SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

SHRP2 C20: Freight Demand Modeling and Data Improvement Strategic Plan

Implementation Plan

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January 13, 2015

U.S. Department of Transportation
Federal Highway Administration

AMERICAN ASSOCIATION of
STATE HIGHWAY and
TRANSPORTATION OFFICIALS
AASHTO
THE VOICE OF TRANSPORTATION

TRB

SHRP2 C20 Implementation : Purpose

Freight data & analytical tools and its necessity

❖ Decision-makers recognize that transportation investments are being informed by an understanding of the implications, benefits, and trade-offs relative to freight.

Today - "ECONOMY drove Freight transportation need"

Vision for tomorrow –

"Freight transportation drives the ECONOMY"

Background: Logistics and Freight Models

- Freight transport demand is a derived demand
- Good representation of logistics in freight demand models allows better prediction of future flows
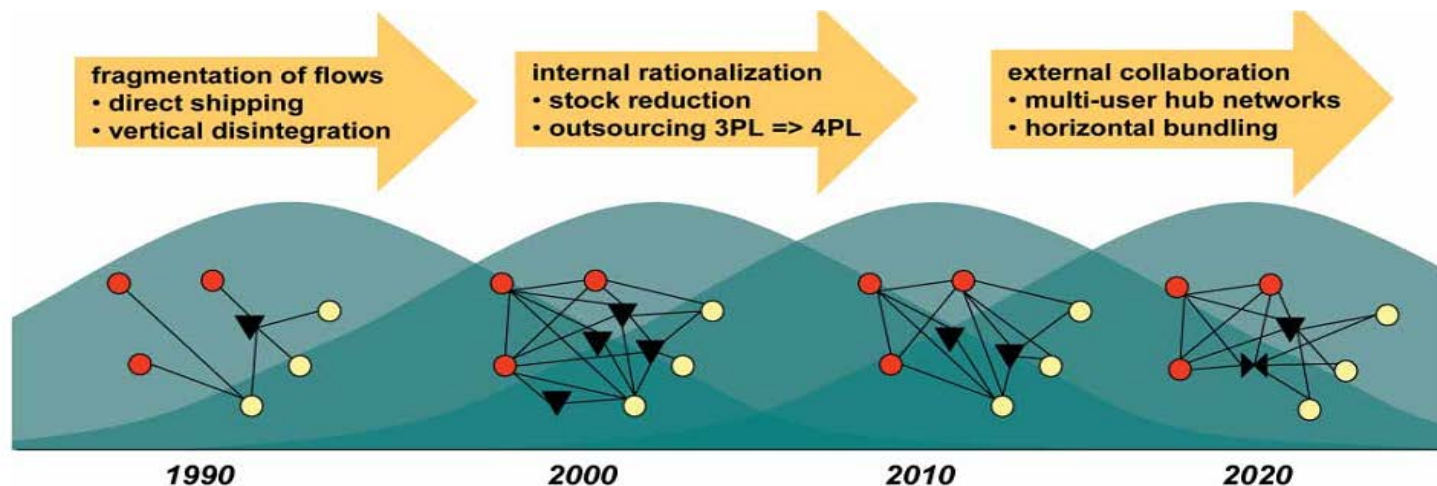- More representative freight flows → Better cost estimates

Figure 1. Evolution of logistics networks through time. The dark dots (top, left) indicate suppliers, the light ones (right, bottom) indicate consumers, and the black triangles warehouses and cross-dock locations.

Source: L. A. Tavasszy, K. Ruijgrok & I. Davydenko (2012): Incorporating Logistics in Freight Transport Demand Models: State-of-the-Art and Research Opportunities, Transport Reviews

3

Implementation Plan:

- Implementation Assistance Program
- National Initiatives

C20: Freight Demand Modeling and Data Improvement

Implementation Assistance Program (IAP) Purpose:

To foster fresh ideas and new approaches
to freight demand modeling and data collection
that ultimately enhance decision-making.
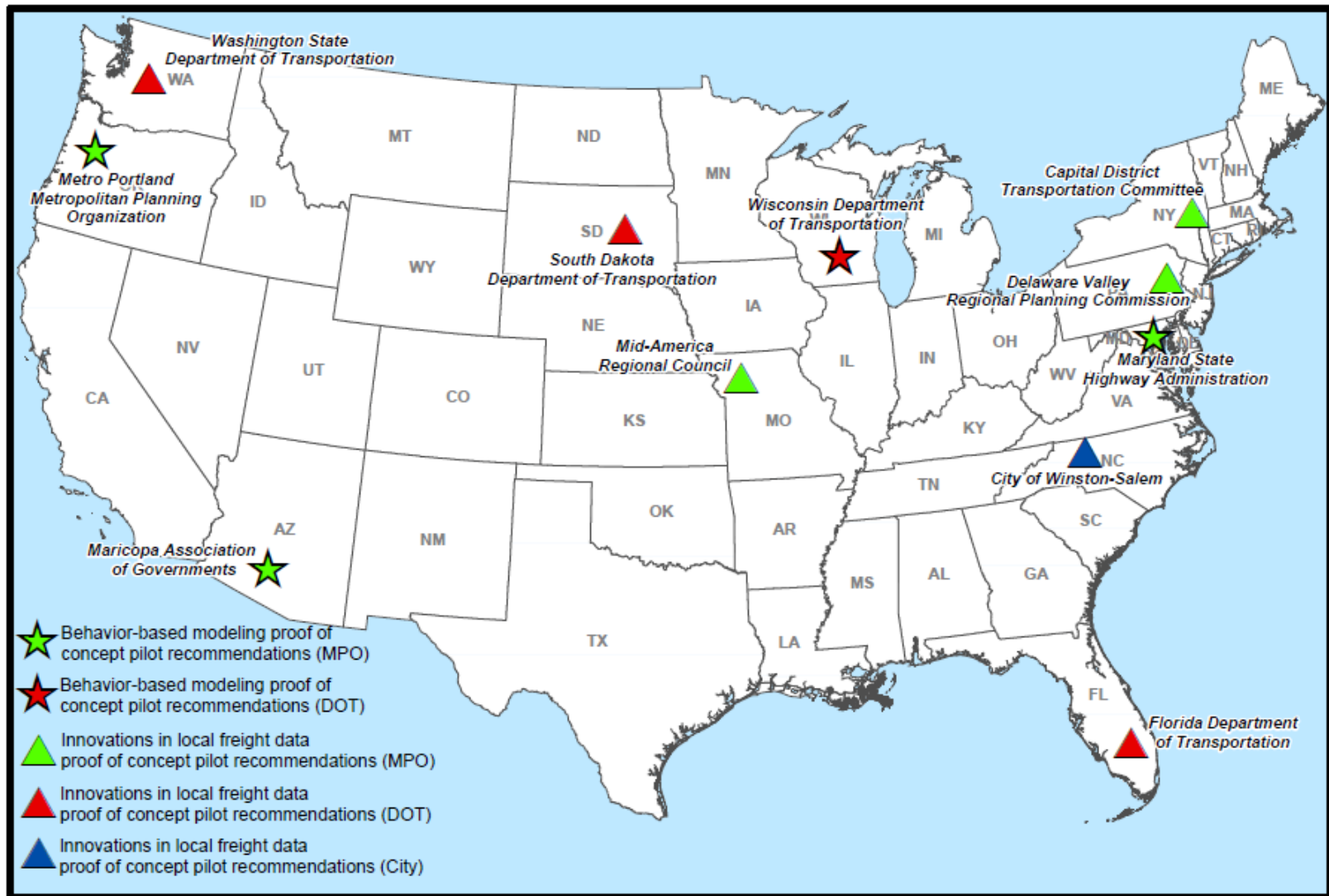
C20: Implementation Assistance Program

Innovations in Local Freight Data Pilot Assistance Program

- Identify and adapt disparate sources of data
- Refine current data sources
- Develop new data sources on smaller geographic scales

Behavior-Based Freight Modeling Pilot Assistance Program

- Advance 'tour-based' and 'supply chain' freight modeling
- Improve the understanding of decision-making by freight agents and their implications for network modeling

C20: Implementation Assistance Program (IAP) - Projects

Map of the United States showing project locations:

- **Washington State Department of Transportation** (WA) — red triangle
- **Metro Portland Metropolitan Planning Organization** — green star
- **South Dakota Department of Transportation** (SD) — red triangle
- **Wisconsin Department of Transportation** — red star
- **Mid-America Regional Council** — green triangle
- **Maricopa Association of Governments** (AZ) — green star
- **Capital District Transportation Committee** (NY) — green triangle
- **Delaware Valley Regional Planning Commission** — green triangle
- **Maryland State Highway Administration** — green star
- **City of Winston-Salem** (NC) — blue triangle
- **Florida Department of Transportation** (FL) — red triangle

Legend:
- Green star: Behavior-based modeling proof of concept pilot recommendations (MPO)
- Red star: Behavior-based modeling proof of concept pilot recommendations (DOT)
- Green triangle: Innovations in local freight data proof of concept pilot recommendations (MPO)
- Red triangle: Innovations in local freight data proof of concept pilot recommendations (DOT)
- Blue triangle: Innovations in local freight data proof of concept pilot recommendations (City)

IAP Projects

Recipient: Portland Metro
State: Oregon
Pilot Type: Behavior-based Model

- Improve the freight model's range of responses to network conditions and costs

- Focuses to support metro freight transportation programs in combinations with statewide/national freight demand forecasts.
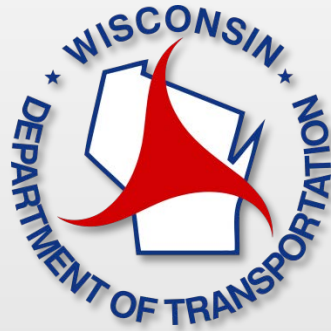
IAP Projects

MARICOPA ASSOCIATION of GOVERNMENTS

Recipient: Maricopa Association of Governments
State: Arizona
Pilot Type: Behavior-based Model

- Multi-modal freight model to understand economic behaviors of establishments, shippers, and carriers by modeling travel and tour formations

- Geographic setting is a freight gateway and mega region

Map legend:

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- Innovations in local freight data proof of concept pilot recommendations (City) — blue triangle

Map labels: Washington State Department of Transportation (WA), Metro Portland Metropolitan Planning Organization, Maricopa Association of Governments (AZ), MT, ID, WY, NV, UT, CO, CA

IAP Projects

Recipient: Wisconsin DOT
State: Wisconsin
Pilot Type: Behavior-based Model

- Hybridized model that integrates statewide model with regional travel demand models

- Allows for sensitivity testing to quantify how different scenarios affect freight transportation in the region
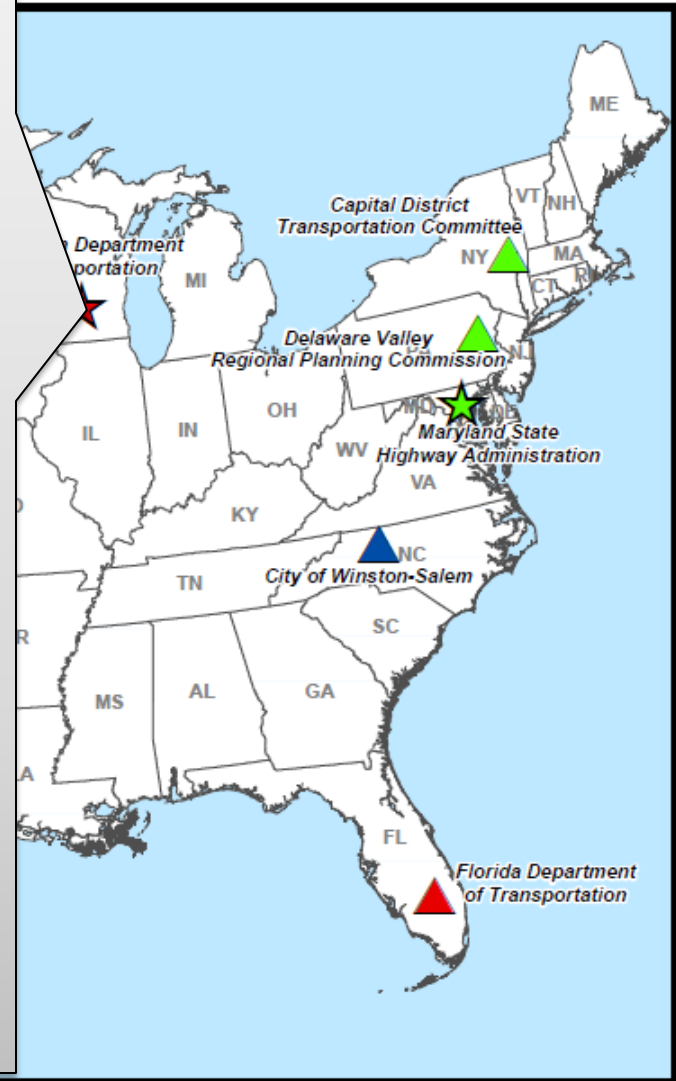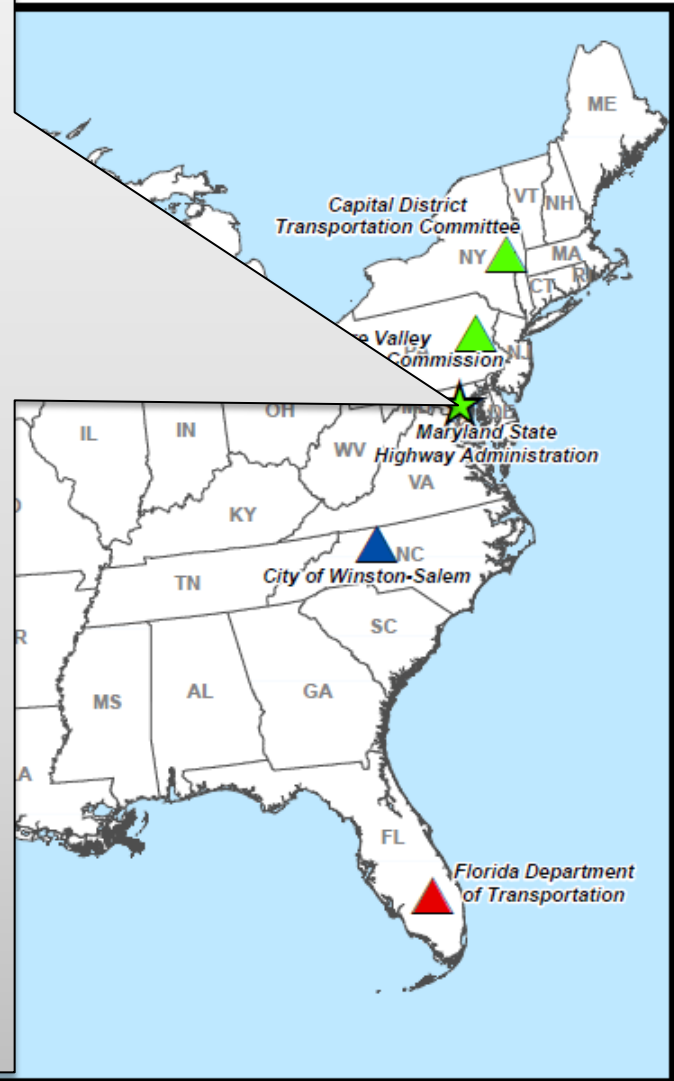
IAP Projects

Recipient: Maryland State Highway Administration and Baltimore Metropolitan Council

State: Maryland

Pilot Type: Behavior-based Model

- Regional tour-based truck model covering intra-local distribution

- Sensitive to the long-distance truck flows represented in the statewide freight model
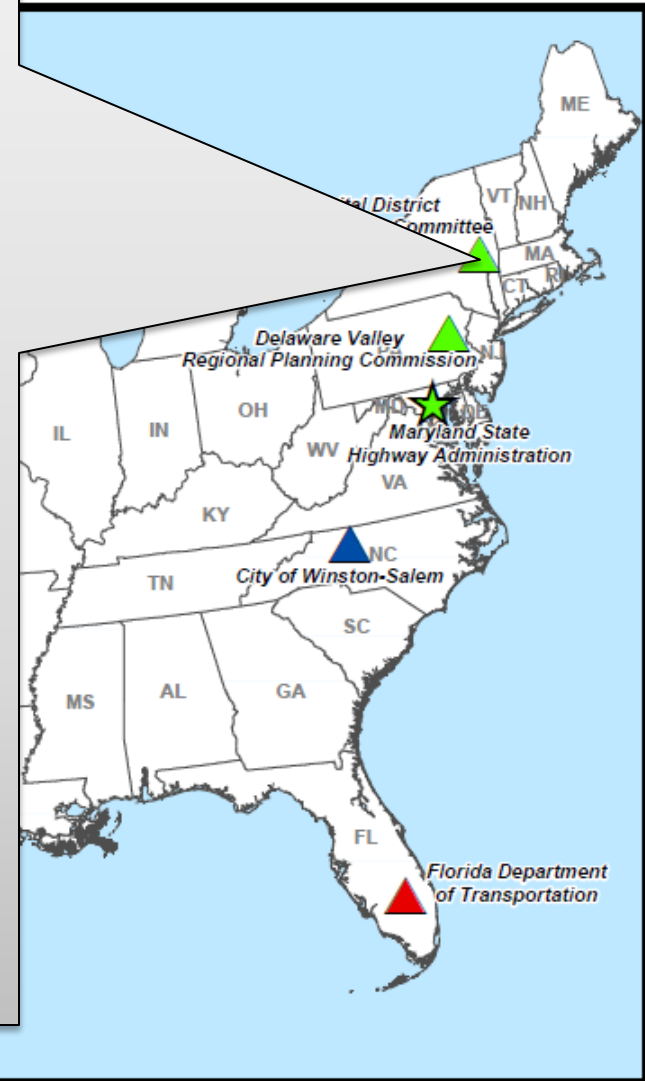
IAP Projects

Capital District Transportation Committee
One Park Place   Albany NY 12205   518-458-2161

Recipient: Capital District Transportation Committee
State: New York
Pilot Type: Local Data

- Creates a unified data set for the region at the zip code or transportation analysis zone (TAZ) level
- Uses from data developed in the project:
  - Mitigating impacts of trucks
  - Determining the impact of freight on quality of life
  - Improving safety and security
 - Prioritizing investments
  - Performance measurement

proof of concept pilot recommendations (City)

IAP Projects

Recipient: Delaware Valley Regional Planning Commission
State: Pennsylvania
Pilot Type: Local Data

- Integrates freight data, including distribution supply chains and for performance management

- Interactive mapping application with potential to be replicated elsewhere
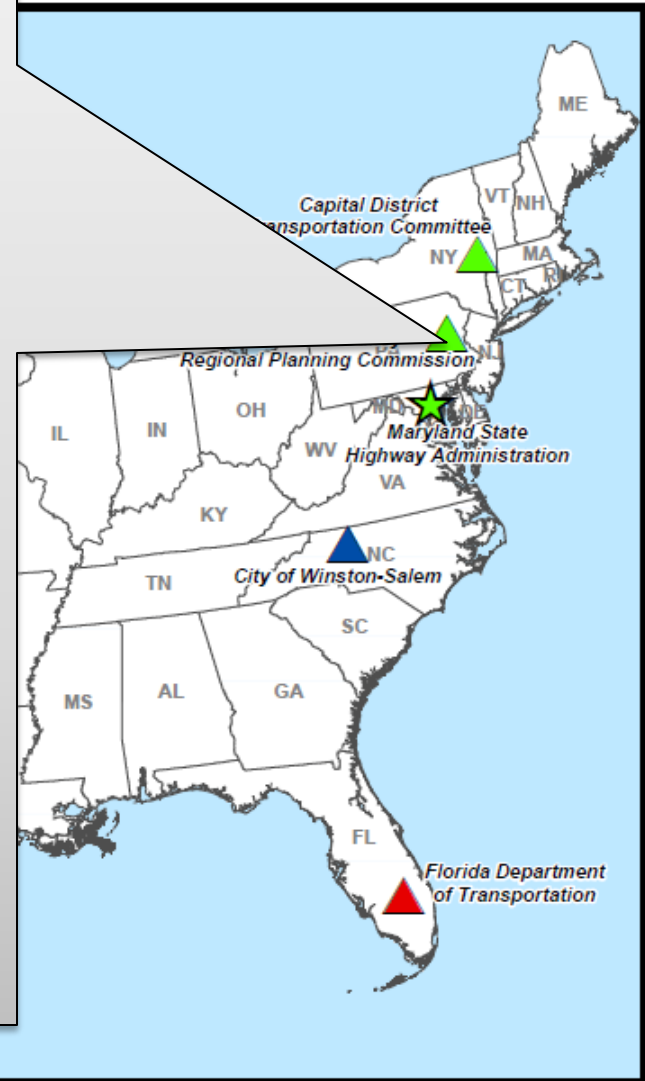
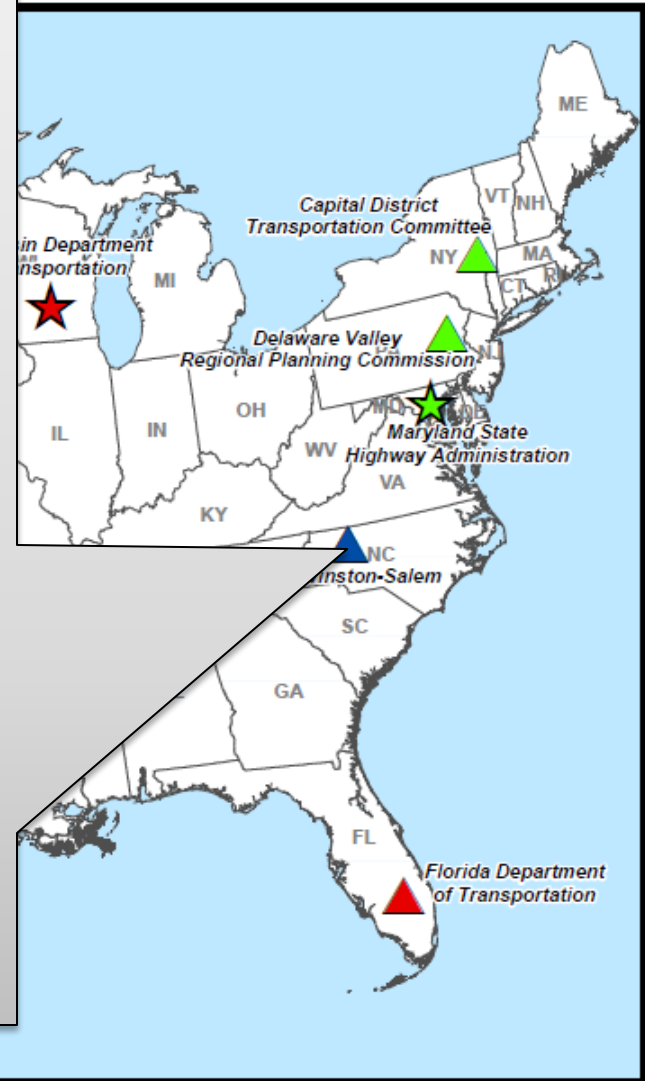proof of concept pilot recommendations (City)

IAP Projects

Recipient: City of Winston-Salem
State: North Carolina
Pilot Type: Local Data

- Collecting freight carrier establishment survey data to support development of an advanced Piedmont Triad regional freight model

- Establishing strong regional partnerships with the private sector, specifically with freight transportation business establishments.
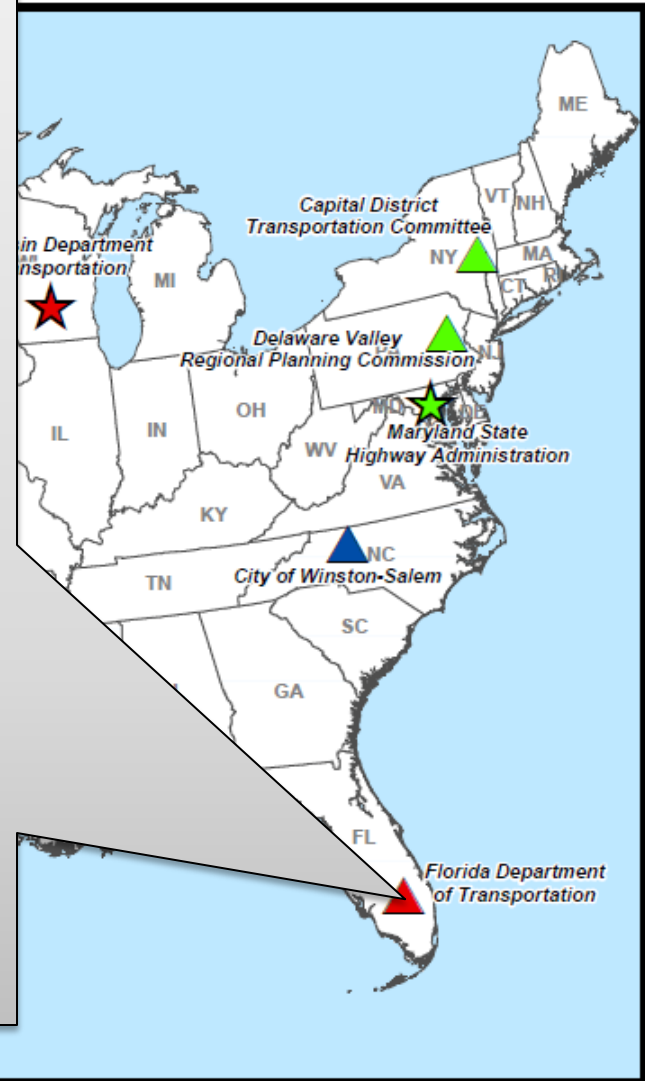
IAP Projects

Recipient: Florida DOT
State: Florida
Pilot Type: Local Data

- Investigating new technology for data collection

- Data will represent the supply and demand chain for petroleum commodities distributed throughout South Florida
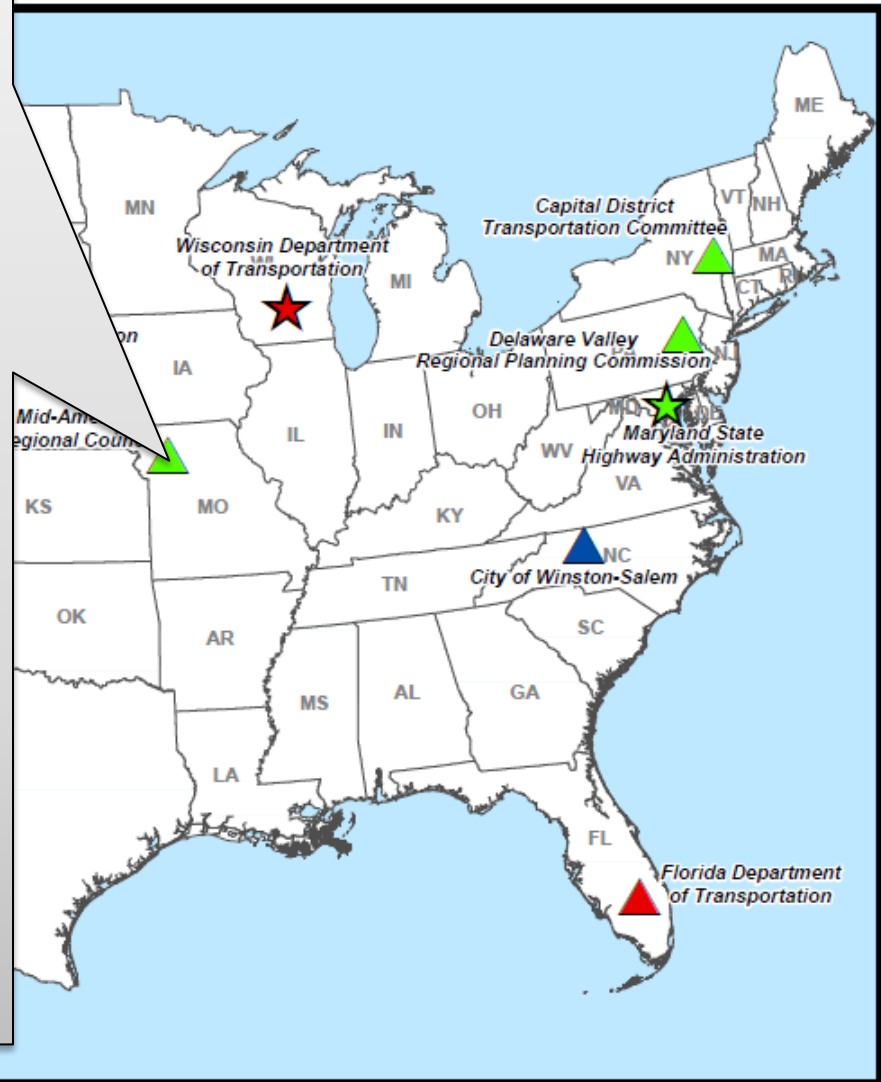
proof of concept pilot recommendations (City)

IAP Projects

MID-AMERICA REGIONAL COUNCIL

Recipient: Mid-America Regional
    Council
State: Missouri
Pilot Type: Local Data

- Using a combination of existing data and new sources of commercial waybill data

- Demonstrates the impacts to the cost of freight movement

proof of concept pilot recommendations (City)

IAP Projects

Recipient: South Dakota DOT
State: South Dakota
Pilot Type: Local Data

- Focuses on an important industry in the region

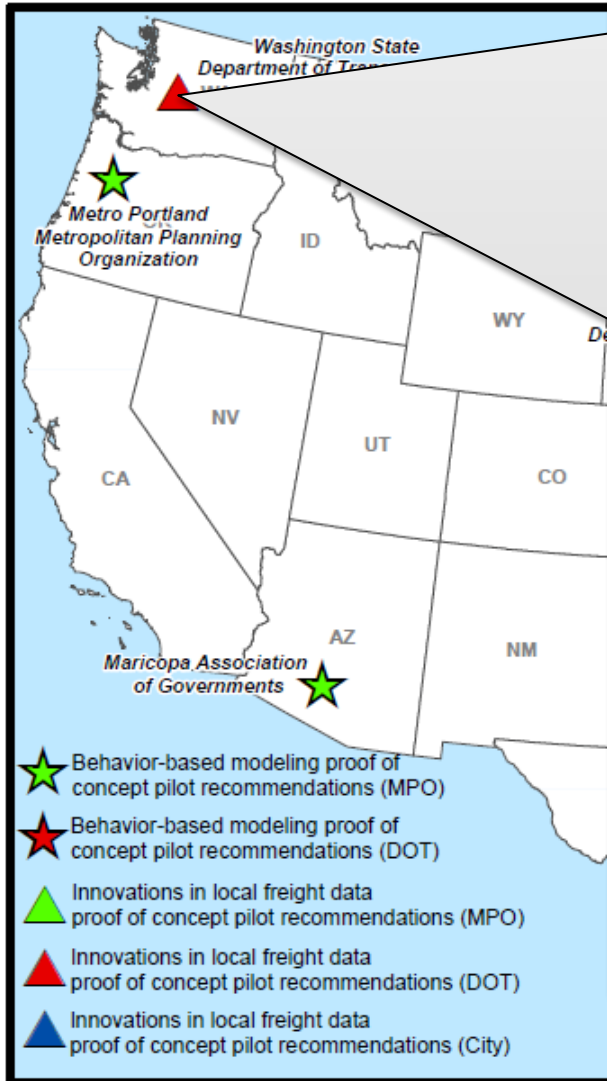- Will improve the understanding of the linkage between agriculture growth, origin and freight movement

Map labels:
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- Maricopa Association of Governments — AZ

Legend:
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- Innovations in local freight data proof of concept pilot recommendations (City)

IAP Projects

Recipient: Washington State DOT
State: Washington
Pilot Type: Local data

- Collecting information from industry and local urban truck volume data for the State's food distribution, and wheat commodity supply chain logistics impacts on state transportation systems.

- Data will assist in modeling behavioral responses to different State policy scenarios

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Washington State Department of Transportation
Metro Portland Metropolitan Planning Organization
Maricopa Association of Governments

Freight Demand Modeling and Data Improvement

National Initiatives:

By 2020, a vision for improved freight modeling and data will be characterized as follows:
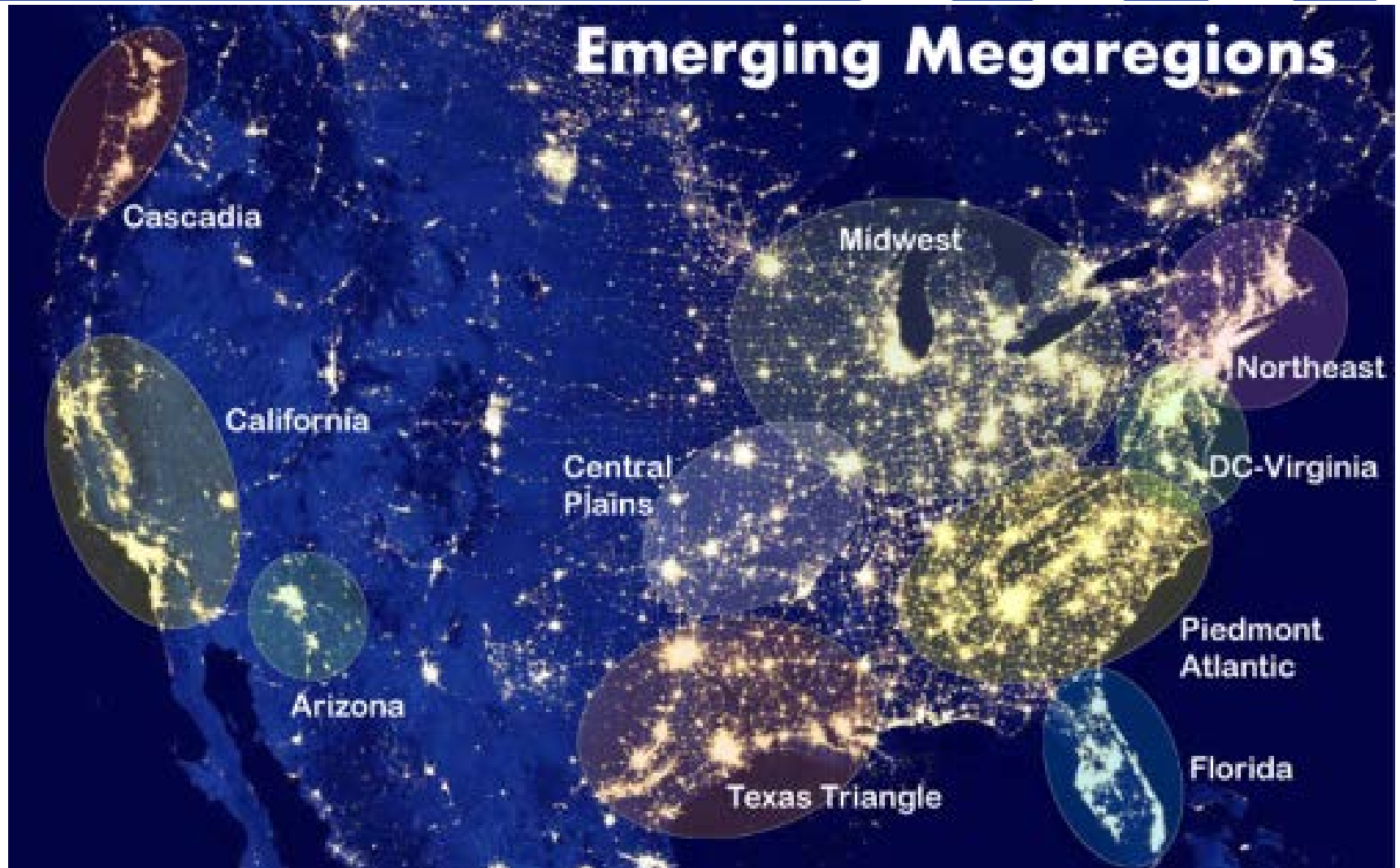
- ❑ Robust freight forecasting tools have been developed and are the standard for public sector freight transportation planning.

- ❑ These tools and data are dynamic in terms of linking with other key variables such as development and land use, and are dynamic in terms of application to local scale, corridors, or regions.

- ❑ The knowledge and skills of DOT and MPO staff have been methodically enhanced to complement the development of better tools and data.

C20 National Initiatives

- Freight Modeling and Data Expert Task Group

- Freight Data and Modeling/Tool Innovation Regional Workshops

- Promote Advanced Research activities

- FMIP Portal – 'Freight Information Place'

- Collaboration, Knowledge Sharing and Outreach
  - Practitioner Handbook
  - Project Case Studies
  - Briefings
  - Peer Exchanges
  - Cross-agency trainings
  - Conferences and presentations
  - Executive training
  - Champion outreach

- Additional Strategic Plan Objectives Development

Regional Workshop Locations: Freight connected places - Megaregion!

Emerging Megaregions

Cascadia · California · Arizona · Central Plains · Midwest · Northeast · DC-Virginia · Piedmont Atlantic · Florida · Texas Triangle

Source: Office of Planning, Environment & Realty (HEP), FHWA - http://www.fhwa.dot.gov/planning/megaregions/

FMIP Portal – Freight Information Place

C20 Implementation Plan

Interaction and Collaboration

National Initiatives

- Expert Working Group
- Freight Data and Modeling/Tool Innovation Regional Workshops
- Freight Analytics Community

IAP Projects

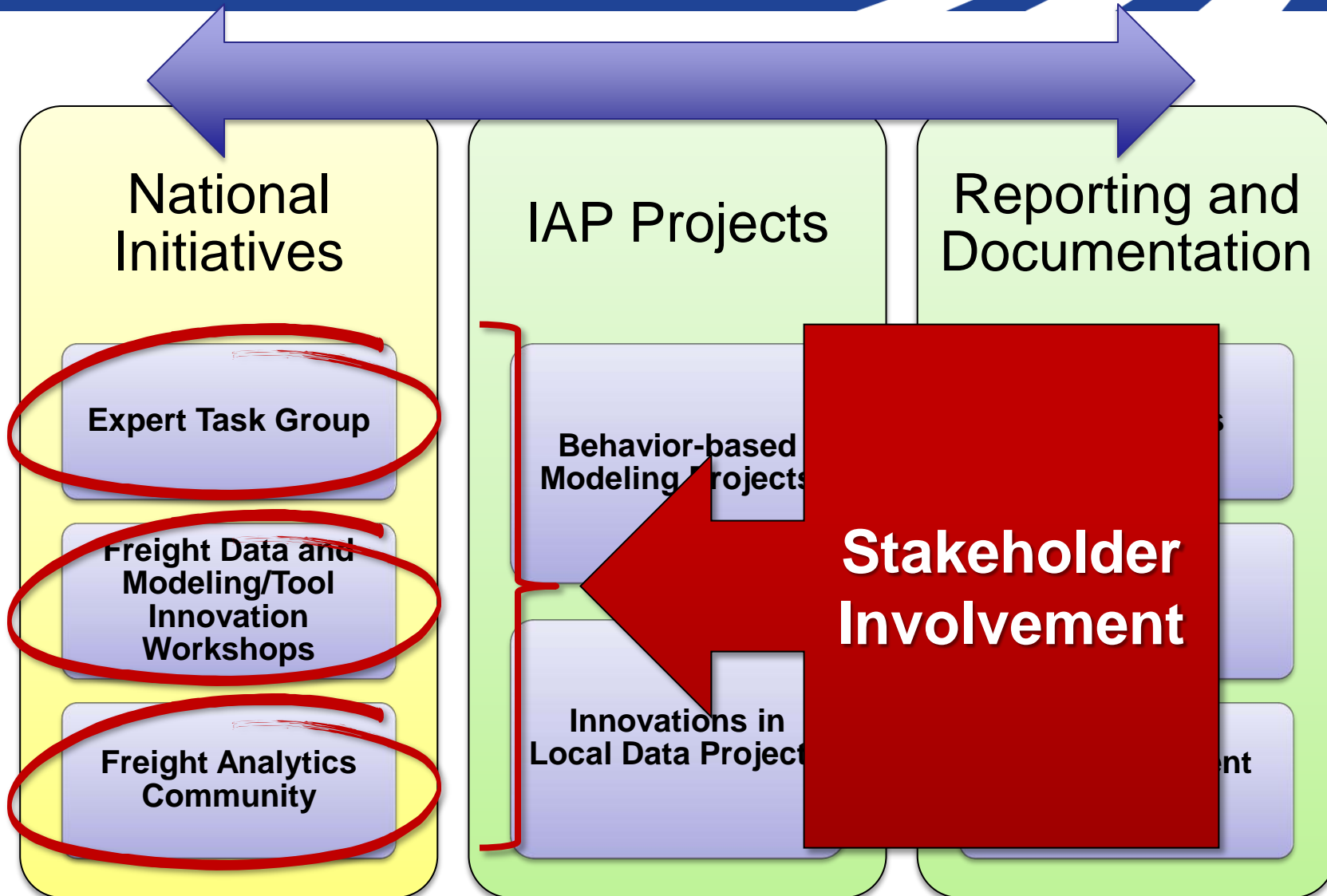- Behavior-based Modeling Projects
- Innovations in Local Data Projects

Reporting and Documentation

- Case studies
- Evaluation
- Self-assessment Tool

C20 Implementation Plan

National Initiatives

- Expert Task Group
- Freight Data and Modeling/Tool Innovation Workshops
- Freight Analytics Community

IAP Projects

- Behavior-based Modeling Projects
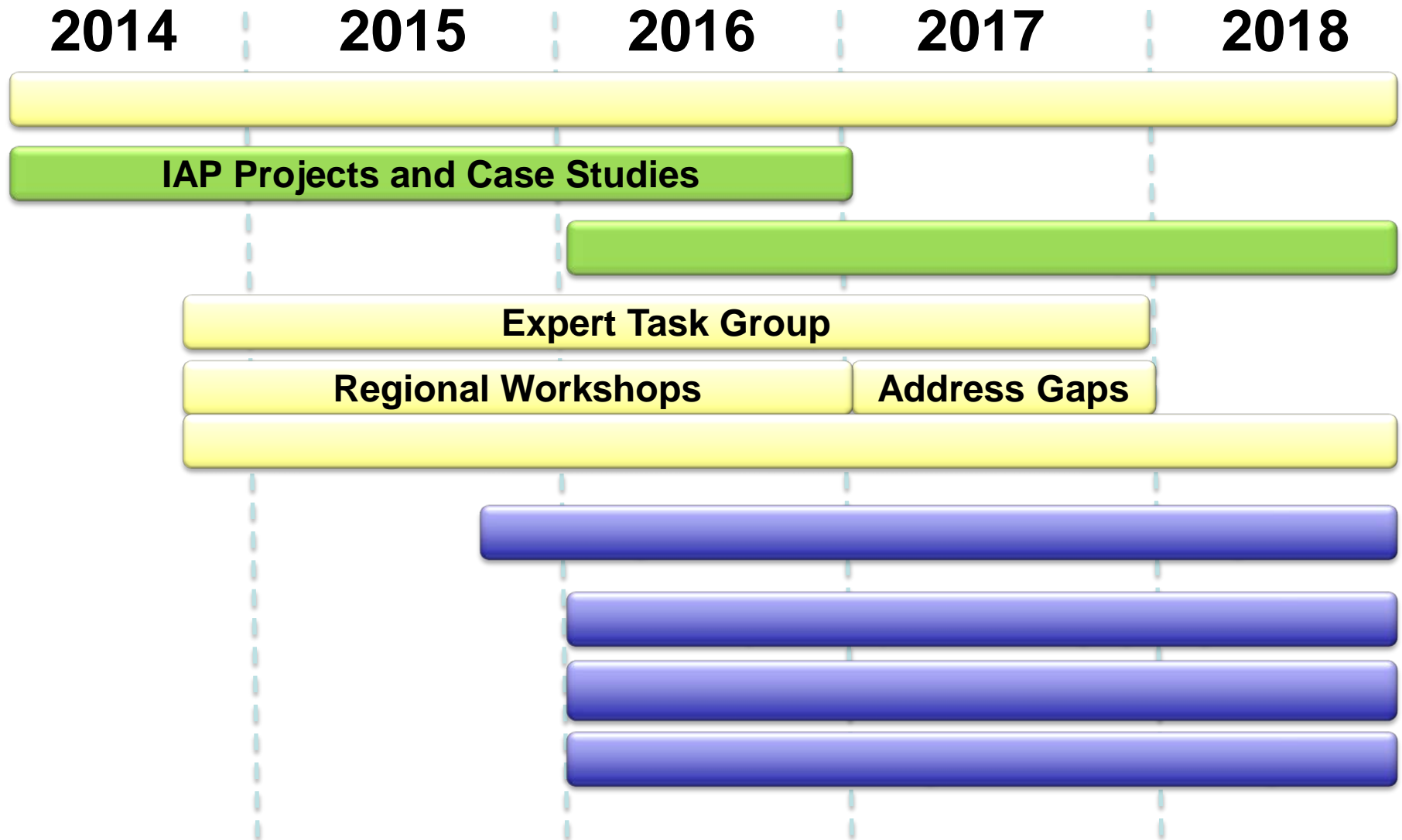- Innovations in Local Data Projects

Reporting and Documentation

Stakeholder Involvement

C20 Implementation Roadmap

| 2014 | 2015 | 2016 | 2017 | 2018 |

IAP Projects and Case Studies

Expert Task Group

Regional Workshops | Address Gaps

C20: Points of Contact

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Questions?