Transforming the way the world moves

HERE Traffic & National Performance Measurement Research Dataset

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Terri Johnson

Company confidential

HERE Overview

HERE Product Overview

National Performance Measurement Data Set (NPMRDS)

HERE has an innovation heritage that spans 3 decades

Industry Firsts

Power in-car GPS EU (1994)

Power online map portal (1995)

Power in-car GPS NA (1996)

Real-time traffic for in-car NA (2004)

Map on a mobile phone (2004)

Map-aided Adaptive Cruise (2006)

Predictive Eco-Cruise (2010)

Power Mercedes Automated Vehicle (2013)

Acquisitions

NAVTEQ

NOKIA

gate5 AG

MAP24™

earthmine™

OI » bit-side

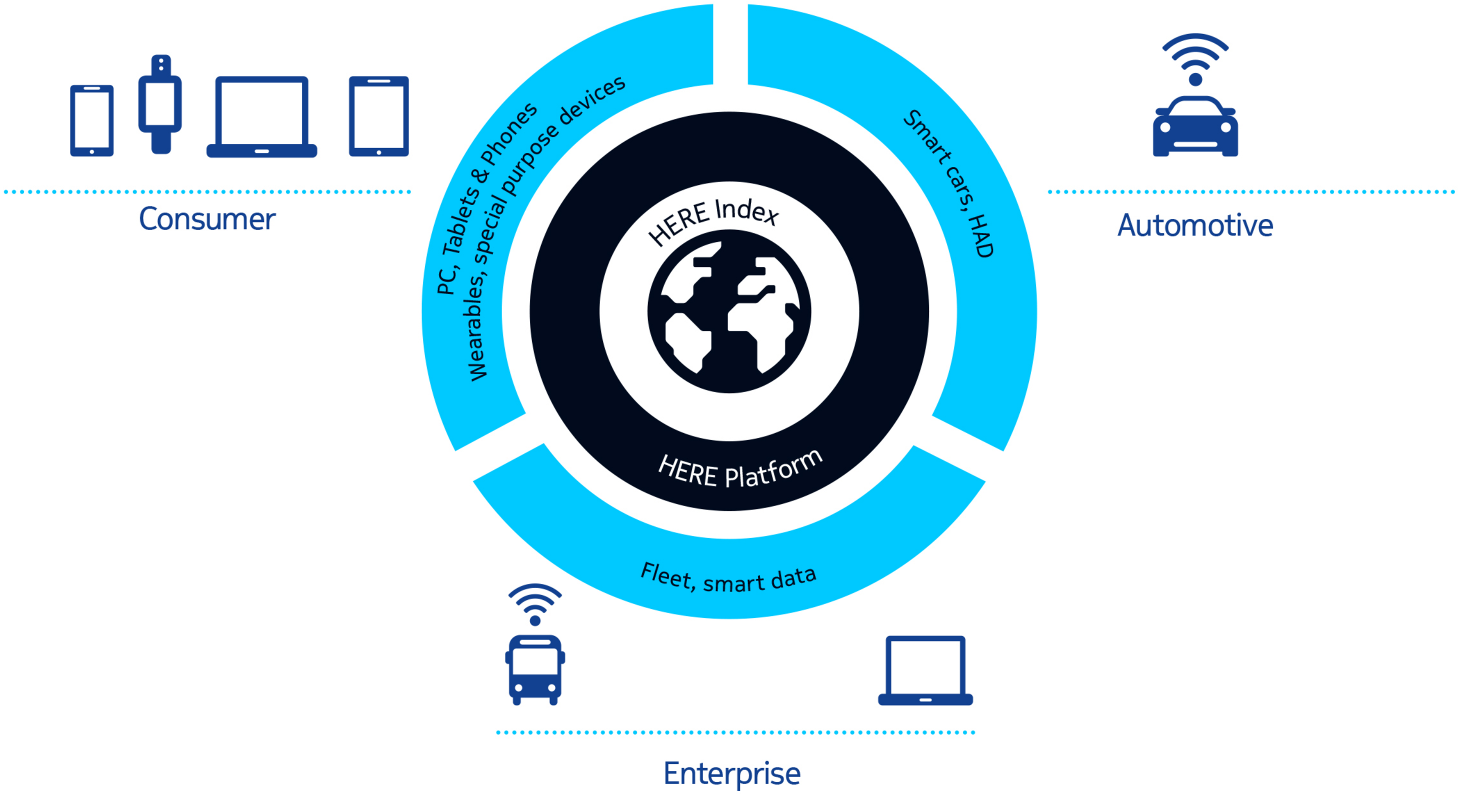
MetaCarta.

plum

New Brand

here

We create experiences for consumers and business

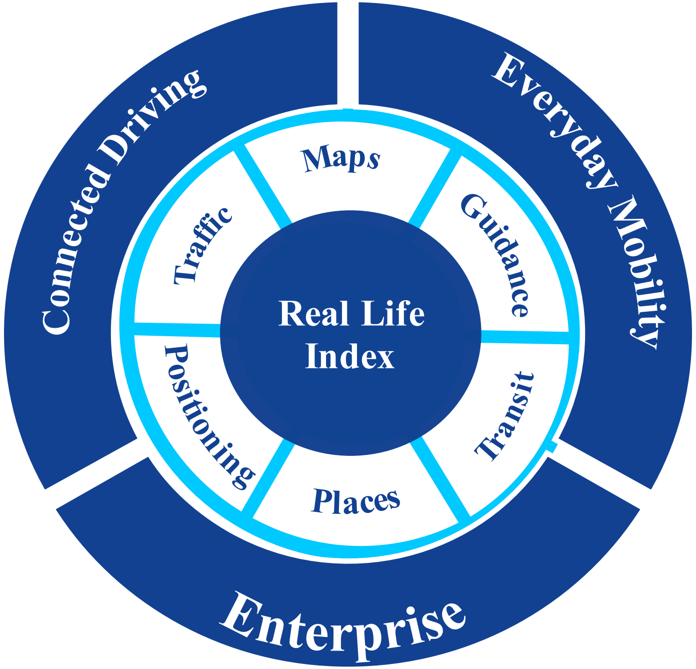

PC, Tablets & Phones
Wearables, special purpose devices
Smart cars, HAD
Fleet, smart data
HERE Index
HERE Platform
Consumer
Automotive
Enterprise

Our Connected Driving mission

At HERE we strive to make driving smarter, safer and more enjoyable by delivering best-in-class Connected Services & Driver Experiences.

Maps for Life

HERE creates the most true-to-life index of the world…



Real Life Index

Maps

Guidance

Transit

Places

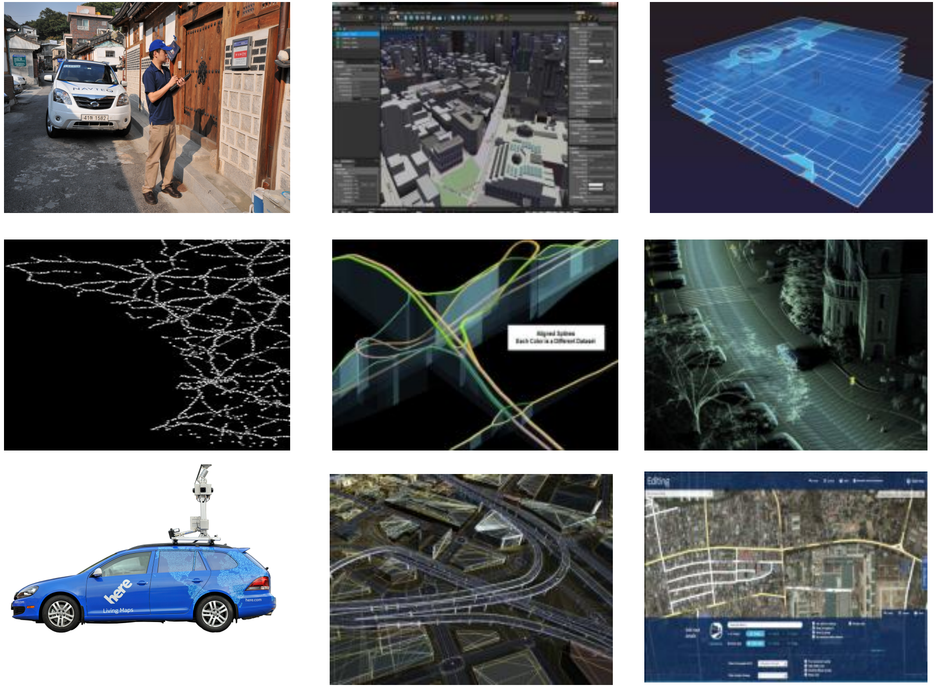
Positioning

Traffic

Connected Driving

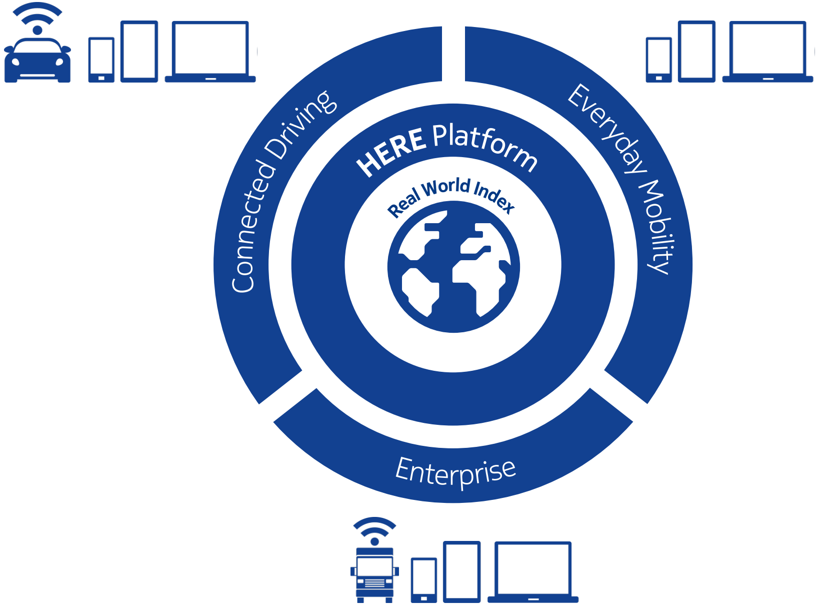
Everyday Mobility

Enterprise



HERE : the world’s first location cloud company

(a NOKIA business)


HERE Platform
Real World Index
Connected Driving
Everyday Mobility
Enterprise

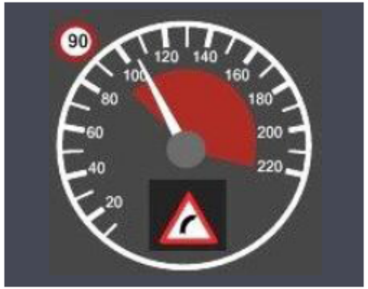
Maps | Guidance | Transit | Positioning | Places | Traffic

HERE makes the world’s freshest and most accurate maps.

We power products and services across automotive, web, mobile and enterprise.

Results: robust mobility, safety, and eco-efficiency apps

Driver Information



- Curve Speed Warning
- Speed Limit Advisor
- Driver Alerts

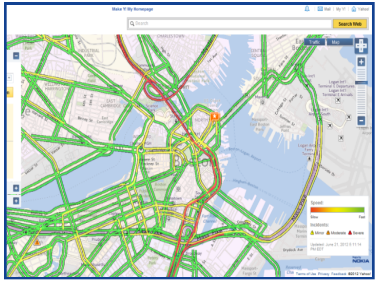
Active Safety

- Adaptive Cruise Control
- Adaptive Frontlights
- Collision Avoidance
- Lane Keeping

Powertrain Efficiency

- Hybrid Powertrain Control
- Transmission Control
- Predictive Cruise Control

Traffic Management



- Consumer Information
- Operations
- Planning
- Performance Measurement

HERE Maps and Real-Time Data are combined in different ways to serve different needs

Delivering distinct end user benefits across all segments

HERE powers 4 out of 5 vehicle with navigation maps and traffic

Consumer

Aol.
GARMIN
NAVIGON
SAMSUNG
YAHOO!
AvMap SATELLITE NAVIGATION
MAGELLAN
Navigation solutions
SONY
at&t
mapquest
NNG
Spokeo
bing
Microsoft
NOKIA
TELENAV
Firefox
NDrive
QUALCOMM
verizon

Automotive

BMW
LAND ROVER
HONDA
KIA MOTORS
MITSUBISHI
HOLDEN
Audi
CHRYSLER
HYUNDAI
SUZUKI
DACIA
Ford
GM
Mercedes-Benz
CITROËN
TOYOTA
mazda
SAAB
JAGUAR
MINI
NISSAN
TATA
OPEL
SEAT
McLaren
TESLA MOTORS
DODGE
VOLVO
SKODA AUTO
RENAULT
LANCIA
Jeep

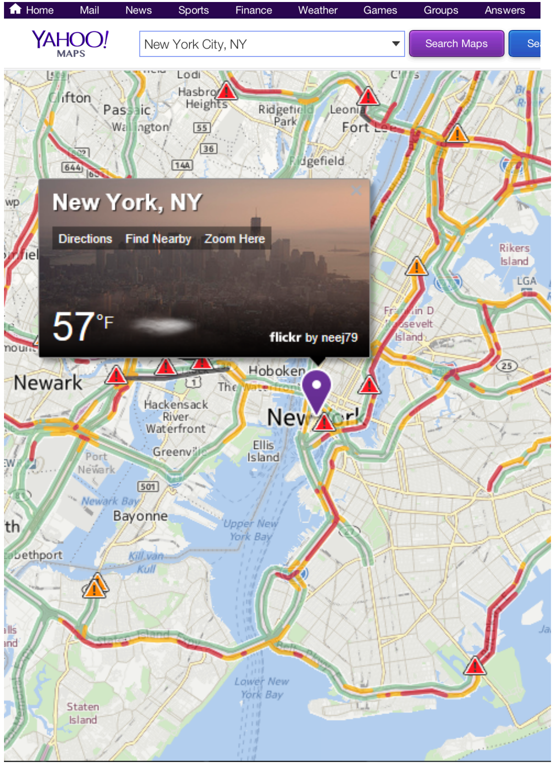
Government & Enterprise

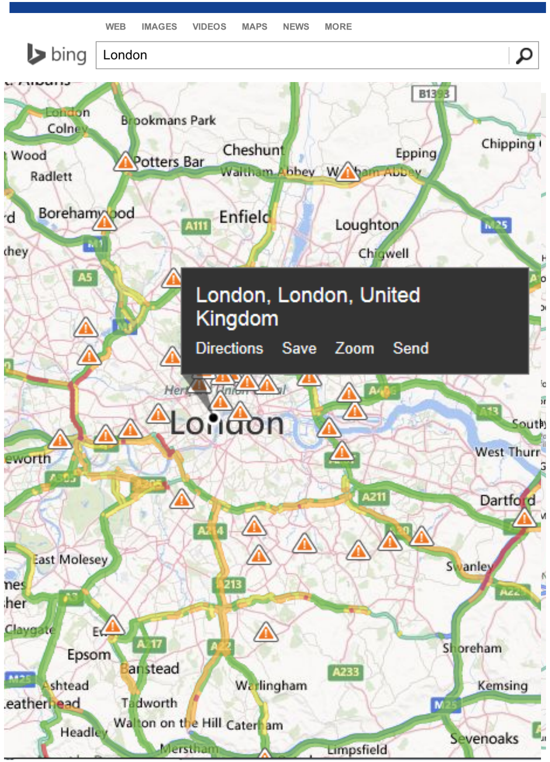
MDOT Michigan Department of Transportation
U.S. Department of Transportation Federal Highway Administration
MoDOT
NEW YORK CITY DOT
New Jersey Turnpike Authority 1949
DART
New York State Department of Transportation
PENNA TURN-PIKE
Connecticut Department of Transportation
UDOT udot.utah.gov
State of Florida Department of Transportation
Department of Transportation The State of New Jersey
Maricopa County Arizona
Indiana Department of Transportation
GDOT Georgia Department of Transportation
ADOT
TRANSCOM Transportation Operations Coordinating Committee

alk TECHNOLOGIES
esri
FedEx
ORACLE
RAND McNALLY
RouteSmart TECHNOLOGIES
SAP
TCS TeleCommunication Systems
Telogis
teletrac
ups

© 2014 HERE

Major Platforms use HERE Traffic


Home
Mail
News
Sports
Finance
Weather
Games
Groups
Answers
YAHOO! MAPS
New York City, NY
Search Maps
New York, NY
Directions
Find Nearby
Zoom Here
57°F
flickr by neej79
Newark
Hoboken
New York
Bayonne
Staten Island


WEB
IMAGES
VIDEOS
MAPS
NEWS
MORE
bing
London
London, London, United Kingdom
Directions
Save
Zoom
Send
London
Enfield
Loughton
Epsom
Dartford
Sevenoaks

HERE Platform powers map platforms of major sites like Amazon, Bing & Yahoo who use HERE Traffic.

HERE platform is serving ~100 million HERE Traffic requests per day!

HERE leads in customer satisfaction

2011

Rank	Vehicle Model	Map & Traffic
1	Dodge Charger	here
2	Hyundai Genesis Coupe	here
3	Chrysler 300 Series	here
4	Acura TSX Sedan	here
5	Audi S4 Sedan	here
6	Hyundai Elantra	here
7	Ford Flex	here
8	Ford Fusion	here
9	Lincoln MKS	here
10	Hyundai Sonata	here
11	Acura TL	TOMTOM
12	Chevy Volt	here
13	Buick LaCrosse	here
14	Lexus RX 350	here
15	Ford Taurus	here
16	Lexus IS 250/IS350/IS-F	here
17	Audi A4 Sedan	here
18	Lincoln MKZ Hybrid	here
19	Audi A5 Coupe	here
20	Infiniti FX-Series	here

2012

Rank	Vehicle Model	Map & Traffic
1	Dodge Charger	here
2	Porsche Cayenne	here
3	Chrysler 300 Series	here
4	Ford Taurus	here
5	Ford Mustang	here
6	Infiniti M37	here
7	Chrysler 200 Sedan	here
8	Ford Fusion	here
9	Ford F-150 LD	here
10	Jeep Grand Cherokee - Garmin	here
11	Hyundai Sonata	here
12	Acura TL	here
13	Acura TSX	here
14	Infiniti FX-Series	here
15	Lexus IS 250/IS 350/IS-F	here
16	Infiniti G-Series	here
17	Jeep Wrangler - Garmin	here
18	Lexus RX 350	here
19	Acura MDX	here
20	Lexus GX 460	here

2013

Rank	Vehicle Model	Map & Traffics
1	Dodge Charger	here
2	Chrysler 300	here
3	Dodge Dart	here
4	Porsche Cayanne	here
5	Dodge Durango – Garmin	here
6	Infiniti G	here
7	Chevy Camaro	here
8	Acura TL	here
9	Chevy Malibu	here
10	Lexus GS	here
11	Nissan Pathfinder	here
12	Ford Fusion	here
13	Nissan Murano	here
14	Nissan Sentra	here
15	Lincoln MKZ	here
16	Jeep Grand-Cherokee - Garmin	here
17	Lexus RX	here
18	Nissan Altima Sdn	here
19	Chrysler 200 – Harman	here
20	BMW 5 Series	TOMTOM

The HERE family of Connected Driving products

HERE Connected Driving Suite

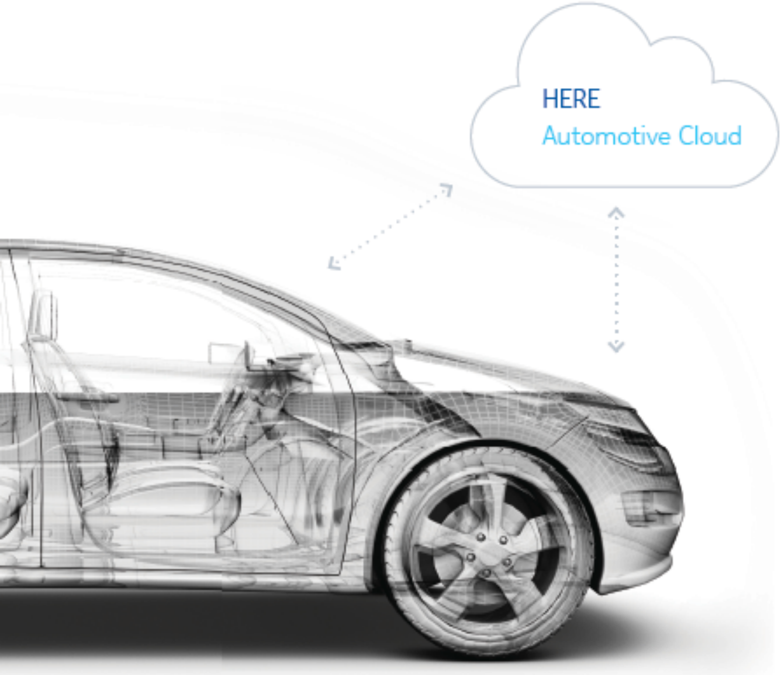
HERE Auto Solutions

- HERE Auto Embedded Solution
- HERE Auto Companion Application
- HERE Auto SPNS

HERE Auto Components

- HERE Auto SDK
- HERE Automotive Cloud
- HERE Platform
- HERE Traffic
- HERE Real World Index

Powering automated vehicle technology today



Nov 2013
HERE has teamed up with Mercedes Benz to jointly develop smart maps for connected cars and ultimately, self driving cars.

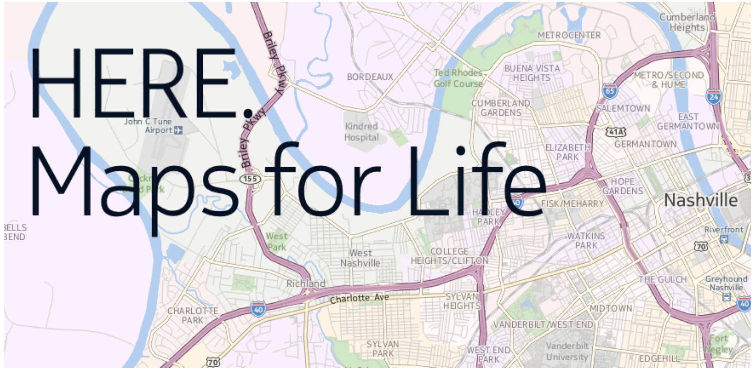
Jan 2014
North American Auto Show 2014: Continental and HERE team up to map out the future of vehicle connectivity

Joint development for next generation Electronic Horizon, Automated Driving and new Intelligent Transportation Systems based on high precision map technology

Map Products

HERE Map – Multi-modal and Dynamic

1. Search for Locations and Address content
2. Route by vehicle type (car, truck, transit/pedestrian)
3. Process and deliver dynamic content (traffic, weather, etc)


HERE.
Maps for Life
Nashville

Traffic, transit and weather
Nashville

HERE leads in customer satisfaction

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10	Lexus GS	here
11	Nissan Pathfinder	here
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13	Nissan Murano	here
14	Nissan Sentra	here
15	Lincoln MKZ	here
16	Jeep Grand-Cherokee - Garmin	here
17	Lexus RX	here
18	Nissan Altima Sdn	here
19	Chrysler 200 – Harman	here
20	BMW 5 Series	TOMTOM

Content: capturing and indexing real life

214
Countries mapped

2.7M
Changes per day

75,600
Buildings with indoor maps

96
Countries with voice-guidance

34
Countries with live traffic services

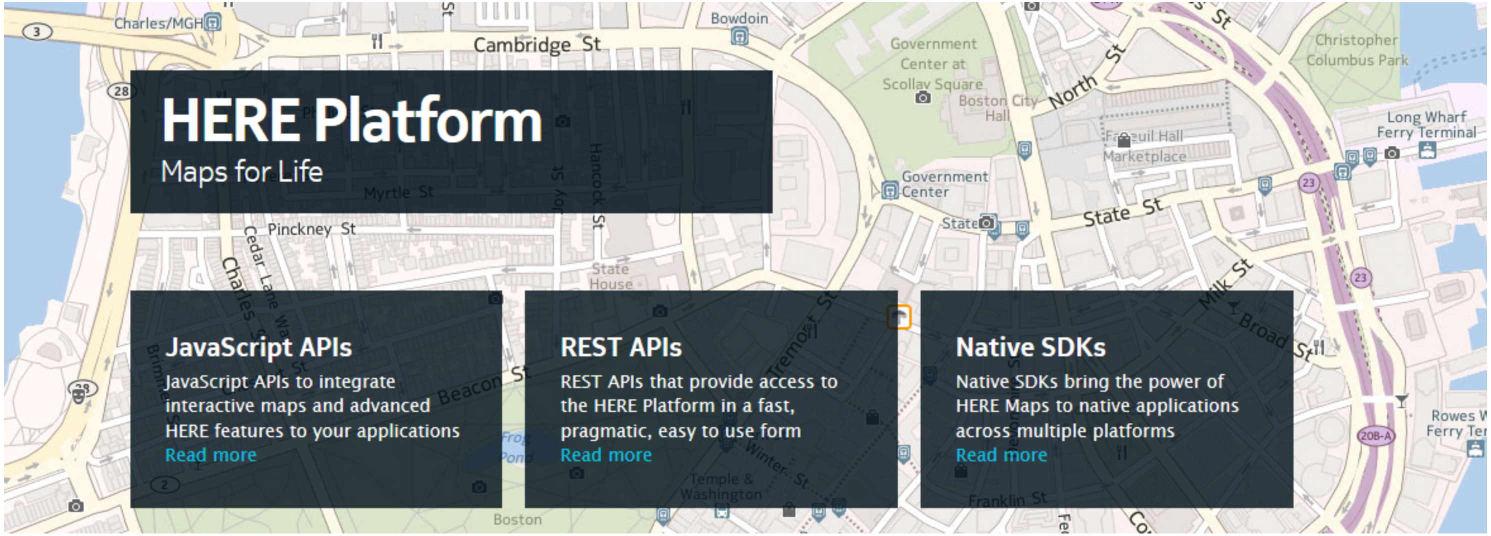
80,000
External sources help to create our maps

805
Cities with public transit

52
Languages

The HERE Map

http://Developer.HERE.com



HERE Platform

Maps for Life

JavaScript APIs

JavaScript APIs to integrate interactive maps and advanced HERE features to your applications

Read more

REST APIs

REST APIs that provide access to the HERE Platform in a fast, pragmatic, easy to use form

Read more

Native SDKs

Native SDKs bring the power of HERE Maps to native applications across multiple platforms

Read more

Charles/MGH
Cambridge St
Bowdoin
Government Center at Scollay Square
Boston City Hall
North St
Christopher Columbus Park
Long Wharf Ferry Terminal
Faneuil Hall Marketplace
Government Center
State
State St
Myrtle St
Pinckney St
Cedar Lane Way
Charles St
Hancock St
Joy St
State House
Milk St
Broad St
Beacon St
Tremont St
Winter St
Temple & Washington
Franklin St
Frog Pond
Boston
Rowes Wharf Ferry Terminal
3
28
23
2
20B-A

Collaborative solutions powering transportation for government

ITERIS

CITILABS

PTV GROUP
the mind of movement

Caliper

esri

RITIS

VirginiaTech
Invent the Future

Traffic Products

Traffic Fast Facts

- 7-day, 24 hours availability
- Coverage: 100% interstate highways and primary arterials
- 100% major traffic signal controlled roads in 134 markets
- 360,000 →1,000,000 miles in US and Canada in 2014
- Providing traffic data to Michigan, Florida, Pennsylvania Turnpike, Missouri, New York, New Jersey and Connecticut
- Selected by FHWA to create new archived data product for performance measurement activities
- Top 20 JD Powers ranked navigation systems all use HERE maps and Traffic

© HERE 2013

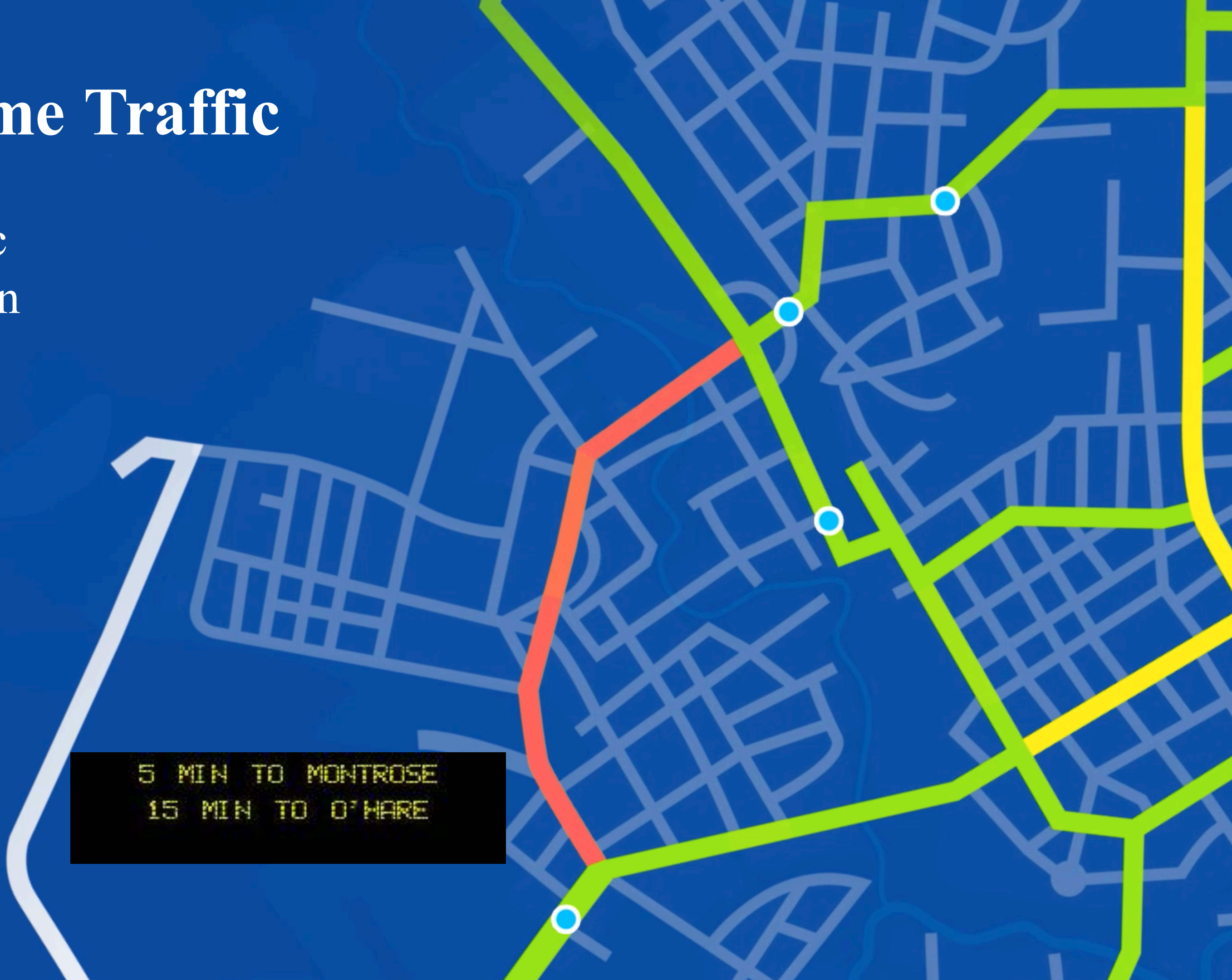
Traffic Product Portfolio

Use Case	Today's Products		What's Next
Provide the public reliable travel times in real-time (DMS, apps)	Real-time	Real-time Feed Speeds, travel times, incidents	Platform
Operations & Planning Groups need to understand patterns over time and different conditions to optimize performance	Archived	National Performance Measurement Research Data Set (Archived travel times)	Volume & Origin Destination Daily Analytics Archive of incident data
		Historical Patterns & ATP Typical speeds & travel times by day/time based on historical data	
The public, operations, and planning groups can benefit from anticipating	Predictive	Predictive models based on normal state, seasonality	Predictive based on incidents, weather

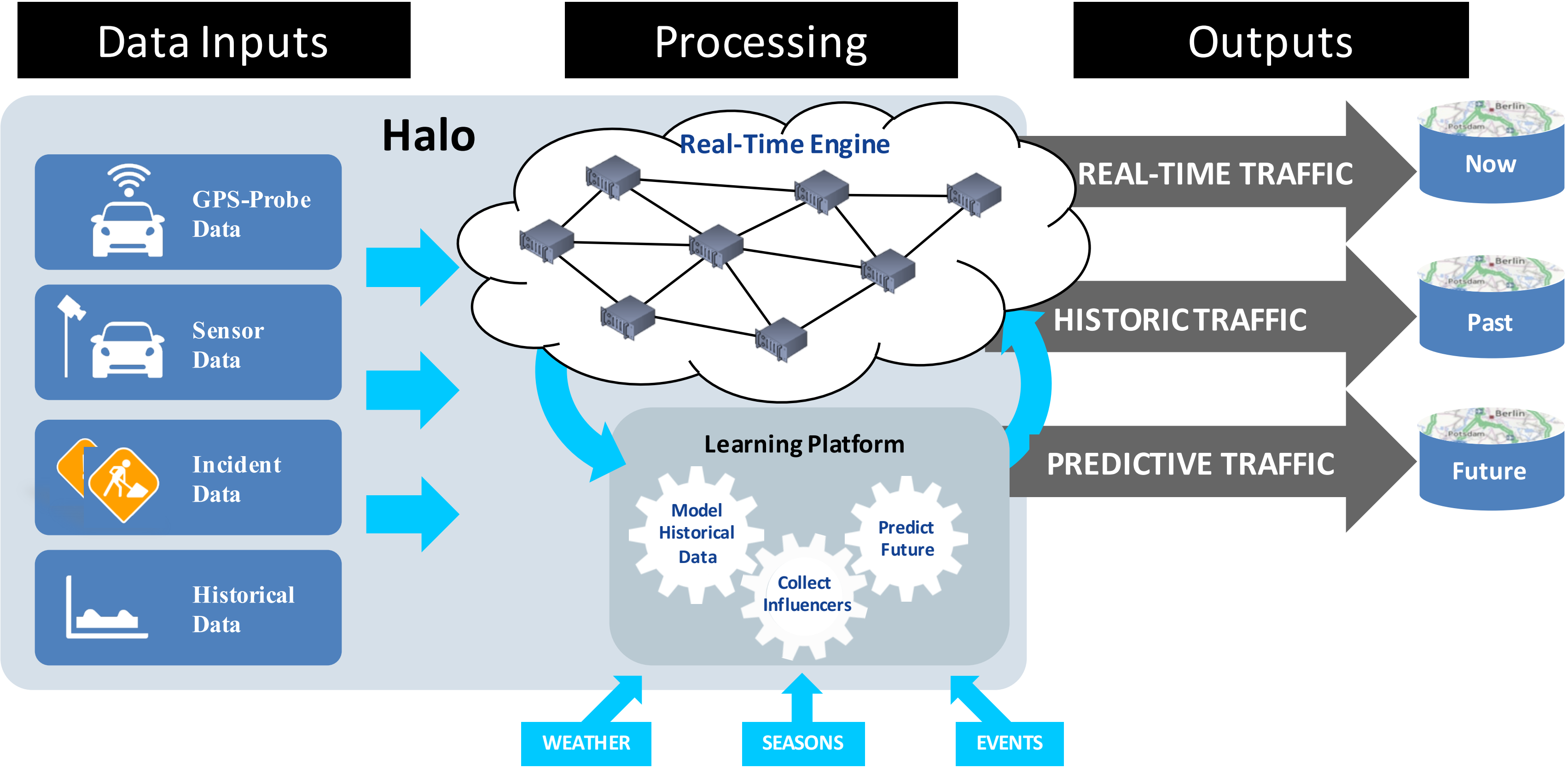
HERE Real-Time Traffic

Continuous Dynamic Traffic Information in Real-Time

A fantastic way to get drivers to their destinations faster and more efficiently


5 MIN TO MONTROSE
15 MIN TO O'HARE

Halo: Real-Time Data Processing Engine



Data Inputs

Processing

Outputs

Halo

GPS-Probe Data

Sensor Data

Incident Data

Historical Data

Real-Time Engine

Learning Platform

Model Historical Data

Collect Influencers

Predict Future

WEATHER

SEASONS

EVENTS

REAL-TIME TRAFFIC

HISTORIC TRAFFIC

PREDICTIVE TRAFFIC

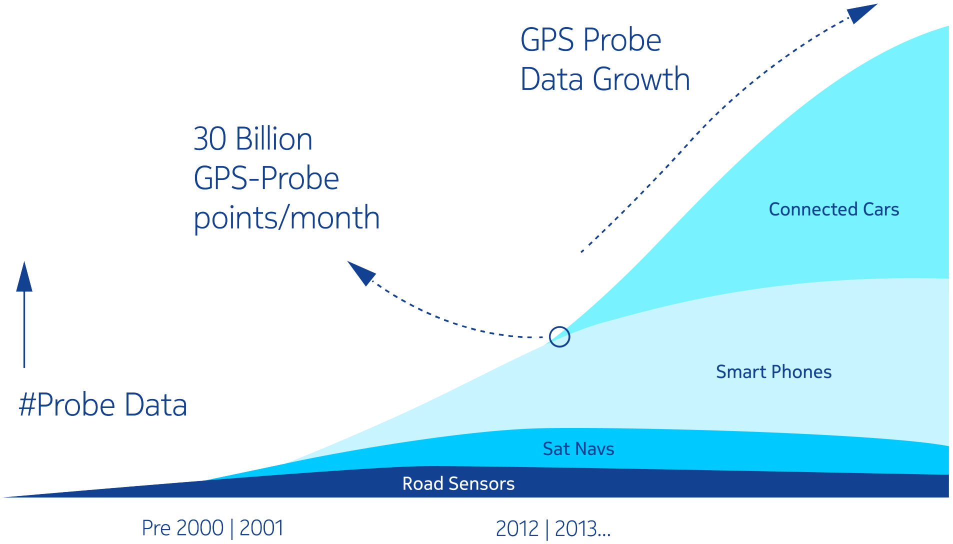
Now

Past

Future

Traffic Input Sources

The great & unique fundaments for premium products



Growing Probe Volume

- Over 100% growth expected in 2014
- Major provider currently being implemented

160+ GPS Probe Sources:

- Connected cars
- Smart phone apps: navigation apps
- Sat navs / PND's
- Fleet management systems
- Tracking systems
- Road sensors

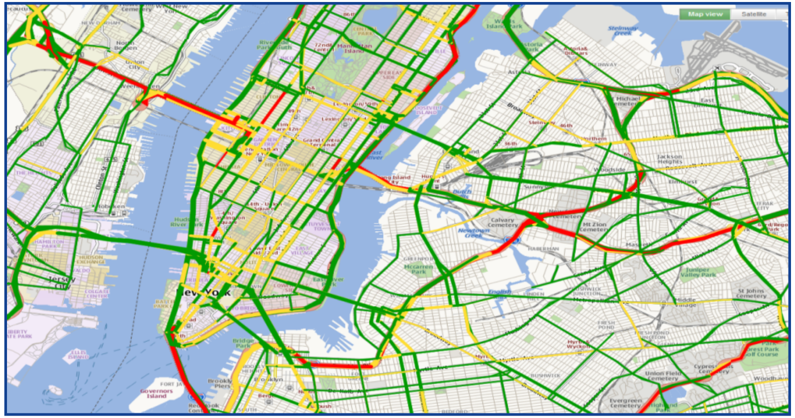
~30 Incident sources:

- National / regional traffic centers
- HERE owned traffic centers (USA, Germany, New Zealand & Australia)
- Road works data providers

HERE Traffic in North America

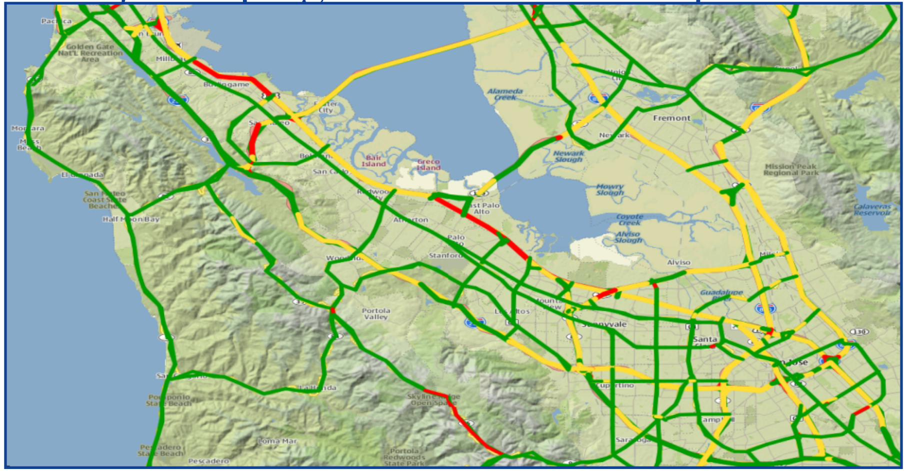
- ~100% coverage on Controlled Access roads nationwide, 24 x 7
  (FC1-FC2 roads/Major Highways)

- ~100% coverage of primary arterials & major stop lighted roads in the top 134



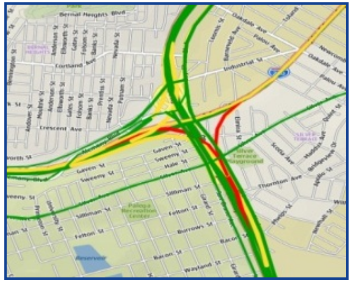
Map view
Satellite
New York
Jersey City

New York City

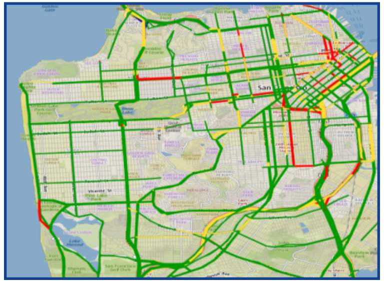


Fremont
Newark
Palo Alto
Stanford
Alviso
Sunnyvale
Santa
Burlingame
Half Moon Bay
Mission Peak Regional Park

San Francisco Bay Area



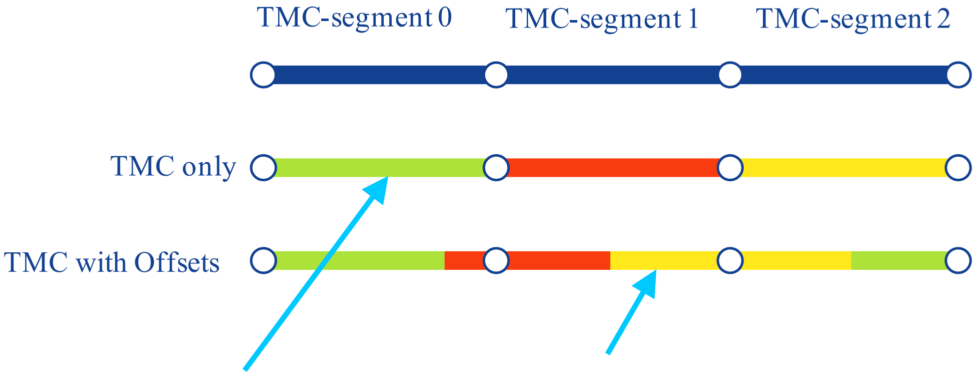
Ramps/Connectors near SFO



San Francisco

New Features: TMC-Offsets

Flow reporting on TMC-road segments example


TMC-segment 0
TMC-segment 1
TMC-segment 2
TMC only
TMC with Offsets

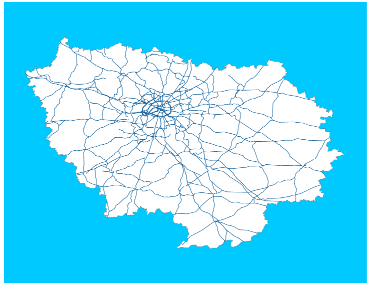
Without offsets, TMC-based traffic reports average conditions from the beginning to the end of a TMC.

TMC-Offsets add precision to traffic reports by specifying the offsets at which congestion begins and ends.

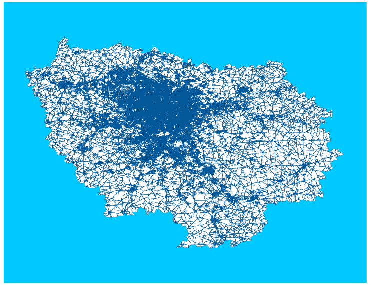
TMC-Offsets brings more granular traffic information on TMC-road segments.

New Features: DLR – Dynamic Location Referencing

TMC vs Link Example



TMC-road segments in Paris



TMC + Link road Segments in Paris

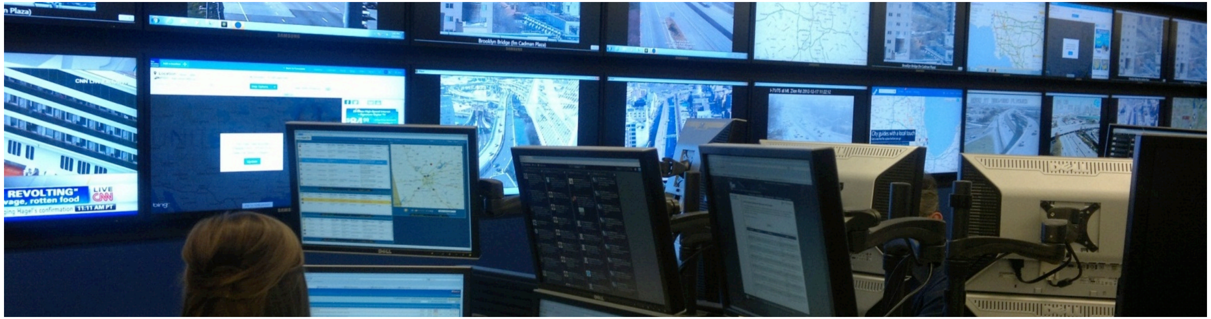
DLR enables traffic reporting on the entire map

Traffic Information reporting on the entire map, at link level.

Allows Traffic to be reported anywhere we can map match a PGS probe point, not just where there are TMC codes.

Traffic where you need it, when you need it.

Incident management center



We collect our own flow & incident data via our incident management center- a hybrid approach of humans and automation.

1.
Operators monitor a variety of sources, including: emergency centers, users, Twitter and police.

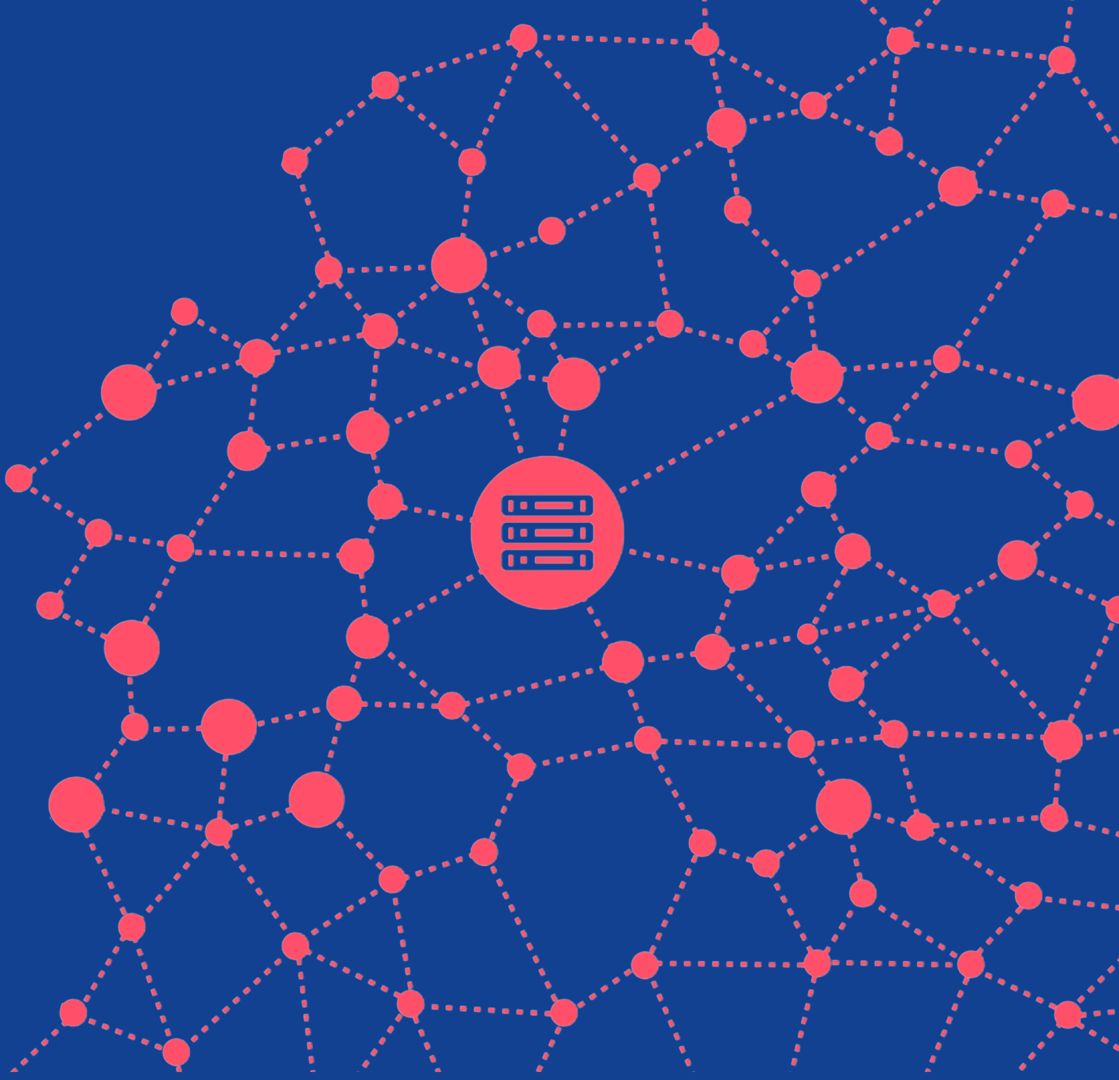
2.
Incidents are then corroborated via flow data from sensor network, traffic sensors, and incident source partners.

3.
Incidents are entered in HERE's proprietary processing engine and broadcast instantly, filtering out non-essential or incorrect reports

HERE Historic Traffic

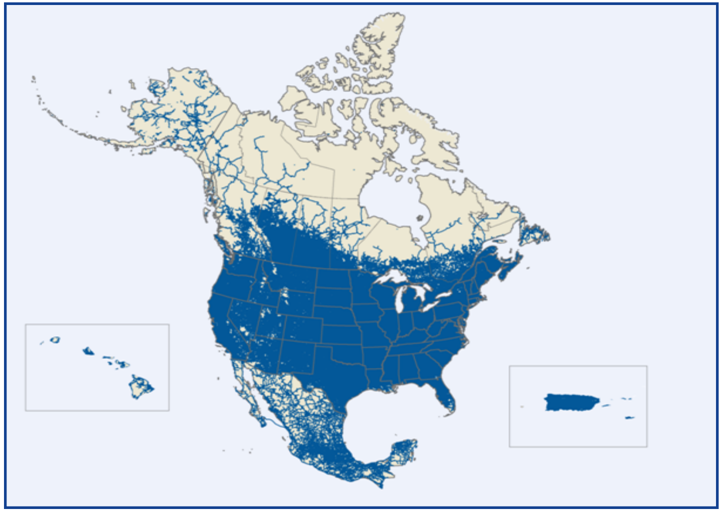
A typical day of average speed values derived from billions of multi-year speed observations

Provides the foundation for optimization of routes and accurate drive time estimates



HERE Traffic Patterns – Product Content

- Available for each 15 minutes of the week:
  - Speed average
- The 15 minute week information is available based on:
  - 3 year probe data observations for **all roads**
- Covers **all roads**

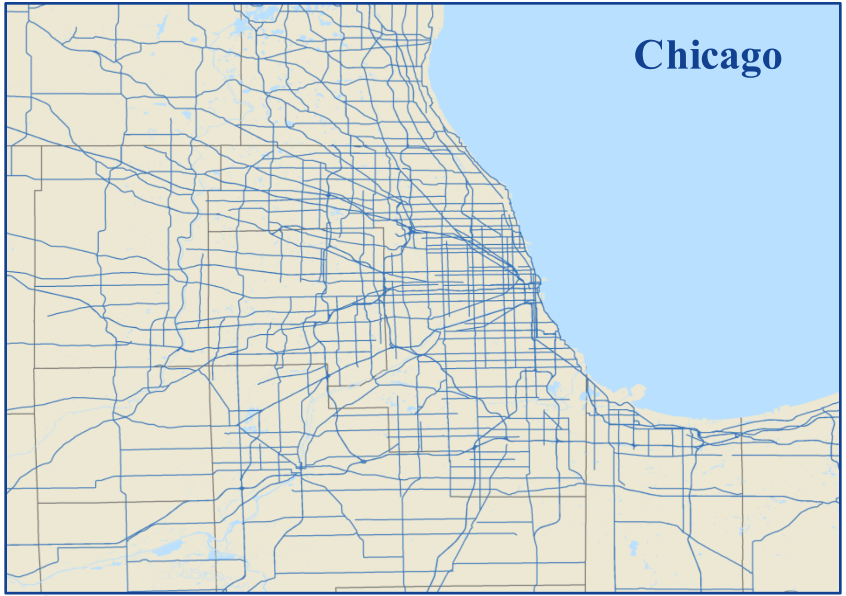


- Data characteristics:
  - Relational csv format for 15-minute data intervals
  - **Annual** model by weekday
  - A Holiday/Seasonal Factors are included, providing guidance for those unusual traffic days
  - **ALL ROADS:** Referenced to TMC codes or Link IDs
  - Referenced to local time
  - Speed values in MPH to 1 MPH increments

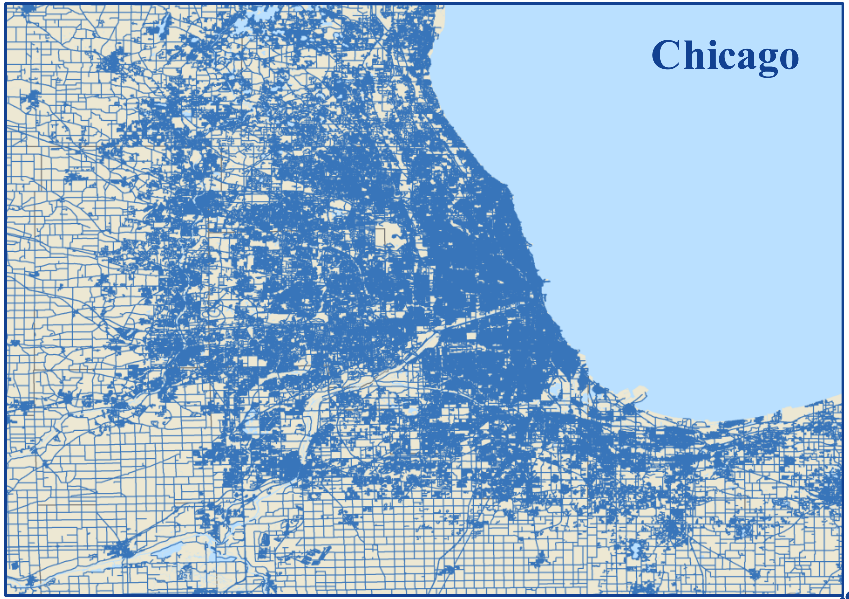
HERE Traffic Patterns – Link-based Coverage

- Provides coverage on all roads in the Map – not just roads that are TMC-coded. This is possible because the data is geo-referenced to Link IDs.
- Allows for detection of traffic conditions that might be aggregated in the TMC-based coverage model
- Greater coverage allows for better routes and more accurate travel times

TMC-based Coverage

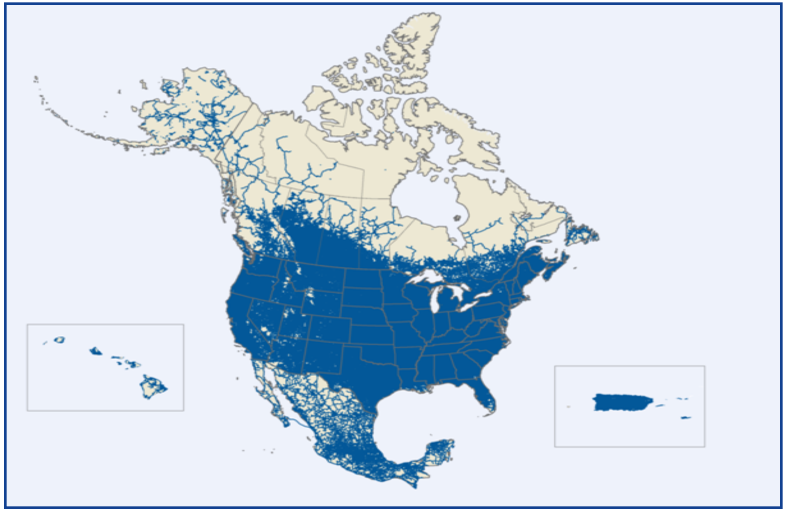


Link-based Coverage



HERE Analyic Traffic – Product Content

- Available for each 15 minutes of the week:
  - Speed average
- The 15 minute week information is available based on:
  - **1 year** probe data observations, TMC roads

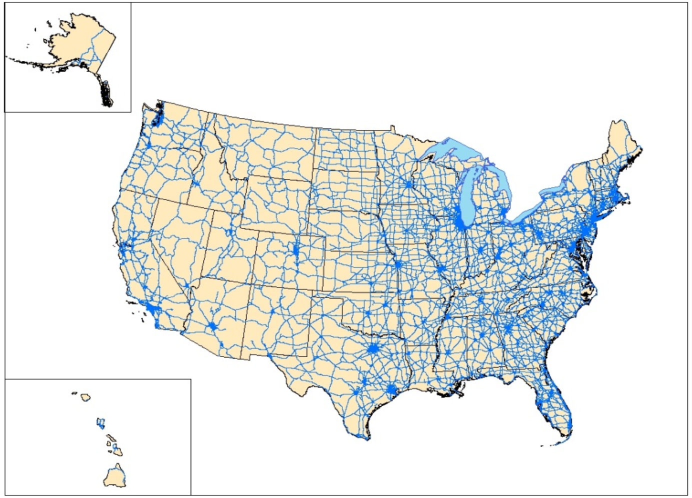


- Data characteristics:
  - Relational csv format for 15-minute data intervals
  - **Monthly** by weekday
  - Referenced to TMC codes
  - Referenced to local time
  - Speed values in MPH to 1 MPH increments

National Performance Research Data Set

NPMRDS – What is NPMRDS

HERE provides a National Highway System (NHS) map extract with TMC codes



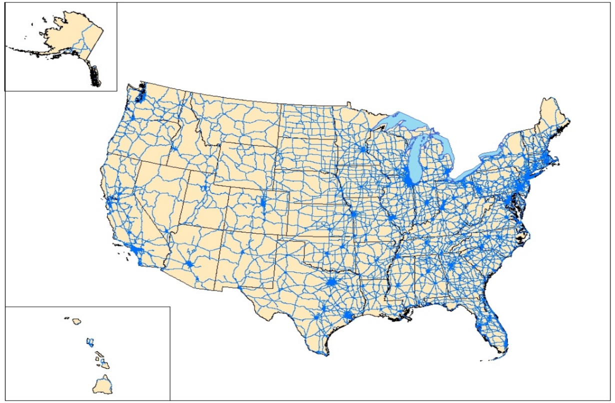
The shapefile will include attributes such as: TMC ID, street name, functional class, direction of travel, controlled access, ramp identifier

NPMRDS – Background

- Key elements of the RFP:
  - Looking for actual, observed measurements only
    - No estimates, historical data substitution or the like
  - Coverage of the entire National Highway System (NHS) as defined by MAP-21
  - Average travel times every 5 minutes, 24 hours a day, 7 days a week
  - “Historical” data set delivered monthly

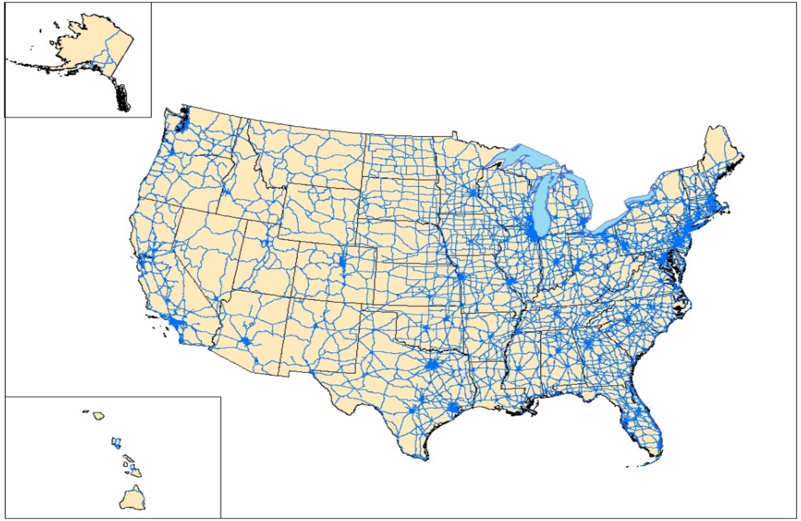
NPMRDS – What is NPMRDS

- A historical archive of average travel times by calendar day in 5-minute increments covering the National Highway System (NHS)
- An archived dataset is also available for October 2011 – June 2013
- Data for July 2013 – September 2013 is currently available
  - Data set is available on monthly basis



NPMRDS – Product Content

- Available for each 5 minutes increments by day:
  - Travel time for Truck, Passenger and Combined
  - Created monthly



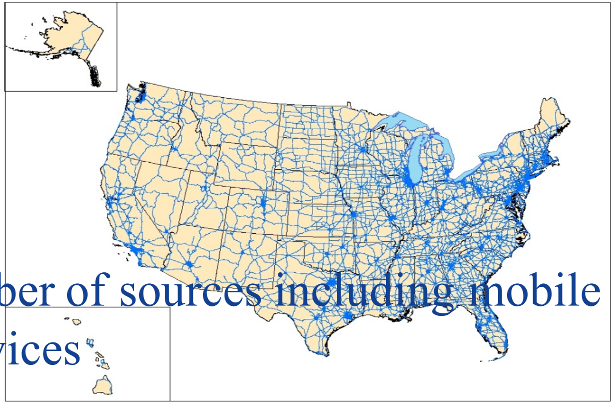
- Data characteristics:
  - **Daily**
  - Relational csv format for 5-minute data intervals
  - Referenced to TMC codes
  - Referenced to local time
  - **Travel-times Only**
  - Data available from 2011 forward

NPMRDS – Product Background

- FHWA is providing access to the data set (NPMRDS) for state DOTs and MPOs free of charge
- FHWA is not providing:
  - Analysis or GIS tools
  - Additional data
- FHWA will hold quarterly webinars so that users of the NPMRDS have an opportunity to discuss issues with using the data amongst their peers as well as answering NPMRDS-specific technical issues

NPMRDS – What is NPMRDS

- FHWA selected HERE (formerly Nokia/Navteq) to provide the NPMRDS
  - Four one-year options (potential 4 year contract)
- The data set includes three distinct average travel times for each 5 minute "bin"
  - Freight
  - Passenger
  - All Traffic
- HERE Data Sources
  - Passenger probe data is obtained from a number of sources including mobile phones, vehicles, and portable navigation devices
  - Freight probe data is obtained from the American Transportation Research Institute leveraging embedded fleet systems



NPMRDS – What is NPMRDS

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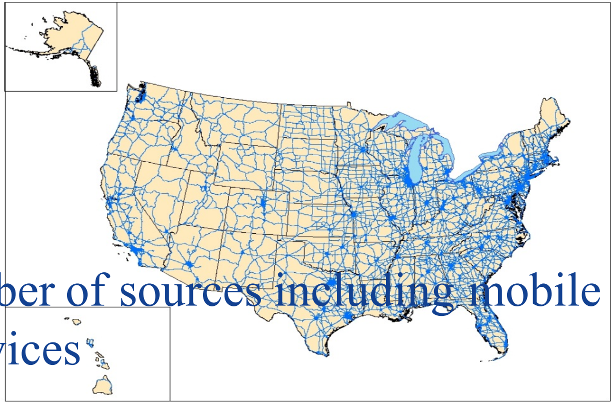


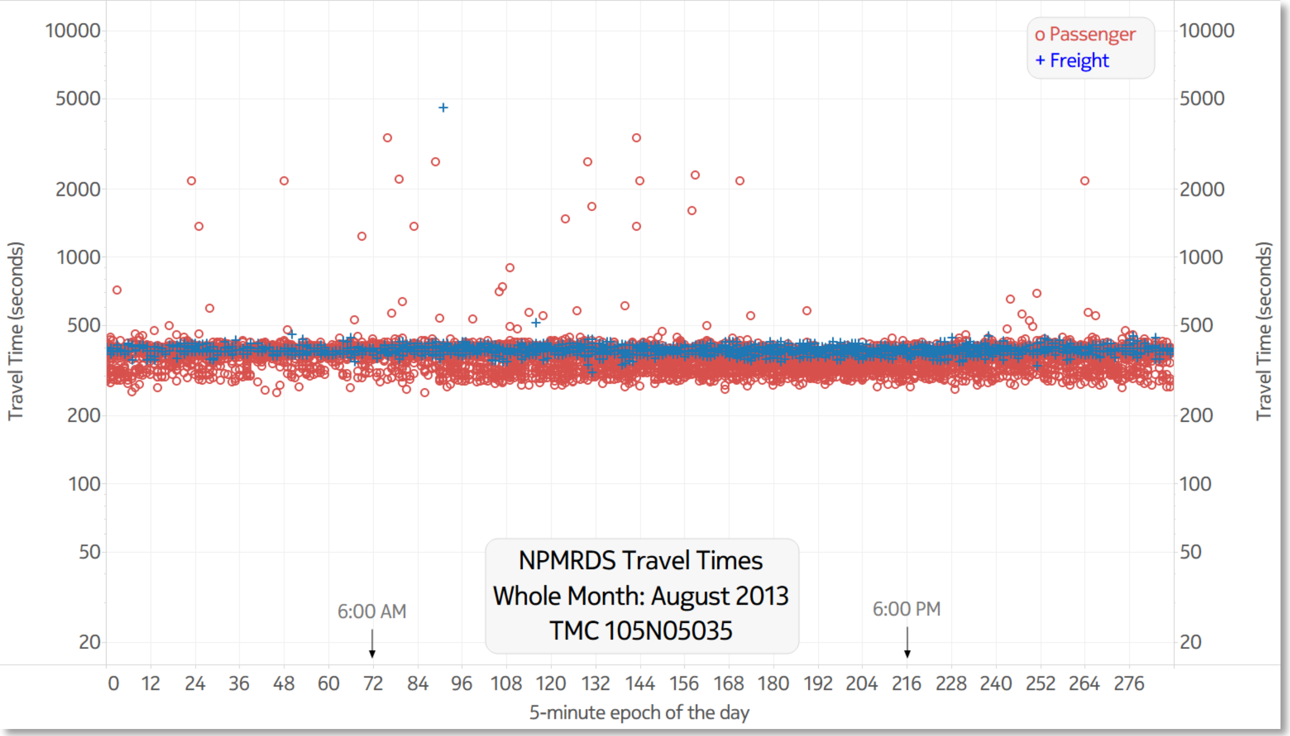
Monthly Dataset Visualization: Example 1 - Rural Interstate

I-5 S outside Bakersfield, CA

Length: 6.3939mi

Speed limit: 70 MPH (TT: 329 s) |

Passenger Free Flow: 70.2 MPH



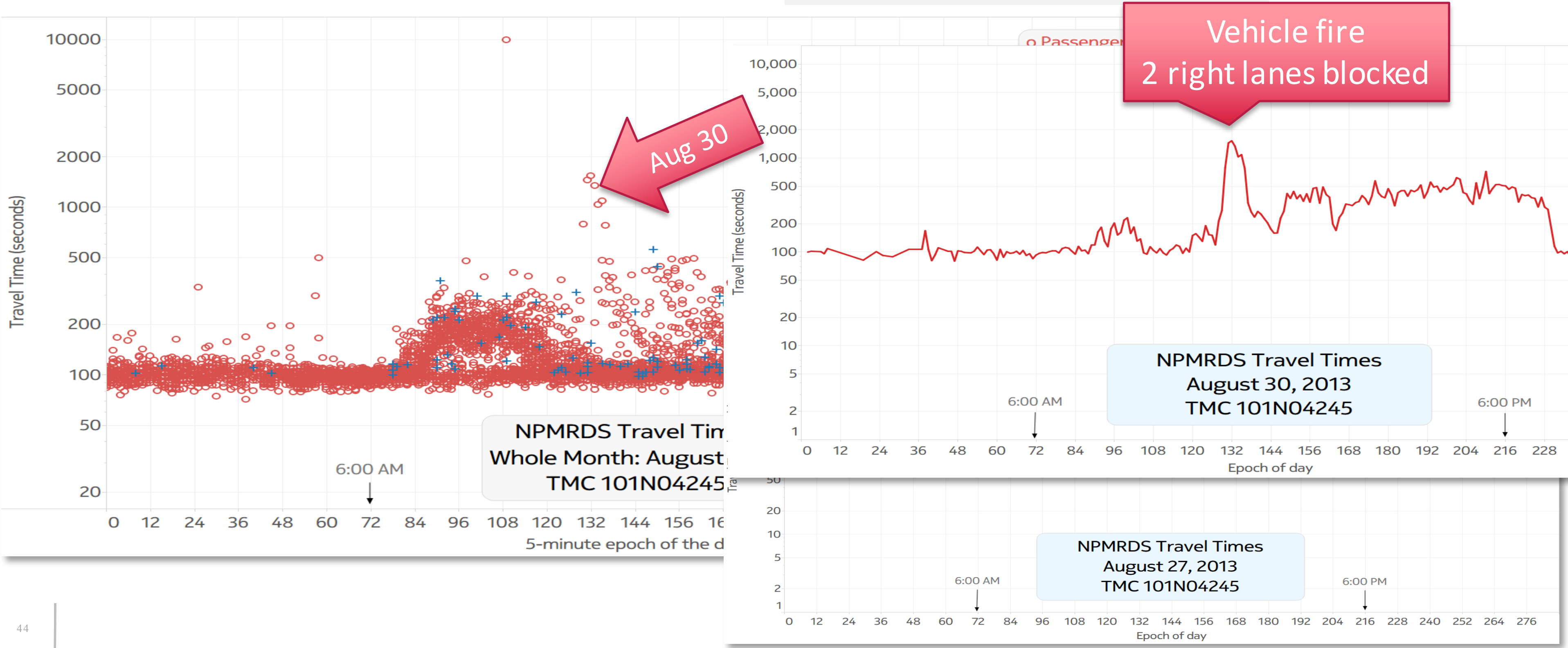
NPMRDS Travel Times
Whole Month: August 2013
TMC 105N05035

© 2014 HERE | Travel Time

Monthly Data Set Visualization - Example 2: Urban highway, typical peak pattern

I-85 S in Atlanta, GA

	Mean	Std Dev
Passenger	167.5 sec	186.1 sec
Freight	260.2 sec	238.0 sec



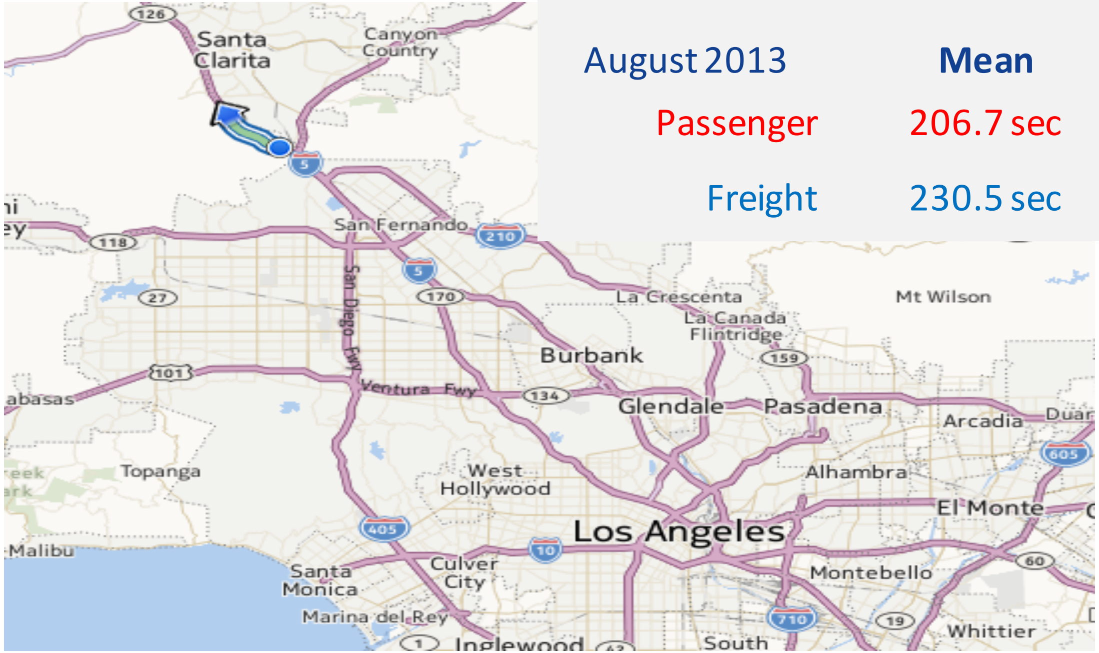
Aug 30

Vehicle fire
2 right lanes blocked

Monthly Data Set Analyses Example: Suburban Interstate

I-5N out of LA

Length: 2.80mi | Speed limit: 65 MPH (TT: 155 s)


126
Santa Clarita
Canyon Country
5
San Fernando
210
118
5
170
27
San Diego Fwy
La Crescenta
La Canada Flintridge
Mt Wilson
Burbank
159
101
Ventura Fwy
134
Glendale
Pasadena
Arcadia
abasas
605
Topanga
West Hollywood
Alhambra
El Monte
405
Los Angeles
10
Malibu
Santa Monica
Culver City
60
Montebello
Marina del Rey
710
19
Whittier
Inglewood
South

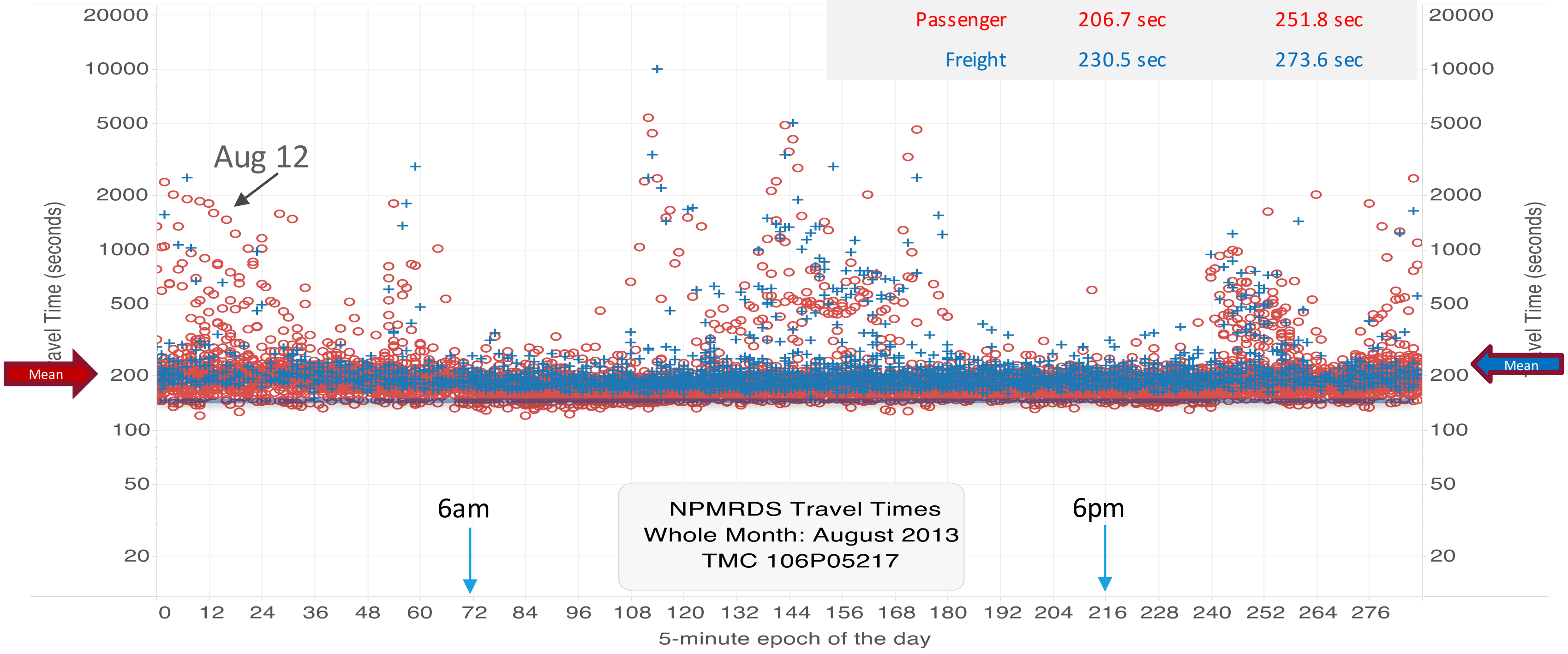
August 2013	Mean	Standard Deviation
Passenger	206.7 sec	251.8 sec
Freight	230.5 sec	273.6 sec

Suburban Interstate
Travel Time Comparison – Aug 2013

I-5N out of LA

Length: 2.80mi | Speed limit: 65 MPH (TT: 155 s)

	Mean	Std Dev
Passenger	206.7 sec	251.8 sec
Freight	230.5 sec	273.6 sec

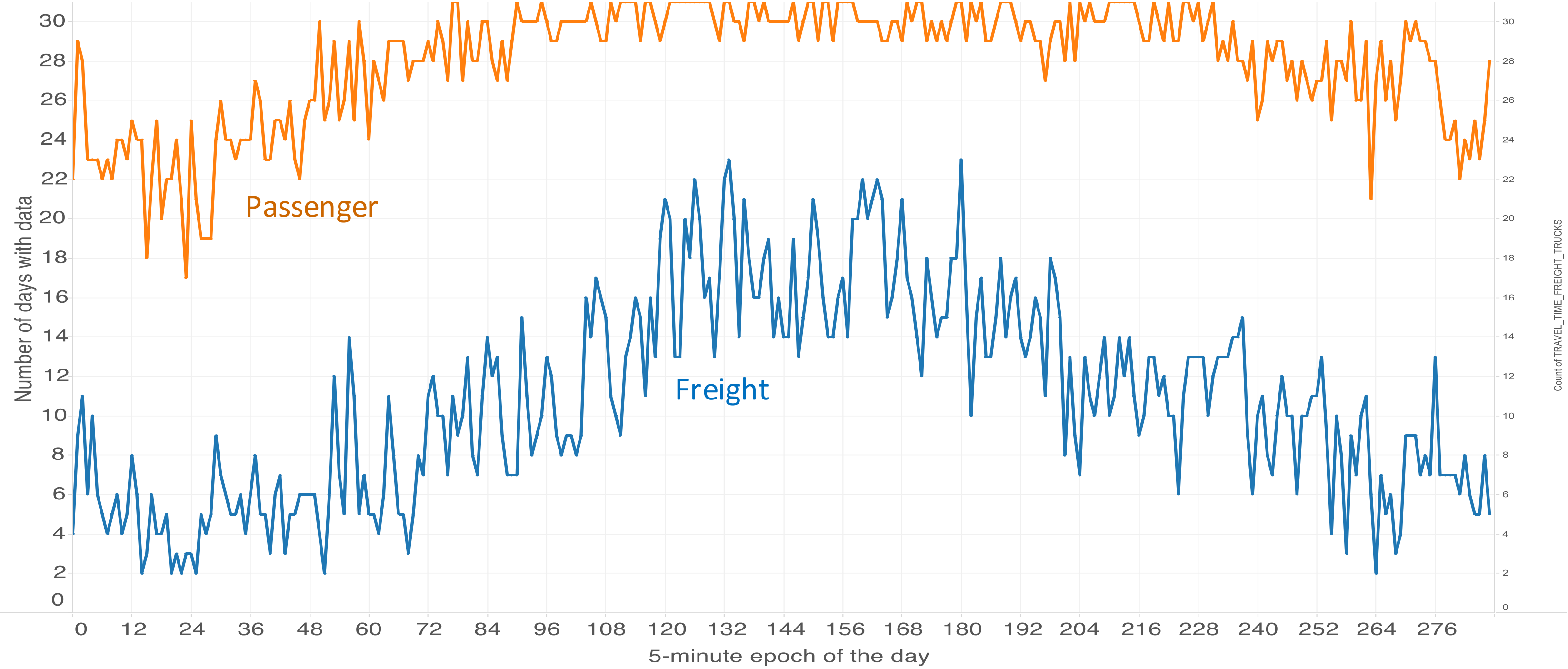


NPMRDS Travel Times
Whole Month: August 2013
TMC 106P05217

© 2013 HERE | Title | Author | Company confidential

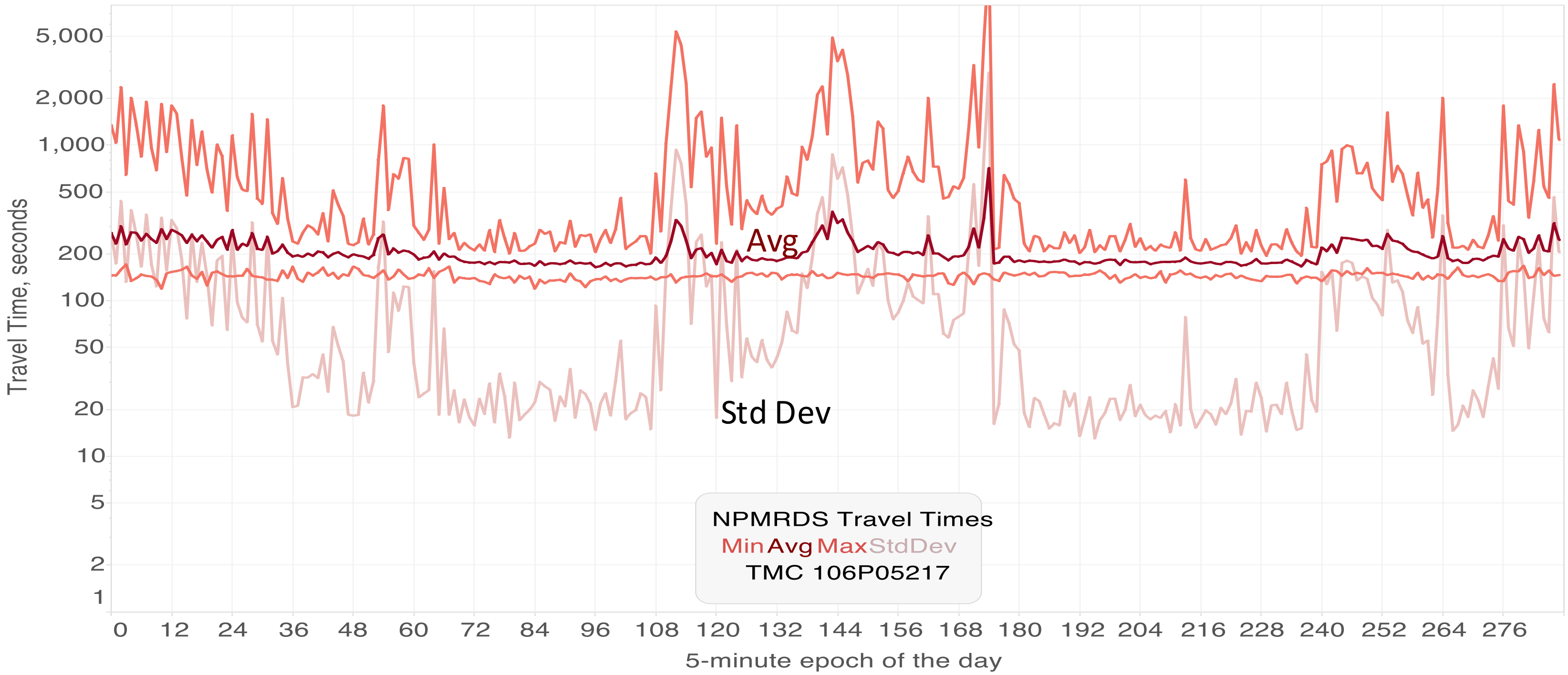
Suburban Interstate
Data Density over August

I-5N out of LA



Suburban Interstate
Passenger Travel Time Avg & Variance

I-5N out of LA



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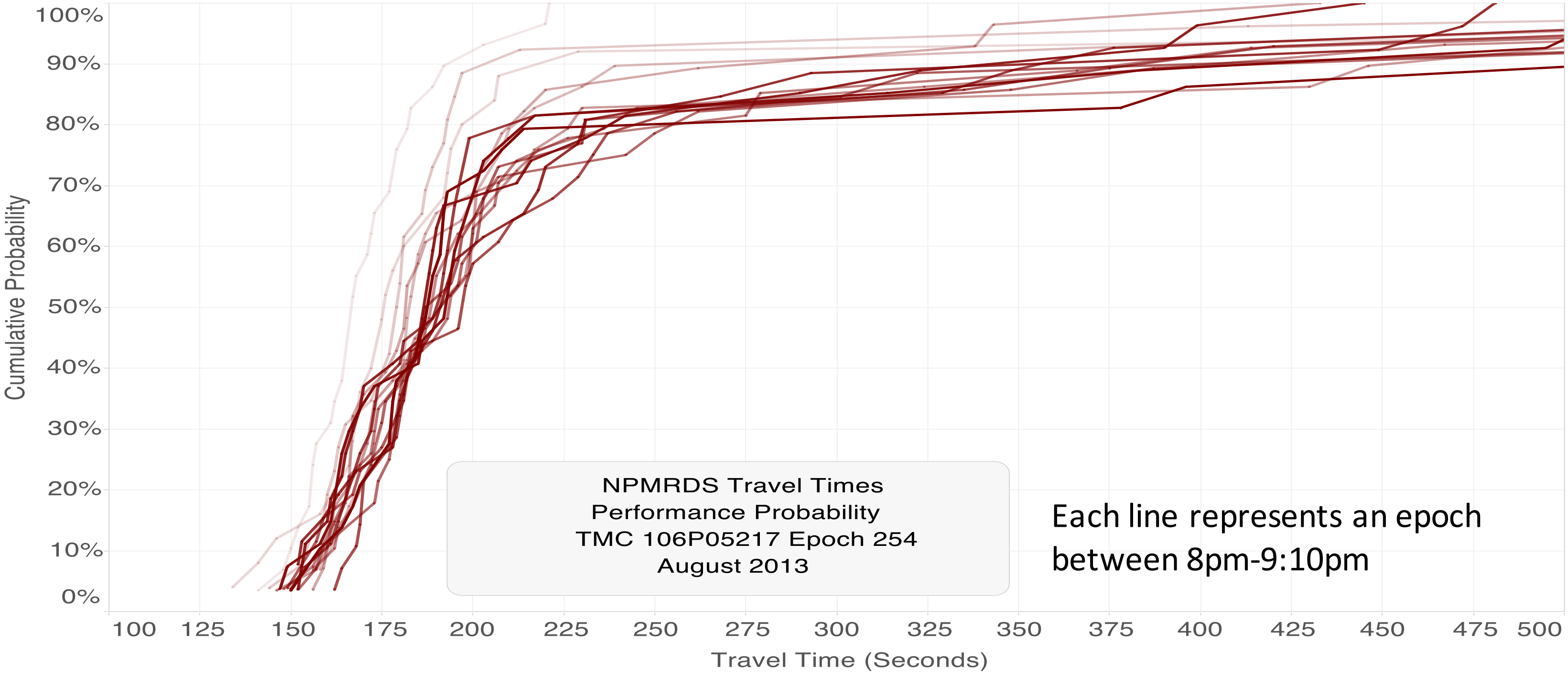
Suburban Interstate
Passenger Travel Time Performance – 1 month

I-5N out of LA

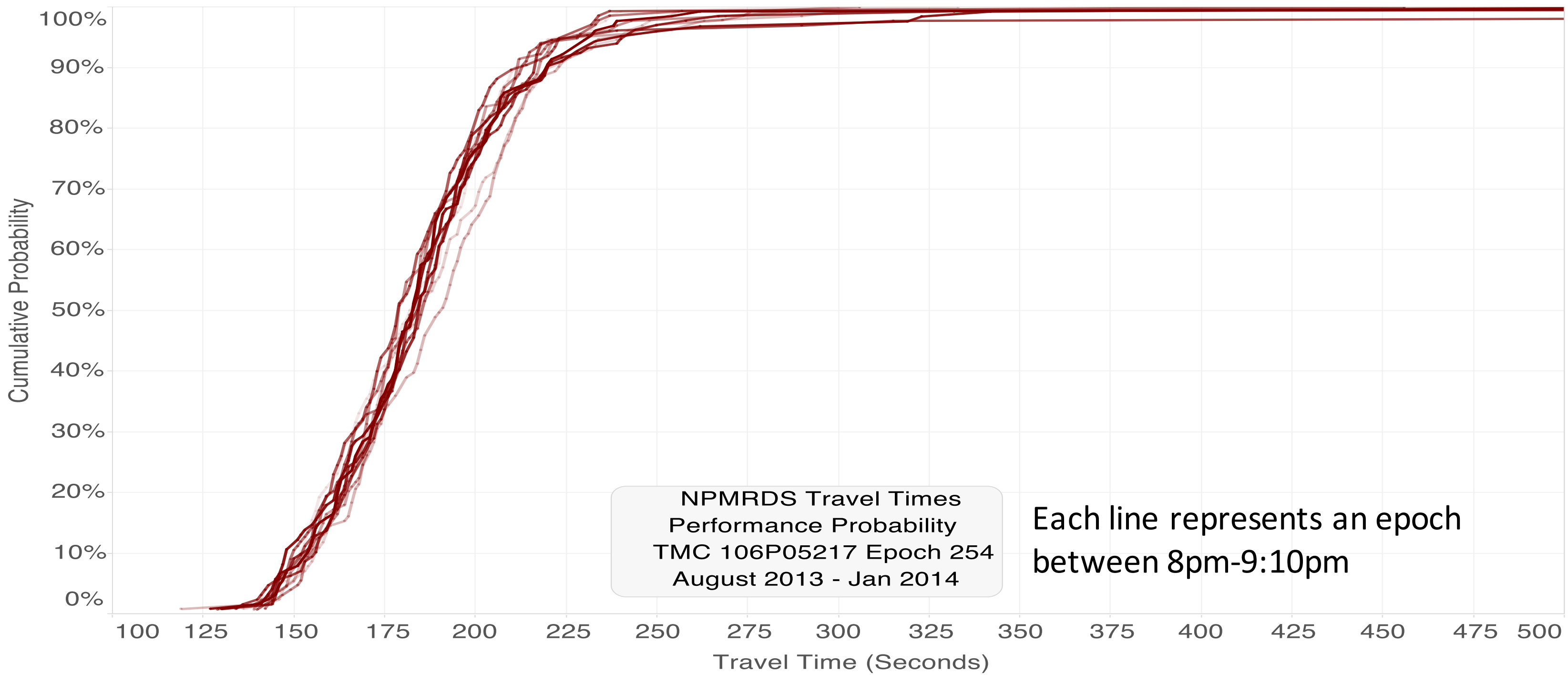


NPMRDS Travel Times
Performance Probability
TMC 106P05217 Epoch 254
August 2013

Each line represents an epoch between 8pm-9:10pm

Suburban Interstate Passenger Travel Time Performance – 6 months

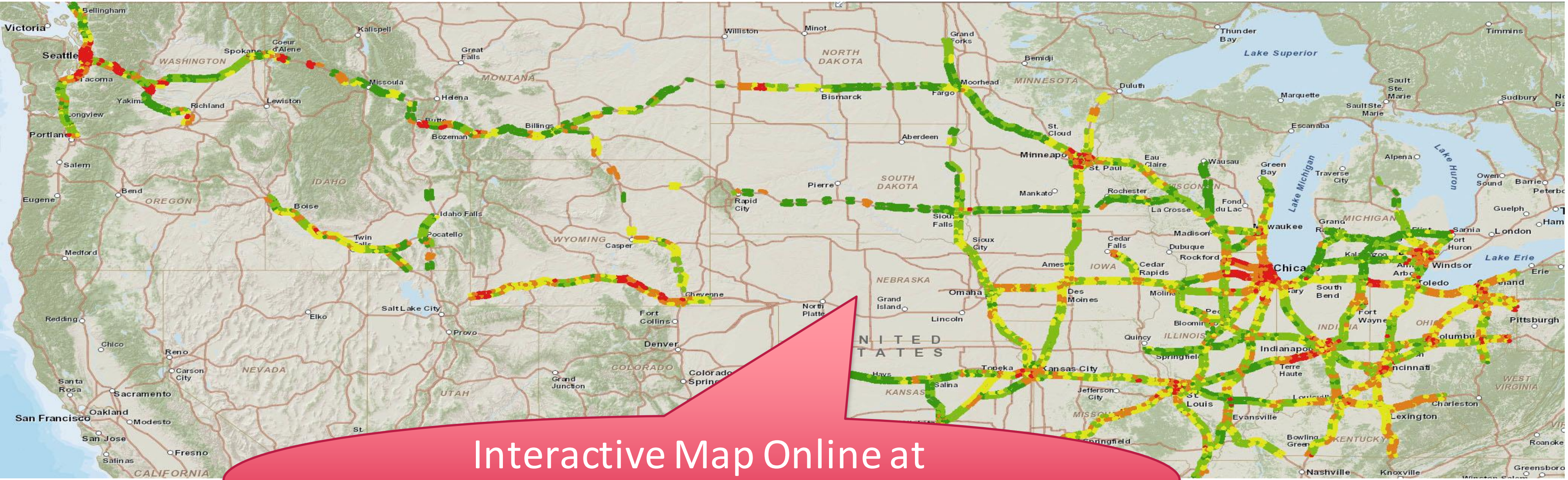
I-5N out of LA



NPMRDS Travel Times
Performance Probability
TMC 106P05217 Epoch 254
August 2013 - Jan 2014

Each line represents an epoch between 8pm-9:10pm

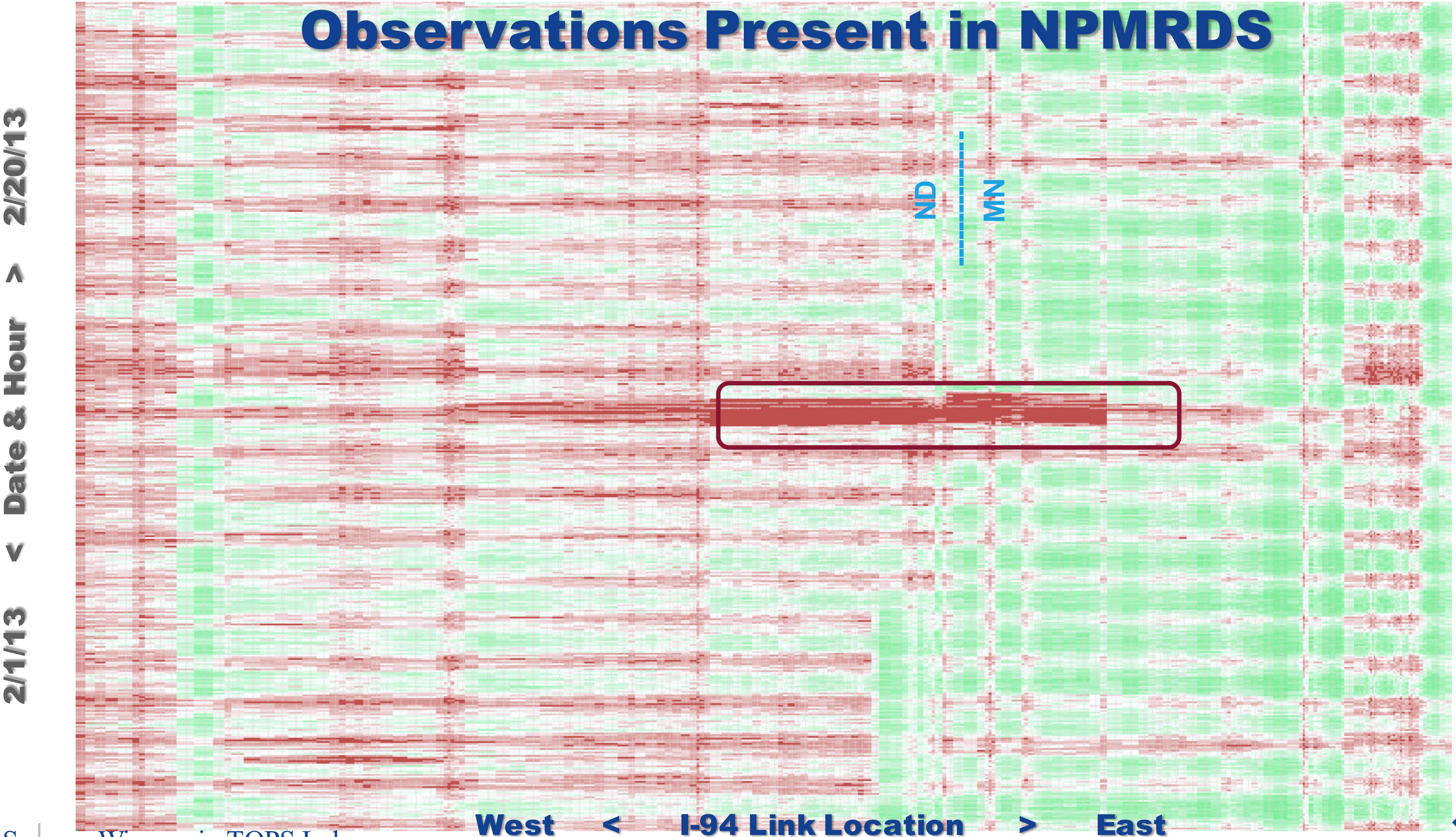
Multistate Operations- Planning Index


Bellingham
Victoria
Seattle
Tacoma
Yakima
Longview
Portland
Salem
Eugene
Bend
Medford
Redding
Chico
Santa Rosa
Sacramento
Oakland
San Francisco
San Jose
Salinas
Modesto
Fresno
Reno
Carson City
WASHINGTON
OREGON
CALIFORNIA
NEVADA
Spokane
Coeur d'Alene
Richland
Lewiston
Kalispell
Great Falls
Missoula
Helena
Butte
Bozeman
Billings
MONTANA
IDAHO
Boise
Twin Falls
Idaho Falls
Pocatello
Elko
Salt Lake City
Provo
UTAH
Grand Junction
WYOMING
Casper
Cheyenne
Fort Collins
Denver
COLORADO
Colorado Springs
Williston
Minot
NORTH DAKOTA
Bismarck
Grand Forks
Fargo
Moorhead
Aberdeen
Pierre
SOUTH DAKOTA
Rapid City
Sioux Falls
Sioux City
NEBRASKA
North Platte
Grand Island
Lincoln
Omaha
UNITED STATES
Hays
Salina
KANSAS
Topeka
Kansas City
Jefferson City
Springfield
Bemidji
MINNESOTA
St. Cloud
Minneapolis
St. Paul
Duluth
Mankato
Rochester
Eau Claire
La Crosse
WISCONSIN
Wausau
Green Bay
Fond du Lac
Madison
Milwaukee
Rockford
Dubuque
Cedar Falls
Cedar Rapids
Ames
Des Moines
IOWA
Moline
Quincy
Peoria
Bloomington
ILLINOIS
Springfield
St. Louis
Chicago
Gary
South Bend
Fort Wayne
INDIANA
Indianapolis
Terre Haute
Evansville
Louisville
Lexington
Bowling Green
KENTUCKY
Nashville
Knoxville
Thunder Bay
Lake Superior
Marquette
Escanaba
Sault Ste. Marie
Lake Michigan
Traverse City
Grand Rapids
MICHIGAN
Kalamazoo
Ann Arbor
Alpena
Lake Huron
Flint
Sarnia
Port Huron
Windsor
Toledo
Lake Erie
Cleveland
OHIO
Columbus
Cincinnati
Pittsburgh
Erie
WEST VIRGINIA
Charleston
Roanoke
Greensboro
Timmins
Sudbury
Owen Sound
Barrie
Peterborough
Guelph
London
Hamilton

Interactive Map Online at
www.glrtoc.org/map/mafc_region

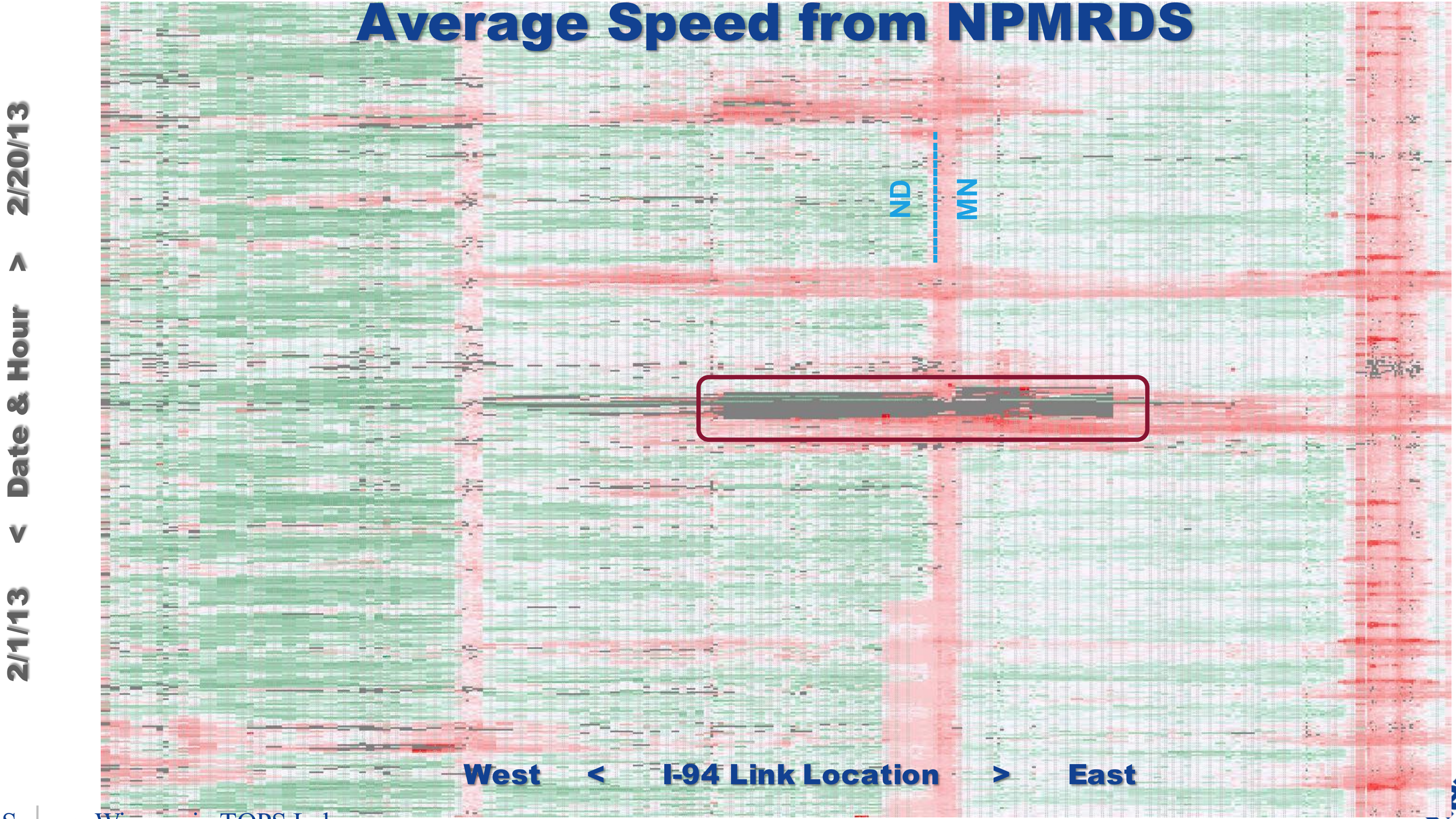
Source: Wisconsin TOPS Lab

Observations Present in NPMRDS



Source: Wisconsin TOPS Lab

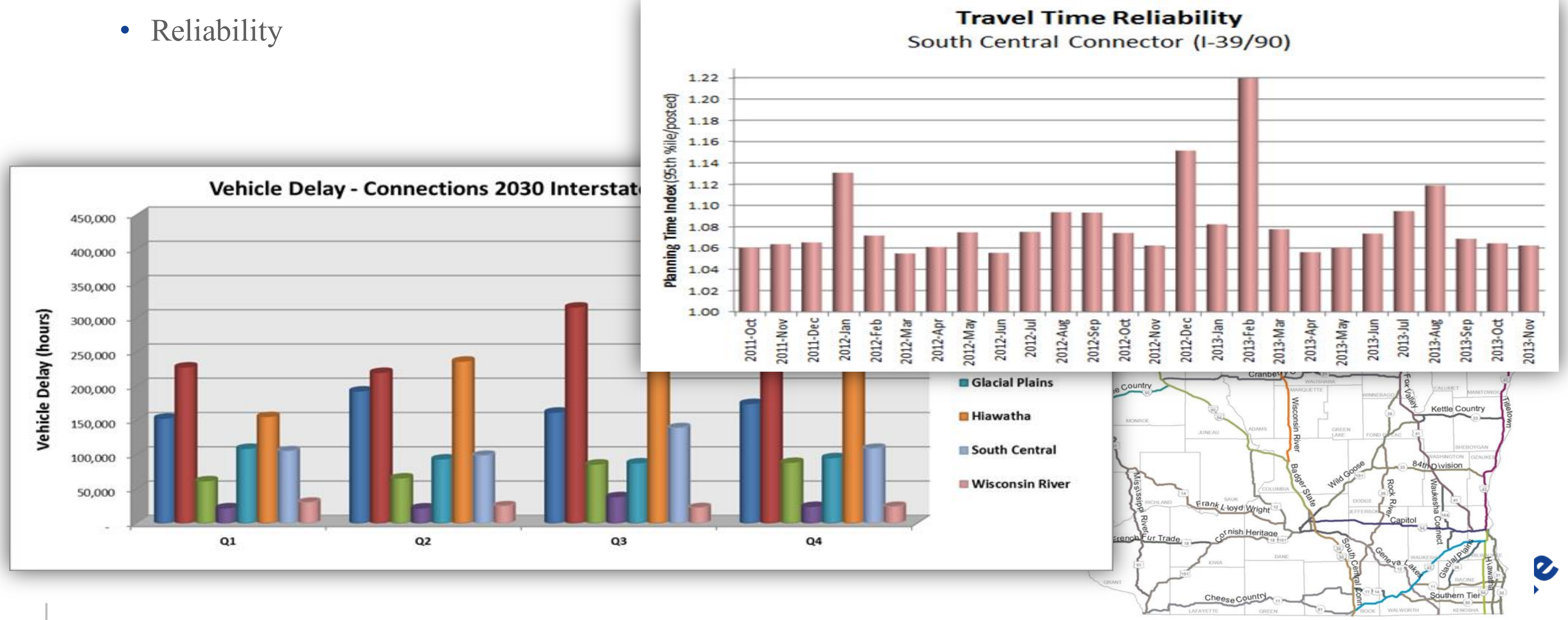
Average Speed from NPMRDS



Source: Wisconsin TOPS Lab

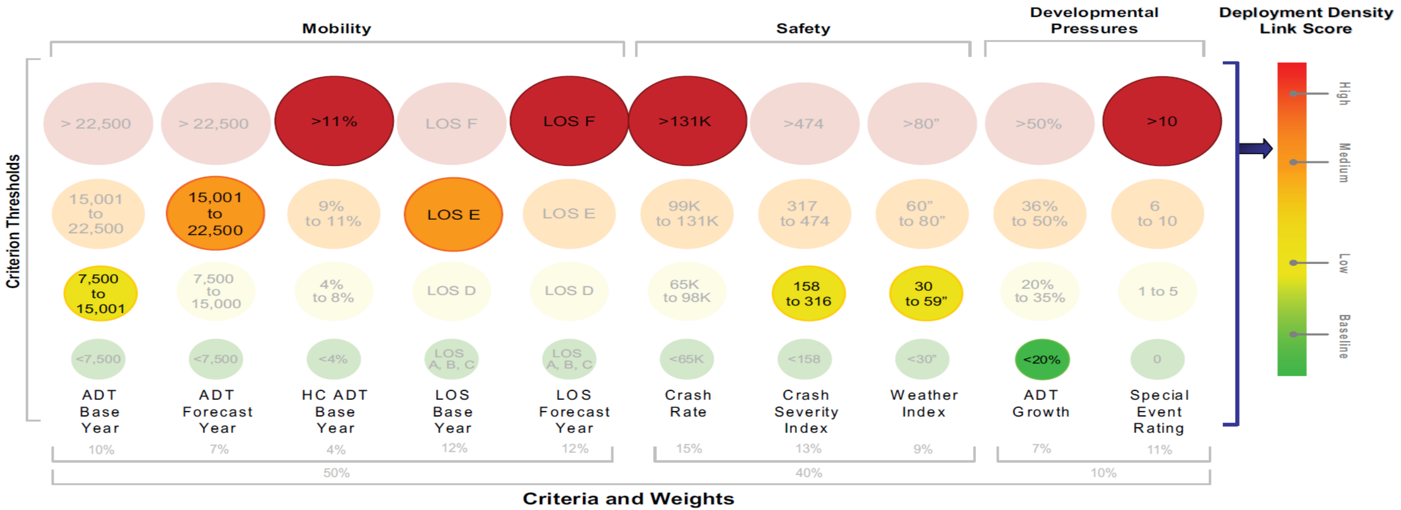
Wisconsin DOT

- Mobility Performance Measures
  - Vehicle Delay
  - Reliability



Wisconsin DOT

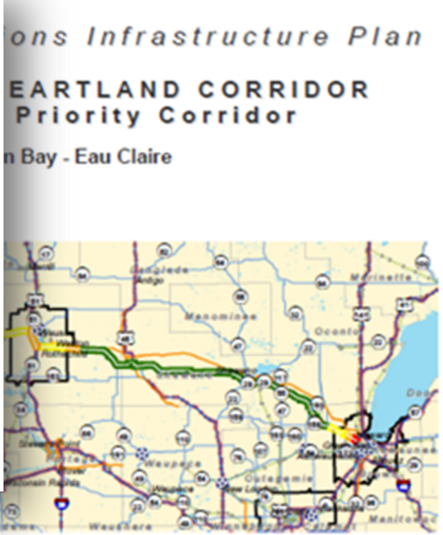
- Planning Processes
  - Traffic Operations Infrastructure Plan (TOIP)
  - Reliability Valuation
  - Merging with WisDOT GIS and data



	Mobility					Safety			Developmental Pressures	
Criterion Thresholds	**ADT Base Year**	**ADT Forecast Year**	**HC ADT Base Year**	**LOS Base Year**	**LOS Forecast Year**	**Crash Rate**	**Crash Severity Index**	**Weather Index**	**ADT Growth**	**Special Event Rating**
	> 22,500	> 22,500	>11%	LOS F	LOS F	>131K	>474	>80"	>50%	>10
	15,001 to 22,500	15,001 to 22,500	9% to 11%	LOS E	LOS E	99K to 131K	317 to 474	60" to 80"	36% to 50%	6 to 10
	7,500 to 15,001	7,500 to 15,000	4% to 8%	LOS D	LOS D	65K to 98K	158 to 316	30 to 59"	20% to 35%	1 to 5
	<7,500	<7,500	<4%	LOS A, B, C	LOS A, B, C	<65K	<158	<30"	<20%	0
	10%	7%	4%	12%	12%	15%	13%	9%	7%	11%
	50%					40%			10%	

Criteria and Weights

Deployment Density Link Score
High
Medium
Low
Baseline

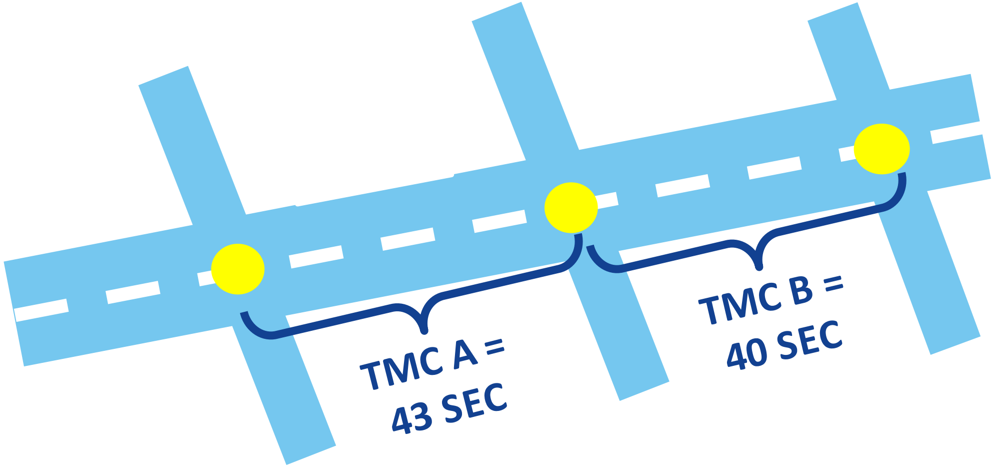


ons Infrastructure Plan
EARTLAND CORRIDOR
Priority Corridor
n Bay - Eau Claire
Menominee
Oconto
Marinette
Waupaca
Outagamie
Shawano
Door
Manitowoc

© 2014 HERE | Travel Time

NPMRDS – What is NPMRDS

- **Travel times will be provided by TMC code**
- **TMC codes are pre-defined road segments based on the industry standard for traffic reporting**
  - TMC-based location referencing simplifies the major road network
  - Allows traffic providers to report varying speeds across different segments of a road



NPMRDS – What is NPMRDS

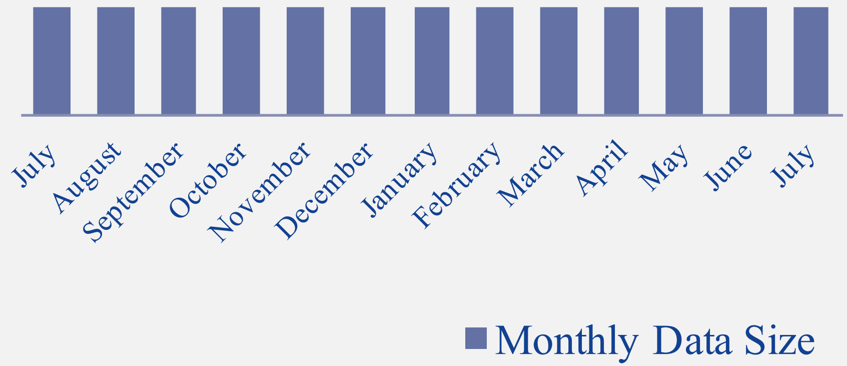
Entire Dataset Includes:

- National Highway System: 486K bi-directional miles
- 50 States, DC and PR
- Crossings into CAN & MEX
- Over half a Billion Travel Time records per month

State Dataset Sizes:

- Large State: 400MB-1.5GB
- Medium State: 100MB-400MB
- Small State: 0.3MB-100MB

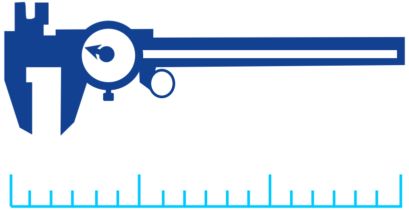
Download and Manage Data Monthly



NPMRDS – Licensing

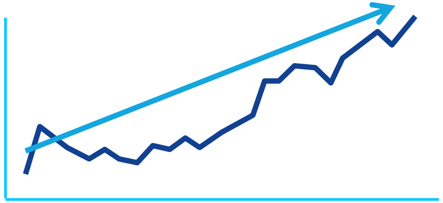
- Who can use it:
  - Any agency that is a State DOT or MPO receiving federal transportation funds and is authorized by FHWA to receive Data.
  - Agencies may grant contractors the right to use data for work performed for the agency, as long as it's used for the outlined purposes.
- Agencies may use the data set:
  - to meet performance management needs related to performance indicators, measures and transportation program management;
  - to disseminate aggregated information to the public consistent with the organizations' transportation planning, programming, management and operations responsibilities as they pertain to performance management activities;
  - in transportation planning and operational analyses, service and data quality validation analyses; and
  - in applications for Agency's internal business.
- Agencies may not:
  - sell or share the vehicle probe data to other public entities which are not part of the above
  - sell or otherwise transfer the vehicle probe data to any private entities for purposes not directly related to activities hereunder.

Our New Big Data Processing Engine



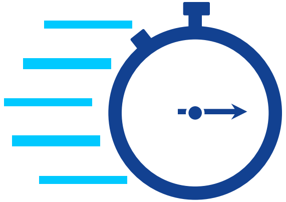
Traffic quality

- Link level accuracy
- Better routing with TMC-offsets
- Traffic where and when you need it with DLR



Growing data volume

- Efficient message handling for faster processing
- Expanded data providers



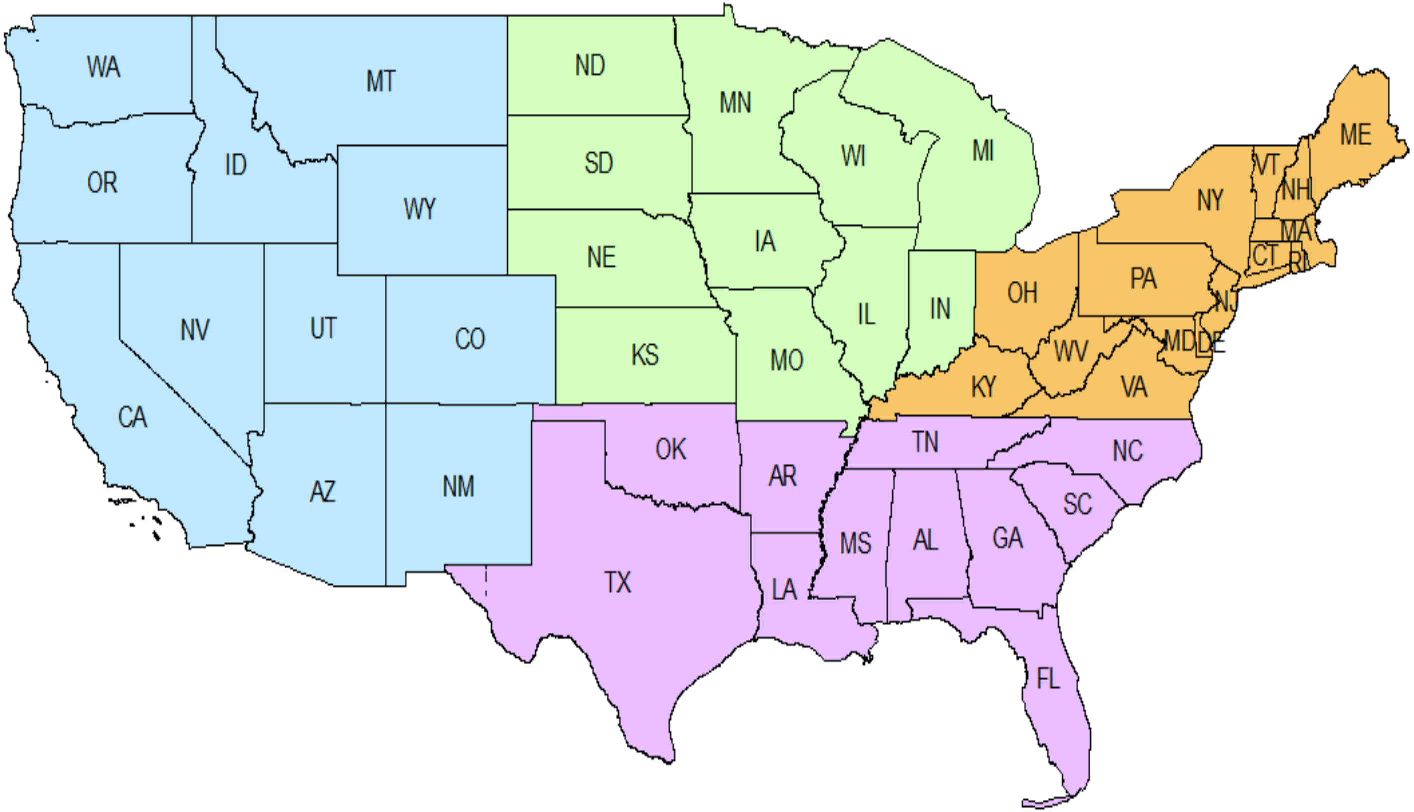
Faster delivery

- TML, RDS-TMC, HD, DAB, TPEG
- Faster integration of new data sources

Traffic Product Portfolio

Use Case	Today's Products	
Provide the public reliable travel times in real-time (DMS, apps)	Real-time	Real-time Feed Speeds, travel times, incidents
Operations & Planning Groups need to understand patterns over time and different conditions to optimize performance	Archived	National Performance Measurement Research Data Set (Archived travel times)
		Historical Patterns & ATP Typical speeds & travel times by day/time based on historical data
The public, operations, and planning groups can benefit from anticipating	Predictive	Predictive models based on normal state, seasonality

NPMRDS – Delivered in 4 regional files


WA
MT
ND
MN
OR
ID
SD
WI
MI
ME
WY
VT
NH
NY
IA
NE
MA
CT
RI
PA
NV
UT
CO
OH
IL
IN
NJ
KS
MO
WV
MD
DE
CA
KY
VA
TN
OK
NC
AR
SC
AZ
NM
MS
AL
GA
TX
LA
FL

NPMRDS File Layout

TMC Static File

Contains descriptive information about the road segment (TMC code, names, admin info, segment lengths, lat/long)

Monthly Travel Time Data File

Contains the travel time data for each day for a 1 month timeframe

Shape File

Contains precise road geometry of the NHS and attributes about the road segment

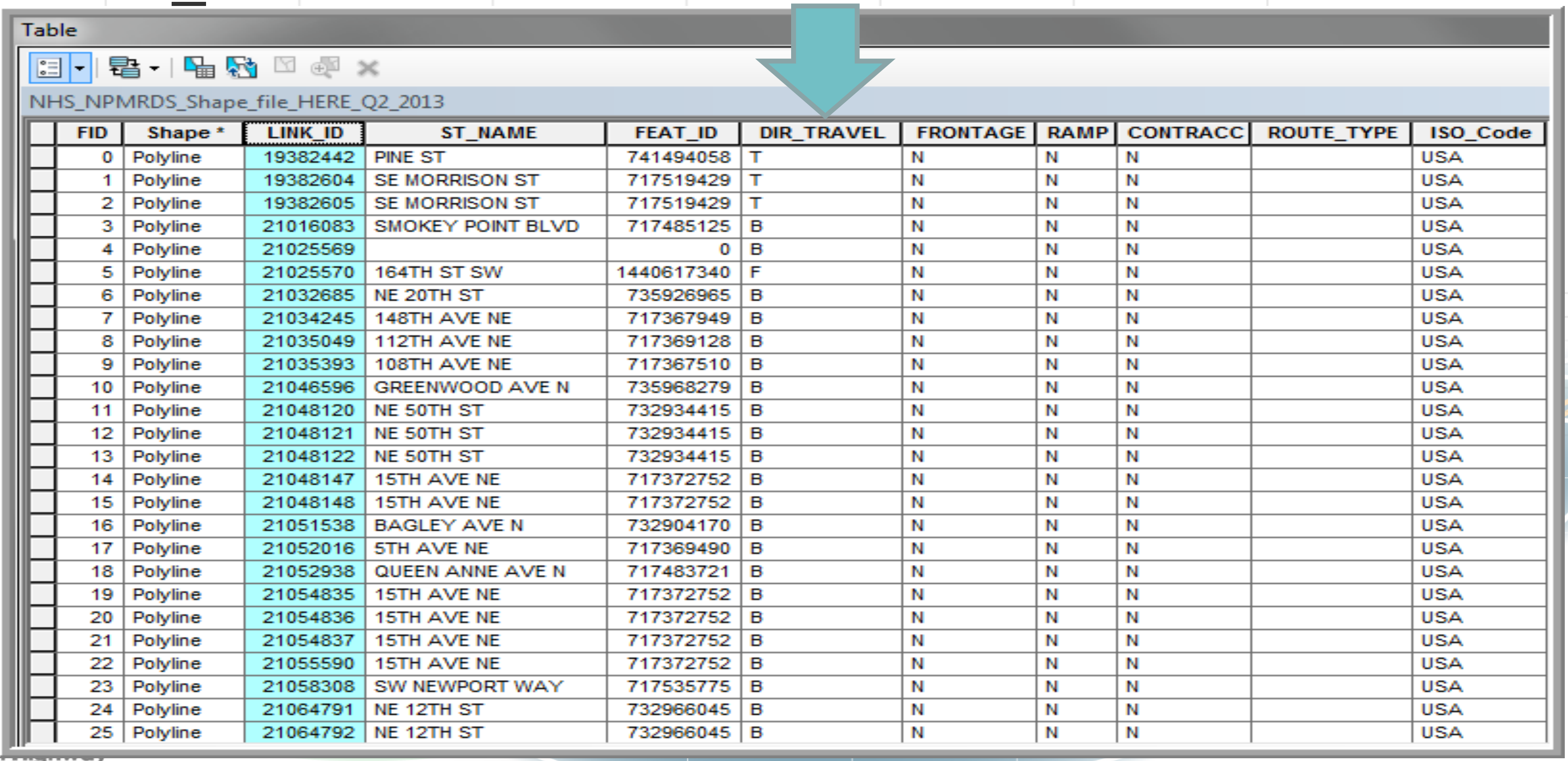
TMC Look Up Table

Specifications & Documentation

© HERE 2013

NHS SHP File - Table

- Link_ID – to relate TMC based Travel-times

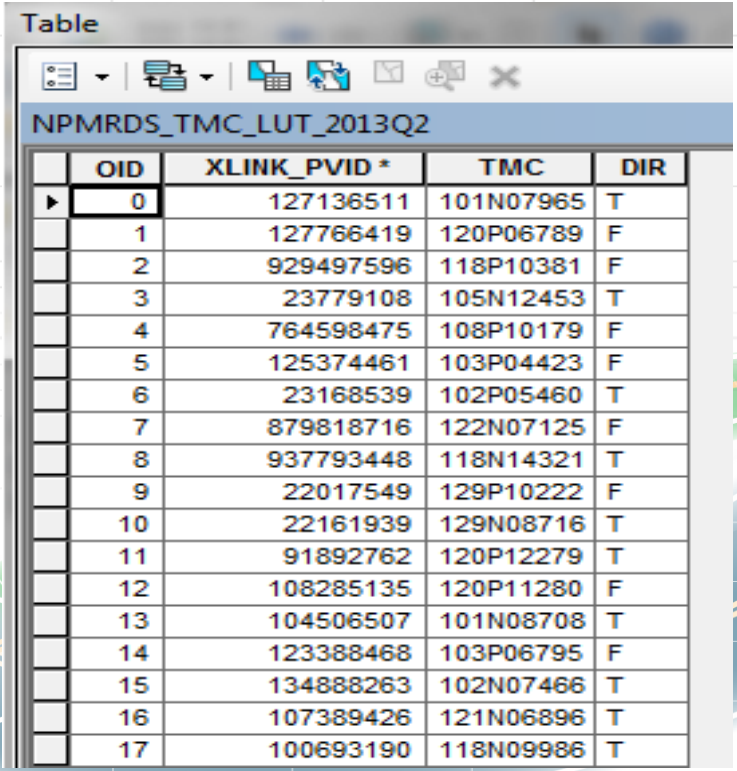


NHS_NPMRDS_Shape_file_HERE_Q2_2013

FID	Shape *	LINK_ID	ST_NAME	FEAT_ID	DIR_TRAVEL	FRONTAGE	RAMP	CONTRACC	ROUTE_TYPE	ISO_Code
0	Polyline	19382442	PINE ST	741494058	T	N	N	N		USA
1	Polyline	19382604	SE MORRISON ST	717519429	T	N	N	N		USA
2	Polyline	19382605	SE MORRISON ST	717519429	T	N	N	N		USA
3	Polyline	21016083	SMOKEY POINT BLVD	717485125	B	N	N	N		USA
4	Polyline	21025569		0	B	N	N	N		USA
5	Polyline	21025570	164TH ST SW	1440617340	F	N	N	N		USA
6	Polyline	21032685	NE 20TH ST	735926965	B	N	N	N		USA
7	Polyline	21034245	148TH AVE NE	717367949	B	N	N	N		USA
8	Polyline	21035049	112TH AVE NE	717369128	B	N	N	N		USA
9	Polyline	21035393	108TH AVE NE	717367510	B	N	N	N		USA
10	Polyline	21046596	GREENWOOD AVE N	735968279	B	N	N	N		USA
11	Polyline	21048120	NE 50TH ST	732934415	B	N	N	N		USA
12	Polyline	21048121	NE 50TH ST	732934415	B	N	N	N		USA
13	Polyline	21048122	NE 50TH ST	732934415	B	N	N	N		USA
14	Polyline	21048147	15TH AVE NE	717372752	B	N	N	N		USA
15	Polyline	21048148	15TH AVE NE	717372752	B	N	N	N		USA
16	Polyline	21051538	BAGLEY AVE N	732904170	B	N	N	N		USA
17	Polyline	21052016	5TH AVE NE	717369490	B	N	N	N		USA
18	Polyline	21052938	QUEEN ANNE AVE N	717483721	B	N	N	N		USA
19	Polyline	21054835	15TH AVE NE	717372752	B	N	N	N		USA
20	Polyline	21054836	15TH AVE NE	717372752	B	N	N	N		USA
21	Polyline	21054837	15TH AVE NE	717372752	B	N	N	N		USA
22	Polyline	21055590	15TH AVE NE	717372752	B	N	N	N		USA
23	Polyline	21058308	SW NEWPORT WAY	717535775	B	N	N	N		USA
24	Polyline	21064791	NE 12TH ST	732966045	B	N	N	N		USA
25	Polyline	21064792	NE 12TH ST	732966045	B	N	N	N		USA

TMC Look Up Table

- Crosstab relating XLINK_PVID to TMCs: One to Many

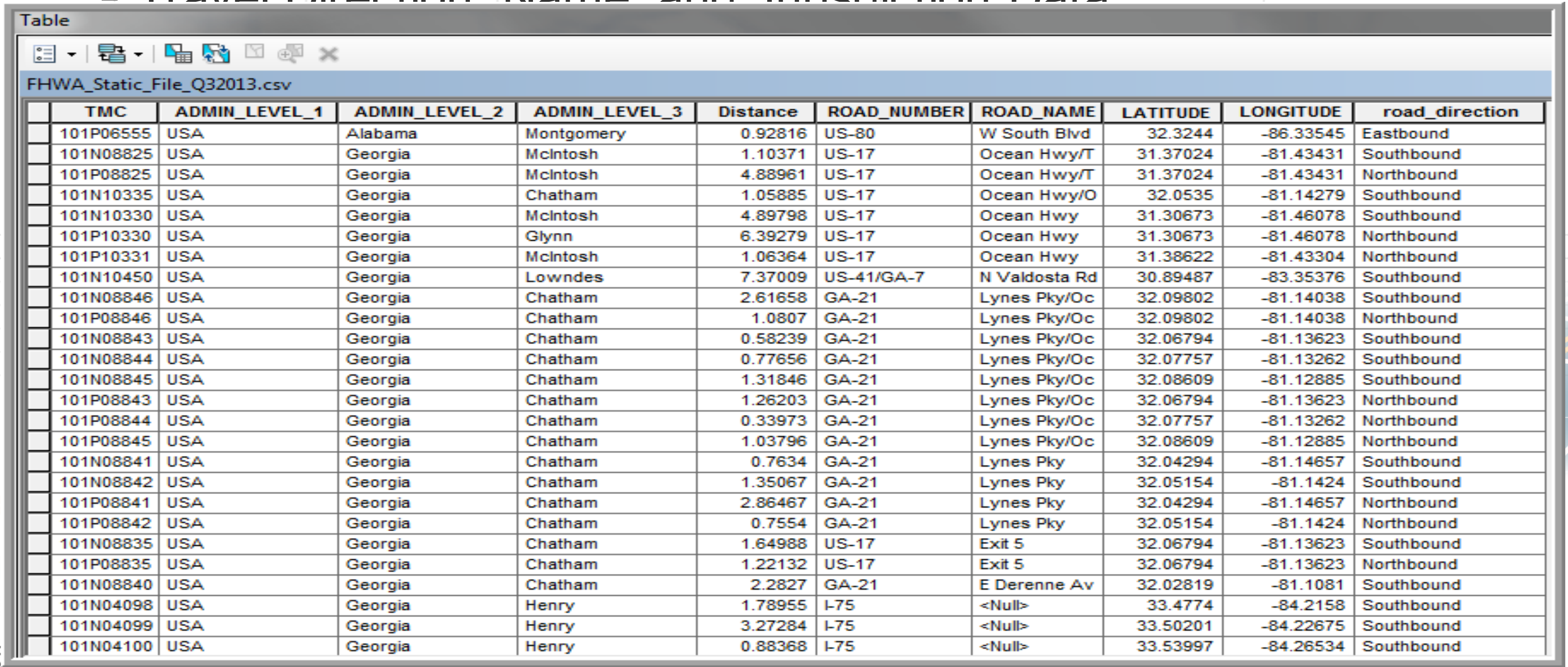


NPMRDS_TMC_LUT_2013Q2

OID	XLINK_PVID *	TMC	DIR
0	127136511	101N07965	T
1	127766419	120P06789	F
2	929497596	118P10381	F
3	23779108	105N12453	T
4	764598475	108P10179	F
5	125374461	103P04423	F
6	23168539	102P05460	T
7	879818716	122N07125	F
8	937793448	118N14321	T
9	22017549	129P10222	F
10	22161939	129N08716	T
11	91892762	120P12279	T
12	108285135	120P11280	F
13	104506507	101N08708	T
14	123388468	103P06795	F
15	134888263	102N07466	T
16	107389426	121N06896	T
17	100693190	118N09986	T

Monthly Static File

- TMC Characteristics
  - Travel Direction, Name, and Jurisdiction Data

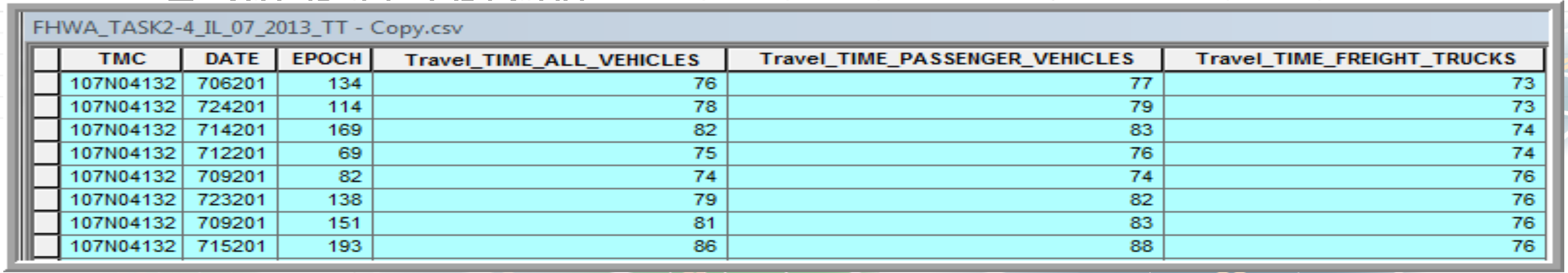


FHWA_Static_File_Q32013.csv

TMC	ADMIN_LEVEL_1	ADMIN_LEVEL_2	ADMIN_LEVEL_3	Distance	ROAD_NUMBER	ROAD_NAME	LATITUDE	LONGITUDE	road_direction
101P06555	USA	Alabama	Montgomery	0.92816	US-80	W South Blvd	32.3244	-86.33545	Eastbound
101N08825	USA	Georgia	McIntosh	1.10371	US-17	Ocean Hwy/T	31.37024	-81.43431	Southbound
101P08825	USA	Georgia	McIntosh	4.88961	US-17	Ocean Hwy/T	31.37024	-81.43431	Northbound
101N10335	USA	Georgia	Chatham	1.05885	US-17	Ocean Hwy/O	32.0535	-81.14279	Southbound
101N10330	USA	Georgia	McIntosh	4.89798	US-17	Ocean Hwy	31.30673	-81.46078	Southbound
101P10330	USA	Georgia	Glynn	6.39279	US-17	Ocean Hwy	31.30673	-81.46078	Northbound
101P10331	USA	Georgia	McIntosh	1.06364	US-17	Ocean Hwy	31.38622	-81.43304	Northbound
101N10450	USA	Georgia	Lowndes	7.37009	US-41/GA-7	N Valdosta Rd	30.89487	-83.35376	Southbound
101N08846	USA	Georgia	Chatham	2.61658	GA-21	Lynes Pky/Oc	32.09802	-81.14038	Southbound
101P08846	USA	Georgia	Chatham	1.0807	GA-21	Lynes Pky/Oc	32.09802	-81.14038	Northbound
101N08843	USA	Georgia	Chatham	0.58239	GA-21	Lynes Pky/Oc	32.06794	-81.13623	Southbound
101N08844	USA	Georgia	Chatham	0.77656	GA-21	Lynes Pky/Oc	32.07757	-81.13262	Southbound
101N08845	USA	Georgia	Chatham	1.31846	GA-21	Lynes Pky/Oc	32.08609	-81.12885	Southbound
101P08843	USA	Georgia	Chatham	1.26203	GA-21	Lynes Pky/Oc	32.06794	-81.13623	Northbound
101P08844	USA	Georgia	Chatham	0.33973	GA-21	Lynes Pky/Oc	32.07757	-81.13262	Northbound
101P08845	USA	Georgia	Chatham	1.03796	GA-21	Lynes Pky/Oc	32.08609	-81.12885	Northbound
101N08841	USA	Georgia	Chatham	0.7634	GA-21	Lynes Pky	32.04294	-81.14657	Southbound
101N08842	USA	Georgia	Chatham	1.35067	GA-21	Lynes Pky	32.05154	-81.1424	Southbound
101P08841	USA	Georgia	Chatham	2.86467	GA-21	Lynes Pky	32.04294	-81.14657	Northbound
101P08842	USA	Georgia	Chatham	0.7554	GA-21	Lynes Pky	32.05154	-81.1424	Northbound
101N08835	USA	Georgia	Chatham	1.64988	US-17	Exit 5	32.06794	-81.13623	Southbound
101P08835	USA	Georgia	Chatham	1.22132	US-17	Exit 5	32.06794	-81.13623	Northbound
101N08840	USA	Georgia	Chatham	2.2827	GA-21	E Derenne Av	32.02819	-81.1081	Southbound
101N04098	USA	Georgia	Henry	1.78955	I-75	<Null>	33.4774	-84.2158	Southbound
101N04099	USA	Georgia	Henry	3.27284	I-75	<Null>	33.50201	-84.22675	Southbound
101N04100	USA	Georgia	Henry	0.88368	I-75	<Null>	33.53997	-84.26534	Southbound

Travel Time Files

- TMC Based
- Travel Time in 5 min Epochs by Vehicle Type
- 288 Epochs per day
  - 0 is 12:00-12:05 AM…
  - 287 is 11:55-12:00;



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TMC	DATE	EPOCH	Travel_TIME_ALL_VEHICLES	Travel_TIME_PASSENGER_VEHICLES	Travel_TIME_FREIGHT_TRUCKS
107N04132	706201	134	76	77	73
107N04132	724201	114	78	79	73
107N04132	714201	169	82	83	74
107N04132	712201	69	75	76	74
107N04132	709201	82	74	74	76
107N04132	723201	138	79	82	76
107N04132	709201	151	81	83	76
107N04132	715201	193	86	88	76