



## Florida Department of Transportation Research

### Exploration of Transit's Sustainability Competitiveness

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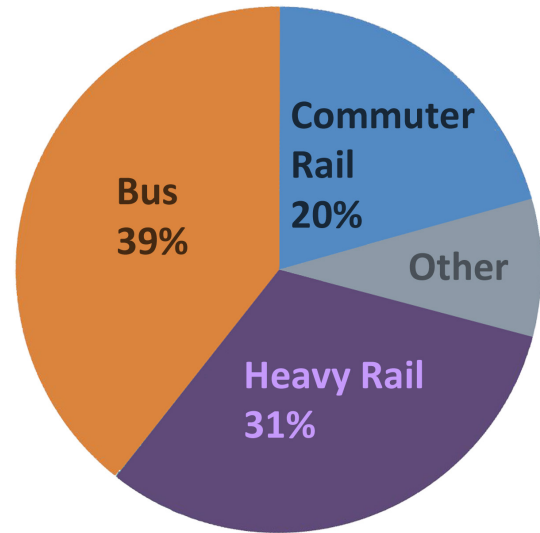
Public transportation is an important community amenity, offering economy of energy use and space. A common assumption is that public transportation is always more energy efficient than the private automobile. University of South Florida researchers explored this assumption to discover whether and when it is true.

The researchers began their study with an explanation of the different approaches to analyzing the energy efficiency of public transport. As goals, sustainability, energy efficiency, and economy are often considered synonymous, however, the researchers showed that this is not the case. In fact, these goals must be balanced in transportation planning.

The researchers examined the advantages and challenges of six levels of analysis, beginning with a focus on operating energy intensiveness and ending with total energy impact. At the most basic level, they compared the energy consumption per passenger mile delivered by different means of transport. Step-by-step addition of aspects of creating and operating a transit system, each with its own energy and financial costs, created a more holistic picture, but it came at the cost of more complex analyses and uncertain data. This process allowed the researchers to establish a proper framework for further investigations.

Researchers summarized the literature about energy efficiencies of different modes of surface transportation and investigated several data sources. Their primary interest was to compare private light-duty passenger vehicles with urban transit buses, Florida's most common form of public transportation. Nationally, buses deliver the highest percentage of passenger miles of all public transit modes and, therefore, present an important target for efficiencies.

The researchers also reviewed petroleum use and emissions of greenhouse gases. Over the past 30 years, petroleum use by most economic



*Data from the National Transit Database show that, nationally, buses are the most heavily used means of surface public transportation.*

sectors has remained level or decreased, yet transportation use of petroleum has increased almost 50%. Its overall contribution to greenhouse gases is second only to the industrial sector, and it is the top producer of carbon dioxide.

The researchers provide a detailed comparison of energy use and efficiency by automobiles and buses. They show that many factors influence the results, such as power plant, age of fleet, and the details of ridership and transit system layout. They extrapolate their findings to look at the potential for future savings under a variety of scenarios, including changes in Corporate Average Fuel Efficiency (CAFE) standards, increasing energy efficiency of buses, aggressive deployment of bus services, and increased productivity of transit services. Based on their study, the researchers offer important insights about creating a proper framework for including energy efficiency in transportation planning.