

Urban Mobility in the age of Smart Communities

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AGENDA

1 Communities become platforms

2 Smart Urban Mobility for Smart Communities

3 Enabling Smart Urban Mobility with GIS

An aerial photograph of a city at sunset. The foreground is dominated by a large, vibrant outdoor market with numerous colorful umbrellas in shades of red, blue, green, and yellow. The market is densely packed with stalls and people. In the background, a city skyline is visible against a bright orange and yellow sunset sky. The sky transitions from a deep orange near the horizon to a dark blue at the top. A large white number '1' is overlaid on the left side of the image, and the text 'Communities become platforms' is overlaid in white across the middle. A blue semi-transparent graphic element is on the right side, and the Bing logo is in the bottom right corner.

1 Communities become platforms



Cities are transformed by digital technologies

* Wikipedia : Digital transformation is the change associated with the application of digital technology in all aspects of human society.



Smart Cities & Communities is (mostly) about the **digital transformation** of cities & communities. It deals with **usages of ICT** to boost **the efficiency of city's Business processes** and to **incrementally improve the services offered to its users.**



(Some) Characteristics of a Smart Cities & Communities

- Forward-Thinking Leadership & Strategy
- Data-Driven Decision Making
- Collaboration Across Departments
- Real-Time Awareness
- Open Governance
- Civic Engagement
- Committed ecosystem
- Sustained business model



**Web
Services
APIs**

**Market
Place**

Data

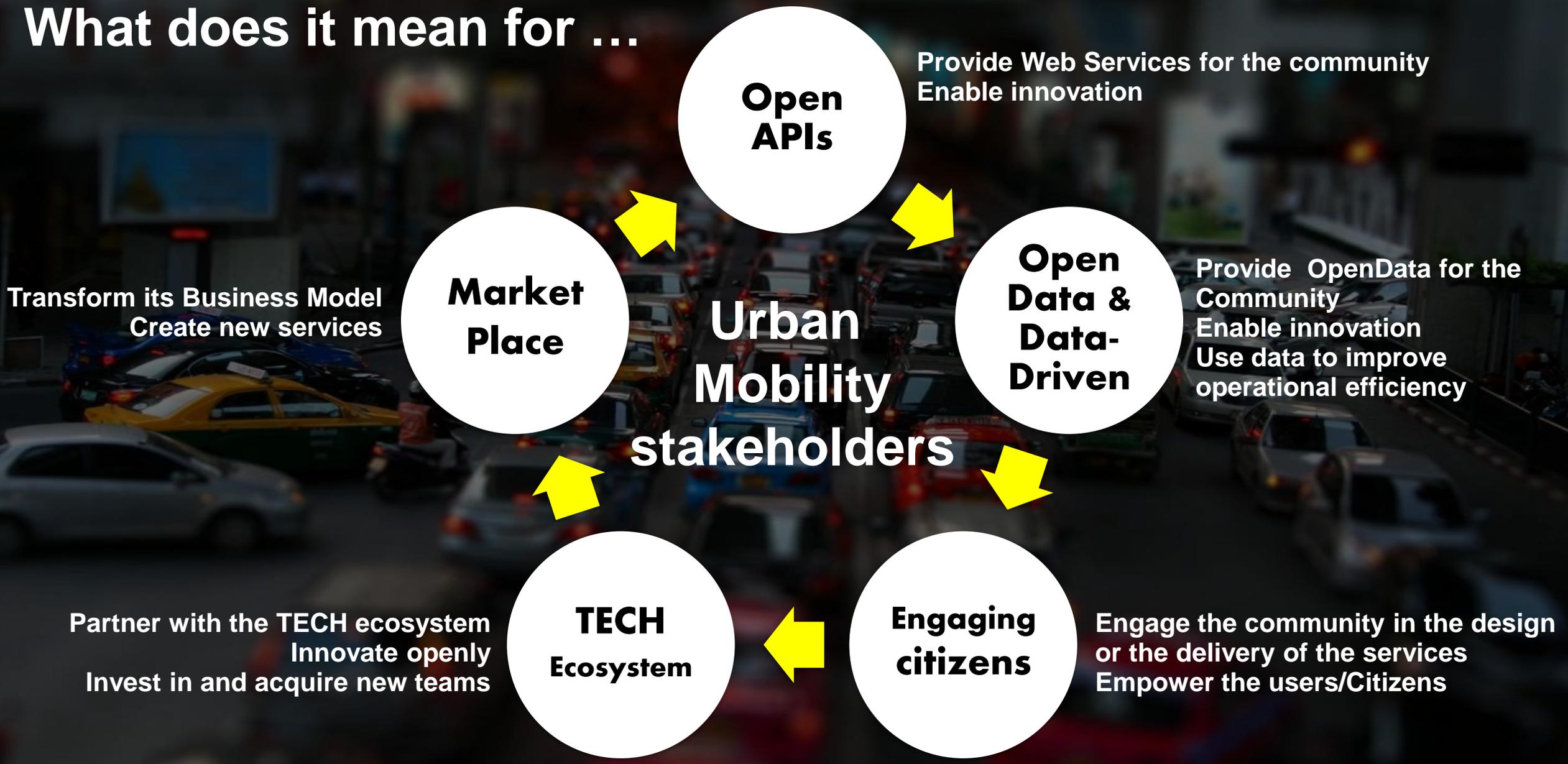
**Cities
become
platforms**

Dev.

Users



What does it mean for ...





2

Smart Urban Mobility for Smart Communities

Market trends through SCC characteristics

Safe



Well-Run



Livable



Healthy



Prosperous



Sustainable



Market trends through SCC characteristics

Safe



Well-Run



Livable



Healthy



Prosperous



Sustainable



- ▶ Ensure urban mobility security and safety
- ▶ Improving public safety in transportation
- ▶ Reduce accident caused by traffic

Market trends through SCC characteristics

Safe



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Prosperous



Sustainable



- ▶ Develop and modernize existing **infrastructures**, including preparing the city for **driverless/autonomous vehicles** and developing **walking and cycling infrastructures**
- ▶ Provide **Electromobility infrastructures** to citizens coupled with the existing energy network
- ▶ Build new infrastructures to better manage **Urban Logistics**
- ▶ Optimize the **Infrastructure asset management**
- ▶ Adopt **Intelligent transport systems (ITS)**
- ▶ **Collect and process Data** from transportation to improve the decision process
- ▶ **Run Data Driven Modelling & Predictive analysis** to improve decision making
- ▶ Reduce traffic and congestion by the use of **advanced analytics** and its impact on operations
- ▶ **Monitor in Real-time transportation networks** (Real-time positioning, geoprocessing and alerts)
- ▶ Fleet management to take benefit from Geo-embedded technologies and Telecommunication networks
- ▶ **Promote Car pooling** to save money, to fight against congestions on roads and to connect citizens

Market trends through SCC characteristics

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- ▶ **Reduce journey time**
- ▶ Improve the public transport **service quality**
- ▶ **Better inform passengers** through multimodal information systems and make them use the transportation mode the right time and at the right place, including walking, cycling, car-pooling, ...
- ▶ **Improving accessibility for persons with reduced mobility**
- ▶ Develop transportation **vehicles sharing and on-demand transportation** services
- ▶ **Promote dynamic Carpooling** as a mean to reduce urban traffic, create social links & erase public transport white areas
- ▶ **Facilitate way-finding to parking and other facilities** to reduce traffic congestion
- ▶ **Develop parking space sharing** to increase the capacity of parking spaces
- ▶ **Develop walkability and cyclability**

Market trends through SCC characteristics

Safe



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Livable



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Prosperous



Sustainable



Improve health by reducing air pollution and noise

Develop walking and cycling mobility modes

Market trends through SCC characteristics

Safe



Well-Run



Livable



Healthy



Prosperous



Sustainable



- Improve transportation budget
- Provide affordable public transport
- Consider new Business Models to support Smart Urban Mobility innovative Services
- Reduce congestion and related economic losses
- Optimize urban freight transport to maximize Business transactions

Market trends through SCC characteristics

Safe



Well-Run



Livable



Healthy



Prosperous



Sustainable



Adopt Integrated planning, mixing Urban Mobility planning with Urban Planning, Climate Change planning, ...

Integrate Freight planning as part of the mobility plan

Involve citizens in the Urban mobility planning process

Adapt supply to demand regarding the evolution of the urbanization

Optimize Land Use

Reduce air pollution & CO² emissions

Reduce Noise

Develop clean and efficient energy for vehicles, including electric vehicles

Develop alternative transportation modes

Develop Transport Mode Balancing / intermodal connectivity

Enablers to support these changes

New Data Sources

IoT – Sensors and Telecommunication

Topology and graph-based science

Big Data Analytics

Artificial Intelligence

Complex system science

THE SCIENCE OF WHERE





3

Enabling Smart Urban Mobility with GIS

Smart GIS

For Enabling Urban Mobility



Modeling,
Designing,
Planning

Real Time Data
Geoprocessing

Advanced
Analytics and
visualization

Engaging
Communities

Collaboration
with the urban
Mobility ecosystem

Integration with
other systems

Informing

Understanding

Collaborating

*Transforming How We Think and Act . . .
. . . Creating a More Sustainable Future*

Smart GIS Is Revolutionizing How We Plan and Design

Integrating and Making Available Everything We Know

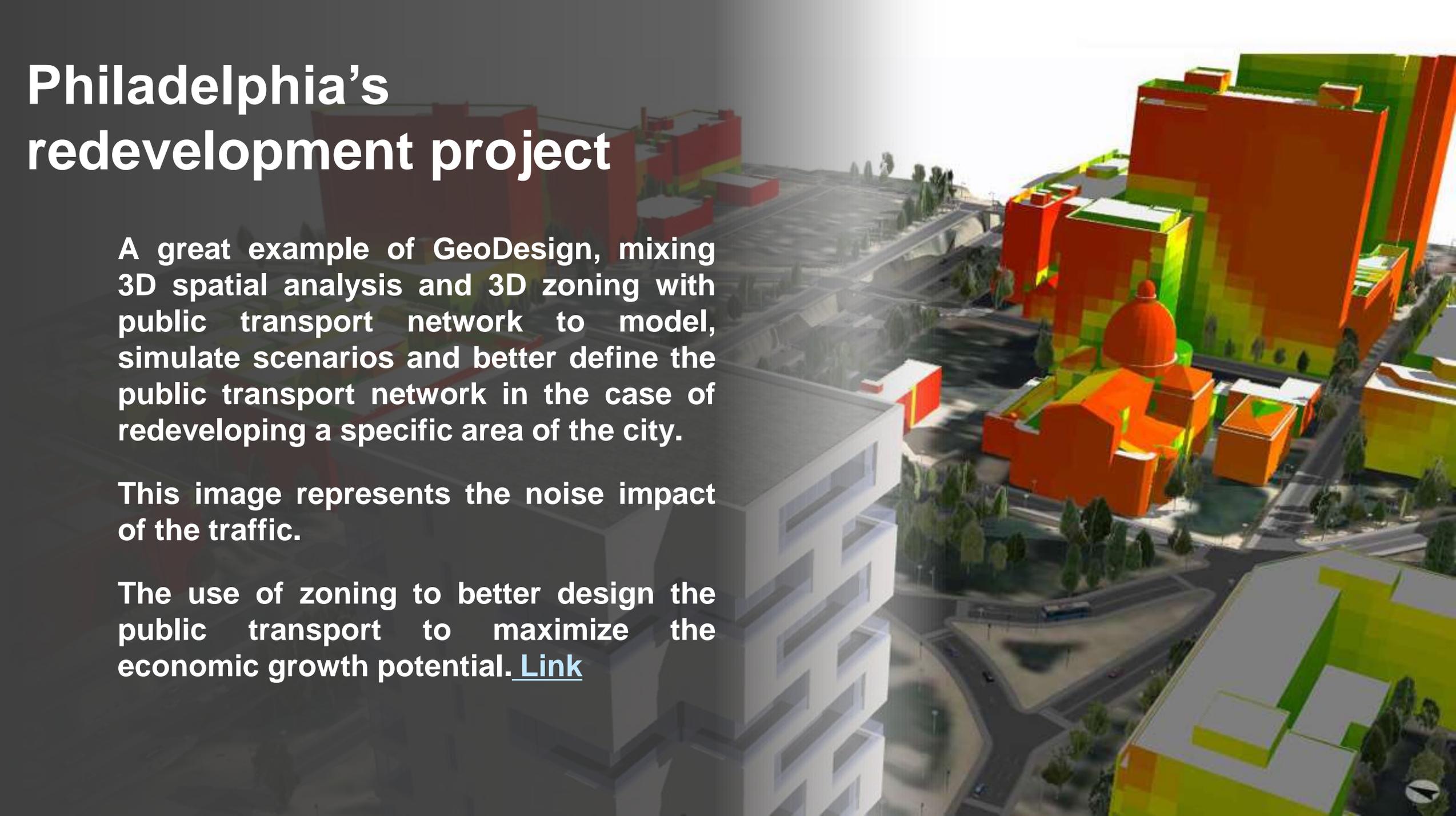


Philadelphia's redevelopment project

A great example of GeoDesign, mixing 3D spatial analysis and 3D zoning with public transport network to model, simulate scenarios and better define the public transport network in the case of redeveloping a specific area of the city.

This image represents the noise impact of the traffic.

The use of zoning to better design the public transport to maximize the economic growth potential. [Link](#)



Smart GIS Integrates Real-Time Data

Providing Dynamic Information About Everything



Auckland - Real Time awareness

Cities use Real Time systems for years to better manage their fleet of public transport, be aware of the traffic, be alerted in case of anomalies in the operation process.

GIS provides a great interface for operation control centers to visualize these real time Data in their geographic context as well as advanced capabilities to geoprocess them and get insights to better run their operations.

Live Bus Updates 195

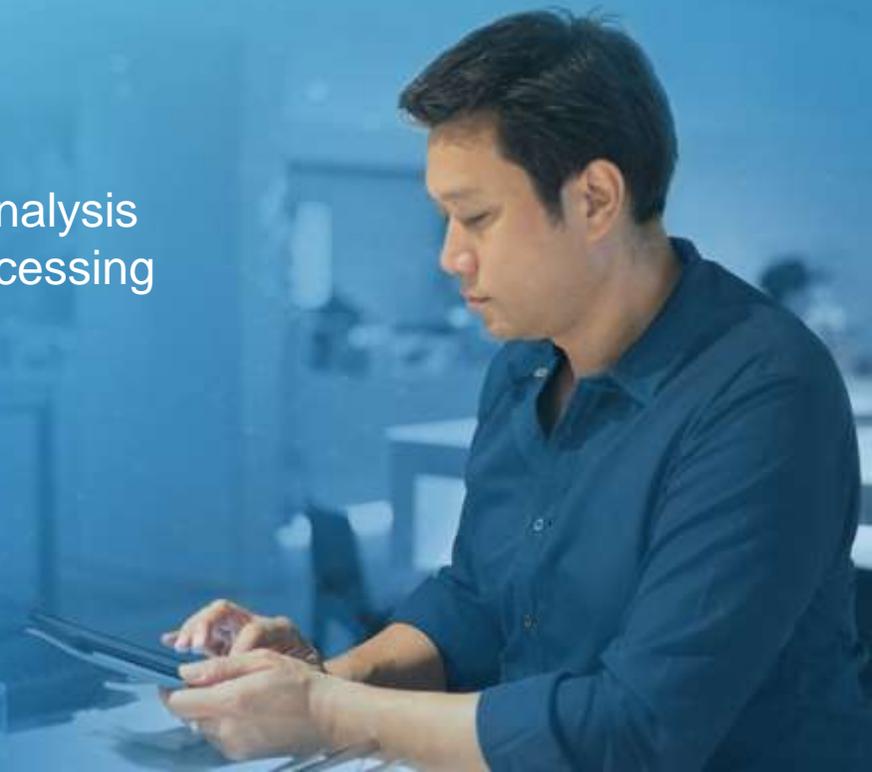
5:38:19 PM	Bus 3781	Heading 0°
5:38:19 PM	Bus 5E6B	Heading 0°
5:38:19 PM	Bus 5E75	Heading 0°
5:38:18 PM	Bus 3785	Heading 238°
5:38:17 PM	Bus 3725	Heading 30°
5:38:17 PM	Bus 3703	Heading 258°
5:38:17 PM	Bus 5224	Heading 76°
5:38:17 PM	Bus 521D	Heading 245°
5:38:17 PM	Bus 2F87	Heading 0°
5:38:17 PM	Bus 5E68	Heading 0°
5:38:17 PM	Bus 3707	Heading 0°
5:38:16 PM	Bus 3747	Heading 194°
5:38:16 PM	Bus 3087	Heading 81°
5:38:16 PM	Bus 36D0	Heading 115°
5:38:16 PM	Bus 3741	Heading 222°
5:38:15 PM	Bus 5E94	Heading 320°
5:38:15 PM	Bus 3731	Heading 245°
5:38:15 PM	Bus 7D9B	Heading 0°
5:38:15 PM	Bus 2F81	Heading 7°
5:38:15 PM	Bus 2C97	Heading 125°
5:38:15 PM	Bus 3812	Heading 0°
5:38:15 PM	Bus 36CC	Heading 299°
5:38:15 PM	Bus 380C	Heading 0°
5:38:15 PM	Bus 37BB	Heading 232°
5:38:15 PM	Bus 3075	Heading 0°
5:38:14 PM	Bus 374C	Heading 220°
5:38:14 PM	Bus 7A56	Heading 235°
5:38:14 PM	Bus 36C4	Heading 12°
5:38:14 PM	Bus 3807	Heading 104°

Passengers



Smart GIS Embeds Advanced Analytics and Visualization

Providing a System of Insight

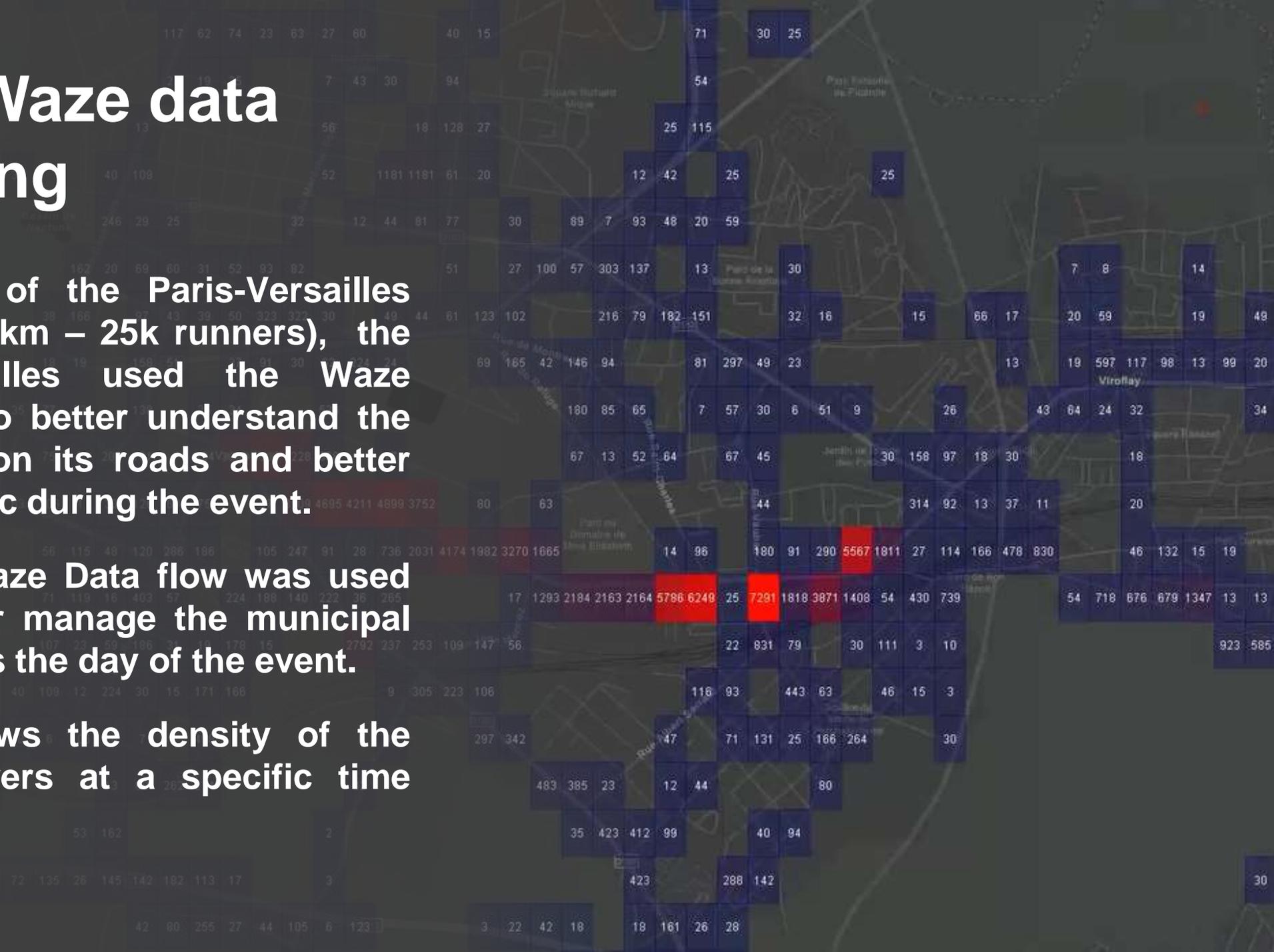


Versailles – Waze data Geoprocessing

In the context of the Paris-Versailles running race (16km – 25k runners), the City of Versailles used the Waze historical data to better understand the traffic patterns on its roads and better manage the traffic during the event.

The real-time Waze Data flow was used as well to better manage the municipal police operations the day of the event.

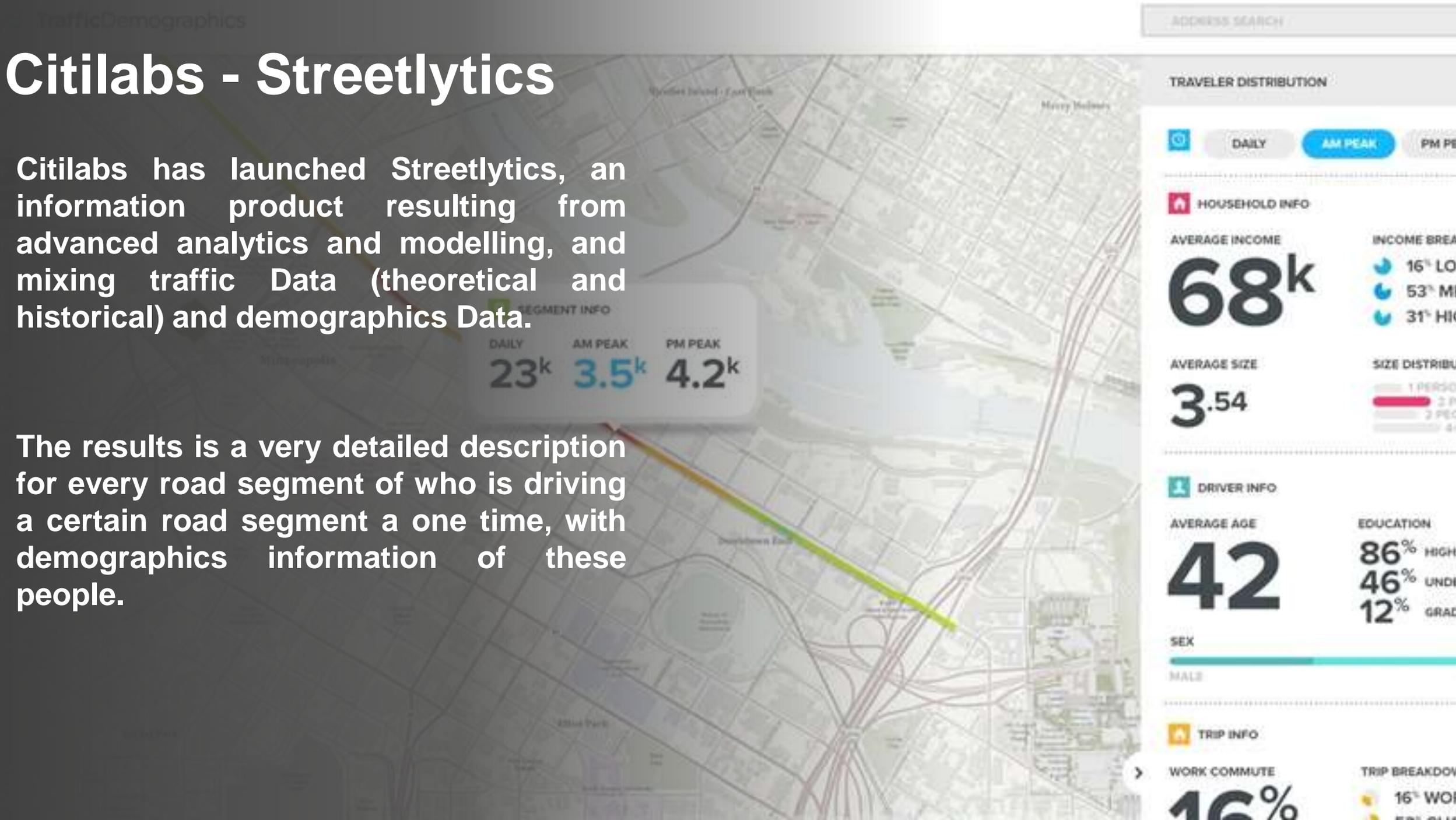
The image shows the density of the alerts from drivers at a specific time during the event.



Citilabs - Streetlytics

Citilabs has launched Streetlytics, an information product resulting from advanced analytics and modelling, and mixing traffic Data (theoretical and historical) and demographics Data.

The results is a very detailed description for every road segment of who is driving a certain road segment a one time, with demographics information of these people.



Smart GIS Integrates Everything

Connecting People, Processes, Things and Data About Them

Improving Efficiency,
Collaboration and
Communication

*System of
Engagement*

Helping Organizations
Understand . . .

*System of
Record*

*System of
Insight*

Web GIS
Supports Multiple
Types of Systems

. . . And Be Aware, Alert,
and Responsive



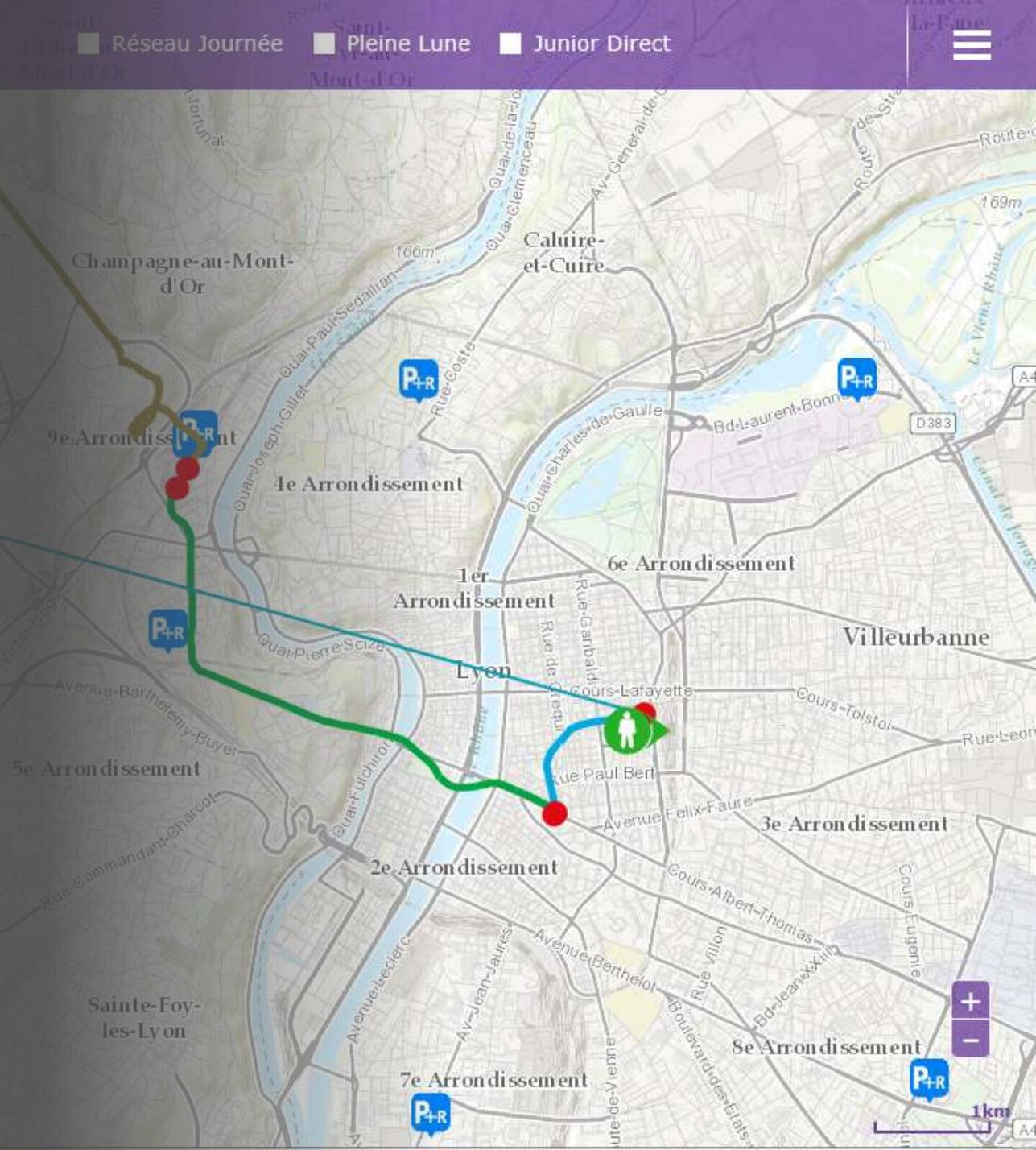
Integrating GIS with other Enterprise IT components

In this example of Multimodal Information System from the city of Lyon – France, Cities are using GIS as :

a system of record, to manage the data from different systems in an harmonized data model,

a system of insight to display the information to the citizen in a comprehensive map, and,

a system of engagement, engaging citizens to use this APP to better manage their journeys.



Smart GIS Engages Communities

“Community GIS” Is a New Pattern



Engaging
All Citizens

*Providing a Platform for
Civic Engagement . . .
Enabling Smart Communities . . .*

Expanding Their GIS to Support Everyone



Vision Zero

LOS ANGELES | 2015 - 2025

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Explore the Data Behind Vision Zero

Vision Zero is a global initiative whose goal is to reduce severe injuries and deaths in roadway collisions.

Through his GeoHUB program, Los Angeles Mayor has launched a Vision Zero initiative to eliminate all traffic deaths by 2025.

The Vision Zero Initiative starts with an Open Data portal that provides to the community all the Data relating to collisions, road network, traffic and spatial analysis related to road accidents.

[DOWNLOAD THE DATA](#)



Vision Zero - Dashboard

Within the Vision Zero initiative, citizen can access useful APPs :

Story Map that explain the LA Vision Zero plan

Several information products such as High injury network or the Collision landscape

Story Map that explain the City Data-Driven Approach

NB : the image represent a Vision Zero Dashboard done for NYC



Smart GIS Enables New Types of Collaboration

Connecting Individuals, Organizations and Communities

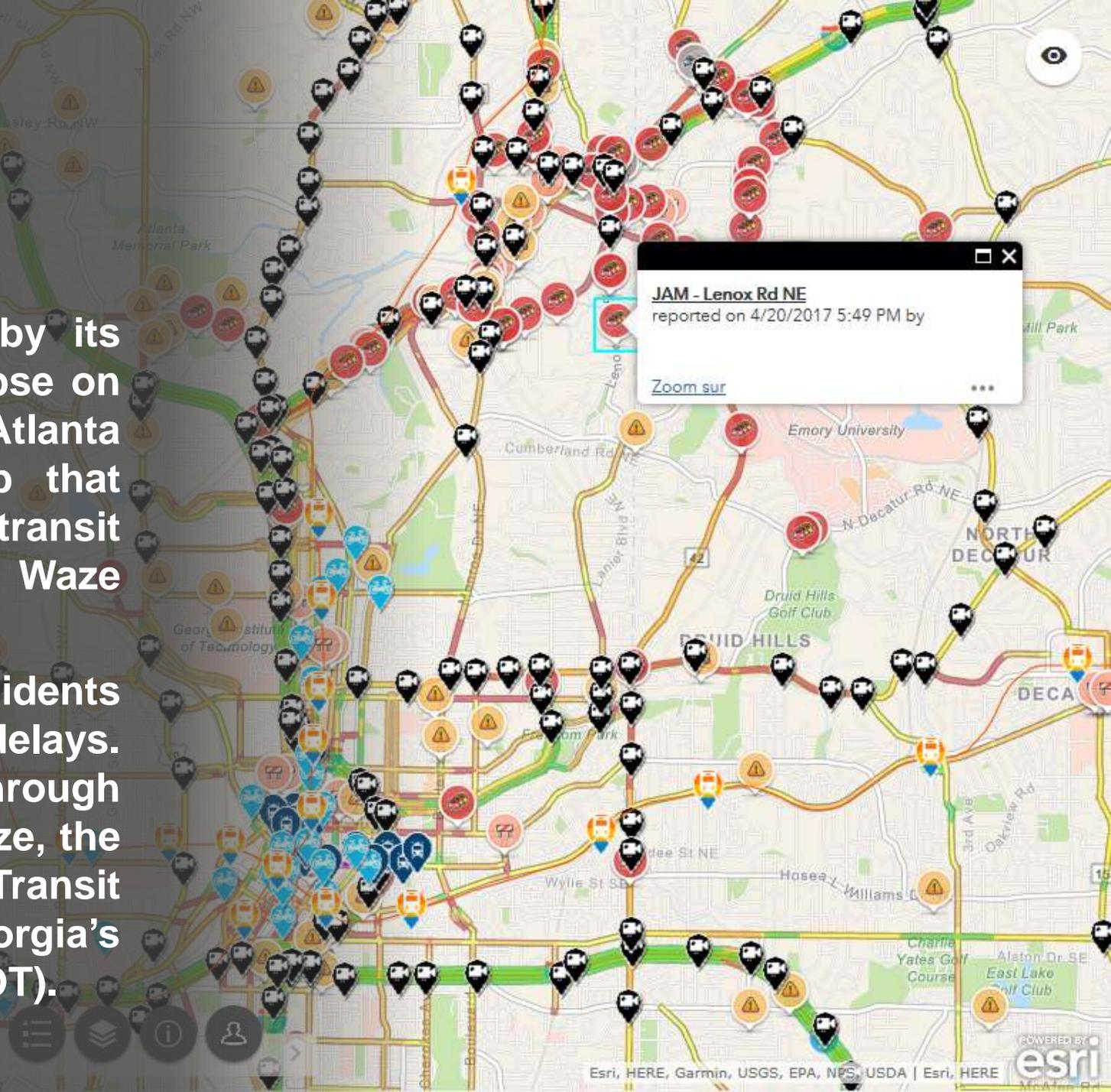


... Creating a Nervous System for Our Planet

Atlanta – Urban Mobility resiliency

To dislodge congestion caused by its Interstate 85 fire and bridge collapse on 2017; March 30, the city of Atlanta rushed out a public-facing map that combines real-time data from city transit agencies and features from the Waze traffic app.

The Map aims at assisting residents caught in the aftermath of traffic delays. The map was made possible through data-sharing partnerships with Waze, the Metropolitan Atlanta Rapid Transit Authority (MARTA) and Georgia's Department of Transportation (GDOT).





esri

THE
SCIENCE
OF
WHERE