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53rd Annual TRANSPORTATION RESEARCH FORUM



Midwestern Logistics – Recent Changes

Bradley Hull PhD
John Carroll University
Cleveland, Ohio
March 17, 2012

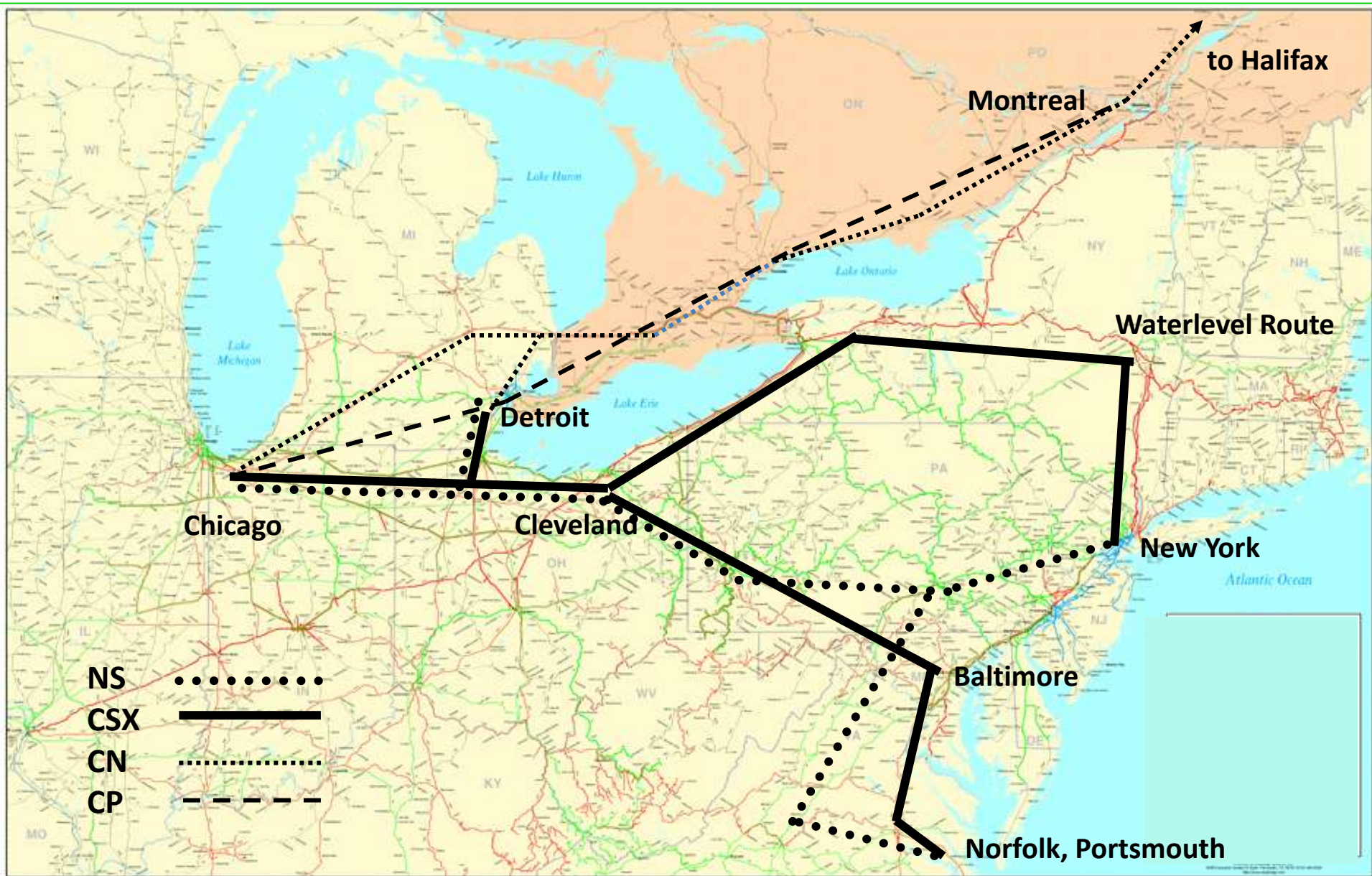
53rd Annual TRANSPORTATION RESEARCH FORUM



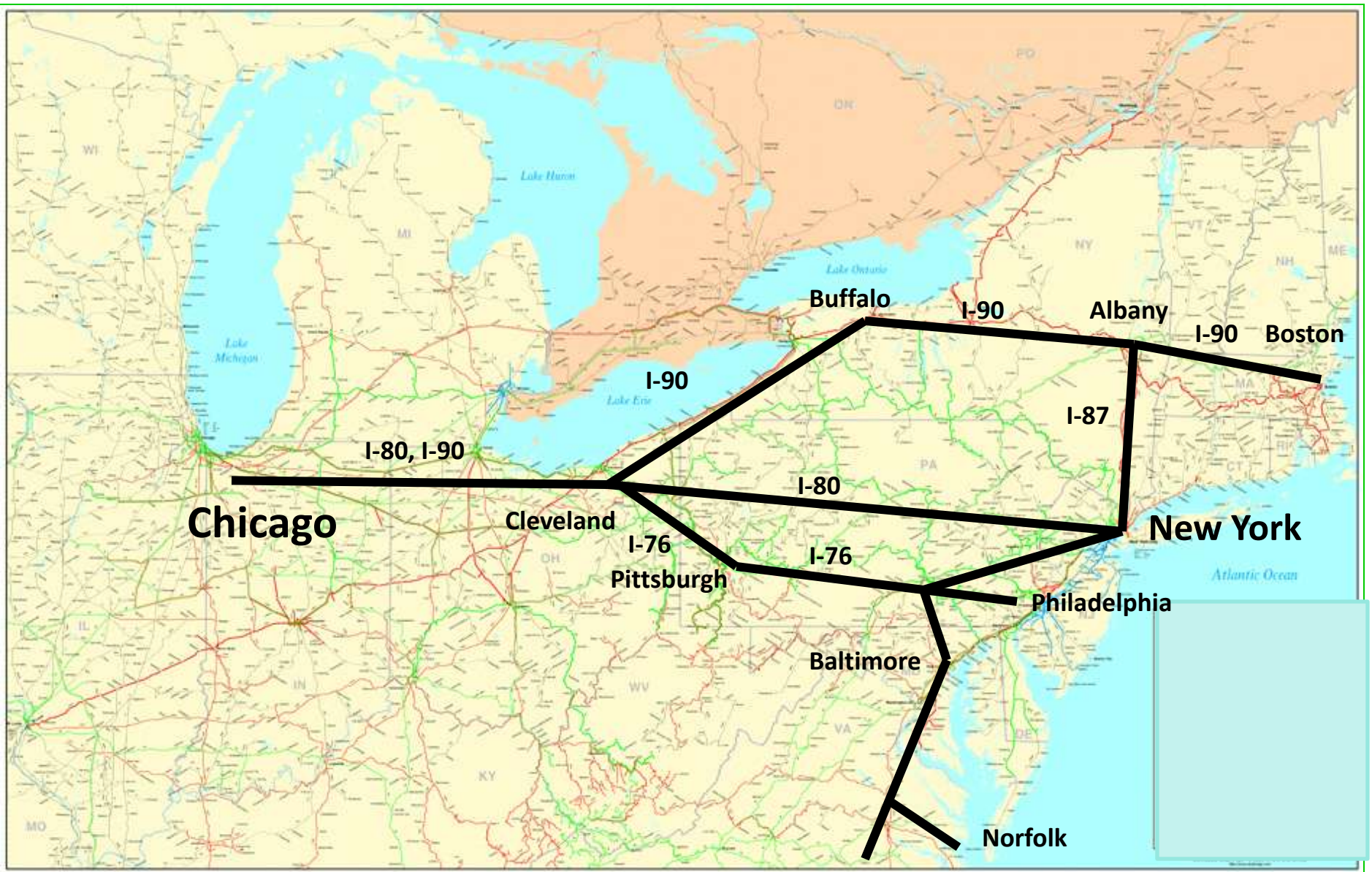
Midwestern Logistics – Recent Changes

- 1. Description of Chicago East Coast Corridor**
2. Exogenous factors
3. Infrastructure Changes
4. Further opportunities

TRADITIONAL CHICAGO-EAST COAST RAIL ROUTES



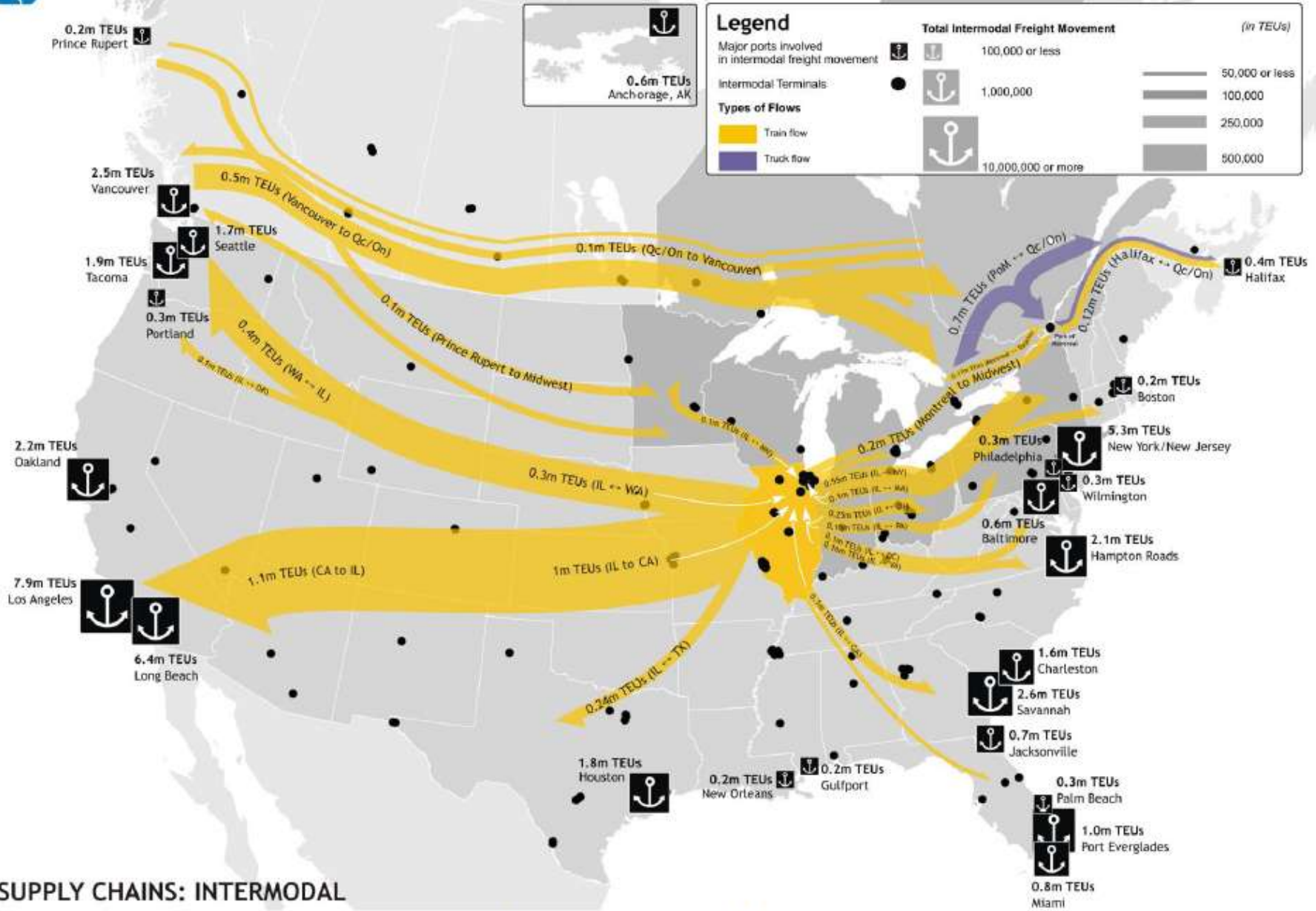
TRADITIONAL CHICAGO-EAST COAST TRUCK ROUTES



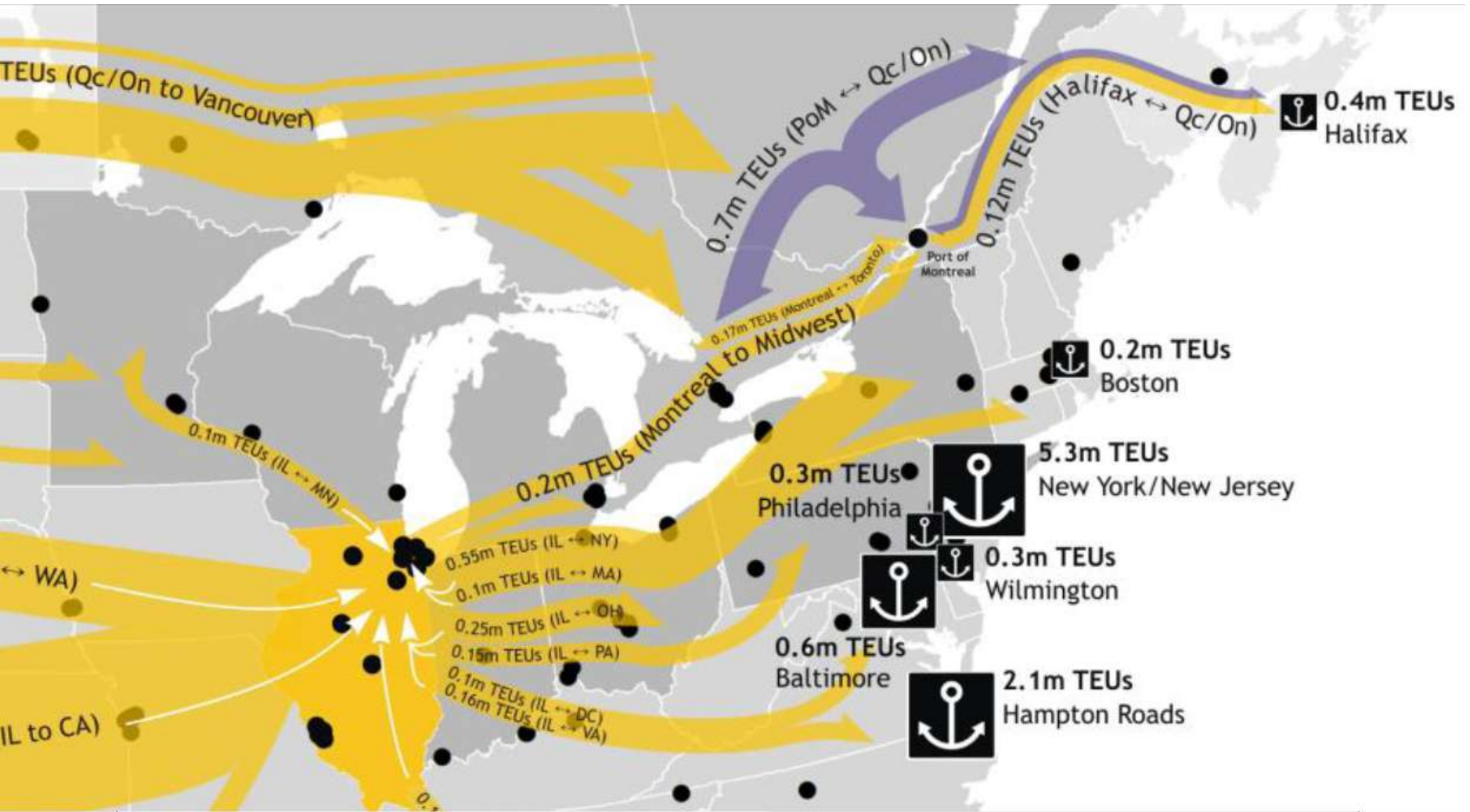
US Toll Roads



Source: Jean-Paul Rodrigue



KEY SUPPLY CHAINS: INTERMODAL



CPCS Transcom Ltd: Multimodal Freight Transportation Within The Great Lakes St Lawrence Basin

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Exogenous Factors:

New Panama Canal @ 50'

Global Manufacturing Shift to India/SE Asia – Suez Canal Route @ 66'

US Manufacturing Shift South

Increasing Fuel Cost

High Greenhouse Gas Emissions of Trucks

Reduced Availability of Trucking

Resulting In:

Shift to Rail Intermodal from Truck

Norfolk, Baltimore, New York dredged @ 50':

Rail Capacity Expansions from East Coast/Midwest

Rail debottlenecking from West Coast/Chicago



How Far on \$500 Worth of Diesel?



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Norfolk Southern RR

1 day transit
Norfolk/Columbus

Corridor:
\$191 million

Corridor, ports,
terminals:
\$300 million



- Heartland Corridor
- Heartland Connector

Heartland Corridor/East Coast Access



Columbus/Cincinnati Connector:
Southern Access

Toledo Airline Yard Expansion:
Switching NY for Chic, Detroit,
Columbus

Norfolk Southern RR



<u>Completion Dates</u>	
Titusville	2009
MSLLC	2011
Heartland	2011
Patriot Corridor	2012
Crescent Ph I	2012

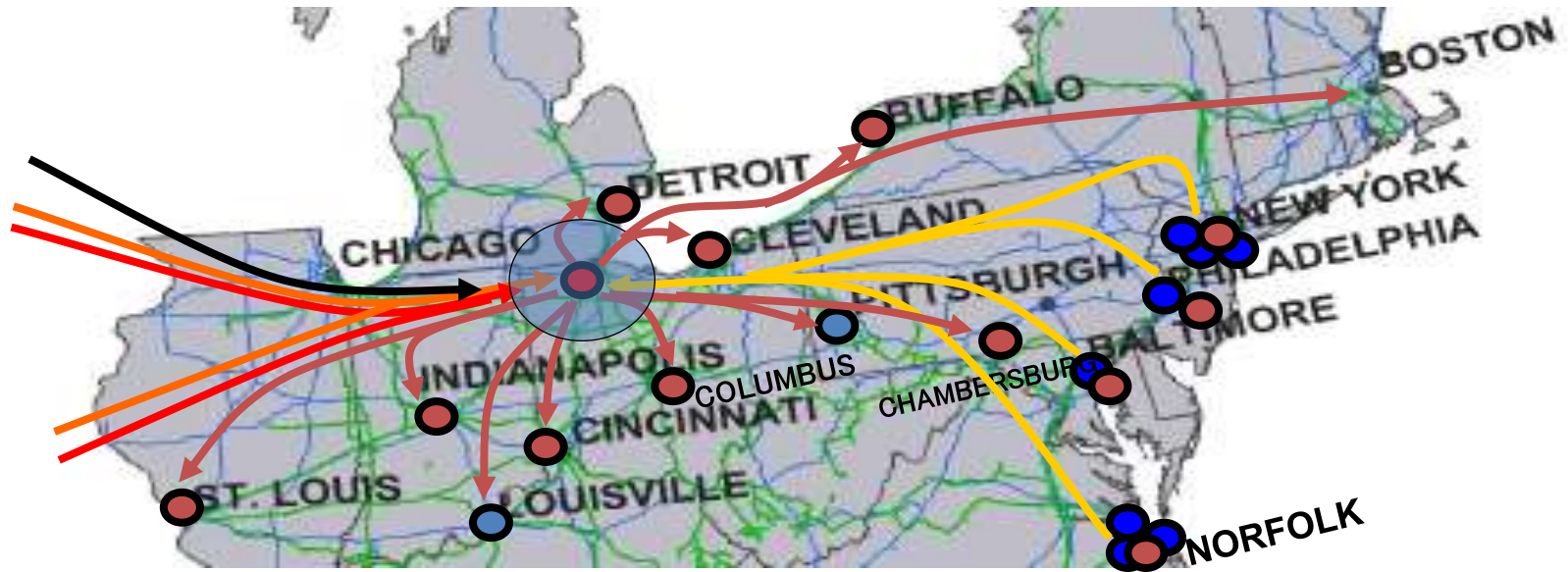
CSX RR National Gateway

\$842 million



CSX RR

North Baltimore Ohio – Midwest Hub



- Terminal allows Chicago run-through service
- Hub strategy will significantly improve routing efficiency
- North Baltimore hub accesses: Chicago, NY, Norfolk, Portsmouth, Detroit, Cleveland, Columbus, Cincinnati, Montreal (new IM terminal)
- New terminal at Pittsburgh when doublestacking is complete.

Network capability will increase



TOLL ROADS



US DOT CORRIDORS OF THE FUTURE



Turnpike Tolls for a 5-Axle Truck

Interstate	Origin/Destination	5-Axle Truck Toll as of September 2011
I-80/90 (Indiana Toll Road)	West Entrance (Chicago area)/East Entrance (Ohio)	\$30.90-\$30.93
I-80 (Ohio Turnpike)	West Entrance (Indiana)/East Entrance (Pennsylvania)	\$32.00-\$40.00
I-76 (Pennsylvania Turnpike)	Ohio Entrance/Valley Forge (Philadelphia Exit)	\$139.24-\$148.75
I-76 (Pennsylvania Turnpike)	Ohio Entrance/Breezewood (Baltimore-Washington Exit)	\$74.26-\$79.35
I-90 (NY State Thruway)	Pennsylvania Entrance/Albany Albany/NYC	\$64.40-\$82.45 \$41.81-\$65.95

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Area	Population	Infrastructure Spending
Chicago-Naperville-Michigan City	9,686,021	\$1500 million
Detroit-Warren-Flint	5,218,852	0
Cleveland-Akron-Elyria	2,881,937	0
Pittsburgh-New Castle	2,447,393	New CSX terminal
Columbus-Marion-Chillicothe	2,172,191	~\$300 million
Toledo (Lucas and Wood Ctys)	566,970	~\$842 million

Lack of Infrastructure Spending in SE Michigan and NE Ohio

- Cleveland loses rail/truck hub status
- Detroit remains a Chicago spoke

Cleveland, no longer a hub:

- No major RR investments in Cleveland
- Originally was a switching hub for NS, CSX.
- NS Cleveland terminal: an origin/destination for NY and Chicago TEUs, but no switching. Additional trucks to/fr Columbus?
- CSX Cleveland terminal: an origin/destination for CSX North Baltimore hub
- Large population area

Detroit, a Chicago spoke:

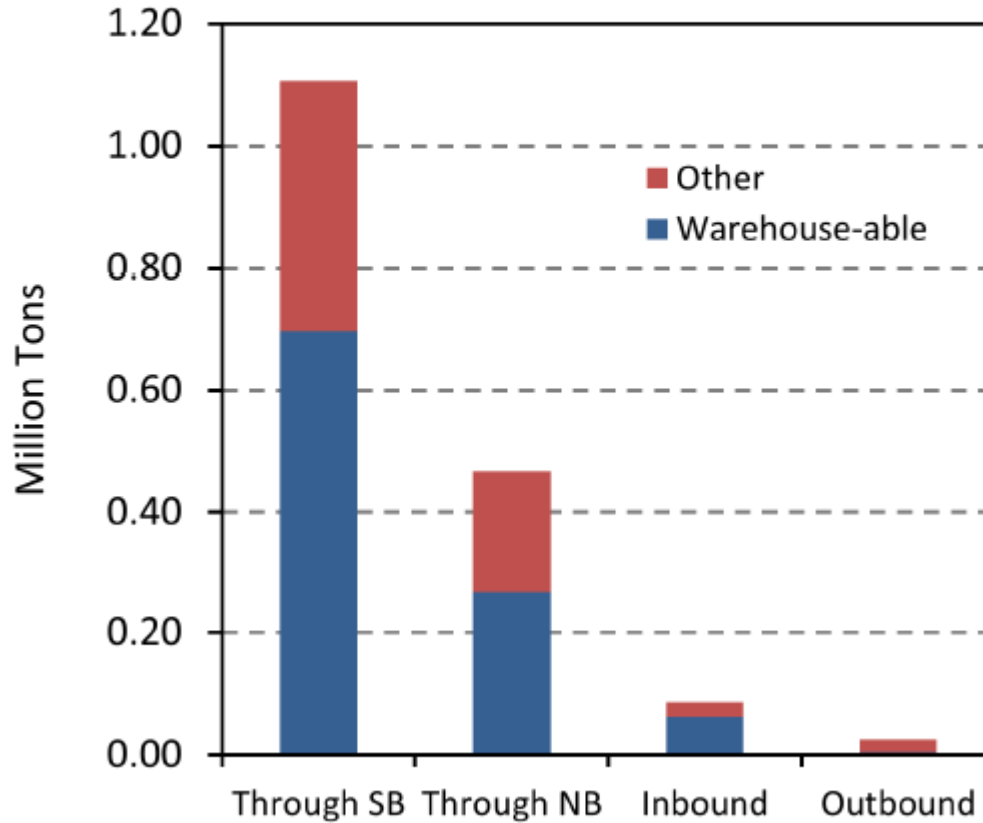
- 200,000 TEUS by rail Detroit to/fr US ports
- Detroit is 250 miles from Chicago
- Detroit receives many TEUS from Chicago by truck on I-94
- Few direct Canadian rail TEUS: 4000 TEUS Detroit to/fr Halifax, 11000 TEUS Detroit to/fr Montreal. 88% of Canadian rail to Detroit passes through. (TranSystems, Translinked Freight Study)
- Michigan has few DCs and little employment in “General Warehousing and Storage”
Location quotients: MI .55, OH 1.56, IN 1.71, ILL 1.50 (Detroit Chamber)
- CN Transit time Halifax/Detroit = 3.6 days versus Halifax/Chicago = 3.1 days
- CP Detroit/Windsor tunnel not fully double stack capable



Recent Detroit Rail Improvements:

- NS shorter transit times from Norfolk
- NS improved access to NY through Toledo Airline terminal
- Consistent CSX service through North Baltimore
- No CN or CP service improvements

Figure 2-27: Detroit BEA – Cargo Flows with the Montreal CMA in 2009



TranSystems: Translinked Freight Study, prepared for Detroit Regional Chamber

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4. **Further opportunities -- Rail**



Canadian Railroads serve Detroit and Chicago

GLITTH: Great Lakes Trading and Transp'tn Hub

Less well served

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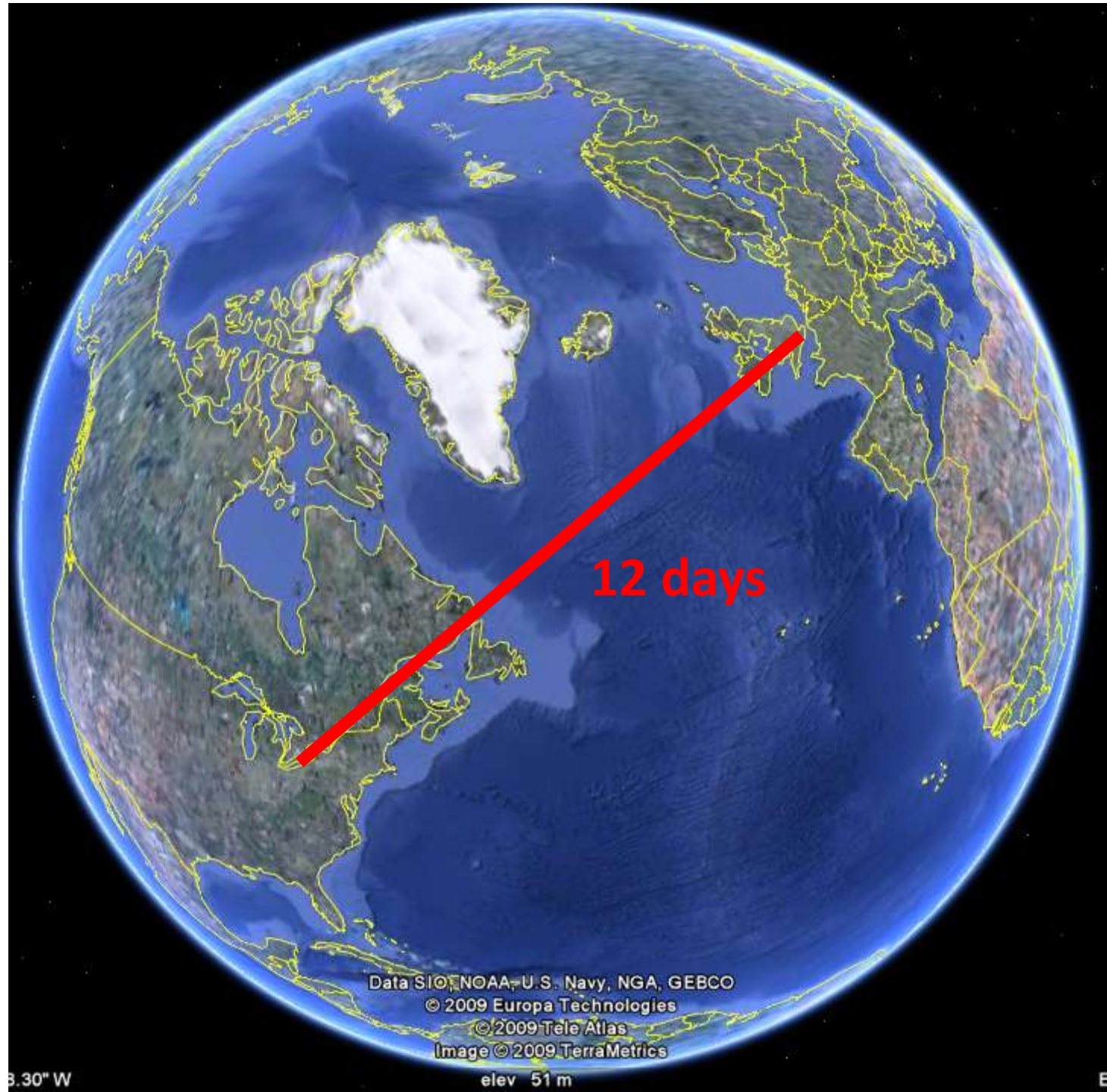
Q: If you sail from Cleveland through St. Lawrence Seaway and across the Atlantic Ocean in a straight trajectory. Where do you arrive?

- A) North Pole**
- B) Greenland**
- C) Iceland**
- D) Scandanavia**
- E) Rotterdam/Antwerp**

Ans: E

Great Circle Route

Cleveland/
Rotterdam
12 days



Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Europa Technologies
© 2009 Tele Atlas
Image © 2009 TerraMetrics

8.30° W

elev 51 m

E



SEASONALITY???

SHIP SIZE??

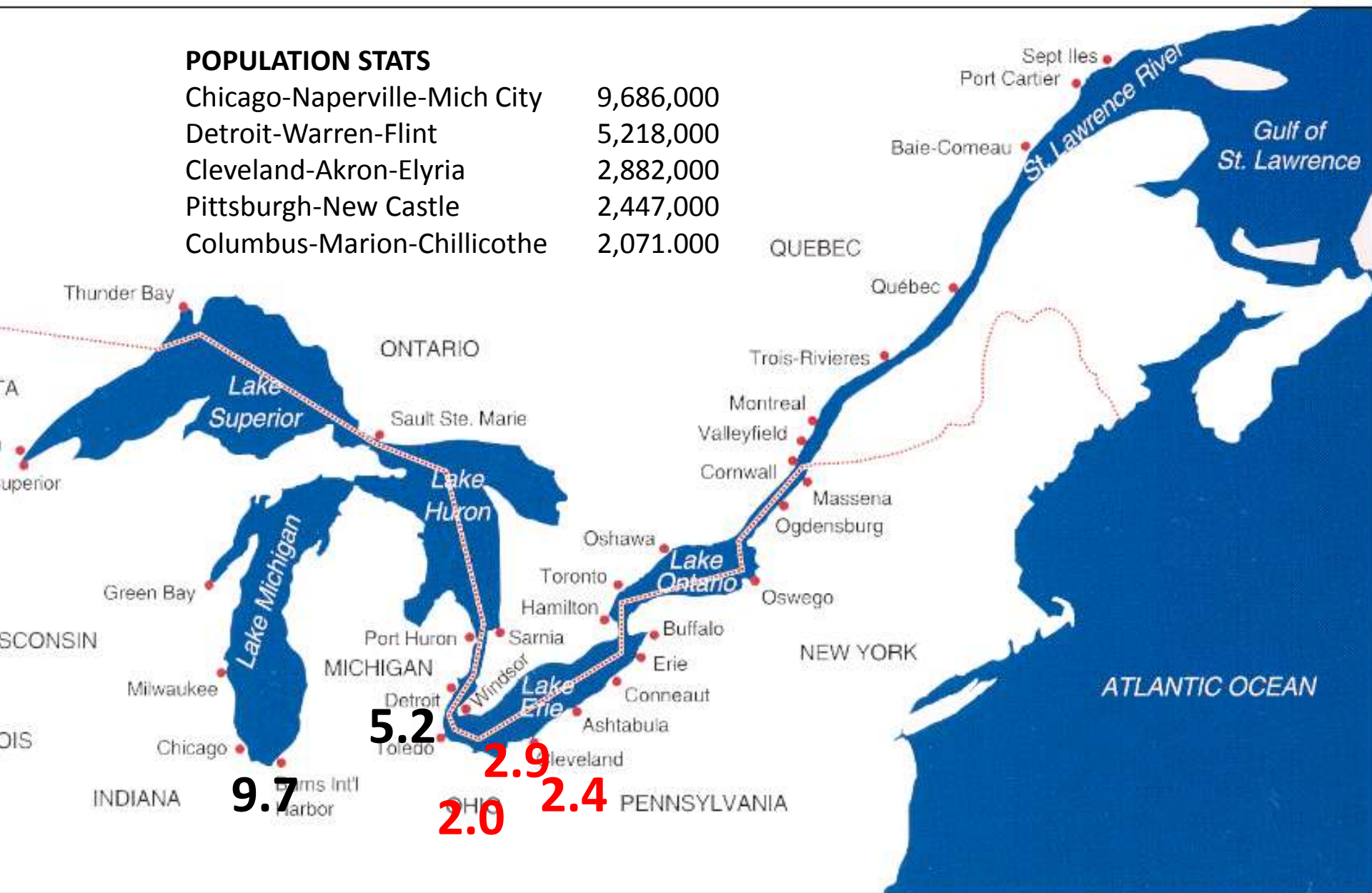
Seaway is closed late December till mid March, but could remain open longer

The steel industry has used the system for >50 years. Transit N. Europe to Cleveland = 12 days



POPULATION STATS

Chicago-Naperville-Mich City	9,686,000
Detroit-Warren-Flint	5,218,000
Cleveland-Akron-Elyria	2,882,000
Pittsburgh-New Castle	2,447,000
Columbus-Marion-Chillicothe	2,071,000



DETROIT/HALIFAX – A LARGER MARKET AREA?

INTERNATIONAL CONNECTIONS

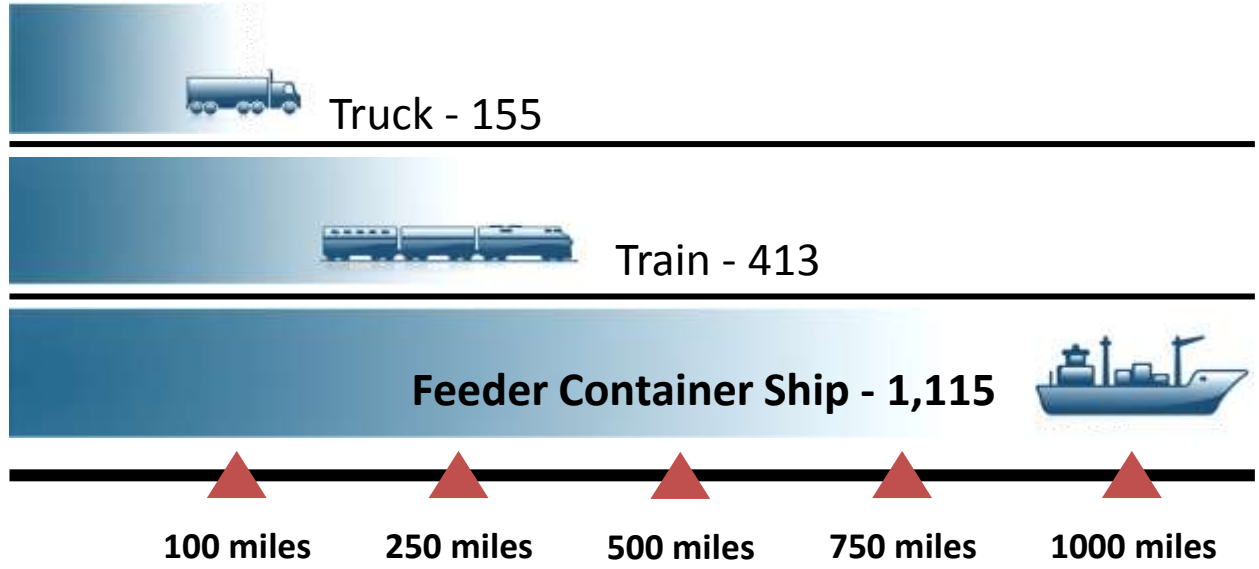
Montreal
Halifax



THE BENEFITS

Miles that 1 gallon will transport 1 ton of cargo

Fuel Efficiency:



Protection from Diesel price spikes:



Source: U.S. Energy Information Administration



Great Lakes St Lawrence Seaway:

2340 miles long, 27' deep, 600' rise with 16 locks

At least 50% available capacity !!



Rhine-Main-Danube Canal:

766 miles long, 13' deep, 1300' rise with 16 locks

A major European commercial artery