Freight- carrying truck traffic is common on Florida highways. This traffic has been increasing steadily for many years with ever more impacts on highway efficiency and safety and damage to highways. Reducing the efficient movement of traffic in turn increases drive times and freight costs. And truck traffic is expected to increase, requiring more and better planning. However, the foundation for such planning does not exist. Good data must be developed to describe the fundamentals of truck traffic, such as detailed origin-destination (OD) data, truck travel times, freight tonnage distribution by OD pairs, transported commodity by OD pairs, and details about truck trip stops and paths.

In this project, University of South Florida researchers explored a new approach to developing truck traffic data by exploiting truck GPS data obtained from truck companies through a joint venture of the American Transportation Research Institute (ATRI) and the Federal Highway Administration (FHWA). Many companies use GPS to monitor their trucks' locations, potentially providing data about truck movements with unprecedented scope and detail. However, the desired measures do not flow automatically from the data, and sophisticated procedures are required to condition the data and then to perform the needed calculations.

A major task for the researchers was attaching the truck GPS data to the model of the State Highway System (SHS). Once this was accomplished, they produced average truck speed data for every mile of selected highways for peak and off-peak times. This required improvements to the SHS model data. Products of this effort were measurements of truck speed reliability and bottleneck analyses.

Next, researchers created algorithms to convert large streams of ATRI's truck GPS data into a more useable truck trip format. The data to be processed was enormous; for this task alone, four months of ATRI data comprised 145 million

An increasing amount of truck traffic contributes to slowdowns on major highways, such as this interstate.

records, which yielded a database of 1.2 million truck trips. The truck trip database contained the data needed to produce the measures of truck traffic listed above, as well as offering future opportunities for more in-depth analyses.

For example, the truck trip database contained over 169,000 unique trucks. The database made it possible to discriminate between long-haul and short-haul trucks, producing more accurate statistics of long-haul trips. The researchers believe that refining these methods will allow better discrimination between truck classes.

The ATRI data is not the only source of truck data available, and it does not cover all trucks. So, the researchers compared truck flows derived from the ATRI data with data from the Telemetric Traffic Monitoring Sites (TTMS). This comparison suggested that the ATRI data represented just over 10 percent of truck traffic on Florida Highways.

As a major transportation hub for all forms of freight traffic in the hemisphere, Florida's highways are an essential link between its air and sea ports and the rest of the nation. The ability to use important new data sources about traffic flows will produce better planning efforts and more efficient and safer highways.