CMAP GO TO 2040

Truck Bottleneck Identification

January 25, 2016

Presented by Todd Schmidt

Truck Bottleneck Identification : Bottleneck Definition

What is a Truck bottleneck?

- Working definition:
  - Locations where truck traffic experiences recurring slow speeds due to an operational or network deficiency
  - Important to mask locations with known construction from the analysis
  - Focus on locations with at least 10 hours of truck light congestion a day

Truck Bottleneck Identification: Overview

- Background
- Data
- Screening Process
- Network Deficiency
- Next Steps
- Questions

Truck Bottleneck Identification : Background

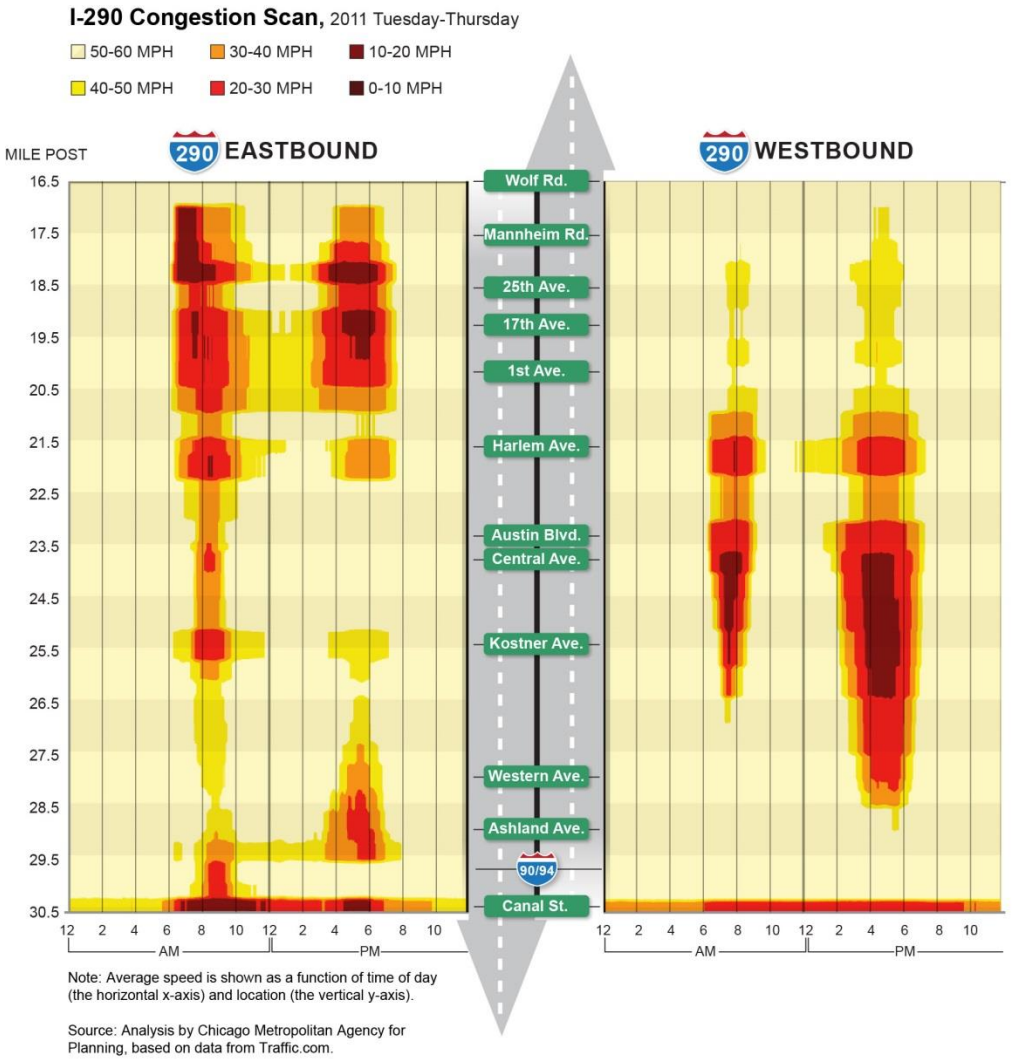
Why locate truck bottlenecks?

- National freight hub
- strategically target funds
- Congestion reduction

Truck Bottleneck Identification : Background

Previous work:

- Expressway traffic scans and other performance metrics
- Lack of data

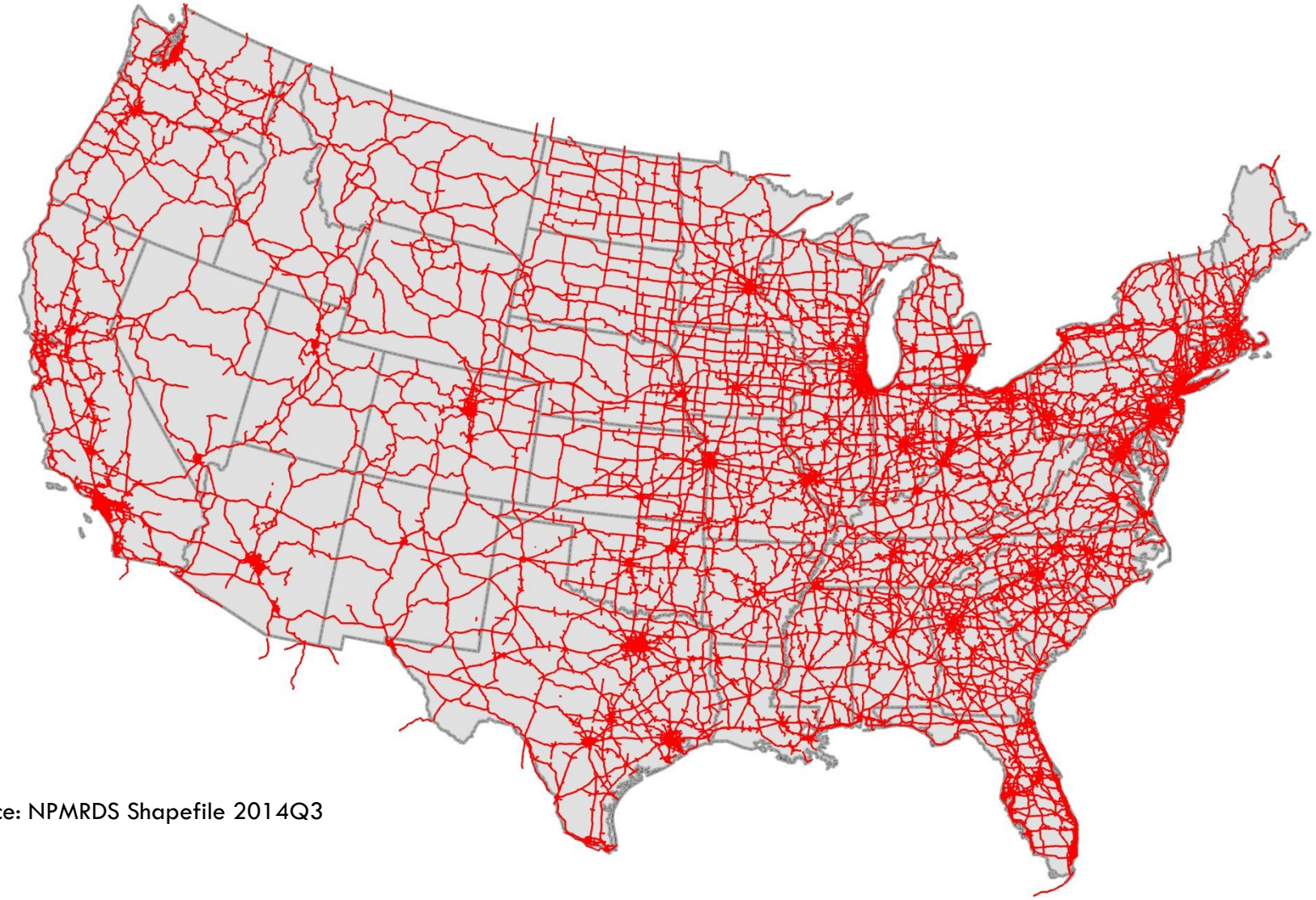


Truck Bottleneck Identification : Probe Dataset

National Performance Measurement Research Data Set (NPMRDS):

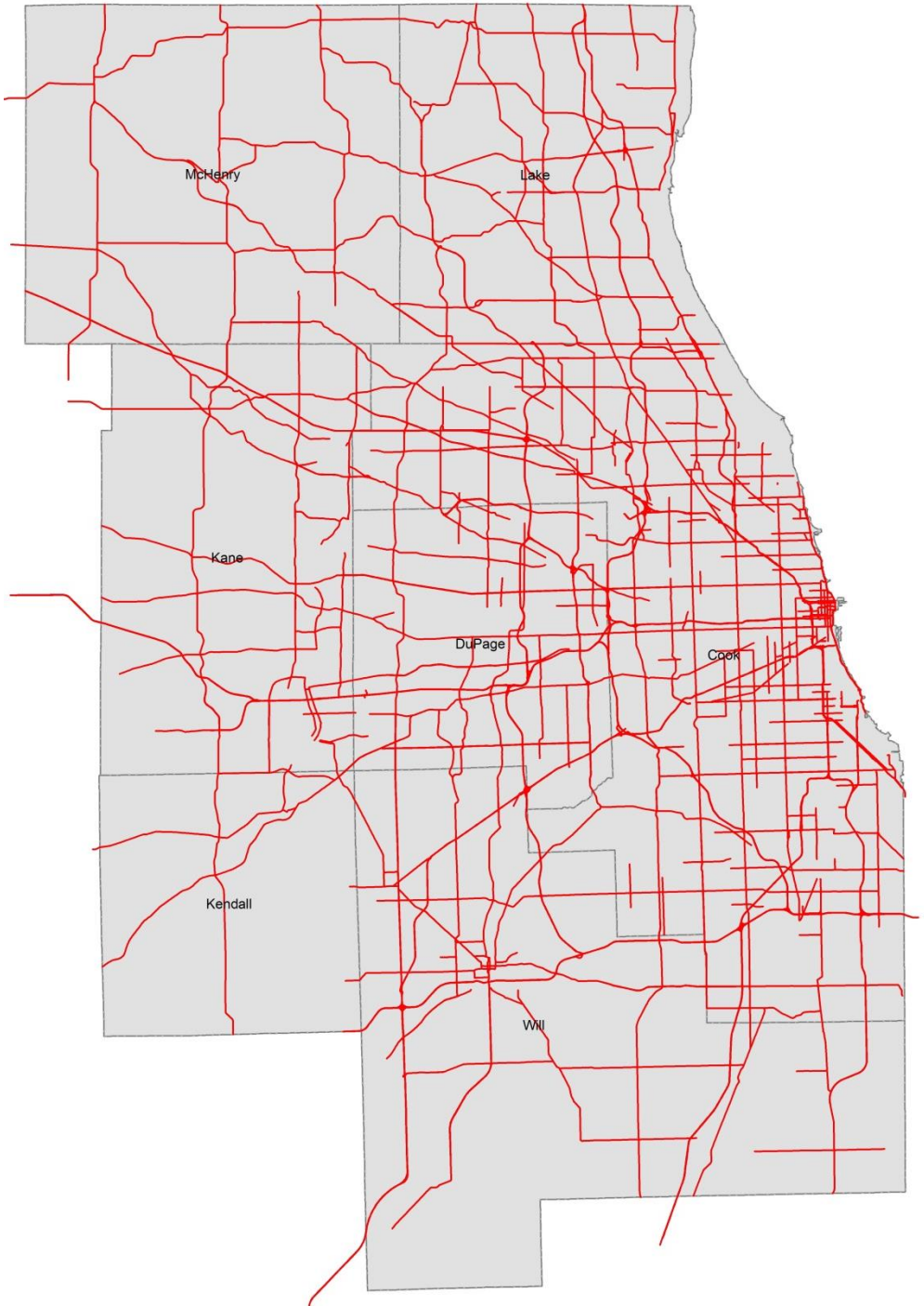
- Provided by FHWA
- Average travel time in seconds by Traffic Message Channel (TMC)
  - TMC – pre-defined road segments based on industry standard for traffic reporting.
- Five-minute time slices
- Data is only provided when there is vehicle data
- Data reported for trucks, passenger cars, and all vehicles
  - Truck data provided by American Transportation Research Institute (ATRI) and includes primarily Classes 7 and 8
- Limited to National Highway System (NHS)
- TMC link shapefile provided to visualize data

Truck Bottleneck Identification : Probe Dataset



Source: NPMRDS Shapefile 2014Q3

NHS CMAP Region

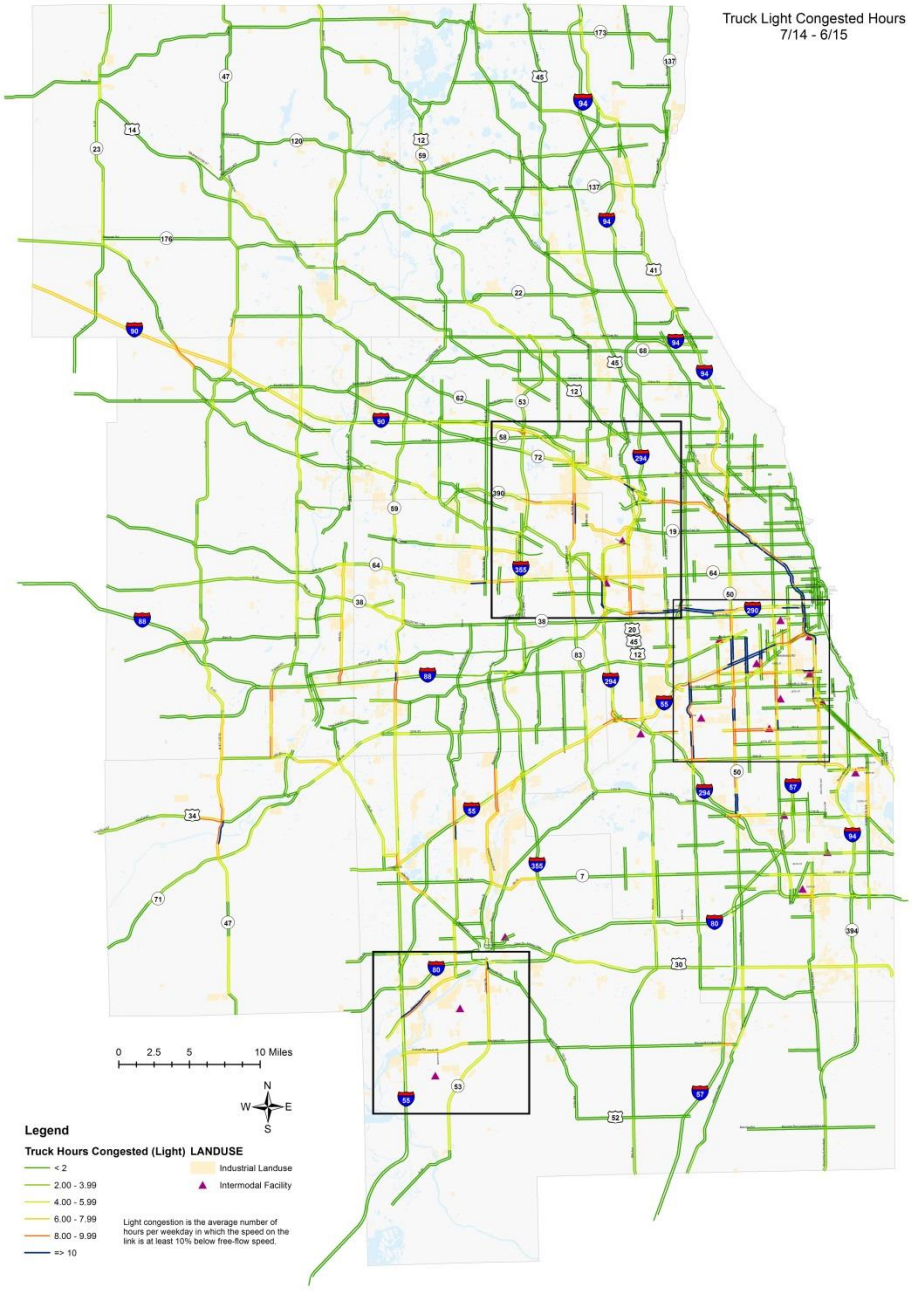


Source: NPMRDS Shapefile 2014Q3

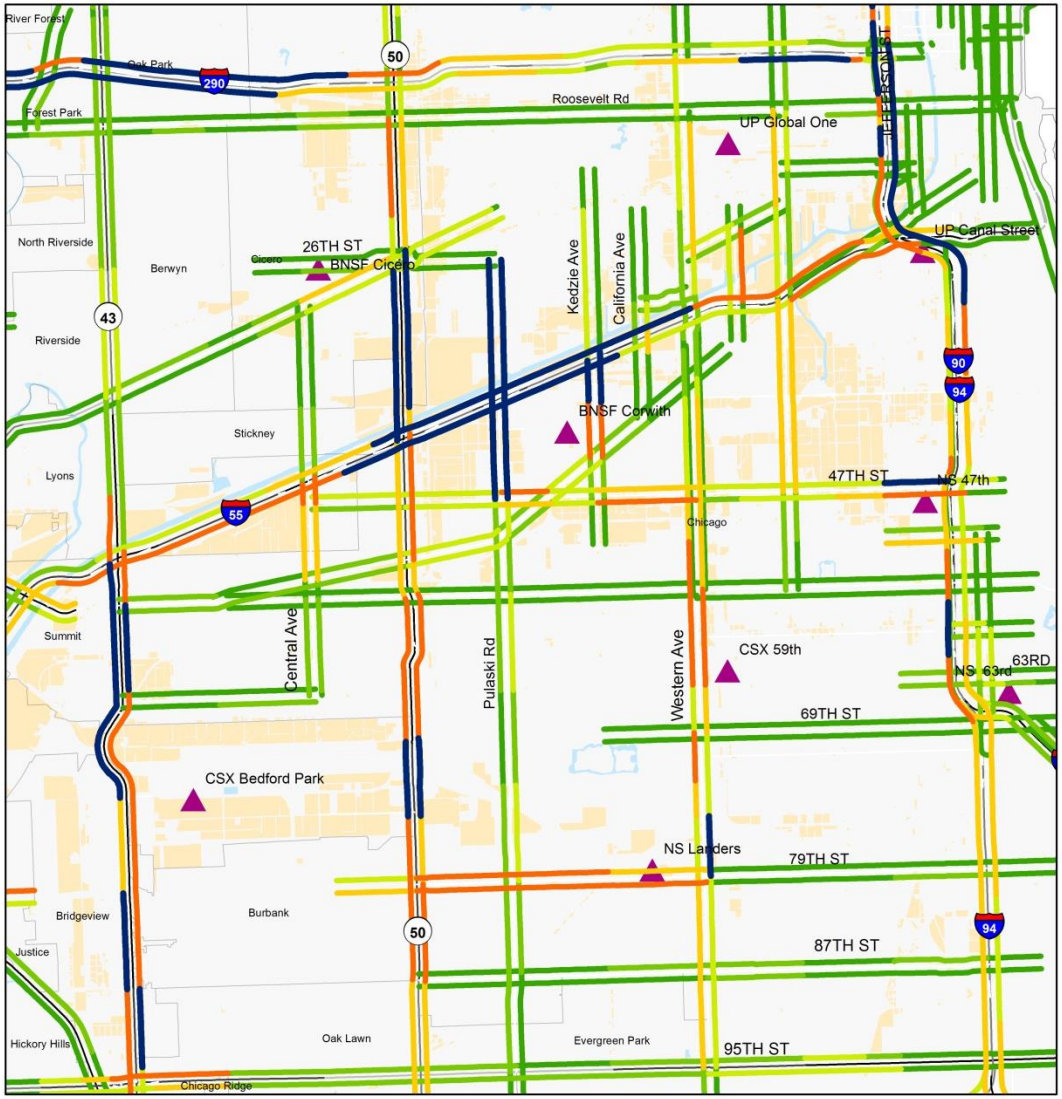
Truck Bottleneck Identification : Process

Overall process:

- Calculate light congested hours to identify candidate bottleneck locations
- Map candidate locations
- Map network deficiency
- Link bottleneck to deficiency
- Develop solutions
- Rank in severity
- Results will highlight locations that warrant a more detailed engineering study


Truck Light Congested Hours
7/14 - 6/15
0 2.5 5 10 Miles
N
W E
S
Legend
Truck Hours Congested (Light) LANDUSE
< 2
2.00 - 3.99
4.00 - 5.99
6.00 - 7.99
8.00 - 9.99
=> 10
Industrial Landuse
Intermodal Facility
Light congestion is the average number of hours per weekday in which the speed on the link is at least 10% below free-flow speed.

Truck Light Congested Hours



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LANDUSE
- Industrial Landuse
- Intermodal Facility

IRIS 2014 AADT Percent Heavy Truck
- 0
- <= 4.5%
- 4.6% - 7.5%
- 7.6% - 11%
- > 11%

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N
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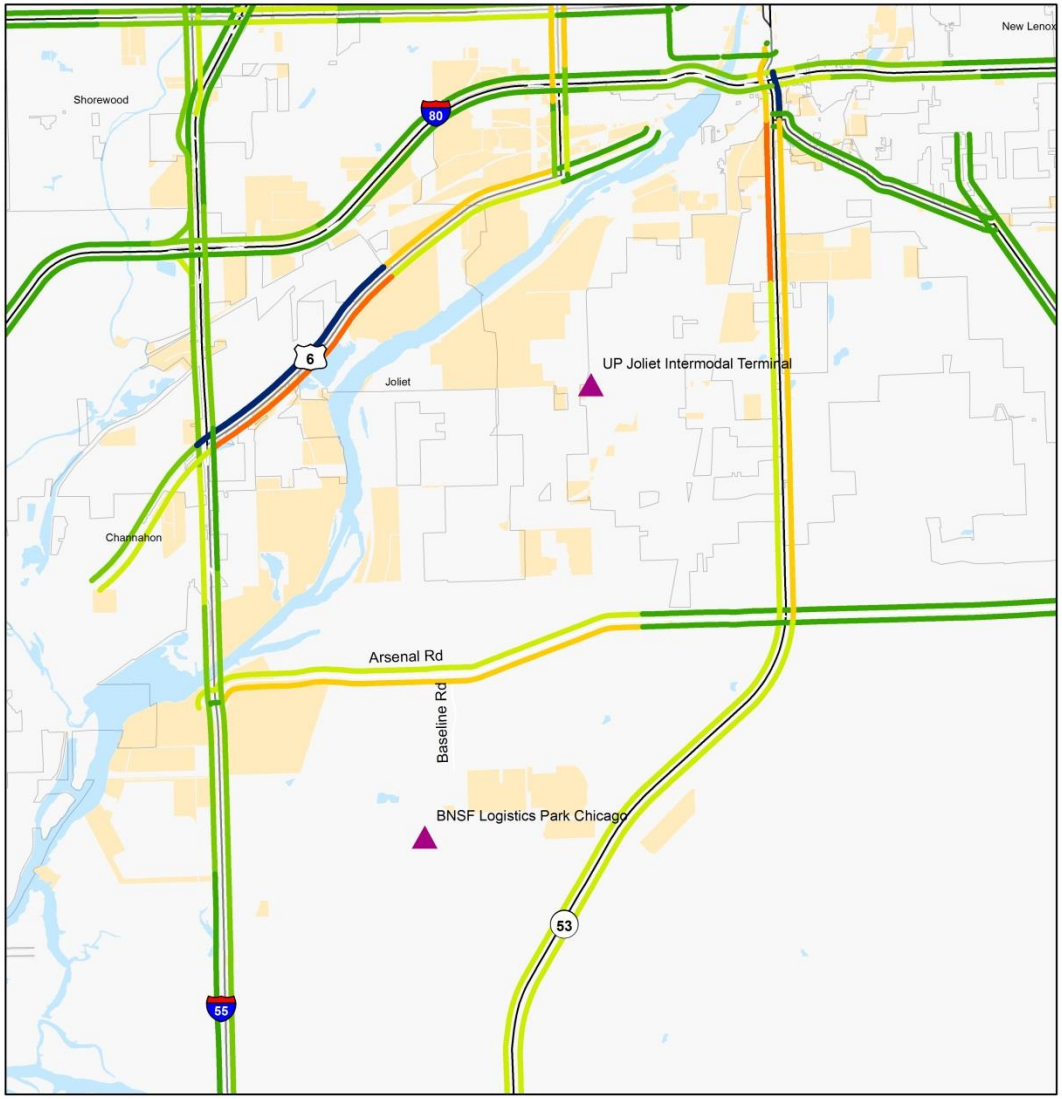
0 0.5 1 2 Miles

Truck Light Congested Hours



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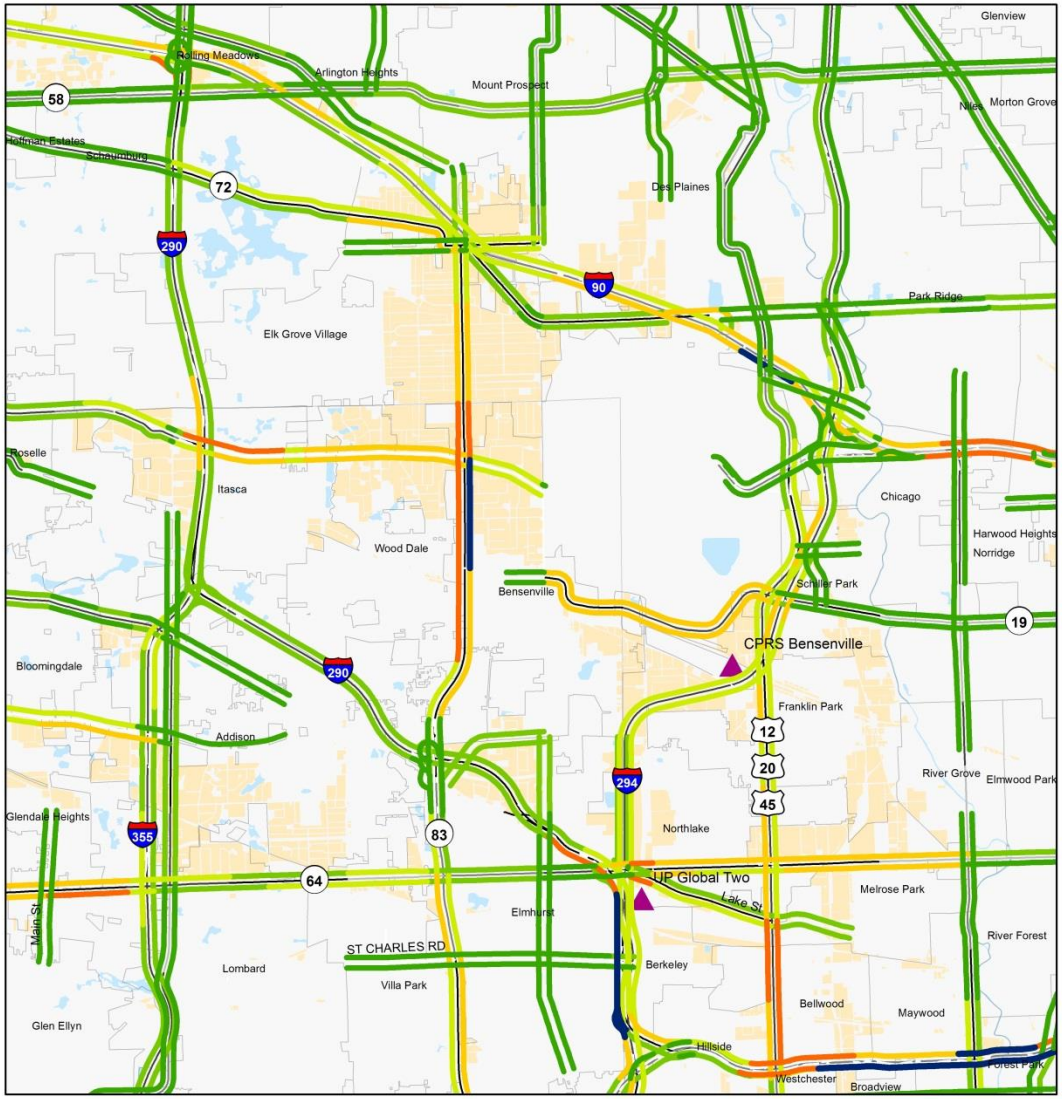

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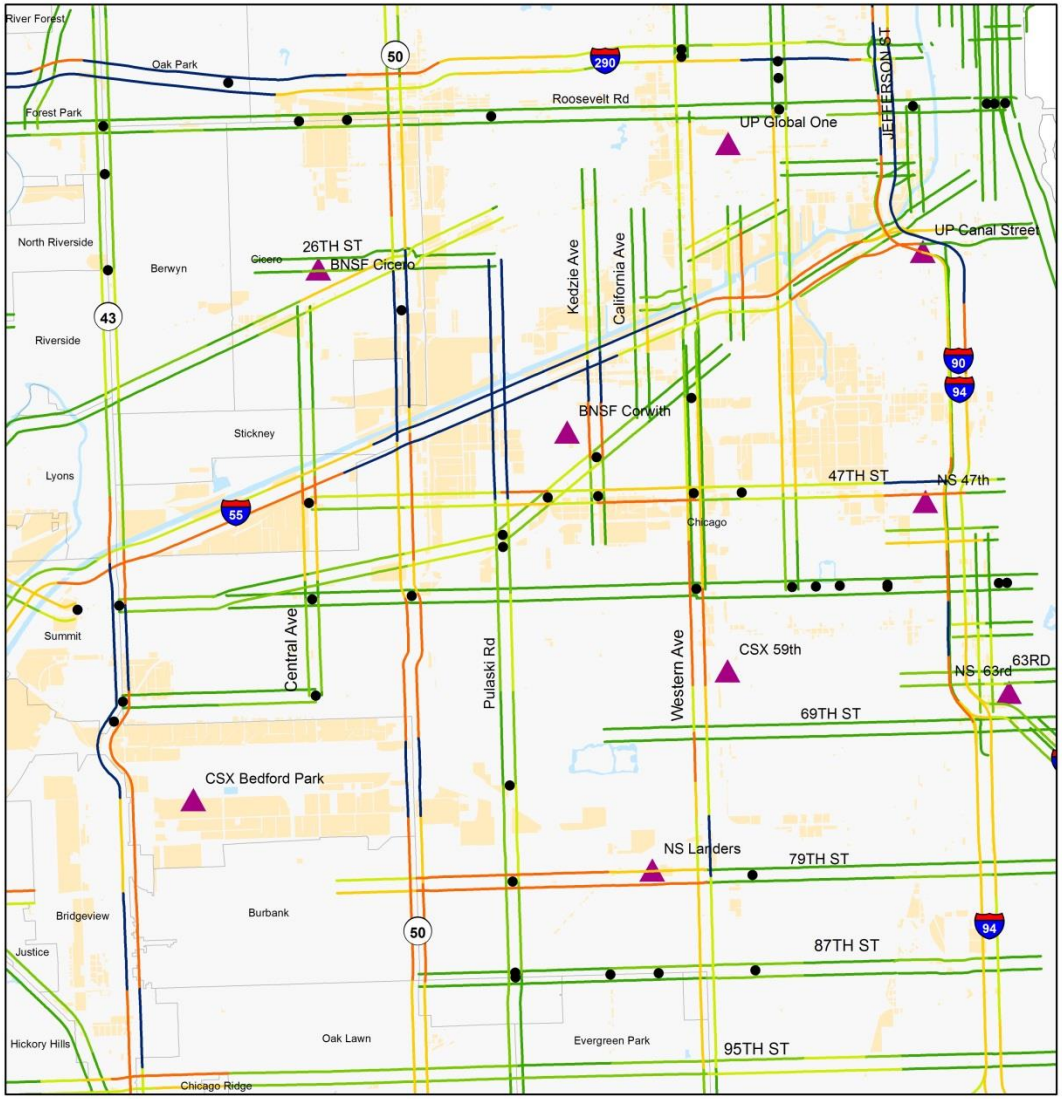
Truck Bottleneck Identification : Network Deficiency

Identify probable causes for bottleneck

- Network deficiencies:
  - Lane drop and pinch points
  - Lane imbalances
  - Lane use restrictions
  - Geometric issues
  - Interchanges (e.g., weaving movements)
  - Signal operations
  - Intersection and mainline capacity
  - Rail crossing
- Important to mask locations with known construction from the analysis

Truck Light Congested Hours and Lane Change



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Lane Change

LANDUSE

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- Intermodal Facility

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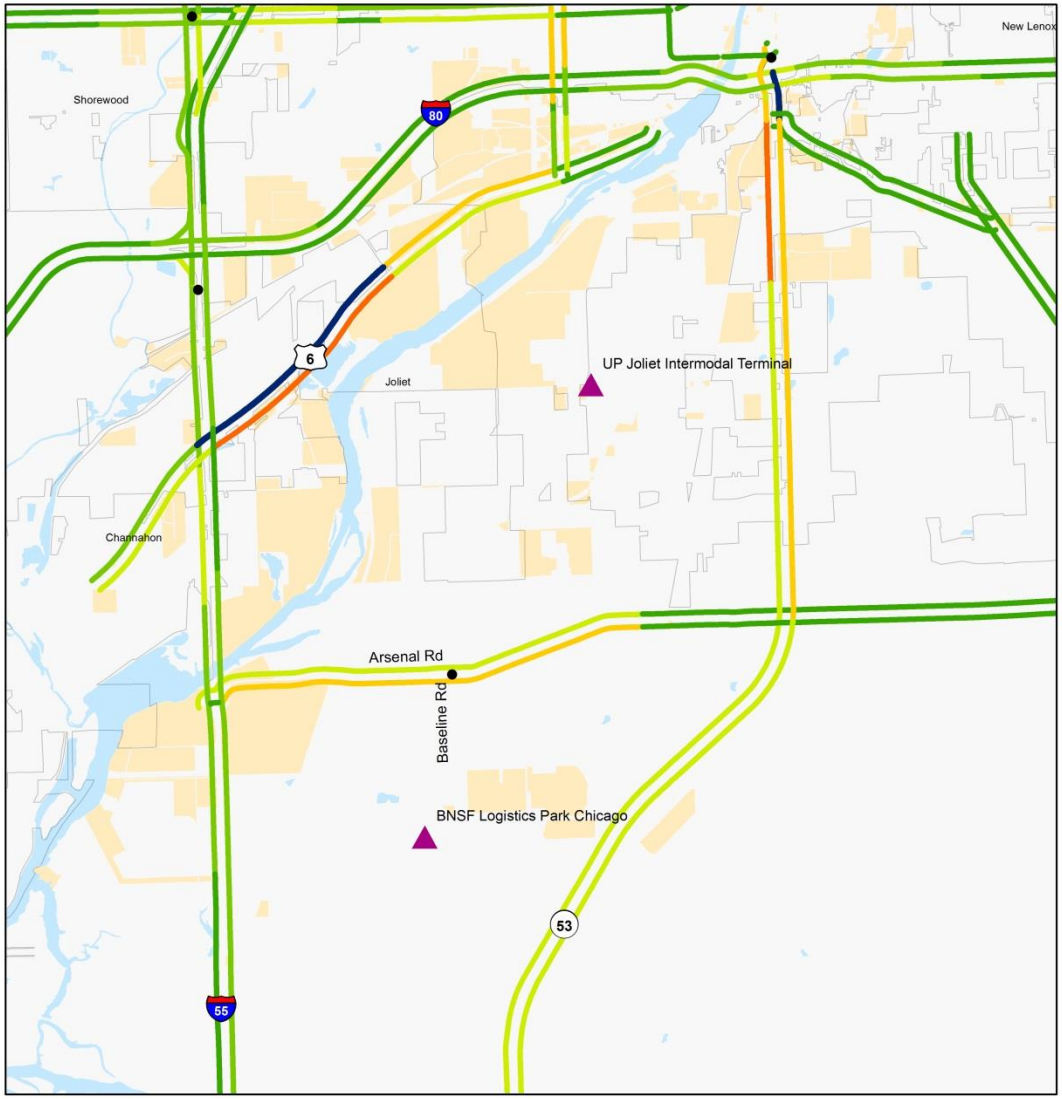
Truck Light Congested Hours



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Lane Change

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Truck Bottleneck Identification : Next Steps

- Determine how sequential links should be grouped as a single bottleneck
- Develop list of probable causes and solutions for most severe bottlenecks in the region
- Repeat process with historical and more current data
- Supplement raw ATRI probe data into analysis

Truck Bottleneck Identification : Question for Committee

- Are the results reasonable?
- Feedback on the method to identify truck bottlenecks?
- Missing operational/network deficiency

Thank you.

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