

The Nation's Highway and Intermodal Freight Transportation System

Committee for a Study of the Future Interstate
Highway System

Presented by

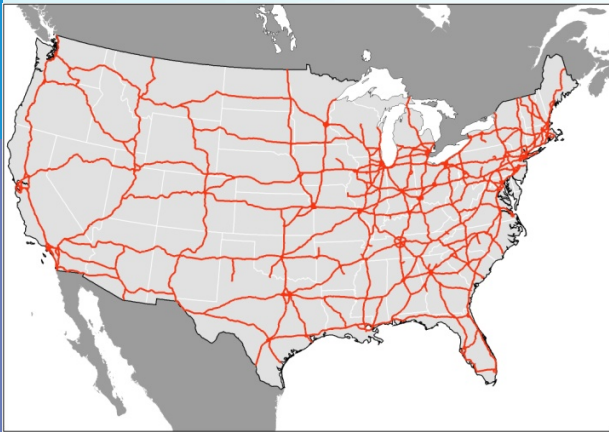
Gary E. Maring

Presentation Outline

- Interstate evolution as backbone of Highway and Intermodal Freight System
- Emerging freight system challenges
- Recent policy responses and look ahead

Nation's Highway Networks

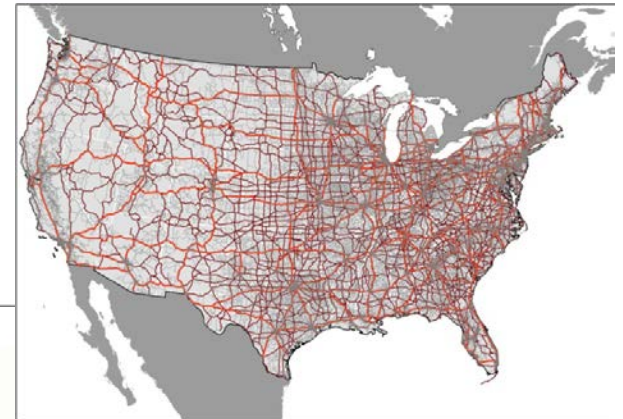
**Interstate
Highway System
48,053 Route Miles**



**National
Highway System
222,743 Route Miles,
including Interstate**



**Other State/
Local Systems
3,948,674 Route Miles**

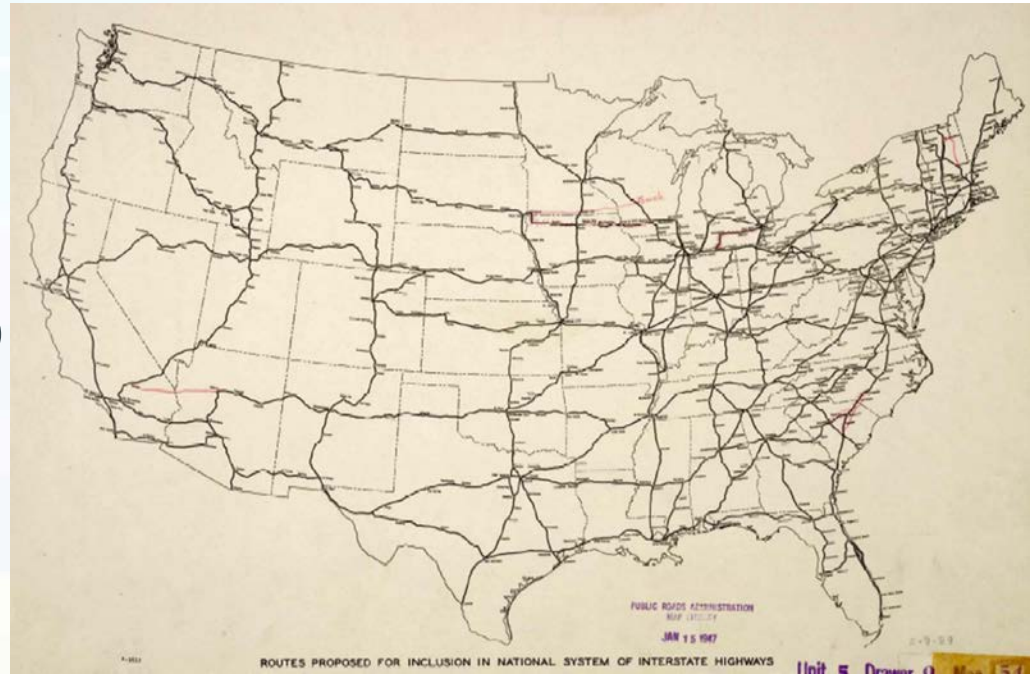


Interstate just over 1% of miles but carries 25% of all travel and over 50% of combination truck travel

Source: Highway Statistics 2015

1940s Interstate Concept

- Interstate as we know it today laid out in 1940s-50s with only modest additions to the 41,000 mile system enacted in 1956
- FHWA may, upon request, designate sections of the National Highway System (NHS) as Interstate Highways if:
 - » Built to Interstate standards
 - » Is a logical addition to the System
- Some 7,000 miles have been added since 1956; Congress has identified some future corridors that would be eligible when upgraded to Interstate standards



**Federal-State mapping of
Interstate system routes
1947**

Historic Interstate Truck Travel Growth

- Growth of interstate truck traffic totally unanticipated by planners in the 1940s and 1950s.
 - » Truck delivery was a local phenomenon at time of Interstate planning with 70 % intrastate travel, much of it agricultural.
 - » Evolution of an interconnected national Interstate highway network and the deregulation of the trucking industry in the 1980s spurred a dramatic increase in truck travel.
- BPR 1961 Cost Allocation report to Congress estimated truck ton miles to climb 131% by 1980. Actual was more than quadrupling.
- With 1980 Trucking Deregulation and increased trade, truck ton miles nearly doubled again by 2000.



Interstate investment key to our nation's productivity growth

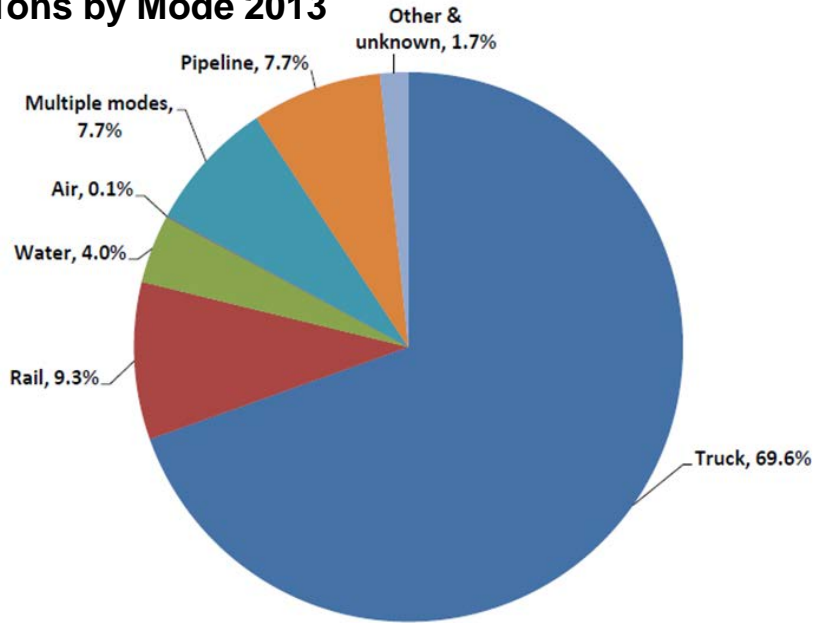
- Nadiri and Mamuneas –studied economic impact of investment in our interstate (non-local) highway system from 1950s through 1980s. They estimated:
 - » **Industry production costs** fell sharply for 32 of 35 major industries studied thanks to easier and cheaper transport
 - Costs fell by **24 cents for each \$1 invested in highways**
 - » During the 1960s, interstate highway spending was responsible for **25% of the annual increase of our nation's productivity growth**; falling gradually to less than 10% in the 1980s as the system neared completion.
 - » Another measure, **net social rate of return** (i.e. benefits to private industries from shared use of interstate highways) was estimated at **35% in the 1960s** and fell gradually over time to about 15% in the 1980s but was still significantly higher than rates of return on private capital.

Source: FHWA

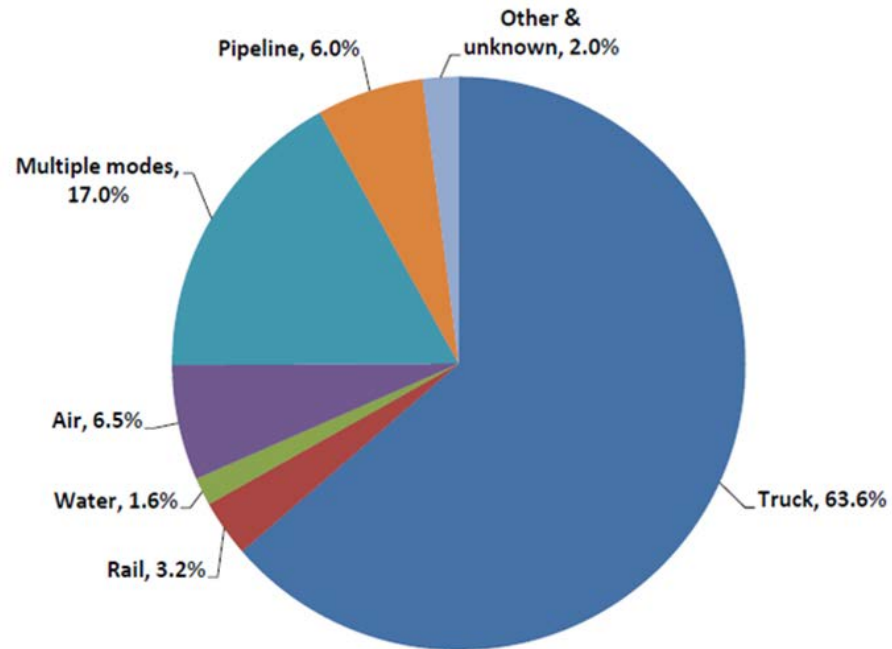
Trucking carries the load

(USDOT/BTS)

Tons by Mode 2013



Value by Mode 2013



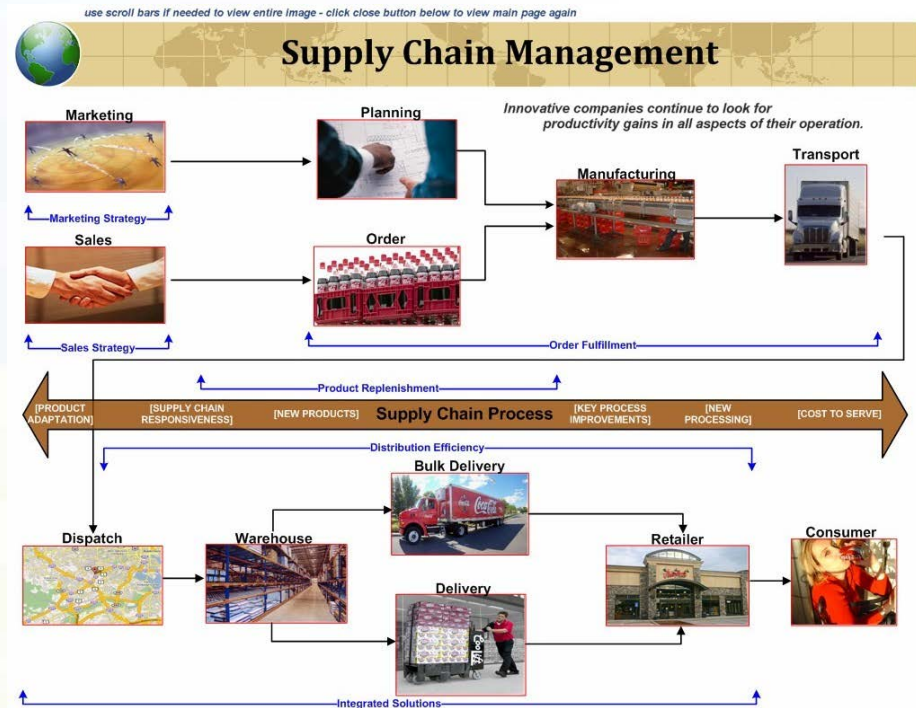
Global Trade Has Increased 10 Fold Since 1980



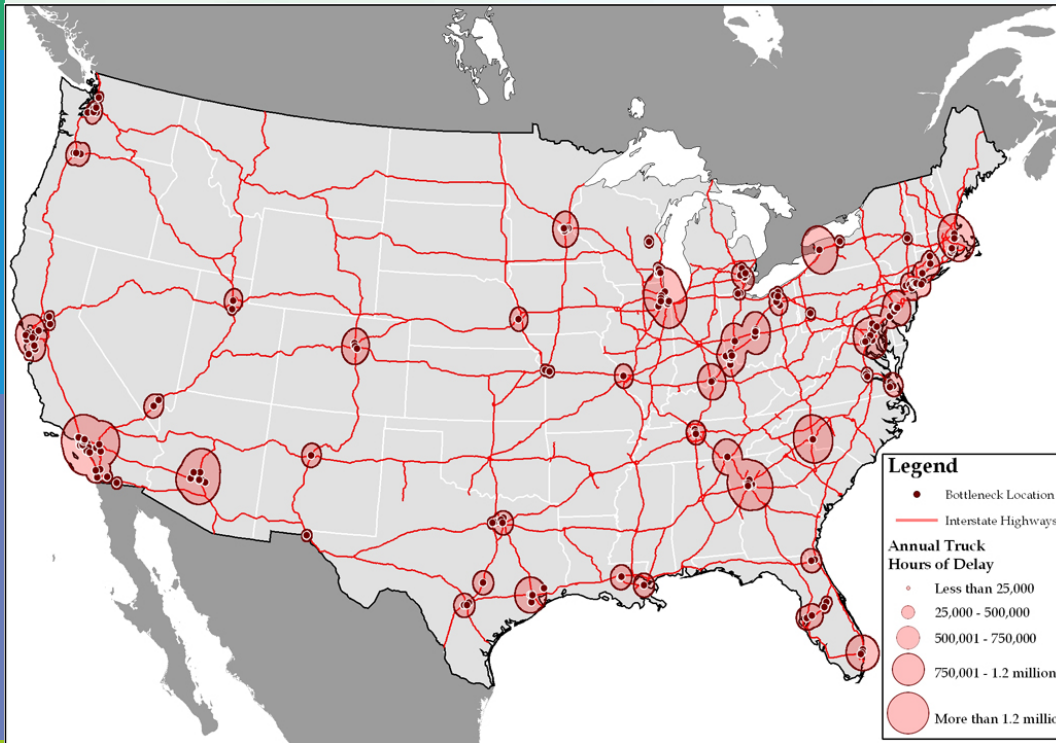
Source: UN Comtrade; IMF Balance of Payments; World Development Indicators, World Bank; McKinsey Global Institute Analysis.

21st Century Freight Logistics System Gradually Emerged

- National/international door-to-door freight service
- Evolutionary shift from push to pull logistics systems
- Lower inventory levels, less slack production capacity, and smaller order quantities
- Demands a tightly knit intermodal transportation system
- Congestion increasingly challenging the system



Highway Freight Bottlenecks



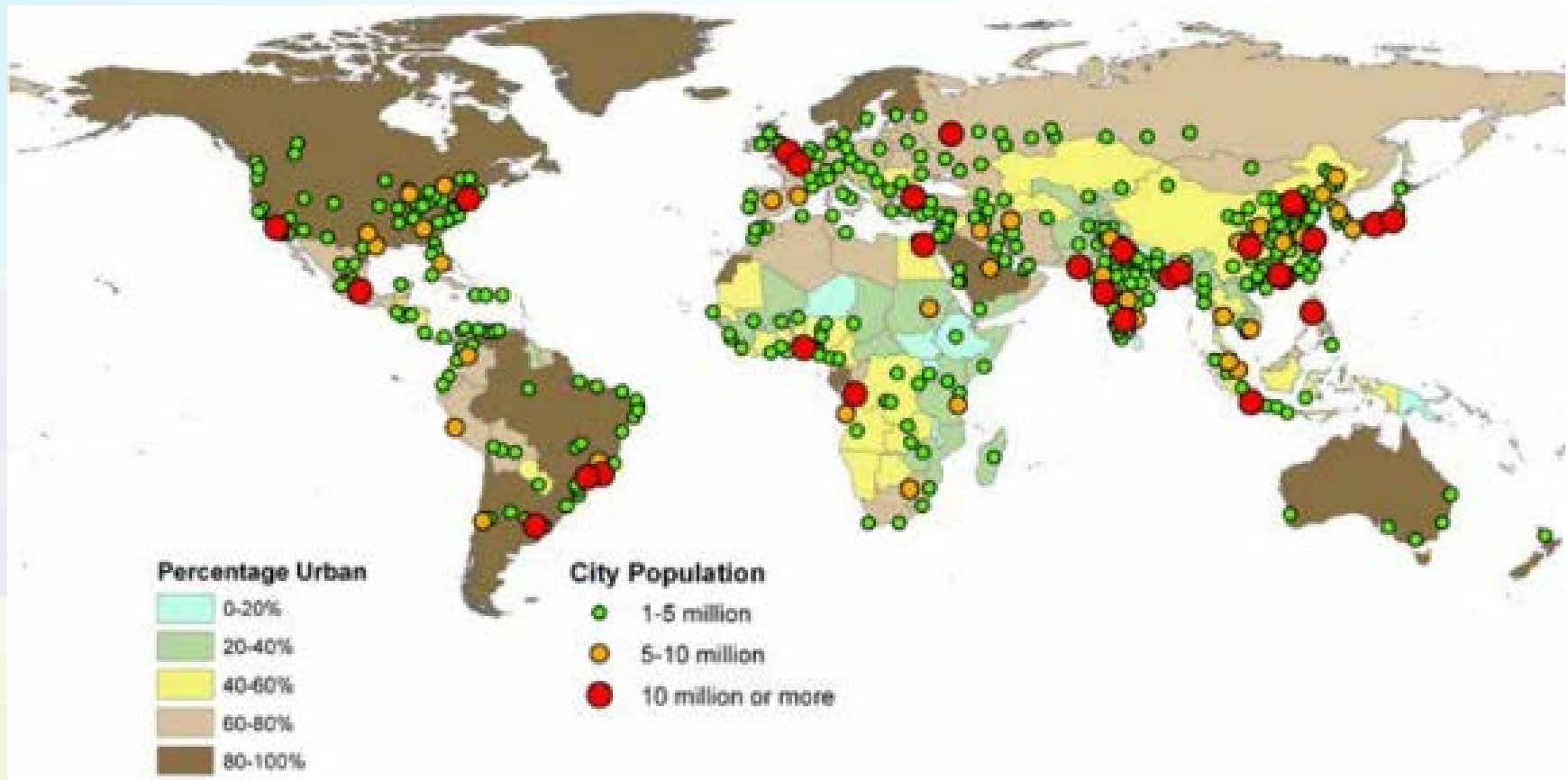
Truck congestion wastes
\$28 billion
in time and fuel annually



Mostly In and Around Major Metro Areas

World Economies Based in Mega Urban Regions and U.S. Megaregions Must Compete in this Global Marketplace

Global Patterns of Urbanization; 2015



Source: World Cities Report.

Freight Analysis Framework (FAF) Overview

- To help respond to emerging freight challenge, U.S. DOT/FHWA created FAF as national freight database and analysis tool
- Latest version FAF-4 integrated from 2012 Commodity Flow Survey data and related sources
- FAF-4 products include assignments to Interstate and other NHS routes for 2012 base and 2045 forecast year

Trucking is forecast to grow faster than other surface freight modes

Trucking grows by:

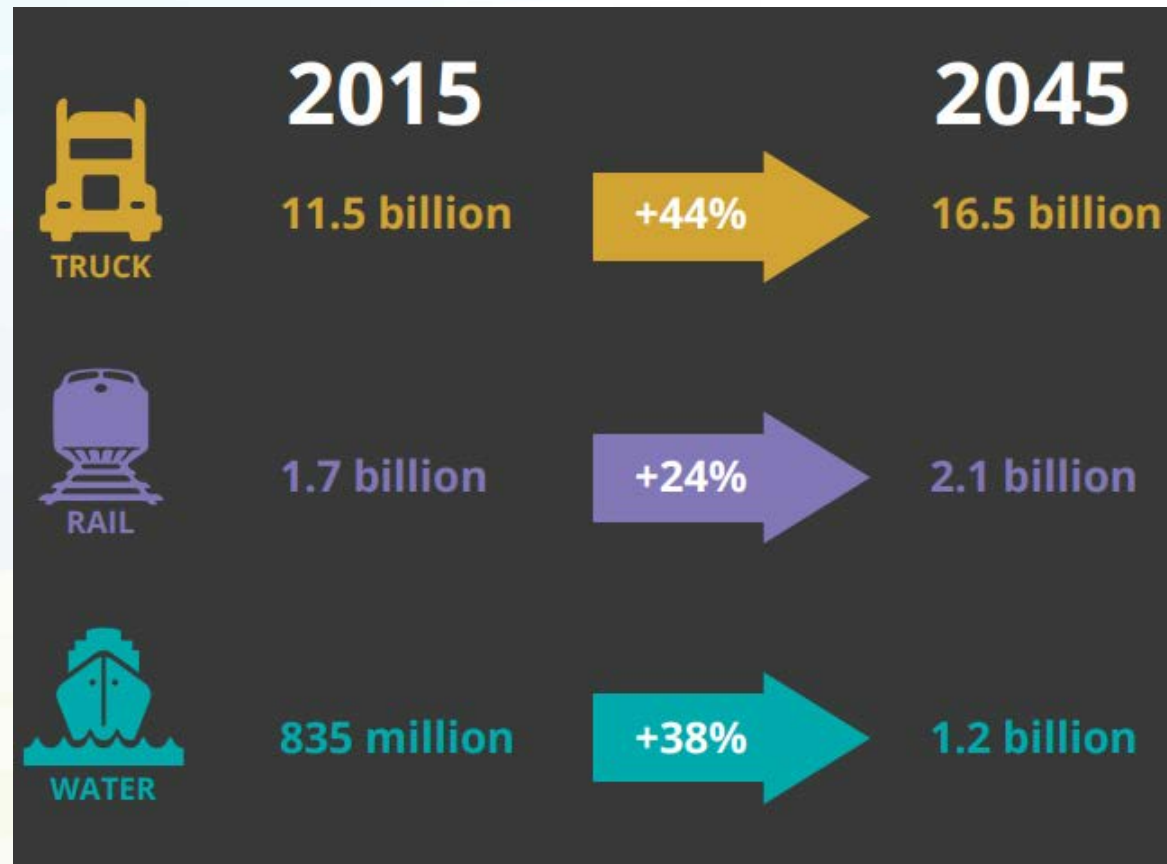
- 1.2 % yr. tons
- 2.1 % yr. value
- 1.6 % ton-miles
- 1.45 % VMT

combination trucks

Compound growth 2015 to 2045

FAF; USDOT

Growth in Tons



Looking Forward Presents More Challenge

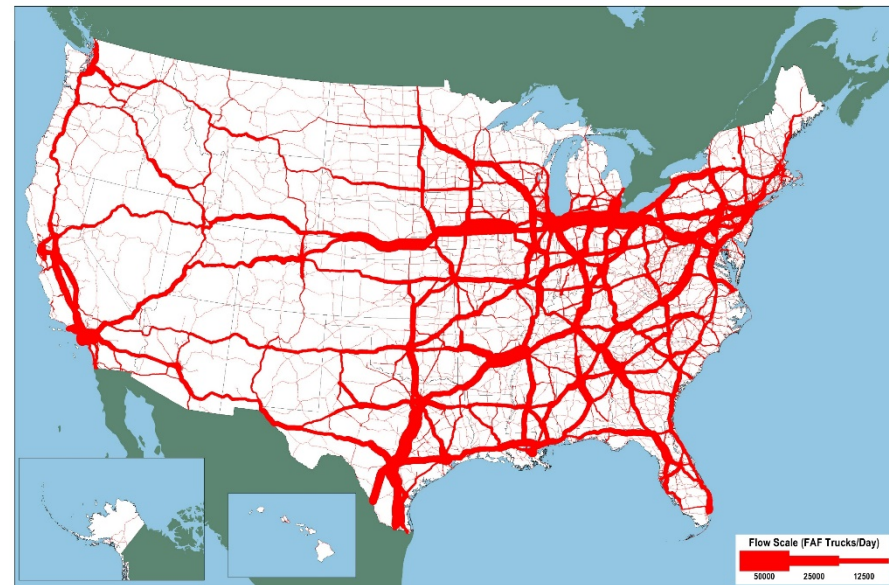
Freight Truck Traffic on Interstate and other NHS routes (2012 and 2045)

Average Daily Long-Haul Truck Traffic on the National Highway System: 2012



Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty five FAF trucks per day and between places typically more than fifty miles apart.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 4.3, 2011

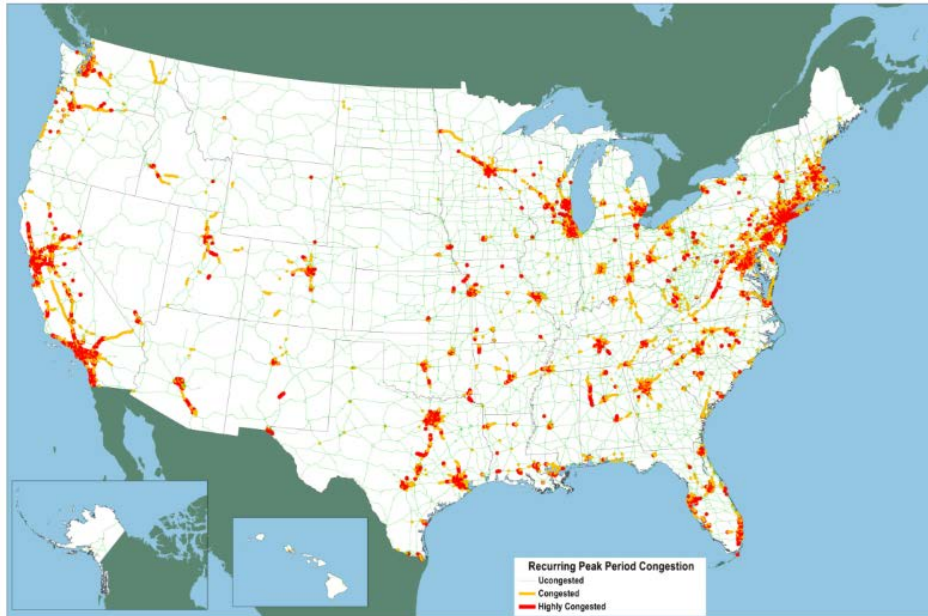
Average Daily Long-Haul Truck Traffic on the National Highway System: 2045



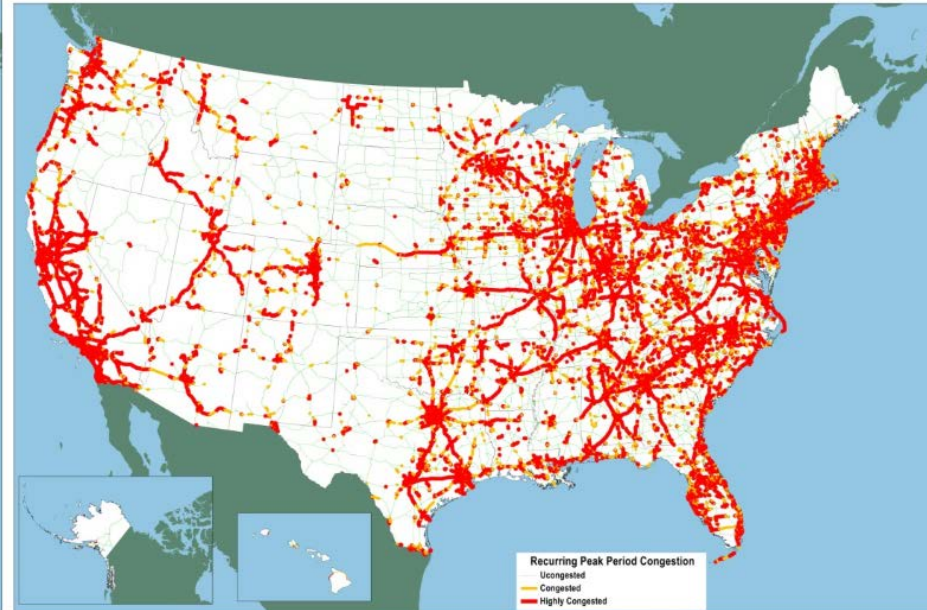
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Looking Forward Presents More Challenge (continued)

Peak Period Congestion on National Highway System: 2012



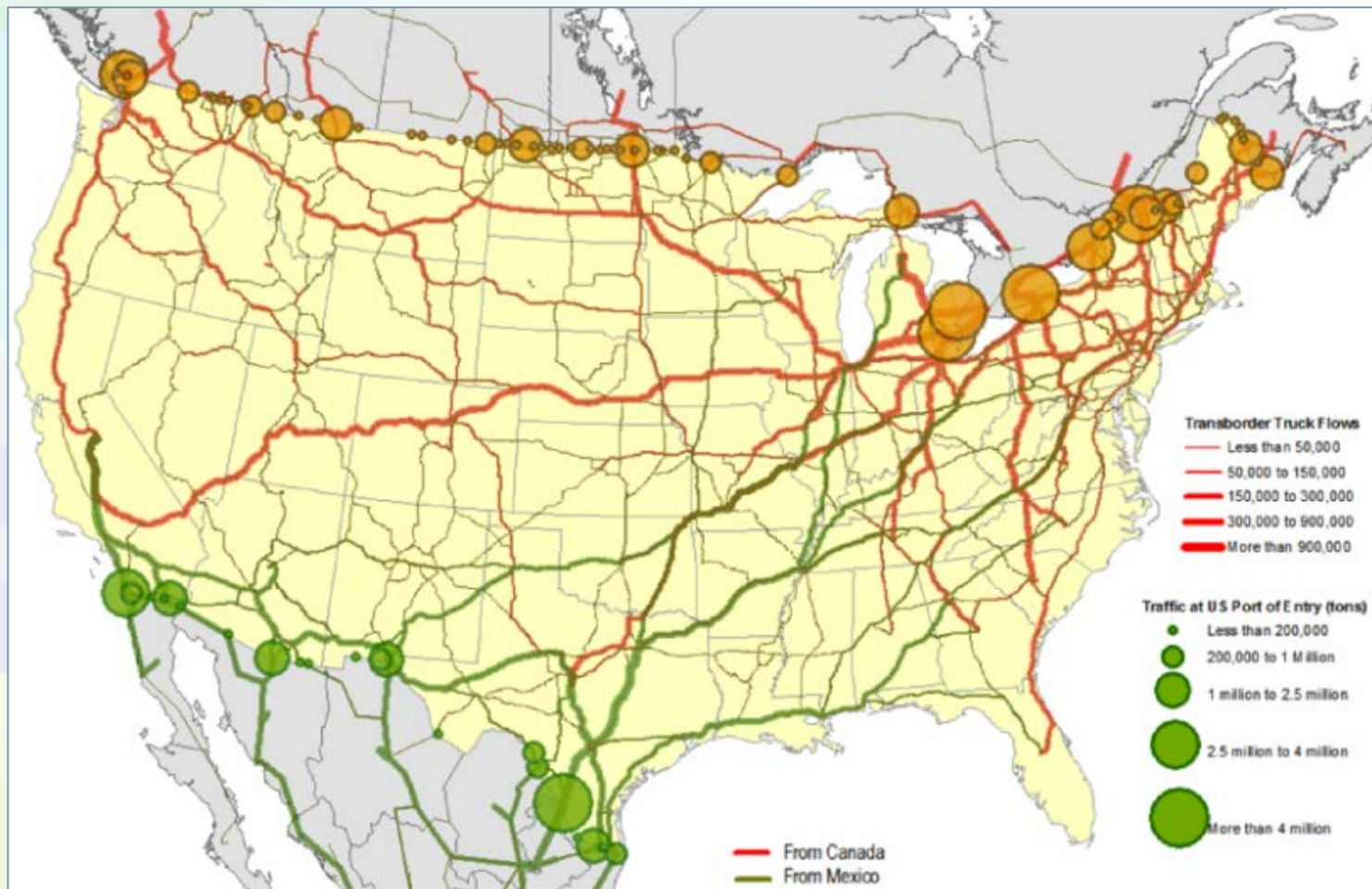
Peak Period Congestion on National Highway System: 2045



Notes: Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual Appendix N

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 4.3.

NAFTA Border Flows

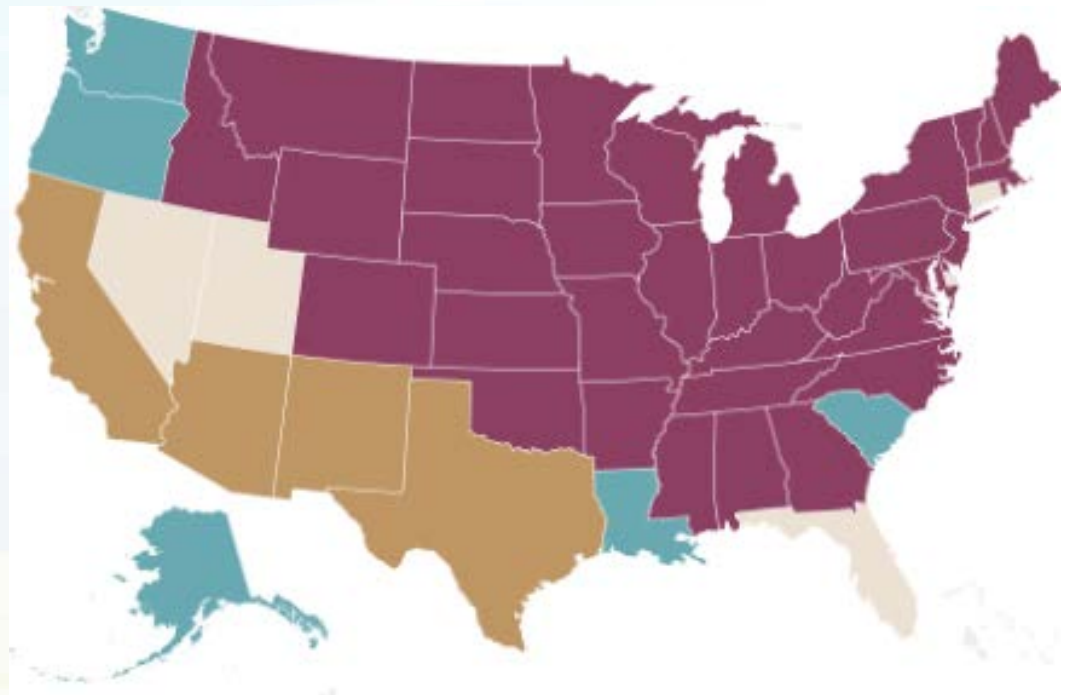


Source: BTS for port of entry data. Truck flows simulated by Matsziw, T.C. (2005) Modeling Transnational Surface Freight Flow and Border Crossing Improvement, The Ohio State University.

U.S. States' Biggest Export Partners

- For 43 U.S. States, their biggest exports are to Mexico or Canada

U.S. States' Biggest Export Partners

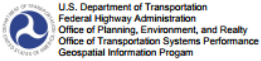


■ Canada ■ China ■ Mexico ■ Other*

* includes Hong Kong, Switzerland, France, Brazil, Australia and Belgium

Canada was the United States' largest goods export market in 2015.

Emerging Interstate Corridors



U.S. Department of Transportation
Federal Highway Administration
Office of Planning, Environment, and Realty
Office of Transportation Systems Performance
Geospatial Information Program

High Priority Corridors Designated as Future Interstates by Congress

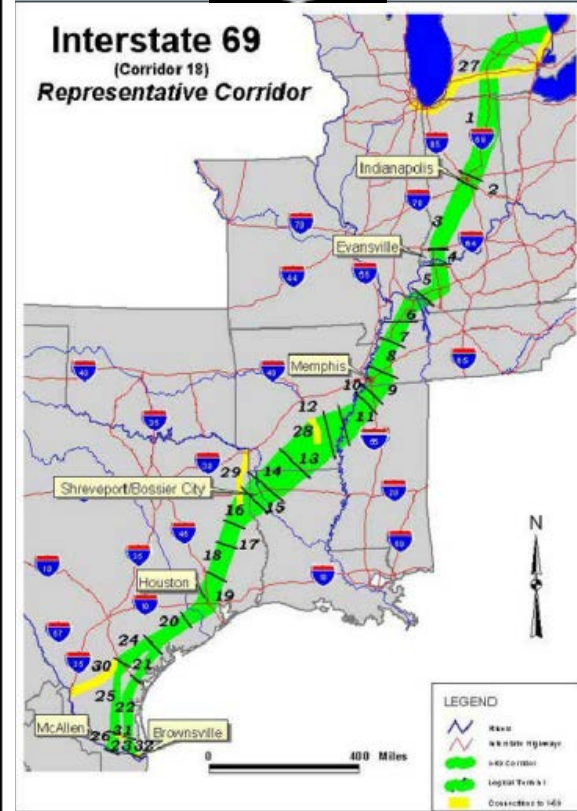


Notes:
Colors are added for clarity only.
Corridor numbers correspond to statutory listing in Section 1105(c) of ISTEA 1991, as amended.
Some portions of the future Interstates have been constructed to Interstate standards, open to traffic and signed as Interstates.

December 16, 2015

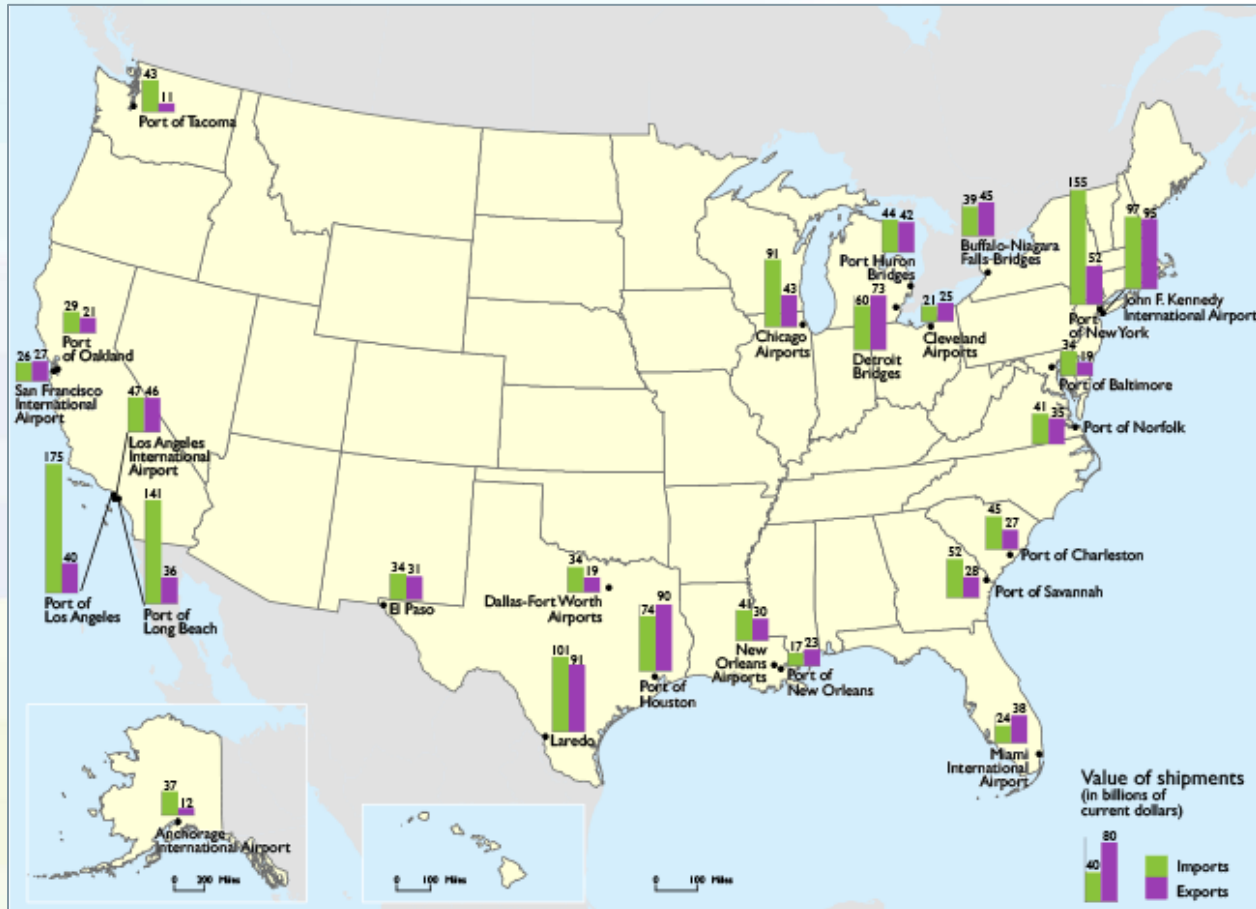


Interstate 69 (Corridor 18) Representative Corridor



Major International Gateways

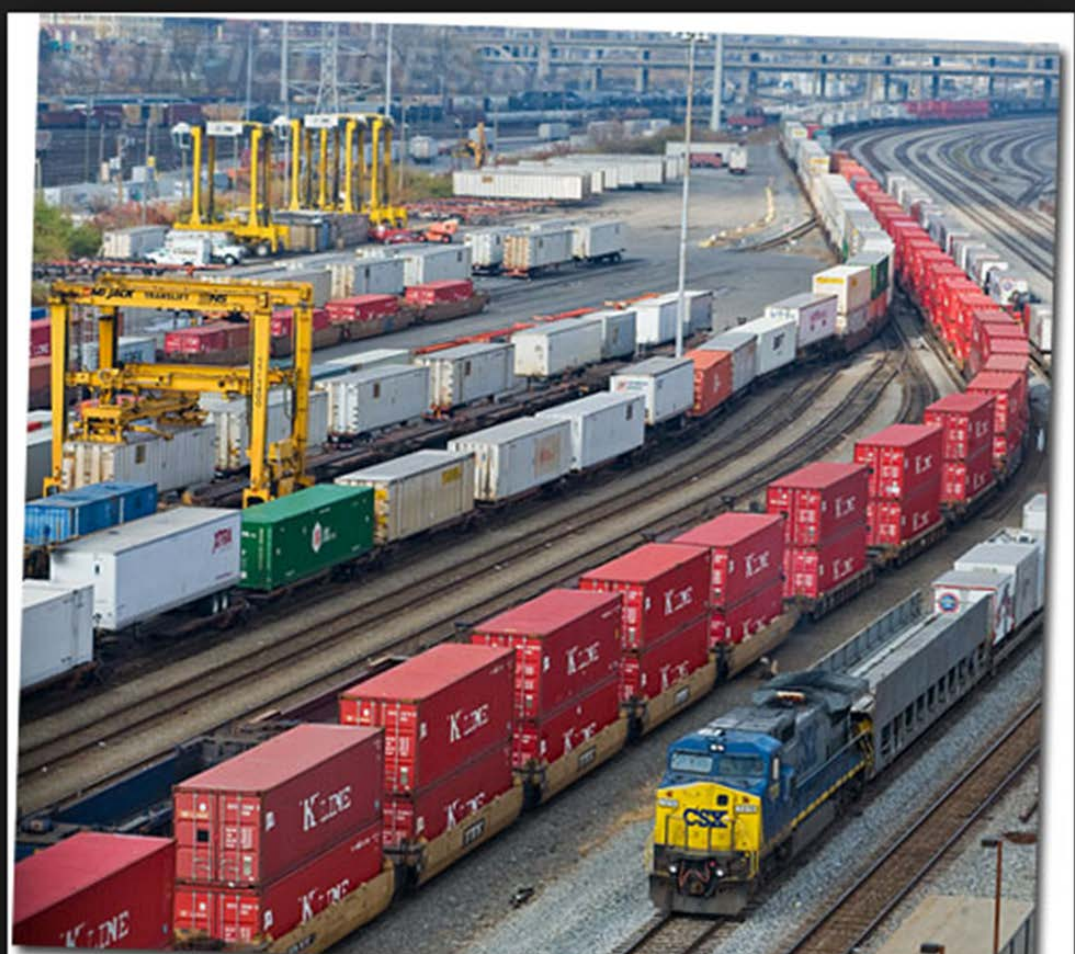
Top 25 U.S.-International Trade Freight Gateways by Value of Shipments: 2014



Source: Bureau of Transportation Statistics.

Intermodal is now largest freight rail component (24% revenue in 2016)

Intermodal rail shipments increased from 2 million in 1980 to 13.5 million in 2016.



Integrated logistics supply chains require seamless rail-truck interface

Panama Canal Expansion opens 2016



Congestion at Ports of Entry



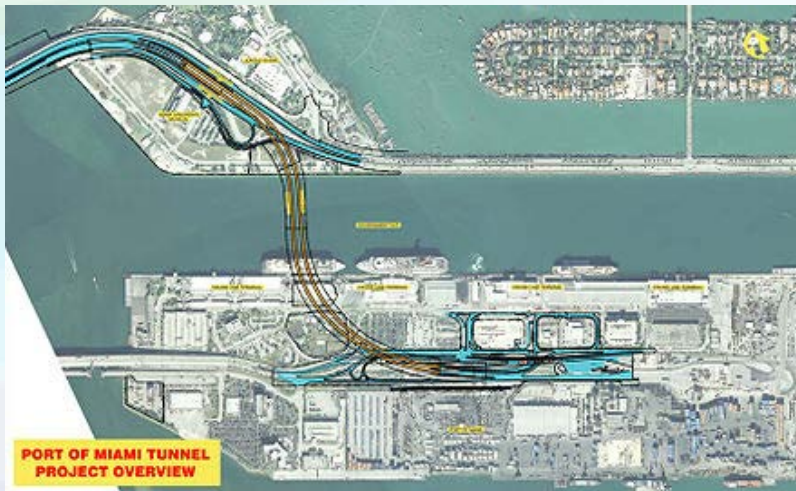
I-710 Proposed Separated Truck Lanes Connection to Ports LA/LB (\$3-8 Billion)



The Study Area for the I-710 corridor



New Miami Freight Tunnel Connects Port to Interstate Routes (\$1 Billion)



Dedicated Truck Lanes on Interstate?

Rapid truck growth and emergence of truck platooning technology spurring consideration by States



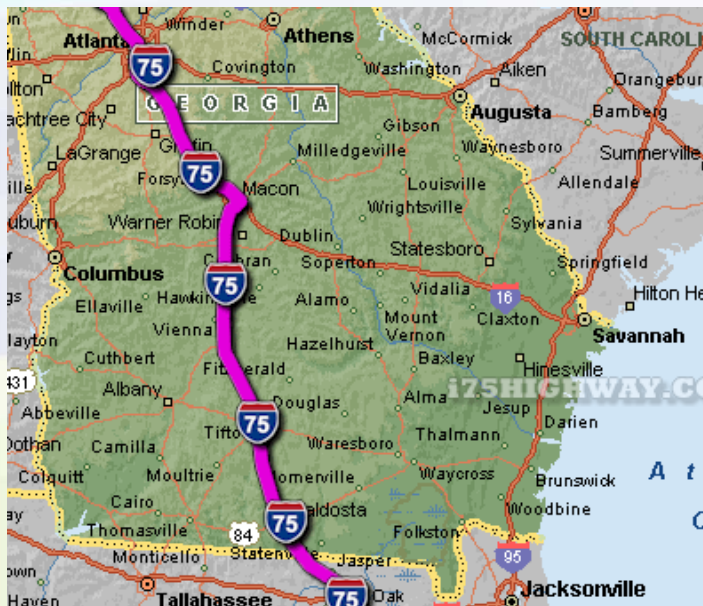
EU Platooning test



Source: Southern California Association of Governments.

Georgia latest state to consider Interstate truck lanes

- Georgia considering building two lanes limited to trucks along 38 miles of Interstate 75, a heavily traveled freight corridor south of Atlanta
- It would be the largest truck-only project in the nation and cost \$2 billion – serves Atlanta to Port of Savannah










Interstate System of Strategic Importance to National Defense

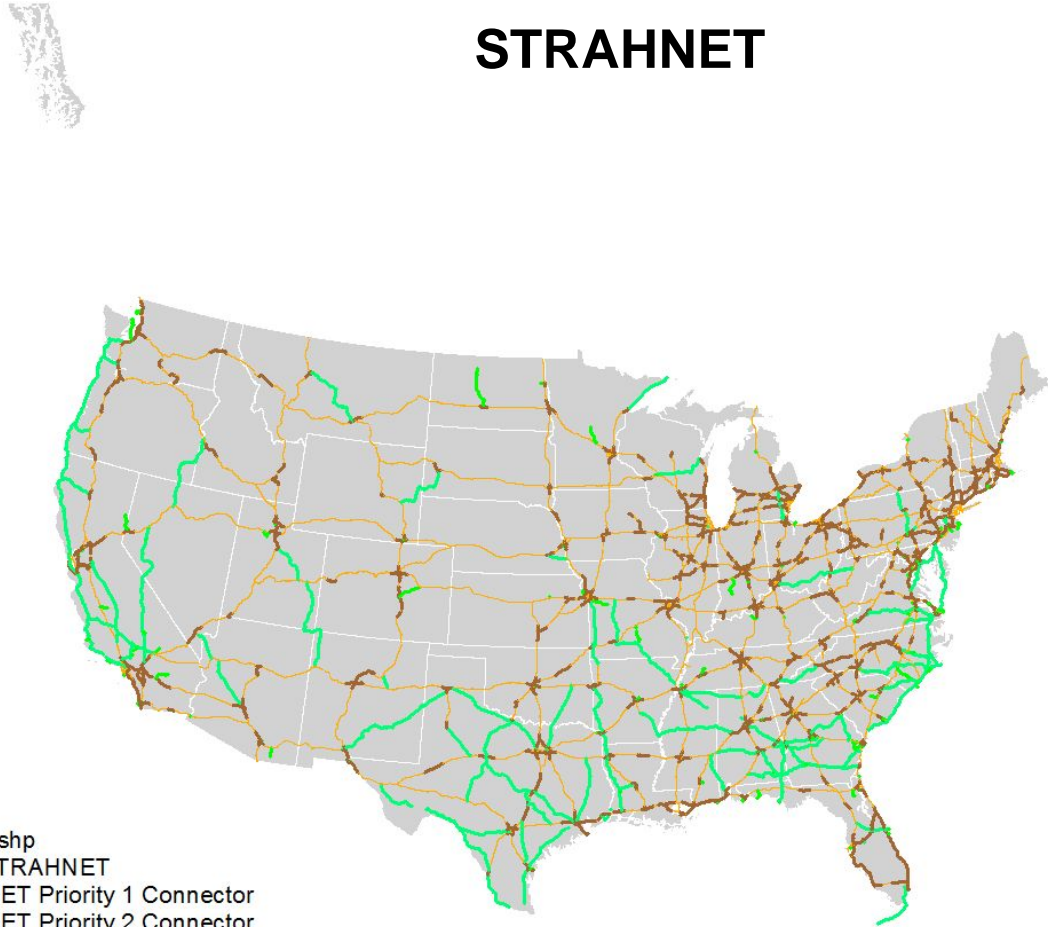
FAST Act designates new Interstate I-14 corridor for port to port connections in Texas



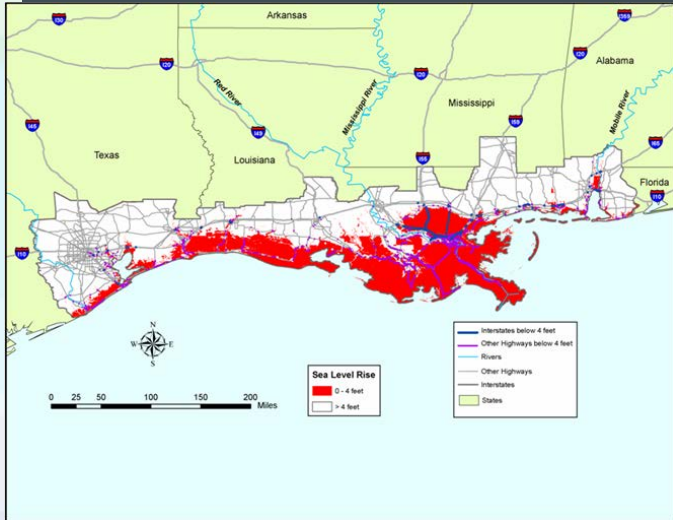
STRAHNET

Nhs20170403.shp

- Not on STRAHNET
-  STRAHNET Priority 1 Connector
-  STRAHNET Priority 2 Connector
-  Non-Interstate STRAHNET
-  Interstate--Designated Urban 16ft. Vertical Clearance Route
-  Interstate--Non-Designated Urban 16ft. Vertical Clearance Route
-  Interstate--all other
- Unknown
-  State.shp

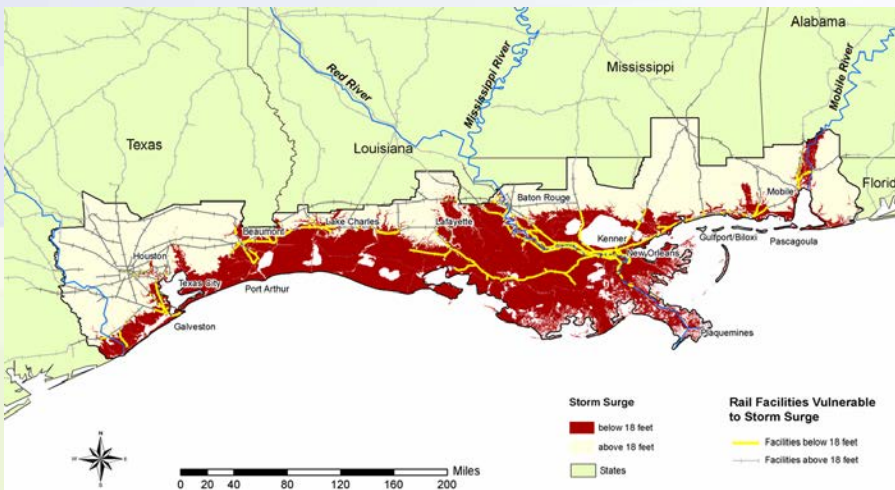


Climate related resiliency concerns for coastal freight facilities



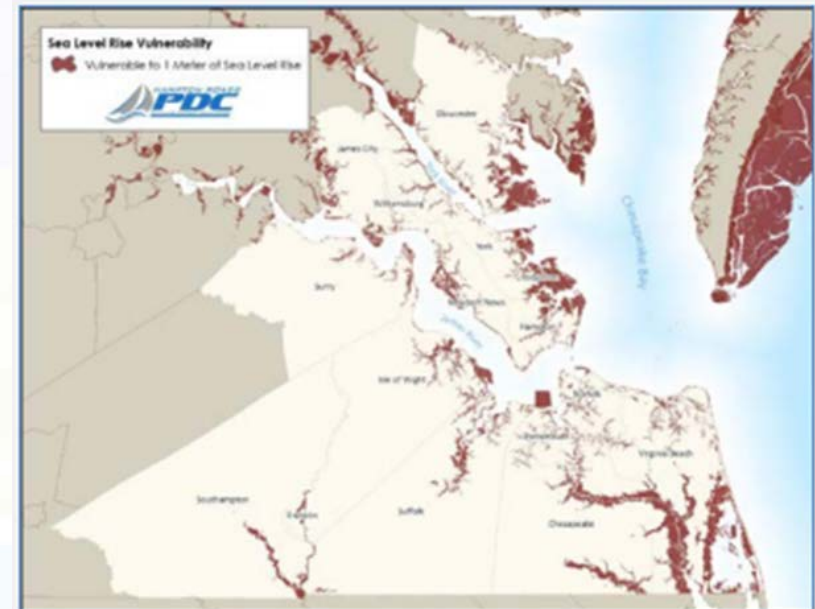
**Gulf Coast
Highways
vulnerable to
4 ft. relative
sea level rise
(CS study for
FHWA)**

**Sea Level rise vulnerability
for intermodal and defense
facilities in Hampton Roads
area**



**Gulf Coast Freight rail lines vulnerable to
18 ft. storm surge**

Map 9.1: Sea Level Rise Vulnerability in Hampton Roads



MAP-21 directed USDOT to develop a National Freight Strategic Plan *(draft 2015)*

Highlighted challenges ahead:

- Freight growth
- Underinvestment in freight system
- Difficulty in planning and implementing freight projects at state and local level
- Increased global competition
- Safety, security, and resiliency
- Adaptation to emerging technology



FAST Act Brings New Focus on Freight

- The new law provides for:
 - » National Multimodal Freight Policy and Freight Strategic Plan
 - » Primary Highway Freight System (PHFS) of 37,436 miles of Interstate and other NHS routes
 - » National Highway Freight Program – \$6.3 billion in formula funds over five years for States to invest in freight projects on the NHFN— up to 10 percent of these funds may be used for intermodal projects
 - » Discretionary Program (FASTLANE)- \$4.5 freight focused grants over five years targeting bottlenecks and other critical highway, rail, port and intermodal freight improvements.
 - » State Freight Plans by Dec. 2017 as condition for program funds
 - » Performance Measurement and Biennial Reporting to Congress

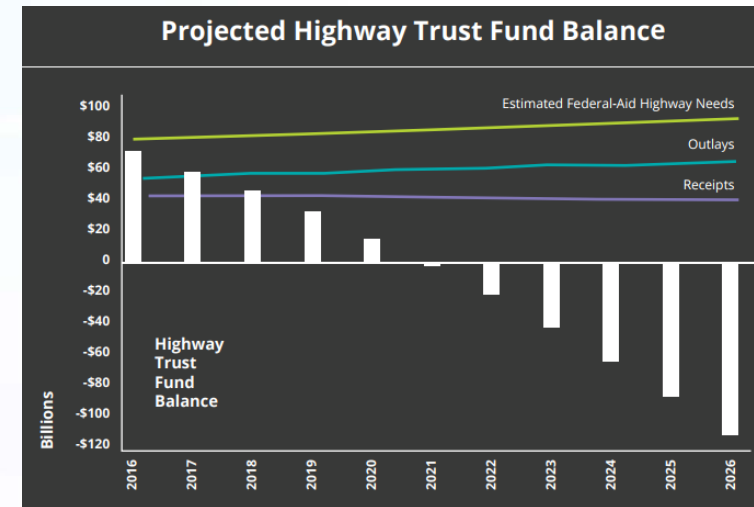
Primary Highway Freight System

(includes 37,436 Interstate miles)



Challenges Ahead

- Investment in Interstate capacity/bottlenecks and intermodal connections
- Multijurisdictional planning and implementation for freight projects
- Economic productivity and competitiveness
- Safety and resiliency
- Adaptation to emerging technology



USDOT

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Questions?

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