National Performance Research Data Set (NPMRDS): Travel Time Probe Data

Northwestern Indiana Regional Planning Commission

Topics Presentation Will Cover:

- What is the NPMRDS?
- How is the NPMRDS used?
- What Performance Measures can the NPMRDS generate?

here

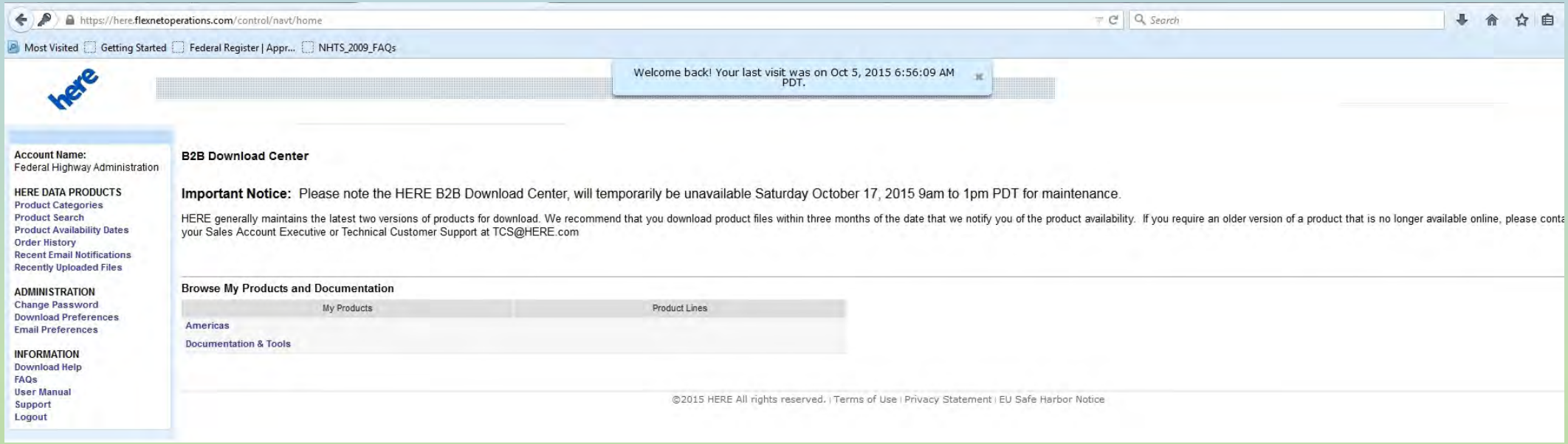
NPMRDS: Overview

- Data is sourced from vehicle probes (GPS devices and cell phones)
- HERE is the licensed packager and vendor of the data
- FHWA Office of Freight Management and Operations entered into a contract with HERE to access the data on the National Highway System
- State DOTs and MPOs are eligible via agreement with FHWA and HERE to access the data

Accessing the NPMRDS Data

Must be an MPO, State DOT, or U.S. DOT user

1. Email heretraffic.nhsdata@here.com and request access
2. Visit https://here.flexnetoperations.com and login



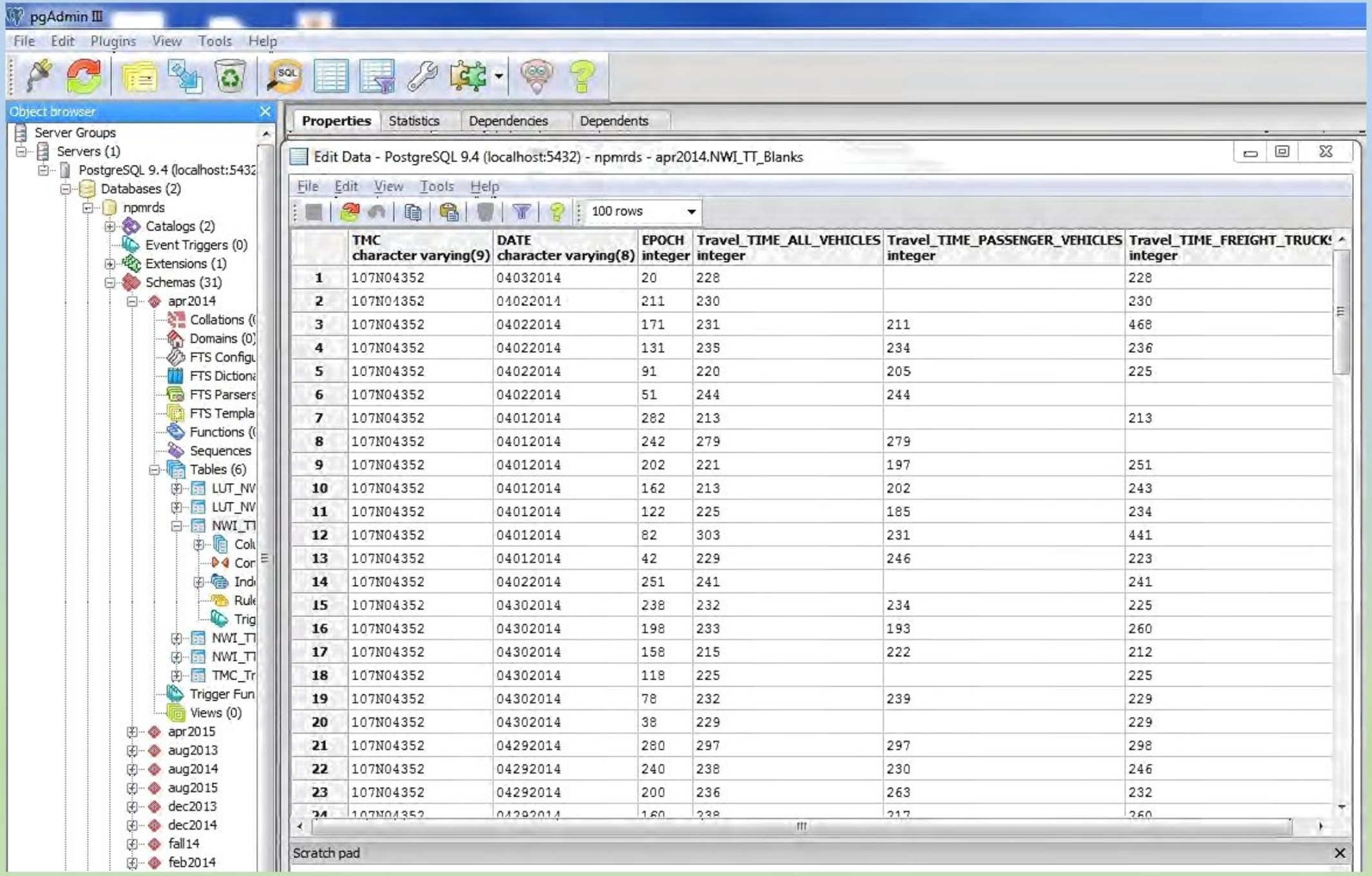
3. Click Americas -> Additional Content Americas, find the month and region and begin the download

Accessing the NPMRDS Data Cont'd

4. Download the newest Shapefile and Static File
5. Unzip the data and shapefile
6. Open and use the data in SQL program of choice
7. Display the Data in GIS and Join using shapefile

How NPMRDS Data Comes In

- National Highway System divided into Traffic Message Channel (TMC) codes approx. 0.5 – 8 miles
- Data comes in at 5-minute intervals called epochs for travel times across a TMC (1 day = 288 epochs)
- Travel Times reported for 3 categories: All vehicles, Passenger vehicles, and Freight trucks

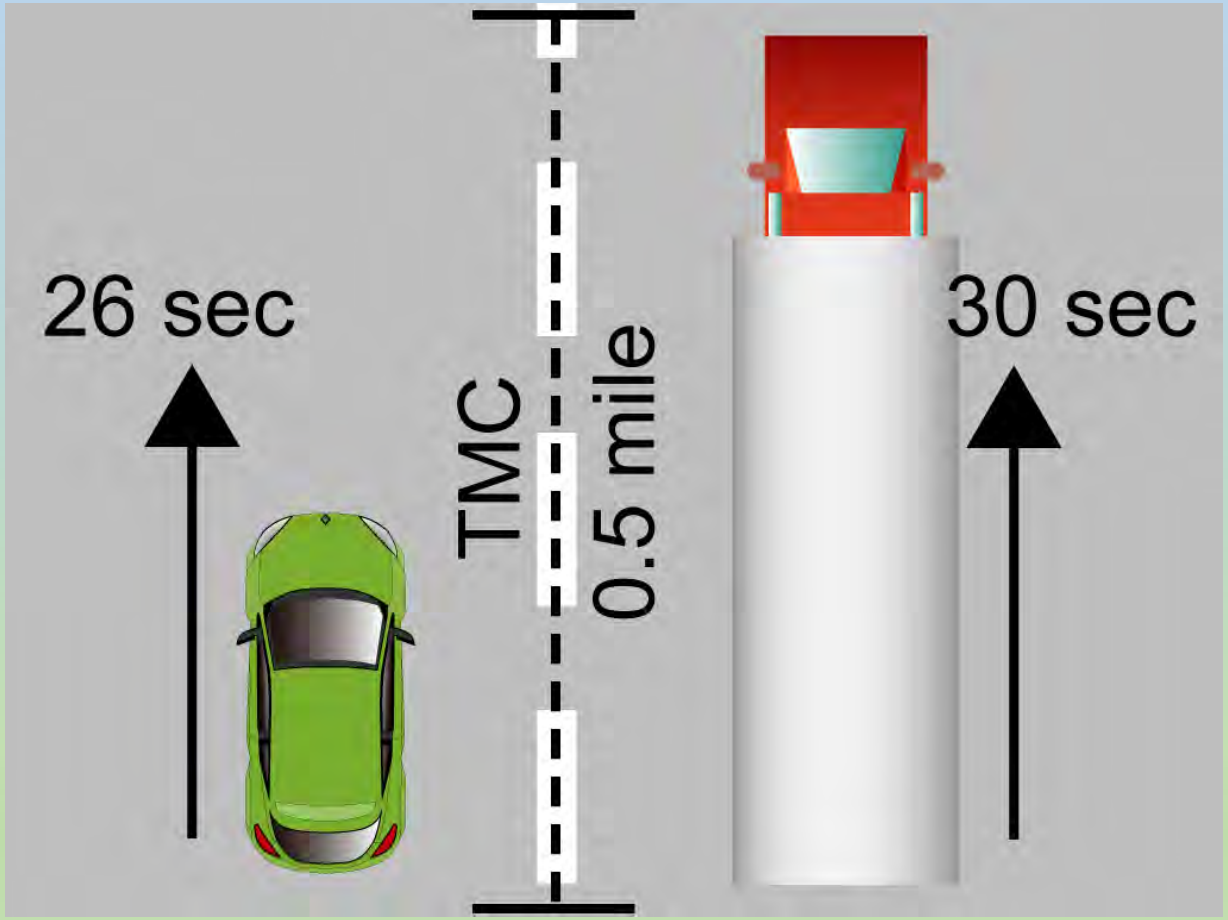


	TMC character varying(9)	DATE character varying(8)	EPOCH integer	Travel_TIME_ALL_VEHICLES integer	Travel_TIME_PASSENGER_VEHICLES integer	Travel_TIME_FREIGHT_TRUCKS integer
1	107N04352	04032014	20	228		228
2	107N04352	04022014	211	230		230
3	107N04352	04022014	171	231	211	468
4	107N04352	04022014	131	235	234	236
5	107N04352	04022014	91	220	205	225
6	107N04352	04022014	51	244	244	
7	107N04352	04012014	282	213		213
8	107N04352	04012014	242	279	279	
9	107N04352	04012014	202	221	197	251
10	107N04352	04012014	162	213	202	243
11	107N04352	04012014	122	225	185	234
12	107N04352	04012014	82	303	231	441
13	107N04352	04012014	42	229	246	223
14	107N04352	04022014	251	241		241
15	107N04352	04302014	238	232	234	225
16	107N04352	04302014	198	233	193	260
17	107N04352	04302014	158	215	222	212
18	107N04352	04302014	118	225		225
19	107N04352	04302014	78	232	239	229
20	107N04352	04302014	38	229		229
21	107N04352	04292014	280	297	297	298
22	107N04352	04292014	240	238	230	246
23	107N04352	04292014	200	236	263	232
24	107N04352	04292014	160	238	217	260

How Travel Time is Measured

Assume Simple Case: 2-lane Highway with 2 vehicles traversing in 1 epoch

Travel Time for Passenger Vehicles = **26 seconds**



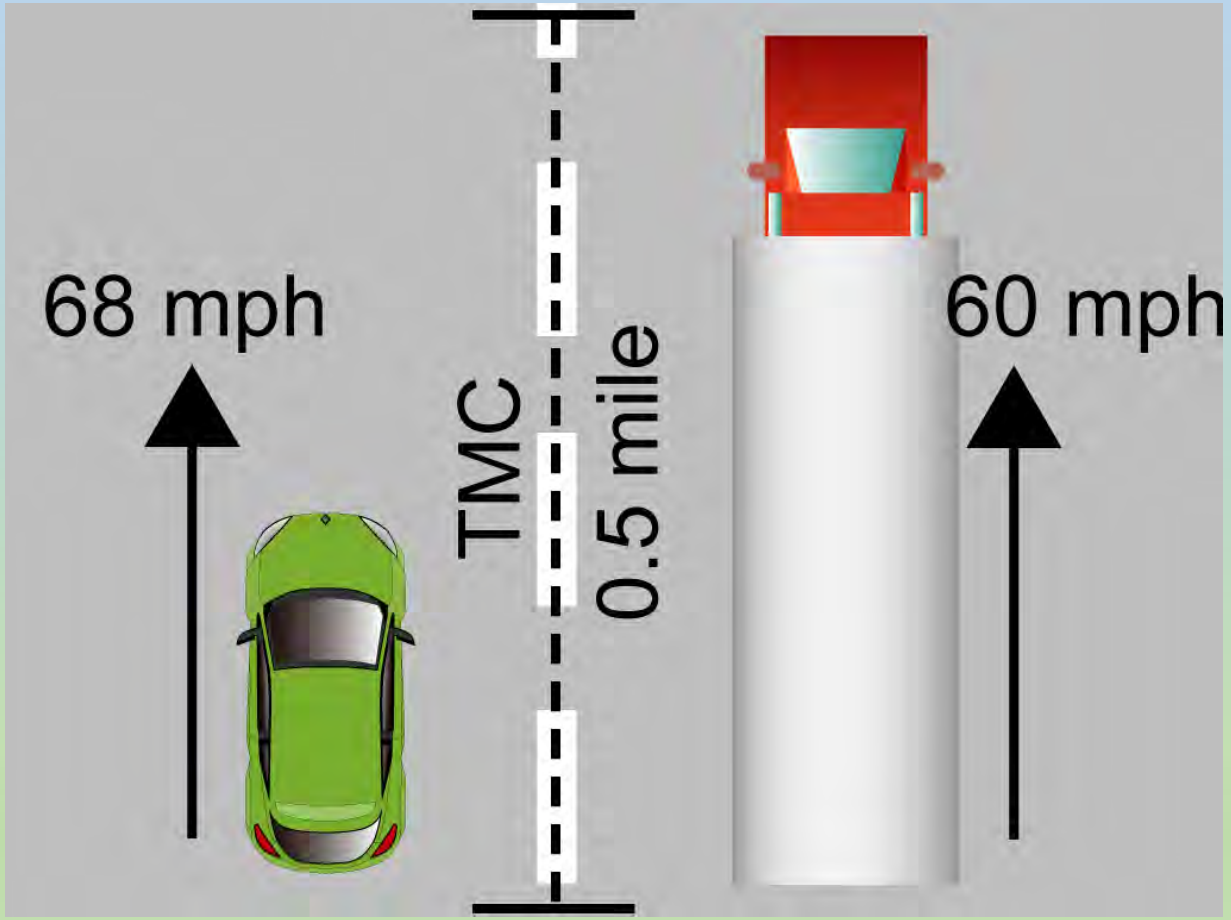
Travel Time for Freight Trucks = **30 seconds**

Travel Time for All Vehicles = **28 seconds**

How Speed is Calculated

Assume Simple Case: 2-lane Highway with 2 vehicles traversing in 1 epoch

Speed for Passenger Vehicles = 0.5 miles / (26 sec / 3600 sec per hour) = **68 mph**



Speed for Freight Trucks = 0.5 miles / (30 sec / 3600 sec per hour) = **60 mph**

Speed for All Vehicles = **64 mph**

Travel Time Takeaways from the Data

- Pros:
  - No Requirement for actively collecting data
  - Very fine resolution of 5-minute intervals
  - Distinction between passenger and freight
- Cons:
  - Sample size is unknown
  - A lot of blanks in the data with no processing
  - Only data coverage of National Highway System

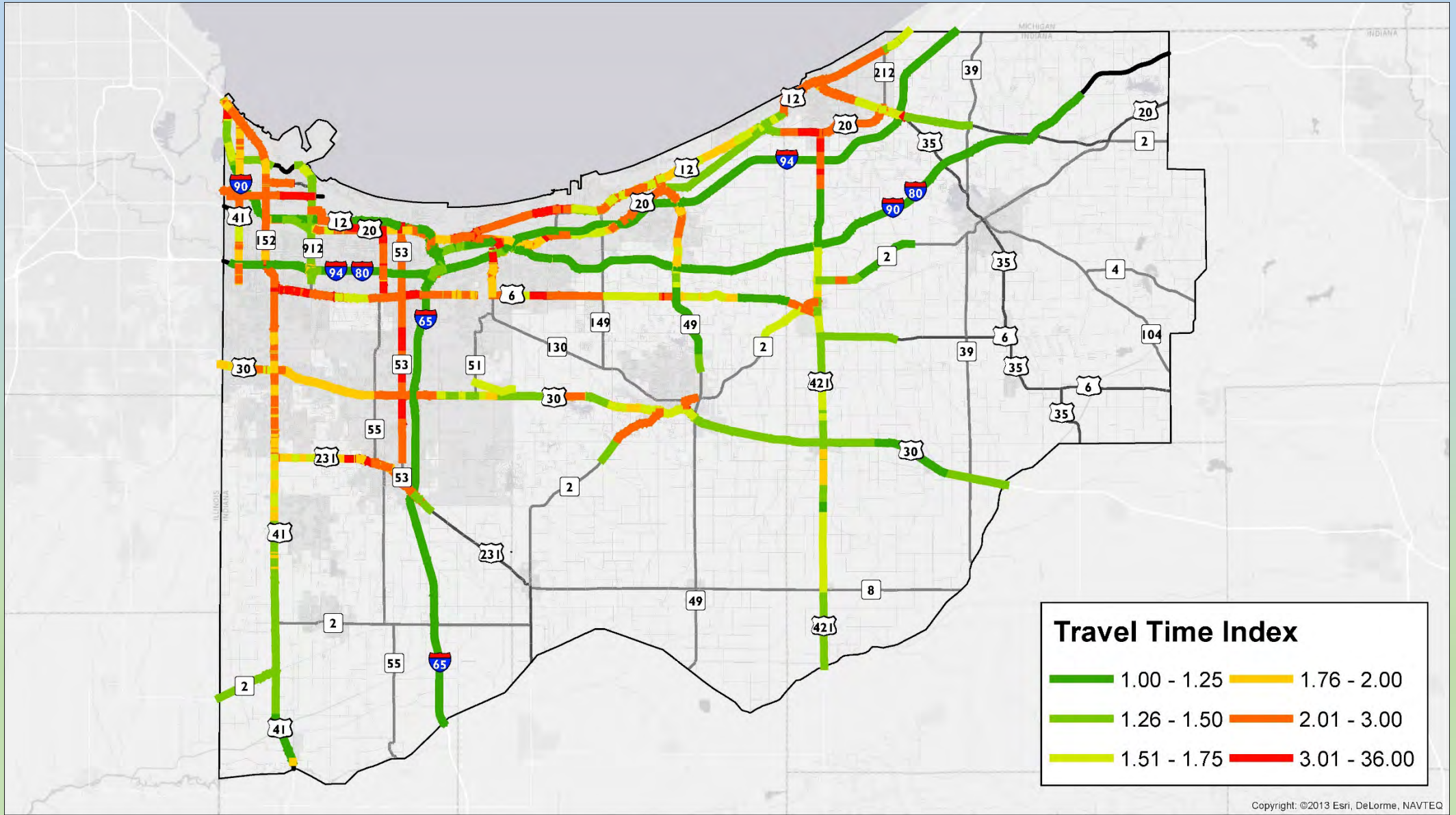
Uses for the NPMRDS

- Performance Based Planning (PBP)
  - Required under MAP-21
  - Mobility is planning factor #4 and system efficiency #7
  - Congestion Reduction and System Reliability are national performance goals
- Congestion Management Process (CMP)
  - Required for all Transportation Management Areas (MPO greater than 200,000 people)
  - Data helps define congested network and track progress

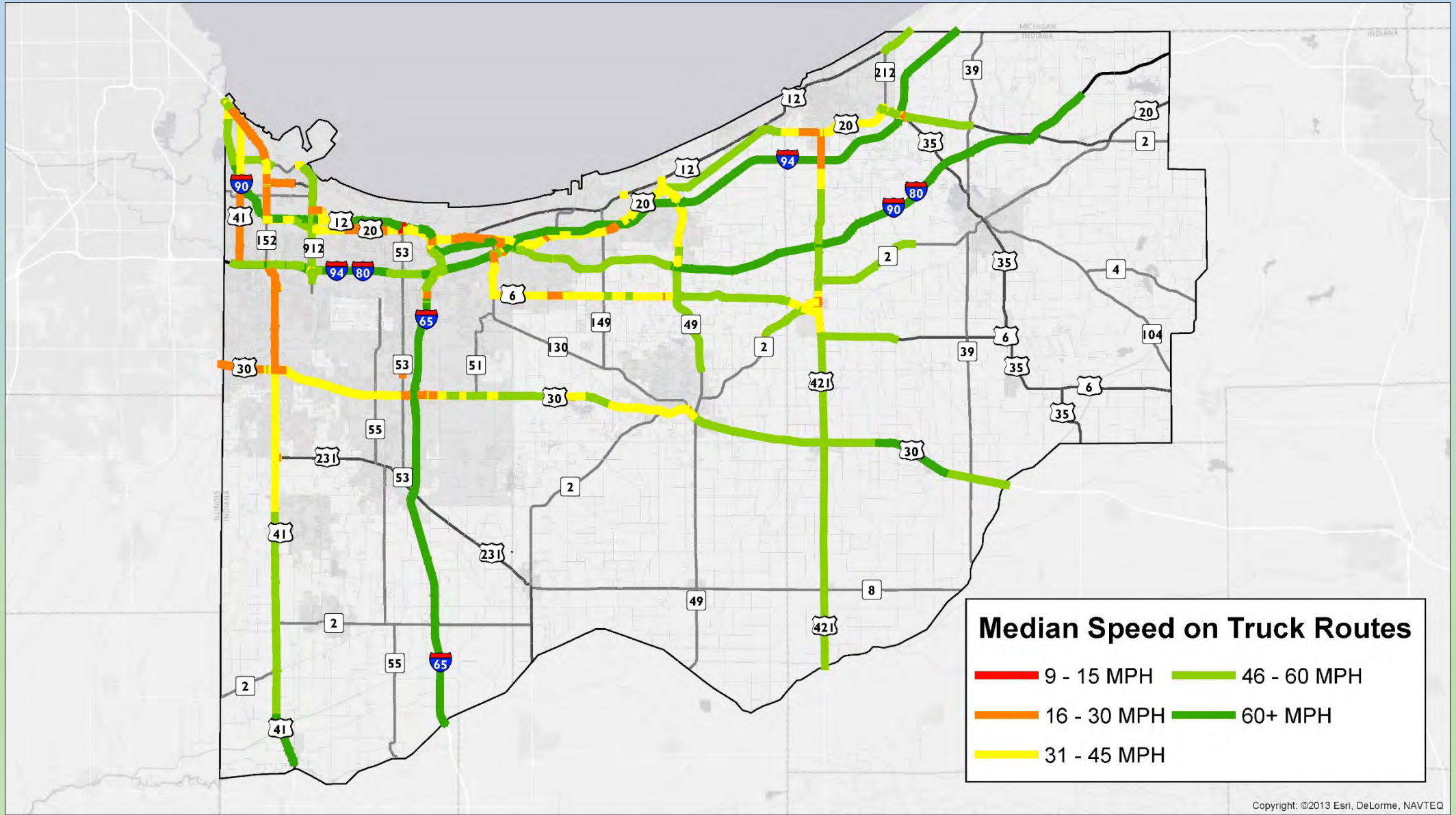
NIRPC's Use of NPMRDS for PBP

- 5 out of 86 performance measures/targets identified in the NIRPC 2040 Comprehensive Regional Plan
  - Travel Time & Travel Time Index
  - Average Speed
  - Delay
  - Average speeds on freight-significant highways
  - Average peak and off-peak travel times for trucks in freight significant corridors
- Congestion Reduction and System Reliability expected to have Notice of Proposed Rulemakings

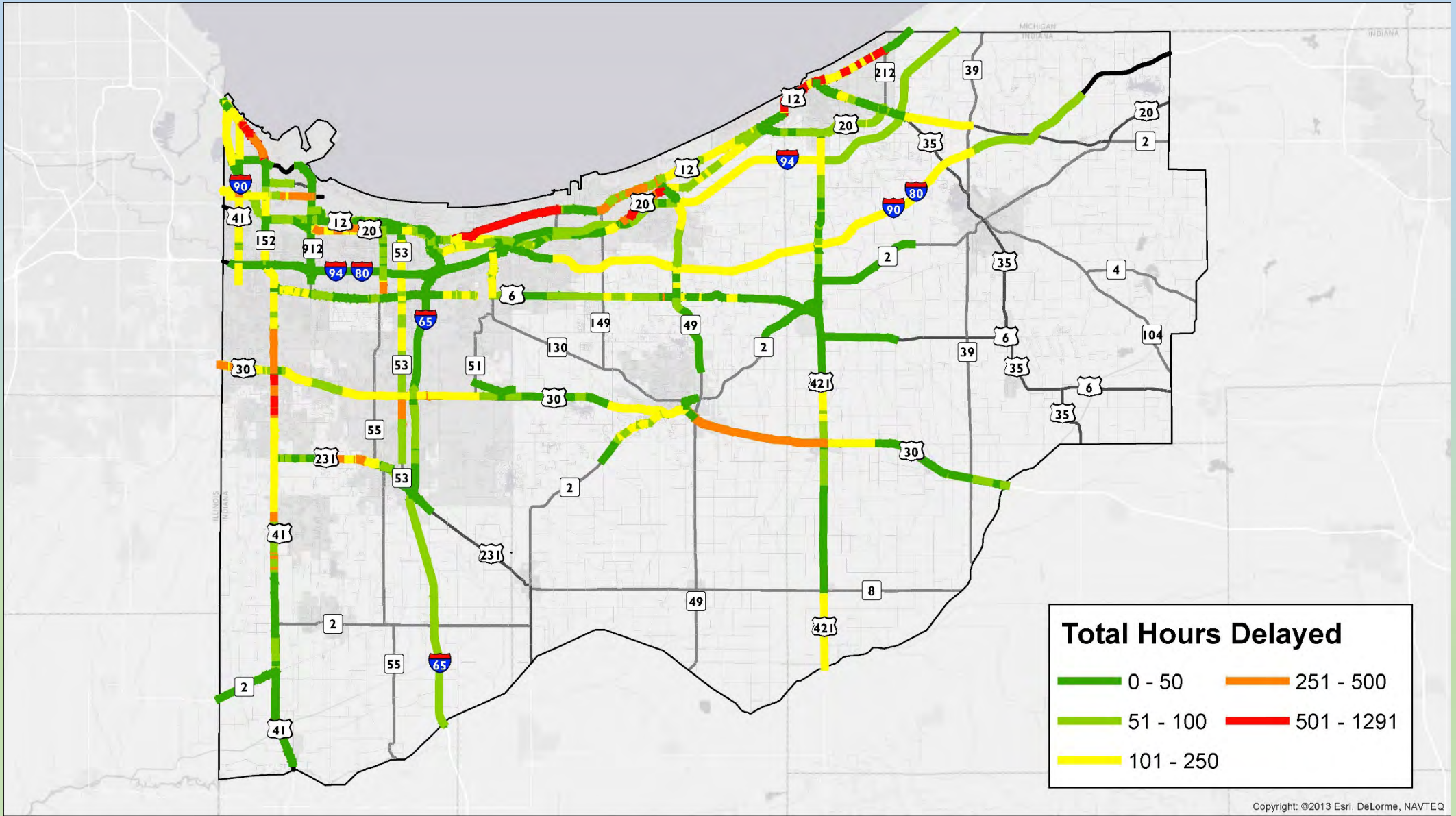
Travel Time Index



Average (Median) Speed



Delay


Total Hours Delayed
0 - 50
51 - 100
101 - 250
251 - 500
501 - 1291
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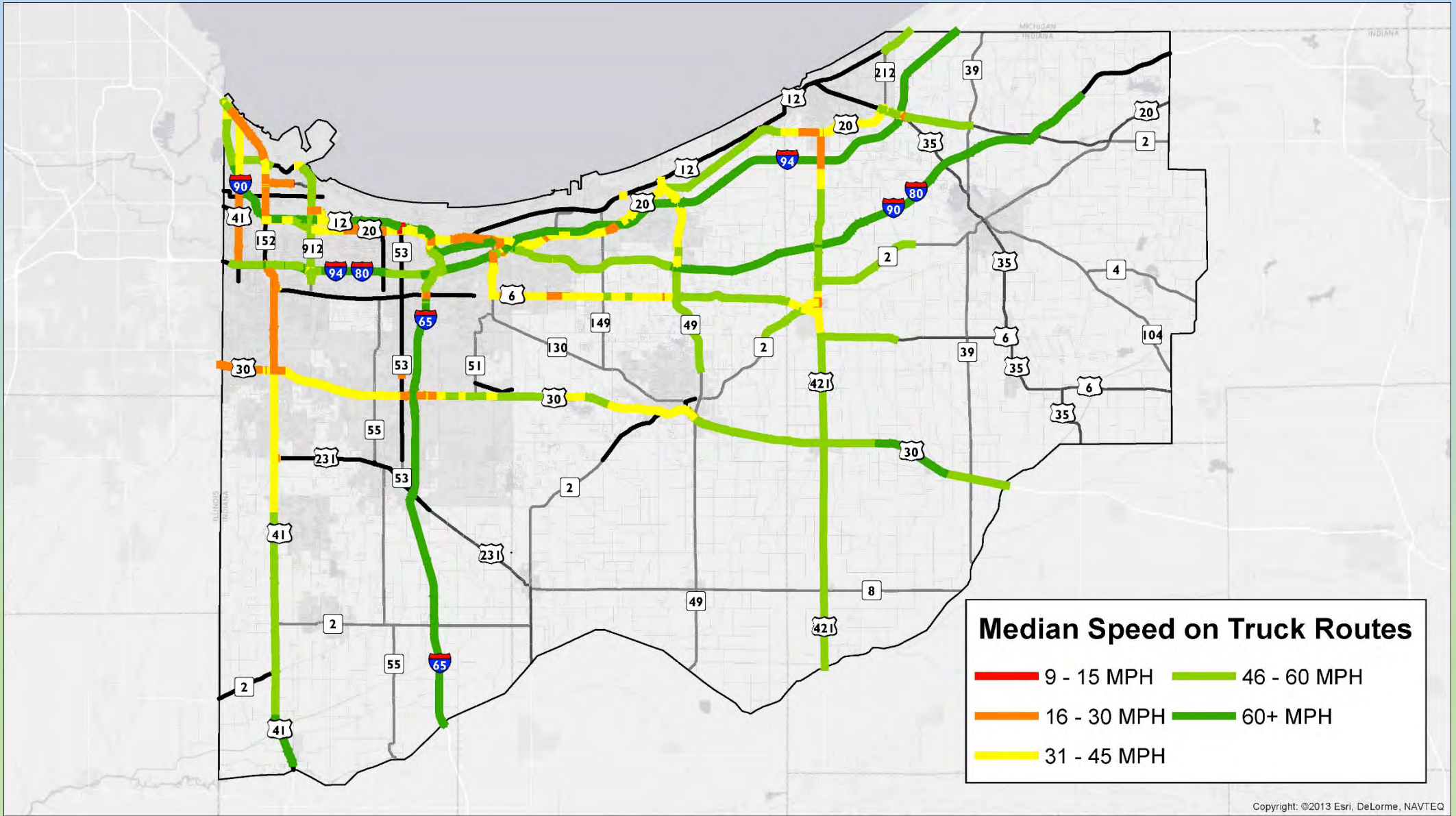
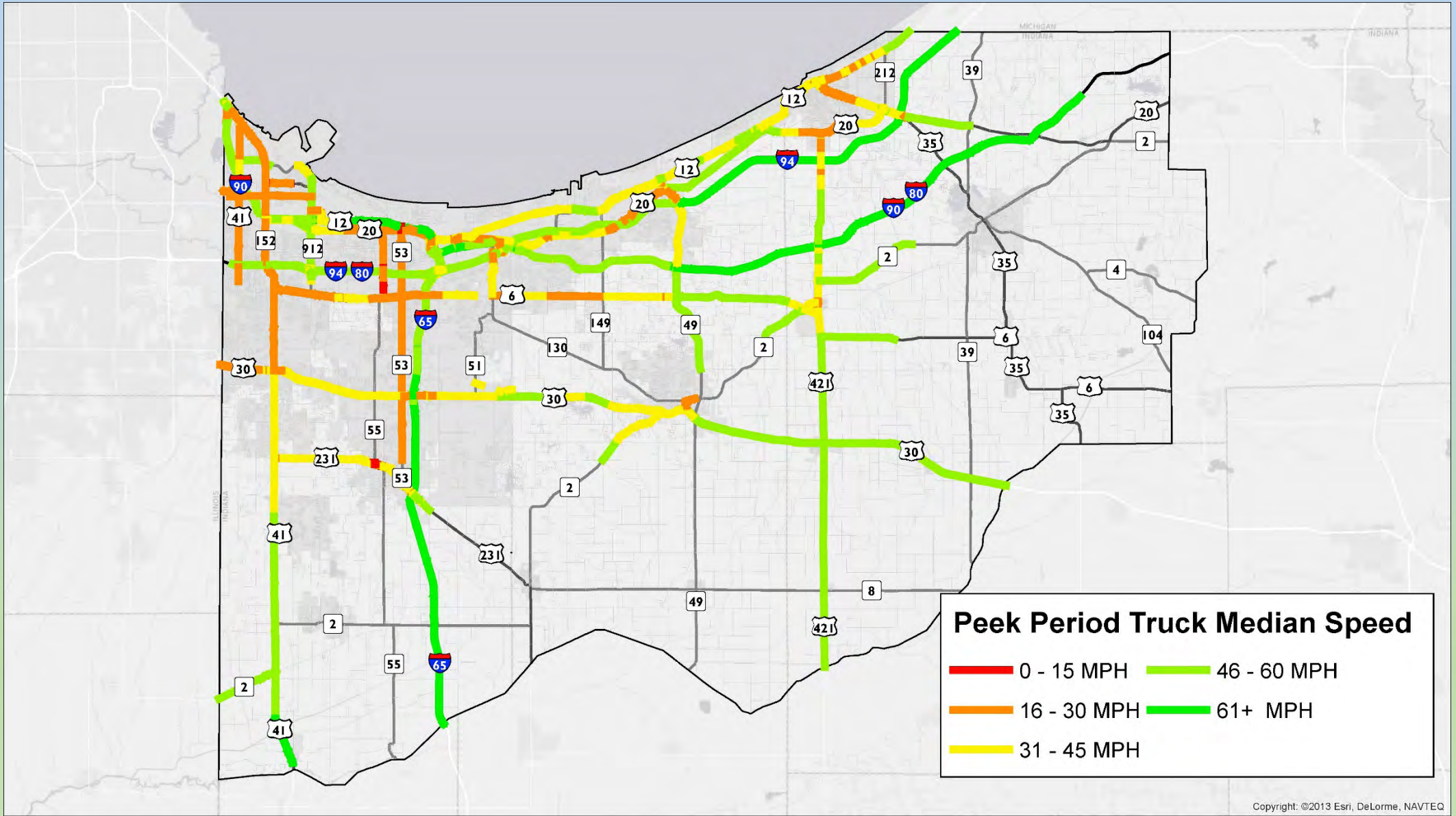
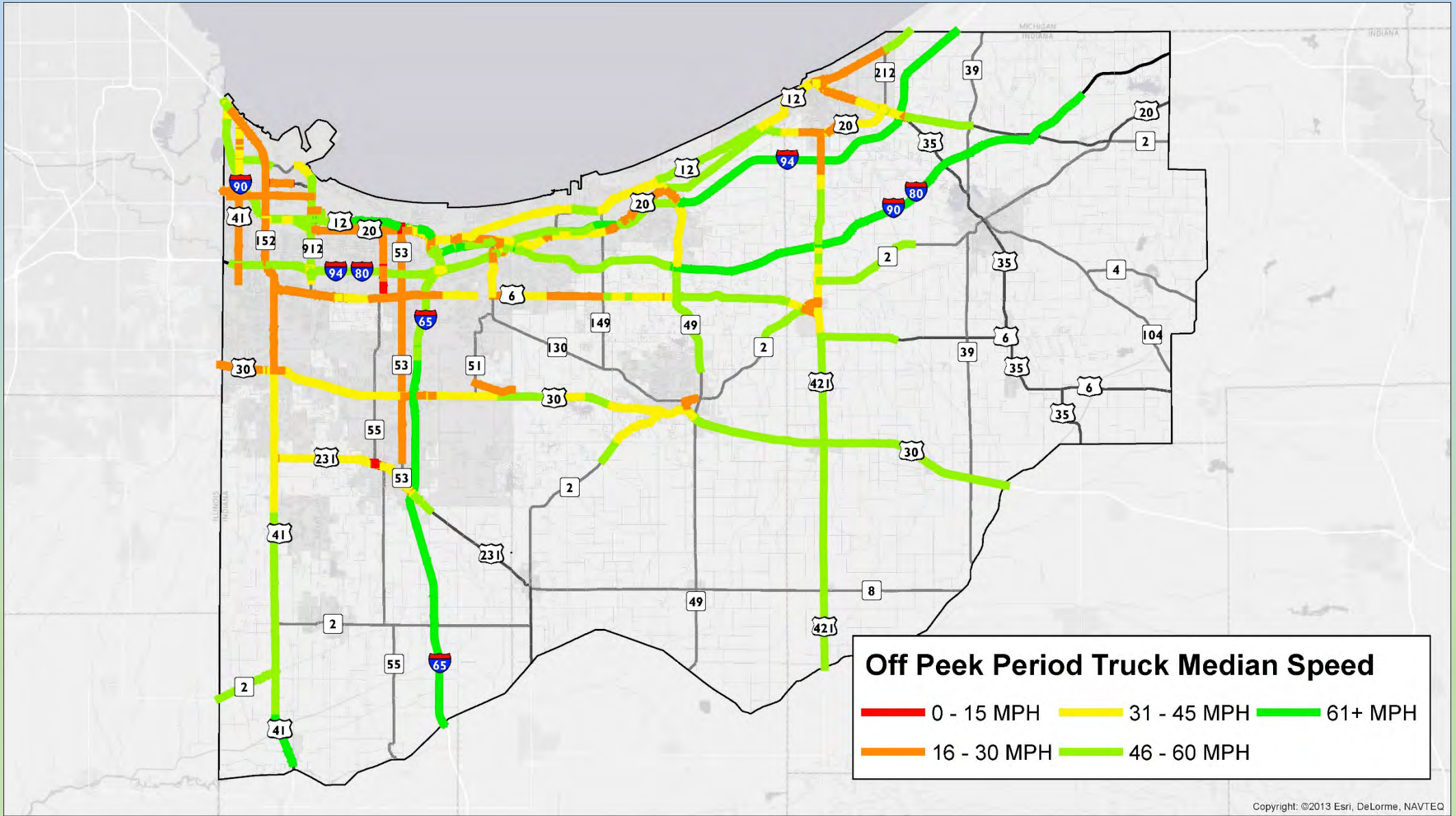
Average Speed on Truck Routes



Average Truck Speed in Peak Period



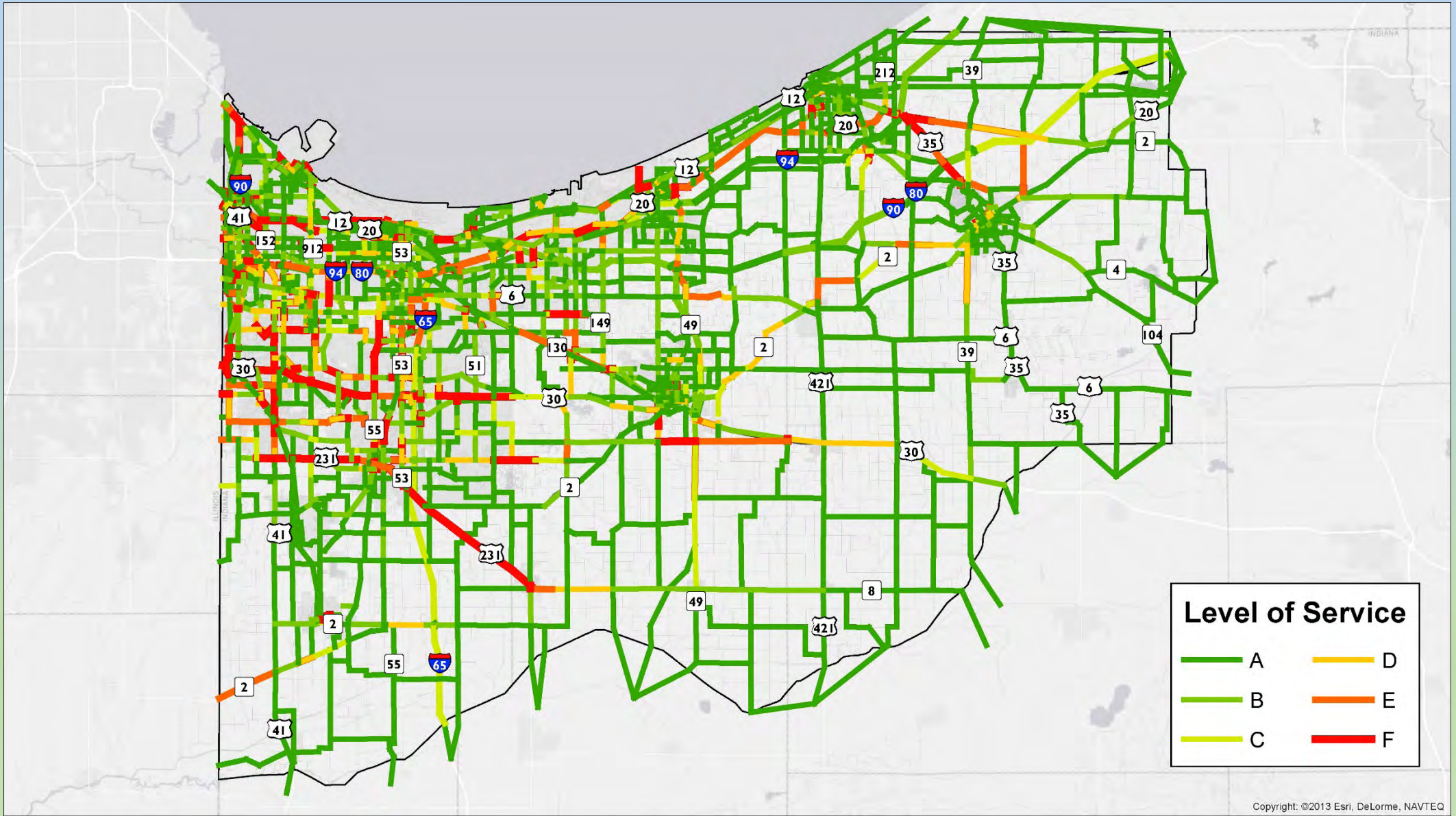
Average Truck Speed in Off-Peak Period



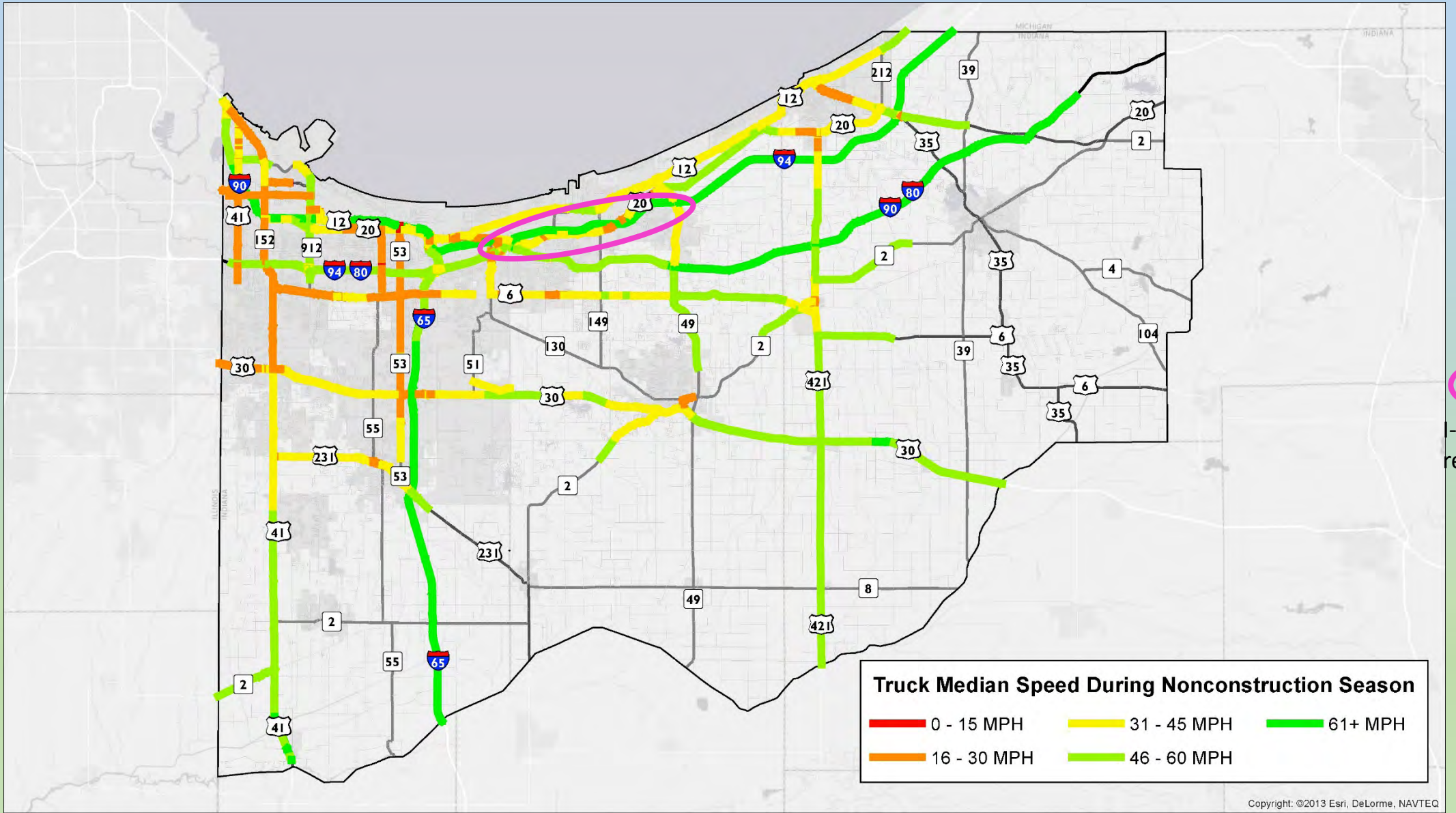
NIRPC's Use of NPMRDS for CMP

- In addition to all of the targets from PBP, NPMRDS helps identify congested network
- Monthly data at 5-min intervals allows tracking progress of major projects

Level of Service (NPMRDS and TD Model)

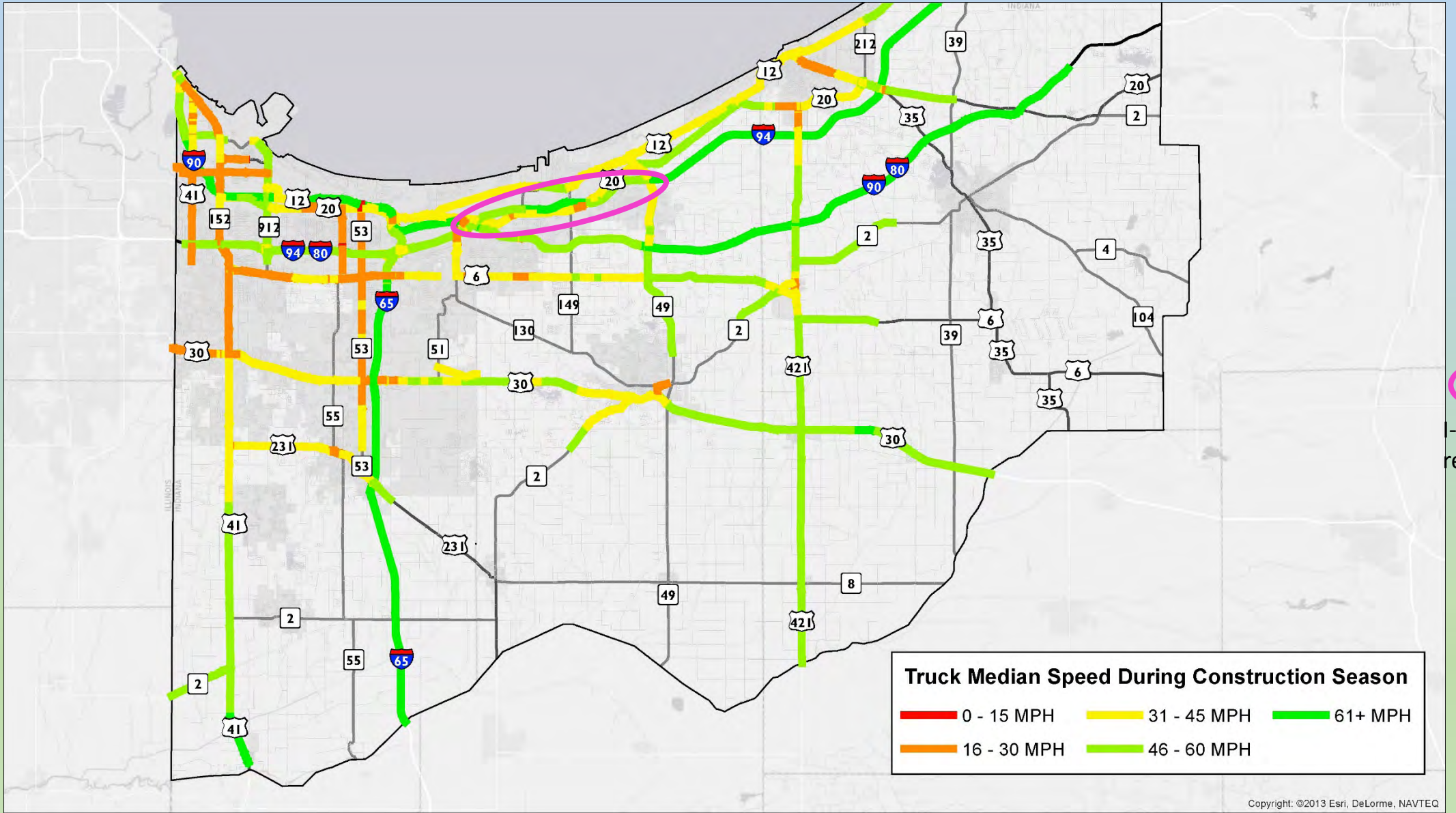


Average Speed Nonconstruction Season



I-94 bridge deck replacements

Average Speed Construction Season



I-94 bridge deck replacements

Conclusions/Takeaways

- NPMRDS is a Free (for most) travel time dataset
- NPMRDS is probe-based with data every 5-min
- Travel Times allow analysis of speed, delay, travel time index, planning time index, etc.
- NPMRDS helps MPOs with Performance Based Planning and Congestion Management Process

Thank You / Questions & Answers

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