers long-term gains in performance that result from investment in transportation infrastructure, using the best available Florida models and data on traffic forecasts, pavement and bridge condition, congestion, and crashes to measure improvements in travel time and reliability, vehicle operating costs, safety, and the environment.

This analysis also considers long-term gains in economic efficiency by applying a nationally recognized model to evaluate how transportation performance improvements such as congestion relief lead to economic growth through improved business productivity and competitiveness. The economic modeling captures effects on the Florida economy from supply chain impacts and greater consumer spending due to job growth.

The benefit-cost ratio equals the total benefits associated with Work Program projects divided by the cost of those projects.

Findings

Between 2024 and 2053, Florida is expected to realize $4.26 of personal and business benefits for every dollar invested in the 2024-28 Work Program. The present value of the benefits these investments are projected to generate is approximately $211 billion (2022 dollars). Additional benefits are summarized below:

Present Value of Benefits	Non-business benefits	$177 Billion
	Economic benefits	$34 Billion
	Total (sum of Economic and Non-business)	$211 Billion
Present Value of Costs	Total *Work Program* and *Moving Florida Forward* budget	$49 Billion
Summary Metrics	Net present value	$161 Billion
	Benefit-cost ratio	4.26
Impacts on the Economy	Present value increase in personal income	$24 Billion
	Present value increase in gross state product	$47 Billion
	Present value increase in output	$106 Billion
	Average increase in annual employment	21,000

Values are presented in 2022 of dollars, discounted at four percent to a present value in 2022. Analysis period is 30 years. Non-business benefits include the value of personal time and reliability, safety, personal operations and maintenance benefits, and other benefits from changes in travel and congestion relief. Economic benefits include labor income impacts on the Florida statewide economy and economic benefits of the seaport program. Numbers may not exactly add up due to rounding.

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1.0 Background

The Florida legislature, through Section 334.046(4) (b) of Florida Statutes, requires that the Florida Department of Transportation (FDOT) evaluate the economic benefits of its five-year Work Program. This macroeconomic analysis estimates the effect of transportation investments on the state's economic competitiveness and compares the overall benefits and costs of FDOT's transportation investments.

This chapter describes alignment of this analysis with statewide transportation planning objectives, summarizes the Florida legislative mandate that this study fulfills, reviews FDOT's program of investments, and discusses the study methodology.

1.1 Strengthening the Florida Economy

The 2055 Florida Transportation Plan (in development as of this report's publication) focuses on five goal areas: enhancing safety, promoting efficient movement of people and goods, engaging and connecting the community, supporting economic competitiveness, and preserving Florida's natural resources and quality of life.

With respect to supporting economic competitiveness, FDOT strives to deliver "transportation initiatives that support economic development, job creation, business growth and the state's economic competitiveness. A resilient transportation infrastructure is necessary to support our state's supply chain for a mix of industries and business."[1]

In alignment with these goals, this analysis quantifies impact of Florida's transportation investments on the people, businesses, and economy of the state. The macroeconomic analysis establishes the link between Work Program investments in highways (specifically in bridge, pavement, and capacity), safety, seaports, and transit over the next five years and benefits and economic growth due to these investments in Florida over the following 25 years.

1.2 Response to Legislative Mandate

Since 2000, Florida's Legislature has required FDOT to study the macroeconomic implications of transportation investments and their impact on the state's competitive position. A more thorough listing of the relevant legislative mandate(s) can be found in Section 334.046(4) (b) of Florida Statutes.

The legislation specifically requires the analysis to assess the following:

1. **The state's economic performance relative to the competition**. Investments in transportation can improve travel time and reliability, reduce vehicle operating costs, and lessen economic costs associated with crashes. This analysis first quantifies changes in transportation costs for people and businesses on a program-by-program basis. It then assesses how some of these savings accrue to the state's businesses, thus enhancing their relative competitive advantage. For example, investments in capacity projects can

[1] Florida Transportation Plan. https://www.floridaftp.com/ (Accessed 15 August 2024).

lessen congestion and enhance reliability, meaning that businesses that ship and receive goods see savings from less driver time, less inventory carrying costs, and fewer penalties related to late deliveries.

The reduced cost of doing business in Florida allows businesses to be more competitive and increase market share in national or global markets. Specific business impacts are increased output (sales), hiring additional workers, and, ultimately, increasing the personal income of Florida's residents and the gross state product. These impacts spread from the users of the transportation infrastructure to the broader Florida economy.

2. **Making the case for Florida as an attractive place to do business**. The TREDIS economic model, used in the macroeconomic analysis, accounts for the expansion and attraction of firms due to a reduced cost of doing business from transportation investments. By providing efficiencies in the transportation system, the state reduces business costs and becomes more attractive to employers of all sizes.

   TREDIS estimates economic expansions and new employment opportunities from the improved business environment. Over the full 30-year analysis period, the improved business environment would support a significant number of new long-term jobs.

3. **The state's capacity to sustain long-term growth**. The emphasis of this analysis is on long-term economic effects of transportation improvements rather than short-term, temporary impacts from construction spending. Over a 30-year period, Work Program investments will reduce the cost of doing business in the state, and these cost savings are projected to produce a substantial increase in personal income for Florida residents.

1.3 Program of Investments

1.3.1 Composition of Transportation Improvements

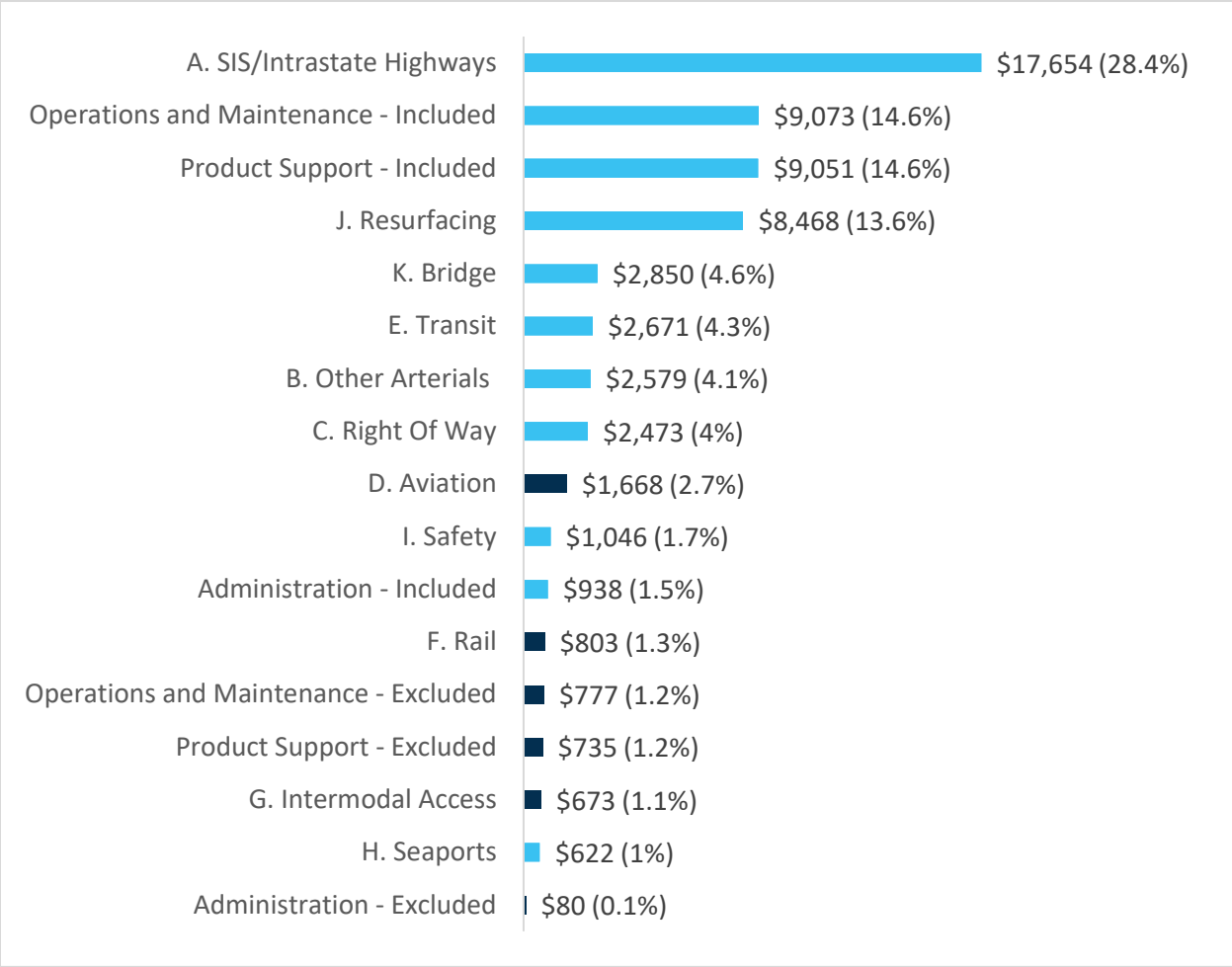
This analysis estimates the impact of investments made by the FDOT Work Program covering Fiscal Years 2023-2024 through 2027-2028 (July 1, 2023, Adopted version) and investments made by Moving Florida Forward covering Fiscal Years 2023-2024 through 2026-2027.

Investments in the FY 2018/2019-2022/2023 Work Program include highway resurfacing/reconstruction; bridges (repair, reconstruction and replacement); upgrades to existing highways (widening and interchange improvements, among others); new highway or interchange construction; safety improvements (improved design and intelligent transportation systems, among others); transit improvements (including for bus; heavy, light, and commuter rail; and paratransit services); and seaport improvements (access roads, facilities improvements, dredging, among others). These and other activities are found in the "Product" category within the 10-year Program and Resource Plan, which includes a summary of Work Program investments over the next five years.

In addition to Product expenditures, FDOT's Program and Resource Plan includes categories for other activities, including Product Support, Operations and Maintenance, and Administration.

These support activities are essential and the Product expenditures could not occur without them. Consequently, these three support activities were included in proportion to the included Product investments. Figure 1 summarizes the composition of the Work Program, ordered by level of investment, and color coded to show included expenditures in green and excluded categories in gray. Consistent with prior analyses, Florida's aviation, rail, or intermodal access infrastructure were not included due to limited data availability and modeling capacity. The analysis captures approximately 92 percent of the FDOT Work Program.

Figure 1. Work Program Composition (millions of year-of-expenditure dollars)



Source: EBP analysis of Florida Program and Resource Plan Summary (July 1, 2024 version)[2] Note: Figure is ordered by level of investment and color coded to show included expenditures in green and excluded categories in gray.

In addition to the Work Program, the Moving Florida Forward Infrastructure Initiative was enacted in 2023 to fund critical needs on state-owned roadways and accelerate previously approved projects with broad community support that were awaiting funding. The impact of

[2] Florida DOT Program and Resource Plan Summary. Downloaded from: https://fdotewp1.dot.state.fl.us/fmsupportapps/Documents/pra/ProgramAndResourcePlanSummary.pdf

Moving Florida Forward is also assessed in this macroeconomic analysis. These projects comprise an additional $5,778 million in capacity improvements that are expected to be complete within the analysis period and have since become part of the adopted Work Program.

In total, the analysis assesses over $63 billion of transportation improvements across the state (Table 1).

Table 1. Investments Analyzed (millions of year-of-expenditure dollars)

	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Work Program	**$16,373**	**$11,981**	**$10,043**	**$9,345**	**$9,684**	**$57,426**
A. SIS/Intrastate Highways	$5,585	$4,184	$2,727	$2,281	$2,877	$17,654
B. Other Arterials	$966	$359	$394	$418	$443	$2,579
C. Right Of Way	$1,290	$565	$279	$200	$139	$2,473
E. Transit	$713	$663	$421	$404	$471	$2,671
H. Seaports	$181	$105	$113	$111	$111	$622
I. Safety	$275	$181	$190	$197	$204	$1,046
J. Resurfacing	$1,652	$1,730	$1,745	$1,692	$1,649	$8,468
K. Bridge	$819	$262	$647	$730	$392	$2,850
Product Support	$2,840	$1,942	$1,581	$1,337	$1,351	$9,051
Operations and Maintenance	$1,880	$1,778	$1,767	$1,790	$1,858	$9,073
Administration	$172	$211	$179	$184	$191	$938
Moving Florida Forward	**$1,589**	**$880**	**$1,795**	**$1,515**	**$0**	**$5,778**
Total Investment	**$17,962**	**$12,860**	**$11,838**	**$10,859**	**$9,684**	**$63,204**

Source: EBP analysis of Florida Program and Resource Plan Summary (July 1, 2024, version)

1.3.2 Understanding Work Program Expenditures

Work Program expenditures are presented in three ways in this report: year of expenditure dollars, constant dollars, and discounted constant dollar costs.

- **Year of Expenditure Dollars |** Year of expenditure dollars (sometimes called nominal dollars) reflect the actual Work Program investments expected to occur in future years. Because some degree of inflation is expected to continue, year of expenditure amounts will be greater than constant amounts to build/improve a particular facility. This is consistent with how FDOT presents investments in its Work Program summary documents and is reported here reference purposes.
- **Constant Dollars |** Constant dollars are adjusted for inflation so that dollar amounts are comparable in terms of purchasing power across years. The economic analysis is reported in 2022 constant dollars, consistent with the data year of the economic model.
- **Discounted Costs |** Costs and benefits occur over multiple years. To account for this, discounting is implemented to account for the time value of money. As described by USDOT: “This concept reflects the principle that benefits and costs that occur sooner in time are more highly valued than those that occur in the more distant future, and that there is thus a cost associated with diverting the resources needed for an investment

from other productive uses in the future. This process, known as discounting, will result in future streams of benefits and costs being expressed in the same present value terms."[3] Discounted Work Program expenditures and benefits are used in the benefit-cost analysis section of this report.

1.4 Methodology Overview

As depicted in Figure 2, the macroeconomic analysis follows a series of steps connecting funded transportation improvements to expected changes in conditions and performance and from there to quantifiable benefits and impacts on the statewide economy. These steps are:

- **Funded Work.** The analysis starts by identifying the universe of funded work across the different modal and program areas.

- **Condition Forecasting.** A combination of Florida-specific and national tools and data are used to forecast conditions for Florida's transportation system and assets with and without the planned investments.

- **Travel Performance.** The analysis next identifies changes in performance stemming from changes in condition including metrics such as travel time, distance, level of congestion, number of crashes by severity, and pavement condition.

- **User and Non-User Benefit.** Benefits to travelers and society are quantified using a mix of Florida-specific and national best practice cost factors. The result is monetary valuation of changes in travel time and reliability, vehicle operating costs, shipper/logistics costs, crash costs, and other benefits from changes in travel and congestion relief.

- **Economic Growth.** Economic modeling is used to evaluate how changes in travel costs enable economic growth through improved business productivity and competitiveness on an industry-by-industry basis. The modeling also captures multiplier effects within the Florida economy from supply chain impacts and greater consumer spending due to job growth.[4]

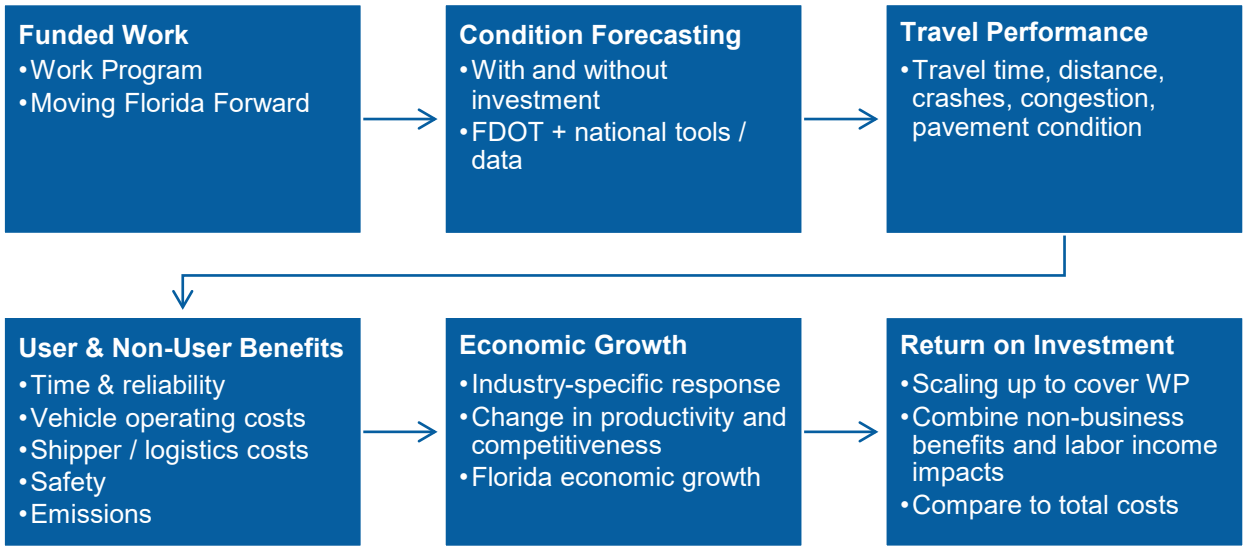
- **Benefit-Cost Analysis.** The analysis calculates benefit-cost ratios by dividing the benefits associated with Work Program and Moving Florida Forward projects by the cost of those projects. To do so, benefits are scaled up in some cases from the subset of benefits captured by modeling to the expected benefit from the full level of funding in the program. Consistent with prior analyses, the numerator of the benefit-cost ratio includes non-business benefits—comprised of the value of personal time and reliability, safety, personal operations and maintenance benefits, and other benefits from changes in travel

[3] USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs, December 2023. https://www.transportation.gov/sites/dot.gov/files/2023-12/Benefit%20Cost%20Analysis%20Guidance%202024%20Update.pdf (Accessed 15 August 2024)

[4] These are referred to as indirect and induced impacts by economists.

and congestion relief—as well as economic benefits, which include labor income impacts and economic benefits of the seaport program. Note that this formulation of benefits differs from a more classical benefit-cost analysis that considers monetized benefits to people and society, but not economic impact metrics like labor income.

Figure 2. FDOT Analysis Framework



This analysis significantly improves on the work of previous macroeconomic analyses[5] by focusing specifically on the projects being funded. Previous analyses leveraged national optimization tools (HERS and NBIAS[6]) that prioritized investments in roadway infrastructure based on data available in Federal databases, meaning the improvements analyzed were not necessarily representative of those funded by the Work Program.

This analysis uses state-specific traffic forecasts, asset condition data, historical safety data, and the list of projects funded by the Work Program and Moving Florida Forward to determine the impact of the investments being made in Florida's transportation system.

Additionally, this analysis transitioned from prior use of the REMI model to the TREDIS model.[7] TREDIS employs the same fundamental economic methods and datasets as REMI, but provides additional functionality specifically designed for evaluating transportation projects. TREDIS was used to monetize benefits using direct inputs of travel performance data, rather than relying on separate benefit analysis off-model as in prior iterations. This process enhanced analysis efficiency and enhanced consistency between the benefit and economic growth components of the evaluation.

Table 2 summarizes the prior methodology, and Table 3 outlines the new approach. Chapter 2 provides additional details for each program area.

[5] Prior analyses conducted in 2003, 2006, 2009, 2015, and 2020.
[6] The Highway Economic Requirements System (HERS) and the National Bridge Investment Analysis System (NBIAS).
[7] Technical documentation for TREDIS is available at: https://tredis.com/support/tech-docs

Table 2. Summary of Prior Analysis Methodology: Leverage National Optimization Software for Major Programs

Program	Direct Effects Tool	Macroeconomic Tool
Pavement	HERS	REMI
Capacity	HERS	REMI
Bridge	NBIAS	REMI
Safety	CRASH + WP List	N/A
Transit	Spending-ridership regressions	Off-model based on REMI
Seaport	SPET + WP List	Included in SPET

Notes: WP = Work Program. CRASH is a statewide FDOT tool for recording and analyzing crashes at project locations. SPET is FDOT's Seaport Project Investment Tool. FHWA = Federal Highway Administration.

Table 3. Summary of Current Methodology: Capture Programmed Projects with FDOT Tools

Program	Direct Effects Tool	Macroeconomic Tool
Pavement	FDOT Pavement Tools consistent with WP	TREDIS
Capacity	Turnpike Model + WP List	TREDIS
Bridge	WP bridge list and FDOT condition data + FHWA/NBIAS forecasts/closure logic	TREDIS
Safety	CRASH + WP List with updated linkage & detail	TREDIS
Transit	Adjusted spending-ridership regressions	Off-model
Seaport	SPET + WP List	Included in SPET

2.0 Macroeconomic Analysis

This chapter provides information on the macroeconomic analysis process and program-level results. It includes analytical assumptions, definitions of key terms, background on the TREDIS model, and program-by-program descriptions of modeled projects, methods and tools, and results.

2.1 Analytical Assumptions

The analysis examined a period of 30 years, including five years of capital expenditures in the Work Program and 25 years of projected benefits and macroeconomic effects. The final year for which quantitative results were generated was 2053.

The costs and benefits are expressed in constant 2022 dollars and discounted to a present value in 2022 using a four percent real discount rate, the rate selected by FDOT for benefit-cost analysis of capital projects. Use of discounted present value of future costs and benefits provides a consistent basis for comparing costs and benefits that occur in different future years.

2.2 Definition of Key Economic Terms

Monetized benefit metrics include reductions in the following:

- **Vehicle Operating Costs**: These include costs associated with tires, maintenance, depreciation, and fuel and are estimated on a per mile basis (reflecting changes in VMT). For mileage driven in congestion, additional fuel consumption costs reflect stop-and-go conditions.
- **Person-Based Travel Time and Reliability (Personal and Business):** Travel time costs include the value of time for drivers, passengers, and crew. Reliability costs capture additional time costs associated with the "buffer time" that travelers add on top of average travel time to ensure an on-time arrival 95% of the time.
- **Freight Time and Reliability (Shipper/Logistics) Costs:** Freight travel time has an opportunity cost, which is related to handling or storage costs, lost sales or late delivery penalties, and production costs associated with holding extra inventory or raw materials. These costs accrue to shippers and receivers of freight.
- **Safety Costs***:* Crashes result in fatalities, personal injuries, and property damage, with each type of crash having an associated value. Number of crashes can be influenced by specific safety improvements and by overall travel exposure and mode split (as measured by VMT).
- **Other Benefits from Changes in Travel and Congestion Relief:** Additional monetized societal value driven by changes in vehicle miles traveled (VMT) by mode, vehicle fuel efficiency, and changes in the proportion of vehicular travel occurring in congested conditions.[8]

Economic impact metrics include:

- **Labor income**: Employee compensation and proprietor income.
- **Value added**: The difference between total output and the cost of intermediate inputs. It consists of employee compensation, taxes on production and imports less subsidies, and gross operating surplus (similar to profit).
- **Output**: The value of industry production.
- **Employment**: Headcount of full and part time jobs.

Business output, value added, and labor income are different metrics that can be used to quantify the same economic activity. They are nested concepts, where value added is a subset of business output, and labor income is a subset of value added. As such, they should never be added together.

[8] See USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs, December 2023, section 5.4 and Table A-6 and Section 4.5 of the TREDIS Data Sources and Default Values: https://tredis.com/pdf/User_Docs/Data_Sources_and_Default_Values.pdf

Total economic impacts are comprised of:

- **Direct impact:** Change in economic activity for industries directly affected by transportation cost changes or changes in productivity.
- **Indirect impact:** The effect of spending by the suppliers to business users benefiting from system improvement.
- **Induced impact:** The effect of household spending due to additional employment and payroll generated by direct and indirect impacts.

2.3 The TREDIS Model

The economic modeling is conducted using TREDIS.[9] TREDIS is a decision support system for transportation planners that spans benefit-costs analysis, economic impact analysis, and freight and trade impact analysis.[10] It is used to evaluate economic outcomes of projects, programs and policies. TREDIS is multimodal and each TREDIS license is calibrated to a specific local, regional, or state economy – in this case the economy of Florida.

TREDIS consists of several model elements including:

- A *travel cost module* that translates changes in speed, distance, reliability, safety, and other travel characteristics into travel efficiency changes and direct cost savings for household and business travel.
- A *benefit-cost module* that calculates benefits and costs over time. Valuation follows international best practice, including the benefit-cost guidance of USDOT.
- An *economic adjustment module* that incorporates a dynamic, multi-regional economic-demographic model to estimate economic impacts over time from changes in transportation system performance. The model accounts for changes in productivity, capital investment, labor supply and demand, employment and wage shifts, and population migration. Changes in supply, demand, and prices redirect spending patterns to different industries and affect their relative profitability and competitiveness. In this way various transportation changes can affect the magnitude of economic growth.

2.4 Pavement (Work Program J)

Pavement resurfacing projects serve to improve roadway efficiency by reducing pavement roughness, which can be measured by International Roughness Index (IRI) or Present Serviceability Rating (PSR), and pavement cracking. Poor pavement increases vehicle operating costs from wear-and-tear (on tires and vehicle bodies), leading to maintenance costs,

[9] TREDIS has been used in 43 US states and Canadian provinces. Users include a wide set of state DOTs and MPOs, as well as local transportation agencies, universities and leading consulting firms. For more information: https://tredis.com/products/product-overview/inside-tredis

[10] Full TREDIS documentation is available here: Technical Docs | TREDIS

and increased fuel consumption as friction increases and driving behavior responds to poor pavement. Savings from pavement projects impact both personal and business-related travel.

2.4.1 Modeled Projects

The pavement projects included in this analysis comprise the roads in FDOT's State Highway System (SHS), including interstate highways and Florida's Turnpike. FDOT prioritizes pavement projects based on a scoring method that considers road condition (cracking deficiencies and roughness).

2.4.2 Methodology and Tools

Pavement Condition Forecasting

FDOT's Pavement Condition Survey (PCS) system was used to forecast the deterioration of SHS roadways by FDOT district and functional classification (arterial, interstate, and turnpike) from 2024 through 2029 under a base scenario (i.e. no investment) and a Work Program scenario.[11] The percentage of deficient lane-miles forecasted for each year was multiplied by FDOT's reported daily vehicle miles traveled (DVMT) for 2023 by district and functional classification and then summed to determine the percentage of total VMT on deficient pavement. For years beyond the Work Program (2029 through 2053), it was assumed that pavement condition would be maintained at constant levels (46 percent deficient for the base scenario and 14 percent deficient for the Work Program scenario).

Because economic modeling relies on mode and trip purpose mix such as commercial trucking, business automobile travel, and commuting, VMT by mode and purpose was projected using data and growth rates from the Florida Turnpike State Model (TSM), as described in Section 2.6.2. The analysis applies a uniform purpose mix to each of the functional classifications tracked in the pavement forecasts.

Economic Modeling

The TREDIS model monetized benefits by comparing the base scenario and the Work Program scenario. As all inputs for both scenarios were identical except for the percentages of deficient pavement, all differences in the results are due solely to changes in pavement condition.

2.4.3 Results

Societal Benefits – Business and Non-Business

Table 4 shows the present value of benefits from pavement projects. Business benefits are entirely due to reduced vehicle operating costs associated with tires, maintenance, depreciation, and fuel for business and freight travel. Non-business benefits include similar operating costs savings for personal travel as well as other benefits from better pavement condition (and

[11] To rate pavement quality, the FDOT's standard forecast models cracking and roughness but not rutting; however, rutting currently is the cause of only 0.3 percent of deficient SHS lane-miles.

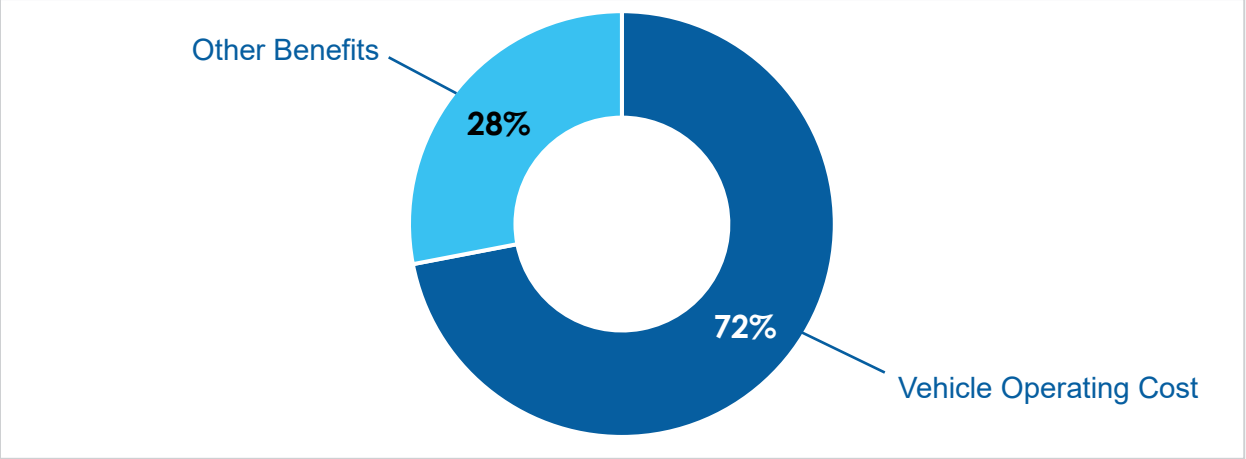
resulting reduced fuel consumption). Nearly three quarters of benefits are vehicle operating cost savings (Figure 3).

Table 4. Present Value of Benefits from Pavement Projects

Benefits	Present Value (2022 Millions)
Non-Business Benefits (Personal vehicle operating cost savings and other benefits from better pavement condition)	$69,241
Business Benefits (Business and freight vehicle operating costs savings)	$16,073
Total Benefits	**$85,314**

Source: EBP analysis with FDOT data and TREDIS. Dollar amounts are in millions of 2022 dollars, discounted at four percent and rounded to the nearest dollar.

Figure 3. Composition of Benefits from Pavement Projects



Source: EBP analysis with FDOT data and TREDIS.

Economic Impacts

Table 5 shows the economic impact results of pavement projects in millions of discounted 2022 dollars. Compared to the base scenario, the Work Program scenario is modeled to have an overall increase in economic activity spread across most industries. The most significant decreases in economic activity are in the automotive repair and maintenance industry, as households spend less on vehicle repairs and have income for other purchases.

Table 5. Economic Impacts of Pavement Projects

Measure	Present Value (2022 Millions)
Labor Income	$8,773
Value Added	$21,159
Output	$49,600
Average Annual Employment	7,835

Source: EBP analysis with FDOT data and TREDIS. Note: Values are presented in 2022 millions of dollars, discounted at four percent, rounded to the nearest dollar. Labor income, gross state product, and output are cumulative measures and annual employment is the average over the 30-year period.

2.5 Bridges (Work Program K)

Investments in maintaining bridges in a state of good repair allow FDOT to ensure bridges remain safe for use now and into the future. Projects prevent future bridge closures or posting that would restrict the passage of trucks. As a result, investments in bridges prevent detours for both car and truck traffic, resulting in savings in travel time, vehicle operating costs, reduced exposure to crashes, and other benefits from keeping bridges open (and avoiding extra vehicle miles of travel). These costs savings directly benefit travelers and also translate into improved efficiency and productivity for Florida businesses.

2.5.1 Modeled Projects

Work Program projects that repair, rehabilitate, or reconstruct bridges were analyzed under this category. Projects that construct new bridges were considered under the highway capacity analysis. The specific bridges improved by the Work Program were identified using National Bridge Inventory (NBI) numbers contained in the Work Program project details.

Individual identifiable bridge projects account for 34.71% of the funding associated with Category K in the Work Program. The remainder of the Work Program projects in the category are not assigned to complete specific bridge improvements. Rather, these projects represent funding set aside to make bridge repairs or perform maintenance as unanticipated issues arise. The modeling described below scales up benefits to account for the remaining funding, under the expectation that other bridge projects will generate similar or greater benefits per dollar as those individually accounted for.

2.5.2 Methodology and Tools

Bridge Condition and Closure/Posting Risk Forecasting

Bridge-specific condition forecasts were prepared at 5-year intervals using current asset condition information from the State of Florida and forecasts of future deterioration from the National Bridge Investment Analysis System (NBIAS).

Forecasted operating ratings and superstructure conditions were used to determine the year in which bridges would first be posted (restricting truck traffic) or closed (to all traffic) using the logic from Appendix B of the Federal Highway Administration's *Bridge Investment Program*

Benefit-Cost Analysis Tool[12]. It was assumed that Work Program projects that fund maintenance and repair projects would allow bridges to avoid all postings and closures for 20 years based on the expected life of those improvements, at which point those bridges would return to their condition prior to improvement by the Work Program.

Economic Modeling

Bridge-specific data from the NBI on daily traffic volumes, the share of traffic made up of trucks, forecasted traffic volume growth rates, and the length of the detour required in the event of a bridge posting or closure was used to estimate the changes in travel time and distance associated with the condition forecasts prepared at 5-year intervals. The amount of traffic detoured in the no-build condition without projects due to posted or closed bridges grows over time as bridge conditions worsen in the future.

These changes in travel performance were then input into the TREDIS model under the no build (without bridge projects) and build conditions (with bridge projects). To calculate benefits, the TREDIS model was used to compute avoided time, distance traveled, and crashes, and then apply valuation factors that reflects costs to Florida residents and businesses. The economic adjustment module of TREDIS is then used to forecast the effect of cost savings associated with avoided detours for freight and other related business travel on economic growth.

2.5.3 Results

Societal Benefits – Business and Non-Business

Table 6 shows the present value of benefits associated with the bridge postings and closures that are avoided because of bridge repair and maintenance projects funded by the Work Program. Modeling of individual bridge projects generates unadjusted benefits reflecting only a portion of the Work Program funding. Total benefits reflect a scaling upwards based on the expectation that the projects that were not associated with a specific bridge and for which condition forecasts could not be prepared would provide societal benefits at the same rate as the projects that were modeled.

[12] Federal Highway Administration. 2023. *Bridge Investment Program Benefit-Cost Analysis Tool User Manual.* https://www.fhwa.dot.gov/bridge/bip/bca/BIP%20BCA%20Tool%20User%20Manual.pdf

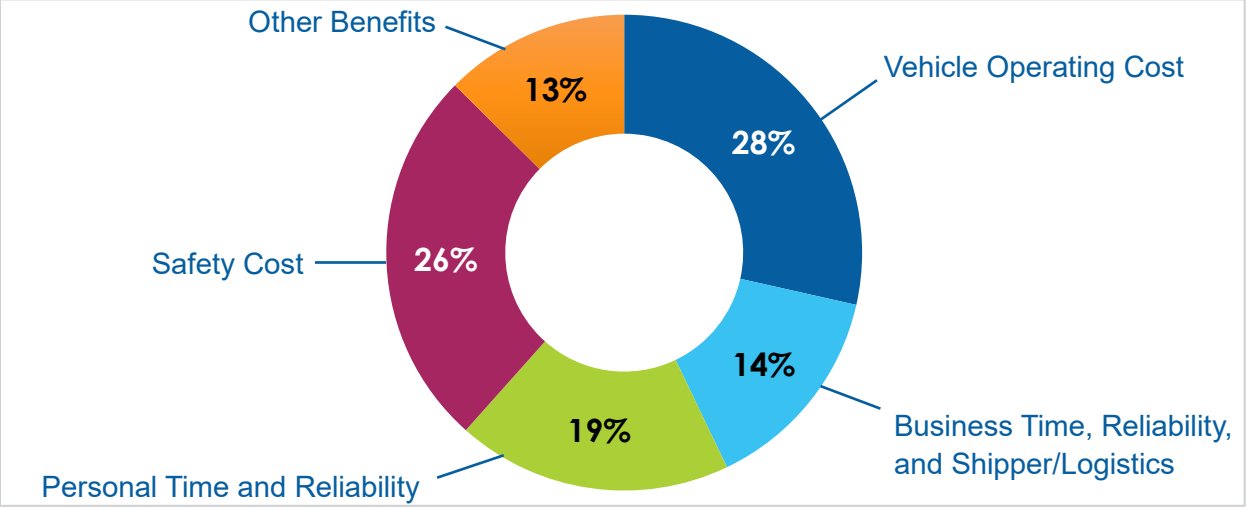
Table 6. Present Value of Benefits from Bridge Projects

Benefits	Present Value (2022 Millions)
Non-Business Benefits (Personal time and reliability and vehicle operating cost savings, safety, other benefits from keeping bridges open)	$36,854
Business Benefits (Business and freight time and reliability and vehicle operating costs savings)	$17,111
Total Benefits	**$53,965**

Source: EBP analysis with FDOT data and TREDIS. Dollar amounts are in millions of 2022 dollars, discounted at four percent and rounded to the nearest dollar.

Figure 4 illustrates the relative composition of benefits generated by the bridge projects. Avoided detours from keeping bridges open yield a broad range of benefits including avoided vehicle operating costs, savings in time, and avoided crashes and other benefits from reduced vehicle miles traveled.

Figure 4. Composition of Benefits from Bridge Projects



Source: EBP analysis with FDOT data and TREDIS.

Economic Impacts

By maintaining bridges and avoiding posting, closures, and associated detours, the bridge program will support long-term economic growth in the state. Over a thirty year period, the bridge program is forecast to add $28 billion in output, $13 billion in value added, and $7 billion in labor income to the Florida economy, supporting an average of nearly 6,900 jobs each year (Table 7).

Table 7. Economic Impacts of Bridge Projects Over Thirty Years

Measure	Present Value (2022 Millions)
Labor Income	$7,167
Value Added	$12,953
Output	$28,065
Average Annual Employment	6,947

Source: EBP analysis with FDOT data and TREDIS. Note: Values are presented in 2022 millions of dollars, discounted at four percent, rounded to the nearest dollar. Labor income, gross state product, and output are cumulative measures and annual employment is the average over the 30-year period.

2.6 Highway Capacity (Work Program Categories A, B, C)

Investments in highway capacity projects benefit Floridians and the Florida economy by relieving congestion, reducing bottlenecks, enhancing reliability, and providing additional connections in locations of growing demand. These projects save people and businesses time, reduce the additional "buffer time" needed to ensure on-time arrival, and in some cases provide more direct connections, resulting in reduced vehicle miles traveled. Each of these results in cost savings for travelers and enhanced economic efficiency enabling businesses to grow.

2.6.1 Modeled Projects

Highway capacity projects include Work Program or Moving Florida Forward projects that add lanes to existing roadways or interchanges, as well as those that construct new roadways or interchanges. It was assumed that most projects will open 5 years after construction begins, except for design-build projects, which will open 7 years after construction begins. The analysis considers projects that are expected to open by 2030, the interim model year within the Florida Turnpike State Model that is closest to the conclusion of the analyzed Work Program.

This analysis directly modeled the impact of 55% of highway capacity projects in the Work Program and 100% of highway capacity projects in the Moving Florida Forward Infrastructure Initiative. Unmodeled Work Program spending includes funding that is bundled rather than project-specific and improvements that cannot be effectively captured using a travel demand model, including interchange and intersection improvements that enhance operational performance but cannot be coded as additional capacity in a network-model. Instead, these projects were assumed to return benefits and generate economic impacts at the same rate as the projects that were modeled.

2.6.2 Methodology and Tools

Travel Demand Model Forecasting of Performance Impacts

The Florida Turnpike State Model (TSM) was used to assess the impacts of the highway capacity projects in the Work Program and Moving Florida Forward. The "no-build" transportation network, depicting the state's transportation network as it stands today and with projects that were funded by previous Work Programs, and a "build" network, depicting the

state's transportation network with the addition of the highway capacity projects being analyzed, were coded into the model. Travel demand models are calibrated using local survey and traffic data to align with travel patterns and traffic levels in the present-day. Travel models also use population and socioeconomic forecasts to estimate travel patterns and traffic levels in future years and under alternative network scenarios.

In total, 5 TSM runs were used for this analysis: the present-day model (representing the year 2022), the 2030 model under the build and no-build scenarios, and the 2050 model under the build and no-build scenarios. These model runs provide information on the number of vehicles that traverse each roadway in the network by hour, the vehicle type (e.g., car or truck), and the number of travelers traveling for a specific purpose (e.g., to commute, for personal reasons, for long-distance travel, etc.). This information was used to create a statewide summary of the amount of time individuals spend on the road in the State of Florida by year and scenario, the distance they drive, and the amount of time spent congested in traffic across each of the years and scenarios considered. Traffic growth was interpolated between model years and the benefits of the projects being analyzed are phased in linearly between 2024 (the first year being analyzed) and 2029 before taking full effect in 2030.

Economic Modeling

Outputs from the travel model forecasting were used to develop TREDIS inputs under the no build and build conditions, including vehicle miles and hours traveled and buffer time that reflects the level of additional time travelers build into their trips because of recurring and non-recurring delay. TREDIS is used to quantify benefits associated with time savings, reliability improvements, avoided vehicle operating costs, reduced crashes, and other benefits from congestion relief and more direct routes. Cost savings that accrue to business also result in economic gains from improved business productivity and competitiveness, as calculated in the TREDIS economic adjustment module.

2.6.3 Results

Societal Benefits – Business and Non-Business

Table 8 shows the present value of benefits that result from capacity projects in the Work Program and Moving Florida Forward. These benefits are the result of changes in the amount of time spent traveling, levels of congestion and reliability, distance traveled, and exposure to crashes across the transportation system. Total benefits reflect scaling of benefits from the modeled capacity projects to the total value of capacity improvements in the Work Program.

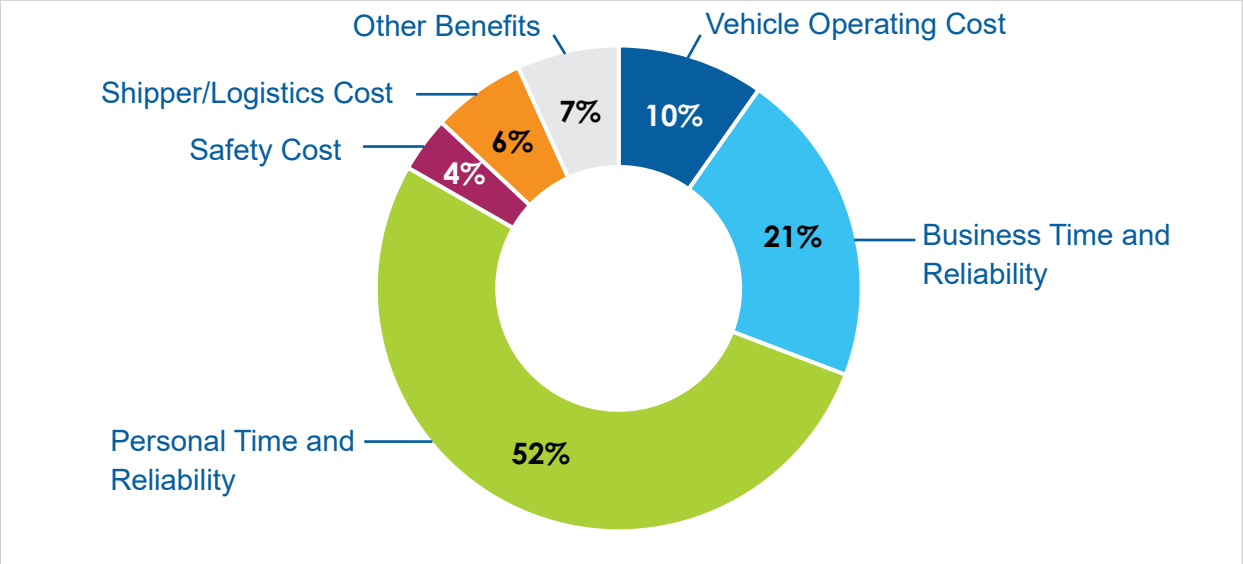
Table 8. Present Value of Benefits from Highway Capacity Projects

Benefits	Present Value (2022 Millions)
Non-Business Benefits (Personal time and reliability and vehicle operating cost savings, safety, other benefits from congestion relief and more direct routes)	$35,063
Business Benefits (Business and freight time and reliability and vehicle operating costs savings)	$16,554
Total Benefits	**$51,617**

Source: EBP analysis with FDOT data and TREDIS. Dollar amounts are in millions of 2022 dollars, discounted at four percent and rounded to the nearest dollar.

Figure 5 illustrates the relative composition of benefits generated by highway capacity projects. The largest categories of benefits are associated with time savings and improvements in reliability.

Figure 5. Composition of Benefits from Highway Capacity Projects



Source: EBP analysis with FDOT data and TREDIS.

Economic Impacts

By eliminating bottlenecks and slowdowns on the roadway network, the highway capacity program, including Moving Florida Forward, will enhance competitiveness and support statewide economic growth. Over thirty years, capacity projects are forecast to add nearly $25 billion in output, expand the gross state product by $11 billion, provide $7 billion in additional income to Florida residents, and support an average of over 6,000 jobs annually (Table 9).

Table 9. Economic Impacts of Highway Capacity Projects

Measure	Present Value (2022 Millions)
Labor Income	$7,012
Value Added	$11,447
Output	$24,740
Average Annual Employment	6,066

Source: EBP analysis with FDOT data and TREDIS. Note: Values are presented in 2022 millions of dollars, discounted at four percent, rounded to the nearest dollar. Labor income, gross state product, and output are cumulative measures and annual employment is the average over the 30-year period.

2.7 Highway Safety (Work Program Category I)

Highway safety projects include improvements such as changes to roadway and intersection geometric, lighting, striping and other roadway delineation, shoulder treatments, and traffic control and intelligent transportation system improvements that reduce the risk of crashes and associated loss of life, injuries, and property damage.

2.7.1 Modeled Projects

This analysis estimated the impact of safety projects funded by the Highway Safety Improvement Program (HSIP). Given the shorter construction and implementation timelines of safety projects, it was assumed that safety projects begin to effect benefits in the year they are first funded and provide the same level of benefit until they reach the end of their useful life. As with other program areas, only a subset of projects could be modeled directly, in this case based on assessment of crash reduction outcomes for similar projects completed in the state of Florida within the past 20 years. For projects not directly modeled, the analysis assumes economic returns to HSIP funding in the Work Program at the same rate as those analyzed, with the exception of preliminary engineering, traffic engineering studies, and transportation work mixes that receive HSIP funding but are not expected to have an immediate impact on crashes.

2.7.2 Methodology and Tools

Forecasting Crash Reductions from Ex-Post Analysis of Safety Projects

This analysis forecasted crash reductions associated with safety projects funded by the Work Program using historical data from the Safety Office's Crash Data System (CRASH). The CRASH data contains information on the number of crashes by severity type before and after various safety improvements were implemented over the past approximately 20 years. Both these historical safety projects and the safety projects funded by the Work Program were categorized based on the type of improvements made, and it was assumed that safety projects funded by the Work Program would return the same level of crash reductions per dollar as historical projects of a similar project type. Expected crash reductions were converted to an expected number of injury reductions by type using a crosswalk from *Crash Costs for Highway*

Safety Analysis.[13] Safety projects were assumed to begin providing benefits in the first year they receive funding and provide benefits until they reach the end of their useful lives, which were determined in consultation with experts in FDOT's Safety Office.

Economic Modeling

Estimates of changes in crashes by severity were entered into TREDIS. Safety benefits are calculated based on avoidance of crashes of different levels of severity and USDOT guidance on recommended monetization factors for avoiding fatalities, injuries, and property damage. Crash reduction also yields improved economic outcomes including reallocation of medical care costs back to payees (both firms and households), reductions of lost productivity due to injury, and savings in insurance costs.

2.7.3 Results

Societal Benefits – Business and Non-Business

Table 10 shows the present value of benefits associated with a reduction in the number of crashes due to the Work Program's investments in safety projects. All safety benefits are non-business benefits.

Table 10. Present Value of Benefits from Safety Projects

Benefits	Present Value (2022 Millions)
Non-Business Benefits (Safety benefits)	$35,133
Business Benefits (Business and freight time and reliability and vehicle operating costs savings)	--
Total Benefits	$35,133

Source: EBP analysis with FDOT data and TREDIS. Dollar amounts are in millions of 2022 dollars, discounted at four percent and rounded to the nearest dollar.

Economic Impacts

Crash avoidance from improved safety also drive changes in the economy, including allowing households and businesses to spend on other goods and services rather than medical care, avoiding loss productivity, and providing for reductions in expenditures on insurance. As a result of these shifts, across a period of thirty years, safety projects are forecast to add over $3 billion output, increase gross state product by $1.6 billion, support an additional $591 million in labor income, and add an average of over 500 jobs annually (Table 11).

[13] Federal Highway Administration Office of Safety. 2018. *Crash Costs for Highway Safety Analysis.* https://safety.fhwa.dot.gov/hsip/docs/fhwasa17071.pdf.

Table 11. Economic Impacts of Safety Projects

Measure	2022 $Millions
Labor Income	$591
Value Added	$1,622
Output	$3,184
Average Annual Employment	562

Source: EBP analysis with FDOT data and TREDIS. Note: Values are presented in 2022 millions of dollars, discounted at four percent, rounded to the nearest dollar. Labor income, gross state product, and output are cumulative measures and annual employment is the average over the 30-year period.

2.8 Transit (Work Program Category E)

The transit program provides technical, operating, and capital funding to transit (including bus service and heavy, light, and commuter rail), paratransit, and ridesharing systems across the state. These services benefit both the users of transit and non-users.

2.8.1 Modeled Projects

Transit investments in the Work Program represent a subset of all funding for transit in the state. This analysis is based on an evaluation of the ridership and associated costs and benefits of all transit and commuter rail systems in Florida. It is then scaled down based on the Work Program's share of overall transit funding.

2.8.2 Methodology and Tools

The analysis considers two categories of benefits for transit:

- User benefits, which apply to riders of transit and are calculated based on ridership and an estimation of "consumer surplus" that reflects people's willingness to pay to use transit and the value of transit services relative to other alternatives.
- Non-user benefits, which accrue to Florida residents overall as a result of reductions in vehicle miles traveled on the roadway network and application of USDOT guidance on valuing external highway use costs including congestion relief, noise, safety, and other benefits.

The analysis begins by forecasting revenue miles of transit service in the state as a function of total transit investment, and then similarly forecasts ridership as a function of the provided revenue miles of service. Both forecasts are developed based on a regression analysis of past data on transit ridership and service for Florida from the Federal Transit Administration's National Transit Database.[14] Because the pandemic introduced a major discontinuity in transit ridership, forecasts are adjusted using estimated ridership developed based on Transit app

[14] FTA. National Transit Database. https://www.transit.dot.gov/ntd

usage for the American Public Transportation Association.[15] This adjustment avoids overestimation and brings the forecast ridership more in line with observed ridership.

Non-user benefits were computed by converting the ridership increase to a VMT decrease (mode shift) using assumptions for trip distance[16] and vehicle occupancy.[17] From there, non-user benefits are calculated using external highway use cost valuation factors encompassing congestion, noise, safety, and other benefits from USDOT BCA guidance.[18]

User benefits were computed from the ridership increase as consumer surplus using assumptions for fares,[19] value-of-time,[20] elasticity,[21] and projected ridership increase. Consumer surplus typically represents the benefit of lowering a price (transit fares, for example) and seeing demand (ridership, for example) increase as a result. In this case the logic runs in reverse – ridership was assumed to increase, so the effective cost of riding (in terms of convenience and comfort) was assumed to decrease.

2.8.3 Results

The present value of user and non-user benefits from transit investments in the Work Program is $1.1 billion (Table 10). Additional impacts on the economy were not estimated for transit.

Table 12. Present Value of Benefits from Transit Projects

Benefits	Present Value (2022 Millions)
User and Non-User Benefits (Consumer surplus, congestion relief, noise, safety, and other benefits)	$1,100
Total Benefits	**$1,100**

Source: EBP analysis with FDOT and national data. Dollar amounts are in millions of 2022 dollars, discounted at four percent and rounded to the nearest dollar.

[15] APTA Ridership Trends. https://transitapp.com/APTA
[16] 2023 Florida Transit Information and Performance Handbook.
[17] 2012 National Household Travel Survey, average vehicle occupancy for "South" region.
[18] US DOT BCA Guidance for Discretionary Grant Programs, Table A-14.
[19] NTD 2022 TS2.1 Service Data and Operating Expenses Time Series by Mode.
[20] Value of time from the Florida Turnpike State Model (TSM). Mode purpose split from APTA Who Rides Public Transportation. apta.com/wp-content/uploads/Resources/resources/reportsandpublications/Documents/APTA-Who-Rides-Public-Transportation-2017.pdf
[21] USF Center for Urban Transportation Research – accessed for 2009 Assessment.

2.9 Seaports (Work Program Category H)

Investments in seaports increase processing speeds and throughput for both passengers and cargo at Florida's ports. Improvements in these measures provide economic benefits to both people and businesses.

2.9.1 Modeled Projects

Seaport projects in the Work Program include port specific projects, as well as state- and district-wide funding programs including the Florida Seaport Transportation and Economic Development Council (FSTED), Strategic Intermodal System (SIS), and past bond programs. Work program items were reviewed and categorized into capital projects, studies/data, and debt payments. For studies/data items (representing costs with no benefits) and debt payments, a BCR of 0 was applied. Generic, districtwide projects also were excluded from the calculation of an average BCR described below.

2.9.2 Methodology and Tools

The annual FSTED project application process provides a pool of project Benefit-Cost Ratios (BCRs) that were used to develop an estimate of economic benefits of the Seaport Office's 2024-2028 Work Program, consistent with the methodology used in 2014 and 2020.

FDOT's Seaport Project Investment Tool (SPET) was used to assess the benefits of projects requesting State funds. The SPET was designed to develop project level estimates of return on investment (ROI) to the State of Florida based on the following:

- Economic benefits of increased cargo and cruise passenger throughput, determined based upon mode type, regional location, and passenger vacation trends (e.g., pre- and post-cruise hotel stays) among other factors.
- Gross Regional Product generated from increased cargo and/or cruise throughput, monetized benefits of improved transportation efficiencies and related safety and operational benefits.
- Total capital costs and maintenance costs over the life of the project, including any linked projects that are necessary to support the increased throughput.

The SPET output was converted from an ROI to a Benefit/Cost Ratio (BCR). Note that because the seaport analysis relies on the SPET tool, the methodology for quantification of benefits differs somewhat from the TREDIS-based approach of the other program areas.

Not all funded projects included in the 2024-2028 Work Program had BCRs available from the FSTED application records. If a project did not have an available BCR, one was matched from a similar project using engineering judgment.

For projects with a BCR, benefits corresponding to the FDOT match were calculated by multiplying the costs from the Work Program by the BCR. For each project without a BCR, one was selected based on a similar project or projects. When multiple projects were used, total

costs and total benefits for the projects were used to calculate an average. Projects selected as representative projects were based on the following characteristics:

- Commodity type (i.e. cargo versus cruise).
- Project type (i.e. dredging versus bulkhead reconstruction).
- Size of port (i.e. large versus small).

Part of the methodology to determine the BCRs through the SPET is using the United States Maritime Administration (MARAD) Port Economic Impact Kit which is used to assess the economic impacts of maritime-related construction and on-going activities. This tool primarily determines benefits based on changes in cargo and cruise passenger throughput. Key factors which impact the benefits beyond the basic volume change include mode type, regional location, and passenger vacation trends (i.e. pre- and post-cruise hotel stays). This tool provides output, employment, income, and gross state product for each project, which is used to determine the BCR.

The average BCR across all projects (including matched values) was then applied to the full value of the Work Program for each of the five years to calculate the economic impacts of the state's seaport investments. The overall BCR was calculated by dividing overall PV benefits by overall PV costs for all projects in the Work Program.[22]

2.9.3 Results

The total benefits for seaport projects in the Work Program was estimated to be $10.2 billion (2022 dollars, 3.95 percent discount rate). The overall total BCR for the seaport projects in the Work Program is 7.24:1.

[22] The SPET has historically used a discount factor of 3.95 percent, which represents original guidance from the Federal Highway Administration's (FHWA) Transportation Investment Generating Economic Recovery (TIGER) Grants. This analysis maintains the 3.95% discount rate for the analysis of seaport projects and reports results in 2022 dollars. This is nearly identical to the 4% used for all other program areas.

3.0 Economic Analysis Results

3.1 Benefit-Cost Analysis

Combining results across all the analyzed programs, the benefit-cost ratio of FDOT's 2024-2028 Work Program and Moving Florida Forward is estimated to be 4.26 with an NPV of $161 billion over 30 years. The analysis indicates that for every dollar invested into the Work Program, Florida's residents and businesses will receive an economic return of over four dollars. The results of this analysis demonstrate the value of FDOT's transportation investments and its impacts on Florida's transportation system compared with making no investments and allowing the system to deteriorate.

Table 13. Summary of the Benefit-Cost Analysis

Present Value of Benefits	Non-business benefits	$177 Billion
	Economic benefits	$34 Billion
	Total (sum of Economic and Non-business)	$211 Billion
Present Value of Costs	Total *Work Program* and *Moving Florida Forward* budget	$49 Billion
Summary Metrics	Net present value	$161 Billion
	Benefit-cost ratio	4.26

Values are presented in 2022 of dollars, discounted at four percent to a present value in 2022. Analysis period is 30 years. Non-business benefits include the value of personal time and reliability, safety, personal operations and maintenance benefits, and other benefits from changes in travel and congestion relief. Economic benefits include labor income impacts on the Florida statewide economy and economic benefits of the seaport program. To avoid double-counting safety benefits tabulated in non-business benefits, only indirect and induced labor income from safety is included in the economic benefit tabulation. Numbers may not exactly add up due to rounding.

3.2 Comparison to Prior Analyses

This report, reflecting analysis performed in 2024, is the sixth Macroeconomic Analysis following the 2000 legislative mandate. All the analyses have shown the State of Florida receives a strong positive return from investment in the FDOT Work Program. The methodology has evolved, broadened, and deepened over these two decades.

This analysis shows an overall benefit-cost ratio that is slightly higher than that of the 2020 report and close to the ratio reported in 2015. This macroeconomic represents a significant change in methodology relative to prior analyses. While **the overarching economic analysis goals, framework, and metrics are consistent with prior years**, the shift towards use of Florida- and project-specific data and forecasts rather than national optimization tools does mean figures are not directly comparable to prior rounds.

FDOT believes that the 2024 Macroeconomic Analysis represents the most thorough and defensible accounting to date.

Table 14. Macroeconomic analysis results over time

Metric	2003	2006	2009	2015	2020	2024
Discounted Benefits	$171	$186	$166	$167	$181	$211
Discounted Costs	$31	$33	$34	$38	$45	$49
NPV	$140	$153	$132	$129	$136	$161
Benefit-Cost Ratio	5.5	5.6	4.9	4.4	4.0	4.3

Source: EBP analysis with FDOT data and TREDIS. Values are presented in 2022 $billions of dollars, discounted at four percent.

3.3 Impacts on the Florida Economy

Transportation projects from FDOT's 2024-2028 Work Program and Moving Florida Forward are forecast to support an increase in $106 billion in output, $24 billion in labor income, and add $47 billion to the gross state product over a 30-year period. Transportation performance improvements and resulting economic growth are forecast to add over 21,000 jobs on average over the same period.

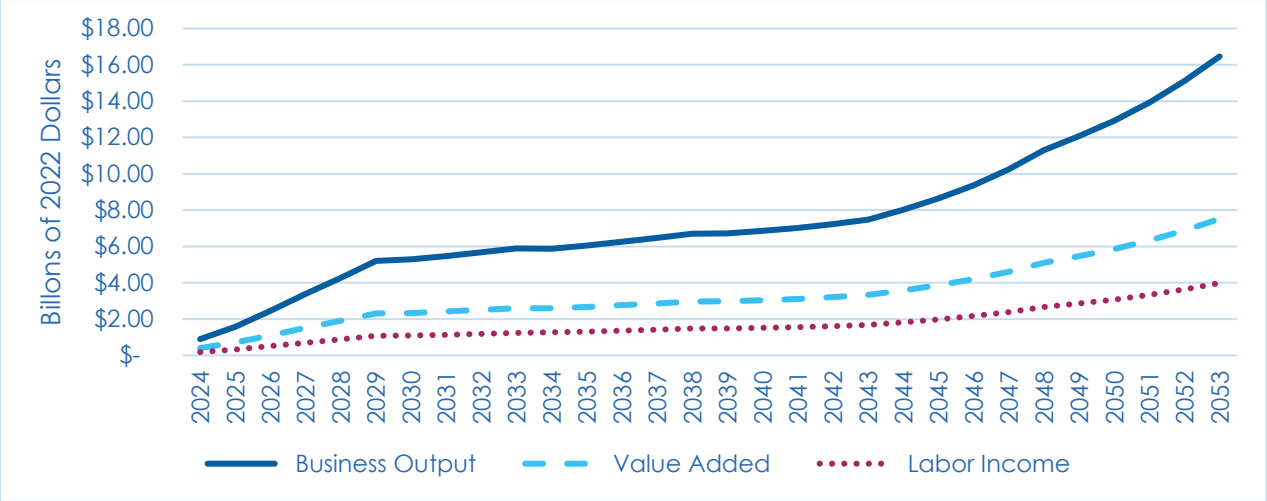
Table 15. Impacts on the Florida Economy Over Thirty Years

Program	Labor Income	Gross State Product	Output	Annual Employment
Capacity	$7.01	$11.45	$24.74	6,066
Pavement	$8.77	$21.16	$49.60	7,835
Bridge	$7.17	$12.95	$28.06	6,947
Safety	$0.59	$1.62	$3.18	562
Total	**$23.54**	**$47.18**	**$105.59**	**21,409**

Source: EBP analysis with FDOT data and TREDIS. Note: Values are presented in 2022 billions of dollars, discounted at four percent. Labor income, gross state product, and output are cumulative measures and annual employment is the average over the 30-year period. Totals do not include results for transit and seaports, which were analyzed outside TREDIS. All impacts include direct, indirect, and induced impacts.

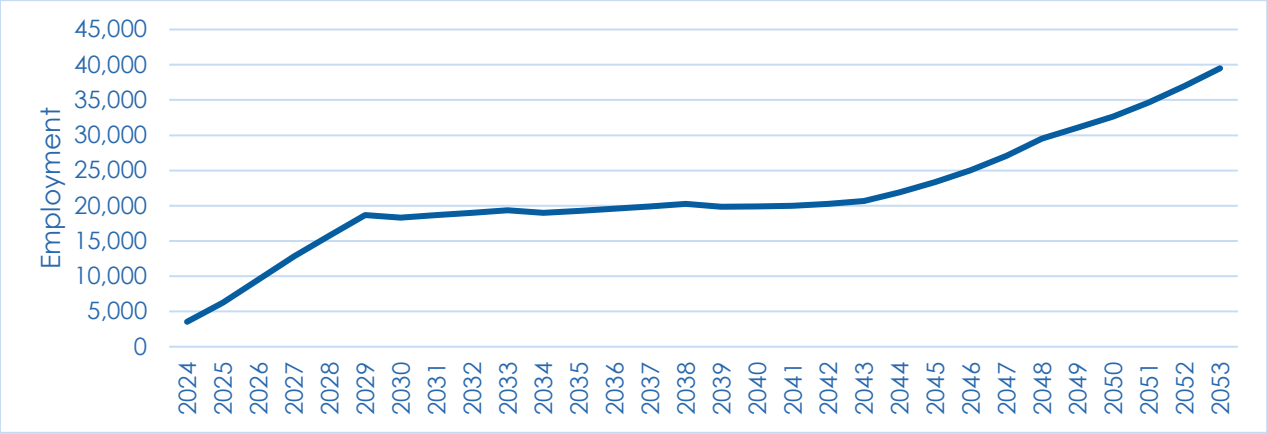
Figure 6 and Figure 7 illustrate how transportation improvements result in gains to the economy over time. Impacts increase in out years due to economic growth and increases in demand on the system as well as increased risk of bridge closure and posting in the future without the necessary projects in the FDOT Work Program.

Figure 6. Labor Income, Gross State Product, and Output Impact by Year



Source: EBP analysis with FDOT data and TREDIS. Note: Values are presented in 2022 billions of dollars, undiscounted. Totals do not include results for transit and seaports, which were analyzed outside TREDIS. All impacts include direct, indirect, and induced impacts.

Figure 7. Employment Impact by Year



Source: EBP analysis with FDOT data and TREDIS. Note: Totals do not include results for transit and seaports, which were analyzed outside TREDIS. All impacts include direct, indirect, and induced impacts.

Table 16 provides employment impacts by industry for the years 2030, 2040, and 2050. Some of the industries showing large employment gains are significant overall in Florida (Financial Activities, Professional & Business, Education & Health). Others show significant gains because they are especially dependent on transportation (Manufacturing, Postal & Warehousing). Certain service sectors do see negative impacts due to declines in the need for vehicle repair and maintenance when Florida's roads and bridges are maintained in a good state of repair.

Table 16. Employment Impact by Industry

NAICS	Industry	2030	2040	2050
111-115, 211-213	Agriculture & Extraction	1,002	1,040	1,741
221	Utilities	106	102	147
230	Construction	613	612	946
311-339	Manufacturing	2,490	2,379	3,350
420	Wholesale Trade	650	591	815
441-454	Retail Trade	792	958	2094
481-488	Transportation	1,144	928	1,309
491-493	Postal & Warehousing	1,045	1,451	2,656
511-519	Media and Information	509	437	602
521-525, 531-533	Financial Activities	3,723	4,002	6,317
541,551,561-562	Professional & Business	5,609	7,295	12,063
611, 621-624	Education & Health	6,868	6,758	8,889
711-713, 721-722,811-814	Other Services	-6,732	-6,865	-8,502
920	Government	506	202	249

Source: EBP analysis with FDOT data and TREDIS. Note: Totals do not include results for transit and seaports, which were analyzed outside TREDIS. All impacts include direct, indirect, and induced impacts.

Systems Forecasting and Trends Office

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