

# Assessing the Impact of Major Interstate System Disruptions on Freight Movement Using GPS Data from Commercial Vehicles

Jeff Short

American Transportation Research Institute (ATRI)

**DHS Science Conference – Catastrophes and Complex Systems: Transportation  
April 1, 2010**

# American Transportation Research Institute (ATRI)

## Trucking and Transportation Research

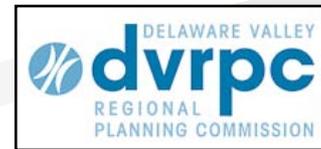
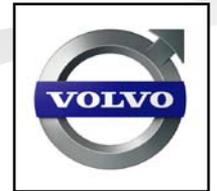
- **Safety and Human Factors**
- **Technology**
- **Environmental Factors**
- **Economic Analysis**
- **Transportation Security**

[www.atri-online.org](http://www.atri-online.org)

# Board of Directors



# Research Advisory Committee



# The Trucking Industry

- **Tonnage**
  - 10.2 billion tons of freight annually
  - 68.8% of total domestic tonnage shipped.
- **Number of Trucks:**
  - 29.6 million trucks registered
  - 2.8 million Class 8 trucks
- **Number of Companies:** >500,000
- **Employment:** 7.3 million people

# “When Trucks Stop, America Stops”

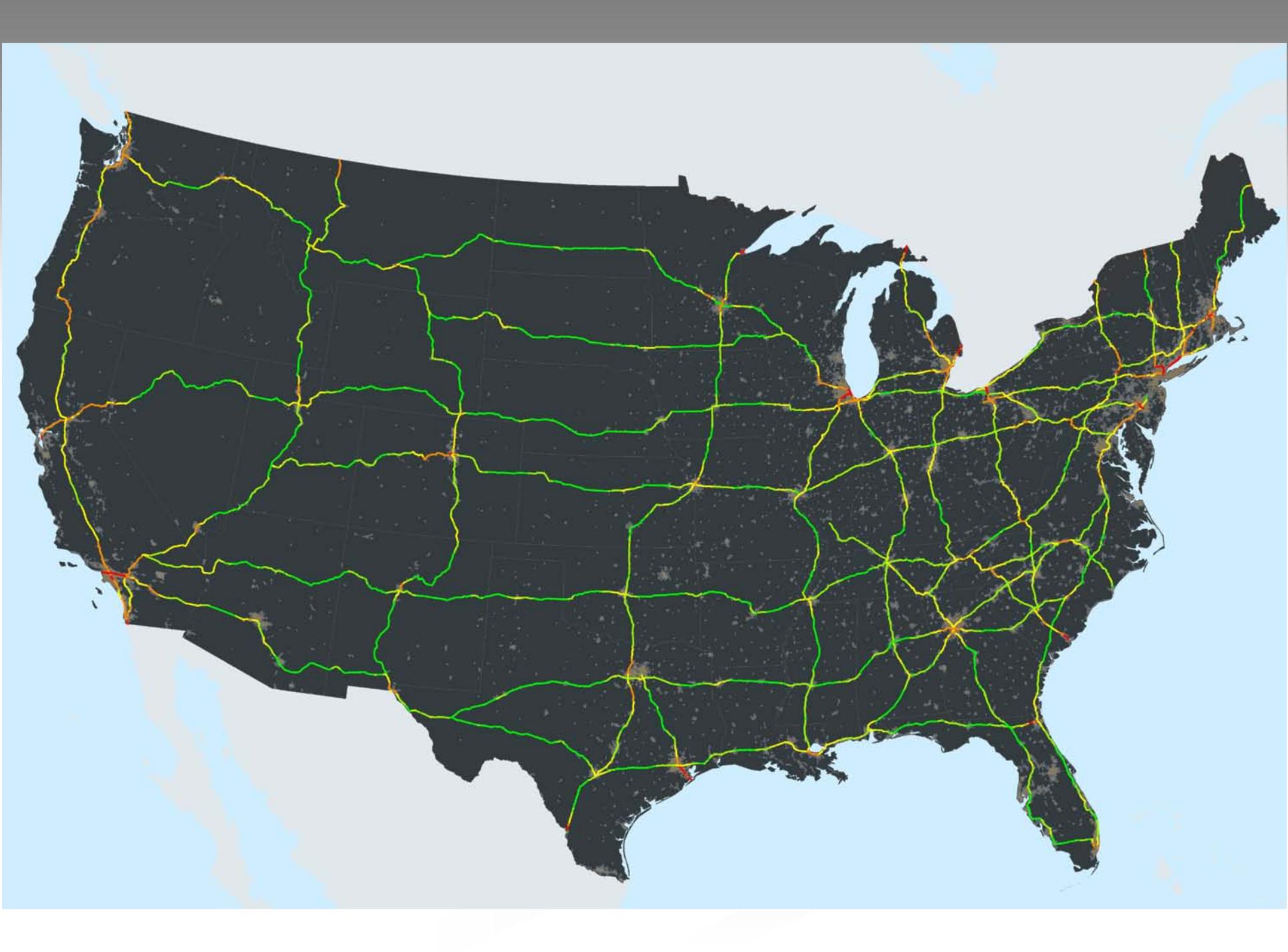
*The unimpeded flow of trucks is critical to the safety and well-being of all Americans.*

- Consumable Goods: Food shortages within days, clean water shortages within weeks.
- Medical Goods, Hospital, Pharmacy
- Transportation: Fuel Service Station Shortages for All Modes (and Generators)
- Waste Removal, Retail, Manufacturing, etc

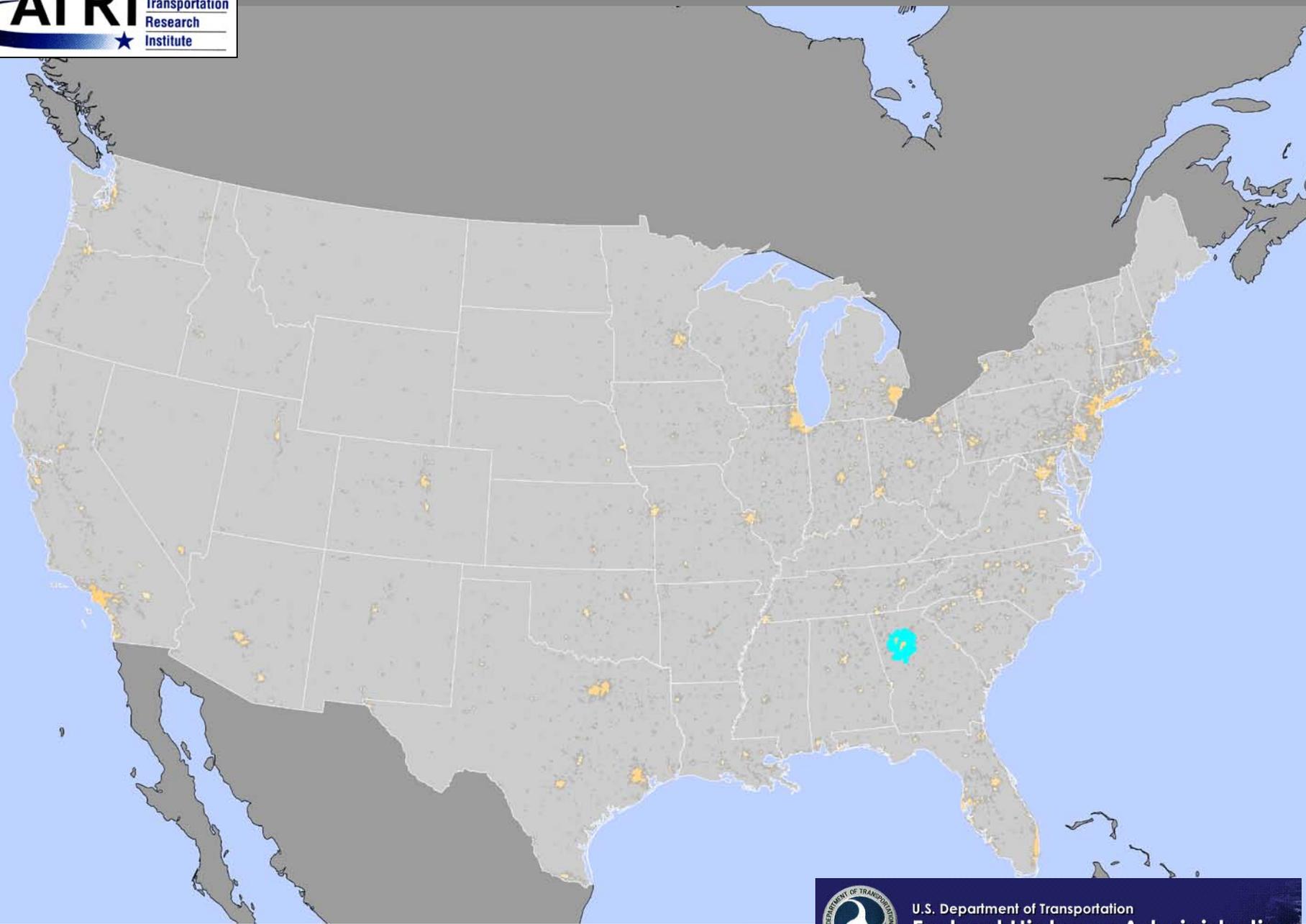


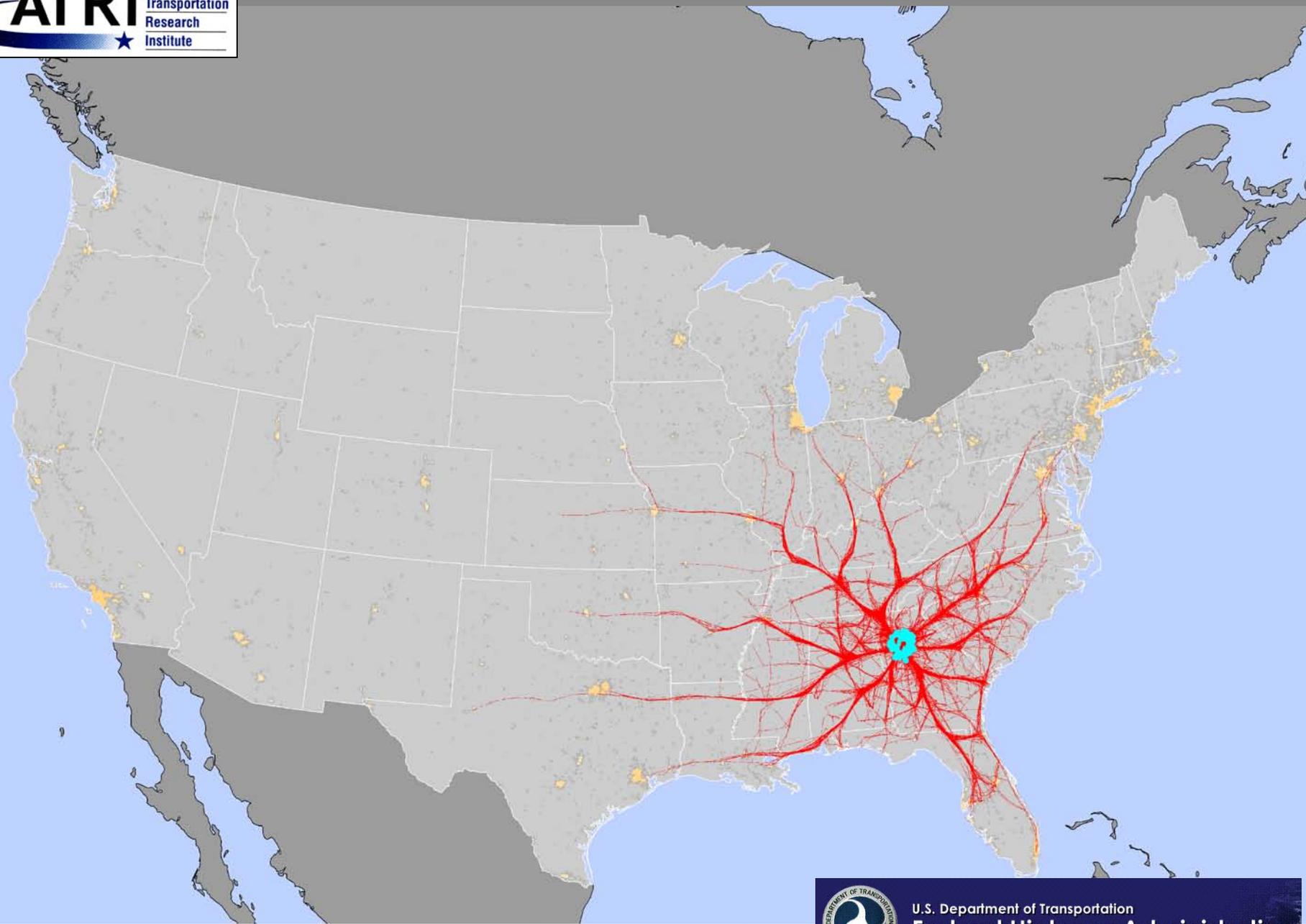
# FPM Background

- Sponsored by Federal Highway Administration, Office of Freight Management and Operations
  - (2002-Present)
- Customized Processing System and Methods For Producing Freight Performance Measures
  - Travel Times/Avg. Speeds/Reliability Measures/Travel Patterns
  - The dataset used is multi-year/multi-source
  - Billions of truck positions received/processed per year
  - Several hundred thousand individual trucks in the population













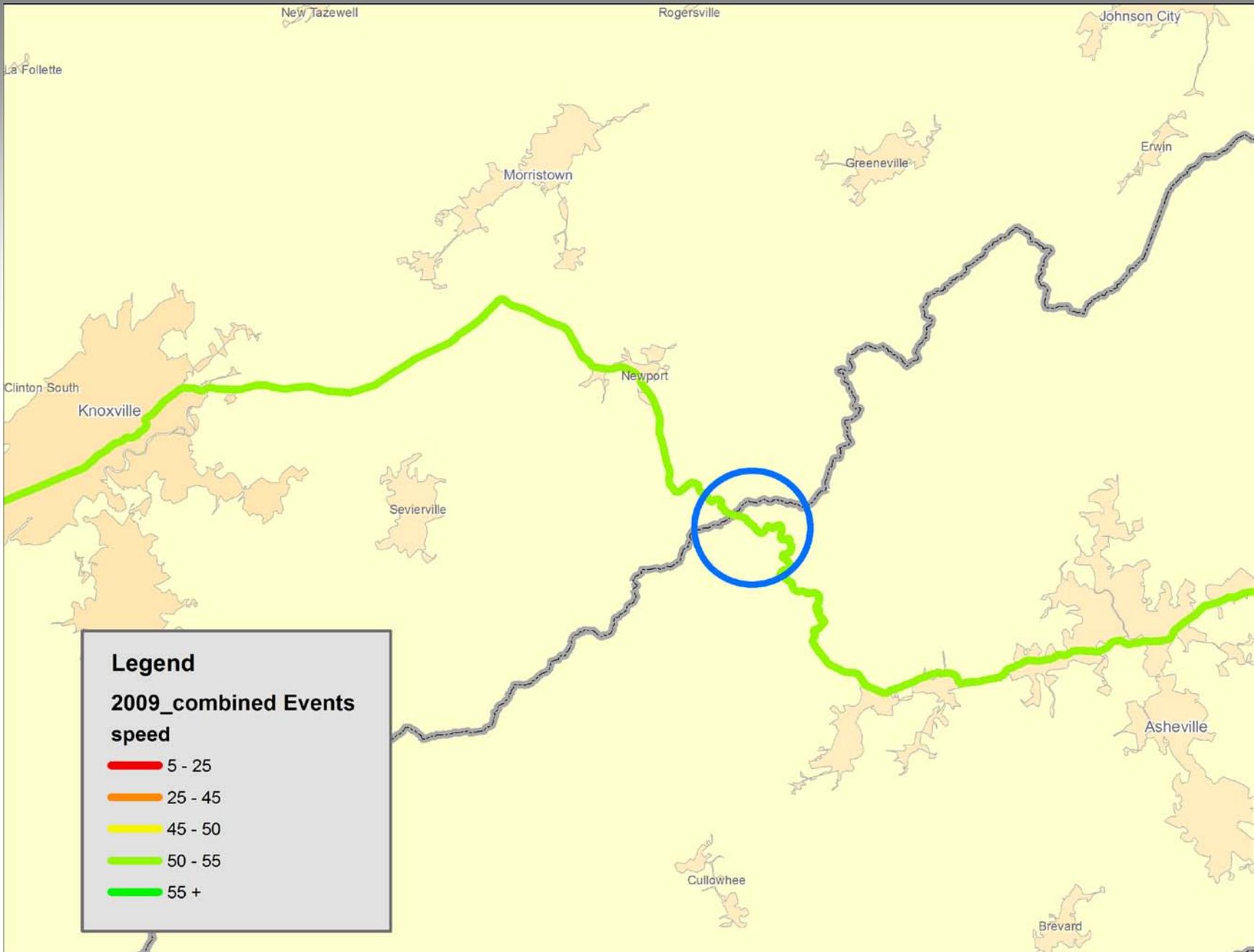


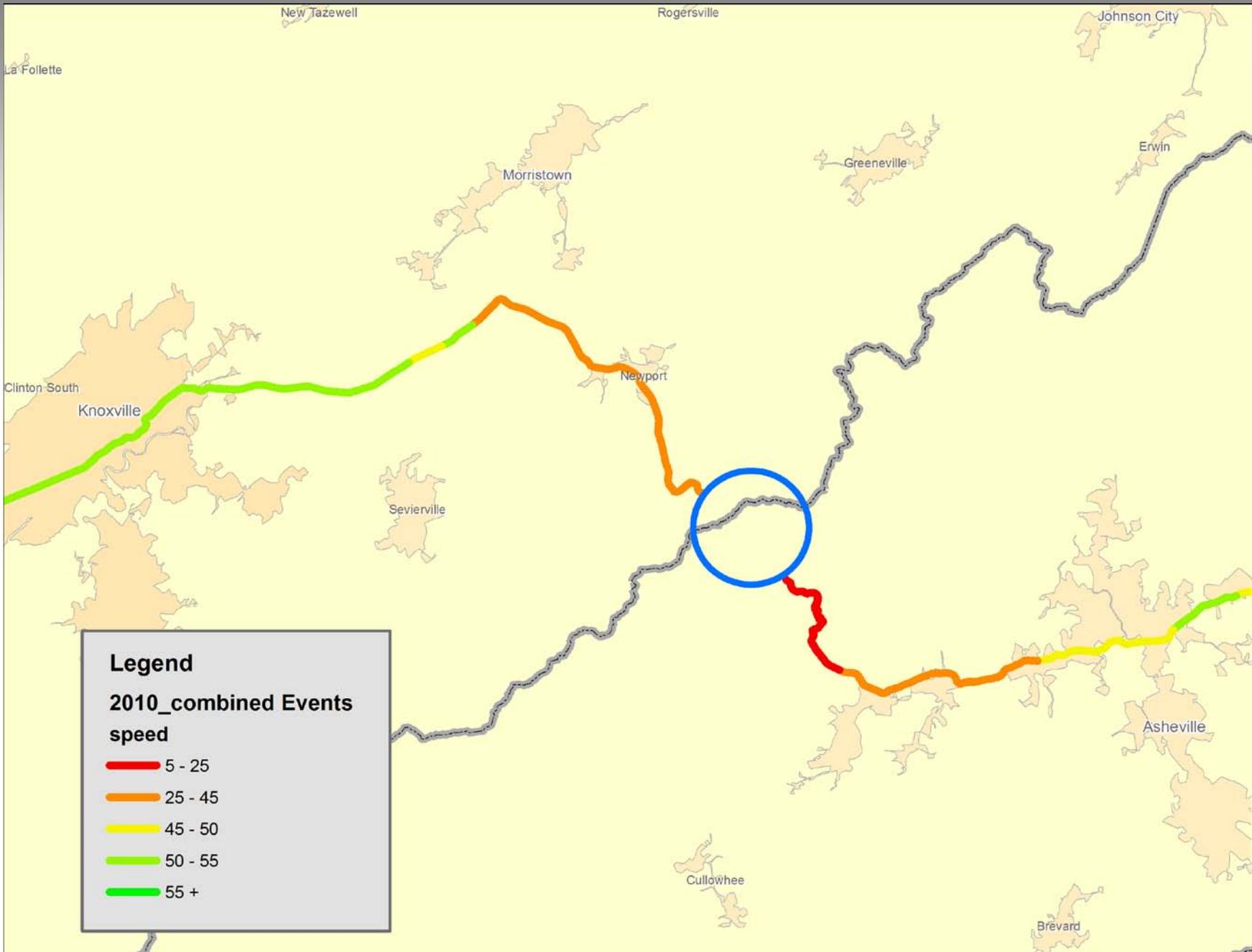




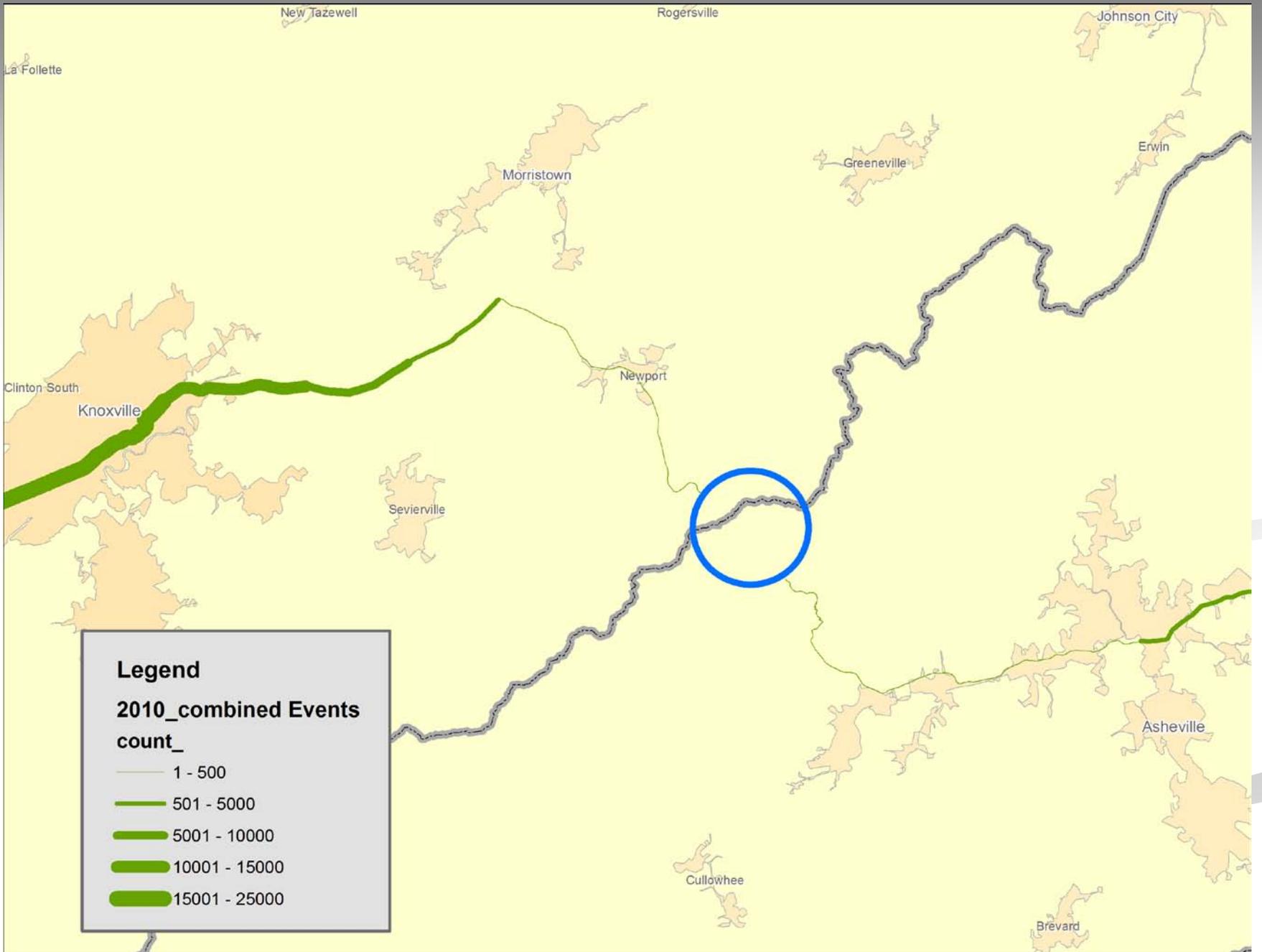
# Rockslide – I-40

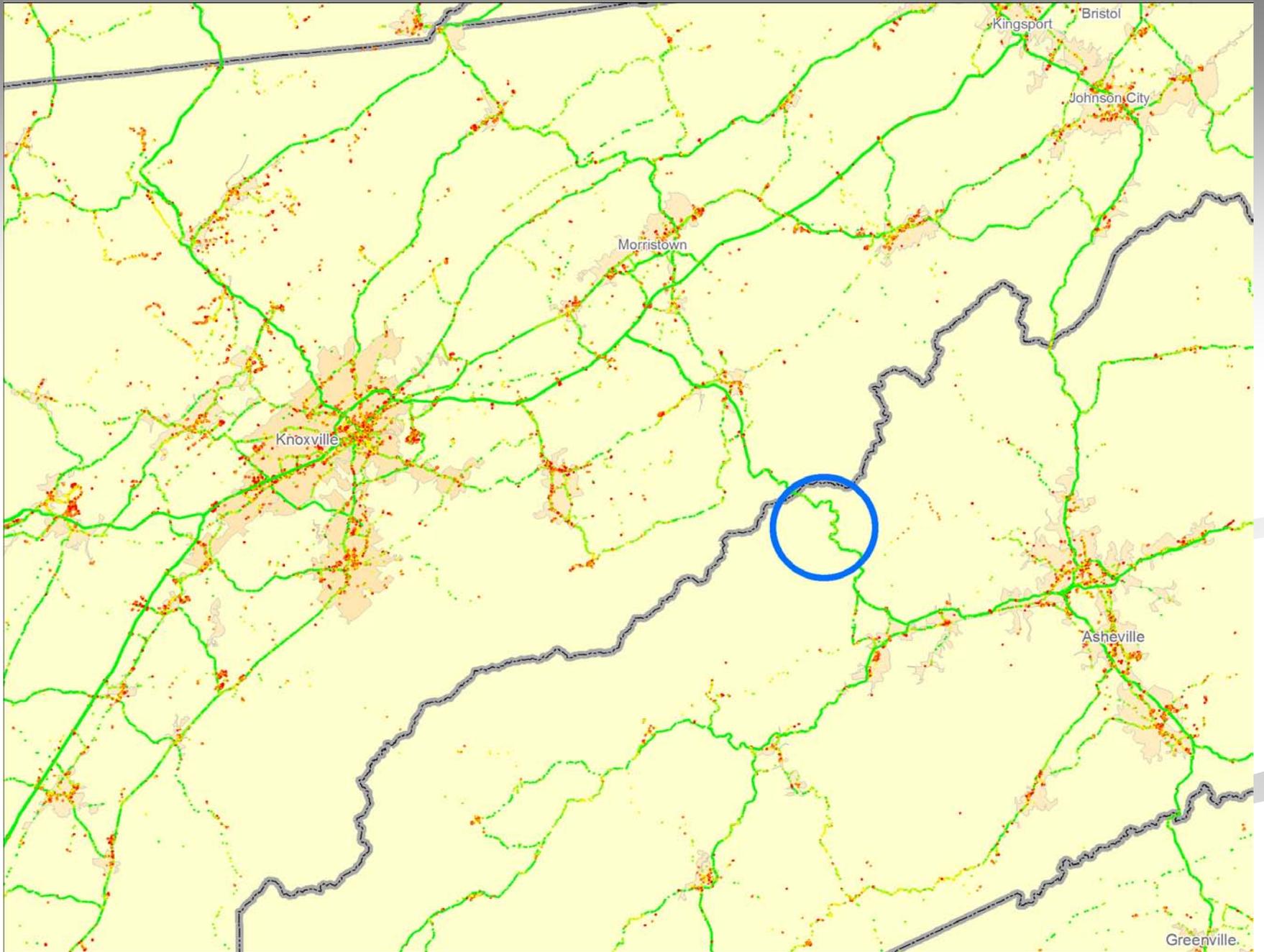


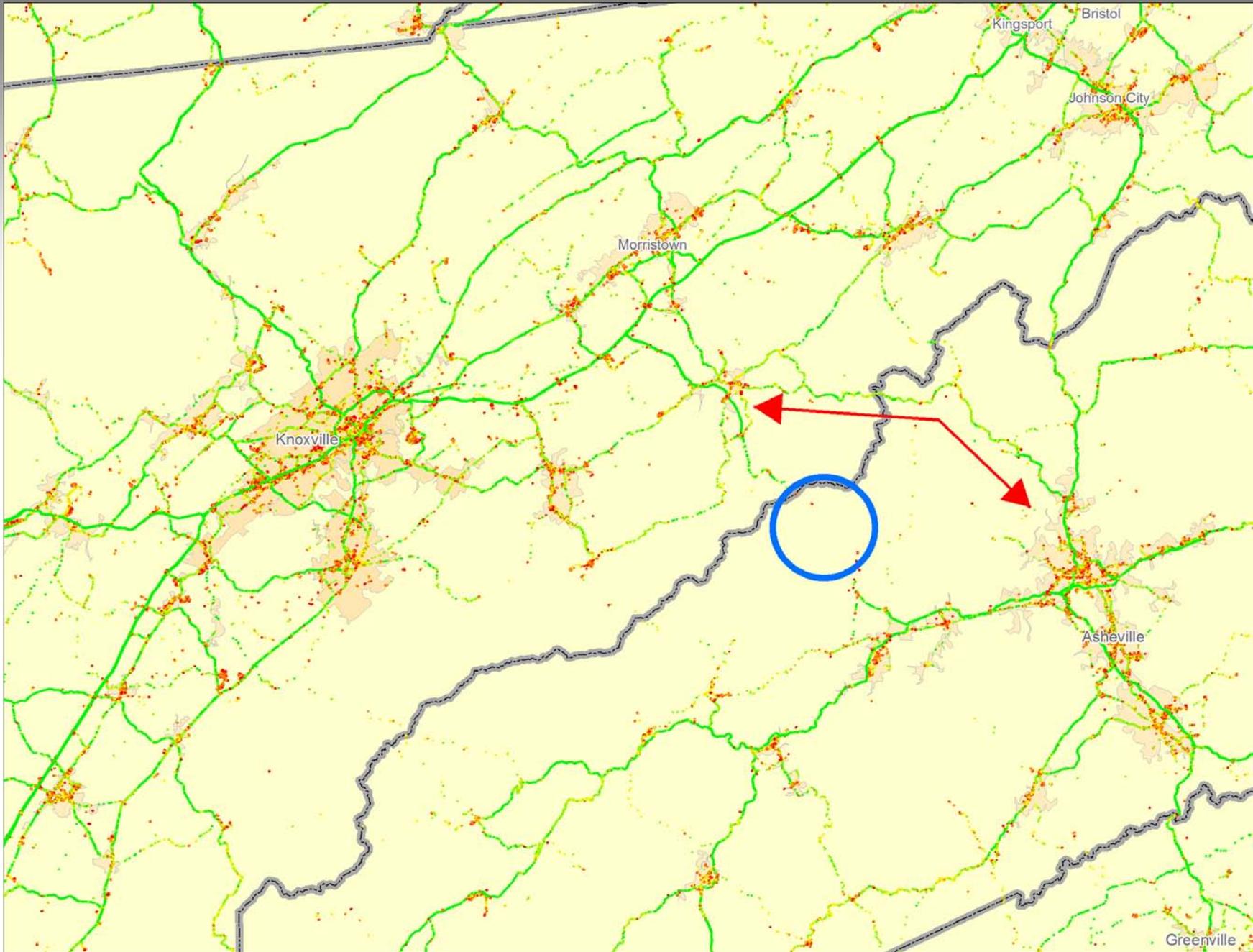


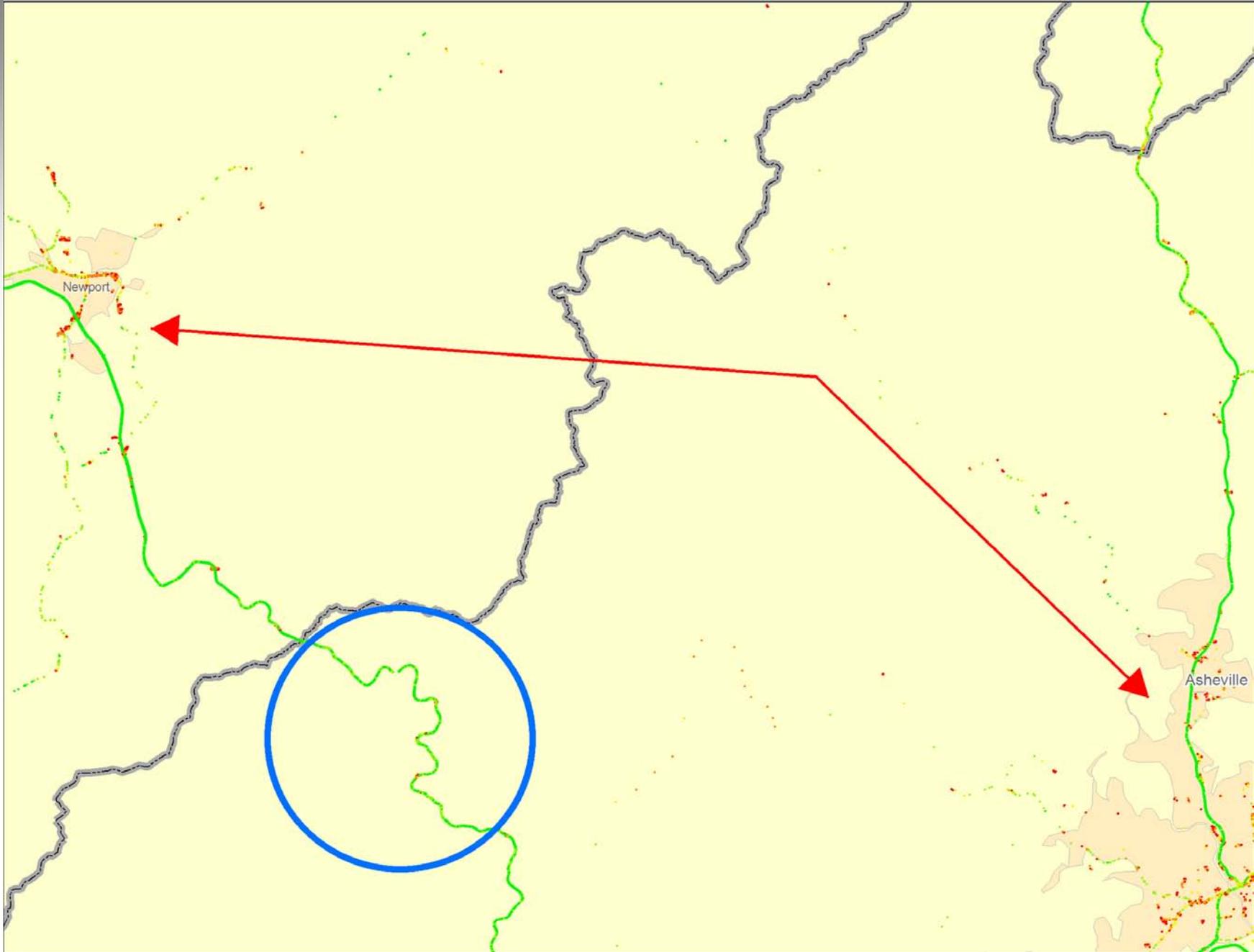


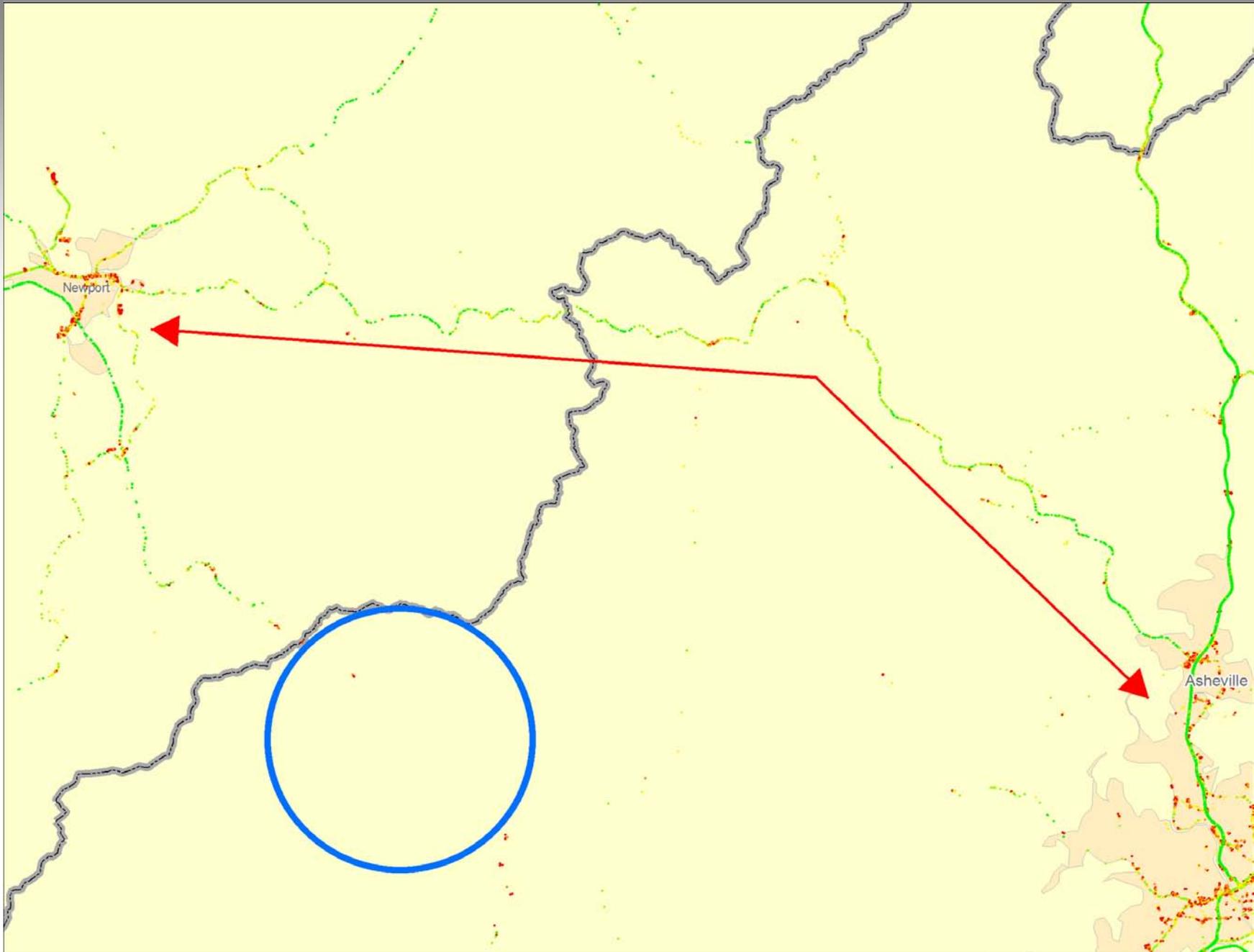


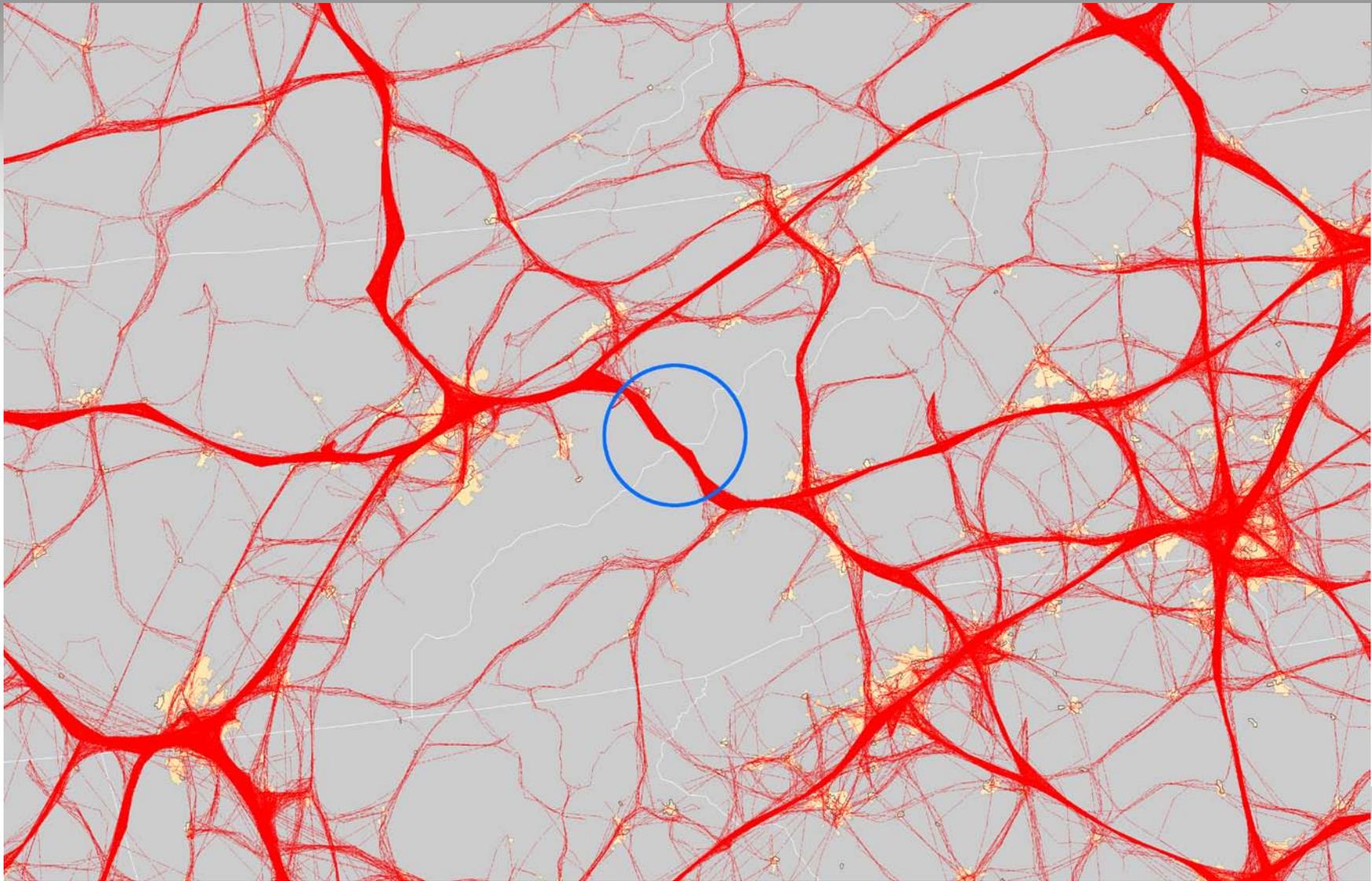


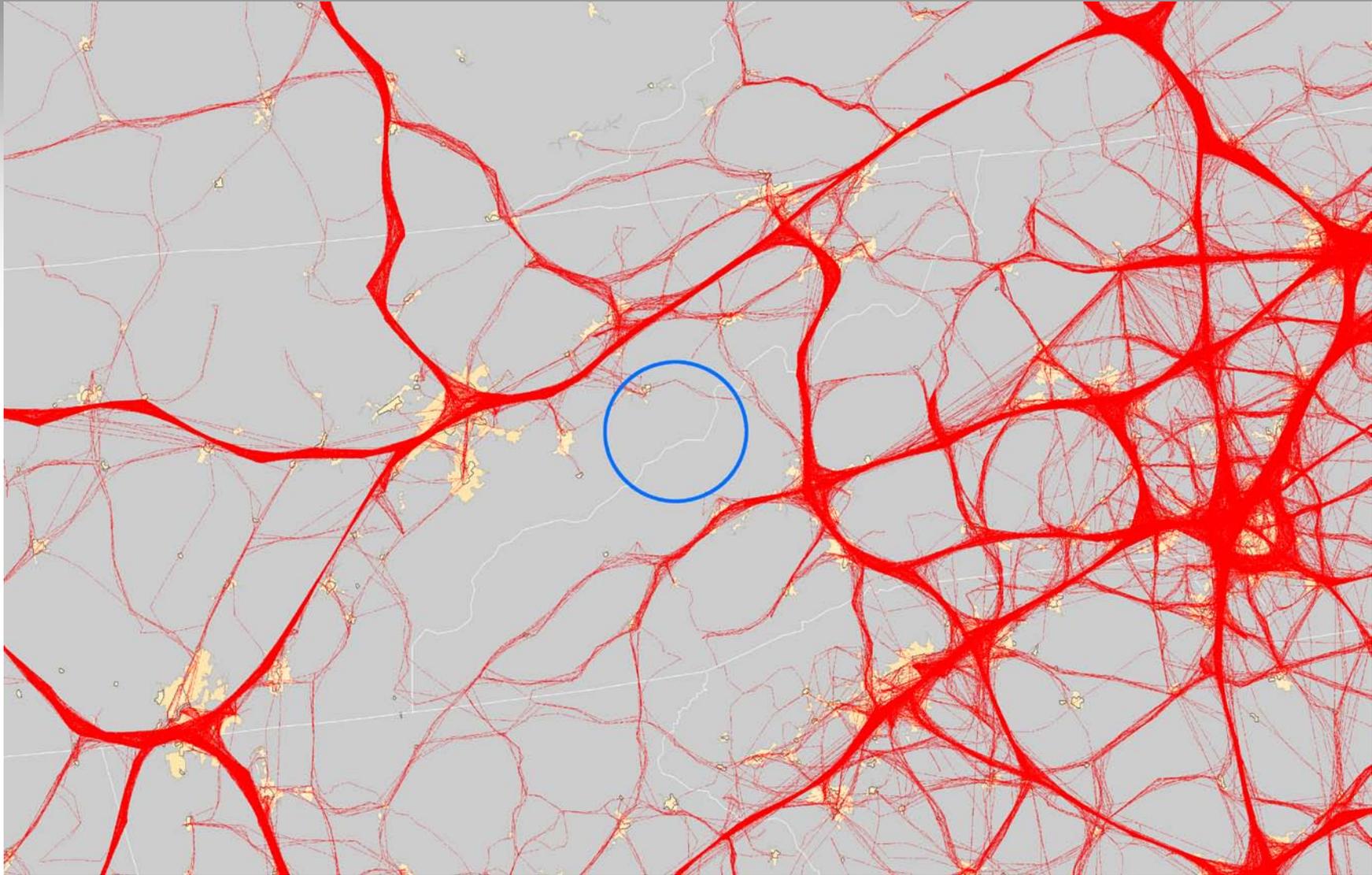


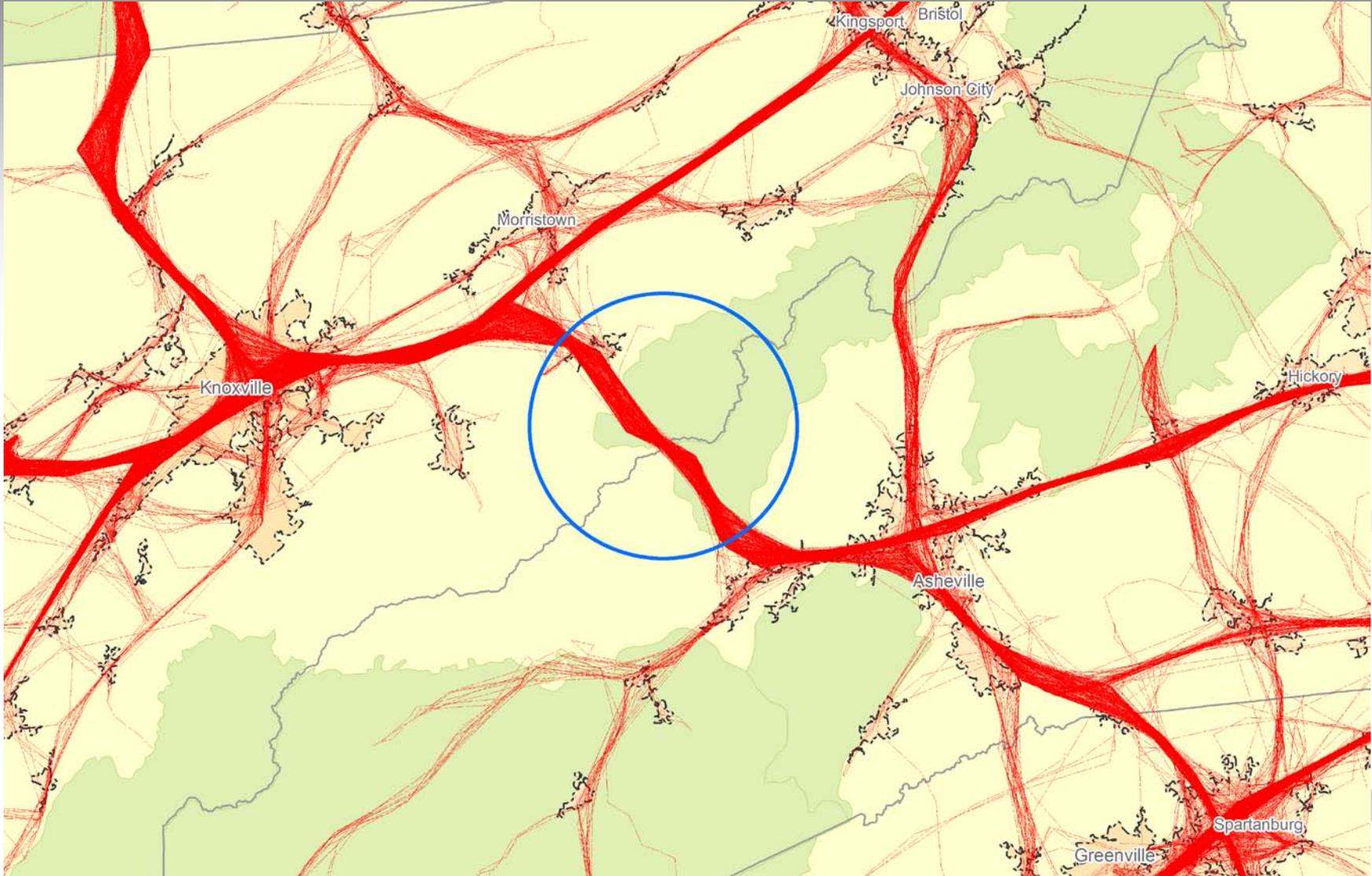


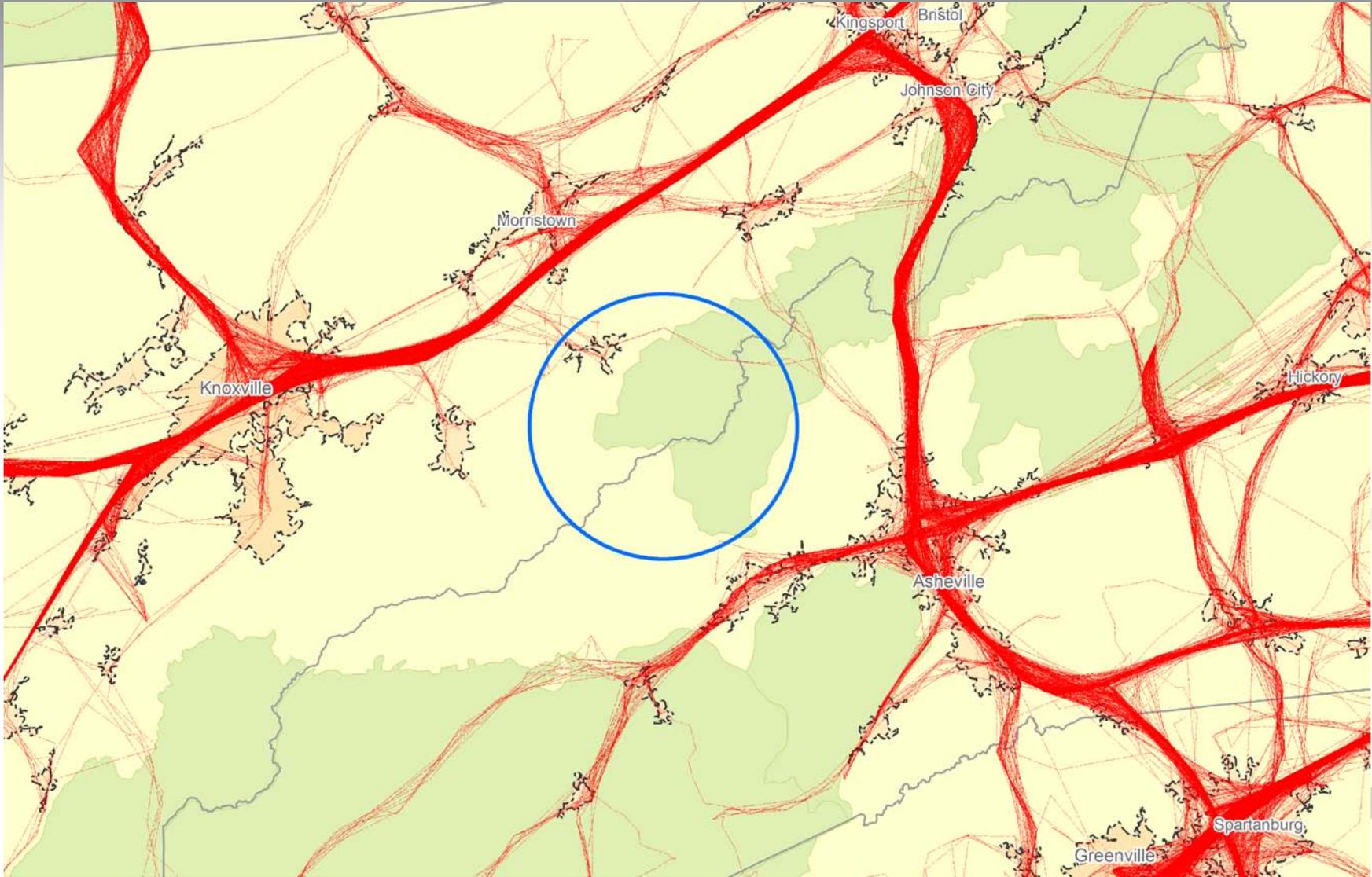


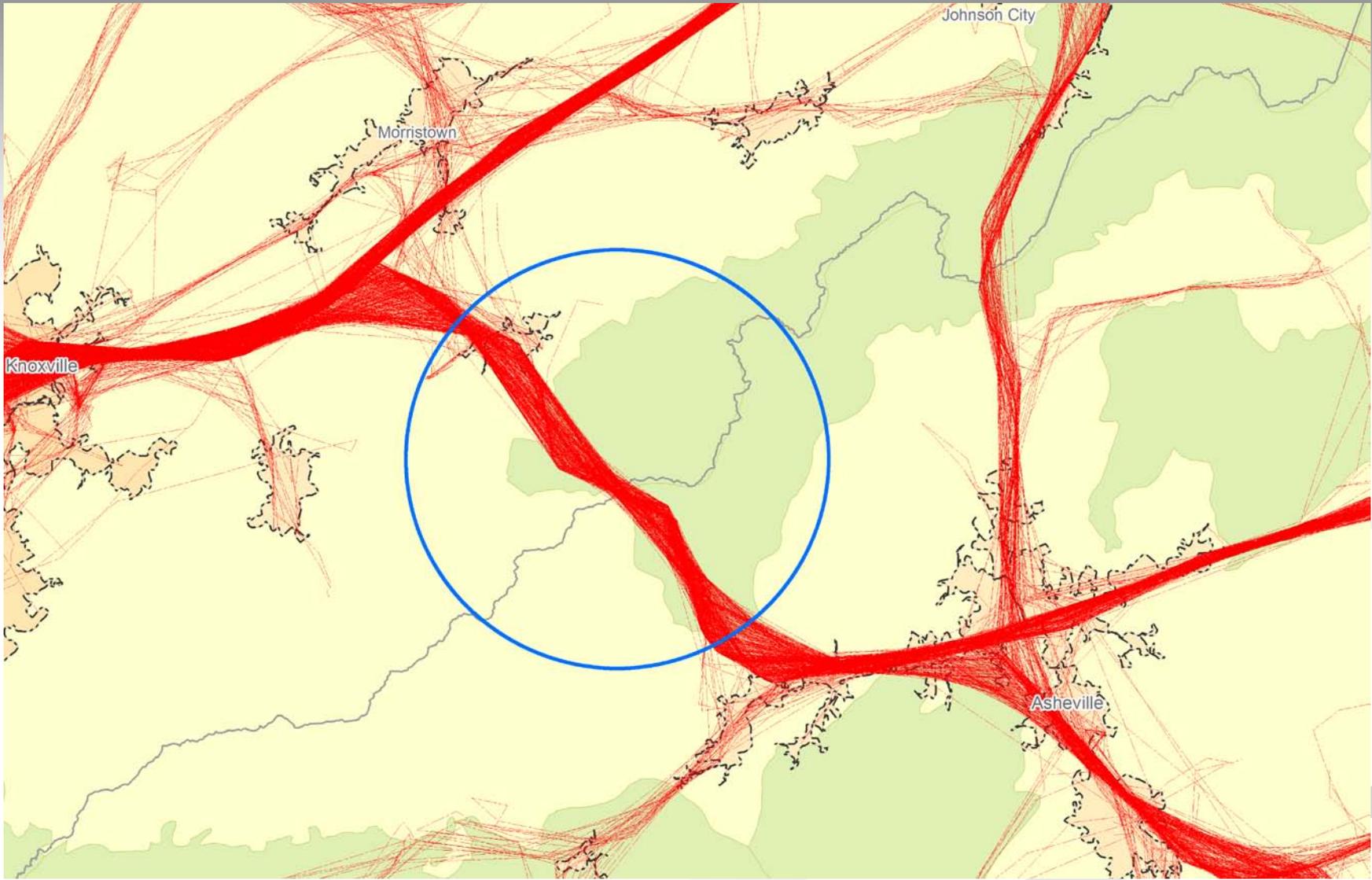


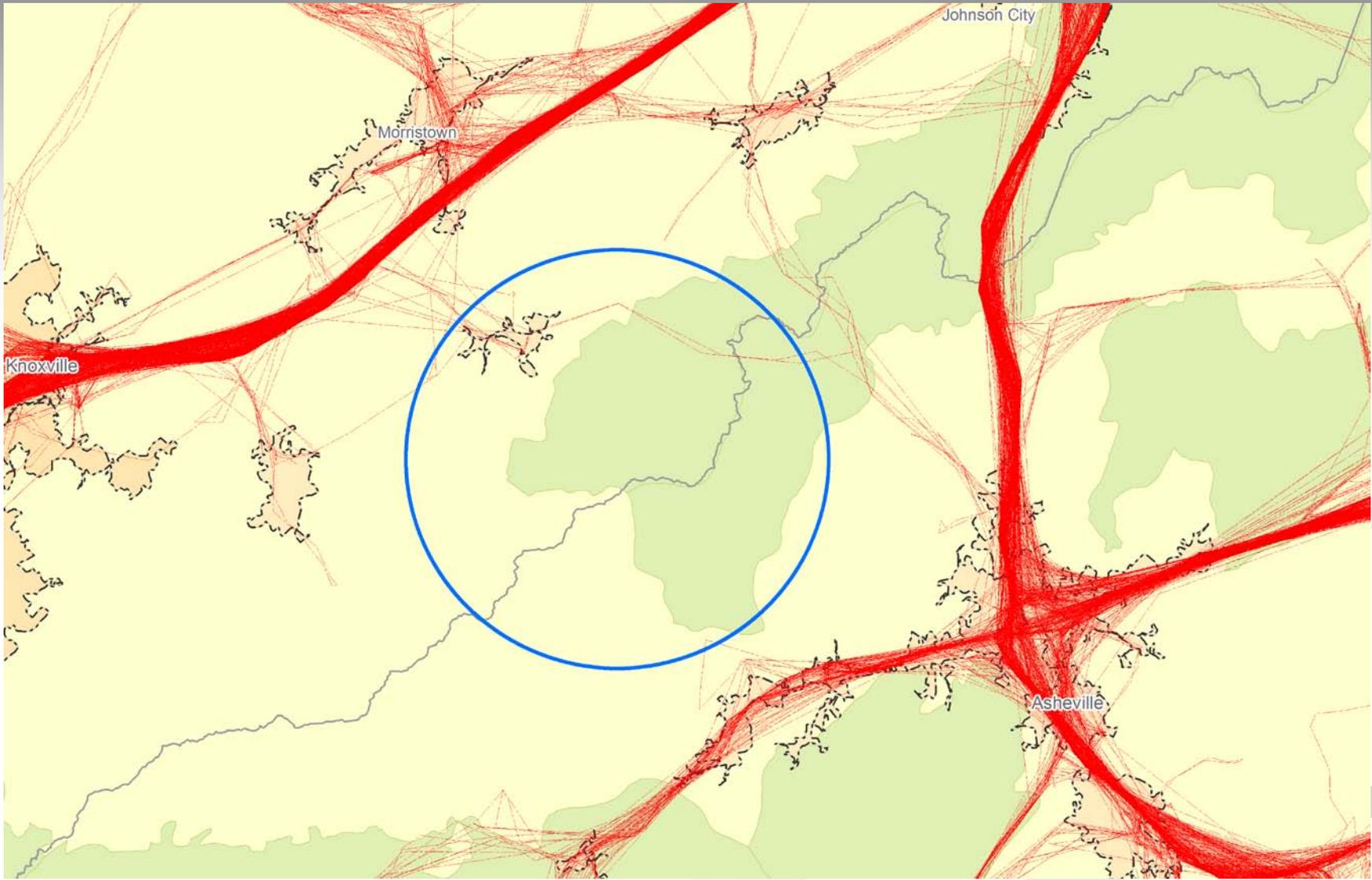






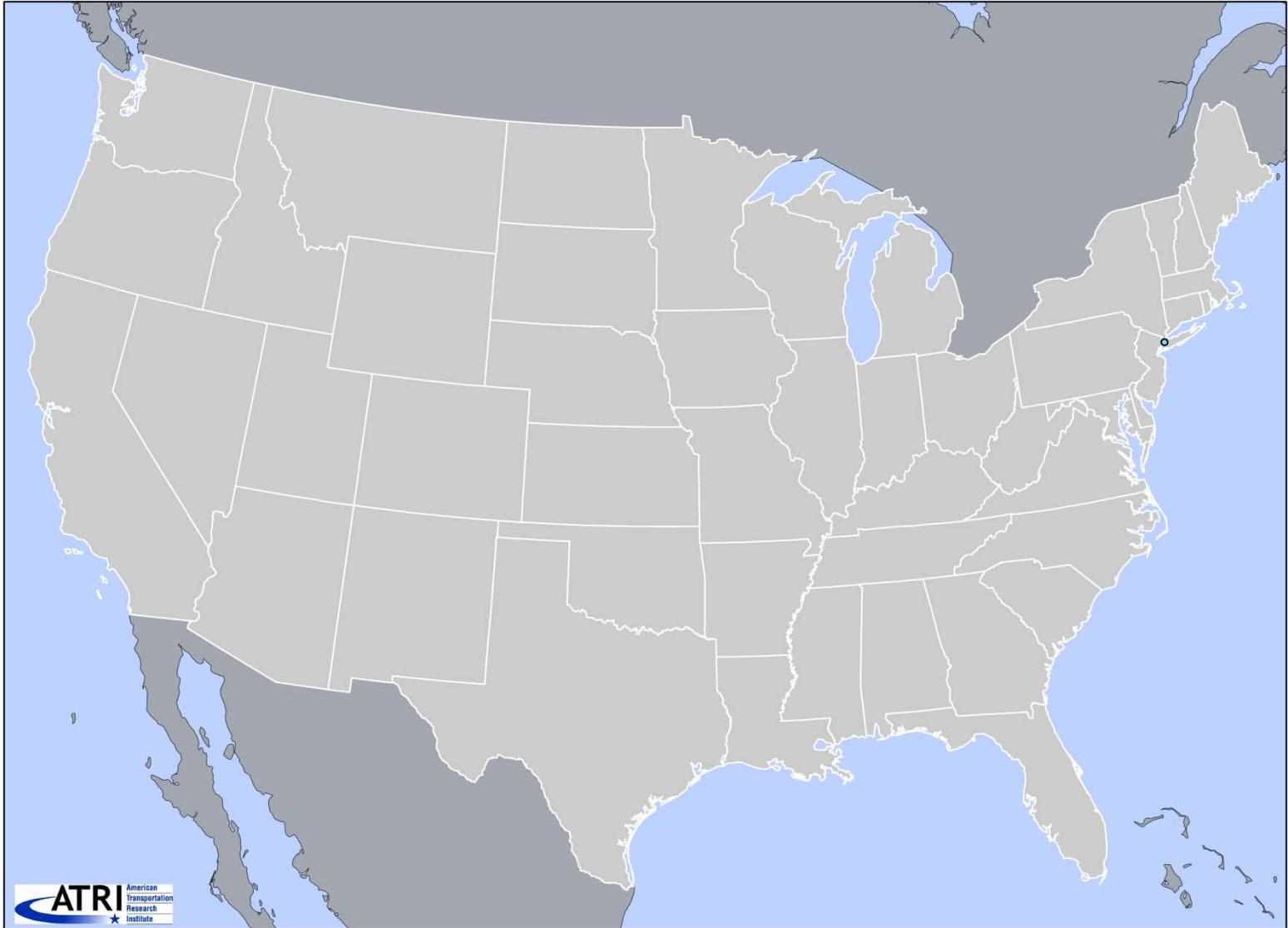




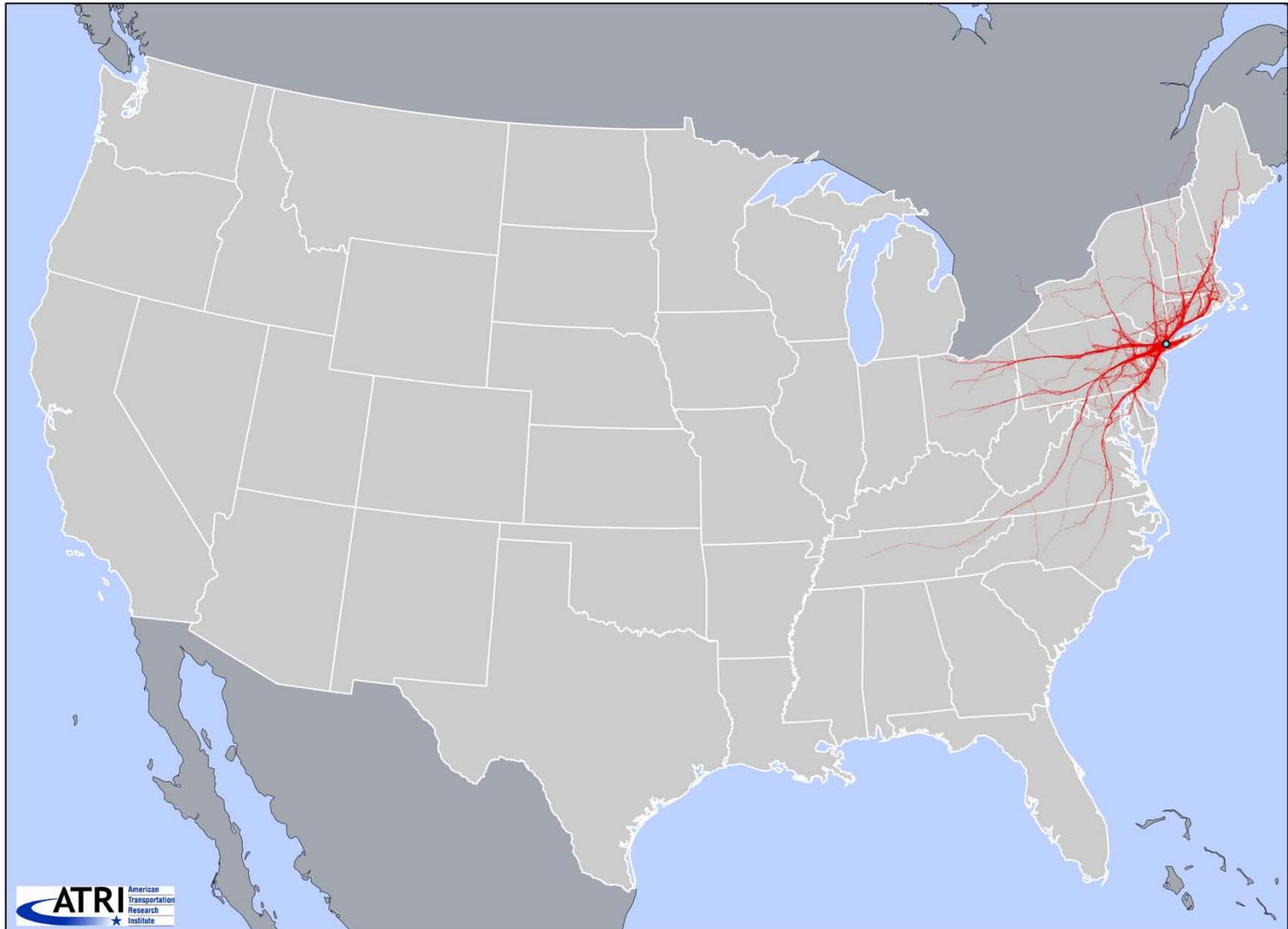


# What does this tell us?

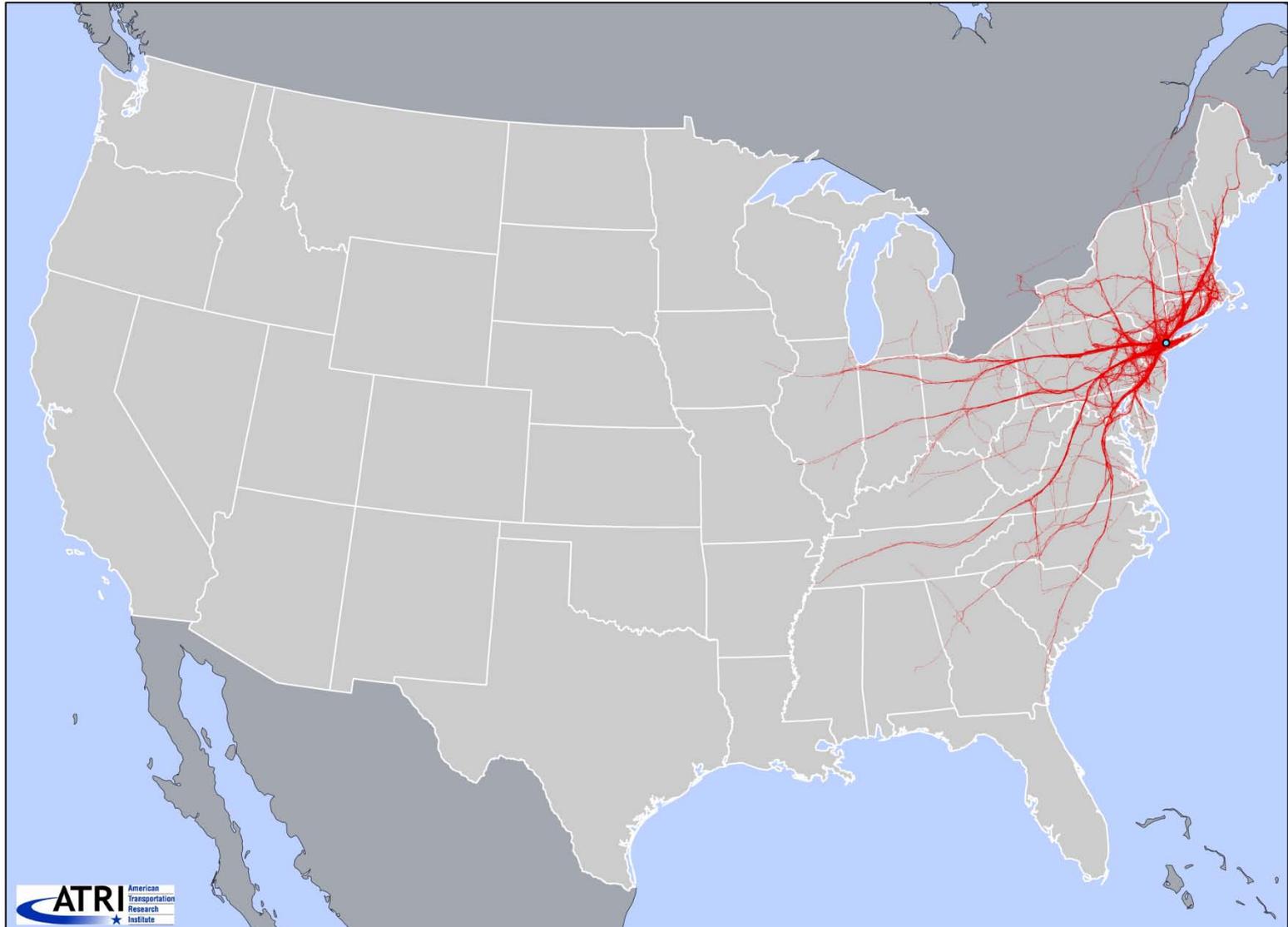
- Importance of Infrastructure
  - Users of this Facility Adapt
  - Travel Time Delays/Costs
- 
- A decorative graphic consisting of several thick, light gray, wavy lines that flow from the bottom left towards the right side of the slide, creating a sense of movement and depth.



# 24 Hours



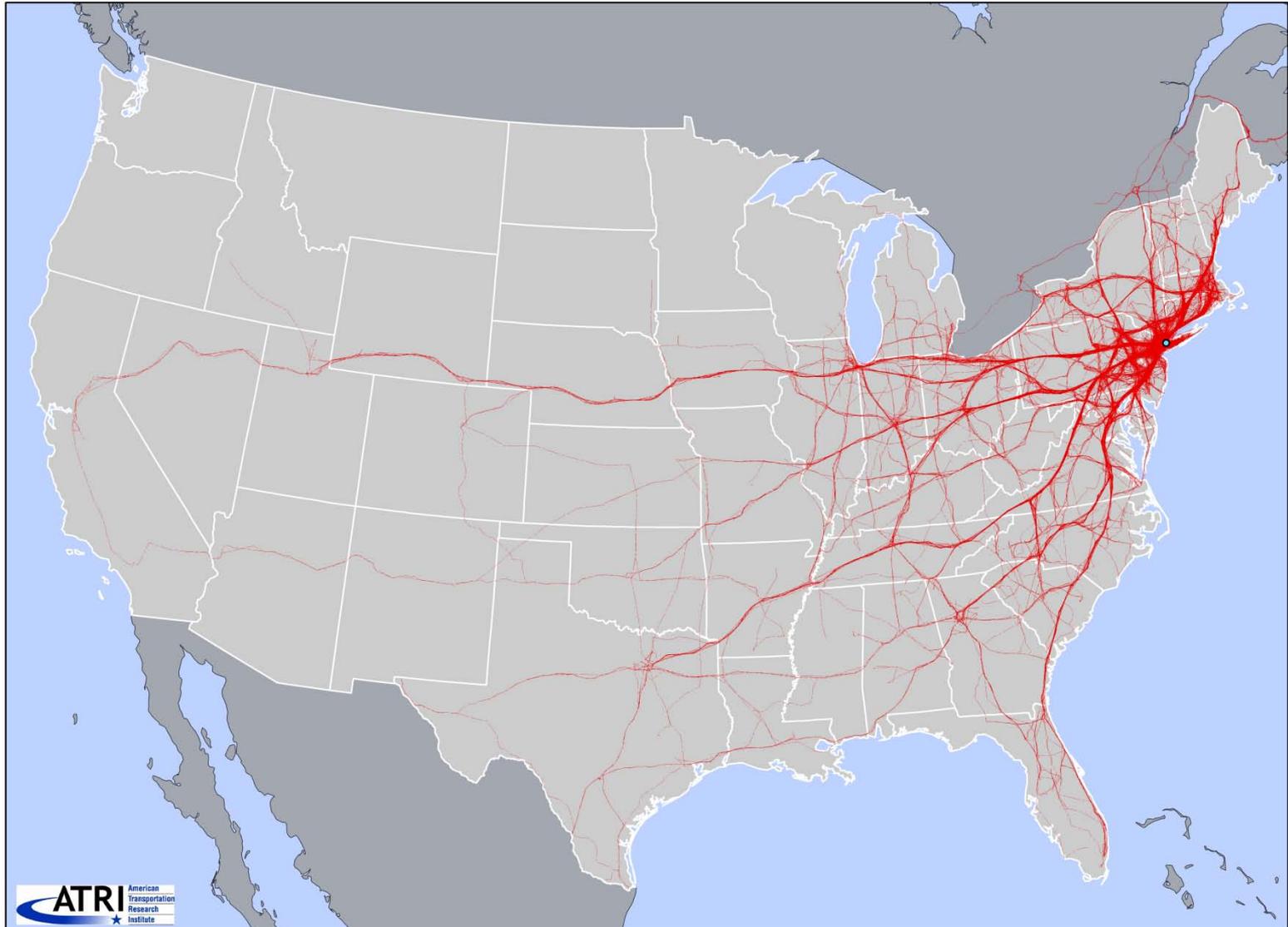
# 48 Hours



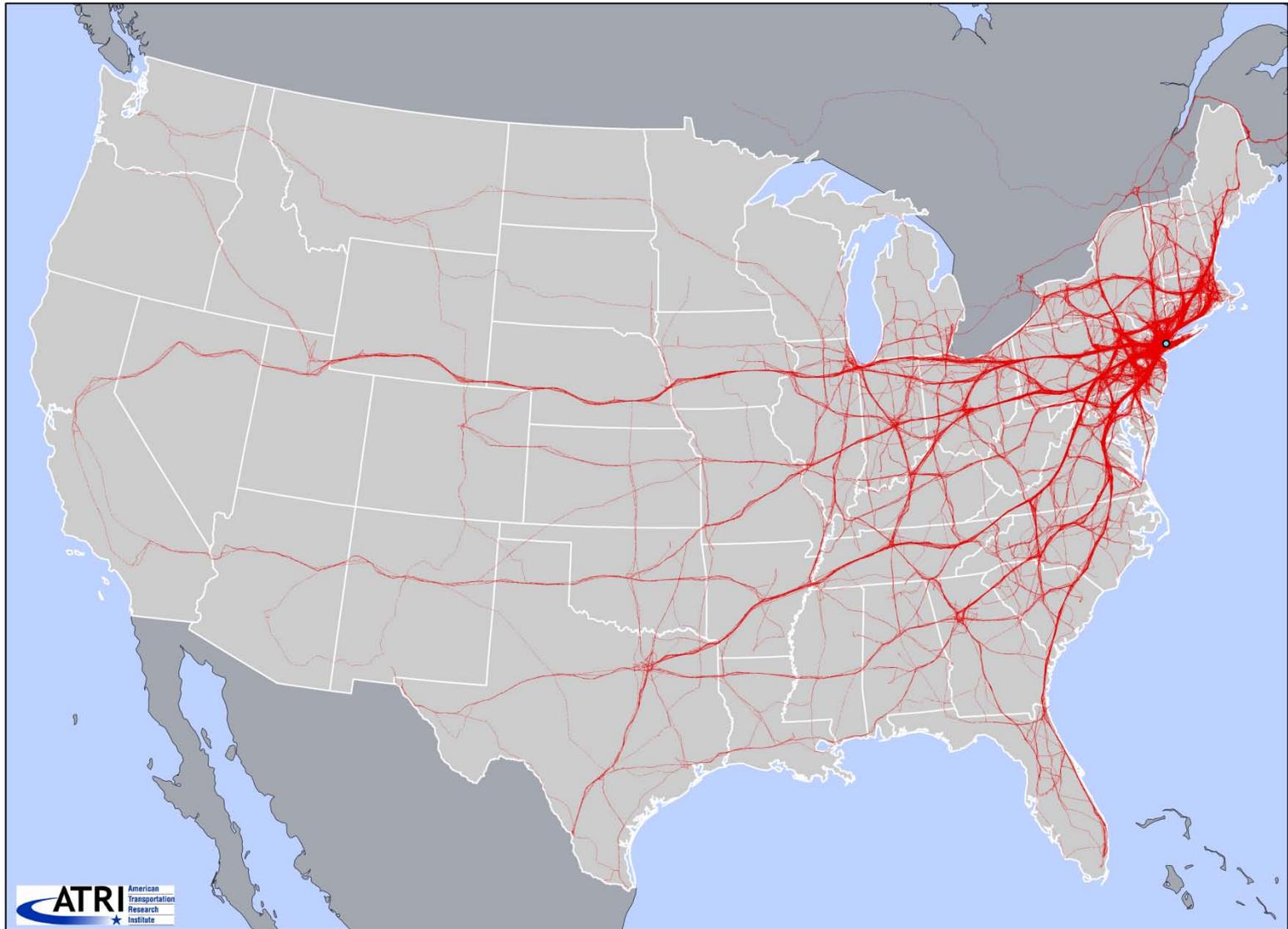
# 72 Hours



# 5 Days



# 7 Days



# Future Research

- Vulnerabilities in the Nation's Transportation System
  - Determine Where Sudden Infrastructure Outages Could Lead to Significant Disruptions of Goods Movement
- Consequences of System Disruption on Goods Movement
  - Better Understand the Likely Impacts of Specific System Disruptions
    - Modeled on on Past Incidents and Catastrophes
- How Resilient is the Interstate System?

# Questions?

Jeff Short

770-432-0628

[jshort@trucking.org](mailto:jshort@trucking.org)