



U.S. Department of Transportation
Bureau of Transportation Statistics

Building a Shared Map of the Nation's Infrastructure to Enable Smart Investments

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USDOT Bureau of Transportation Statistics

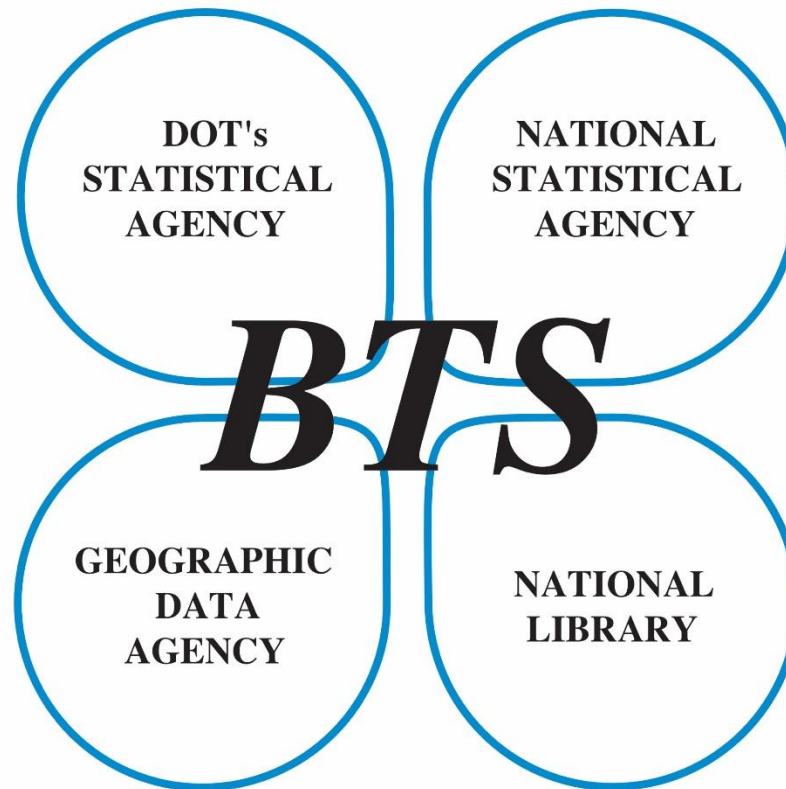
Director, Office of Spatial Analysis and Visualization

Overview

- The BTS Interest
- Opportunities and Challenges
 - Current
 - Emerging
- Solution Sets



BTS in 4 worlds



Geospatial at the Bureau of Transportation Statistics



Data



Applications



Maps

by Category



Performance



Safety



Freight



Energy and
Environment



Transportation
Infrastructure



Passenger
Movement



Boundaries
and
Landmarks



Characteristics

by Mode



Rail



Aviation



Roads



Transit



Marine



Current Opportunities and Challenges



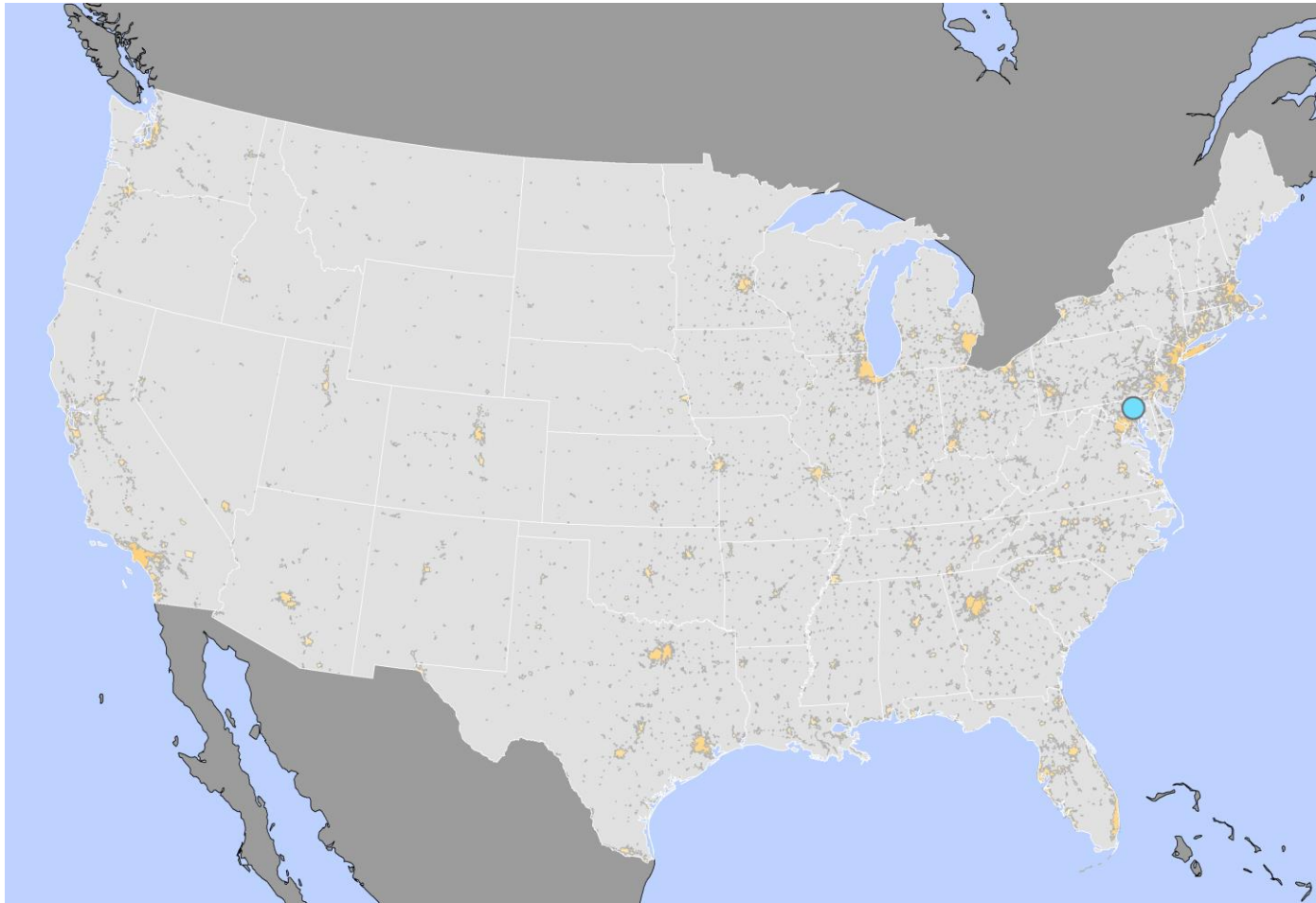
U.S. Department of Transportation

Freight

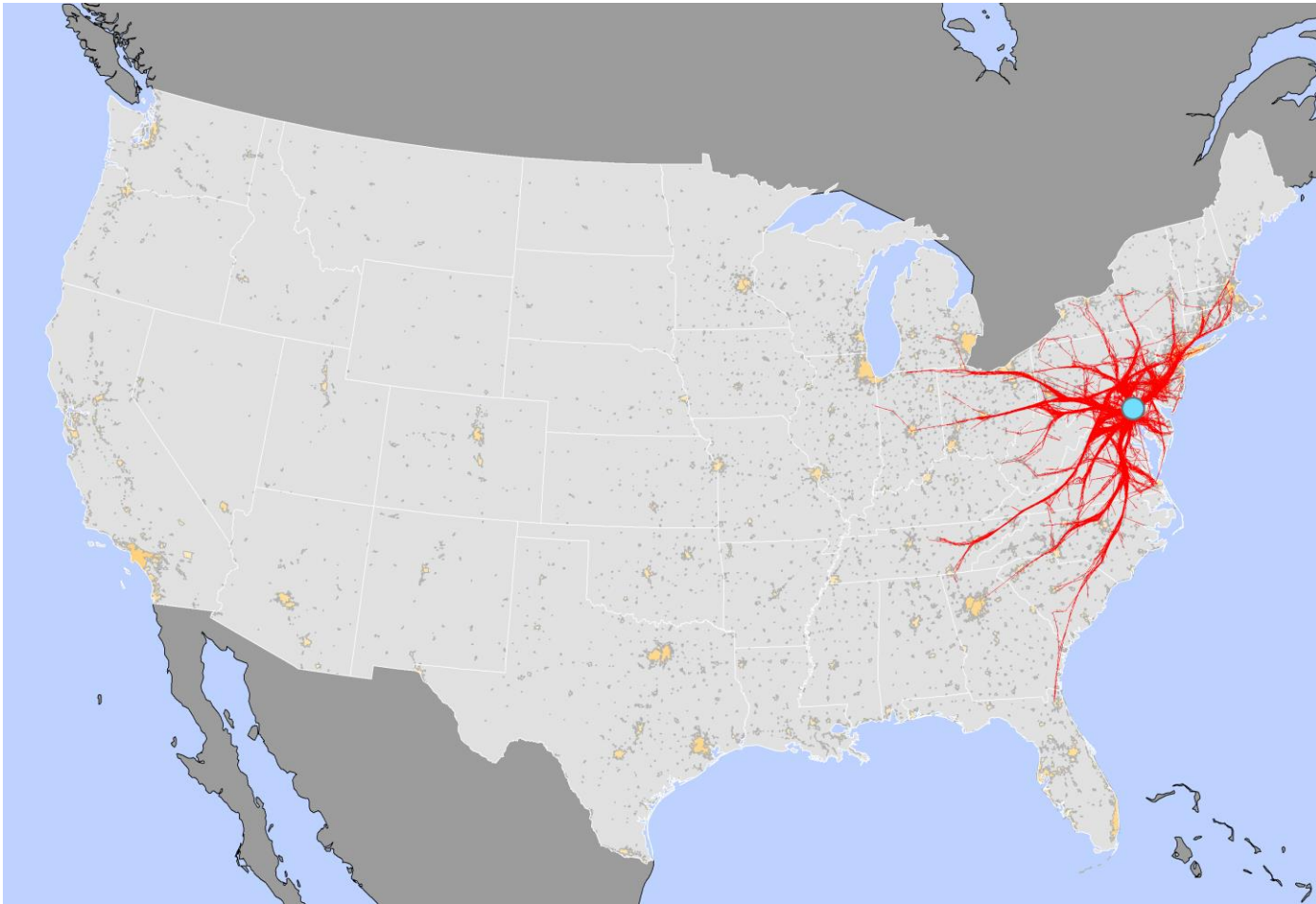


Freight Truck Movement

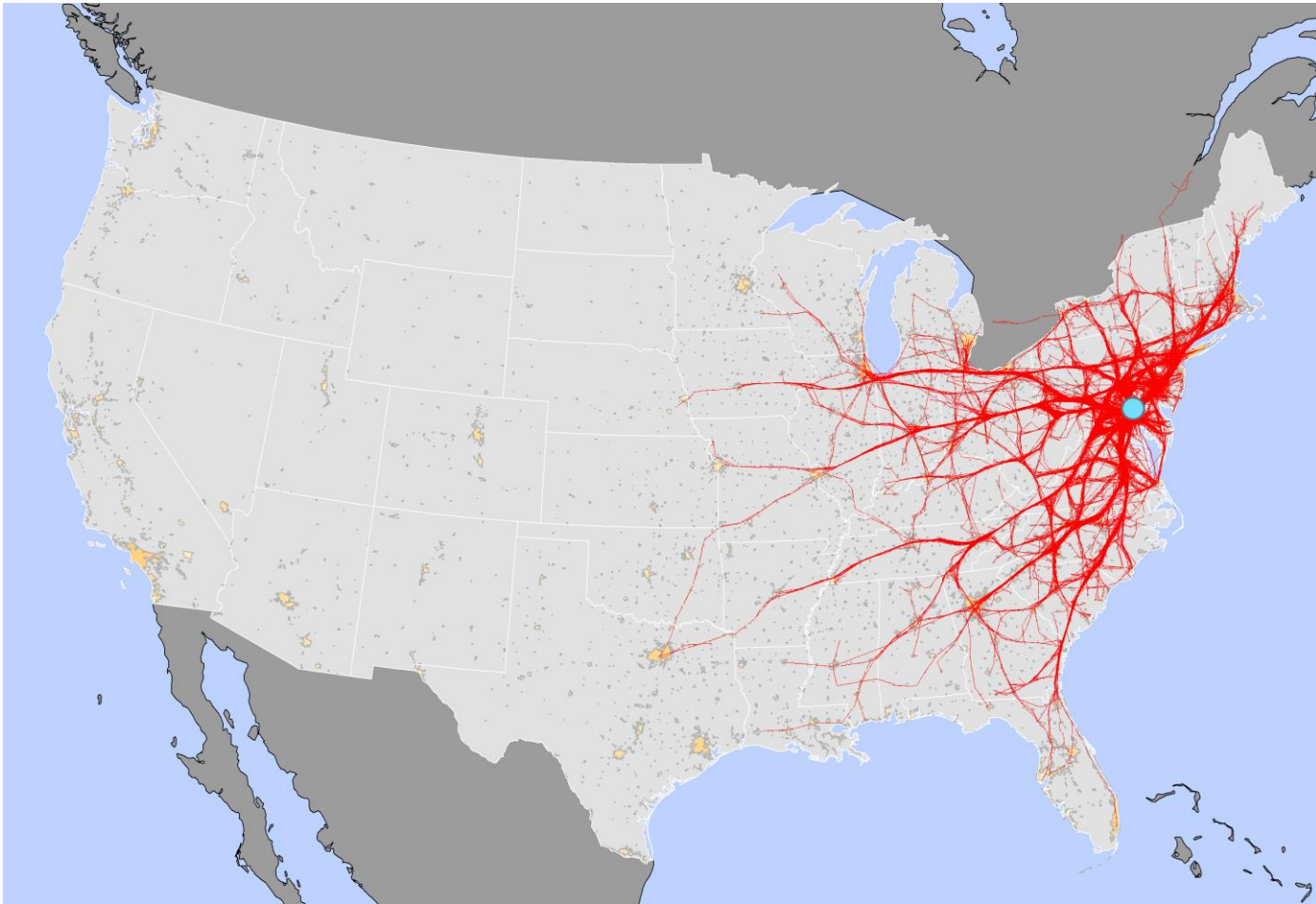
Port of Baltimore – a 5 Day View



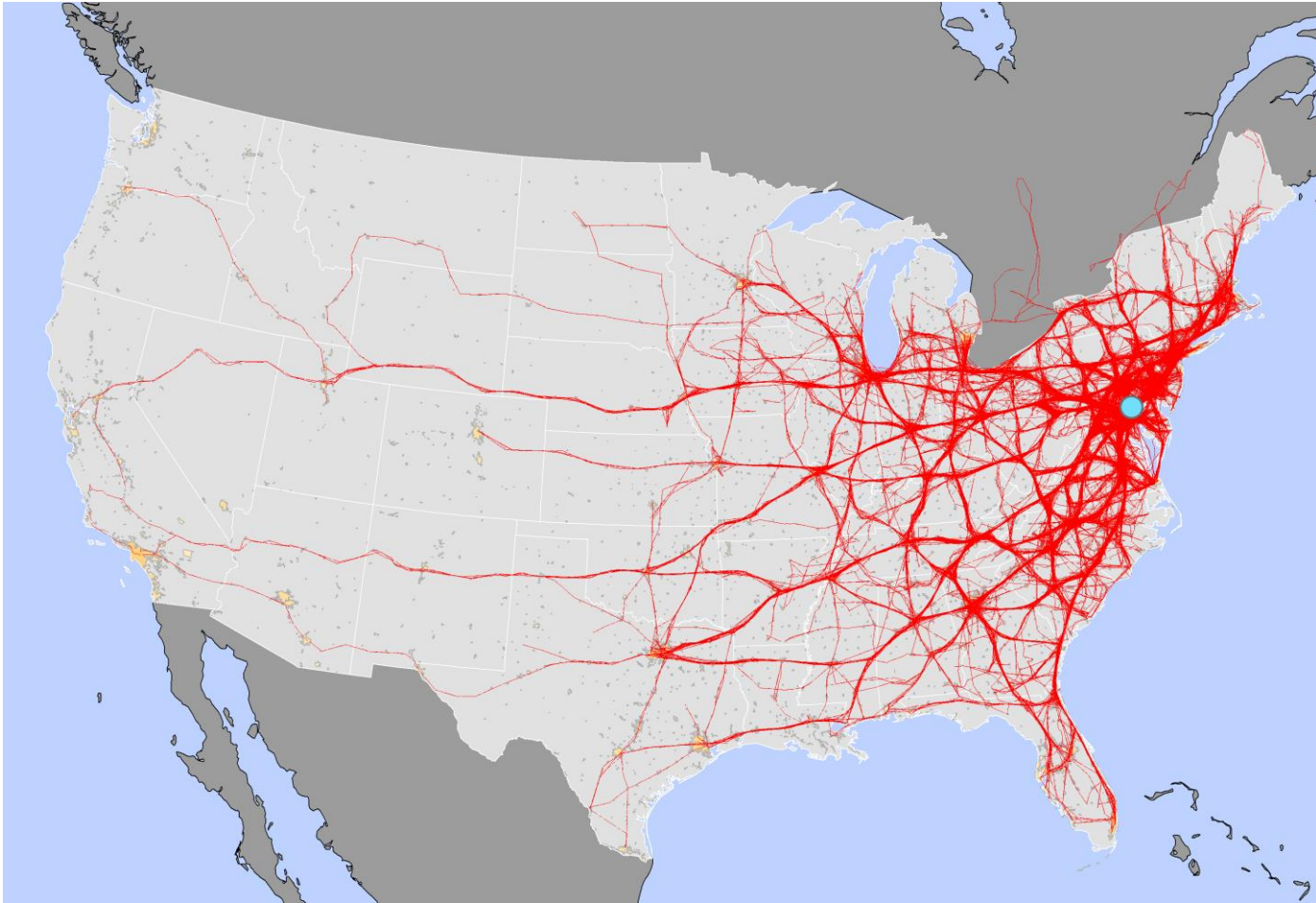
Day 1



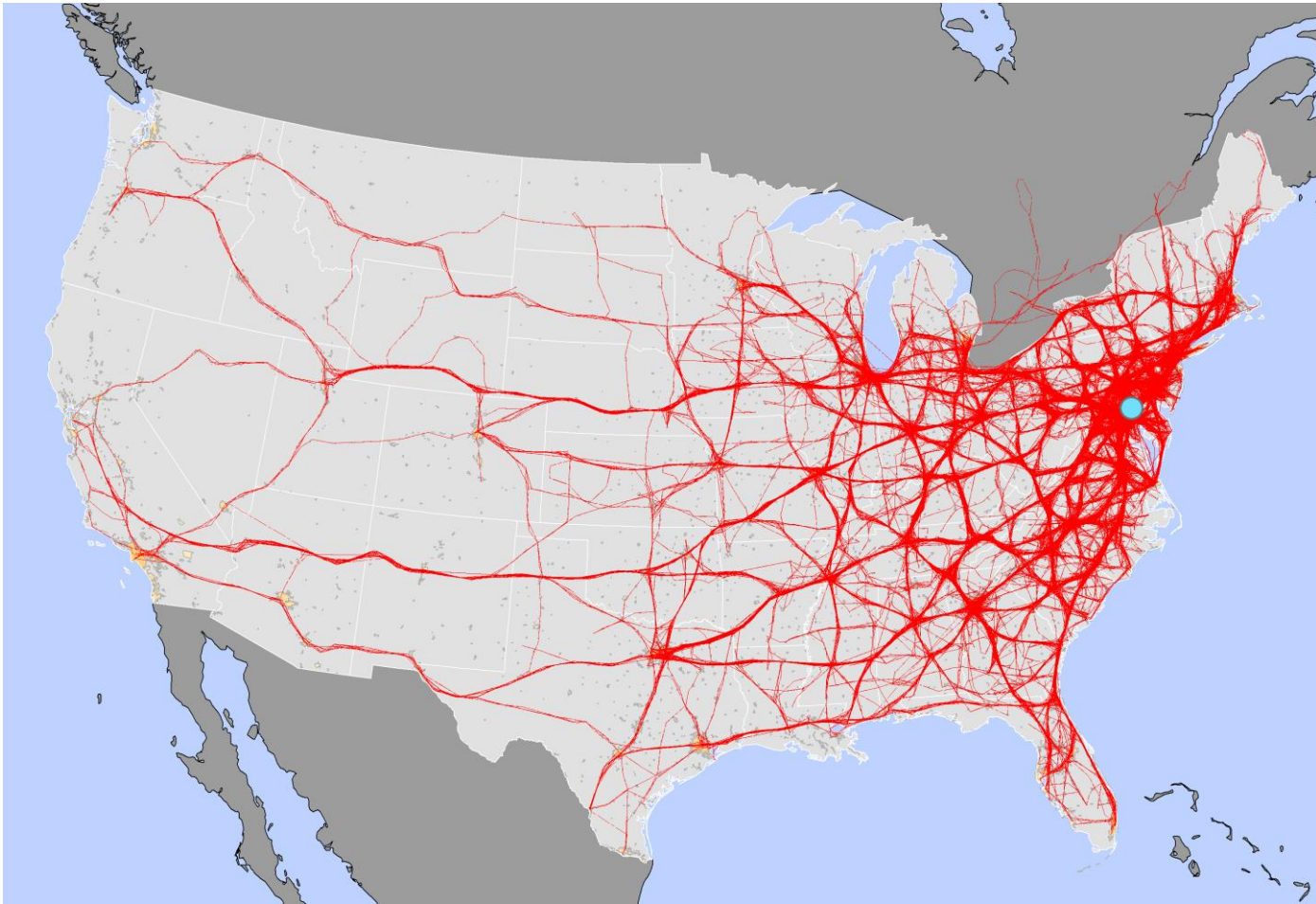
Day 2



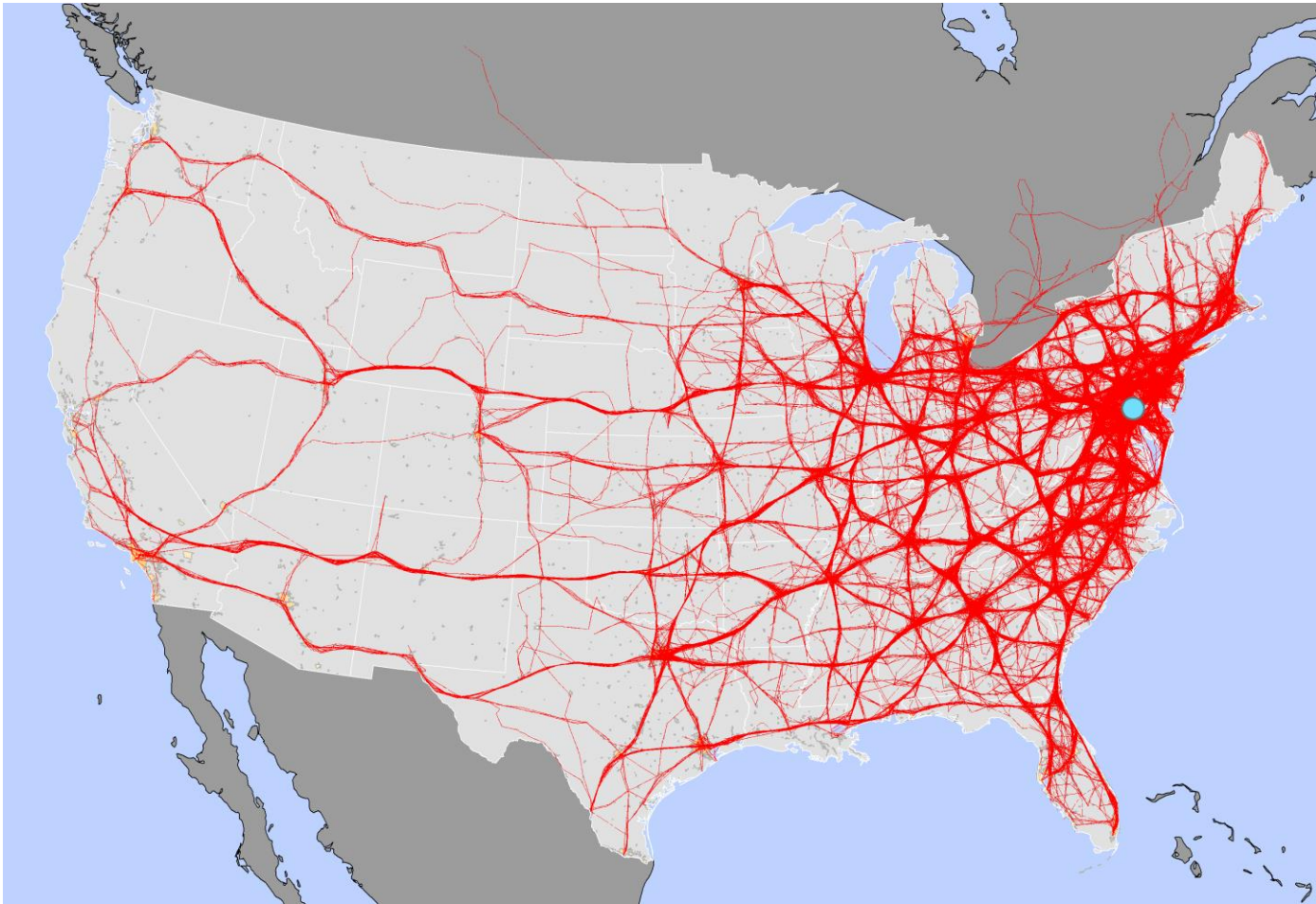
Day 3



Day 4



Day 5



National Multimodal Freight Network

FAST Act —The Under Secretary of Transportation for Policy shall establish a National Multimodal Freight Network

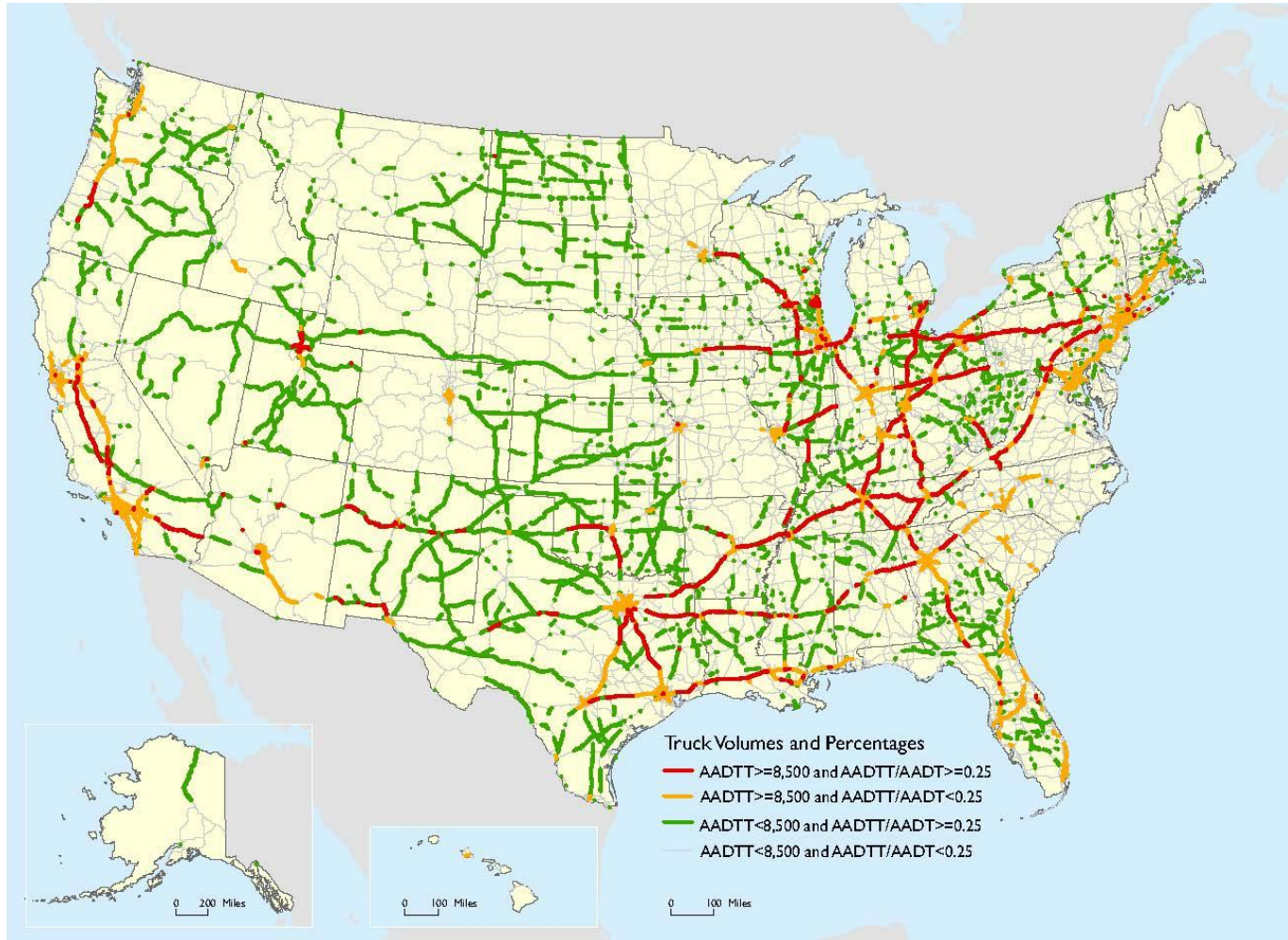
- to assist States in strategically directing resources toward improved system performance for the efficient movement of freight on the Network;
- to inform freight transportation planning;
- to assist in the prioritization of Federal investment; and
- to assess and support Federal investments to achieve the national multimodal freight policy goals.

Factors required for the Final Network:

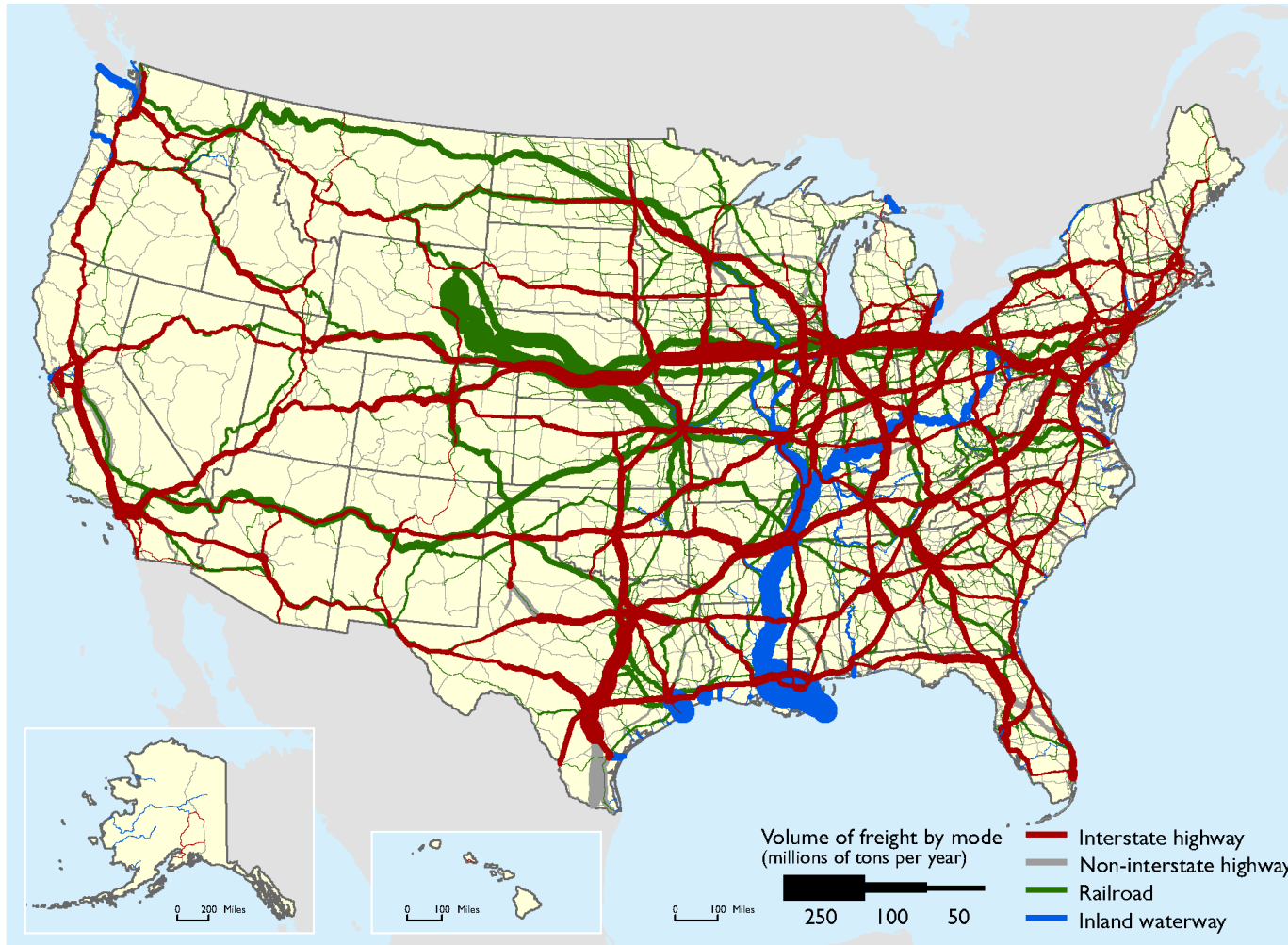
- (A) origins and destinations of freight movement within, to, and from the United States;
- (B) volume, value, tonnage, and the strategic importance of freight;
- (C) access to border crossings, airports, seaports, and pipelines;
- (D) economic factors, including balance of trade;
- (E) access to major areas for manufacturing, agriculture, or natural resources;
- (F) access to energy exploration, development, installation, and production areas;
- (G) intermodal links and intersections that promote connectivity;
- (H) freight choke points and other impediments contributing to significant measurable congestion, delay in freight movement, or inefficient modal connections;
- (I) impacts on all freight transportation modes and modes that share significant freight infrastructure;
- (J) facilities and transportation corridors identified by a multi-State coalition, a State, a State freight advisory committee, or a metropolitan planning organization, using national or local data, as having critical freight importance to the region;
- (K) major distribution centers, inland intermodal facilities, and first- and last-mile facilities; and
- (L) the significance of goods movement, including consideration of global and domestic supply chains.



Major Truck Routes on the National Highway System



Freight Flows by Highway, Railroad and Waterway



Sources:

Highway

- Freight Analysis Framework
 - CFS
 - HPMS
 - EIA
 - USDA
 - Census
 - BTS

Rail

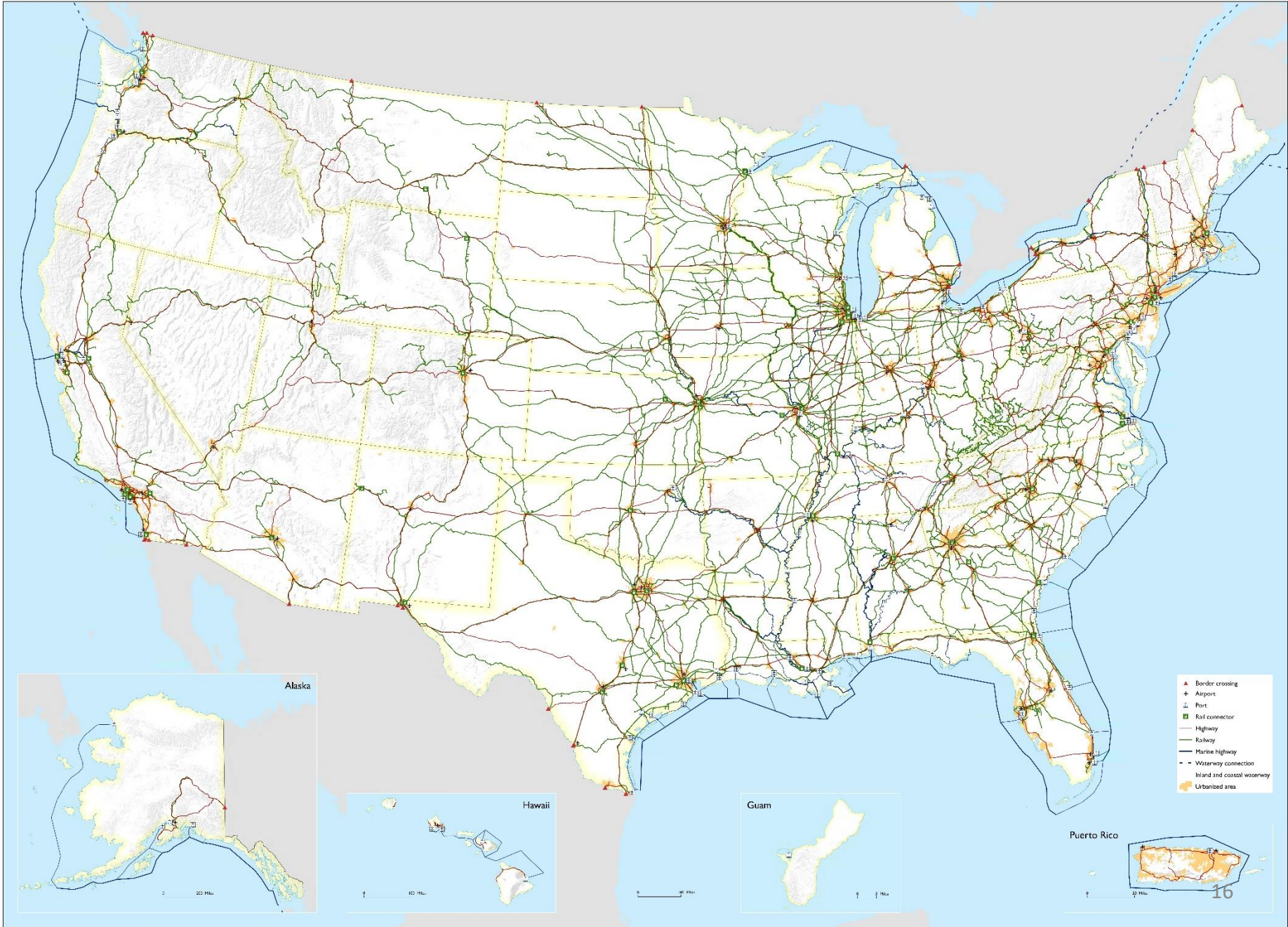
- STB Waybill

Water

- USACE Annual Vessel Operating Activity
- USACE Lock Performance Monitoring System



INTERIM MULTIMODAL FREIGHT NETWORK



Port Performance Statistics Program

- Provide nationally consistent measures of performance for the Nation's largest ports
- Report on port capacity and throughput

PORT OF BALTIMORE

CAPACITY

Container terminals

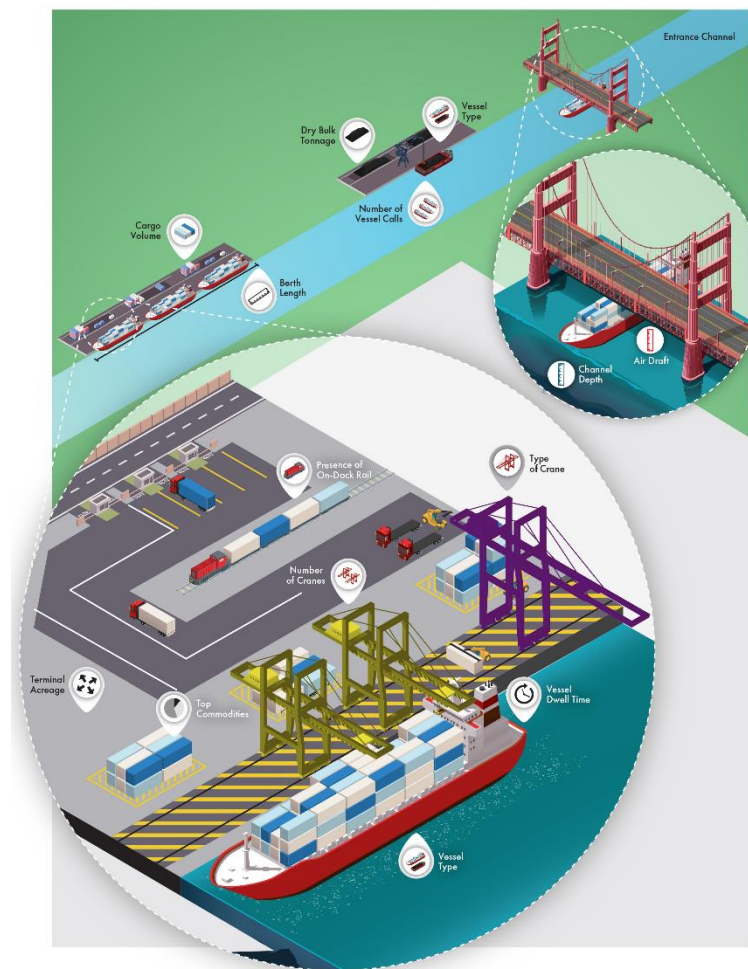
Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Dundalk Marine Terminal	10	2,874	182	Chesapeake Bay	42	4	-	-	N
Seagirt Marine Terminal	284	4,352	182	Chesapeake Bay	42	-	7	4	N

Non-container terminals

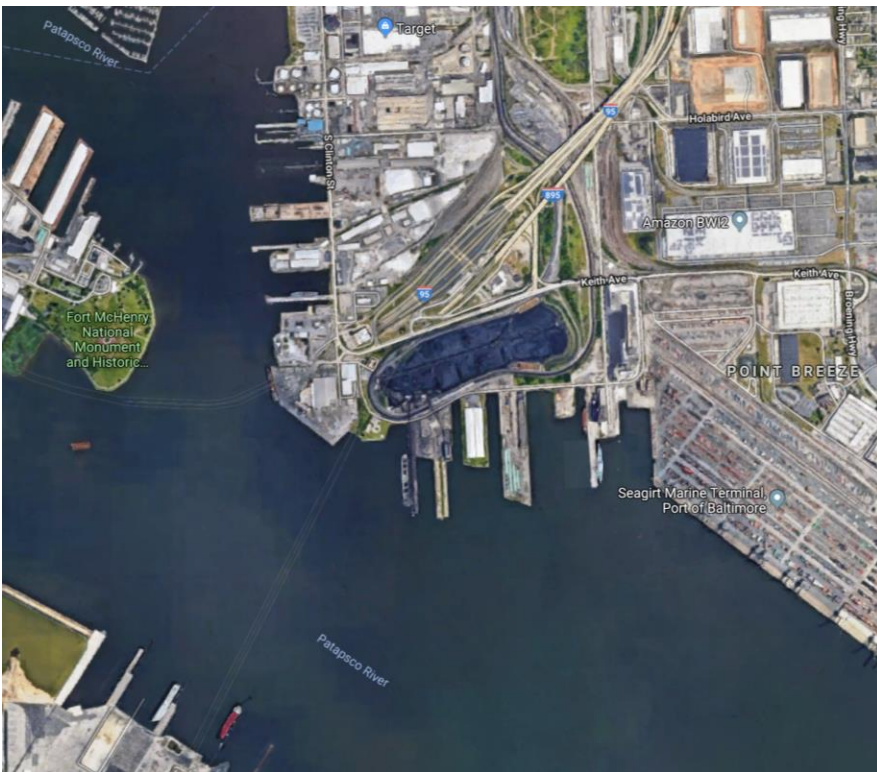
In addition to the container terminals listed above, the Port of Baltimore complex includes the following terminals: Fairfield/Masonville Automobile Terminals, North Locust Point Marine Terminal, South Locust Point Marine Terminal, and a portion of Dundalk Terminal that handles non-container cargoes.

Channel depth

Authorized channel depth (ft)	50.0	Maximum depth of approach channel (ft)	50.0
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Defining Port and Terminal Boundaries



Emerging Opportunities and Challenges



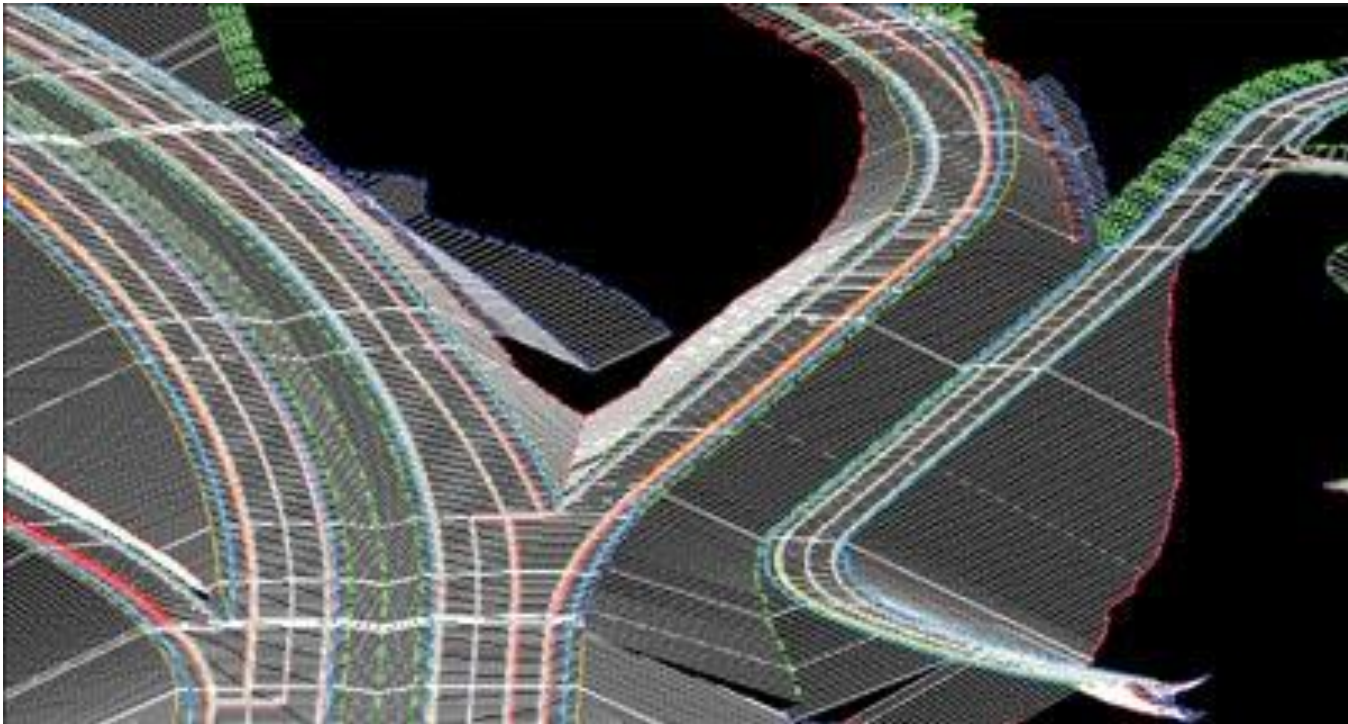
Autonomous Vehicles



IoT and Smart Cities



CIM and BIM



Source: HNTB.

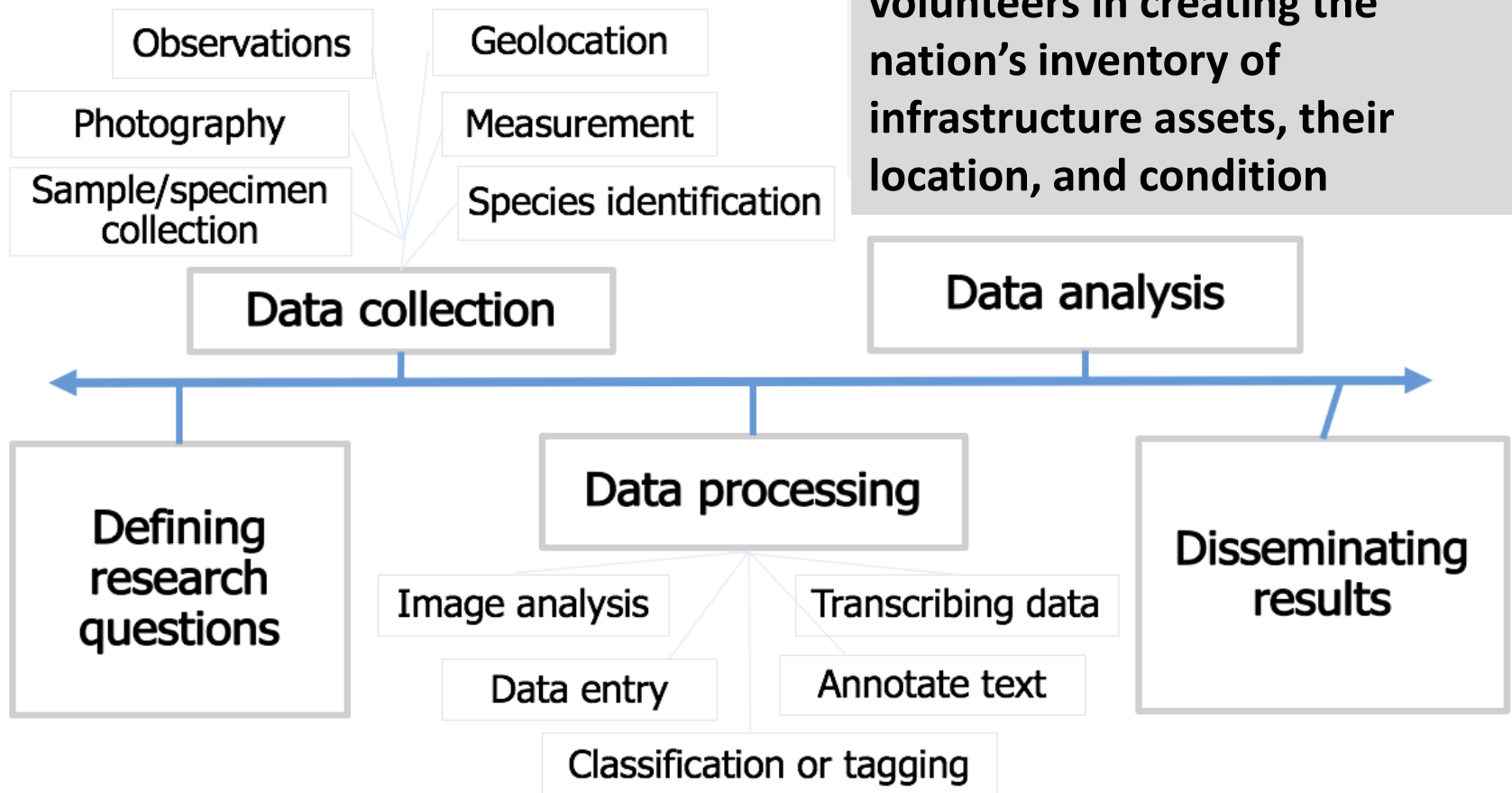


Solution Sets



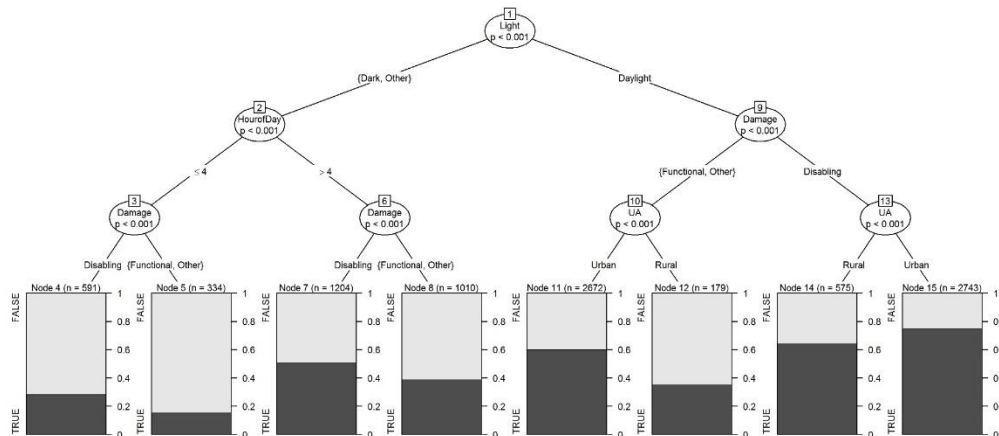
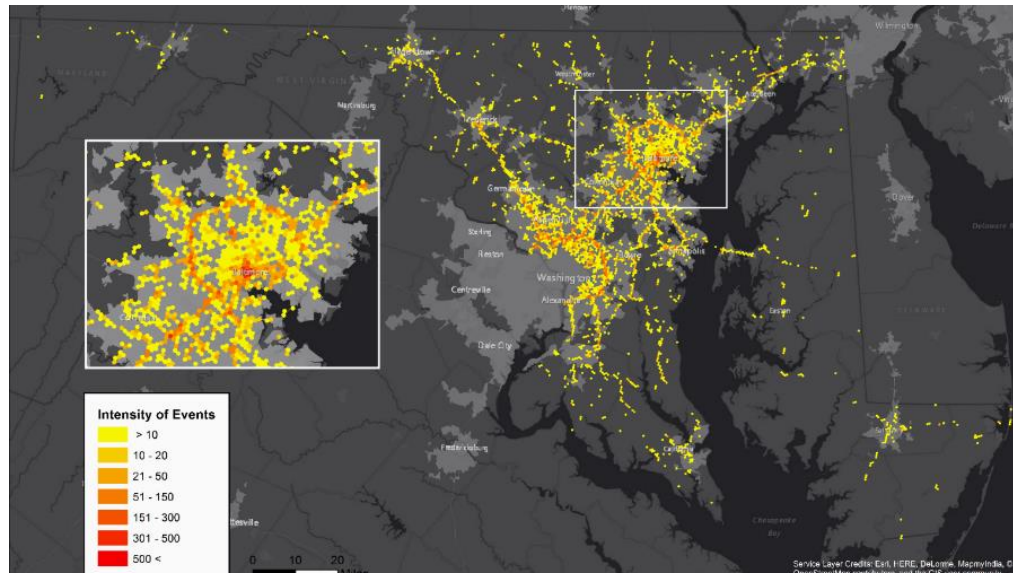
Crowdsourcing

There are many ways to involve volunteers in creating the nation's inventory of infrastructure assets, their location, and condition



Machine Learning

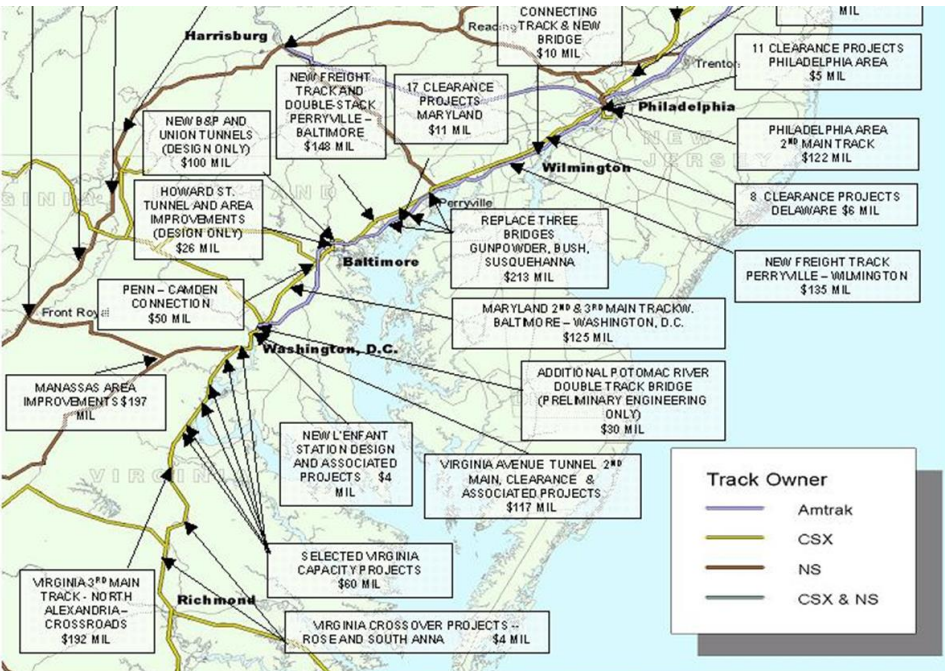
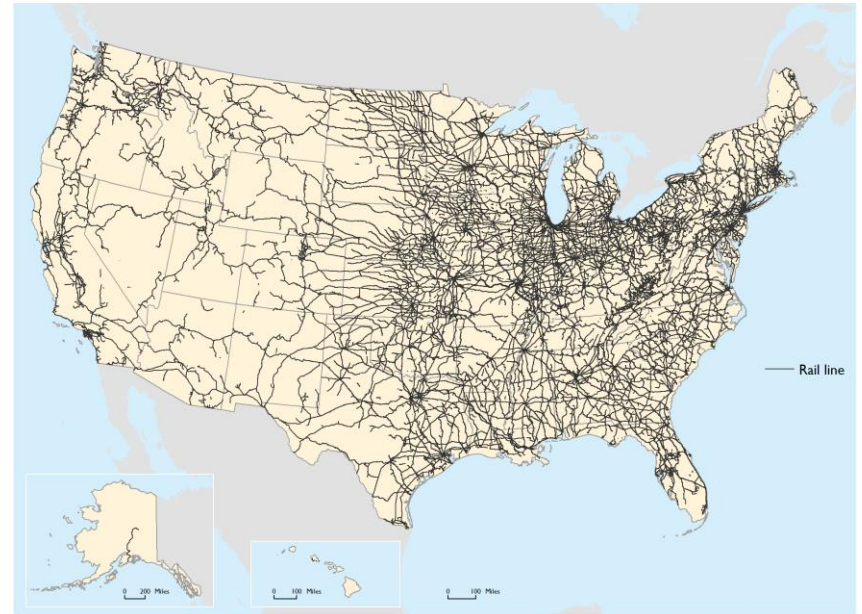
- Use of Data Sources
 - Remote Sensing
 - Sensors
- Adaption of Techniques
 - Intelligence Community
 - Medicine and Health



Partnerships

North American Rail Network (NARN)

- Brings together the previous FRA network, data from the FRA Automated Track Inspection Program, and other government data sources into a single rail network.
- Adopted by the Association of American Railroads as the industry standard
- Division of labor for maintaining database



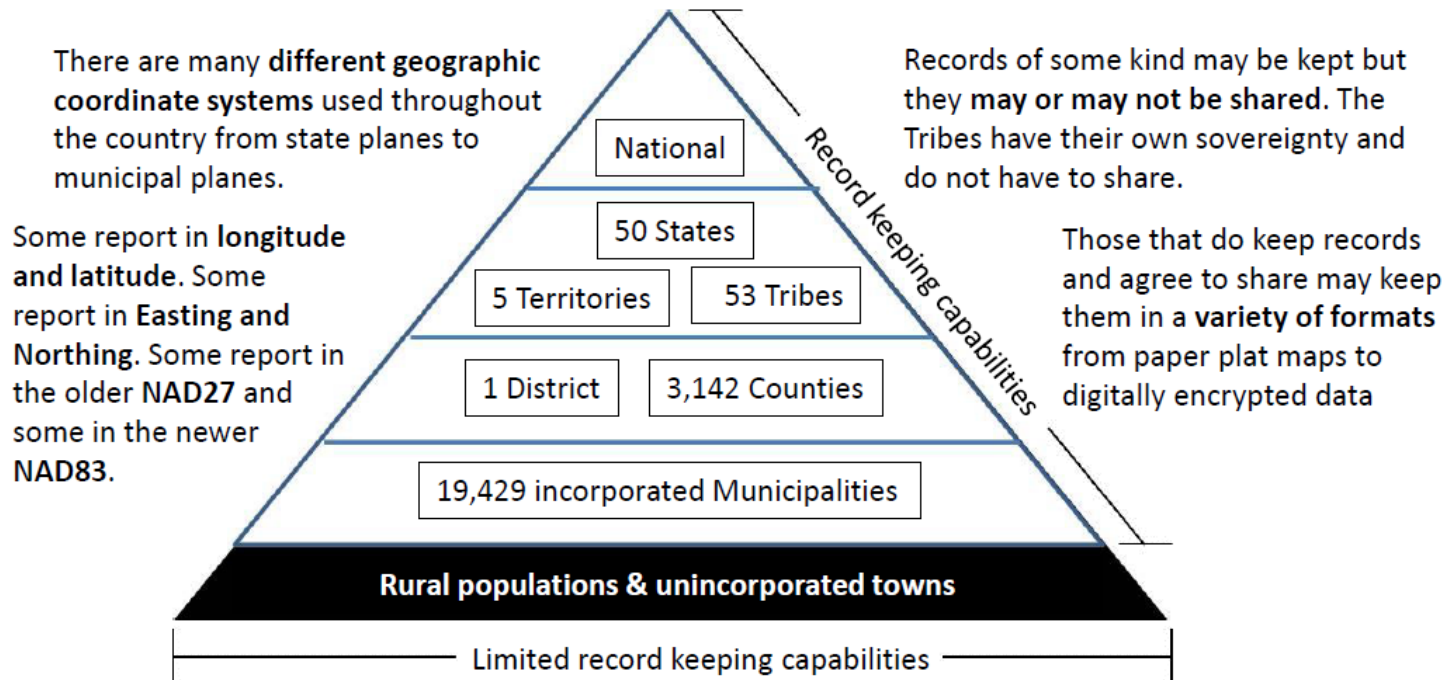
I-95 Mid-Atlantic Rail Operations Study

- 5 states, 3 railroads and I-95 Coalition
- Examined the performance of region's transportation system
- Formulated a consensus program of rail investments, and
- Recommended a public private/partnership to implement the program

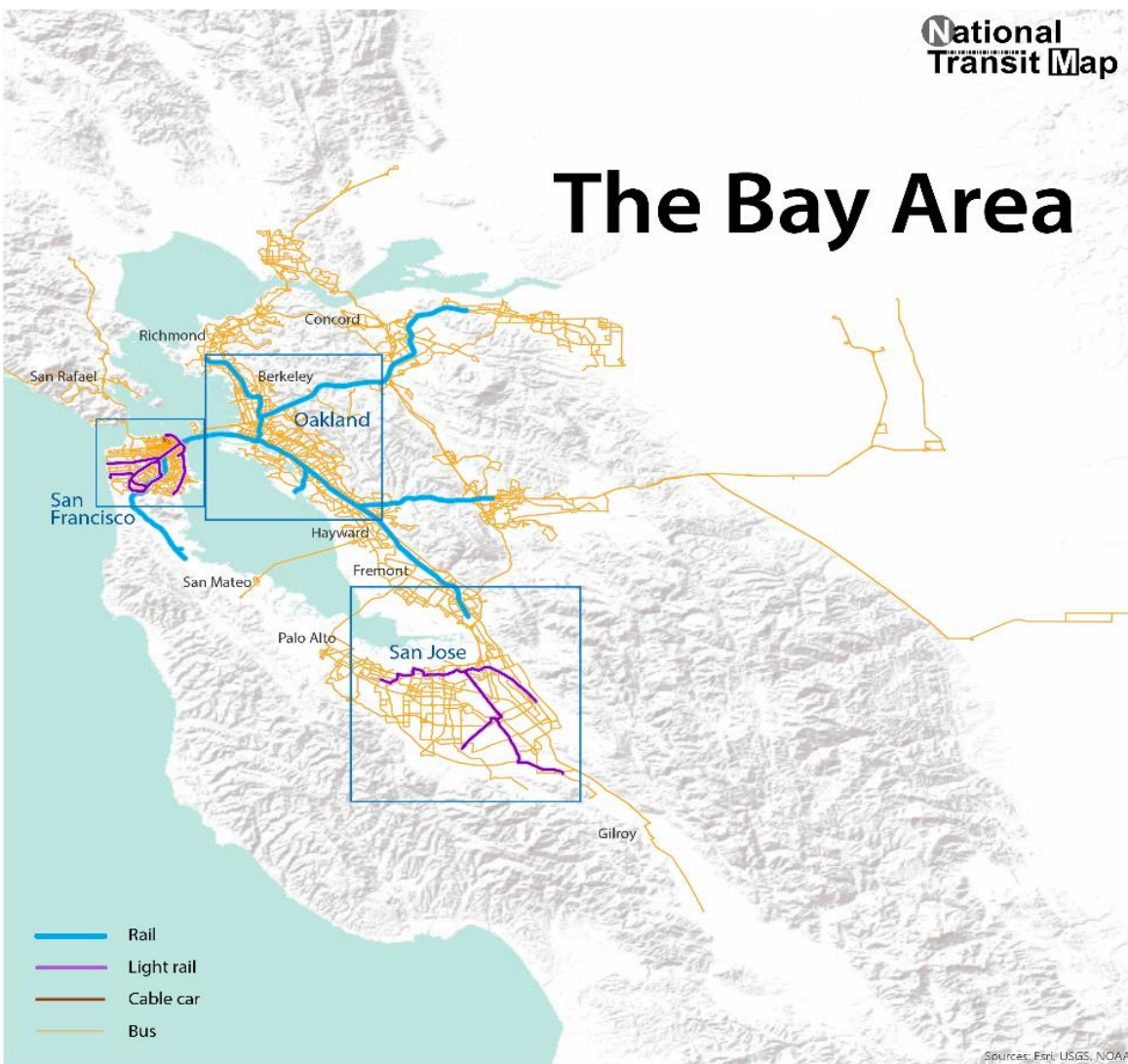
Partnerships

National Address Database - A uniform, authoritative, open source dataset comprised of all commercial and residential addresses available in the public domain.

- USDOT and Census Bureau lead coordination of public and private partners
- A universal location and address schema
- Data available and open in the public domain
- Each authoritative address location has a unique ID



Standards



National Transit Map

- Compiled from General Transit Feed Specification (GTFS) files
- Quickly and inexpensively pull together a large amount of detailed transit data from agencies across the country and create a national map that can be updated frequently
- Currently describes the operations of close to 300 transit agencies including nearly 500,000 stops and over 60,000 routes



Bureau of Transportation Statistics



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