



## Project Number

BDV31-977-119

## Project Managers

Frank Tabatabaee

FDOT Planning Office

## Principal Investigator

Zhong-Ren Peng

University of Florida

## Florida Department of Transportation Research

# Life Cycle Costs and Benefits Analysis of Freight Transportation Projects

March 2021

### Current Situation

Every year, millions of trucks use Florida's highway system to meet the needs of individuals and businesses. Freight volume has increased significantly in response to growth in Florida's population, its booming tourism sector, and its busy international ports. Businesses and individuals rely more than ever on timely freight service. However, the growth of freight movement places enormous pressure on an increasingly congested transportation system. With freight, time is truly money, and delays due to inadequate or congested roadways reduce the timeliness and efficiency of freight transport. Evaluating the costs and benefits for freight transport of any roadway system enhancements is difficult, and this evaluation is crucial for prioritizing projects to improve freight flows on Florida highways. Currently, there are very limited tools to specifically evaluate the impact of freight-related projects.

### Research Objectives

University of Florida researchers developed a method to evaluate life-cycle costs and benefits of freight transportation projects based on a previously developed economic impact analysis tool, FreightTEC.

### Project Activities

In a previous project (BDV31-977-63), the researchers developed software, the Florida Freight Transportation Economic Impact Kit (FreightTEC), an economic analysis framework and collection of models to estimate the impacts of freight-related transportation projects on the Florida economy at different levels. In the current project, they extended FreightTEC to evaluate life-cycle costs and benefits of freight projects. Costs and benefits evaluated include construction costs, maintenance costs, rehabilitation interval, and growth in annual vehicle hours traveled as well as more default parameters, making it useful for examination of a wide variety of projects.

The extended FreightTEC was applied in three case studies. The first, a proposed expansion of I-10 in Gadsden County, near Tallahassee, showed positive statewide impacts. In the second case study, adding lanes to the Florida Turnpike in Miami-Dade County found positive impacts overall. The third case study, a proposed interchange at Oslo Road and I-95 in Indian River County found strongly positive economic impacts along with potential improvements in future traffic capacity, freight transportation, incident response time on I-95, regional connectivity, travel time for area travelers, and evacuations route for area residents.

The case studies demonstrated the usefulness of the extended FreightTEC software, but they also showed the sensitivity of the analyses to the accuracy of project cost estimates.

### Project Benefits

A better understanding of the impacts of freight-related transportation projects can lead to better prioritization of these projects and greater efficiency and timeliness of freight traffic.

For more information, please see [www.fdot.gov/research/](http://www.fdot.gov/research/).



*Efficient roadways and timely delivery are critical factors for millions of tons of freight moving on Florida roadways every day.*