

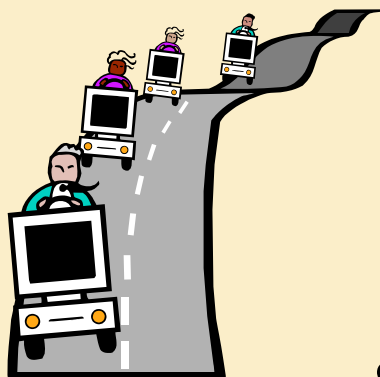
ESTIMATING THE MONETARY BENEFITS OF REDUCING DELAYS ON HEAVILY TRAFFICKED TRUCK FREIGHT CORRIDORS: THINKING (ABOUT WHAT'S) INSIDE THE BOX

by

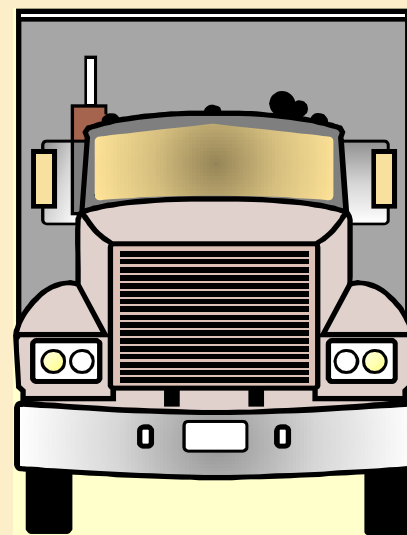
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Background: The July 2012 MAP-21 legislation requires state DOTs to develop performance targets in support of their strategic freight plans, while emphasizing the role played in the economy by strategically significant freight corridors.

We focus here on the following question:

How do we estimate the monetary value of reducing corridor traffic congestion? This leads us to ask in turn:

a) **What goods are moving on our major highway corridors** (now and in the future)?

b) **How fast are they moving?**

and,

c) **What do delays to these goods movements cost** (in dollar terms) U.S. industries?

Objective: Specifically, **this project aims to develop improved estimates of the value of travel time savings for different classes of truck travel, using a method that can be applied at the level of intercity corridors.**

Project Tasks

Task 1: Defining a Study Corridor



Task 2: Generating a Matrix of Origin-Destination-Commodity-Truck Class (O-D-C-V) Flows based on Location Specific Economic Activity Data.



Task 3: Carrying out a Multi-Class, Origin-Based and Congestion Sensitive Assignment of Truck Trips to the Selected Corridor



Task 4: Estimating the Dollar Value of Recent and Future Year Truck Travel Time Savings (under different O-D disaggregation, different ton-to-truck conversions, different value of time assumptions)



Task 5: Writing the Draft and Final Project Reports

The Challenge:

Detail O-D data on commodity flows is very limited and likely will be difficult to come by for some time. (Surveys too costly, limited IT information on loads)

For planning purposes, this means creating synthetic, geographically detailed commodity-cum-vehicle class specific O-D Flow matrices from a combination of data sources

Innovation:

The R&D looks to improve current planning practice through:

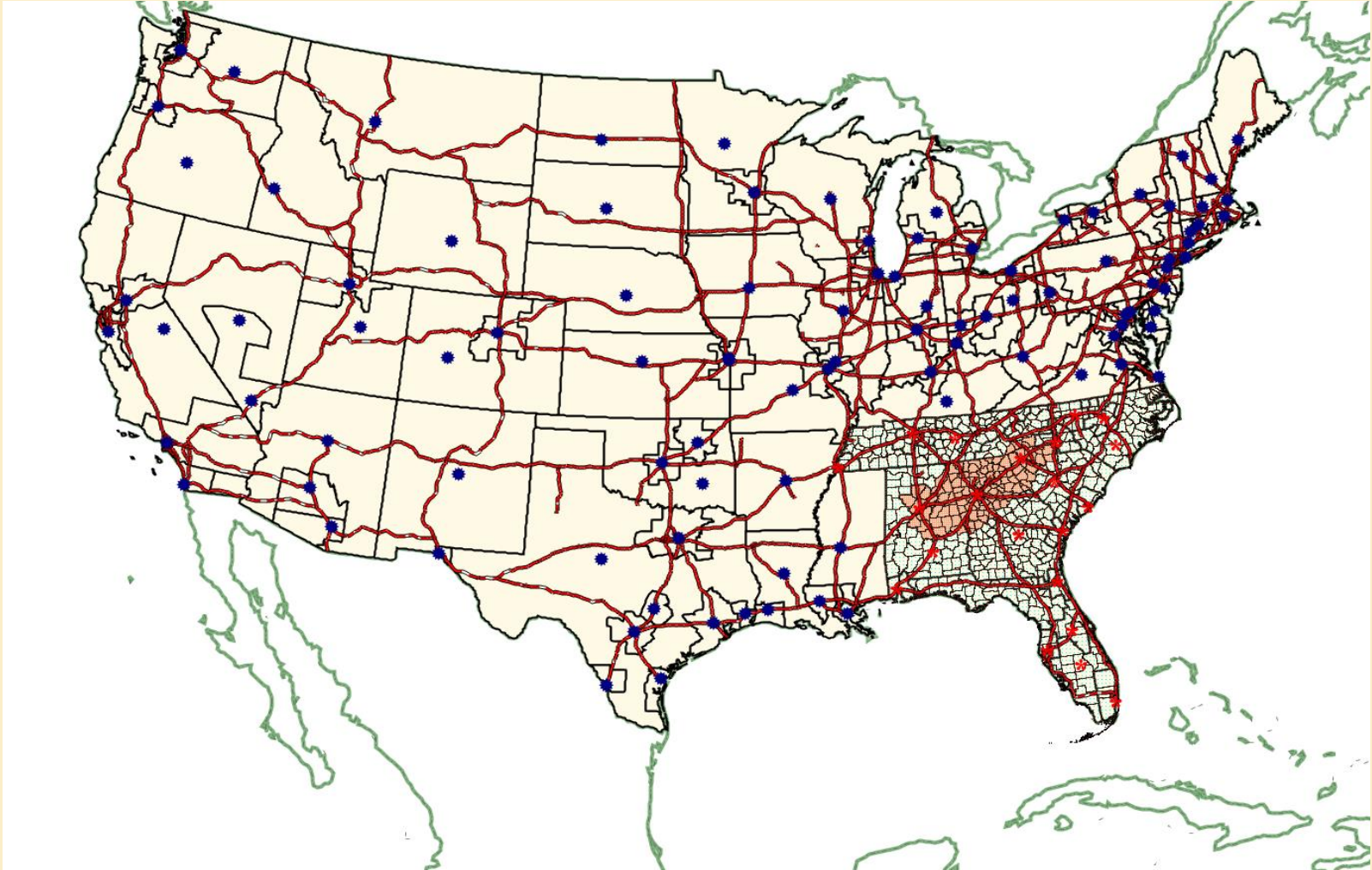
- ❖ Use of alternative spatial and industrial sector disaggregation methods.
- ❖ Use recent advances in origin-based network route assignment modeling to connect detailed O-D-Commodity specific flow estimates to specific corridor movements.
- ❖ Use the latest theoretical developments in value of time modeling to produce monetized benefits estimates grounded in travel behavior and spatial economic theory

Progress to Date:

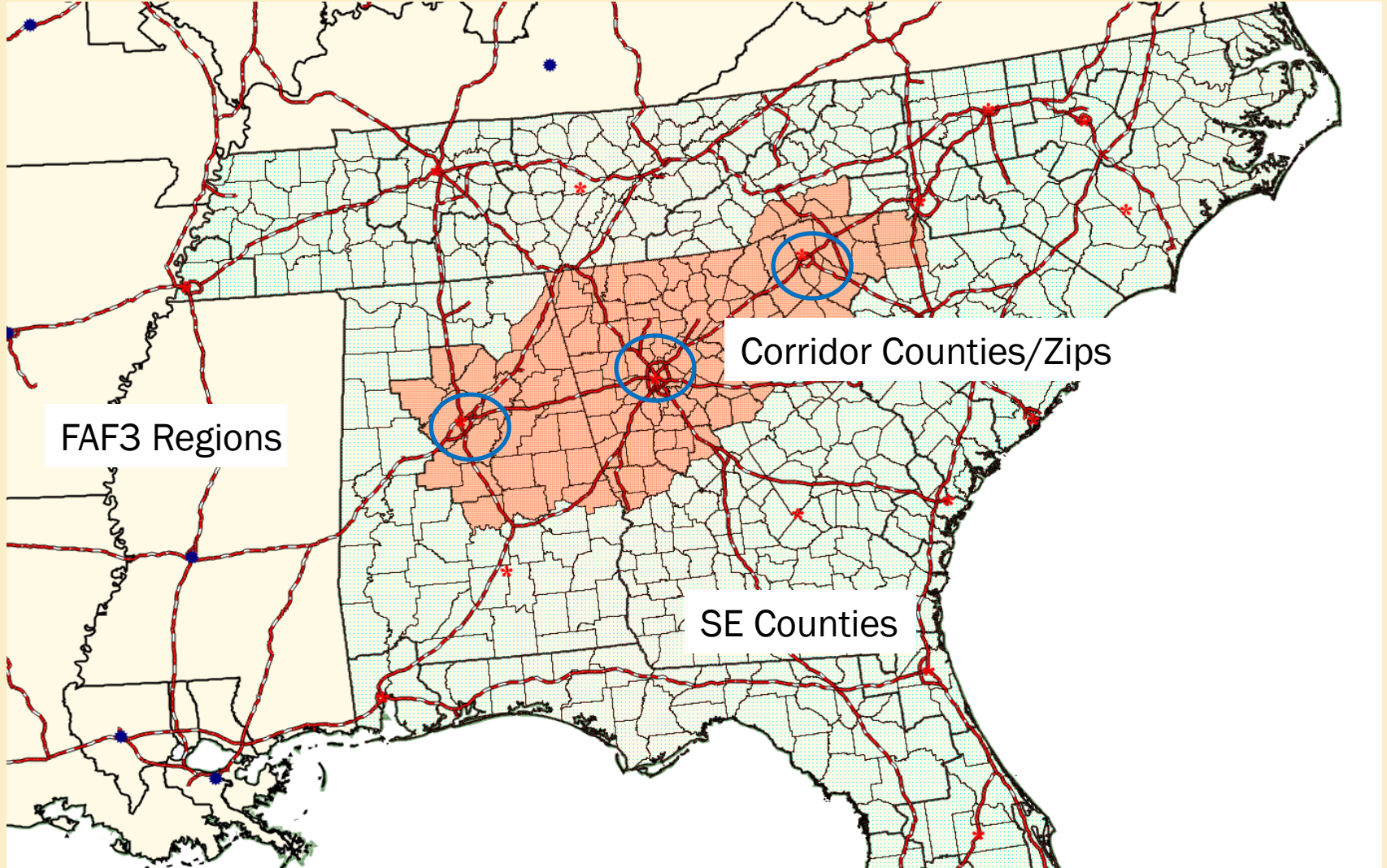
Task 1: Corridor Selection

Candidate Corridor 1: I-20/I-85 Corridor: Huntsville, AL <-> Atlanta, GA <-> Greenville, NC

Candidate Corridor 2: I-85 Corridor: Montgomery, AL <-> Atlanta, GA <-> Greenville, NC



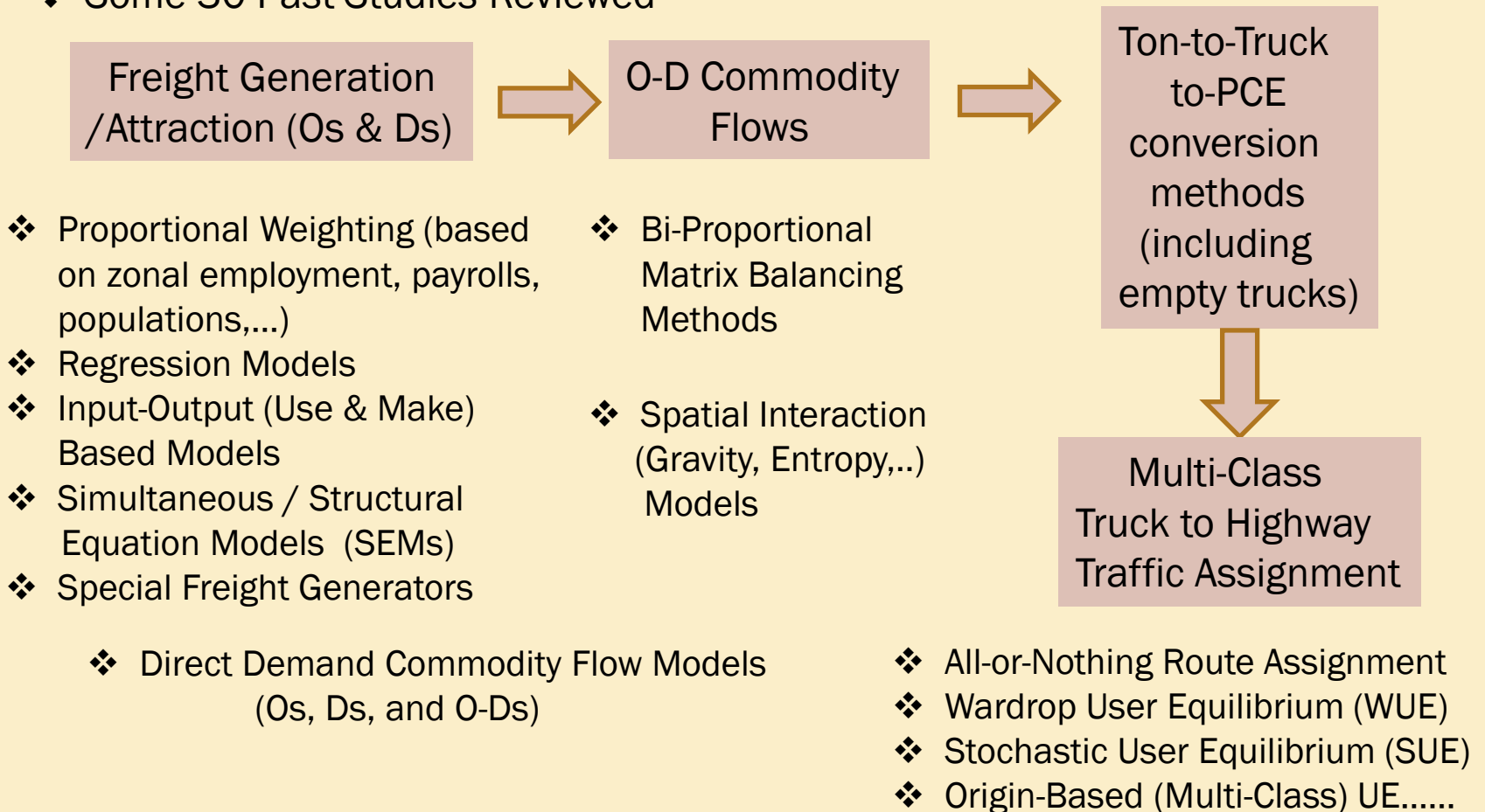
Modeling at Three (or More) Levels of Spatial Disaggregation



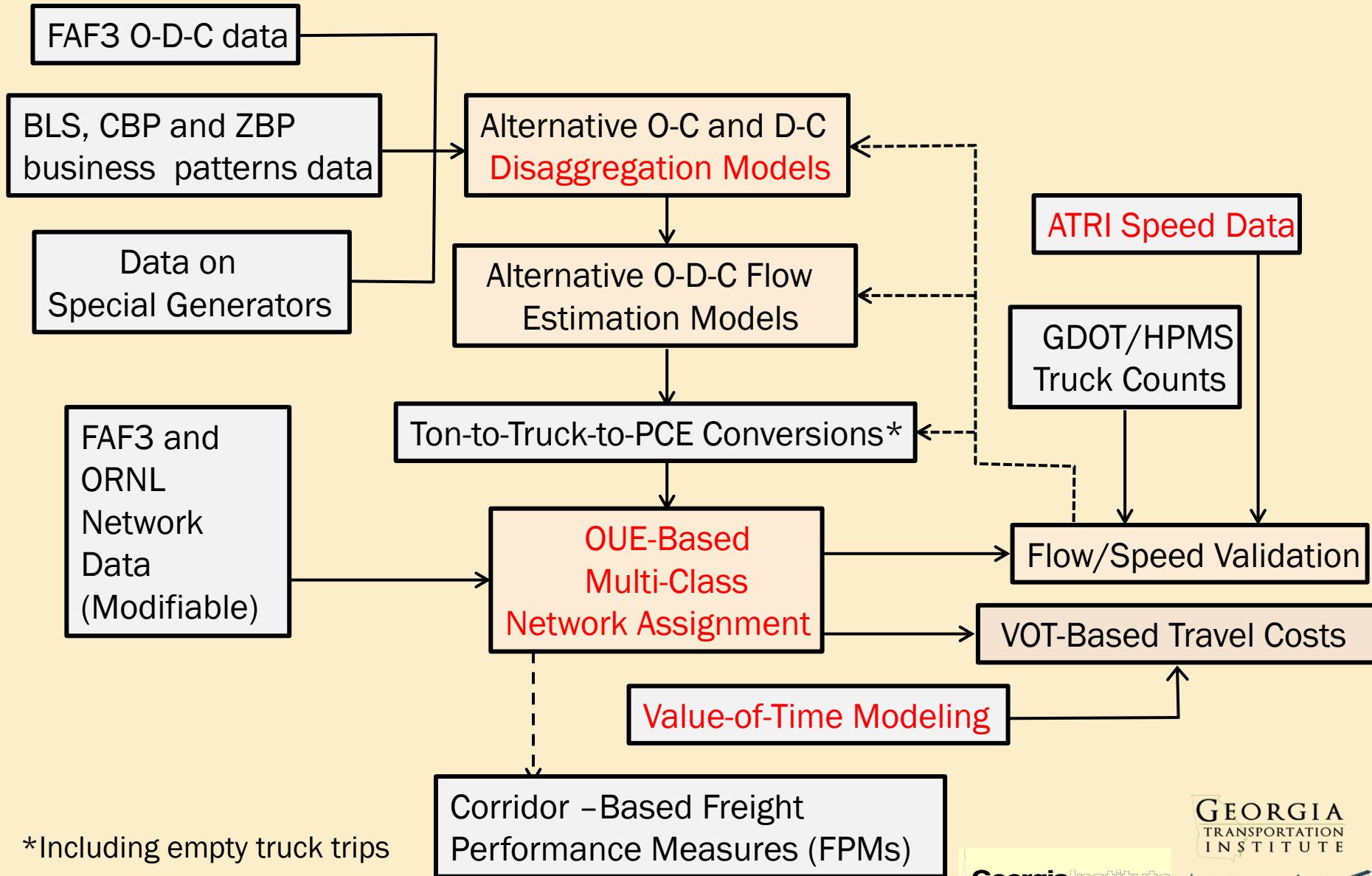
Task 2: Generating a Matrix of Origin-Destination-Commodity-Truck Class (O-D-C-V) Flows (continued...)

Alternative Flow Disaggregation Methods recently reviewed in Southworth, F. “On The Creation of Spatially Disaggregated Commodity Flow Matrices: An Overview of U.S. Studies” (Draft report to Oak Ridge National Laboratory, January, 2014)

❖ Some 30 Past Studies Reviewed

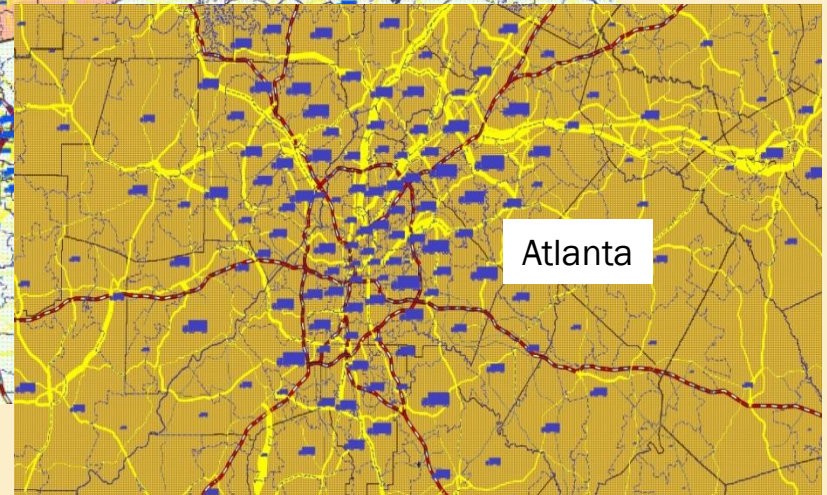
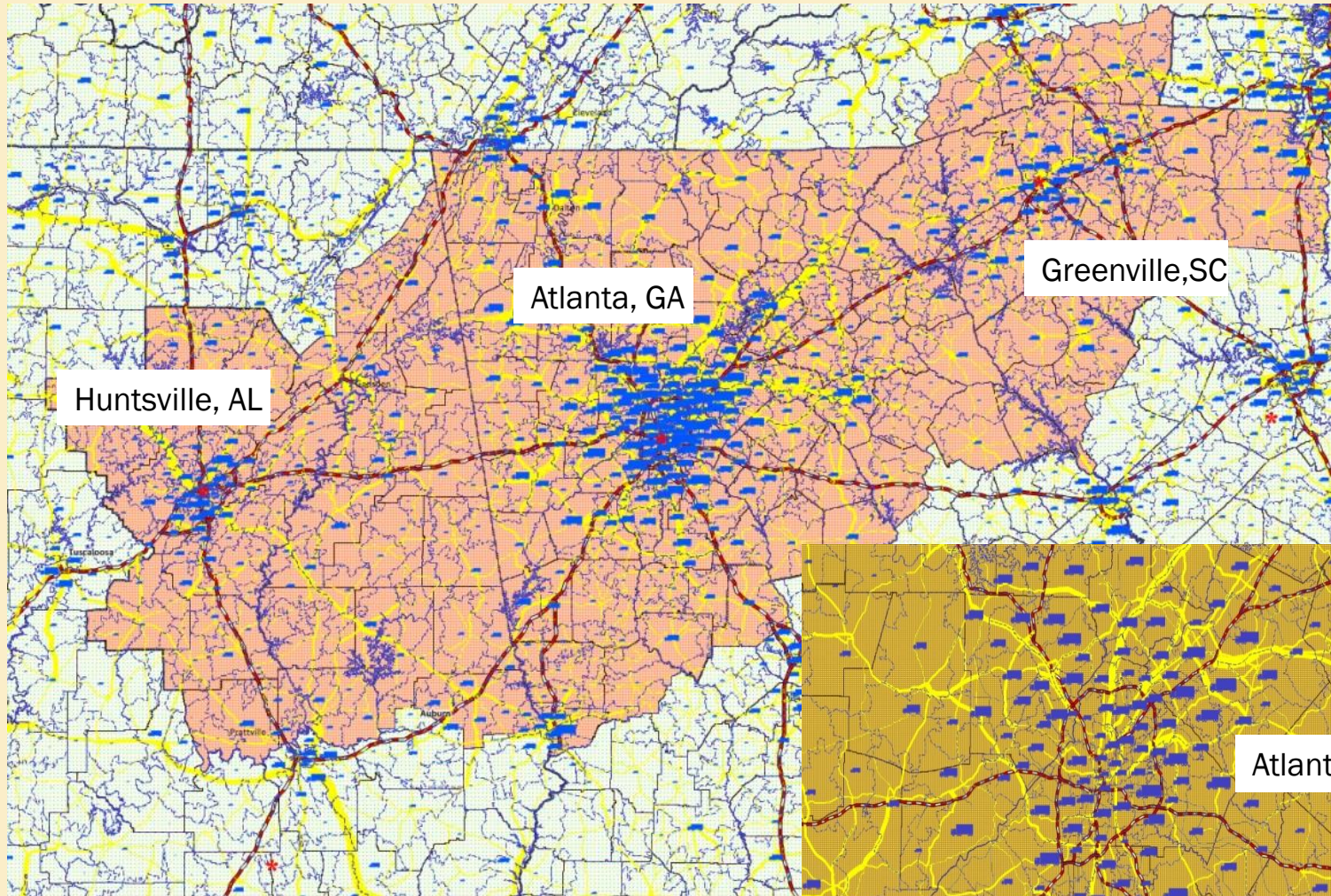


Commodity-to-Truck Flow Modeling Using Multiple Data Sources



*Including empty truck trips

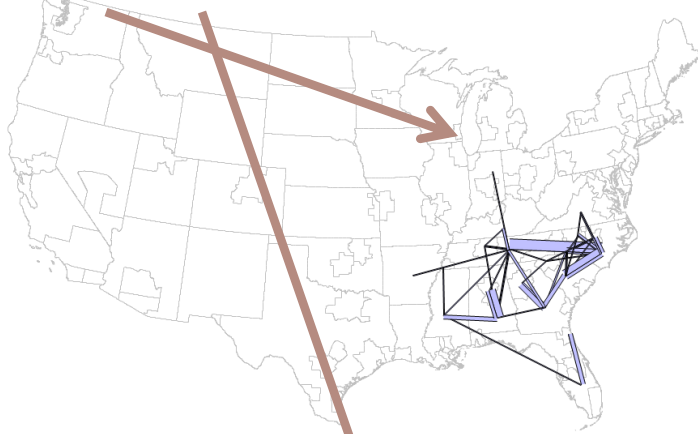
County & Zip Code Based Freight-Inducing Industrial Activity — How Useful is Current Data ???



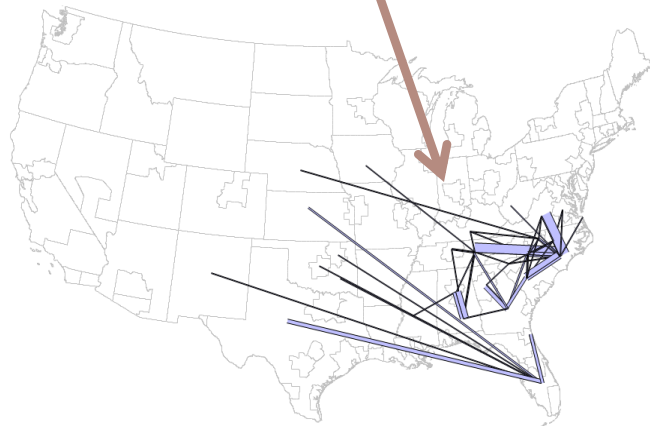
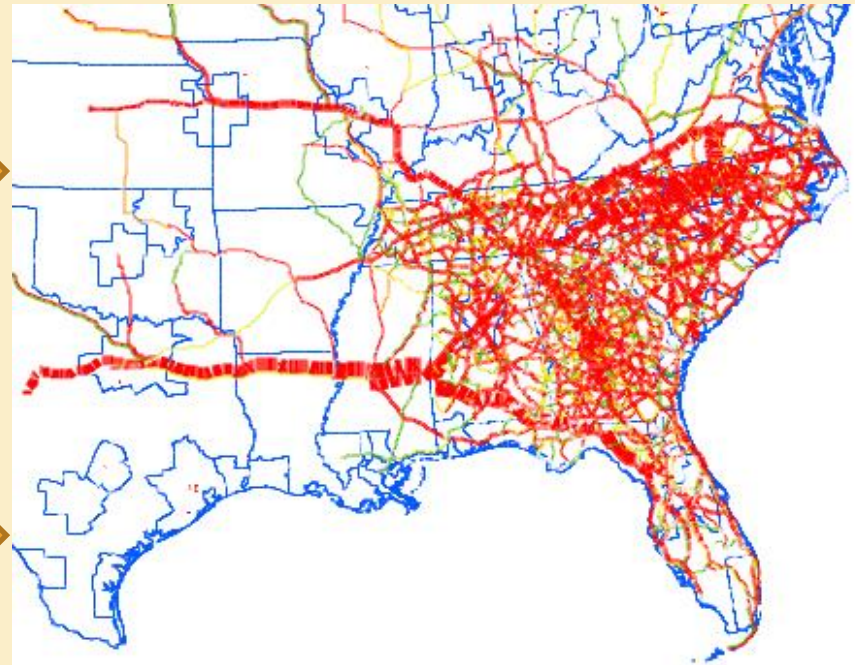
Task 3: Multi-Class, Origin-Based and Congestion Sensitive Assignment of Truck Trips to A Selected Corridor

An Example Commodity -cum-Truck Flow Pattern (Preliminary)

Live Animal/Fish Shipments
to & from SE United States, 2007

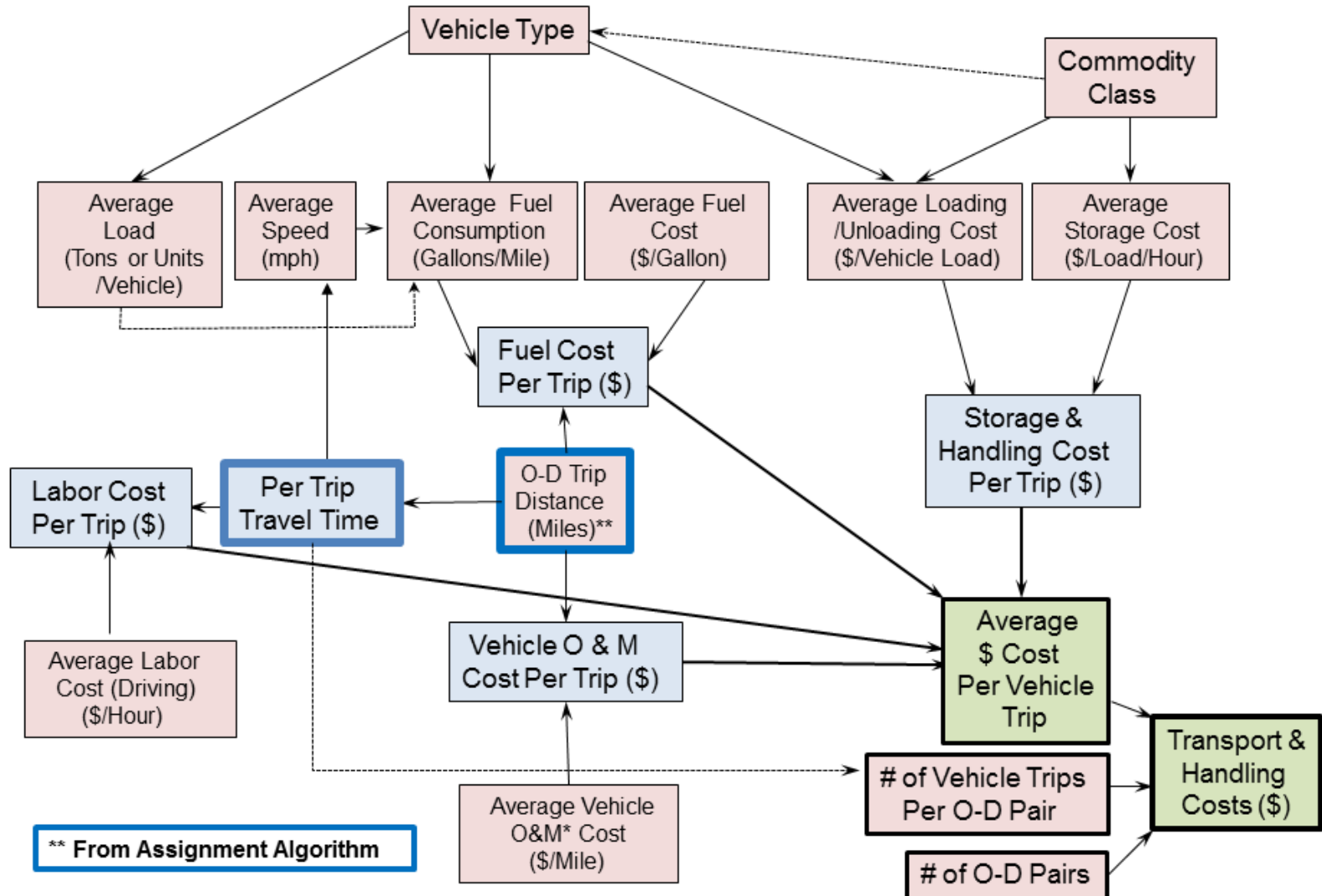


Origin-Based UE Traffic Assignment based
on a simple county O-D disaggregation and a
ton-to-truck pce model



Task 4: Estimating the Dollar Value of Recent and Future Year Truck Travel Time Savings

Truck Transport and Logistics Cost Modeling Concept



* Vehicle O&M cost includes costs associated with tires, oil, parts maintenance and replacement, insurance and licenses