



CMAP

GO TO 2040

Freight Fluidity

Chicago Regional Perspective

December 10, 2015

Congestion

I-55 Congestion Scan: Average Speeds by Time of Day by Milepost

Can You Find the Corwith Intermodal Terminal?

But What Does It Mean?

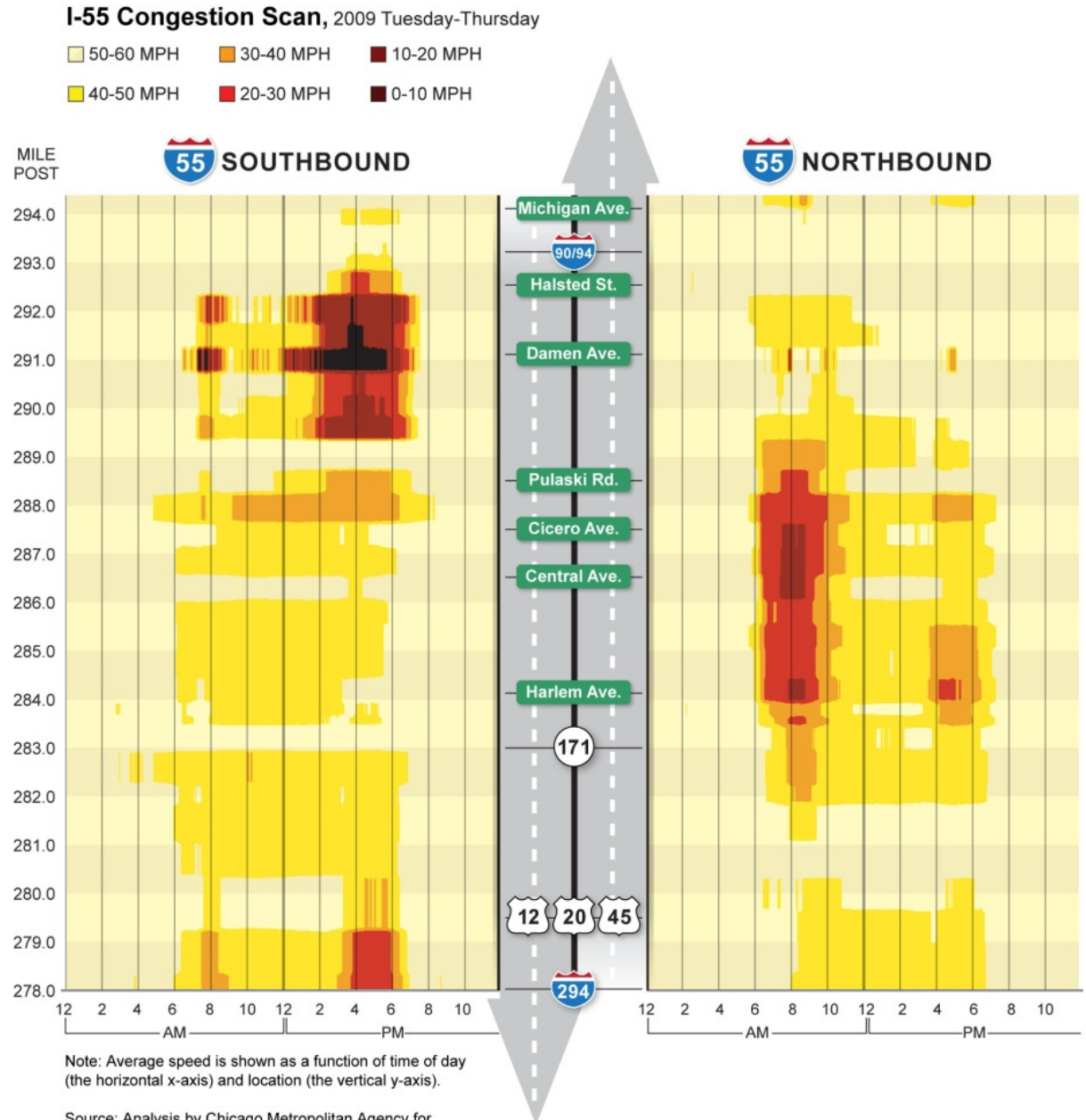


Image: CMAP

Supply Chain Performance Measures: Chicago Regional Perspective

Focus of My Discussion:

- On-Going Improvements to CMAP's Ability to Model the Freight System
- How the Development of Supply Chain Performance Measures Could Support the Long-term Development, Validation, and Application of the Models
- Improving Basic Understanding of the Freight System

Regional Freight Models



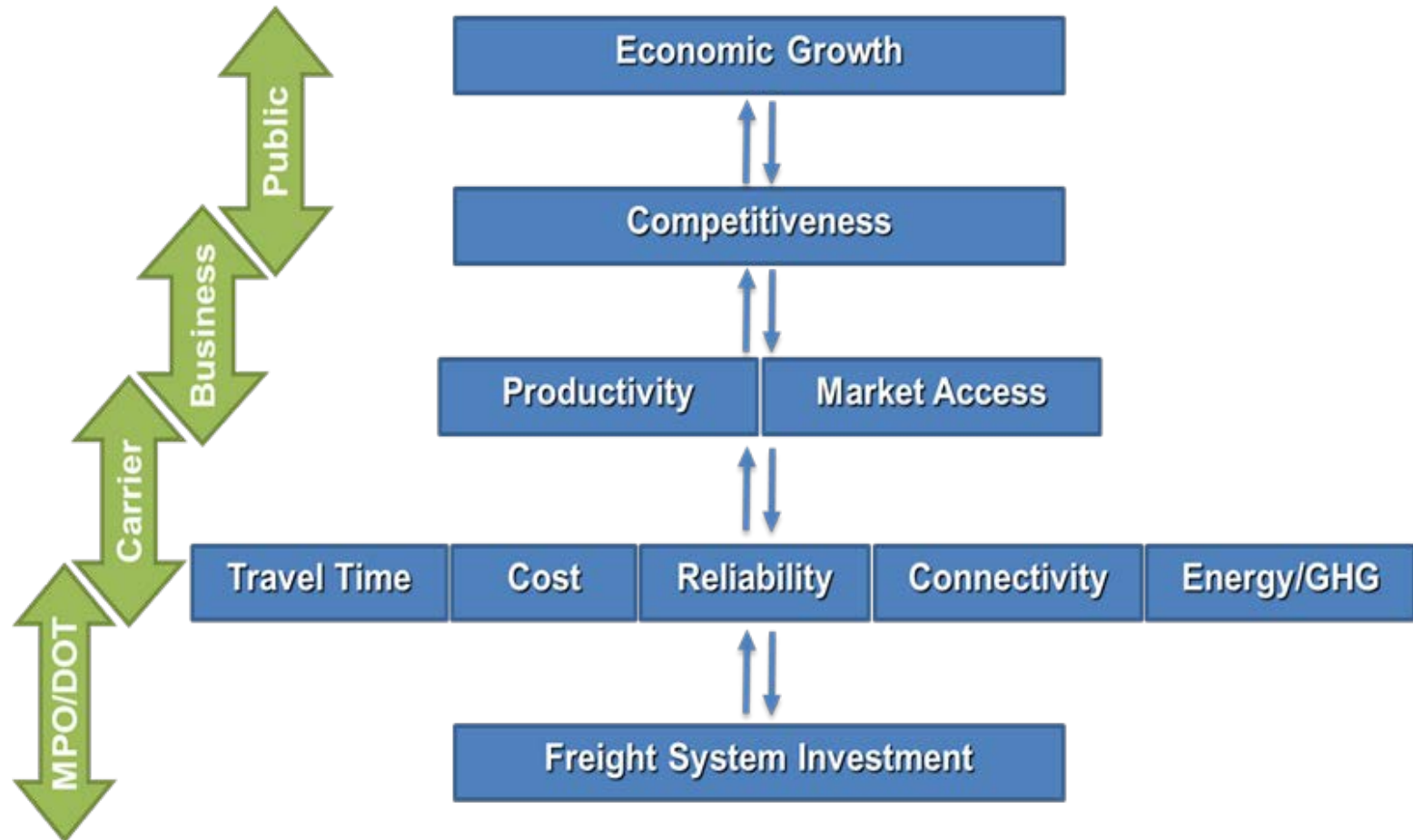
“Essentially, all models are wrong, but some are useful.” - George Box, FRS, and Norman Draper

Regional Freight Models

Development of GO TO 2040 Comprehensive Regional Plan revealed deficiencies in CMAP's former trip-based freight models.

- ▣ Not responsive to policy
- ▣ Not responsive to facility improvements or market changes
- ▣ Don't address the economic development issues that propel regional interest in freight.
- ▣ Really not useful at all.

Core Freight Planning Principles Or, How to Get What You Want



Regional Freight Models (1)

National Supply Chain Model

- Firm Generation

 - (from County Business Patterns)

- Producer Firms' Production Capacity

- Consumer Firms' Purchase Requirements

 - (from Input/Output Tables)

- Similarly for Imports and Exports

 - (from USA Trade Online)

Source: Craig Heither

Regional Freight Models (2)

National Supply Chain Model (Continued)

- Simulate Distribution Channel
- Simulate Shipment Size and Frequency
- Simulate Cost of Shipping via Different Modes (linehaul, storage, damage, handling fees)

Source: Heither

Regional Freight Models (3)

National Supply Chain Model (Continued)

Business Transactions:

- ❑ Buyers Consider Shipping Times, Cost and Minimization of Supply Chain Disruptions
- ❑ Sellers Consider whether to Trade with a Buyer in the Face of Other Offers
- ❑ Firms Form Trading Preferences Based on Past Experience
- ❑ Outcome Reflects Purchase Contracts between Sellers and Buyers

Source: Heither

Regional Freight Models (4)



Flexible Extension for Scenario Testing:

- Macroeconomic Conditions
- Transport and Logistics Costs
- Business Operating Strategies

Source: Heither

Regional Freight Models (5)

Regional Truck-Touring Model

- Trip Assigned to Warehouse/Distribution Center
- Estimate size of shipment & truck
- Estimate tour pattern, duration of stops, start time

Source: Heither

Regional Freight Models (6)

Notable Capabilities

- Not only identification of bottlenecks, but the capability to estimate the products/commodities affected
- Ability to complete scenario testing, including policies, facilities, and economic relationships
- Development partnership with FHWA (RSG), following initial development by Cambridge Systematics as part of a larger advanced model development program.
- Complexity: the model is designed to be useful, but it's wrong.... Modular design facilitates incremental advancement

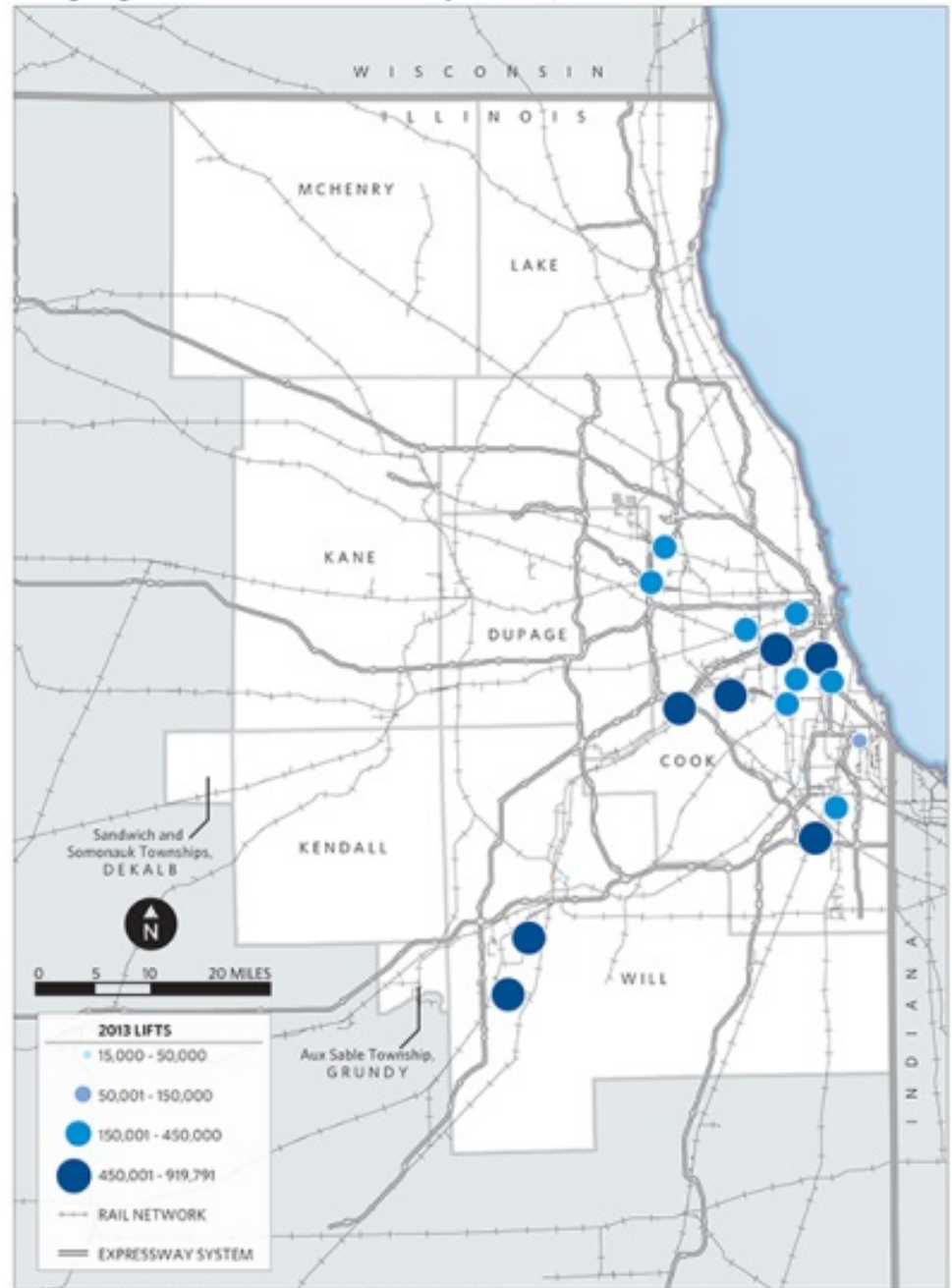
Understanding the Freight System: Data Activities

- Validation Using ATRI datasets
 - ▣ Tour
 - ▣ Performance Data
 - ▣ Being Completed Using PostgreSQL
 - ▣ Performance Information in the Context of a Tour
- Freight Bottleneck Identification on Parallel Path Using NPMRDS (Specific Facilities Identified)
- Quarterly Congestion Reports Being Developed for Trucks and All Vehicles

Focus on Intermodalism

The map at right shows the locations and volumes of intermodal truck-rail terminals in the Chicago region.

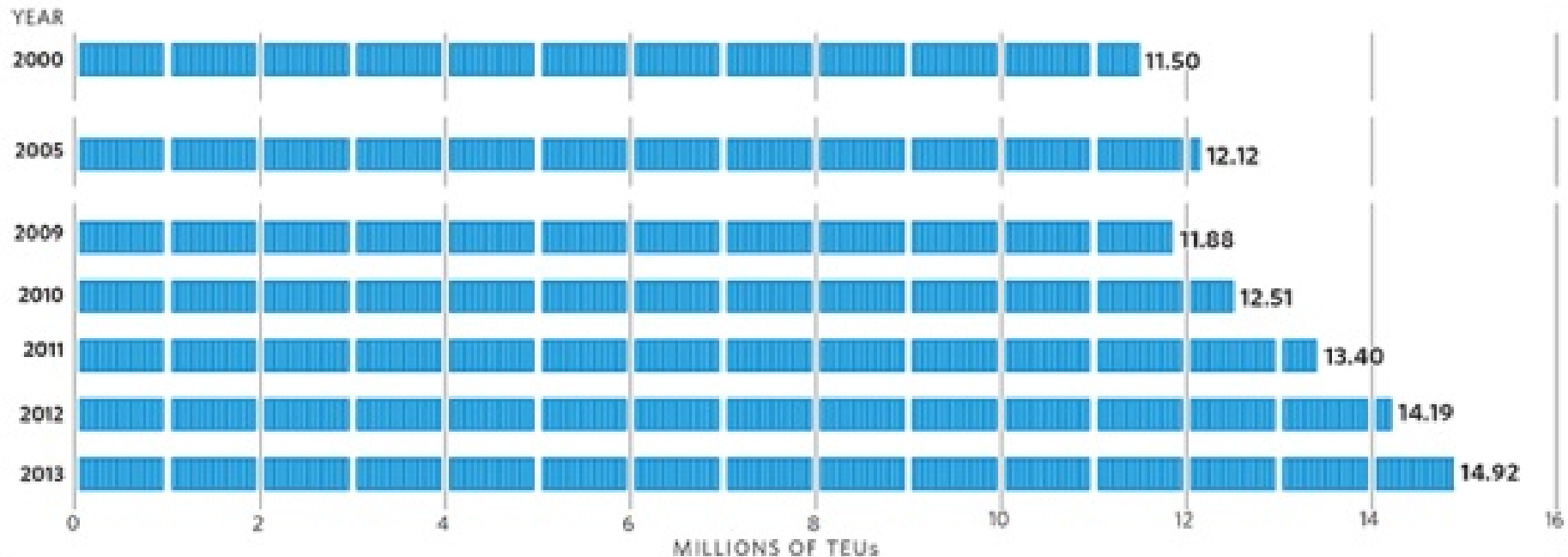
Chicago region active intermodal facilities by total lifts, 2013



Source: Chicago Metropolitan Agency for Planning analysis of railroad data.

Usage, in TEUs

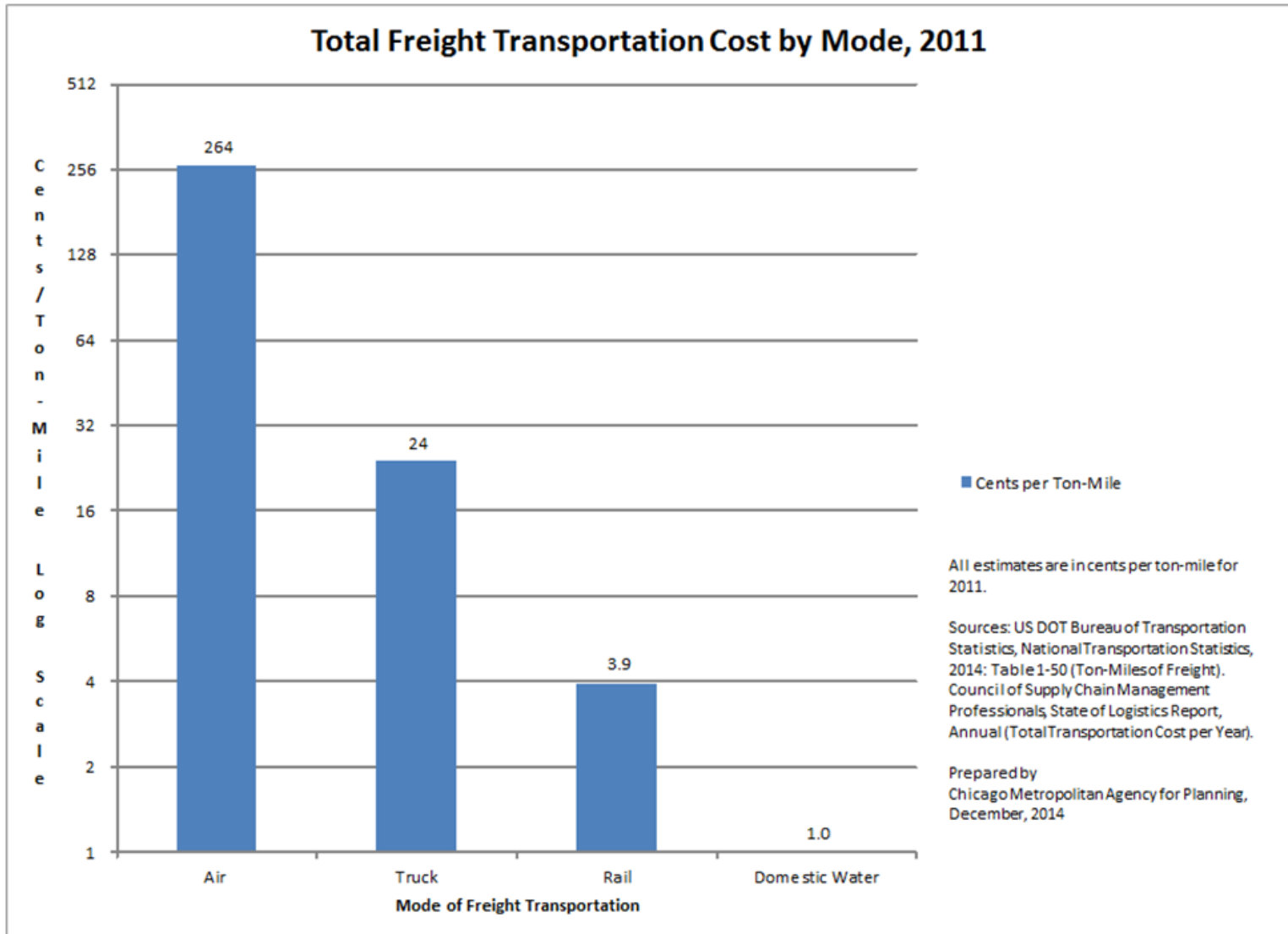
TEUs moved through rail-truck intermodal facilities in Chicago region in select years, 2000-13, in millions



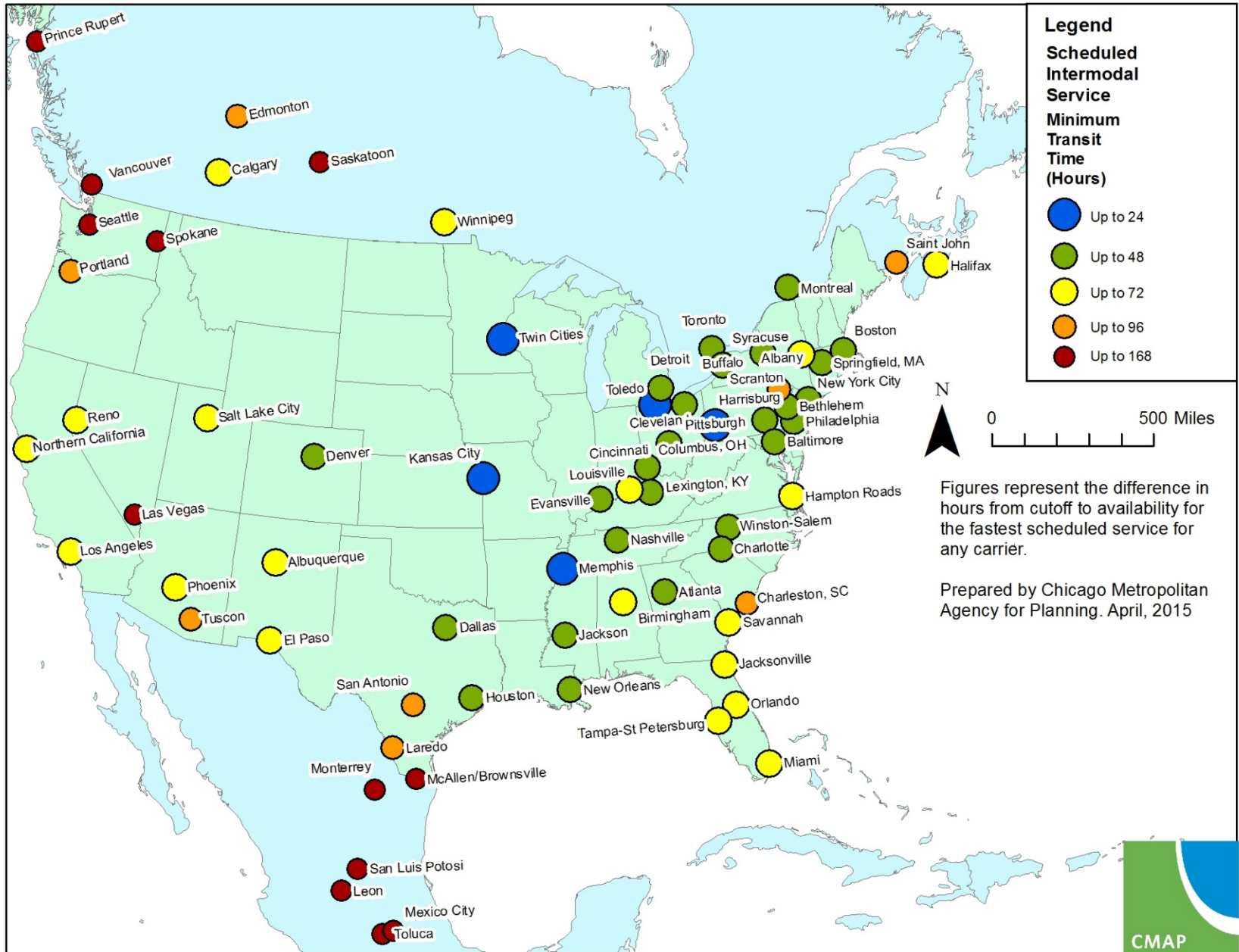
Note: TEU is a 20-foot equivalent freight cargo container. Data not available for 2001-04 and 2007-08.

Source: Chicago Metropolitan Agency for Planning estimates.

Why We Care about Intermodalism: Economy

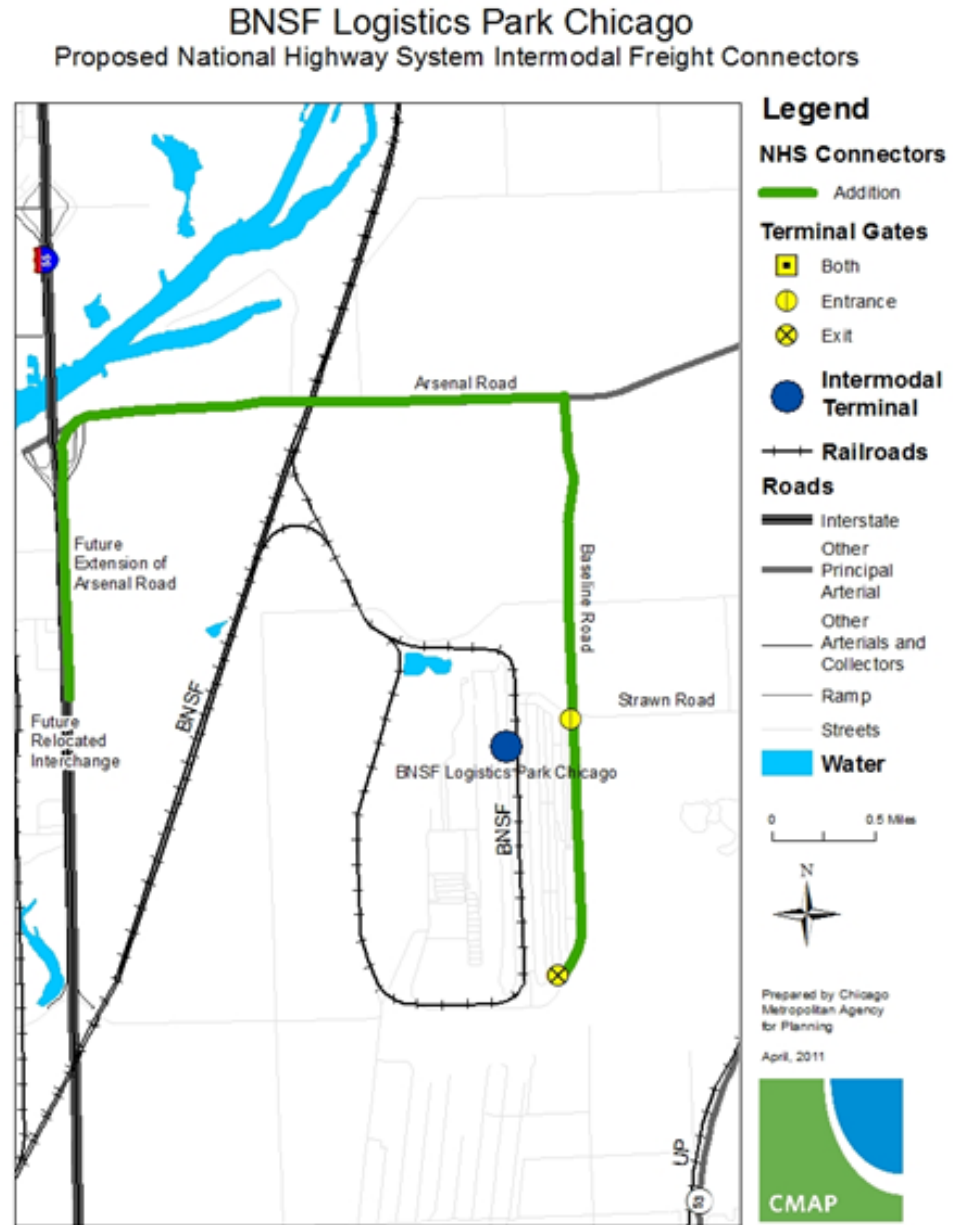


Minimum Intermodal Transit Times from Chicago, 2015



Local Access

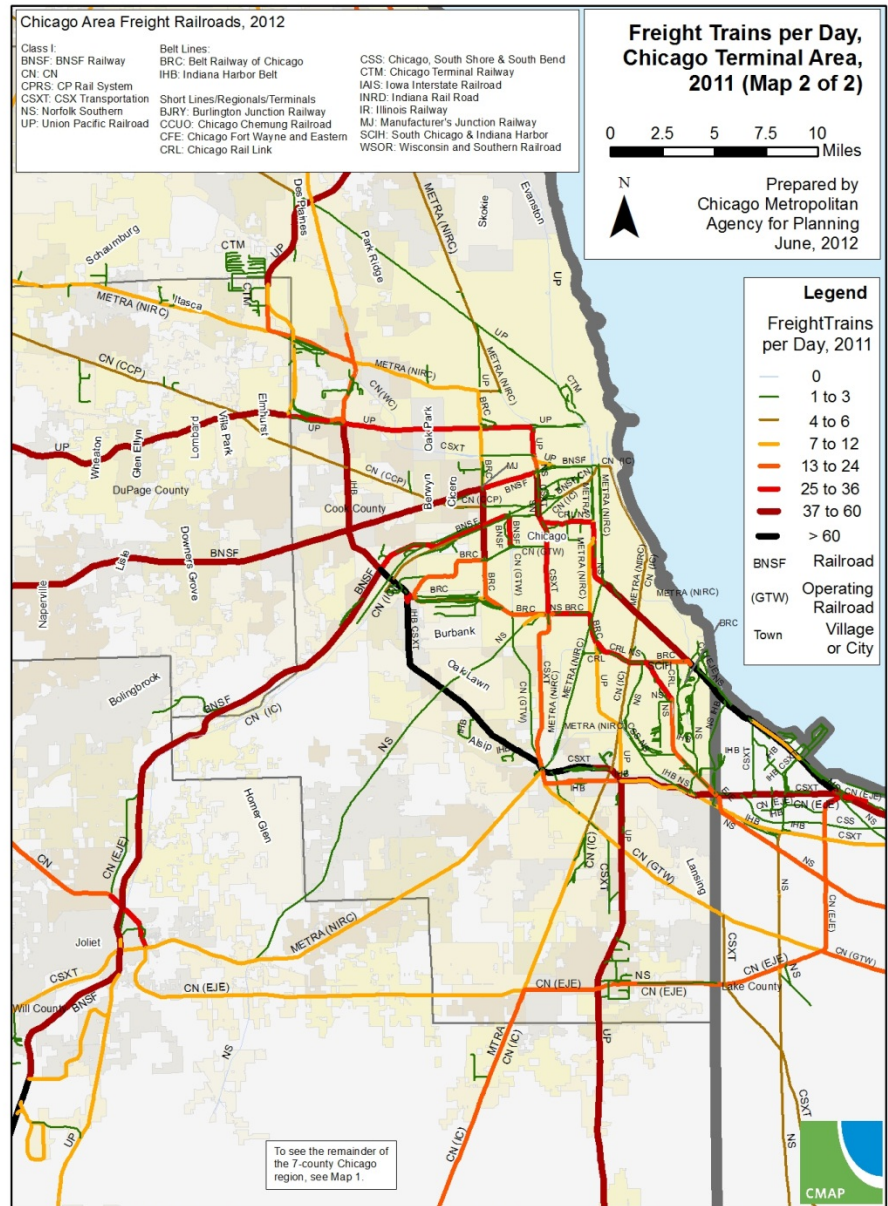
- National Highway System Intermodal Connectors
- Recommended by MPO with involvement of local officials
- Approved by IDOT and FHWA
- Provide seamless access between terminals and the remainder of the NHS



Sample of Rail Data

Estimated Freight Trains per Day, 2011

Rail industry continues to consolidate lines, focusing on modernization and productivity.



Estimate by CMAP, 2012. Sources: National Transportation Database, 2011, Updated with information from createprogram.org, Illinois Commerce Commission Grade Crossing Database, Google Earth, personal communications. Missing data was interpolated.

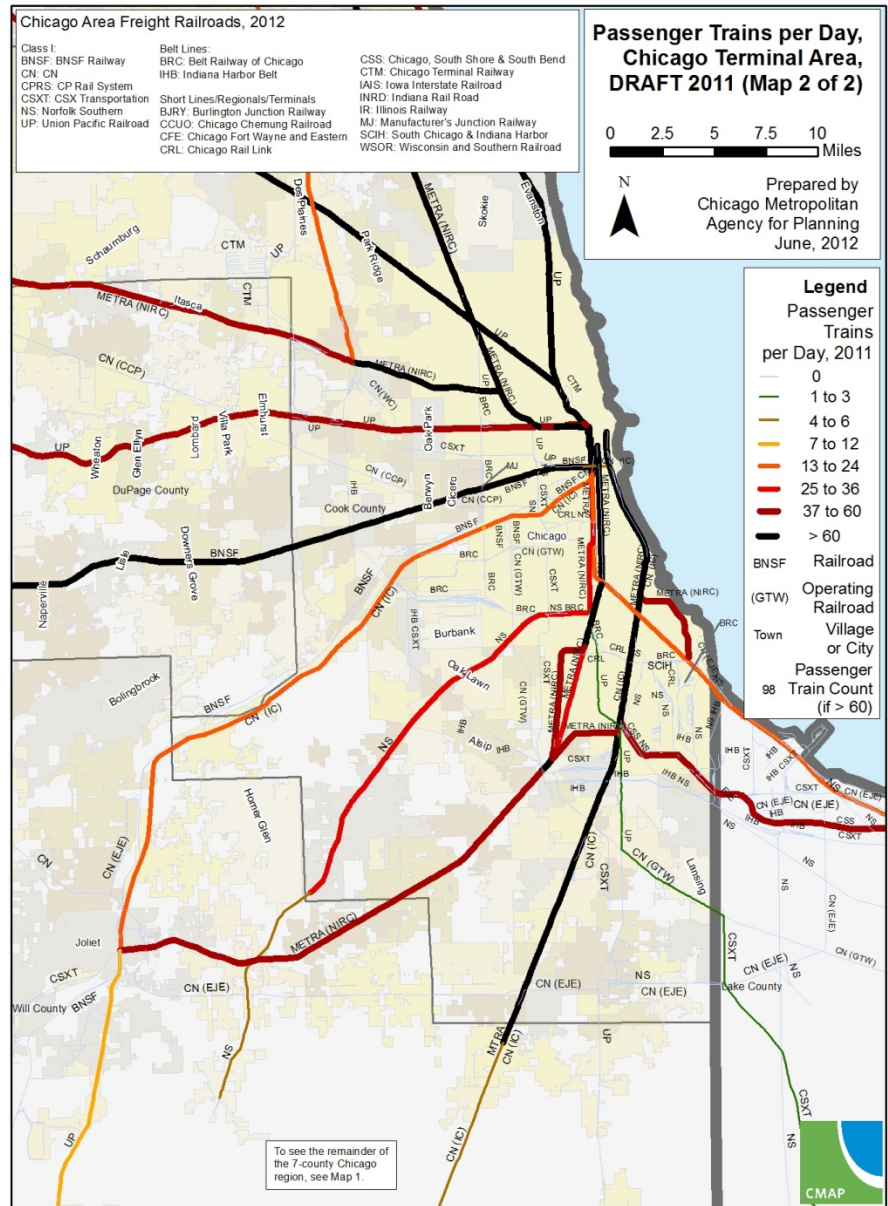
Note: Figures include overhead trackage rights for many railroads, including Metra, the regional commuter railroad.

See <http://www.cmap.illinois.gov/freight-snapshot>.

Sample of Rail Data

Estimated
Passenger Trains
 per Day, 2011,
 excluding
 Deadheads.

Passenger and
 freight system
 conflicts continue.



Estimate by CMAP, 2012. Sources: National Transportation Database, 2011, Updated with information from Google Earth, personal communications, and Amtrak, Metra and South Shore passenger train schedules. Note: Figures include overhead trackage rights for many railroads, including Metra, the regional commuter railroad. See <http://www.cmap.illinois.gov/freight-snapshot>.



CMAP GO TO 2040

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