Using GIS to Analyze Crash Data in the I-95 Corridor

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presented by

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Transportation leadership you can trust.

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Presentation Objectives

1. Describe Coalition organization and programs

2. Demonstrate how GIS (ICAT) can be used to enhance crash analysis capabilities in a multi-state region.

3. Identify challenges to multi-state data coordination and planning

4. Describe “next steps” for ICAT development as a multi-state analysis and planning tool.

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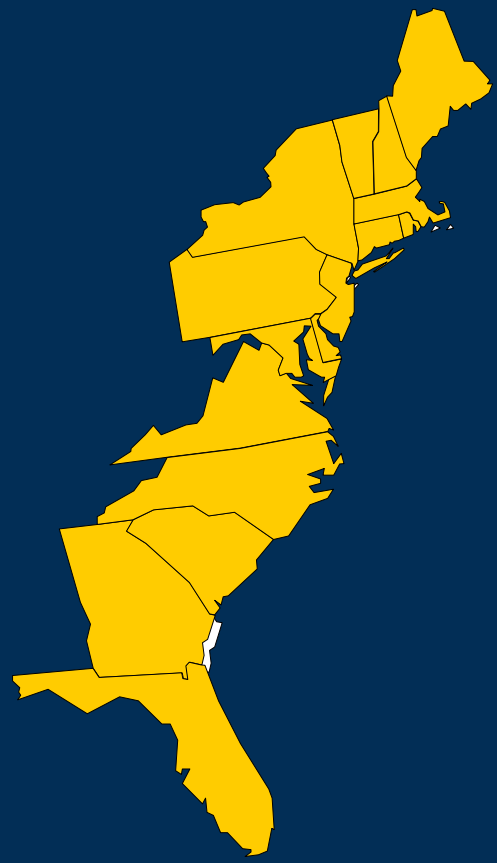
What is the I-95 Corridor Coalition?

- An alliance of transportation agencies, toll authorities and related organizations from Maine to Florida
- A forum for key decision and policy makers to address transportation management issues of common interest
- Program focus on safety, incident management, traveler information, and intermodal passenger and freight
- Customer focus on long-distance travel



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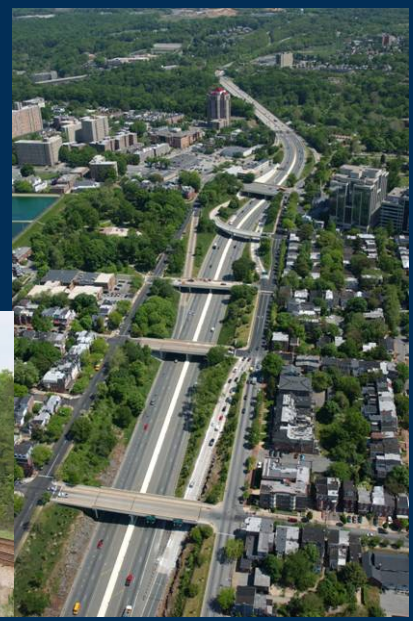
The I-95 Transportation Corridor: System Summary

- 1,919 miles of I-95
- 40,000 National Highway System miles
- 22,000 miles of Class I rail mileage
- 46 major seaports
- 103 commercial airports



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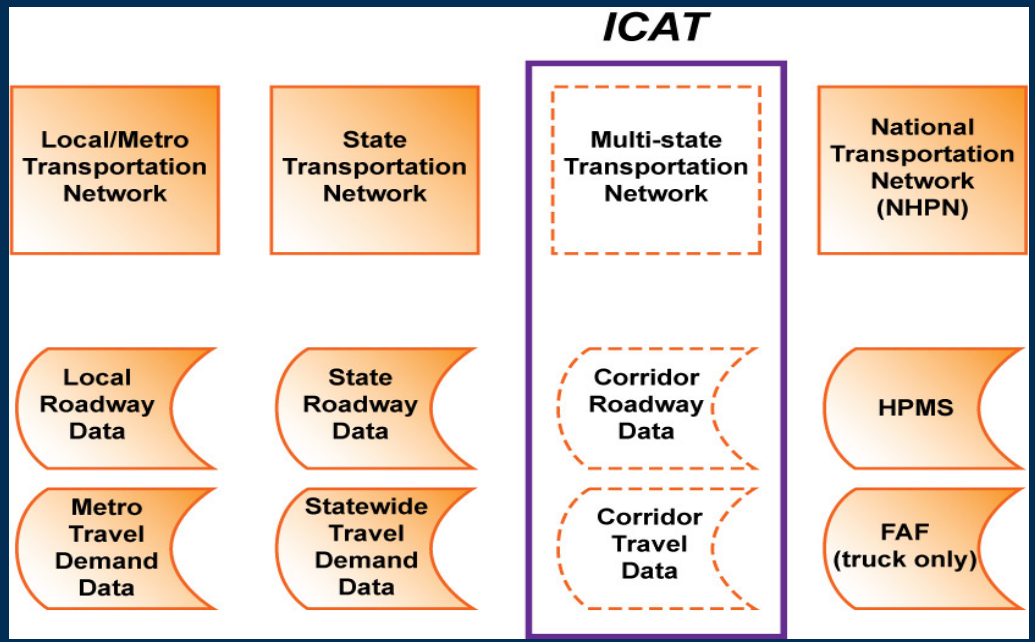
What is ICAT?

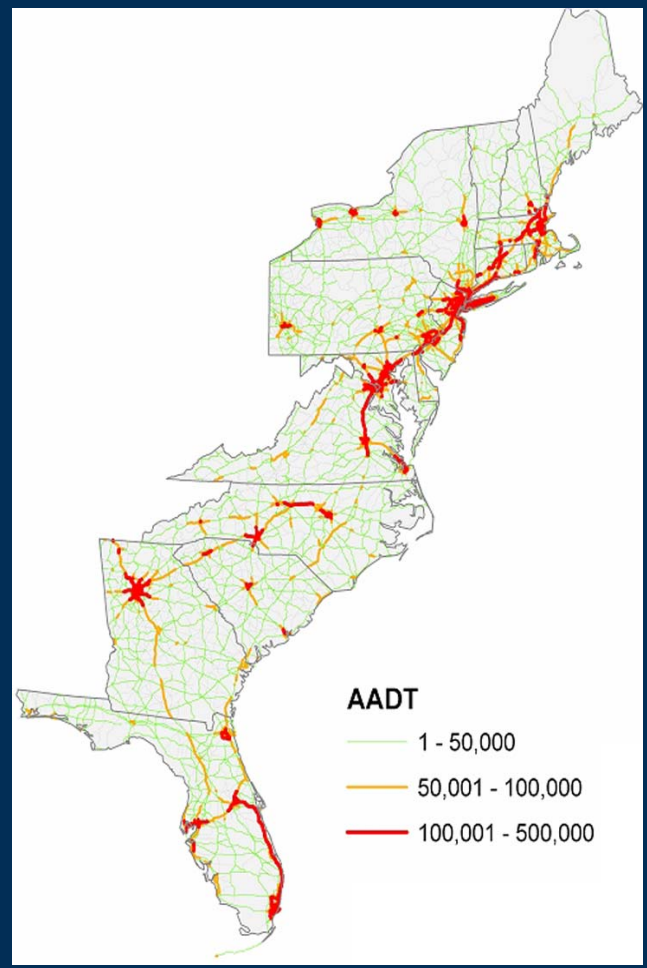
Integrated Corridor Analysis Tool (ICAT)

- System of transportation networks, origin-destination flows and locationally referenced data for the entire Coalition region.
- Data is accessible to all Coalition members, and can be viewed using web-based GIS.
- Designed to help Coalition members coordinate multi-state transportation planning, investment and operations.

ICAT Network

The ICAT network is a geo-spatial, multi-state transportation network that covers the full 17-State Coalition region.





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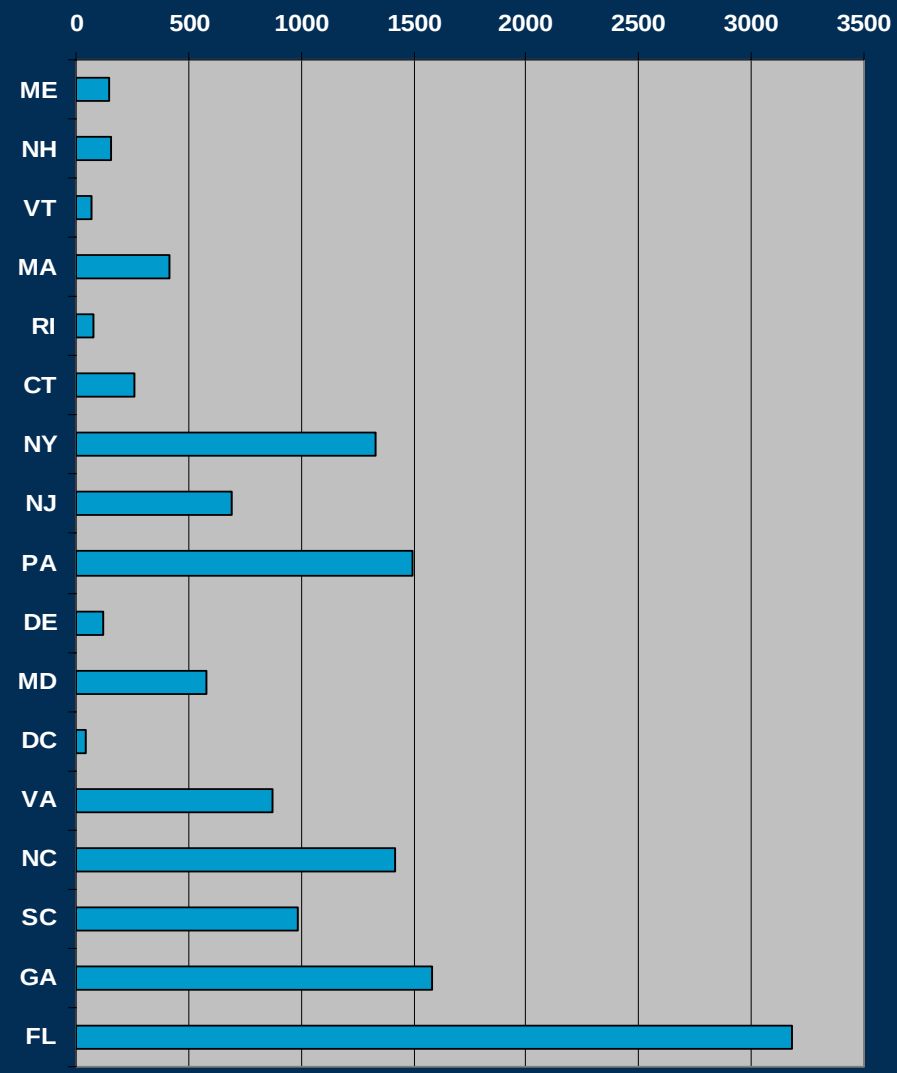
Fatality Analysis Reporting System (FARS)

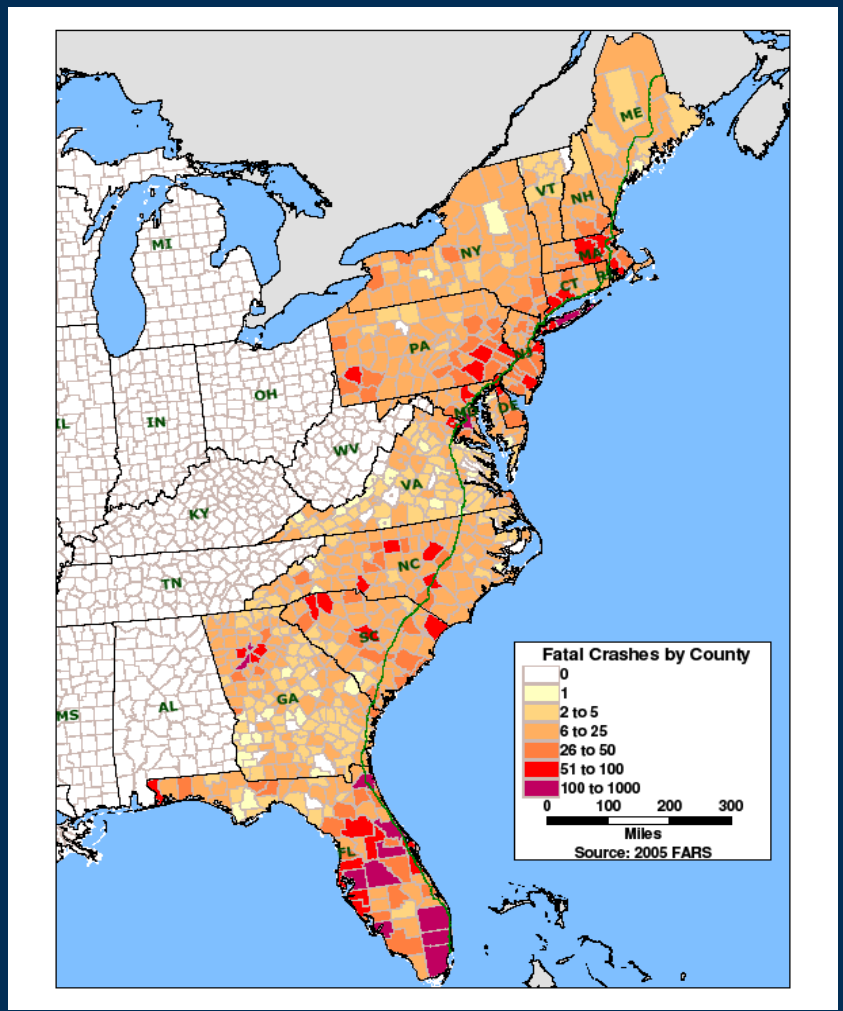
- Compiled by NHTSA from state reports on every highway crash involving a fatality.
- Data includes characteristics of the crash, vehicles involved, and vehicle drivers.
- In 2005, NHTSA included geo-coded crash location on its public release version of FARS.

Enhanced Crash Analysis Capabilities Supported by GIS (ICAT)

1. **Visualize geographic distribution of data**
   - **Find clusters of crash locations**
   - **Identify anomalies or geocoding errors**
   - **Detect patterns or trends in the distribution of crashes**
   - **Display crash characteristics in thematic maps (e.g, driver- vs. vehicle-related causes)**

Fatal Crashes by State and County: I-95 Corridor Coalition





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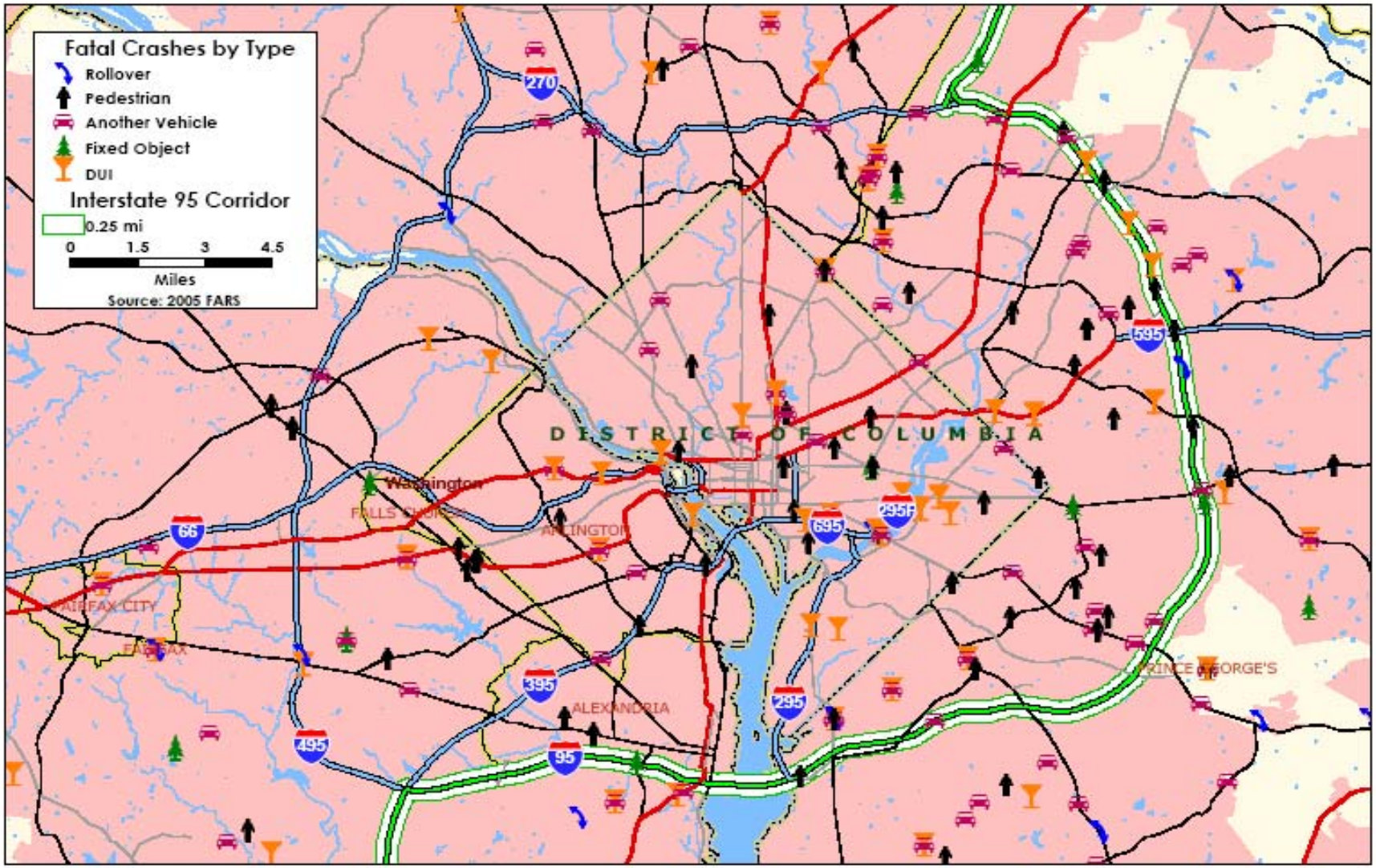
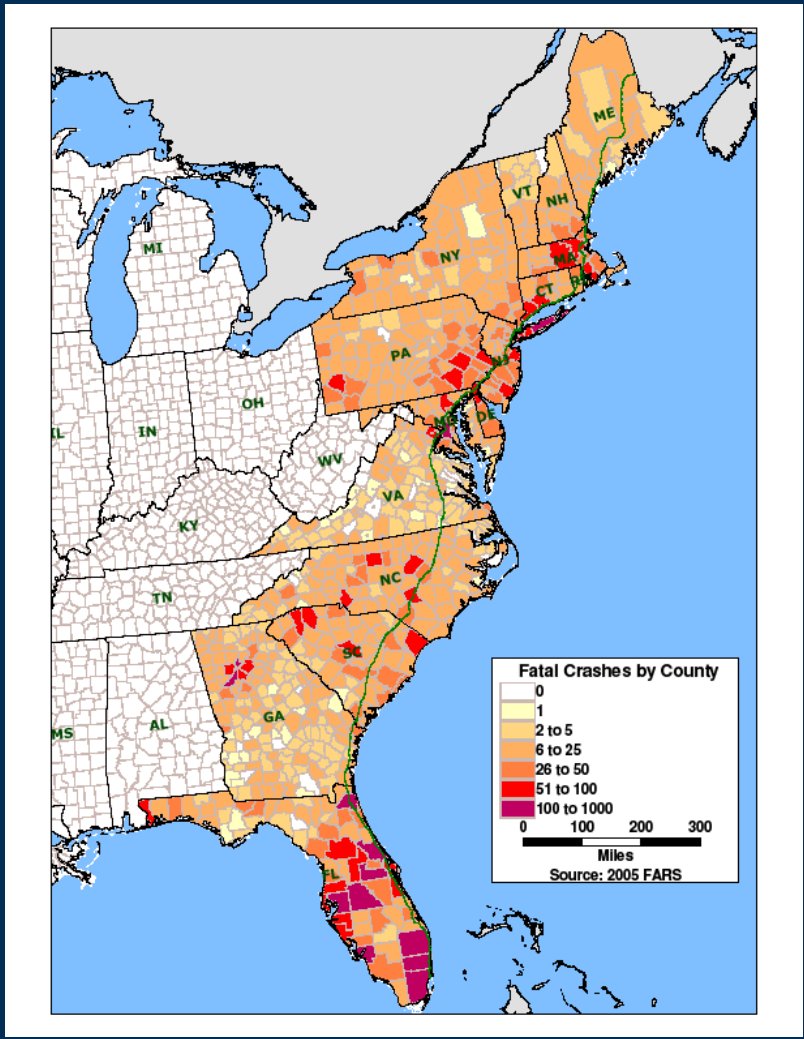
Fatal Crashes by Type – Washington DC Area

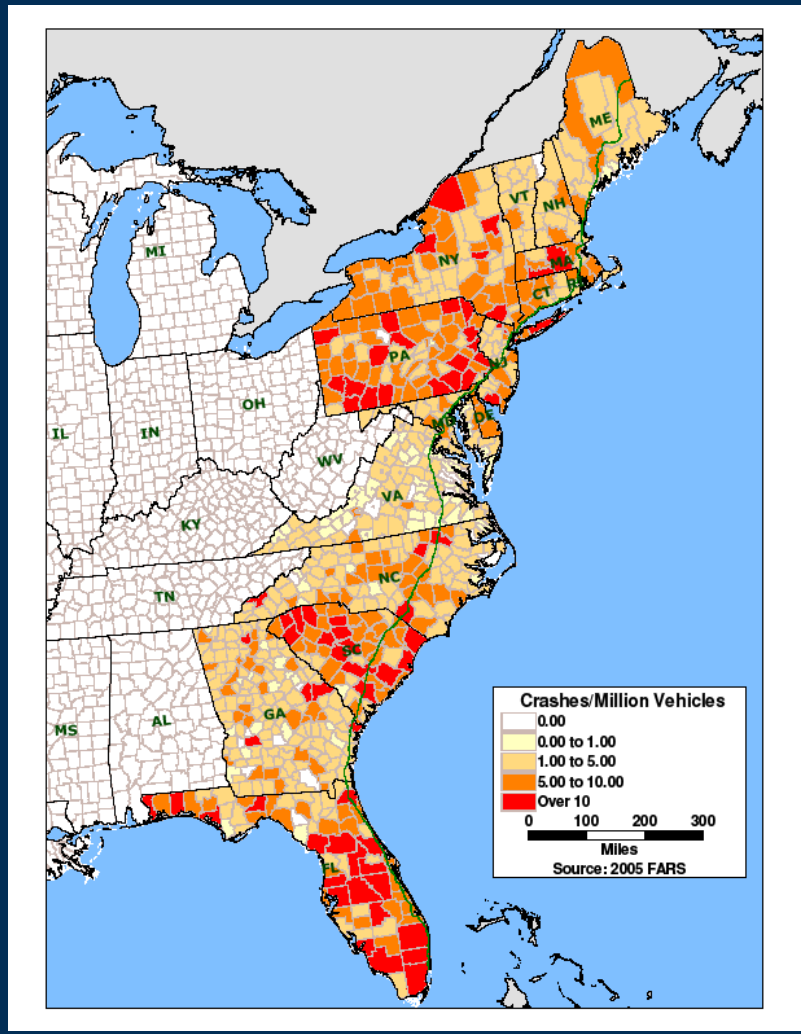


Enhanced Crash Analysis Capabilities Supported by GIS (ICAT)

2. **Integrate databases using location as common identifier**
   - **Summarize crashes by area (e.g., urban vs. rural; along a specific highway)**
   - **Append highway characteristics to crash records (e.g., average daily traffic volumes)**
   - **Select crashes by sub-area for further analysis**

Fatal Crashes by County: Total and by Crash Rate





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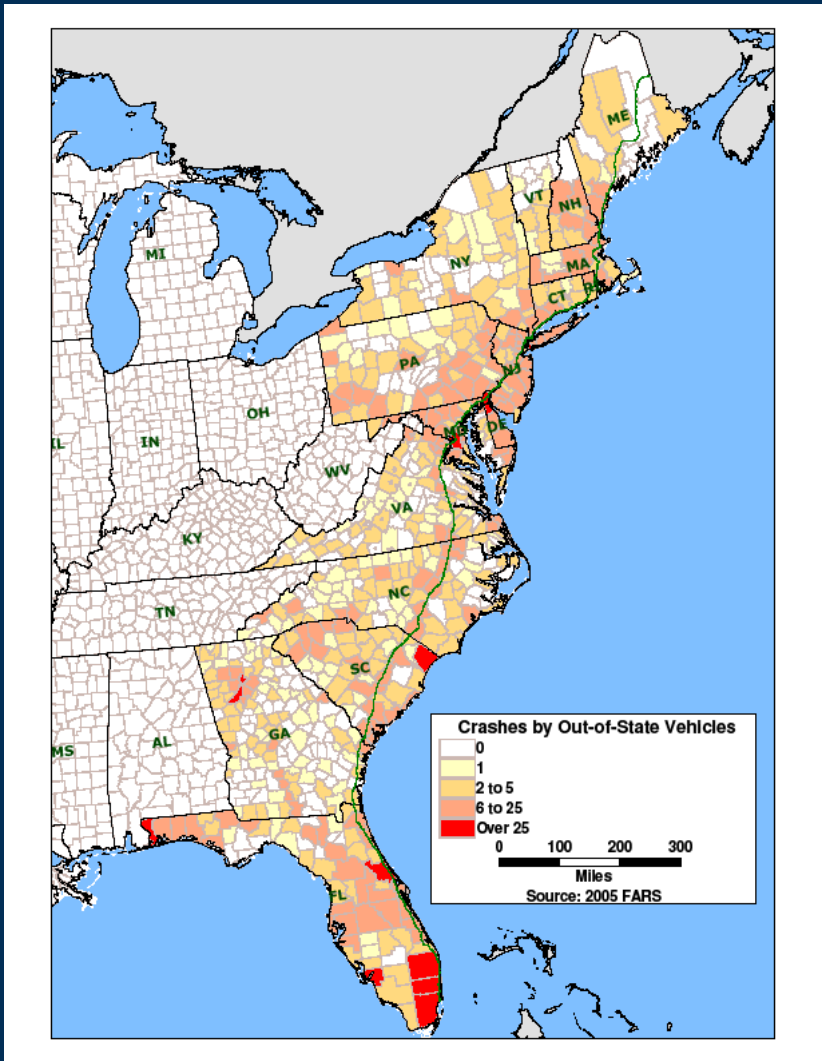
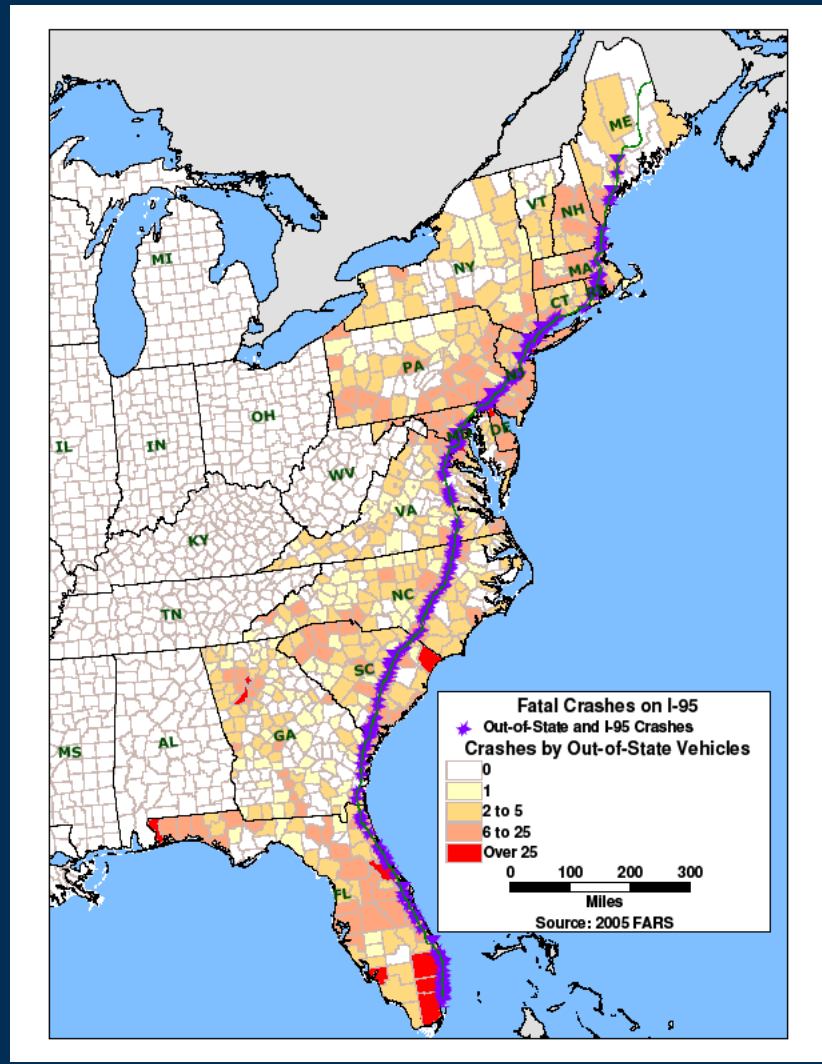
Enhanced Crash Analysis Capabilities Supported by GIS (ICAT)

3. **Calculate distances between features represented in databases**
   - **Locate crashes involving out-of-state vehicles or drivers**
   - **Identify crashes involving drivers that are more than 500 miles from home.**

Fatal Crashes Involving Out-of-State Vehicles





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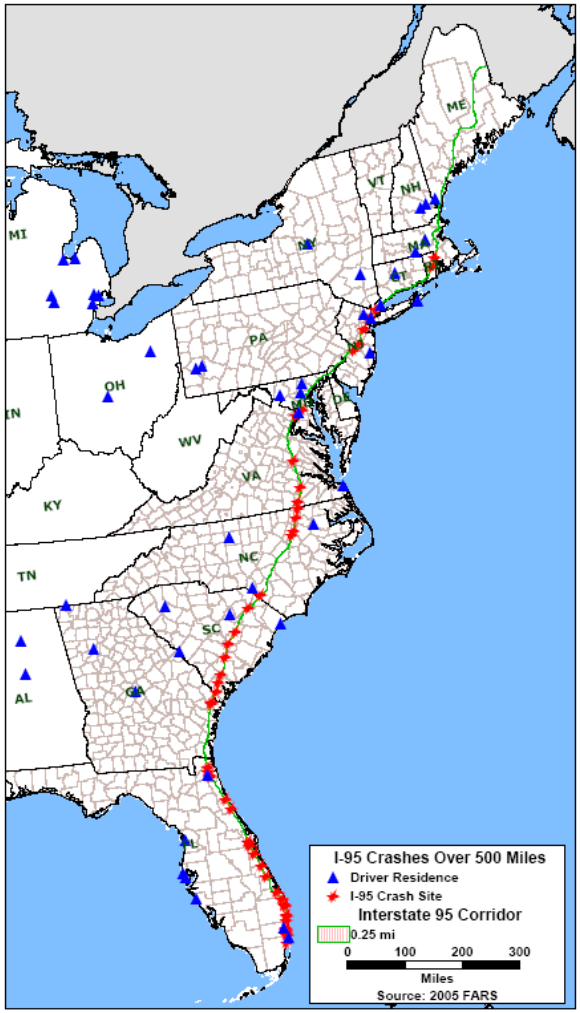
I-95 Crashes Occurring 500+ Miles from Driver's Home



- 65 percent of crashes still involve corridor state drivers.
- Crashes with driver-related factors include:
  - Failure to stay in Lane
  - Reckless driving
  - Inattention

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In Summary

- GIS provides a powerful tool for analyzing crash data and presenting the results of these analyses to decision makers.
- Crash analyses can provide insight into the causes of and potential strategies for reducing severe/fatal crashes.
- Analyses of multi-state data, through tools like ICAT, further enhances our understanding by allowing States to look beyond their borders for both causes and cooperative solutions.

Challenges to Multi-State Highway Safety Coordination

- Differences in State laws and procedures related to highway safety (e.g., motorcycle helmet requirements).
- Differences in crash data collection (e.g., data definitions, reporting requirements, etc.)
- Lack of common analysis tools, performance measures, and platforms for reporting crash data.

Next Steps for ICAT

- Complete development of ICAT network and web-based data mapping platform.
- Demonstrate ICAT as a “proof-of-concept” safety analysis tool.
- Work with safety councils in Coalition States:
  - identify common data sources
  - Coordinate data collection practices and data sharing among states
  - Develop multi-state safety performance measures