Cost Saving Transportation Technologies

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@PolicyMapper

THE SCIENCE OF WHERE™

Current Trends in Transportation

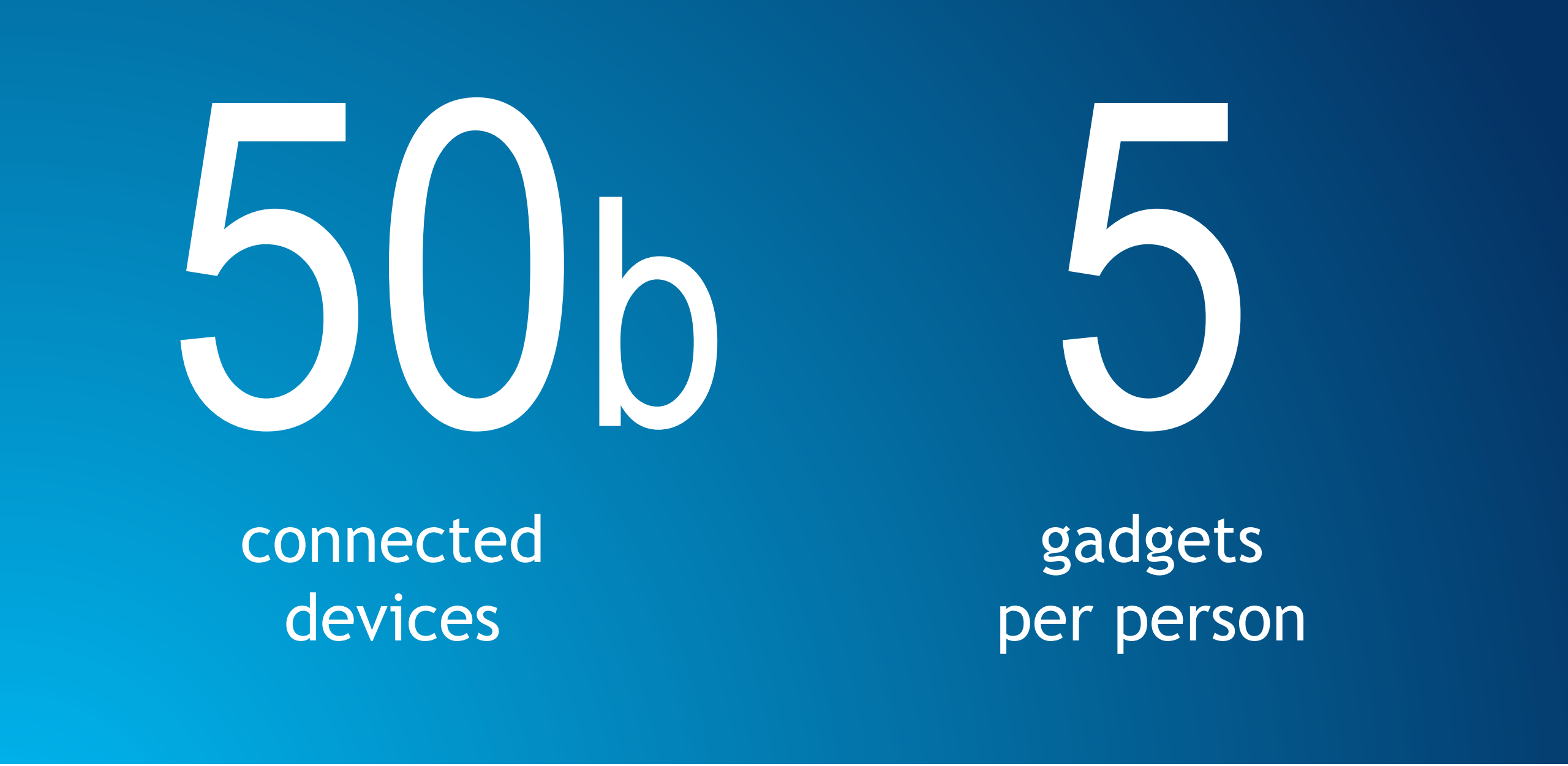
Change and Disruption

- **Decline in Auto Ownership by Millennials**
- **New Means of Transport**
- **Growth (but also dissatisfaction) in Public Transport**
- **Increasing Congestion in Cities**

Opportunities in Transportation

To Address Change and Disruption

- **New Data Sources to Better Understand Use & Mobility Patterns**
- **Big Data Analytics and Spatial Analysis**
- **“Smart Cities / Smart Transportation”**
- **Breaking Down the Silos of Information**

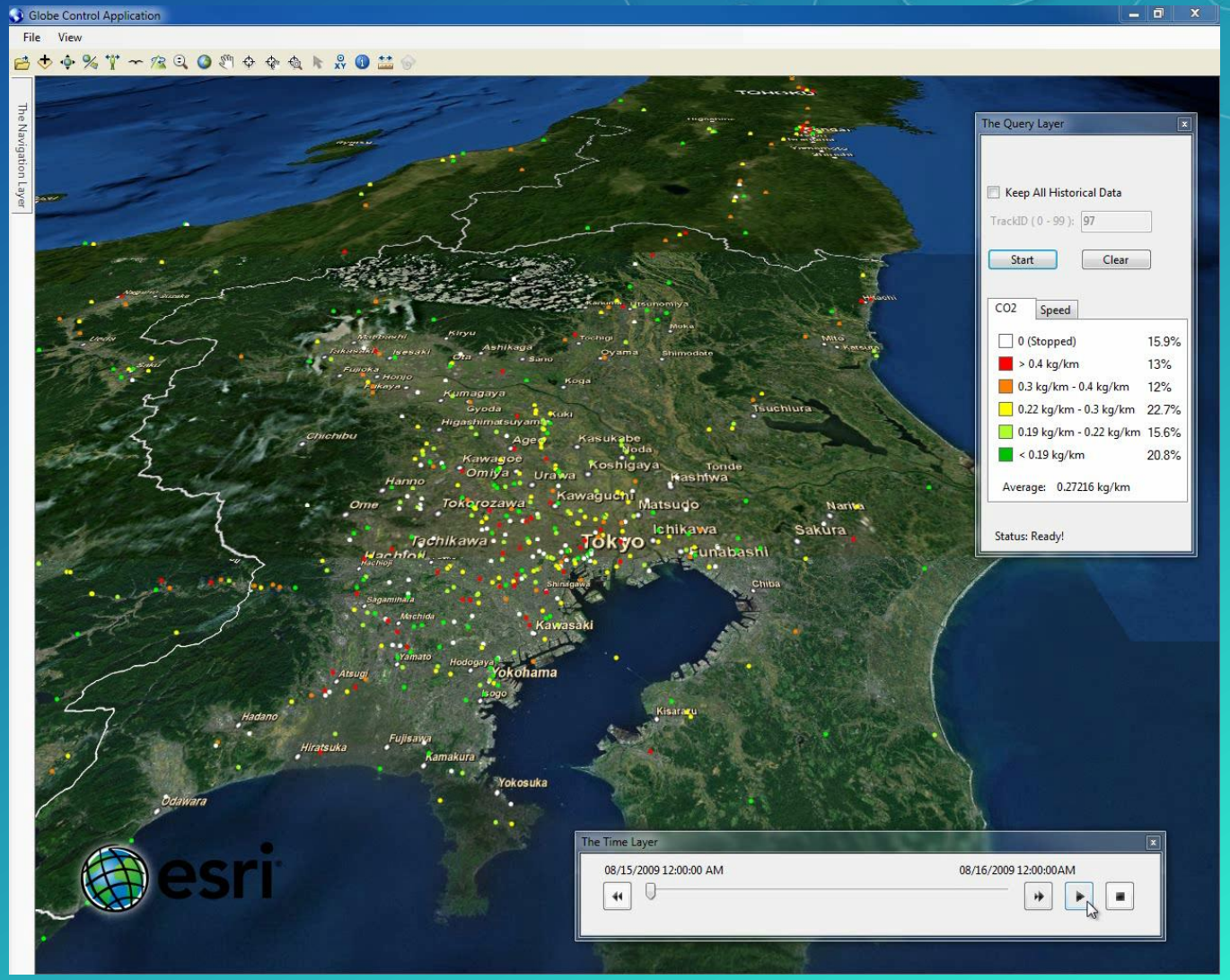


2020: The Internet of All Things

Connected Consumer; Collecting Insight

New Data Sources

Leveraging Cellular Data for Travel Information



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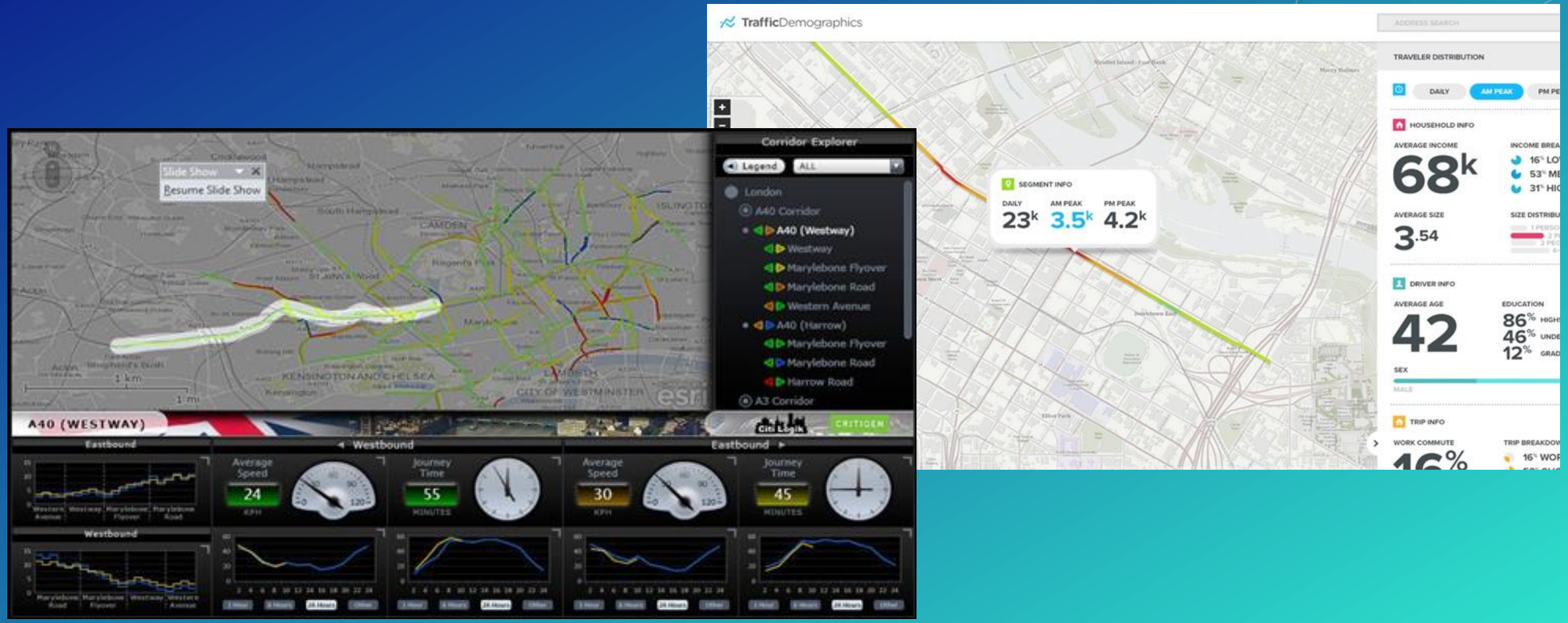

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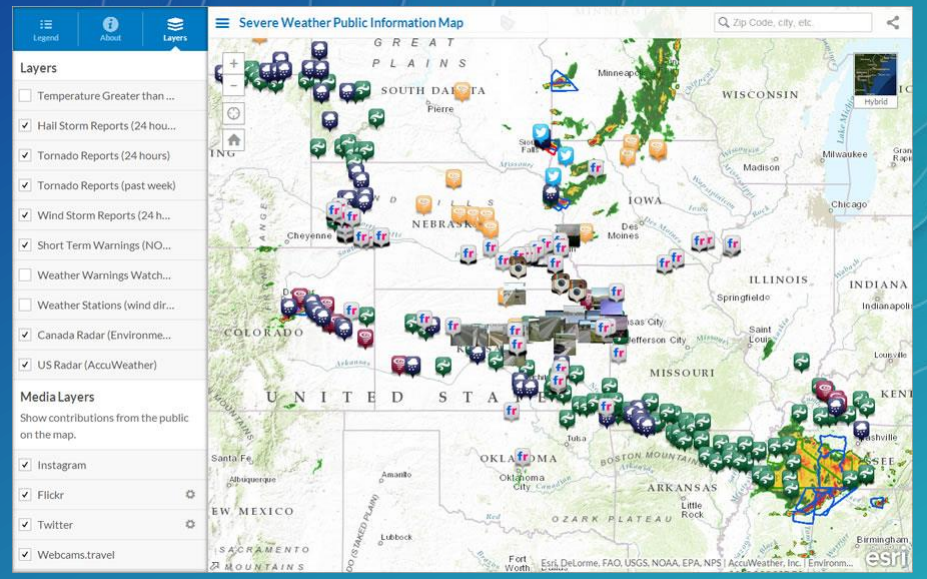
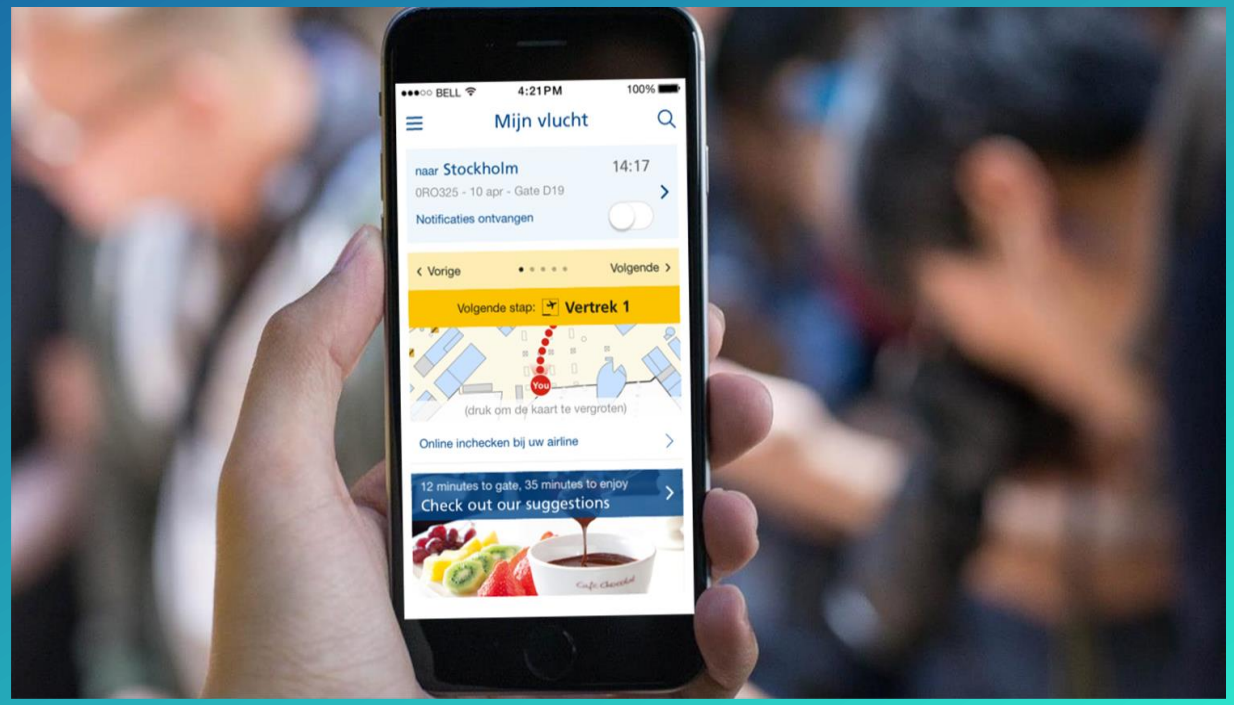


Twitter Posts

Indoor (Bus) Tracking with Wi-Fi and Bluetooth

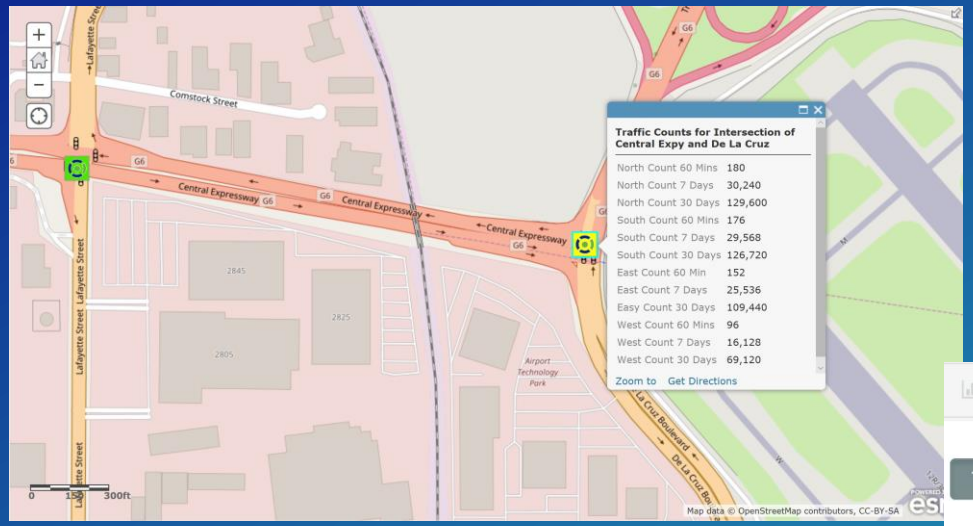


”We are just beginning to understand how we can use the technology for understanding consumer behavior.”

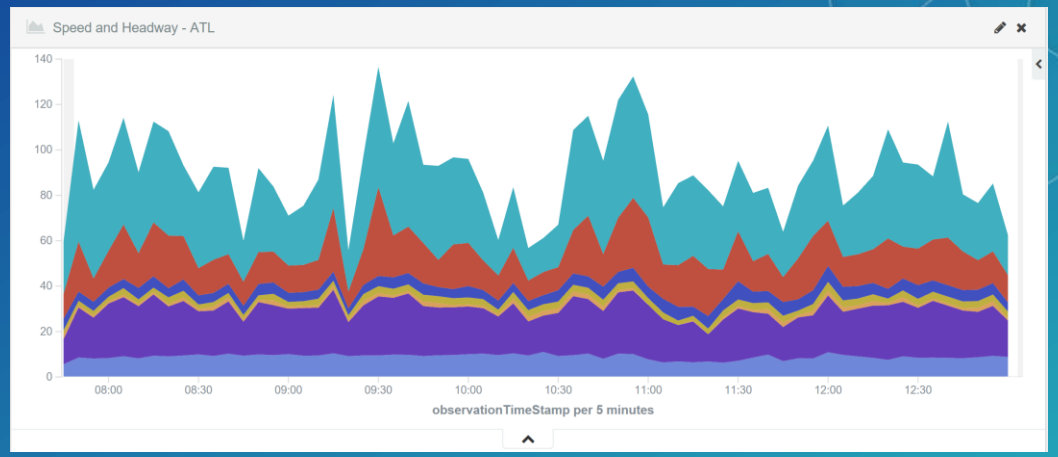
Josh Kavangh U of Washington

New Data Sources

Leveraging Traffic Cameras for Real Time Counts and Speed Data



4 Way Traffic Counts from Traffic Camera



Speed and Count - ATL

Table | Request | Response | Statistics

observationTimeStamp per 10 minutes	Count	Average speed
October 1st 2016, 03:30:00.000	73	10.247
October 1st 2016, 03:40:00.000	175	9.949
October 1st 2016, 03:50:00.000	194	9.985
October 1st 2016, 04:00:00.000	174	10.77
October 1st 2016, 04:10:00.000	203	9.872
October 1st 2016, 04:20:00.000	211	10.498
October 1st 2016, 04:30:00.000	220	11.373
October 1st 2016, 04:40:00.000	213	11.089
October 1st 2016, 04:50:00.000	277	10.838
October 1st 2016, 05:00:00.000	275	11.589

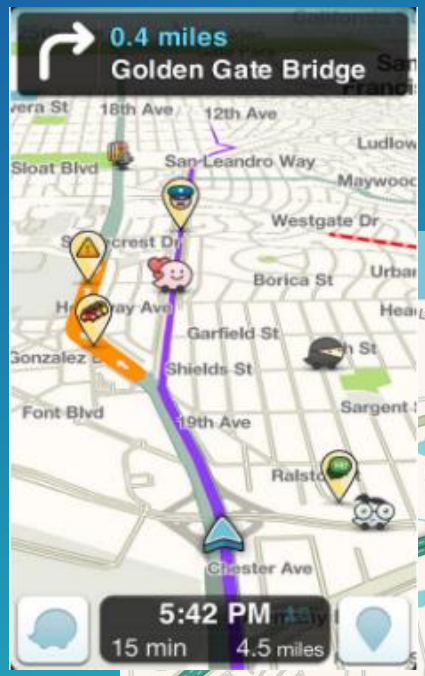
"Our solutions partner converted our traffic cameras into 24 x 7 count stations, providing us with enhanced traffic data. From this data, we were able to improve our signal timing, mitigating overall congestion."

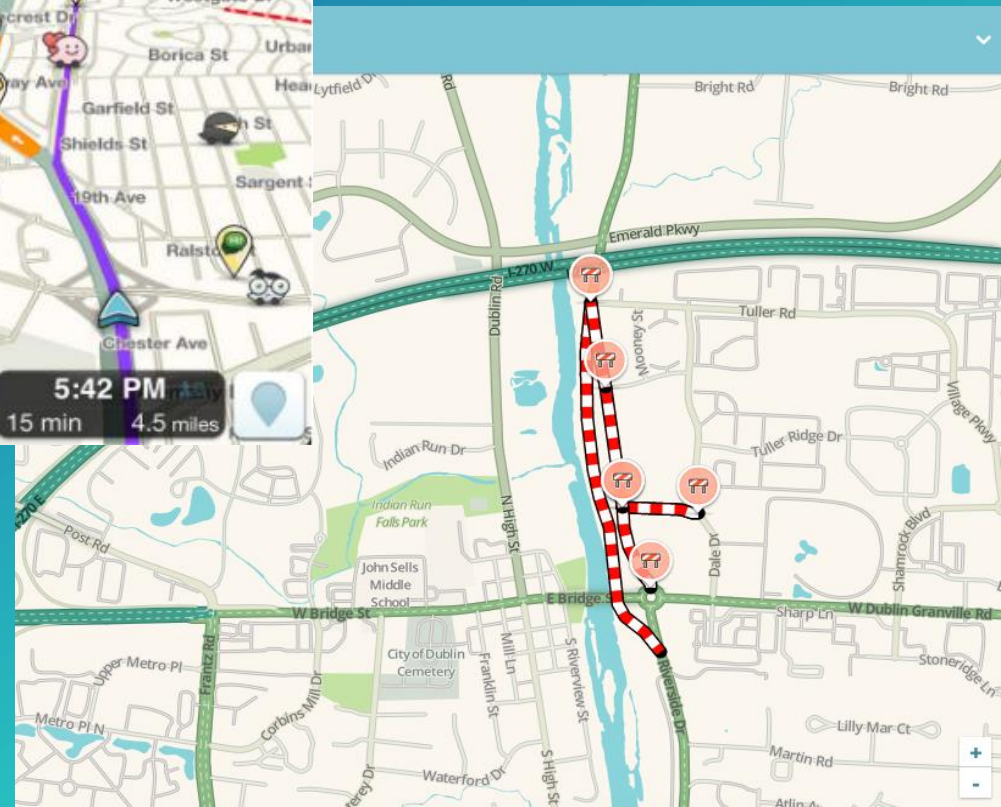
Ananth Prasad Senior Civil Engineer
County of Santa Clara

Leveraging Crowd Sourcing

Every Citizen is a Sensor

Waze Partnerships





Understanding Big Data

$V^3 + L$

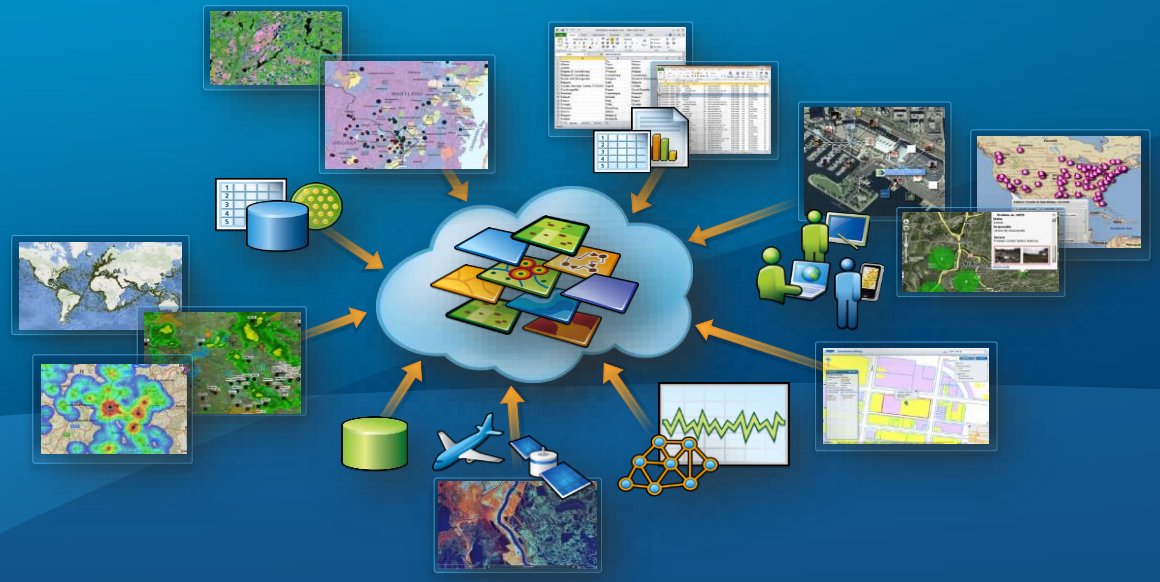
Sensor Information and Big Data: generating massive amounts of data

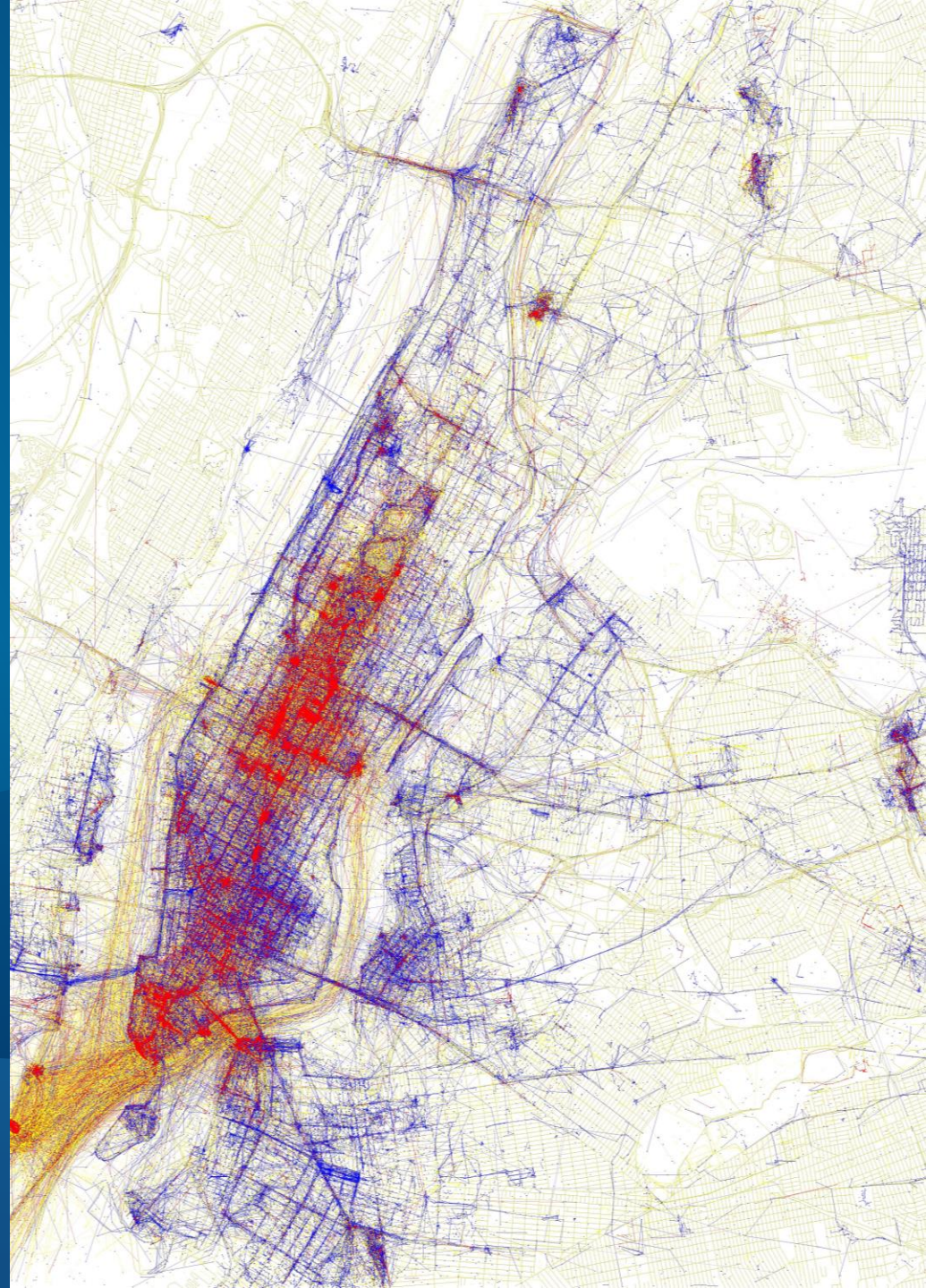
Three V's of Big Data: Volume, Velocity, and Variety—the sheer amount, the speed, and the different types of data

But, Location provides the understanding and context

GIS Integrates All Types of Data

Including Big Data





GIS provides and manages the *context* of your data assets and resources

Location Information is Everywhere

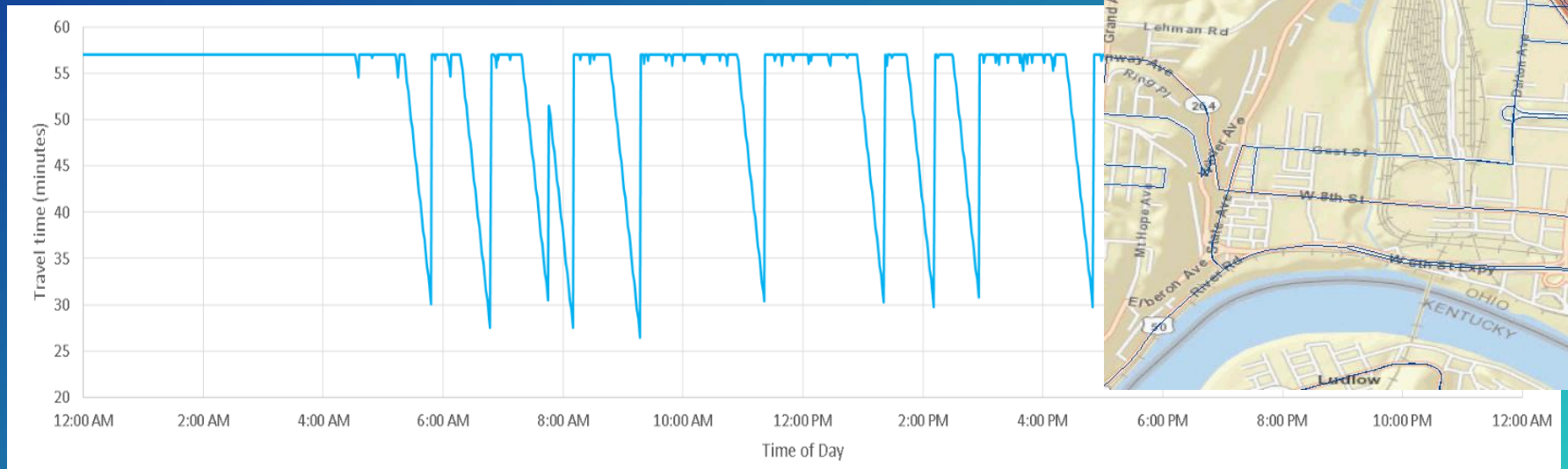
Geographical Information Systems

Smart Technology Embeds Advanced Analytics & Visualization

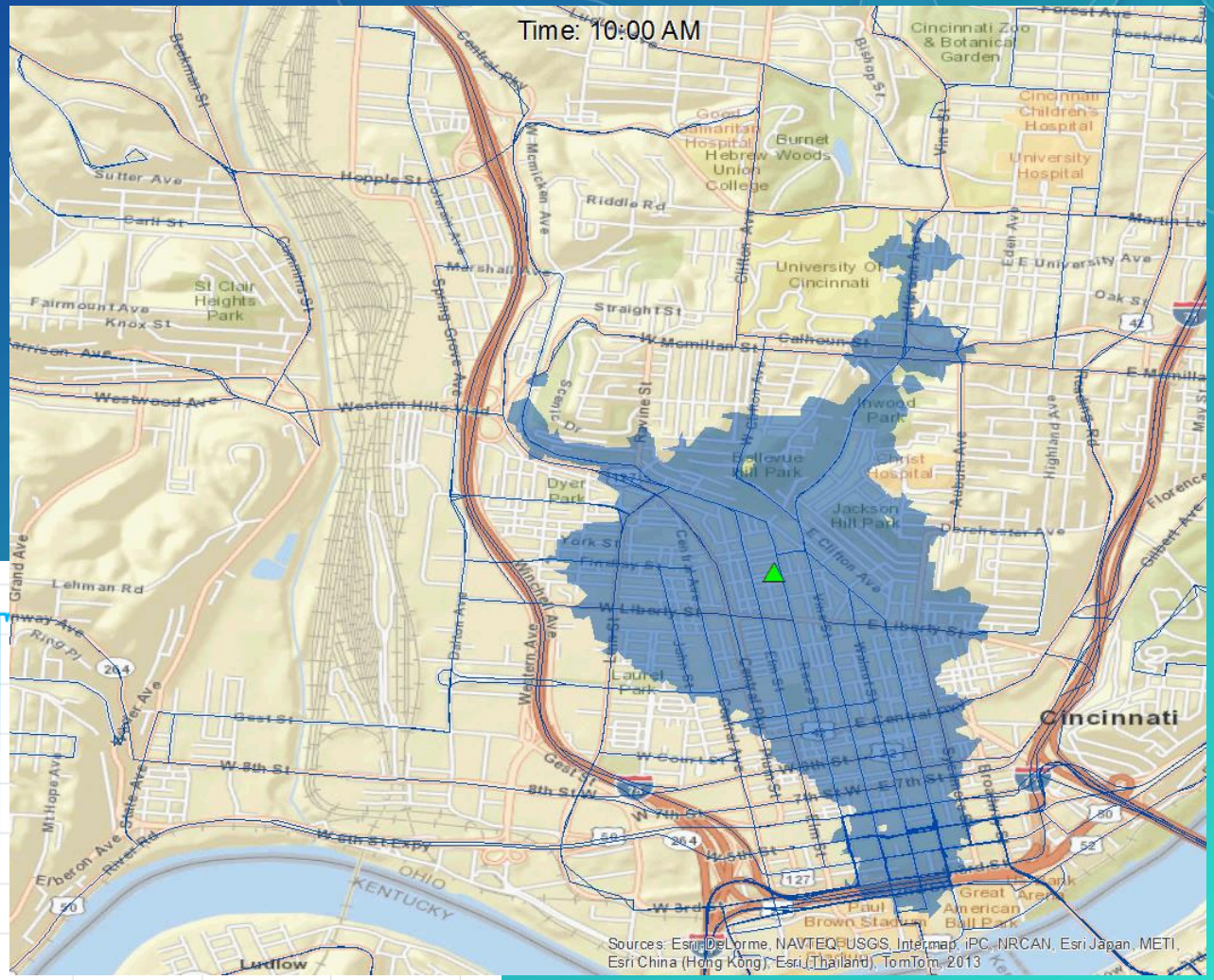
Providing a System of Insight

Enabling Smarter Transportation

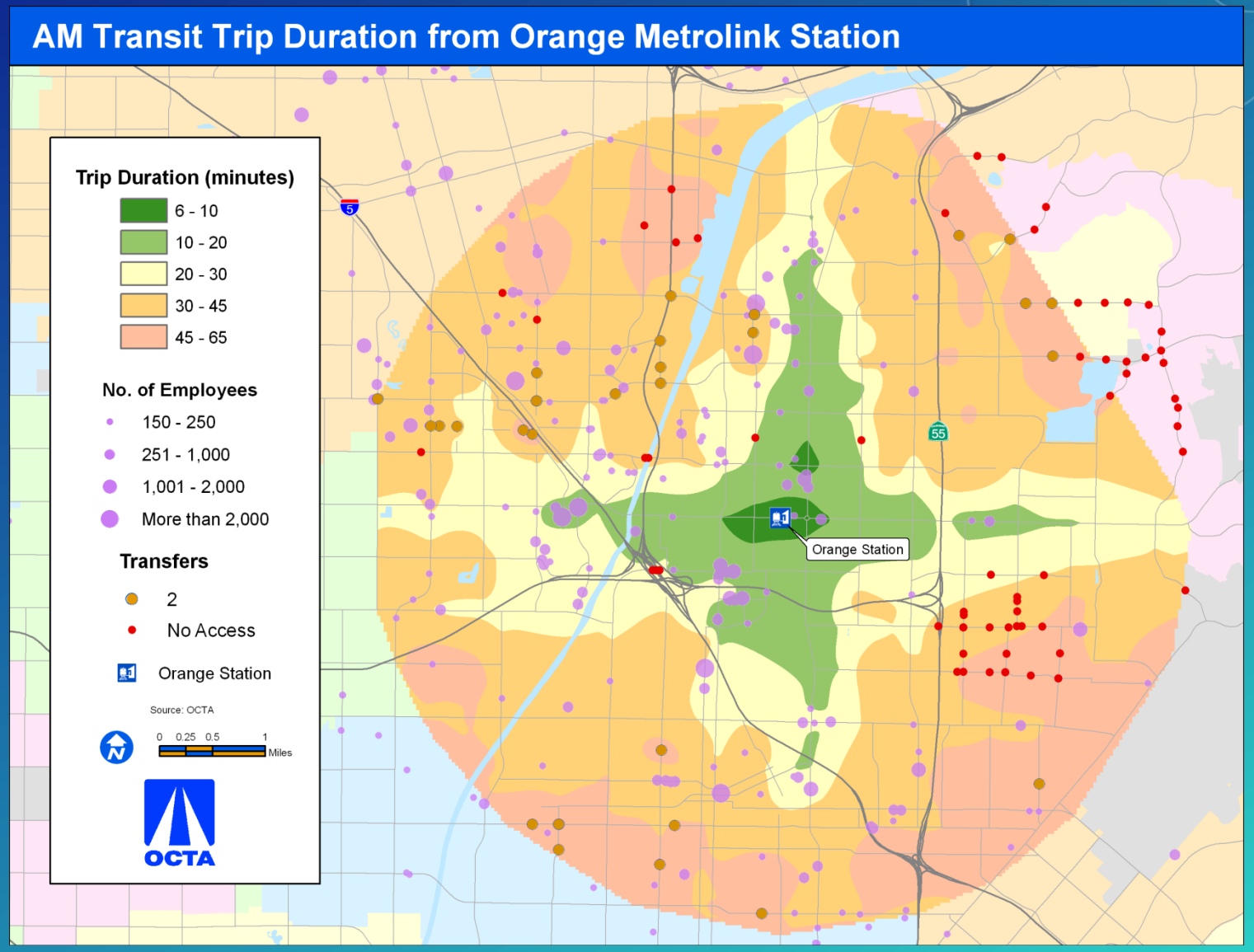
Real Time Transit Accessibility



Travel time between two places changes rapidly depending on the schedule.



Transit Accessibility



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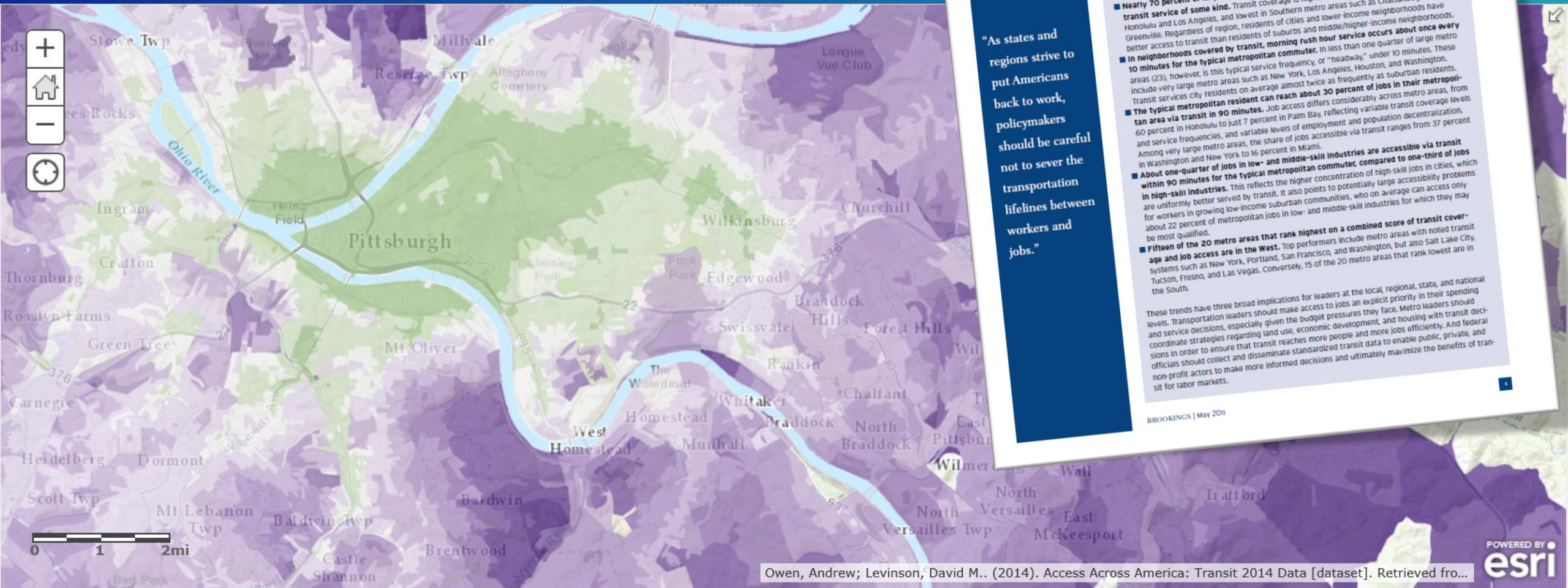


Metropolitan Policy Program at BROOKINGS

METROPOLITAN INFRASTRUCTURE INITIATIVE SERIES AND METROPOLITAN OPPORTUNITY SERIES

Missed Opportunity:
Transit and Jobs in Metropolitan America

Adie Tomer, Elizabeth Kneebone, Robert Puentes, and Alan Berube

"As states and regions strive to put Americans back to work, policymakers should be careful not to sever the transportation lifelines between workers and jobs."

Findings

An analysis of data from 371 transit providers in the nation's 100 largest metropolitan areas reveals that:

- **Nearly 70 percent of large metropolitan residents live in neighborhoods with access to transit service of some kind.** Transit coverage is highest in Western metro areas such as Honolulu and Los Angeles, and lowest in Southern metro areas such as Chattanooga and Greenville. Regardless of region, residents of cities and lower-income neighborhoods have better access to transit than residents of suburbs and middle/higher-income neighborhoods.
- **In neighborhoods covered by transit, morning rush hour service occurs about once every 10 minutes for the typical metropolitan commuter.** In less than one quarter of large metro areas (23), however, is this typical service frequency, or "headway," under 10 minutes. These include very large metro areas such as New York, Los Angeles, Houston, and Washington. Transit services city residents on average almost twice as frequently as suburban residents.
- **The typical metropolitan resident can reach about 30 percent of jobs in their metropolitan area via transit in 90 minutes.** Job access differs considerably across metro areas, from 60 percent in Honolulu to just 7 percent in Palm Bay, reflecting variable transit coverage levels and service frequencies, and variable levels of employment and population decentralization. Among very large metro areas, the share of jobs accessible via transit ranges from 37 percent in Washington and New York to 16 percent in Miami.
- **About one-quarter of jobs in low- and middle-skill industries are accessible via transit within 90 minutes for the typical metropolitan commuter, compared to one-third of jobs in high-skill industries.** This reflects the higher concentration of high-skill jobs in cities, which are uniformly better served by transit. It also points to potentially large accessibility problems for workers in growing low-income suburban communities, who on average can access only about 22 percent of metropolitan jobs in low- and middle-skill industries for which they may be most qualified.
- **Fifteen of the 20 metro areas that rank highest on a combined score of transit coverage and job access are in the West.** Top performers include metro areas with noted transit systems such as New York, Portland, San Francisco, and Washington, but also Salt Lake City, Tucson, Fresno, and Las Vegas. Conversely, 15 of the 20 metro areas that rank lowest are in the South.

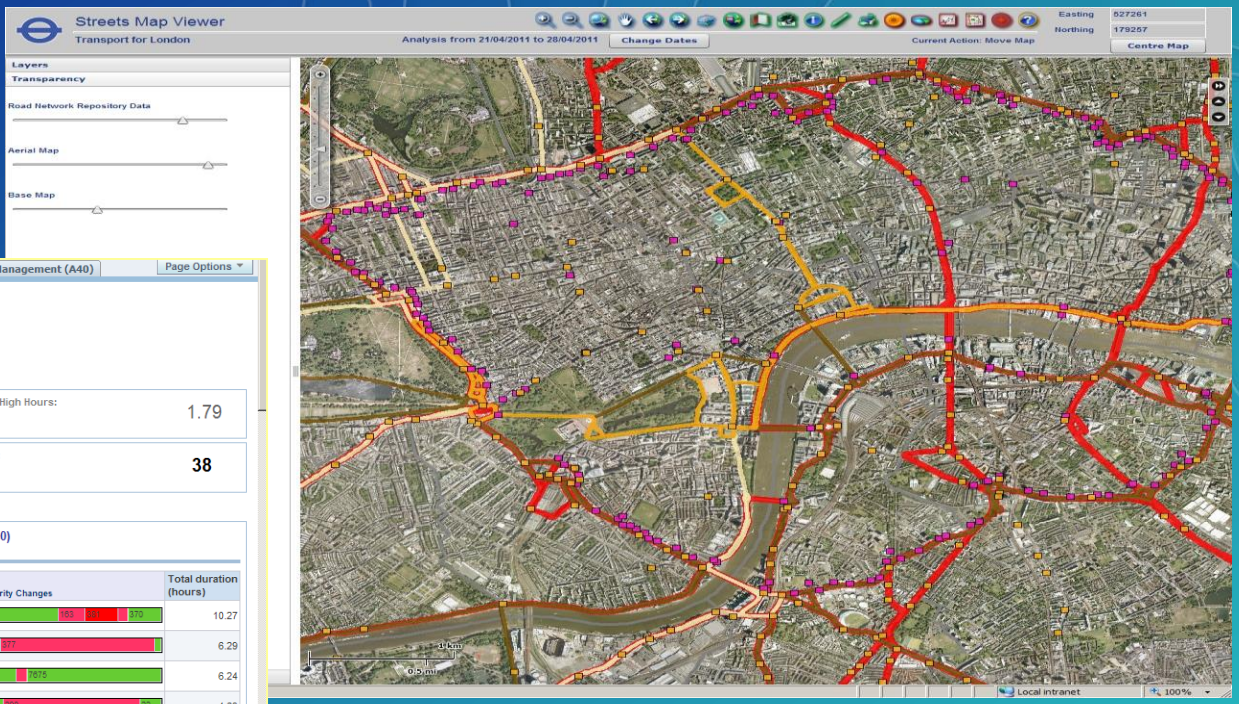
These trends have three broad implications for leaders at the local, regional, state, and national levels. Transportation leaders should make access to jobs an explicit priority in their spending and service decisions, especially given the budget pressures they face. Metro leaders should coordinate strategies regarding land use, economic development, and housing with transit decisions in order to ensure that transit reaches more people and more jobs efficiently. And federal officials should collect and disseminate standardized transit data to enable public, private, and non-profit actors to make more informed decisions and ultimately maximize the benefits of transit for labor markets.

1

BROOKINGS | May 2011

Owen, Andrew; Levinson, David M.. (2014). Access Across America: Transit 2014 Data [dataset]. Retrieved fro...

Big Data Analysis



Daily Report | Trendspotter | Periodic Report | Blackwall Tunnel (Periodic) | SCOOT Analysis | Borough Report | Strategic Corridors | Last 7 Days | Fatality Report | StreetWorks Test | Routes | SASS | Corridor Management (A40) | Page Options

ROAD NETWORK DISRUPTIONS REPORT (PERIODIC)

The purpose of this report is to provide operational management information to the London Streets Traffic Control Centre (LSTCC), Traffic Directorate. Information on this dashboard is sourced from the London Traffic Information System (LTIS) except where stated differently.

Please note: the report always defaults to the most recently completed reporting period.

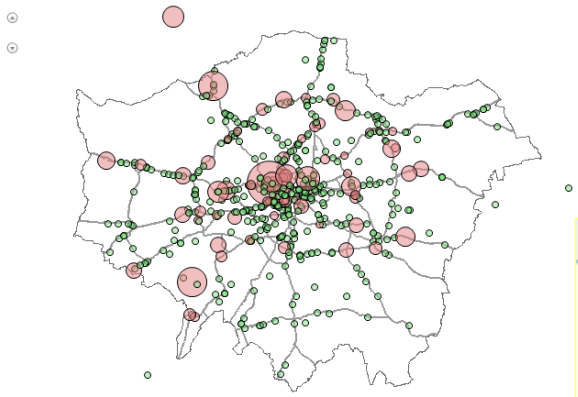
2010 - 2011 Period 12

Start	End
06/02/2011 00:00:00	05/03/2011 23:59:59

Overall number of incidents in period:	1,708	Active High Hours:	134.11	Average Active High Hours:	1.79
Disruptions with serious/ severe duration (count):	69	Active Low Hours:	61899.30	CF/LC in period:	38

Spatial Distribution of Network Disruption

Source: London Traffic Information System (LTIS)



Highest duration of Network Disruption (Top 10)

Source: London Traffic Information System (LTIS)

Event ID	Location	LTIS Category	NAM Category	Start Time	End Time	Severity Changes	Total duration (hours)
200156	MARYLEBONE ROAD BAKER STREET	WATER WORKS	Work Zones	26/02/2011 19:33:00	28/02/2011 04:36:39	498 / 103 / 881 / 370	10.27
200480	BARNET WAY (BARNET BY-PASS)	ACCIDENT	Traffic Incidents	27/02/2011 12:28:00	27/02/2011 19:18:10	28 / 372	6.29
200008	RICHMOND ROAD CROMWELL ROAD	WATER WORKS	Work Zones	21/02/2011 15:45:00	28/02/2011 04:27:16	1353 / 7675	6.24
200248	CITY ROAD OLD STREET ST AGNES WELL	ACCIDENT	Traffic Incidents	24/02/2011 07:49:00	24/02/2011 13:44:10	43 / 290 / 22	4.83
200954	EUSTON ROAD	ACCIDENT	Traffic Incidents	04/03/2011 05:27:00	04/03/2011 12:20:23	111 / 28 / 303 / 25 / 49	4.22
200341	M25	ACCIDENT	Traffic Incidents	25/02/2011 07:32:00	25/02/2011 13:19:28	39 / 371 / 74 / 84	4.08
200504	WESTERN AVENUE OLD OAK COMMON LANE WESTWAY OLD OAK	ATS ON LOCAL	Control	28/02/2011	01/03/2011	1300 / 164 / 385	3.98

Index | Daily Report | Trendspotter | Periodic Report | Blackwall Tunnel (Periodic) | CCWE2 Removal | Borough Report | Strategic Corridors | Forward Planning | Fatality Report | StreetWorks Test | Routes | Plan & Procedure overrides (Periodic) | Plans, Procedures & SASS (Daily) | SASS (Periodic) | ADDtest | Corridor Management | Bug List | Borough Report 2 | StreetworksV1 | Streetworks

Sunday 6th March 2011

Select a month and/or day of interest: 2011 M 03 | 2011/03/06 | Go

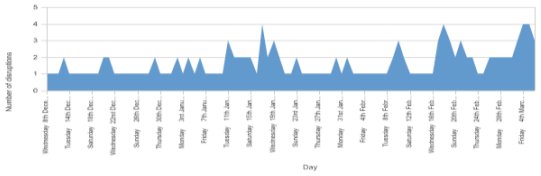
Note: The Corridor Management report is still under development, but eventually the user will be able to select a corridor of interest from a drop-down list or have it defaulted always to a particular corridor.

Difference from Journey Time Profile (%)

Source: London Congestion Analysis Project (LCAP)

Daily trend for network disruptions (last 90 days)

(Source: London Traffic Information System)



A40 Strategic Corridor

(Note: The user will be able to opt between a geographic and schematic view.)

The map shows disruption (duration in minutes) as reported on the London Traffic Information System (LTIS). This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office. © Crown Copyright (GLA 100032379/2002).

Click here for more spatial analysis options (opens new window with the Data Service Flex Viewer)

Network Disruptions (all severities) for the selected day

(Source: London Traffic Information System)

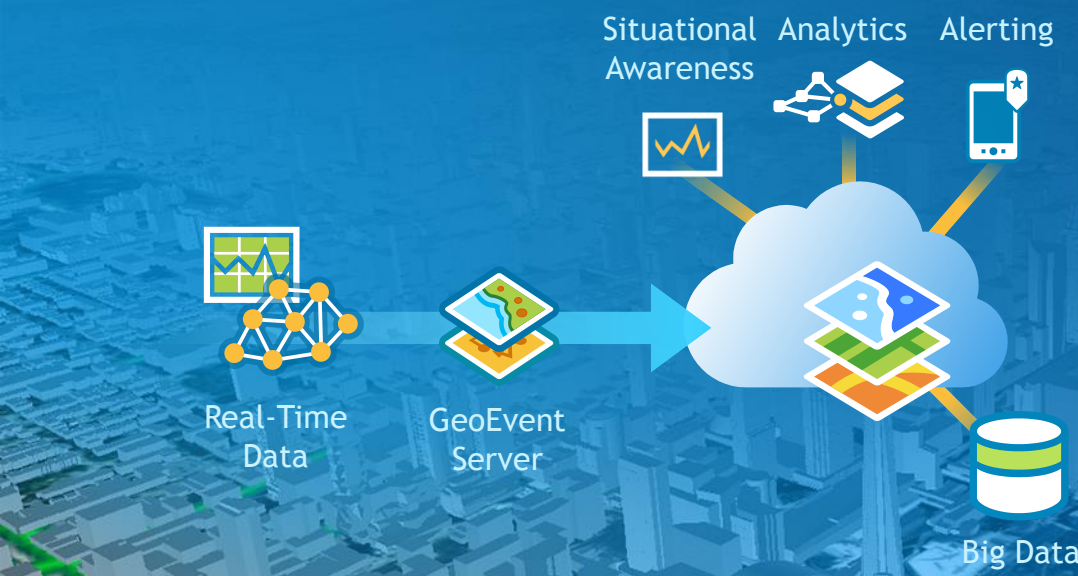
Event ID	Location	LTIS Category	StartTime	EndTime	Description	Borough	SevGraph	High (Mins)	Low (Mins)	Count
194629	WESTWAY	TFL STREETWORKS	12/12/2010 03:34:00	31/12/2011 10:00:00	Eastbound and westbound direction.	WESTMINSTER	953346	0.00	1440.00	1
198420	WESTWAY WOOD LANE	TFL STREETWORKS	28/02/2011 21:30:00	11/04/2011 06:00:00	Eastbound and westbound	HAMMERSMITH AND FULHAM	69550	0.00	1440.00	1
201115	WESTWAY ST MARKS ROAD	EMERGENCY ROADWORKS	05/03/2011 20:30:00	06/03/2011 03:21:58	Eastbound direction.	KENSINGTON AND CHELSEA	417	0.00	201.97	1
Grand Total								**0.00**	**3081.97**	**3**

Incident(s) that caused the most amount of disruption (serious/severe duration). Disruption category, incident number and active high duration provided.

Real-Time

Integrating Sensor Networks and the IoT

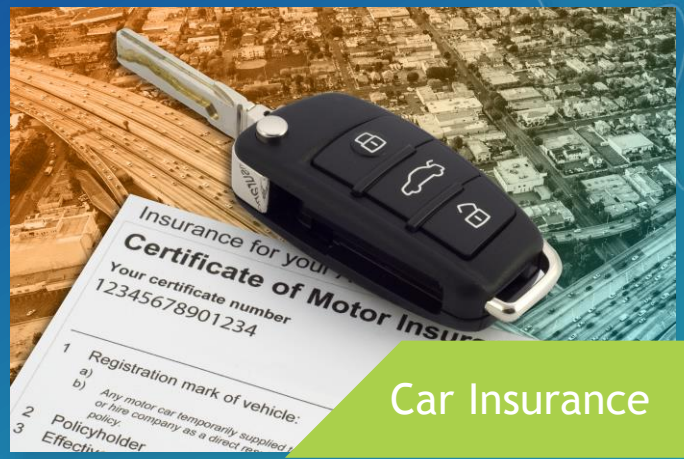
- High-Velocity Data Streams
- Monitoring and Alerting
- Dynamic and Big Data Analytics



Supporting Real-Time GIS Applications . . .
. . . Enabling Smarter Organizations

Everything is Driven by Location

Connected Vehicles



Car Insurance

Parking Fees and Management

TOLL COLLECT
service on the road

Toll Collection Systems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