


FREIGHT TRENDS AND URBAN IMPLICATIONS

WORKSHOP: INNOVATION IN URBAN FREIGHT
JOSEPH BRYAN, PARSONS BRINCKERHOFF
SEATTLE WA, FEBRUARY 2012

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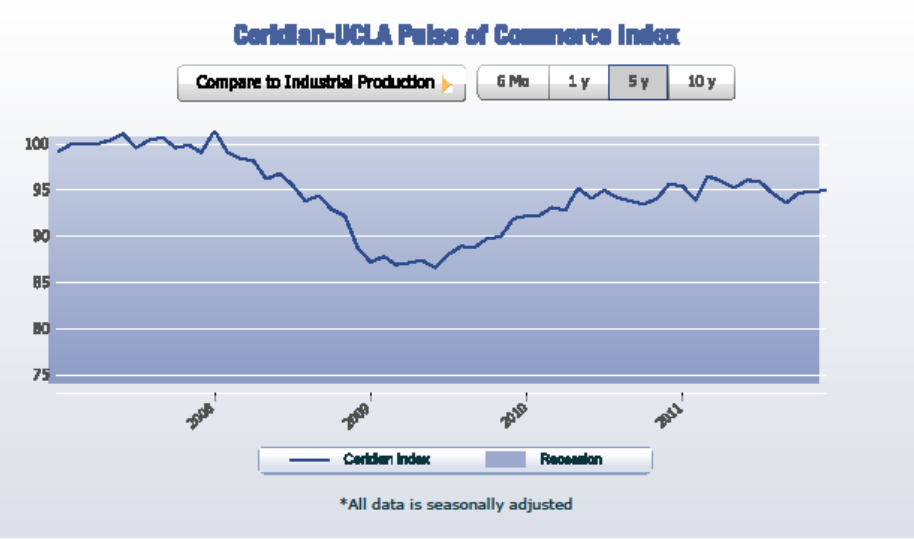
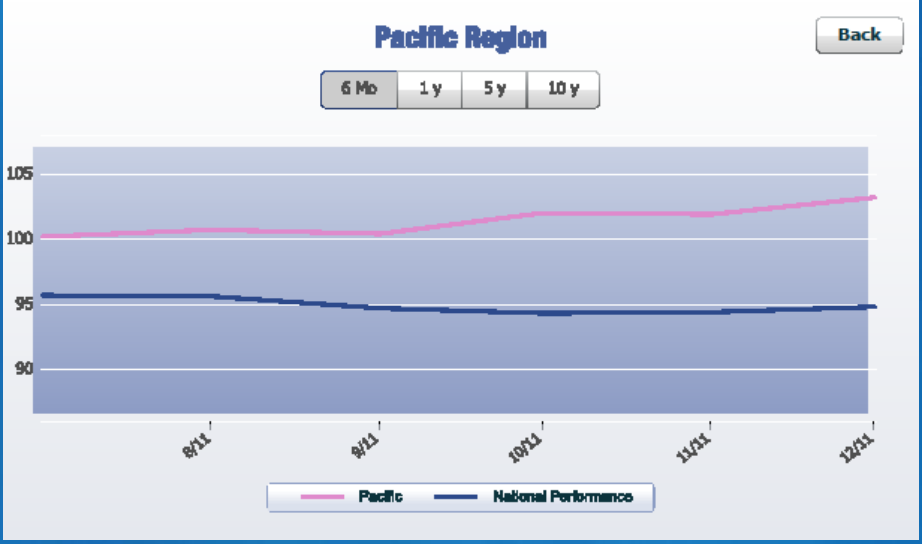
US Freight Market Volumes





- Volume mainly recovered by mid-2010
  - Below 2007 peak
  - But caught up with prior years
- Flat since
- Pacific Region (West Coast) above national trend

Supply Chain: Gasoline

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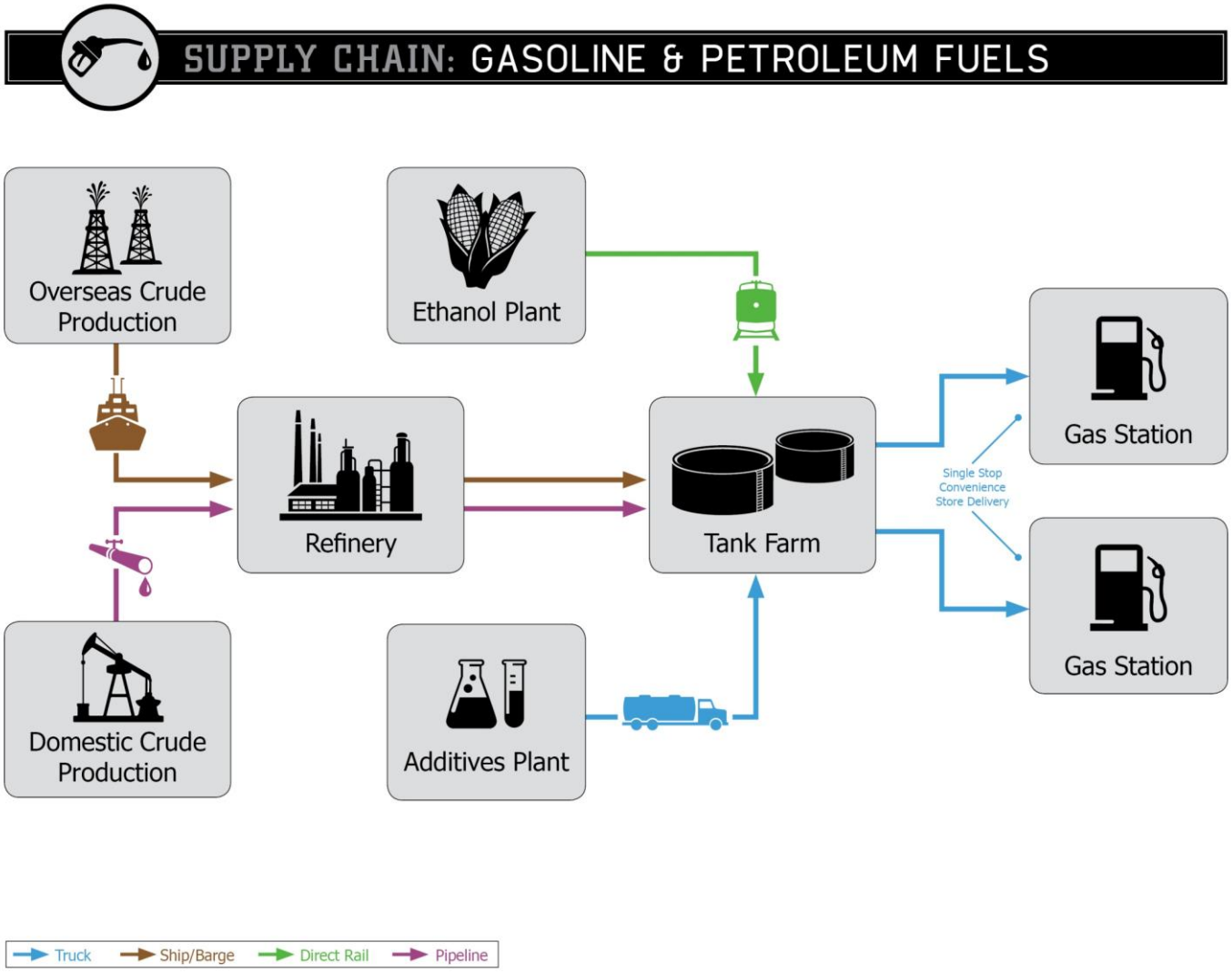

Source: NCFRP 15

Supply Chain Trend: Shale Oil

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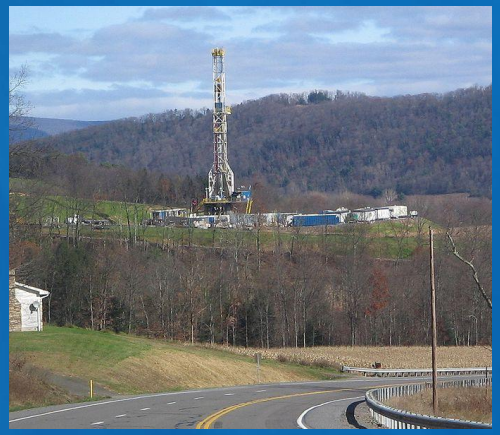
- Ubiquitous supply chain
- Major sourcing change
- Limited urban effect
  - Feed goes to refineries
  - Some bulks in transit



Supply Chain: Big Box Retail

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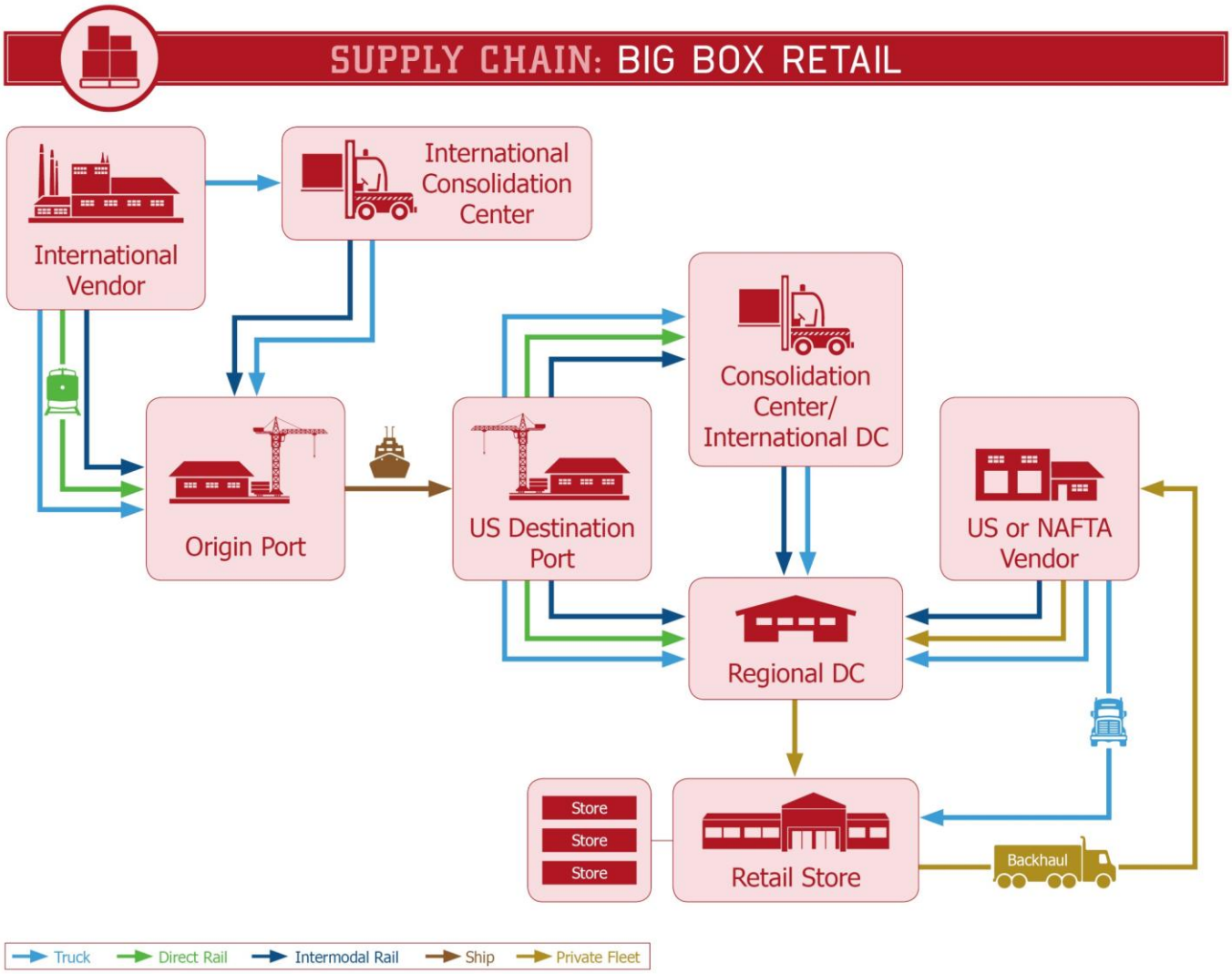

Source: NCFRP 15

Supply Chain Trend: Nearshore Sourcing

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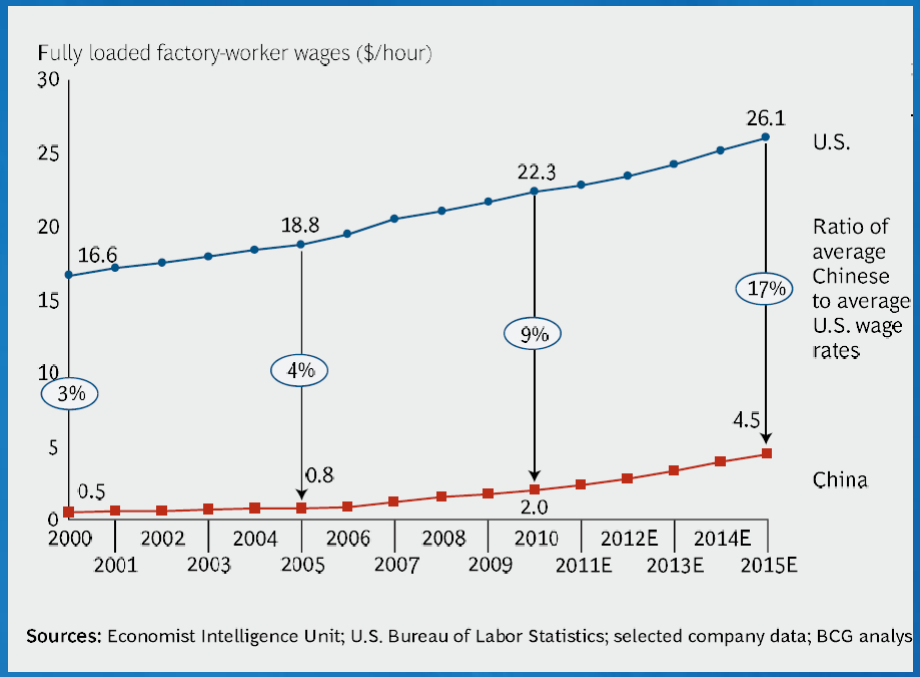
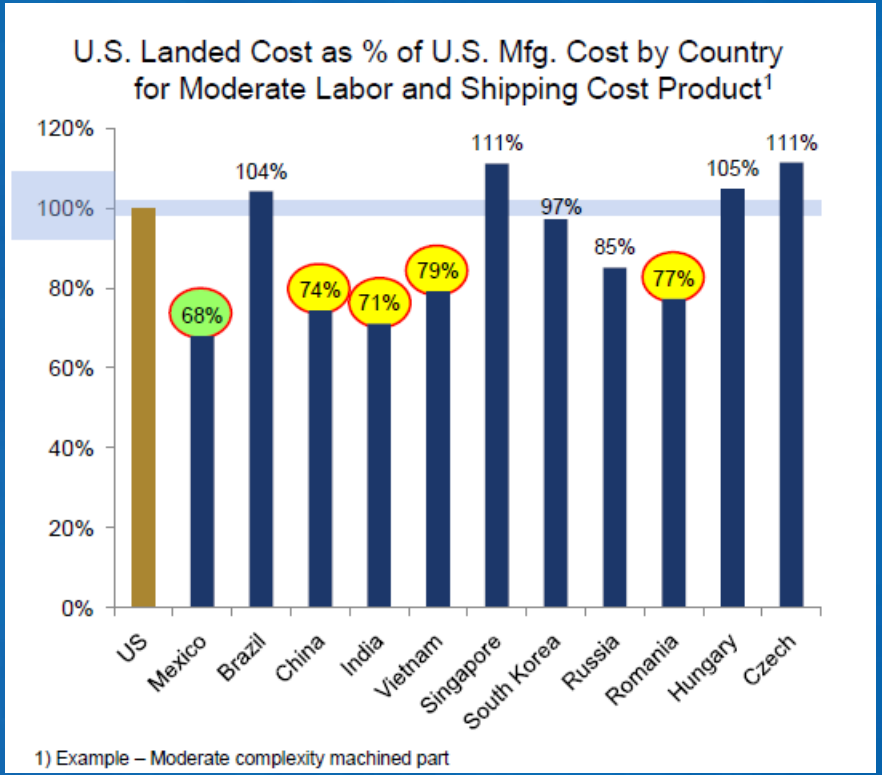


Source: BCG

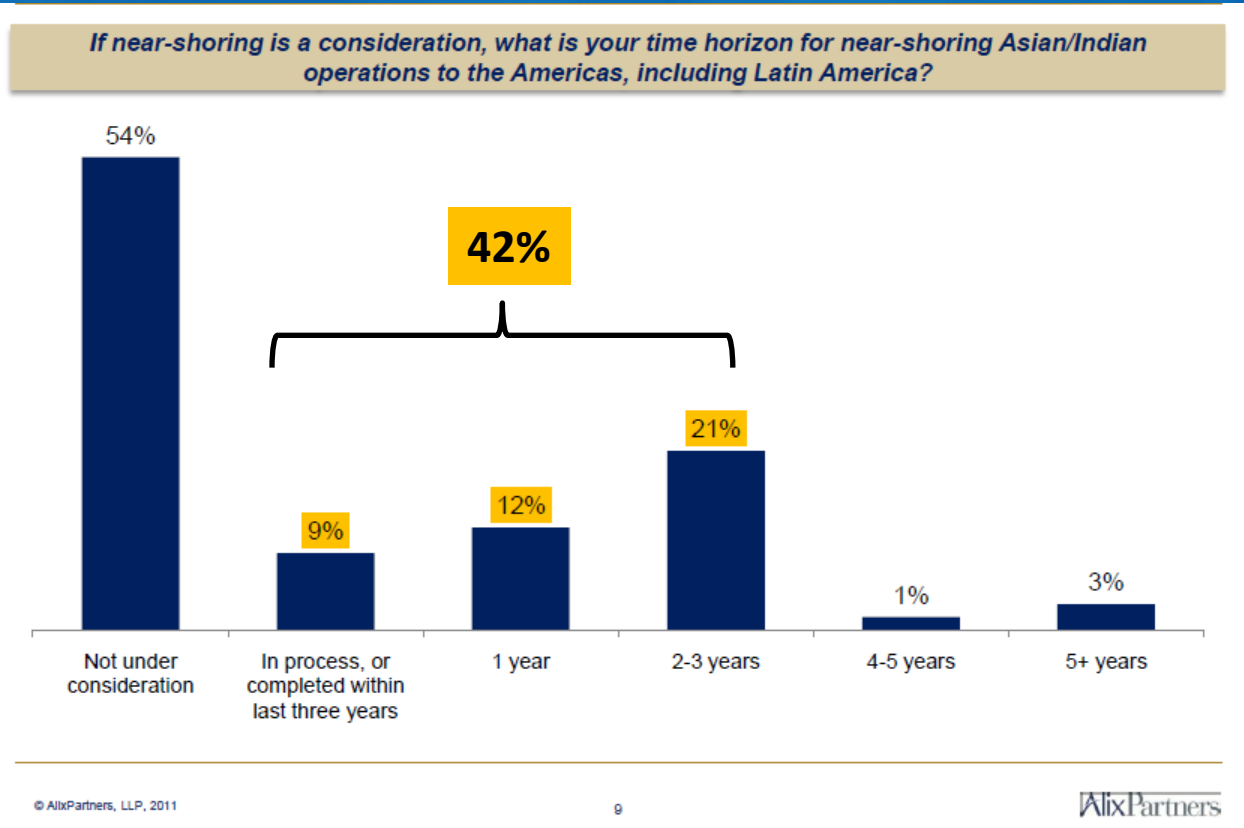
- Chinese wage advantage narrowing
  - Plus other costs and risks



Source: Alix Partners

- Low landed cost favoring Mexico
  - Not all products
  - Alix Partners analysis

Nearshoring Effects



Source: Alix Partners

- 42% of manufacturers surveyed engaged in nearshoring
- Of these, 63% favor Mexico, 19% US
  - Alix Partners 2011 Survey
- Decision factors: time to market, delivered cost, labor content, risk
  - Tompkins Associates analysis

➡Urban effects: gateway and modal substitution, directional volume, local production

Supply Chain Topology: Panama Canal Expansion

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- **Reduced transportation costs small relative to product value**
  - Import TEU - value of contents: $100,000
  - Transportation cost reduction: $200
  - Reduction of product value: 0.2%
  - Induced consumption increase: zero

➡Result: little *volume* effect from expansion

- Zero sum game

Expansion Effects: Coastal Shifts – Shipping Costs

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- **A variety of cost factors are likely to affect potential coastal shifts**

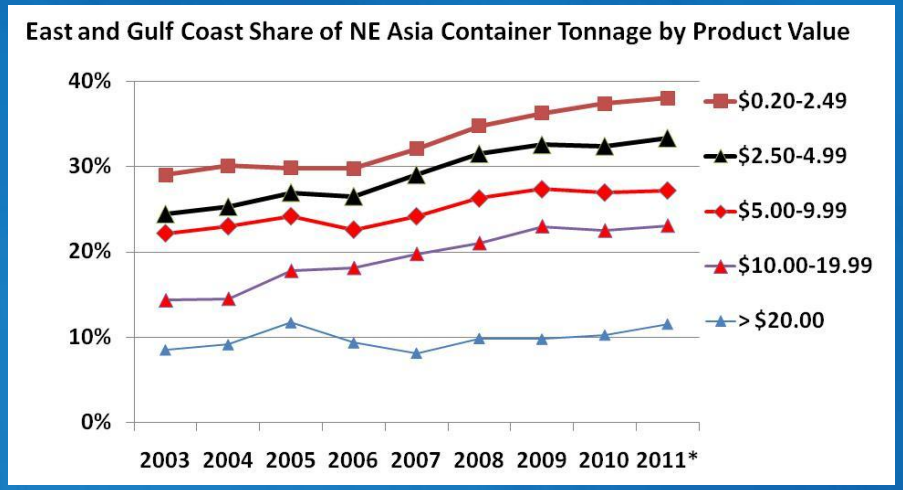
  – Maximum per TEU cost reduction to the US East Coast
  $410
  (13,000 TEU vessel rather than a 5,000 TEU Panamax vessel)

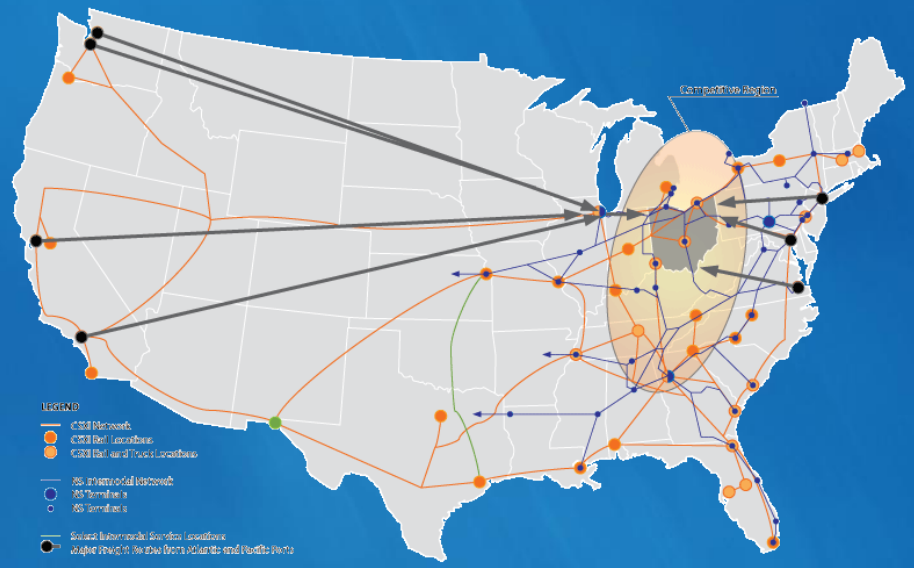
  – Cost reductions must be ***realized by shippers*** to affect shifts

    - Carriers, ports and the Panama Canal will likely retain a portion of East Coast cost reduction savings
    - Net savings passed on to shippers could be:
      $125

  – Cost reductions are ***relative*** to those on the West Coast where pass through savings could be $55 per TEU, leaving a relative per TEU cost reduction of:
  $70

Expansion Effects



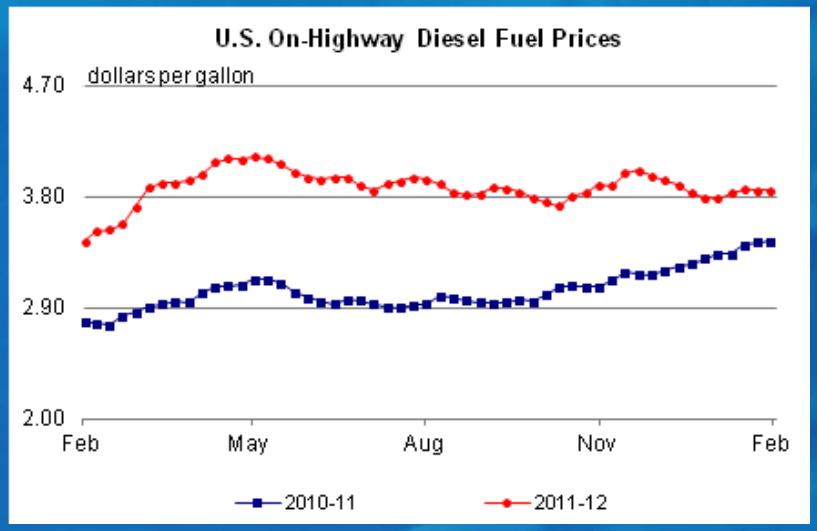


- Result: some coastal shift
  - Some long underway
  - Midwest competitive zone
- No tsunamis likely, to or from
  - Transshipment could develop

➡Urban effects:

- Gateway and modal substitution, directional volume

Supply Chain Topology: Network Design
Fuel, Carbon, Congestion



Source: Energy Information Administration

Source: JB Hunt

- Supply chain network models minimize cost, based on:
  - Where customers are
  - Modal portfolio and transport costs
  - Facility operating costs: leasing, labor and skills, utilities, etc.
- Tend to add DCs when fuel costs climb
  - Carbon would have same effect, if monetized
- Beginning to consider congestion
  - Adds 3rd element to standard tradeoff: time vs. distance vs. conditions

➡Urban effects: location, proximity, mode

Intermodal Rail Shifts

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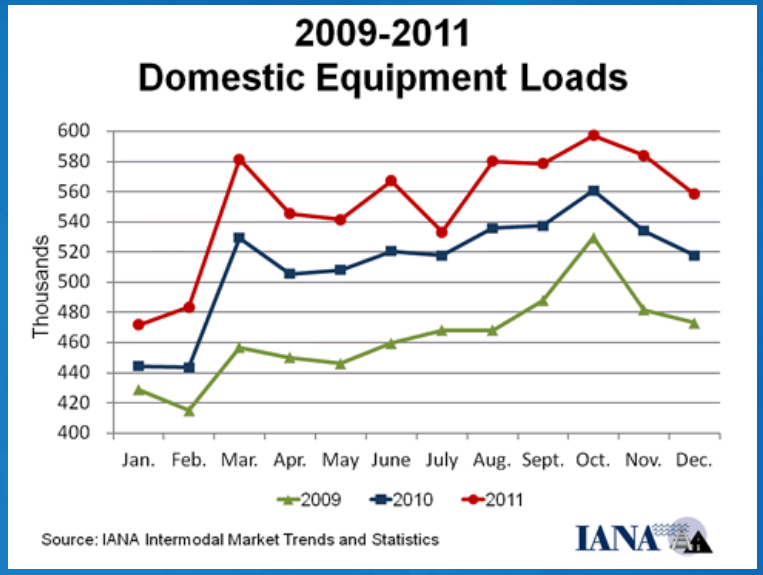

Source: CSX

- Domestic growth, shorter hauls
  - Motor carrier fuel cost, asset utilization, transloading
  - Opportunity cost in revenue per foot
  - East vs. West
- Wide span cranes
  - Sorting efficiency
  - Lanes in play
  - Terminal capacity potential

➡ Urban effects: modal options, terminal viability & location, traffic concentration

Supply Chain Velocity & Responsiveness

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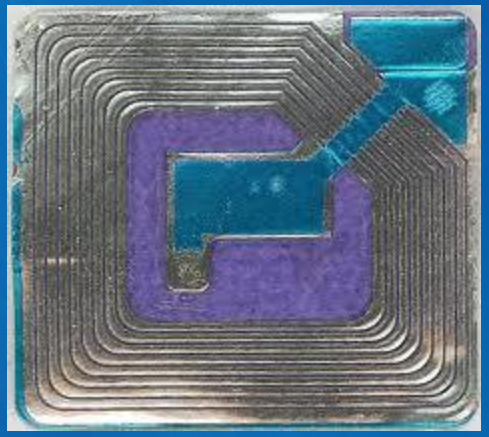
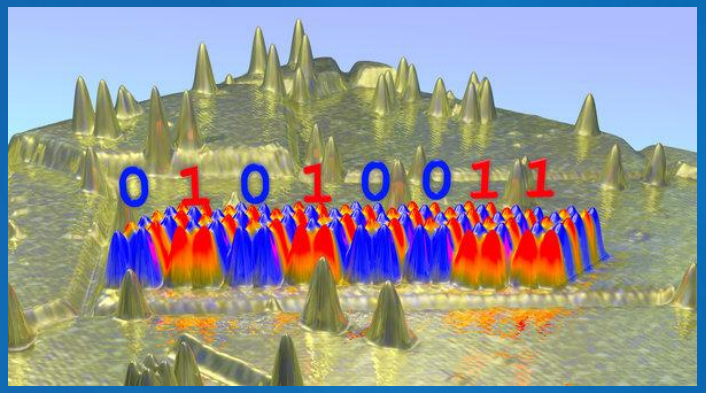
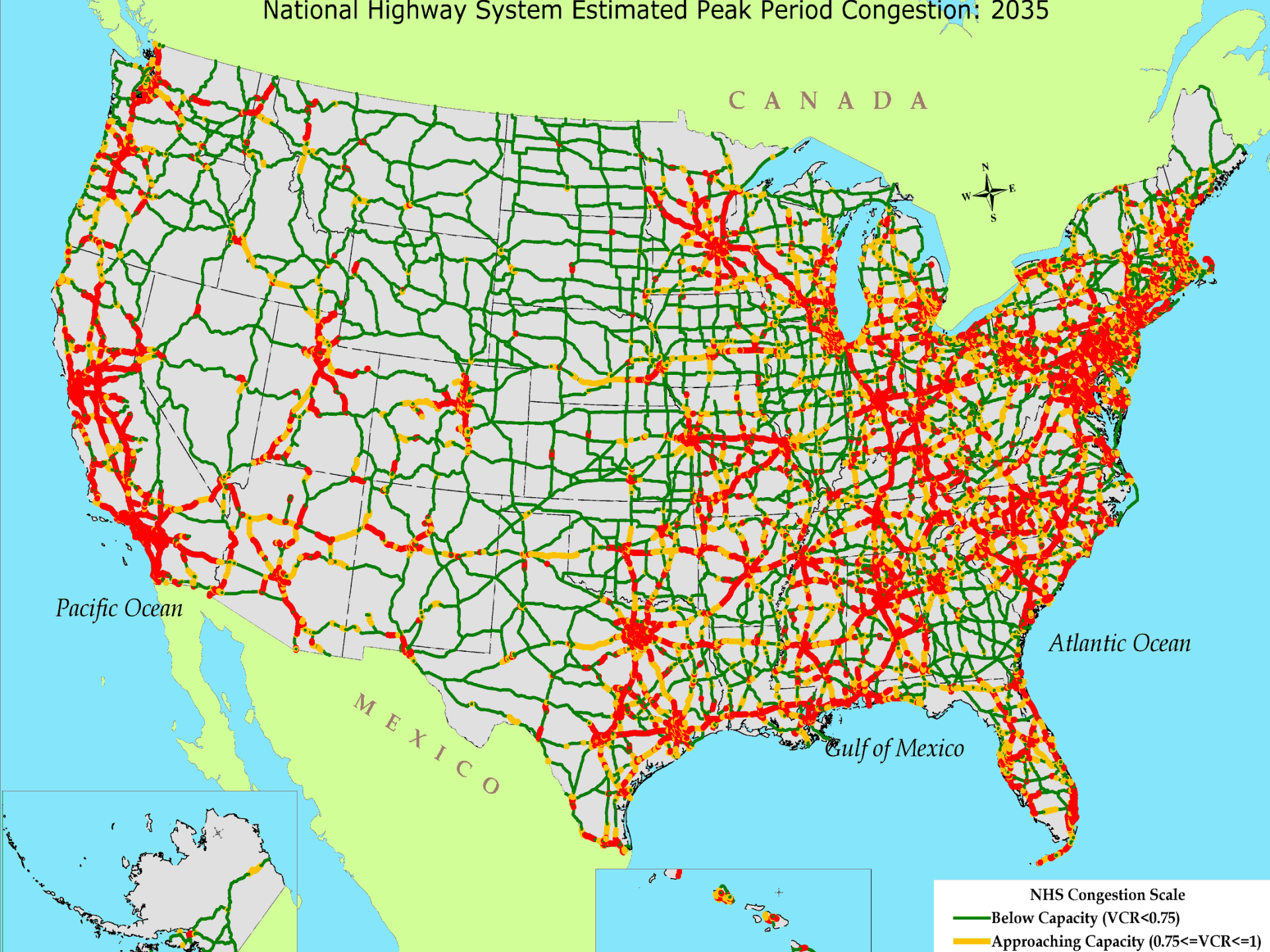
- Technology: RFID tags
  - Common as today's barcodes in 30 years – and just as transformational
- Technology: 12 atom nanochip
  - Information revolution isn't over
- Process: cross-dock proliferation
  - More, closer facilities
  - Goods in motion

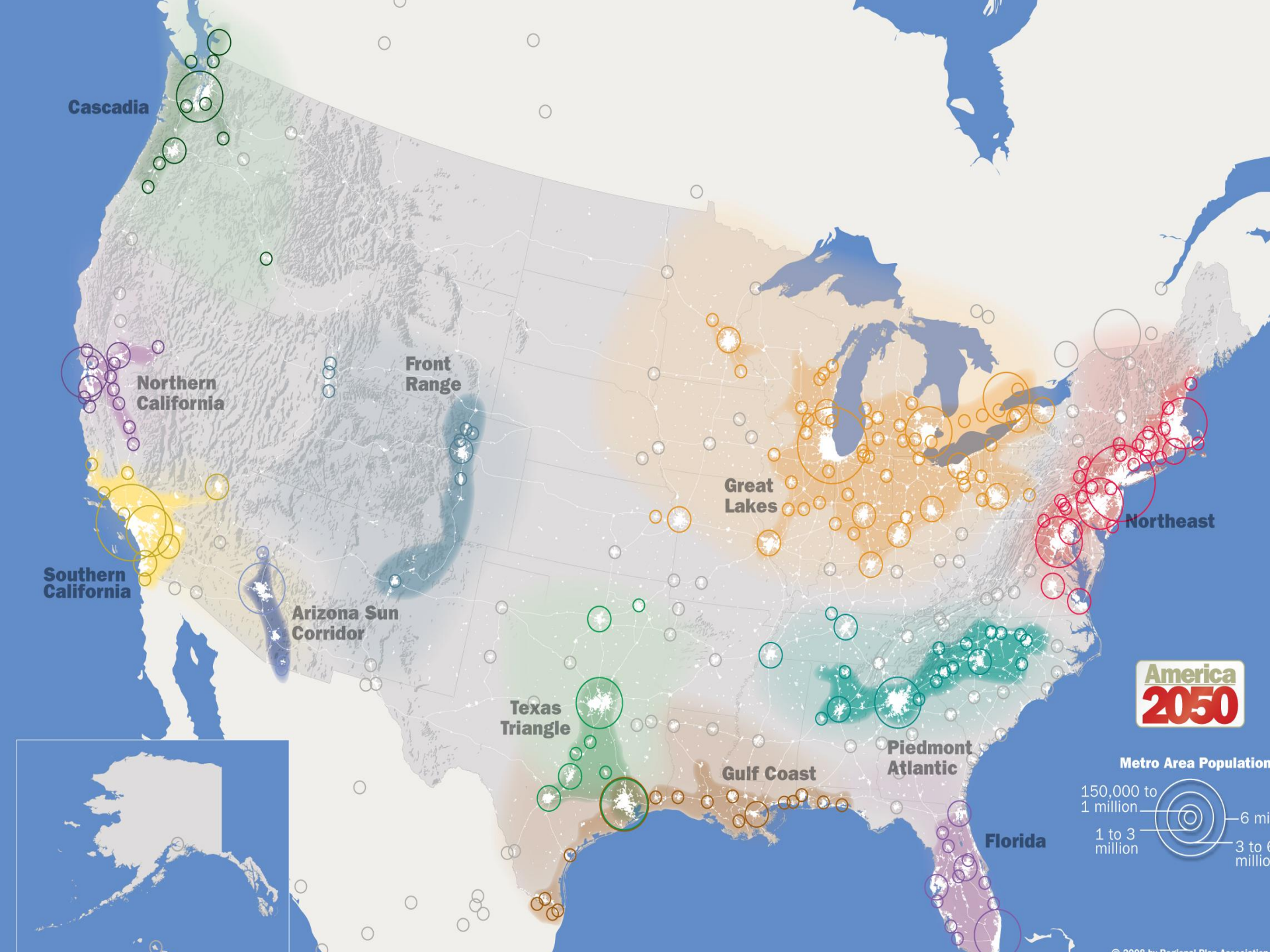
➡ Urban effects: proximity, mode, performance sensitivity, risk & Wolfe's Paradox





National Highway System Estimated Peak Period Congestion: 2035




Cascadia
Northern California
Front Range
Southern California
Arizona Sun Corridor
Great Lakes
Northeast
Texas Triangle
Gulf Coast
Piedmont Atlantic
Florida
America 2050
Metro Area Population
150,000 to 1 million
1 to 3 million
6 mi
3 to 6 millio

Growth in Markets & Risk

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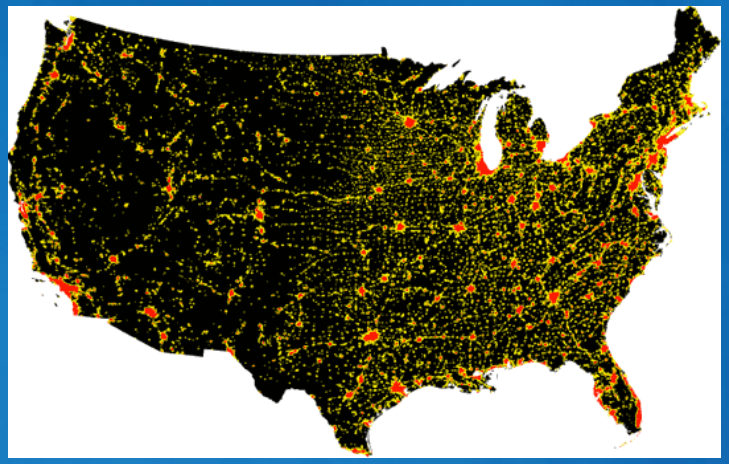
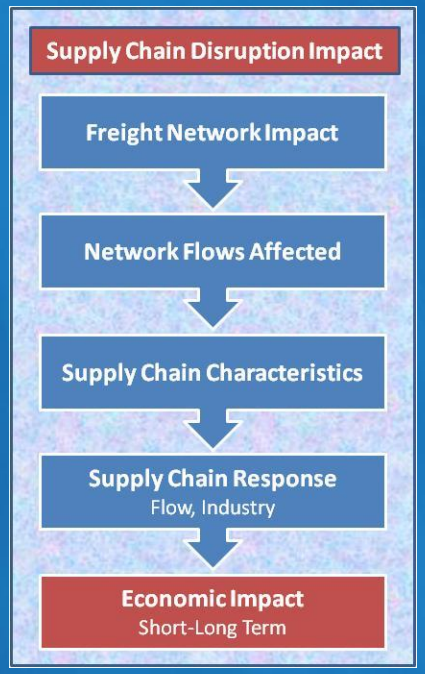


Source: NASA



- Massive metro-market growth
  - Metro areas grow fastest
  - Urban % population continues to rise
  - De facto economic units
- Emerging economic units riddled with congestion
  - Not unique to any city, or to US
- Opportunity paired with risk
  - Regions will compete on performance

➡Urban effects: risk management, economic competition

Network Performance

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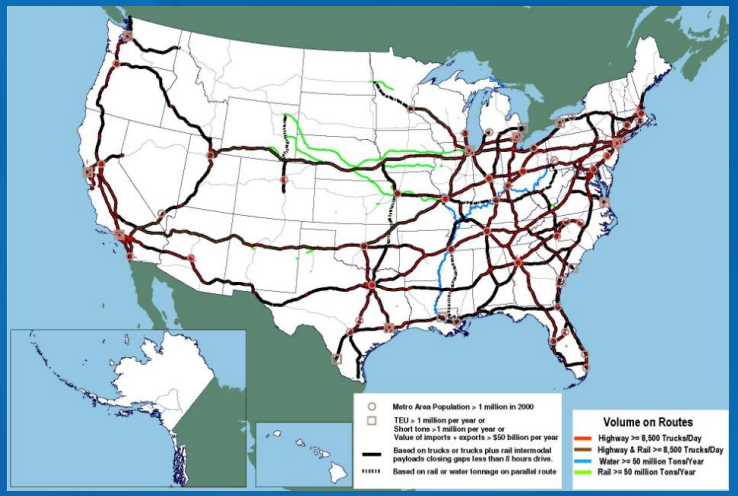
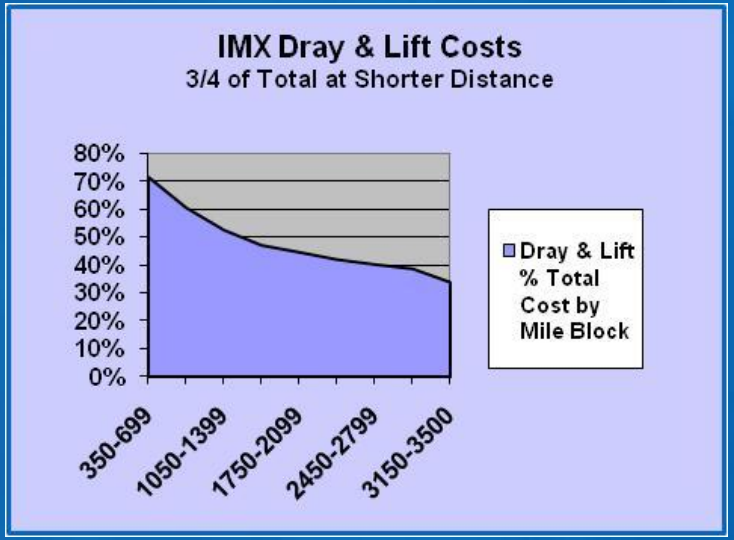
- Supply chains run end-to-end, integrated all the way to market
  - National network is a linehaul system
  - Depends on pickup, delivery, & transfer: largely urban
  - P&D is high cost, high risk part of operations
  - Urban networks are key to delivered performance
- No one is in charge of end-to-end public network performance
  - Like a supply chain without an organizing company
  - Tends to be managed for capacity not product

➡Implication: effective freight strategy is integrated end-to-end, rooted in metropolitan components



Source: FHWA



Source: NCHRP 8-42

Thank You!

PARSONS BRINCKERHOFF

Parsons Brinckerhoff
Freight & Logistics
Boston, MA
BryanJG@pbworld.com