

BNSF Railway

Inland Ports and High-Capacity, Asset-Intensive Transportation Networks

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Transportation Network Characteristics

High-capacity asset-intensive forms of transport – Air, Ocean, Rail

- Produce inherent economies of scale – low unit operating costs
- Yield higher levels of reliability and service
- Require freight/passenger density – i.e. large population centers
- Operate efficiently and profitably in large markets
- Require hub and spoke networks, scalable vehicles and/or operating subsidies to serve smaller markets

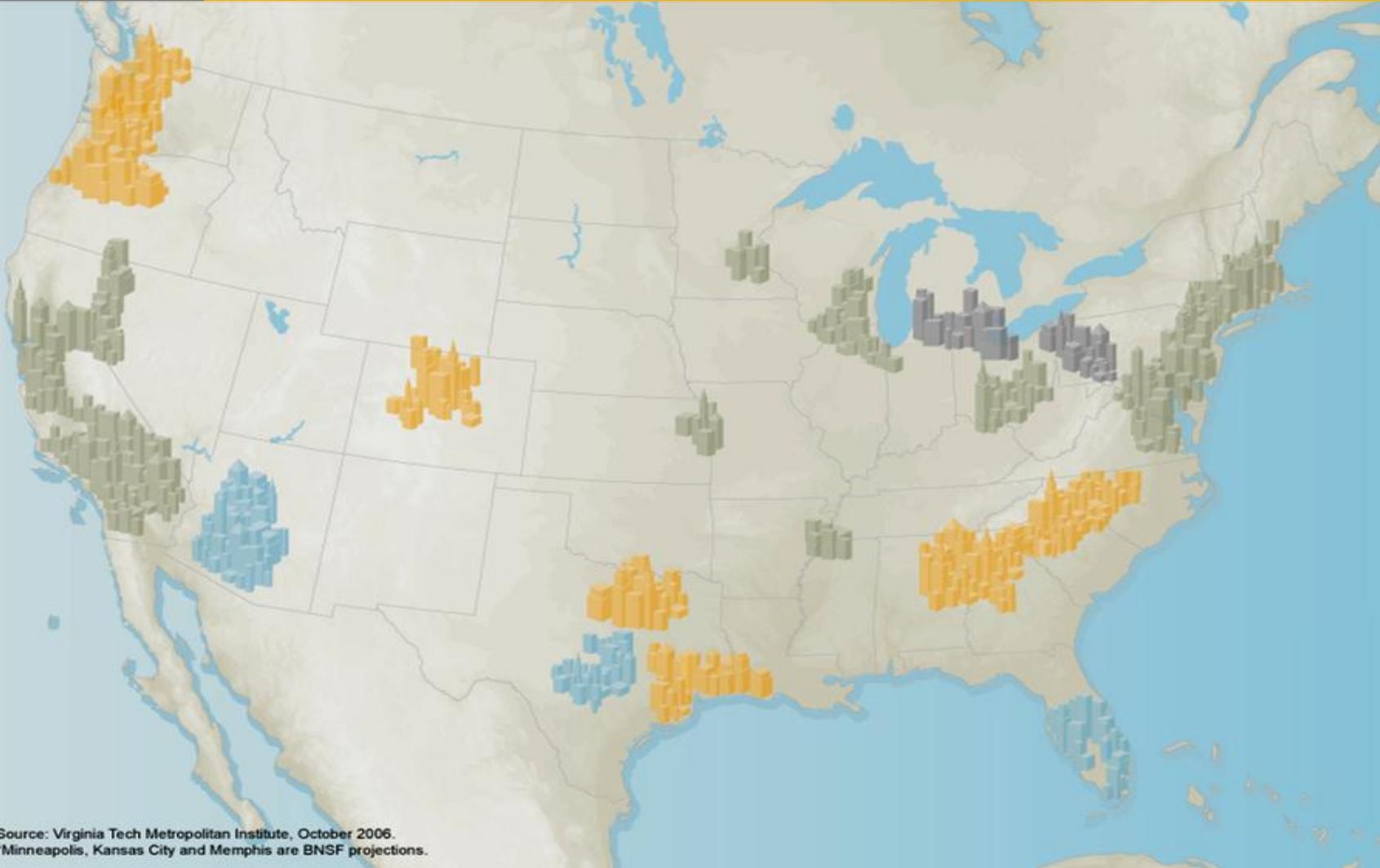
Key Factors in Determining Intermodal Rail Facility Success

- **Freight volume, density and balance**
- **Proximity to each other**
- **Market coverage**

Mode Comparison

	Truck	Intermodal Train	Ocean	Air
Unit of Shipment	1 truckload	1 unit train (150 – 400 truckloads)	1 ship (50 – 5000 truckloads)	5 – 300
Labor (2000 mile trip)	1 person	26 people (1 train)	5 – 20 crew	2 – 10 crew
Frequency of Service	Daily / Hourly	Daily volume dependant	Daily/Weekly volume dependant	Daily/Hourly
Annual Volume Required for Daily Service	365	91,250	1 Million	2,000 – 100,000
Transit	Mile/day: 500 Average MPH: 50 Operates: 10 hrs/day	Mile/day: 500 Average MPH: 21 Operates: 24 hrs/day	Mile/day: 500 Average MPH: ~20 Operates: 24 hrs/day	500 MPH
Route Infrastructure	Federal and State highway system	Privately owned rail network	Ocean & port infrastructure	Airways & airport infrastructure
Route Options	Virtually unlimited: multiple route options between origin and destination	Limited - Normally just one viable route between origin and destination	Virtually unlimited	Highly flexible
Scalable	Yes	No	Yes	Yes

Megapolitan – Demand Centers



Source: Virginia Tech Metropolitan Institute, October 2006.
*Minneapolis, Kansas City and Memphis are BNSF projections.

BNSF Rail Intermodal Facilities



BNSF Core Rail Routes

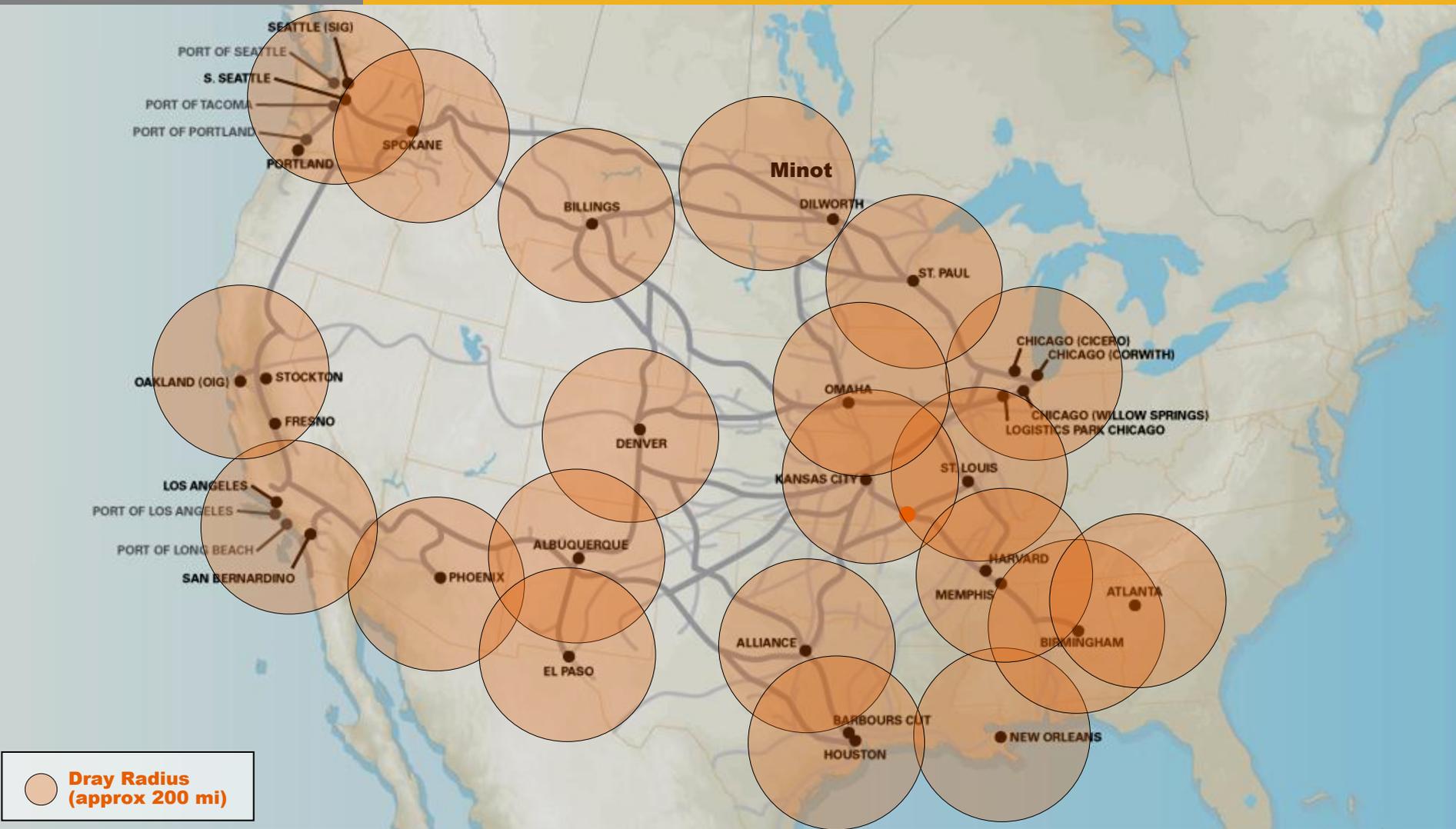


BNSF Intermodal Facility Network



Source: Virginia Tech Metropolitan Institute, October 2006.
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BNSF Market Coverage



Facilities Closed to Improve the Network

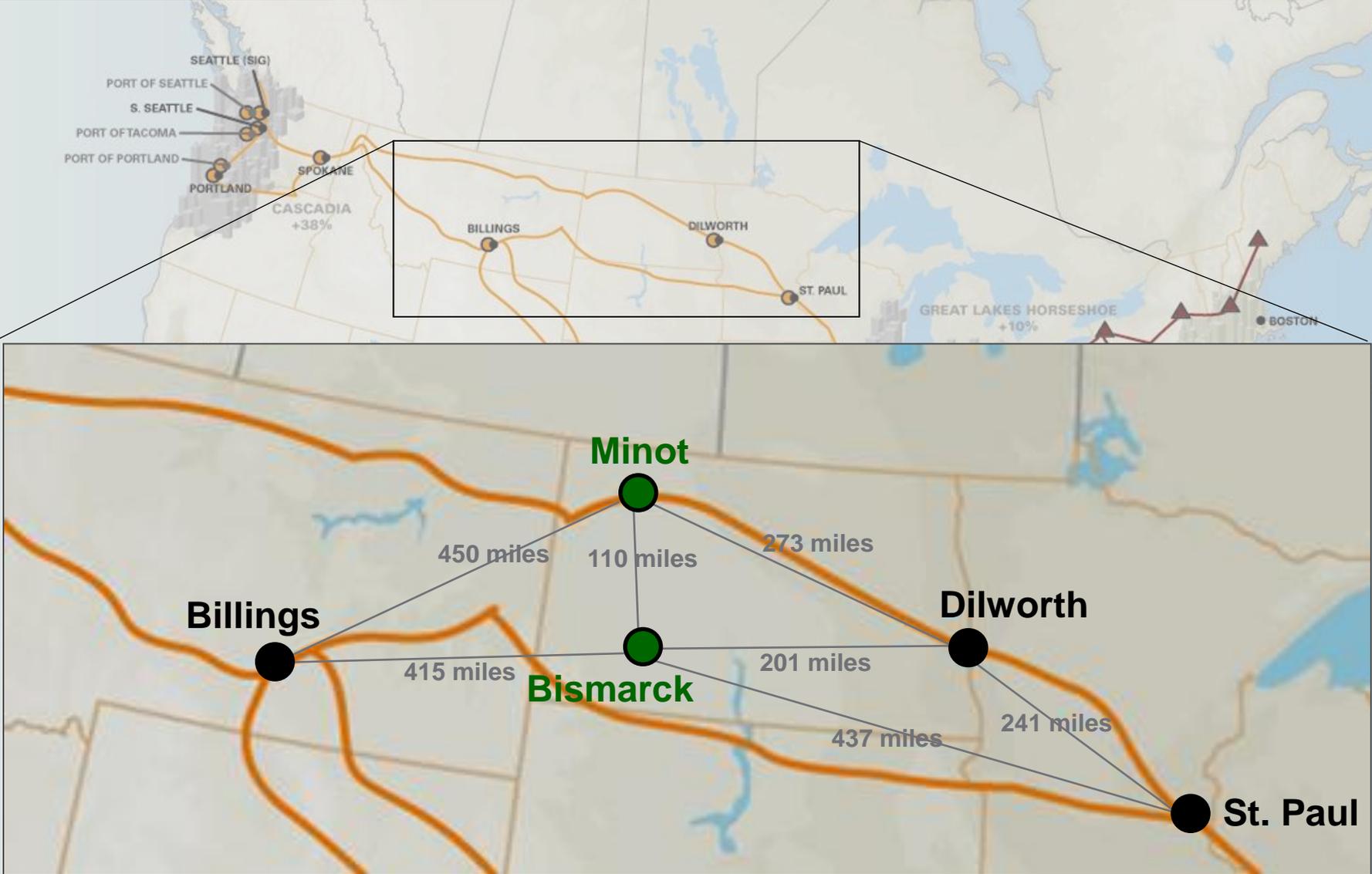


Facilities Proposed Due to Economic Demand

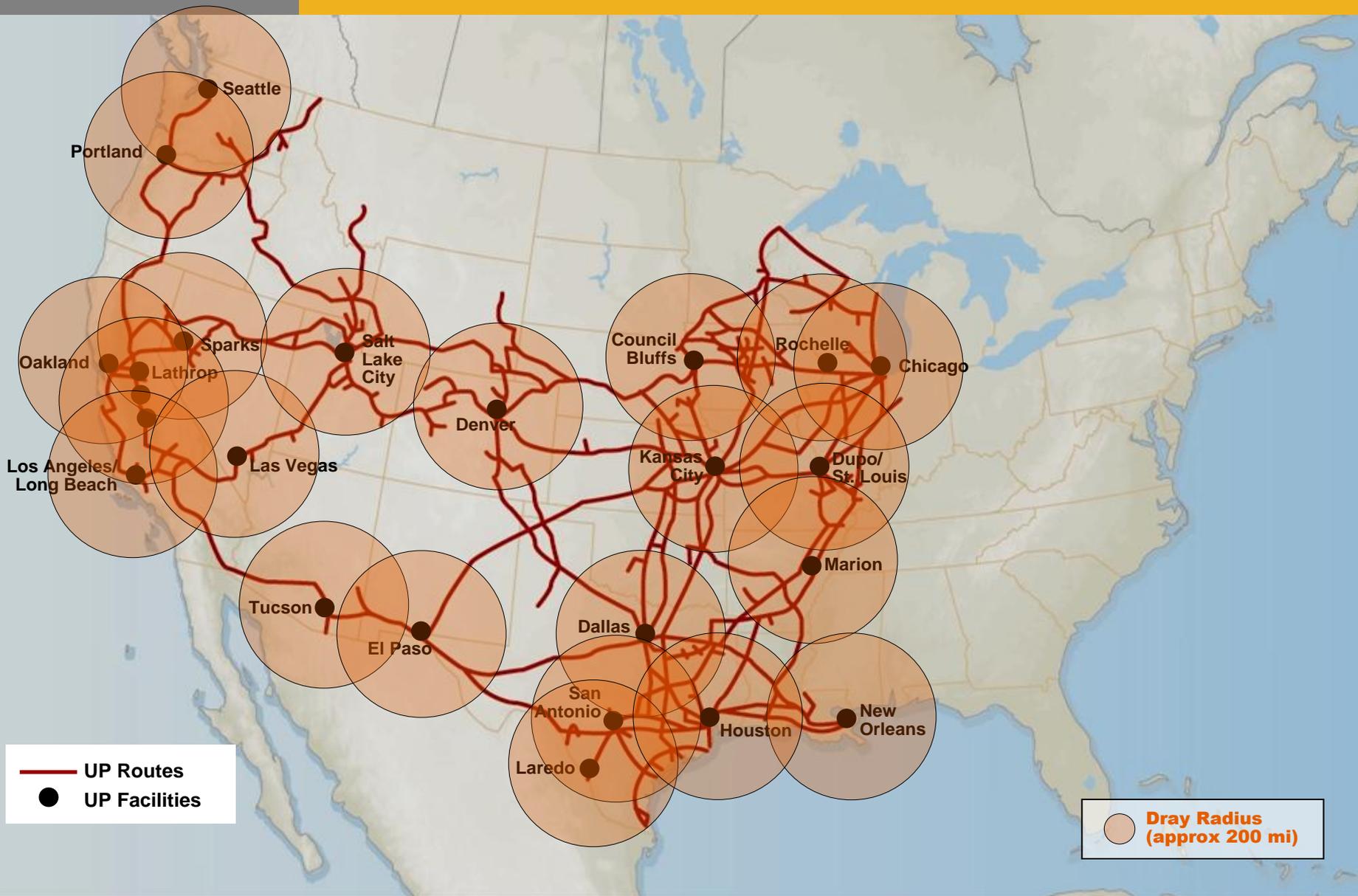


 **Development Requested**

BNSF – Montana / North Dakota



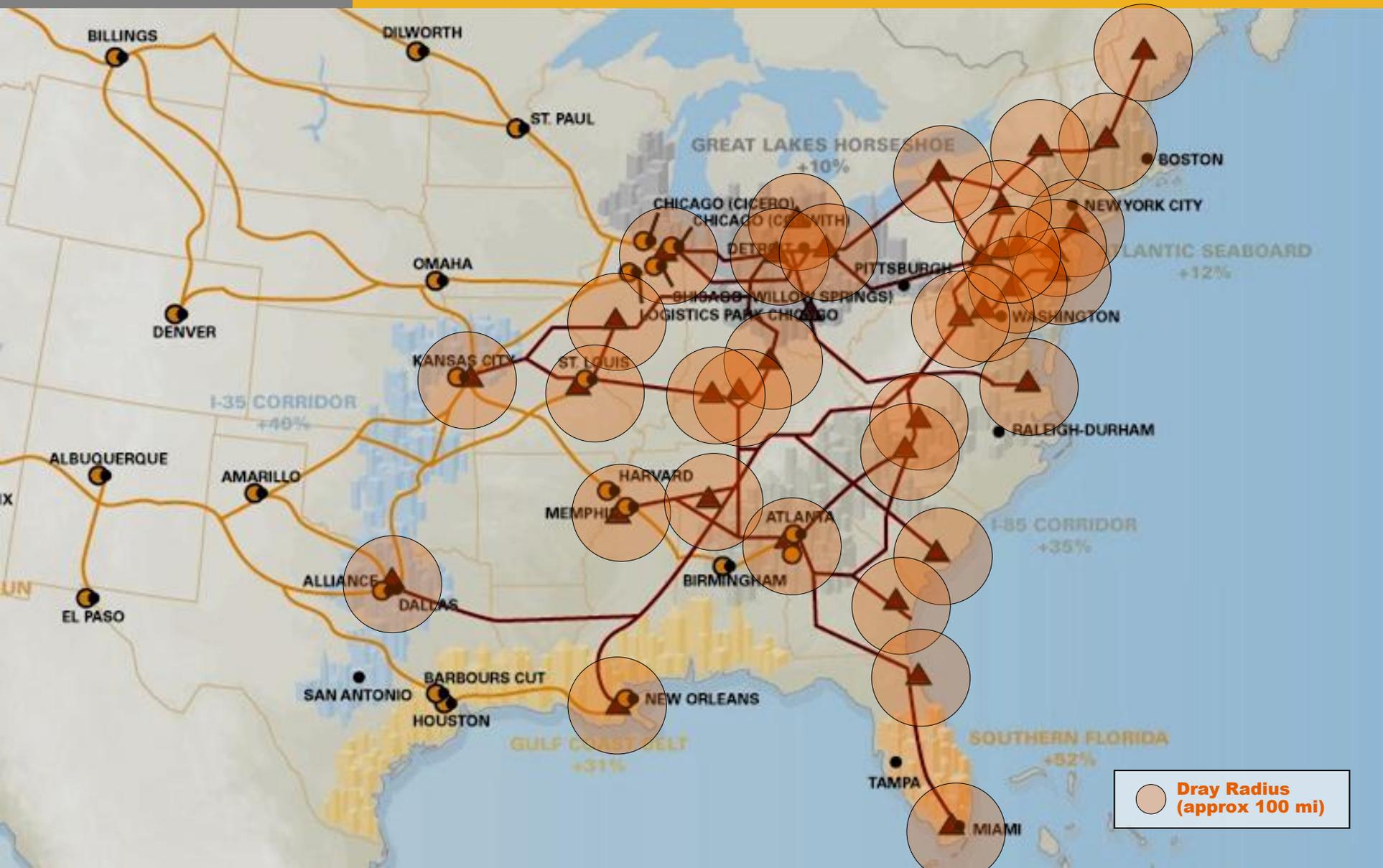
Western Networks: Union Pacific



Eastern Networks: CSX Intermodal



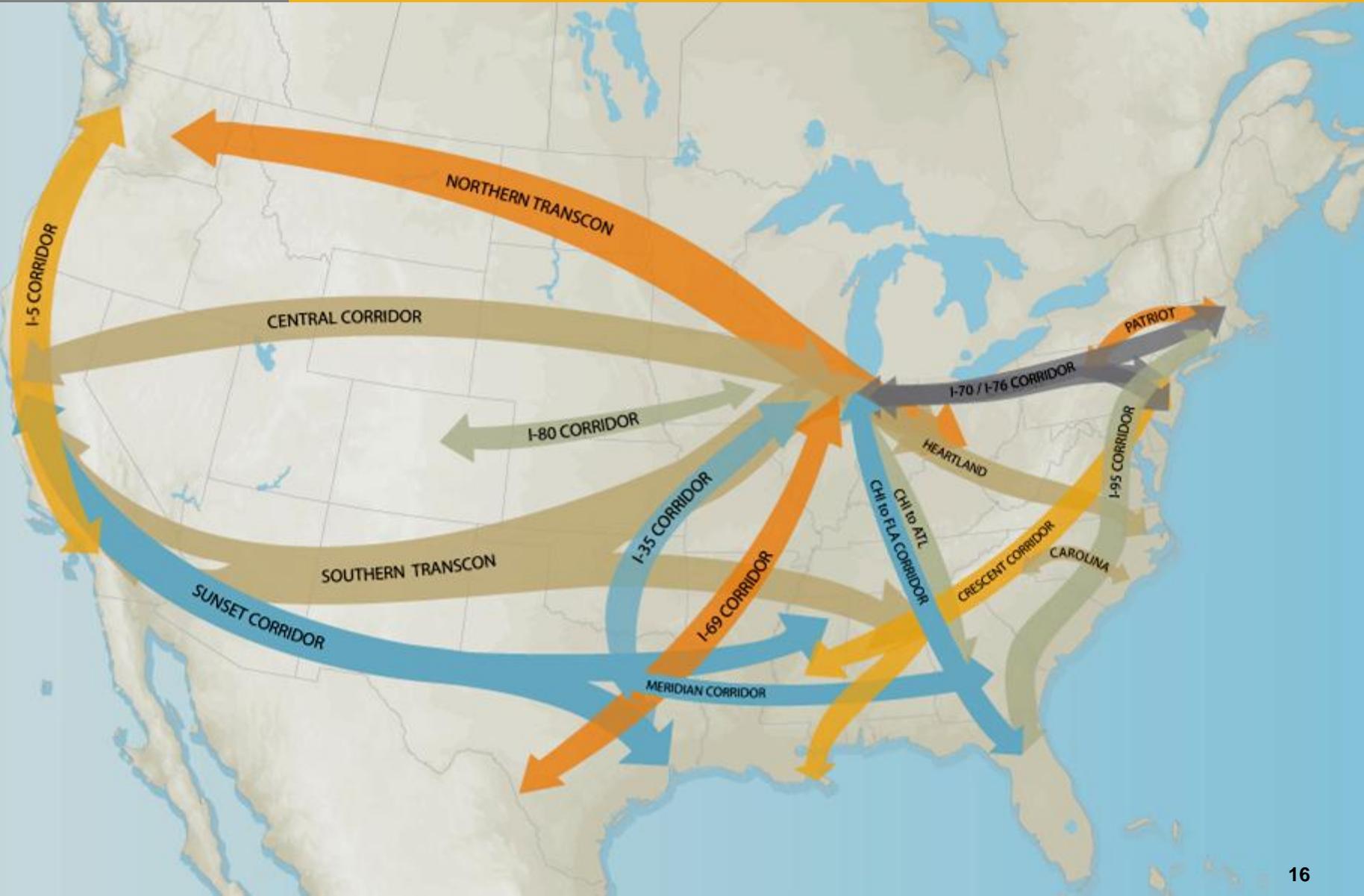
Eastern Networks: Norfolk Southern



Consequences: Improper Management of Facility Location

- **Complicates train make-up and dismantling process**
- **Complicates train operation with set-outs and pick-ups**
- **Adds time to overall transit**
- **Increases variability of service (less reliable)**
- **Increases costs of providing service**
 - **Facility operating costs**
 - **Train operating costs**
- **Makes it more difficult to make effective investments in infrastructure**

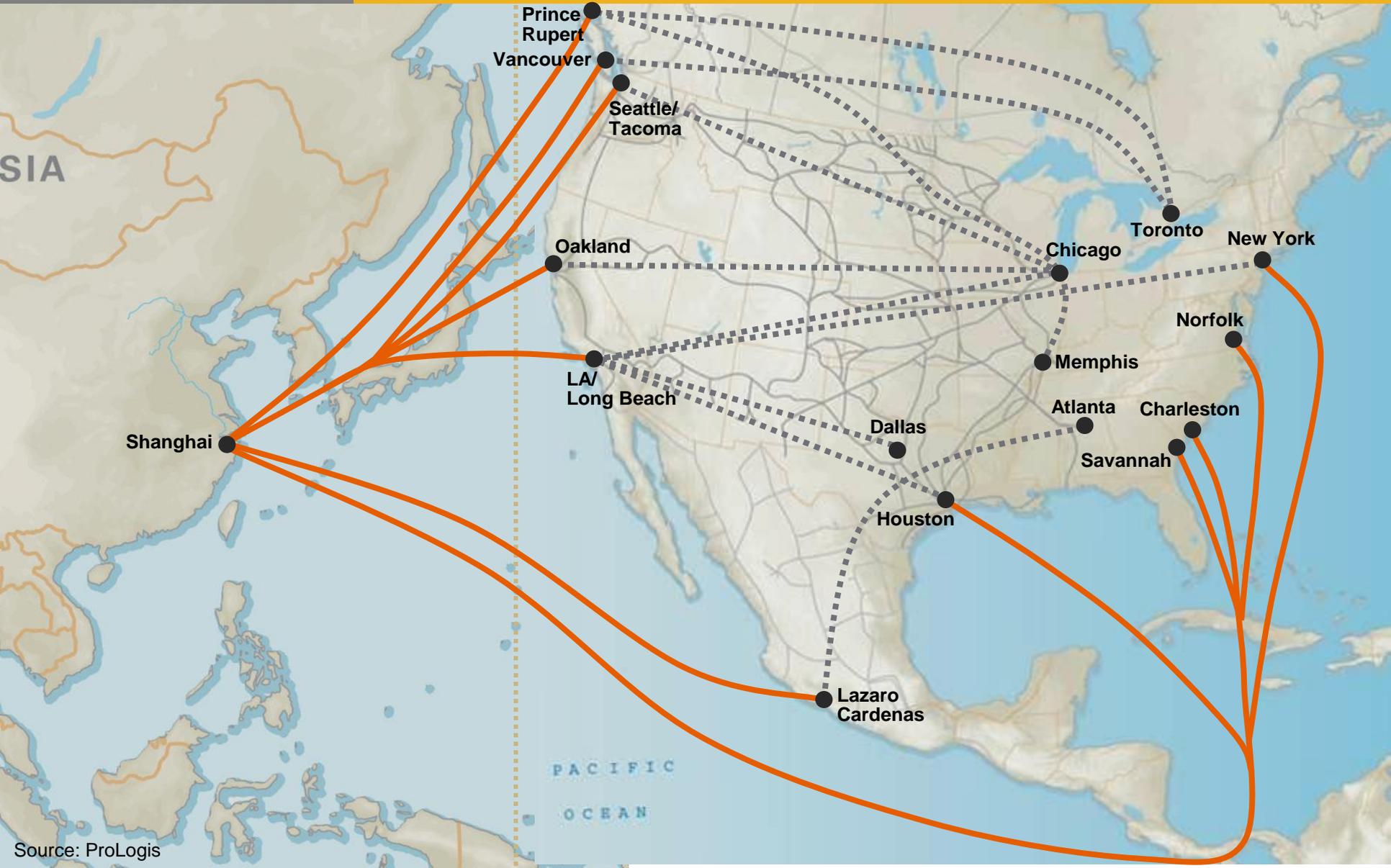
Major US Intermodal Corridors



Important Characteristics of Rail Intermodal Routes

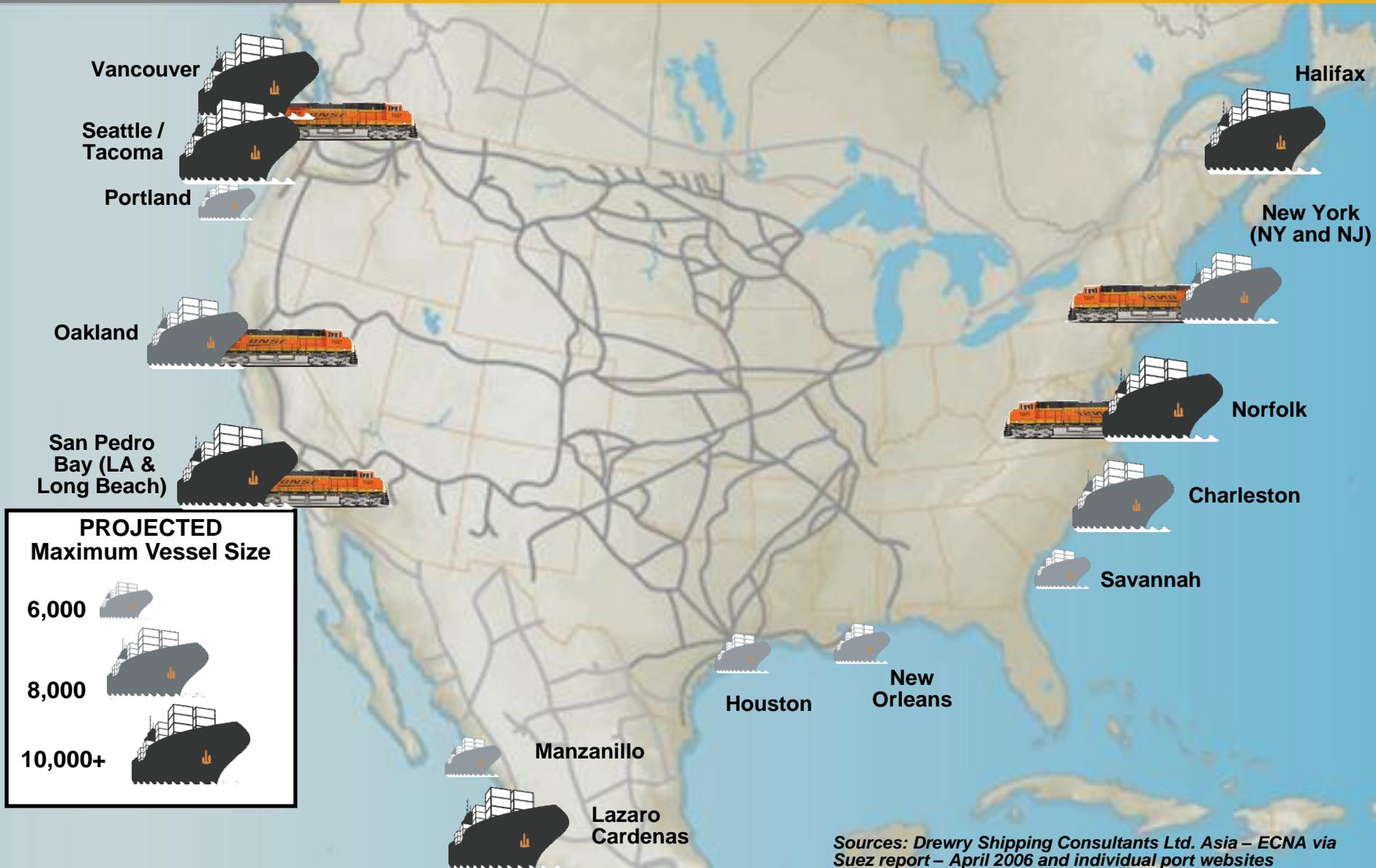
- **Connect major markets**
- **Connect to major ports**
- **High capacity**
 - **Signaling**
 - **Sidings**
 - **Single, double, triple main track**
- **Minimize route options (more density, less complex)**
- **Minimize gateways (more density, less complex)**

Ocean Container Shipping Routes

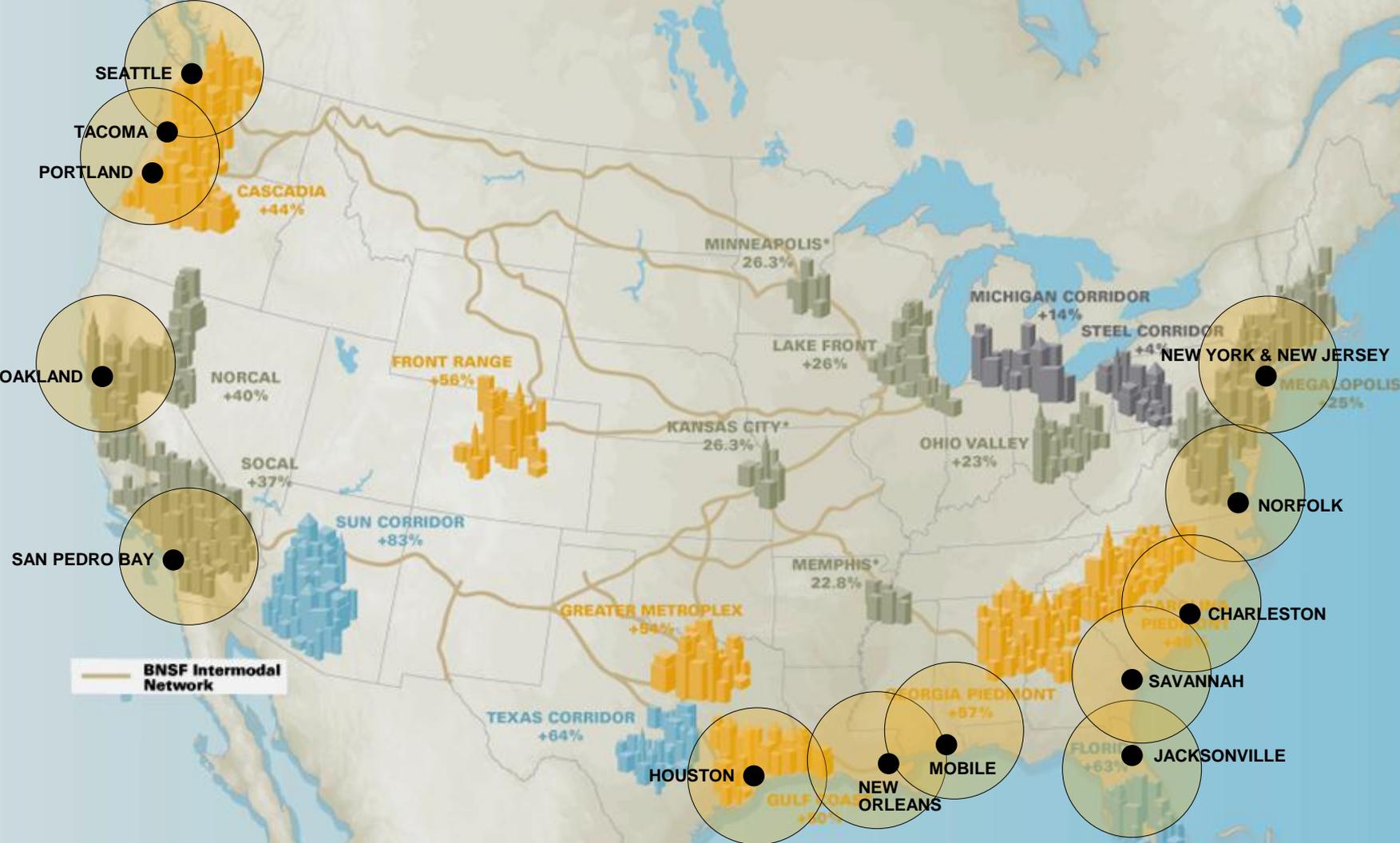


Source: ProLogis

Port Capacity and Gateway Capability

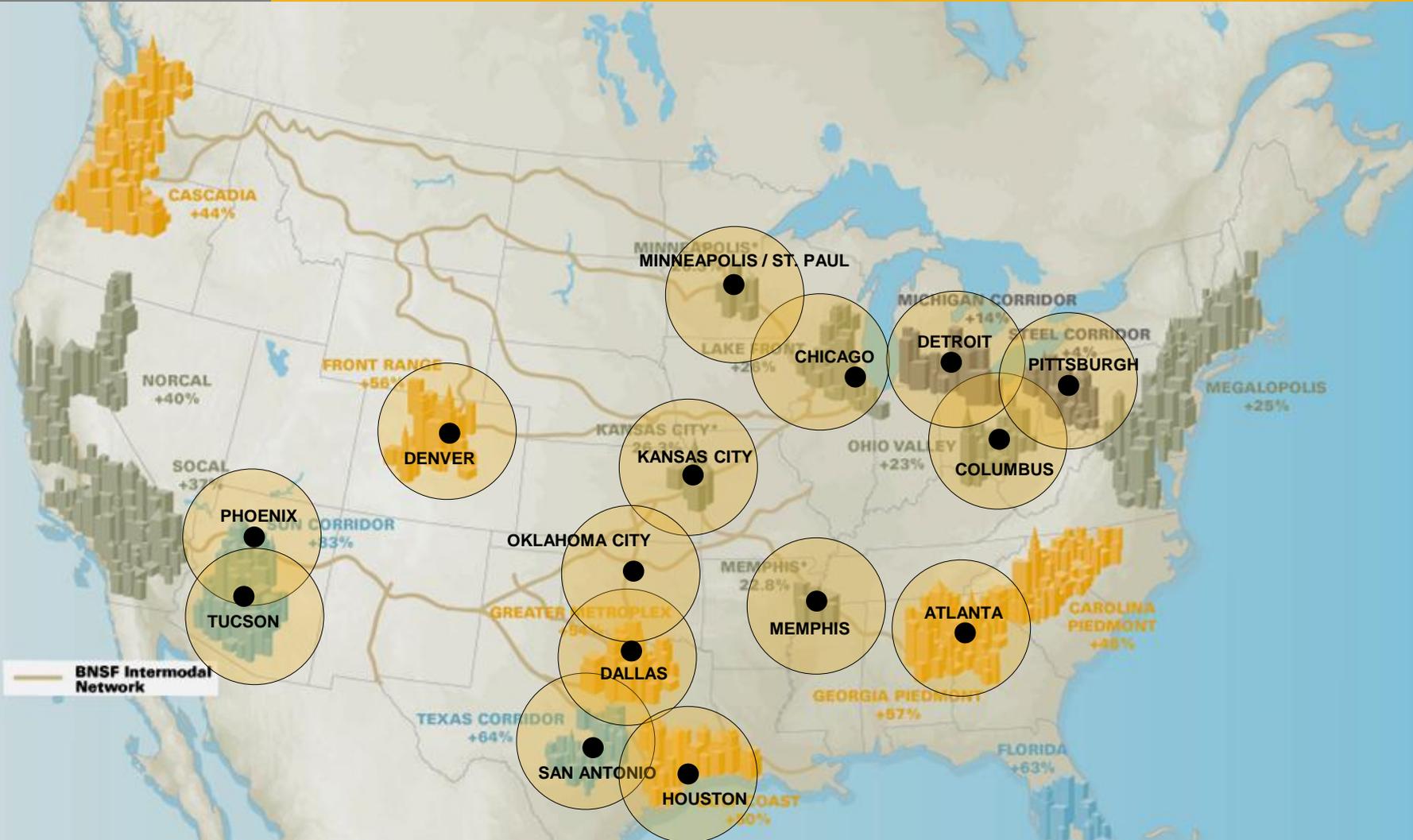


Local Port Markets



Source: Virginia Tech Metropolitan Institute, October 2006.
 *Minneapolis, Kansas City and Memphis are BNSF projections.

Inland Port Markets



Source: Virginia Tech Metropolitan Institute, October 2006.
*Minneapolis, Kansas City and Memphis are BNSF projections.

Important Characteristics of Container Port Facilities

- **Freight density**
- **Local market**
- **Proximity and market coverage**
- **Connectivity to core rail routes or inland waterways**
- **Common use facilities**
- **Water depth and infrastructure restrictions
(i.e. bridges)**

Conclusion

- **Freight density is critical to high-capacity, asset-intensive transportation networks**
- **Intermodal facilities (inland & port) are key to driving freight density**
- **Routes should be high capacity and options are/should be minimal**
- **Effective development of a rail intermodal network drives:**
 - **Reduction in intermodal service complexity**
 - **Reliability of Intermodal service**
 - **Intermodal profitability**

What You Can/Should Do

- **Transportation professionals need to do a better job of educating politicians/legislators and shippers on transportation networks**
- **Need to help define transportation networks of the future**
- **Need to help define a better process for allocating federal and state transportation money**