Florida Department of Transportation Research

Impact of Heavy Trucks and Permitted Overweight Loads on Highways and Bridges Now and in the Future versus Permit Fees, Truck Registration Fees, and Fuel Taxes

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Project Manager
Thomas Beitelman
FDOT Maintenance Office

Principal Investigator
Hesham Ali
Florida International University

Current Situation

Each year in Florida, thousands of trucks carry millions of tons in freight, connecting Florida's homes and businesses and serving Florida's many air and sea ports. Roads and bridges are designed to carry significant loads for many years, but traffic takes its toll, and the larger the vehicle the greater the wear and tear. In Florida, to compensate for these costs, trucking companies pay fees assessed by the Florida Department of Transportation (FDOT) based on the class of the truck up to a certain weight. Vehicles that carry weights above a certain threshold must apply for a special permit. These costs must be re-evaluated from time to time to keep pace with maintenance costs.

Overweight loads can be hauled on Florida roads, but special permits are required.

Research Objectives

Florida International University researchers assessed the current fee structure for overweight trucks in order to provide guidance that can be used by FDOT to adjust the overweight vehicle fee structure.

Project Activities

Calculations of damage costs must include many factors, such as vehicle type, number of axles, road category, and bridge type. These costs must be spread across fee categories so that the new fee structure represents a reasonable increase for trucking companies while assuring FDOT of adequate revenues for maintenance.

The researchers considered roads and bridges separately. Based on road classification and traffic levels, three road categories were defined: interstates, principal arterials, and minor roads. Life cycle cost and damage analysis were conducted for 37 road segments that represented a range of road categories, traffic levels, construction costs, and maintenance and repair costs. Damage was estimated as equivalent single axle loads (ESALs), which can then be used for any vehicle by multiplying by the number of axles and a factor to account for the extra damage of weight distributed across fewer axles.

For bridges, which vary significantly in type and construction details, the researchers developed nine bridge categories defined by bridge cost, average daily truck traffic, span length, and material and structural type. Damage assessment was based on fatigue damage as measured by the effective bending moment of representatives of the nine Florida bridge types. For each bridge type, a consumption factor was determined in dollars per mile.

Consumption costs computed for the nine vehicle weight classes from road and bridge damage assessments were used to construct a fee schedule for single and multi-trip permits. Proposed fees were compared with current FDOT fees and fees in other states. A revenue analysis showed the revenues FDOT could expect based on the proposed fee structure.

Project Benefits

The results of this project will allow the Florida Department of Transportation to more properly account for the damage to Florida roads and bridges caused by the frequent passage of overweight vehicles and to recover appropriate costs for repair and maintenance.

For more information, please see www.fdot.gov/research/.