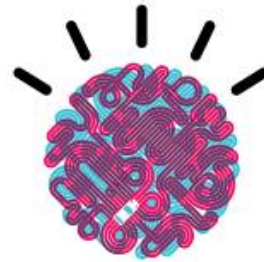


**TORINO 26-27 Sept 2013**

Centro Congressi Lingotto

Smart Mobility > Smart People > Smart City



**Smart***Mobility*World

**Title:**  
**Big data in Automotive**  
**Smarter Connected cars**

**Presented by:**  
**Eric-Mark Huitema**

[huitema@nl.ibm.com](mailto:huitema@nl.ibm.com)



# Intelligent Transport Systems (ITS) for the future



## BUILDING A SMARTER PLANET

with  
**Smarter Mobility**







## Congestion is the daily pain of cities.

The costs of traffic congestion are enormous.

The total costs of road congestion have been estimated at around **2% of GDP**.

Reducing the congestion problems would reduce both the individual and the external costs of transport.

Source: [ec.europa.eu/transport/.../doc/.../white\\_paper\\_2011\\_ia\\_full\\_en.pdf](http://ec.europa.eu/transport/.../doc/.../white_paper_2011_ia_full_en.pdf)

**2 billion / 7 billion**

It took all of history for human population to reach 2 billion, and only one generation to more than triple to nearly 7 billion.

**476 cities over 1 million**

In 2010 there are 476 urban areas with at least 1 million people. That's an increase of 573% from 1950 when there were 83. Over half the world's population now lives in urban areas.

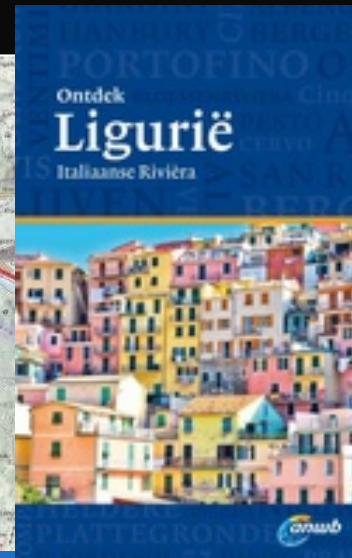
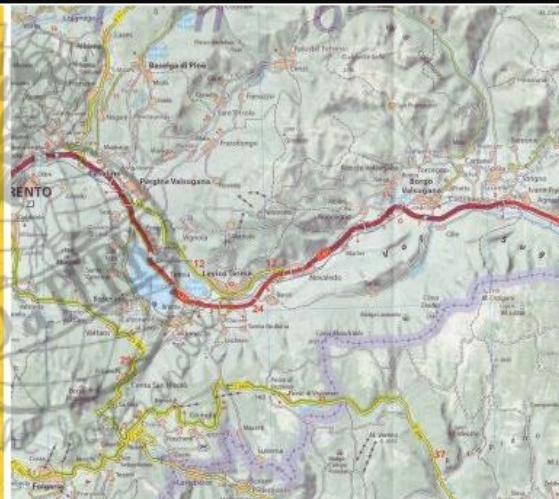


# Travel - Times are changing

IBM



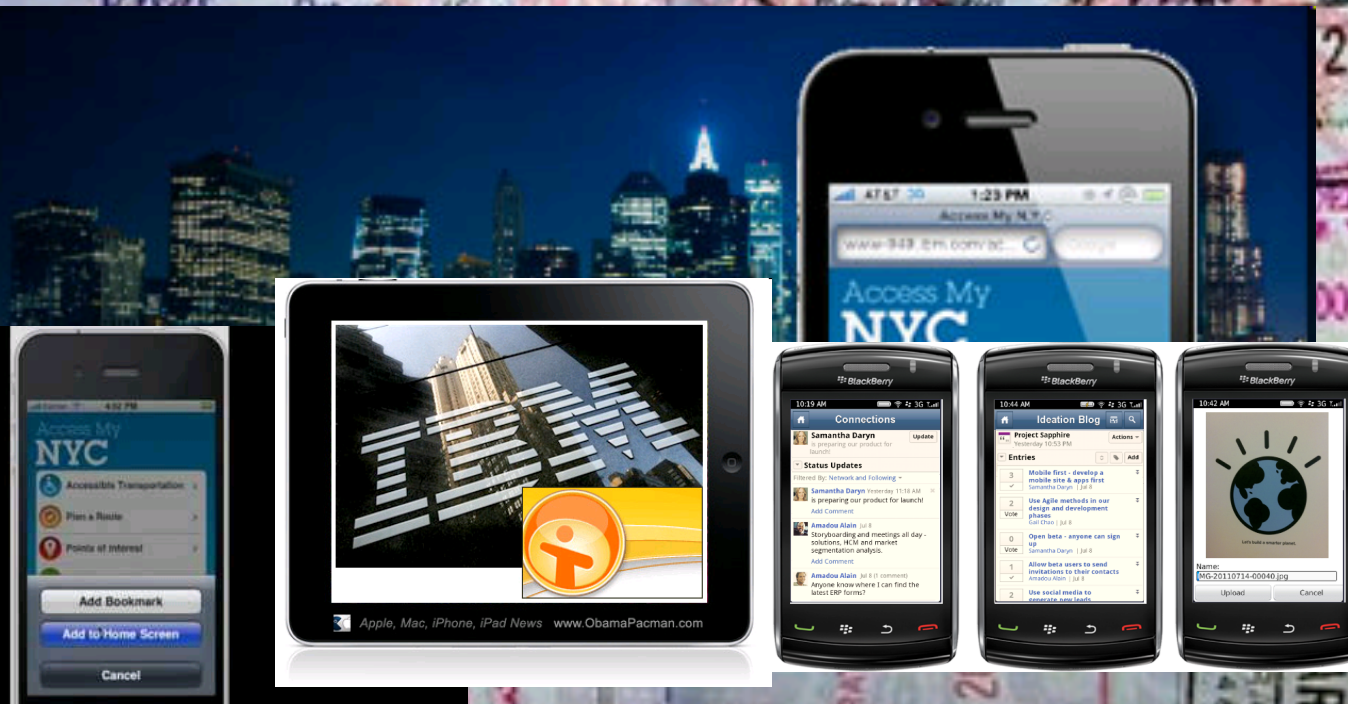
My father was planning our holiday trip to Italy with Maps and Travel Guides





# Travel - Times are changing

IBM



**My children ask me:**

Daddy, do we have **uninterrupted** internet connection **during travel** and at **destination** ! ( and I want it too – business, whatsapp, facebook etc.)



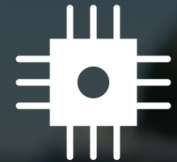
BECAUSE WE WANT IT FOR THE FUTURE.

IBM

## How?

The world is becoming **INSTRUMENTED**

Smart sensors on road, in cars, Connected cars everywhere



The world is becoming **INTERCONNECTED**

Linking information on road, in cars and railways, throughout the supply chain – *“the internet of things”*



The world is becoming **INTELLIGENT**

Cars talking to each other, sensors talking to each other, we can predict where traffic jams are, **before** and **while** you drive

Cars avoiding accidents, Preventive maintenance, interaction with the environment, schools, signs, events, cars and POI info.





# Smarter Transportation creates opportunities to unlock new benefits – created by Big Data

Building a smarter planet: smarter transportation



## Challenges

Reduced Budgets  
Increase Delivery Expectations  
Aging fleets more models  
Increased Threats



## New Benefits

Increased Revenue  
Operational efficiencies  
Reduced Costs  
Economic Vitality

## From the 3 I's to the 3 A's:

- **Awareness:** Leverage real-time visibility across data sources
- **Anticipate:** Proactively identify problems to mitigate impact to services
- **Act:** Coordinate cross-business operations to drive better business outcomes

# Intelligent Operations – Leveraging Multiple Data Sources

Building a smarter planet: smarter transportation

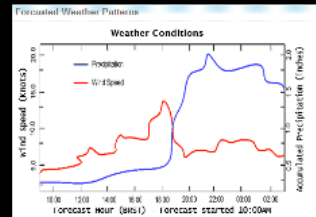


## Evolution of Data Sources

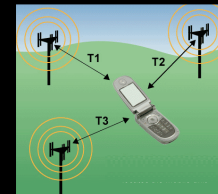
*Connecting across multiple data sources for a single picture across the city*



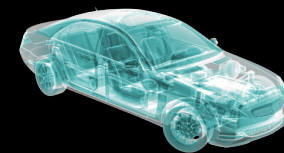
Video



Prediction



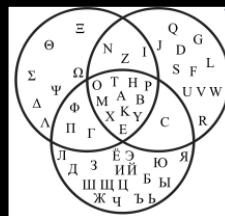
Mobil Phone Tracking



The car



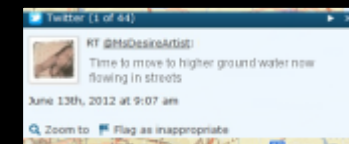
Sensors



Correlation



Citizen Collaboration



Social Media Analytics

Factual

Mathematical

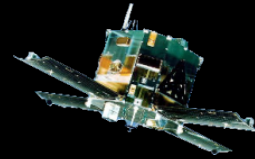
Observational

Sentiment

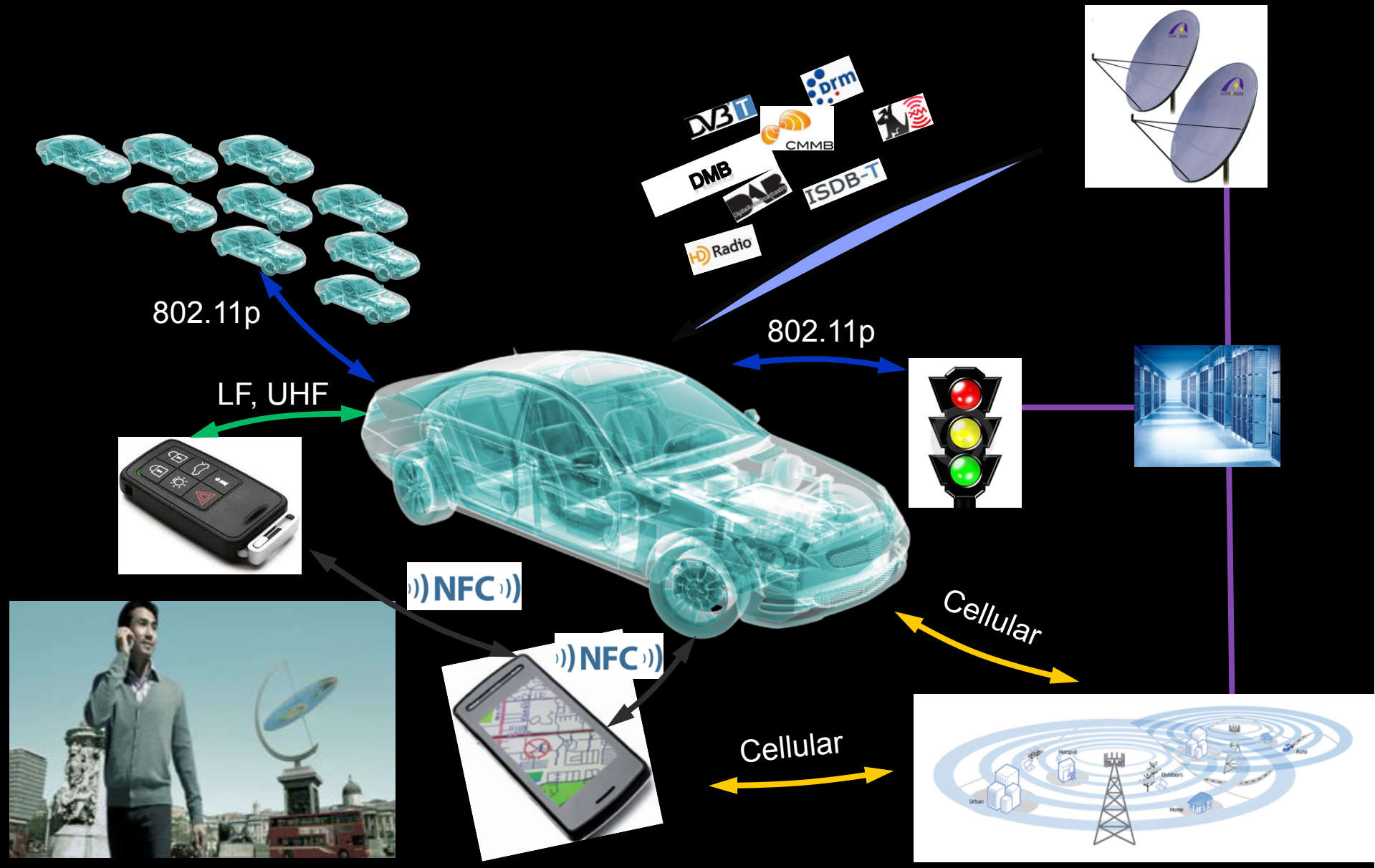


# The Connected Car is there .....

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IBM

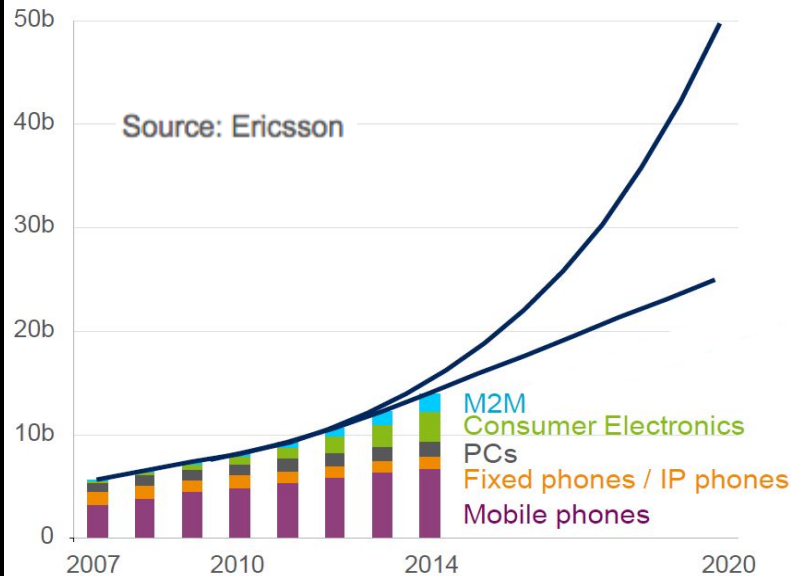


# .....with numerous related application areas: DATA



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Connected Devices Worldwide

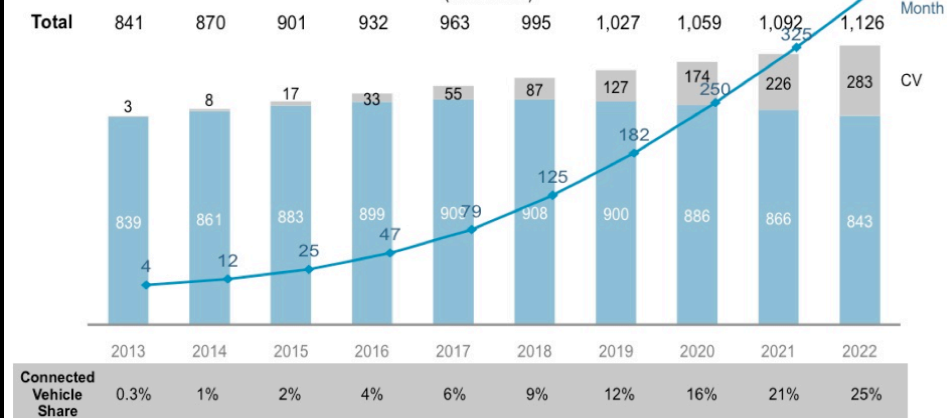


## 55% Automotive related

Top Connected Devices We May See in 2020 & Their Estimated Values

➔ <b>Connected Car</b>	<b>\$600 billion</b>
Clinical Remote Monitoring	\$350 billion
Assisted Living	\$270 billion
Home & Building Security	\$250 billion
➔ <b>Pay-As-You-Drive Car Insurance</b>	<b>\$245 billion</b>
➔ <b>New Biz. Models for Car Usage</b>	<b>\$225 billion</b>
Smart Meters	\$105 billion
➔ <b>Traffic Management</b>	<b>\$100 billion</b>
➔ <b>Electric Vehicle Charging</b>	<b>\$ 75 billion</b>
Building Automation	\$ 40 billion

Global Passenger Vehicle Population & Share of Connected Vehicles (in Millions)



<sup>1</sup> Average of 1.5 GB/month/vehicle, 1 Petabyte = 1,048,576 GB

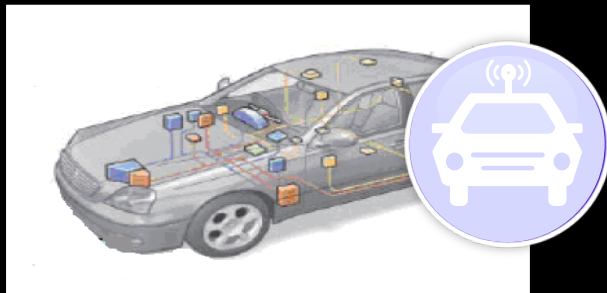
Sources: Cisco IBSG, 2011, based on data from U.S. Department of Transportation, iSupply, McKinsey & Company





# In our experience with clients, we know the majority of automotive use cases falls into one of the following areas ....

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## Connected vehicle

**Analyze data from vehicle sensors**  
to enhance customer experience, improve safety or security, or monetize data



## Predictive asset optimization / warranty

**Analyze a variety of machine data**  
to reduce asset down-time and/or reduce vehicle warranty costs



## Actionable Consumer Insight

**Extend existing customer insights**  
by incorporating additional internal & external data sources



## Underpinned by security considerations & data warehouse optimization

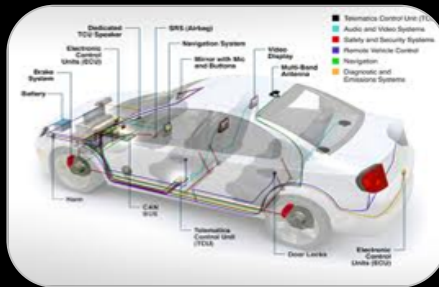
Integrate big data and data warehouse capabilities to increase operational efficiency  
Ensure suitable security, especially for connected vehicle use case

# ... and is deployed in different configurations, effecting how the vehicle is personalized



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## Built In



- *Emergency assistance eCall - bCall*
- *Vehicles health reporting*
- *Security and safety*
- *Battery management*
- *Automotive eCommerce*

## Beamed In



- *Weather*
- *Traffic management*
- *Points of interest*
- *Business listings*
- *Radio*

## Brought In



- *Driving routes / navigation*
- *Music and video*
- *Calendar*
- *Social Media*
- *E-mail and SMS*
- *Social media / internet*

Hybrid models are emerging that require integration points...

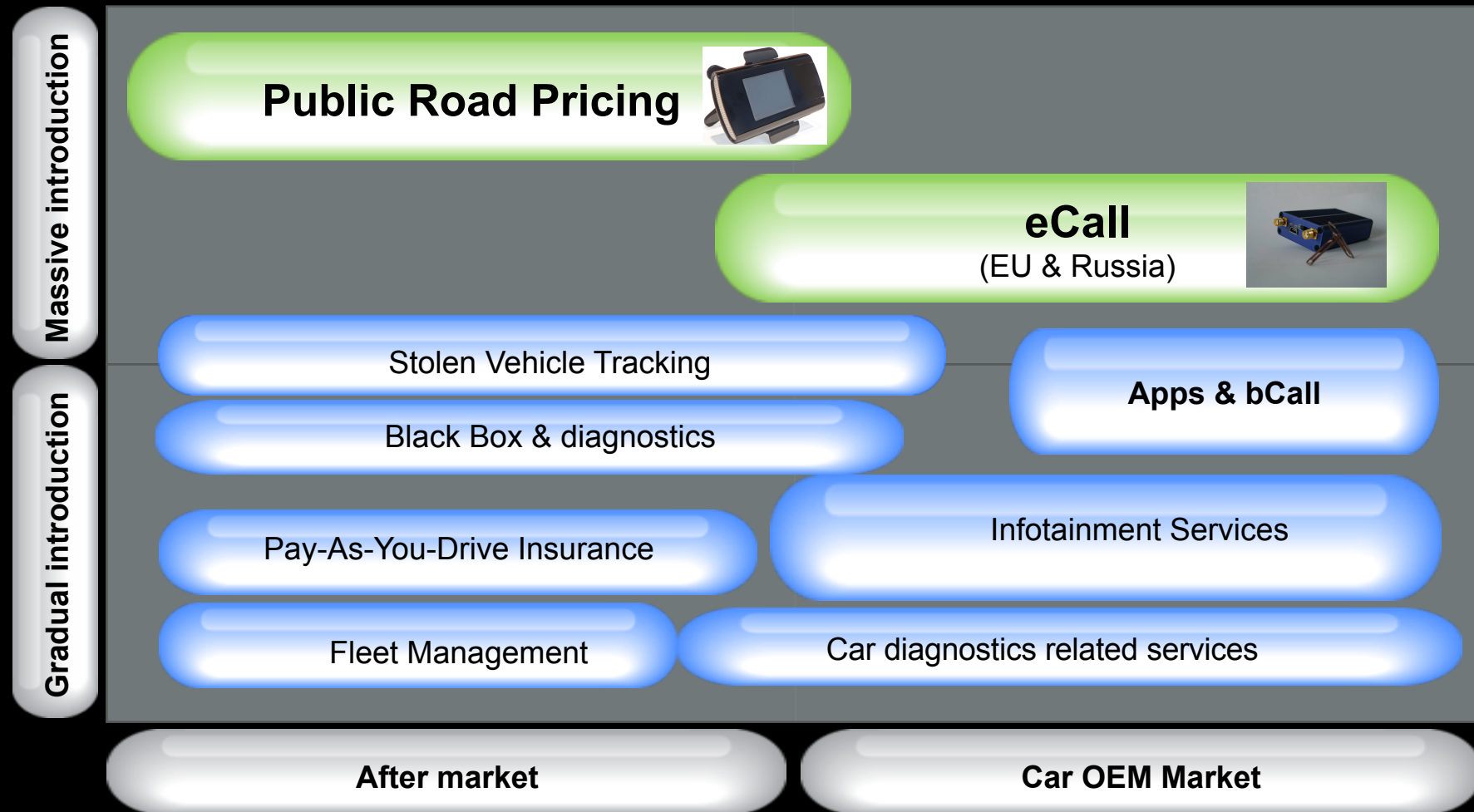


...depending on what the application is best suited for



# Government enabled markets kick-starts profitable GPS Value Added Services for Automotive

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## Using your Connected Car:



- In-Car data used to warn **drivers** and **governments** about dangerous road conditions;

- Potholes, slippery roads, car accidents, Traffic jams and prevent car failures.

- The Dutch Department of Transport (RWS) integrates in Traffic Management Centers (TMC's) to:

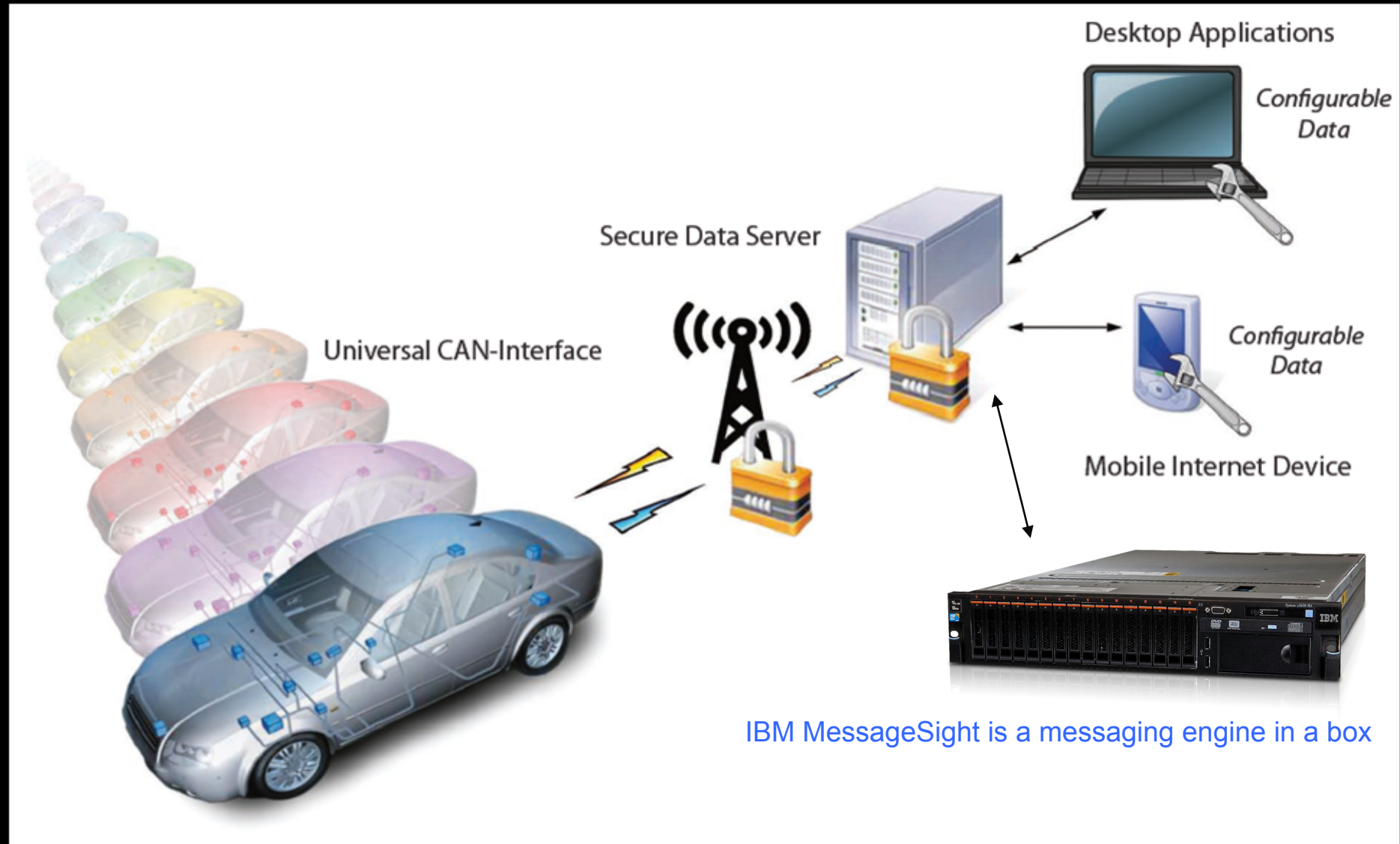
- make roads safer,
  - do proactive road repairs, and
  - optimise the road network based on free flow car data





# We Connect the Car

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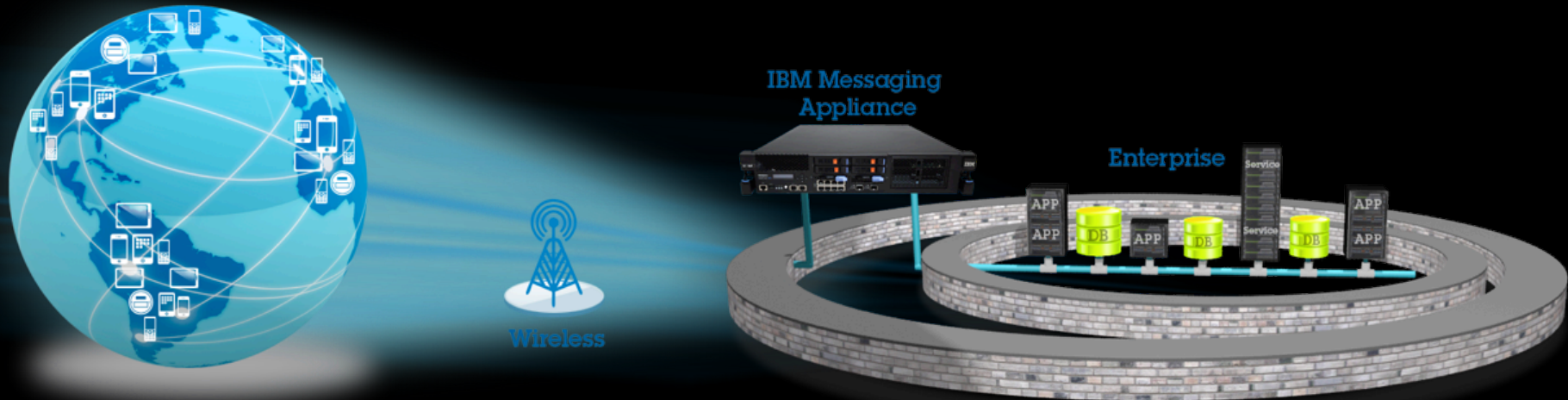


# IBM MessageSight appliance for MobileFirst & M2M

Building a smarter planet: smarter transportation



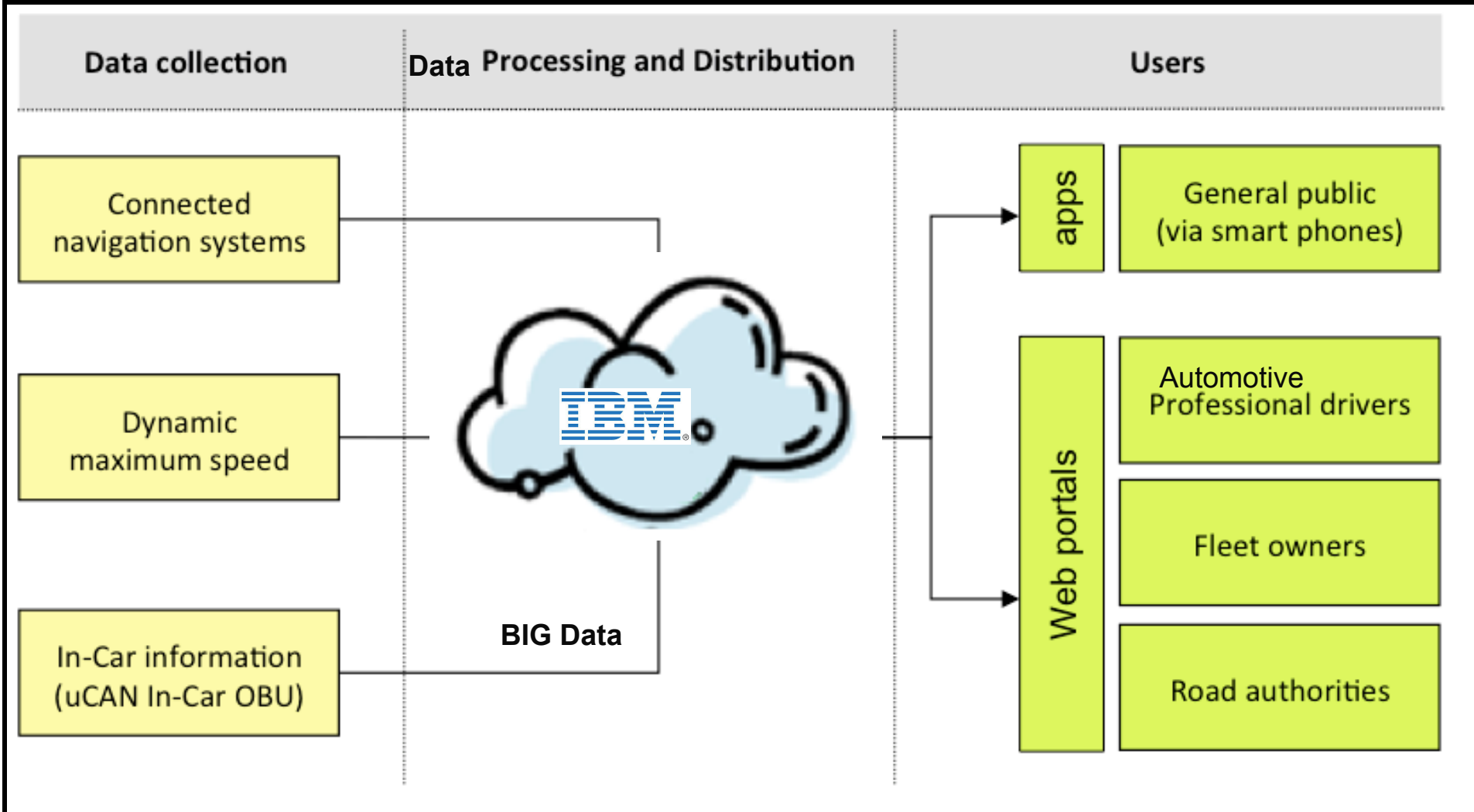
- **Simplifies “Internet of things”, connected car, and mobile**
  - Designed for millions things, millions of events, very dense, very green technology
- **m2m engineered for wireless**, with low latency, reliable delivery and quality of service
- **93x faster, 10x less battery, 8x lower bandwidth** versus HTTPS
  - 1 rack does 273M messages/sec, 21M concurrent connections (like 1,000 web servers)
- **IBM colleague : Lattanzio Coletti, will go into details in TS3 tomorrow**





# Real time in-car data delivers valuable information

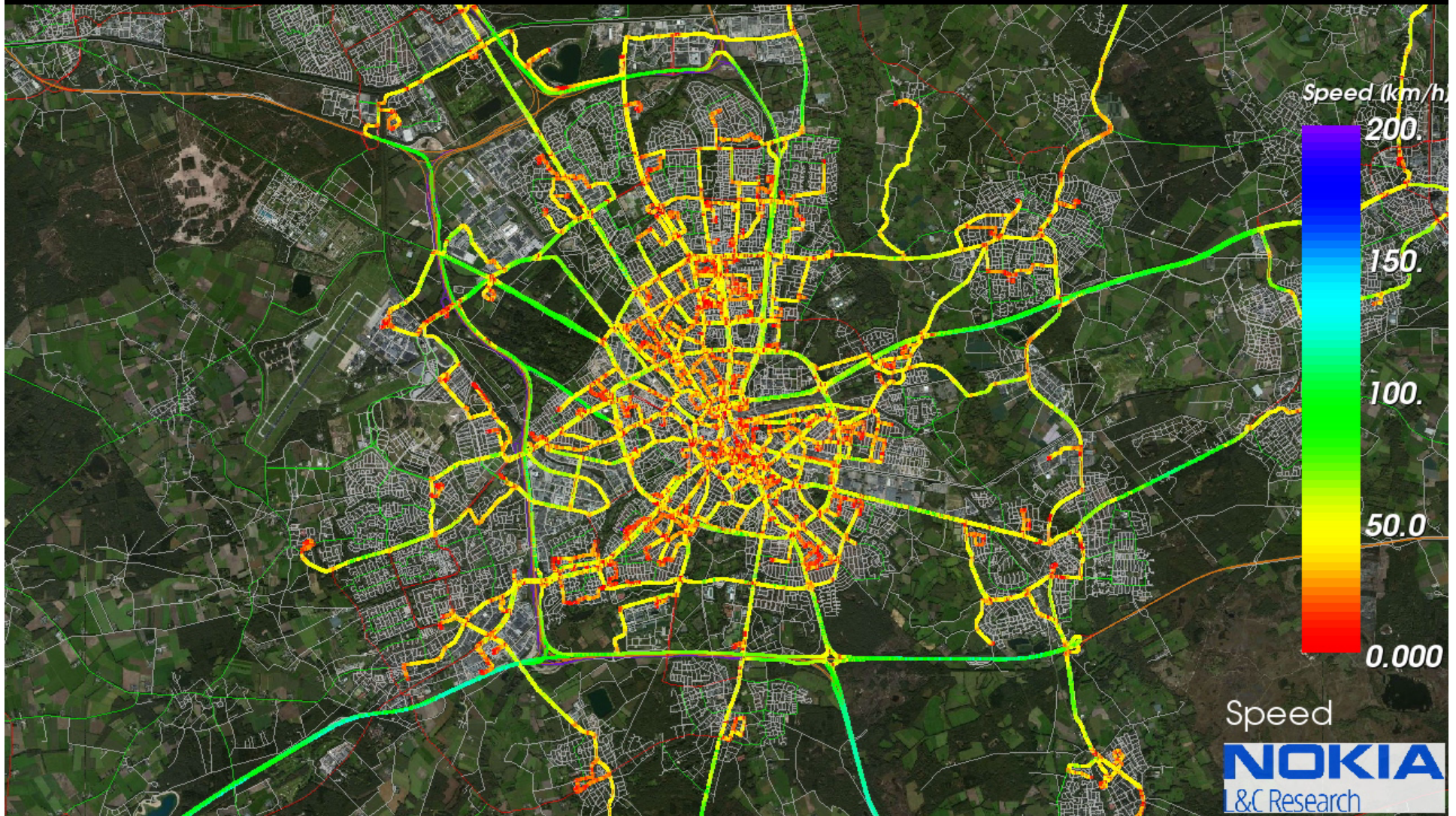
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# Speed real time

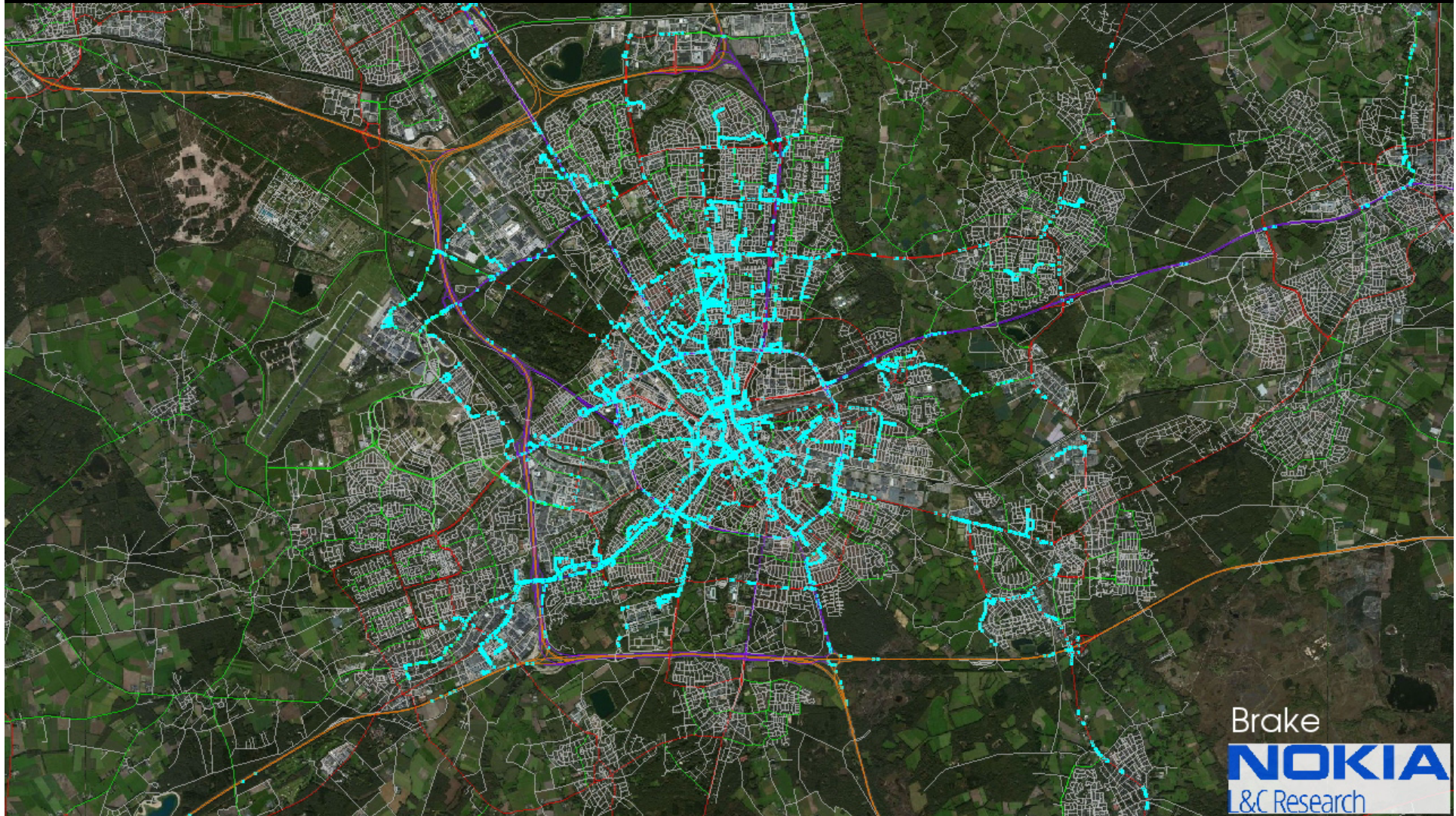
Building a smarter planet: smarter transportation





# Braking real time

Building a smarter planet: smarter transportation



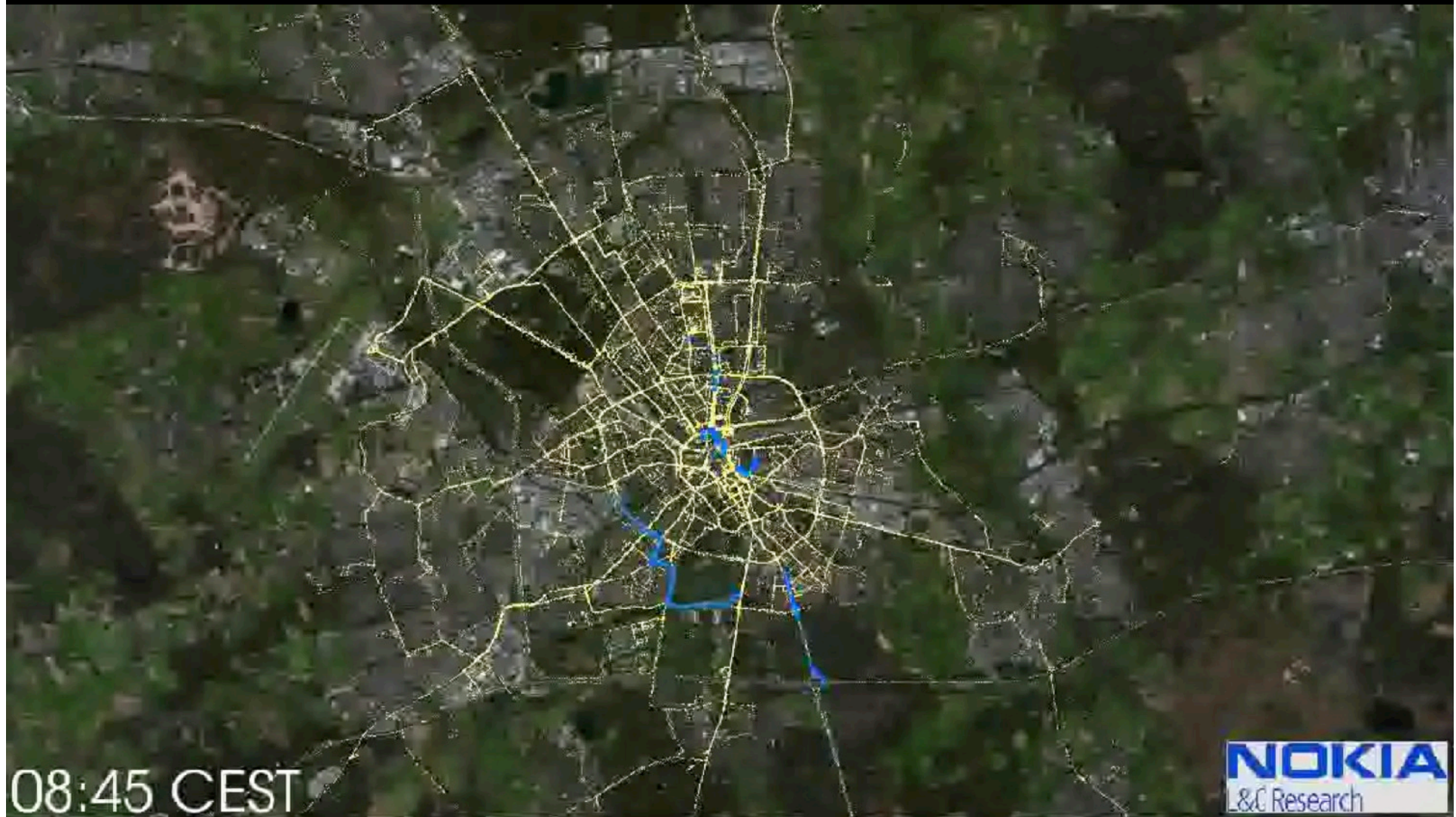
Brake  
**NOKIA**  
&C Research



# Snow and Ice rain real time – November 25 2012, 08:45

IBM

Building a smarter planet: smarter transportation





# Snow and Ice rain real time – November 25 2012, 09:15

IBM

Building a smarter planet: smarter transportation

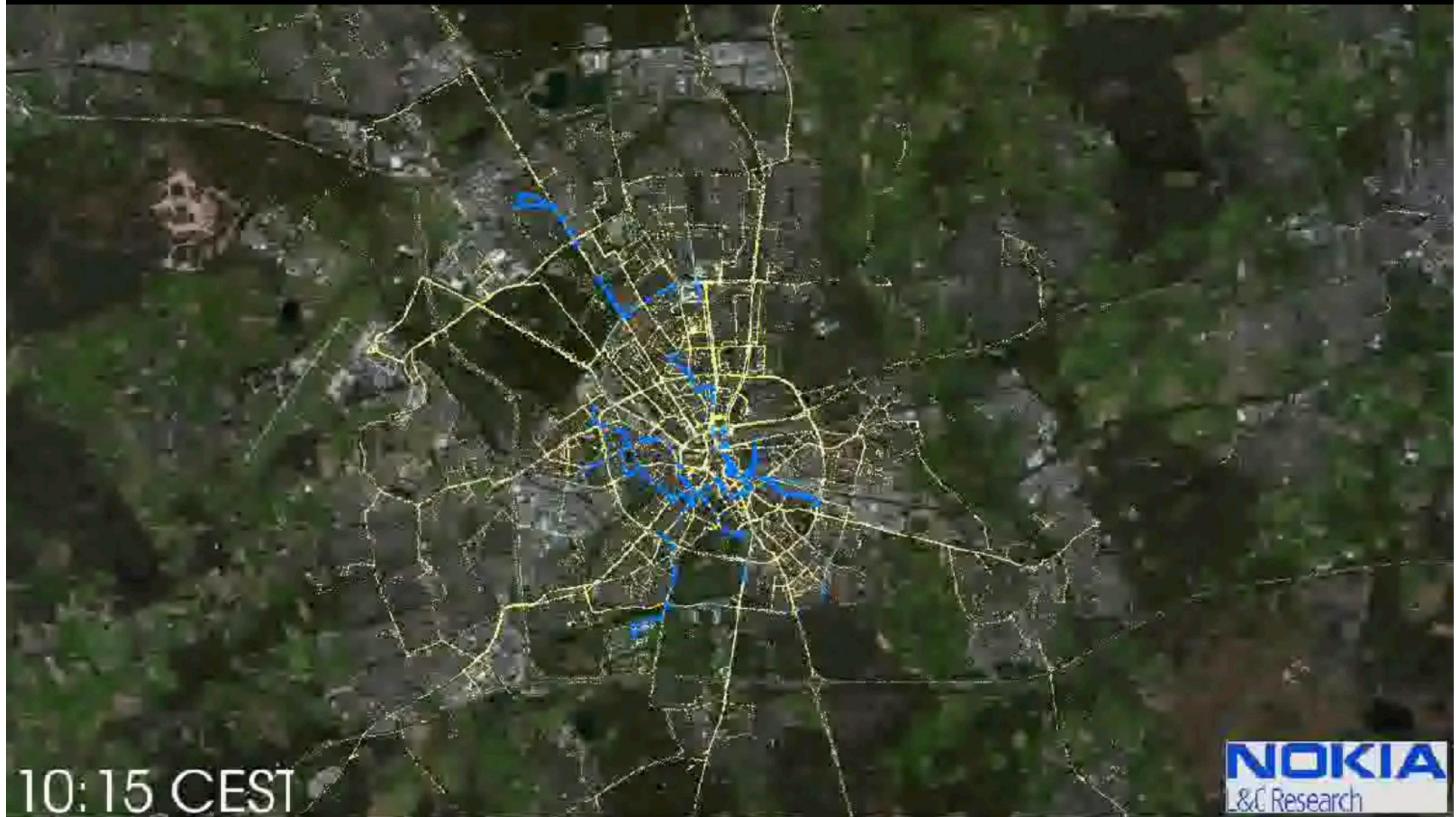




# Snow and Ice rain real time – November 25 2012, 10:15

IBM

Building a smarter planet: smarter transportation

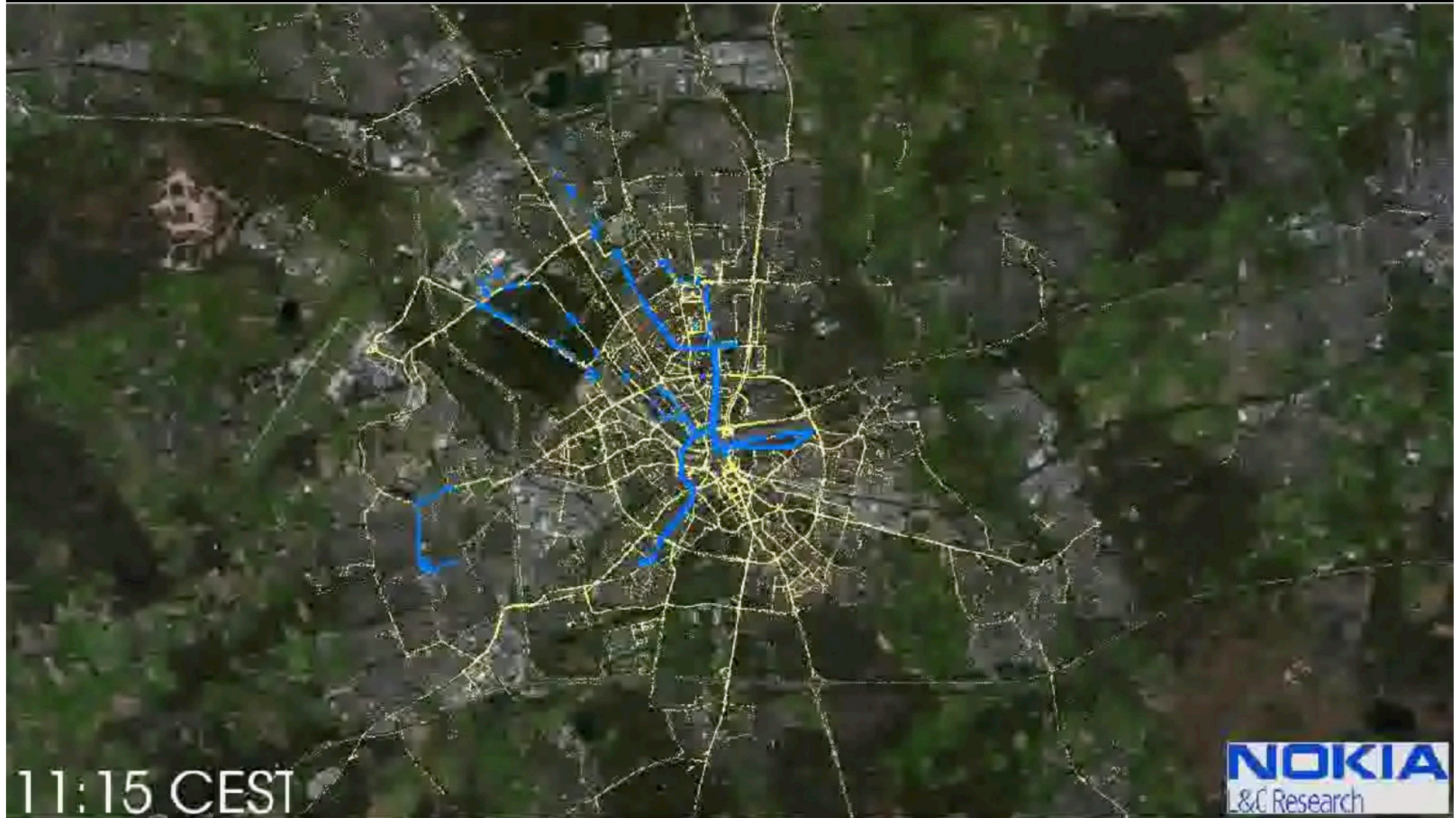




# Snow and Ice rain real time – November 25 2012, 11:15

IBM

Building a smarter planet: smarter transportation





# Snow and Ice rain real time – November 25 2012, 12:00

Building a smarter planet: smarter transportation

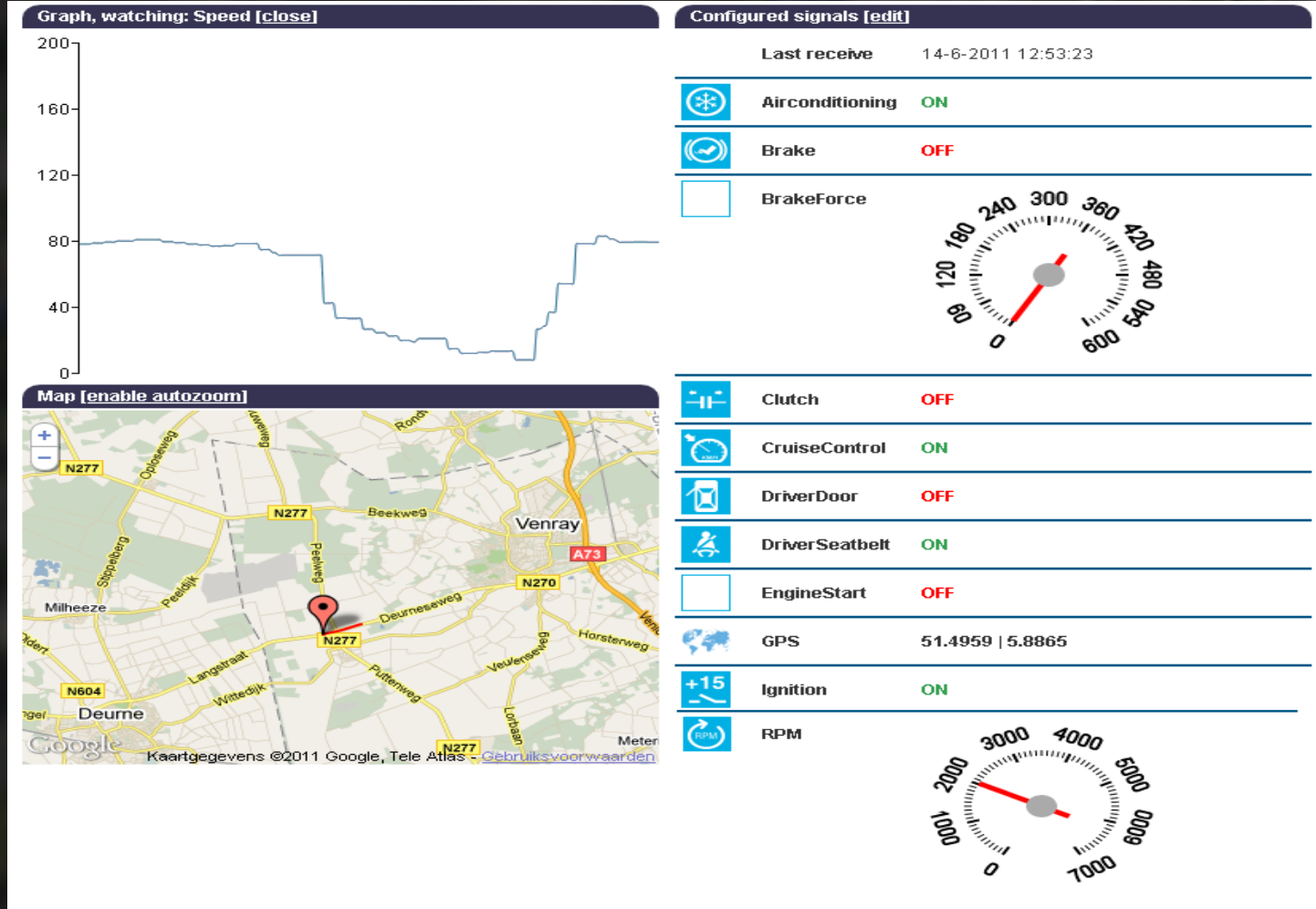


**Heavy Snow / Rain**





# SMART-In-Car : real time car generated data



# IBM Intelligent Transportation solution (IIT™) :

connects & displays all sensor Data

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## IBM Intelligent Transportation solution

### IBM Intelligent Transport (IIT™)

#### Analytics

Predictive Systems

Modeling & Simulation

City Archives



Event Rules



Semantic Models



Workflows

Service Bus

#### Visualization

Dashboards

Alerts

Reports/  
Analysis/  
KPI's

sensors to life

Partner & other products

- Open Standards based (Interfaces)
- Component based architecture
- Open Data Integration
- Cross-Agency/domain Collaboration
- Domain & Cross Domain Analytics
- Visualization





## Continental and IBM sign connected-car alliance

The automotive supplier's technology is moving toward "highly automated driving," with IBM servers processing real-time vehicle data so cars can anticipate detailed driving conditions.

By [Stephen Shankland](#)



September 10,

A Continental car antenna including integrated electronics for mobile network data transfer.

(Credit: Continental)

IBM and auto supplier [Continental announced](#) an alliance designed to let carmakers link their vehicles to the network and therefore offer new services to customers. Under the deal, IBM will supply back-end computing infrastructure that can process an immense volume of data streaming in from many [cars](#), then process it so cars can know details about what's just ahead in real time, the companies announced Tuesday at the Frankfurt auto show.

"Anticipatory driving will be enhanced by Continental and IBM to develop a next generation 'electronic horizon' platform, which will ultimately make highly automated driving a reality," Continental said in a statement.



# FORBES: IBM And Sprint Team Up On Smarter Connected Cars That Send Data When The Engine's Off

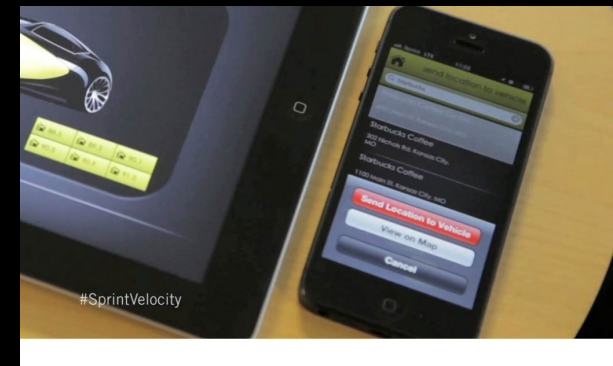
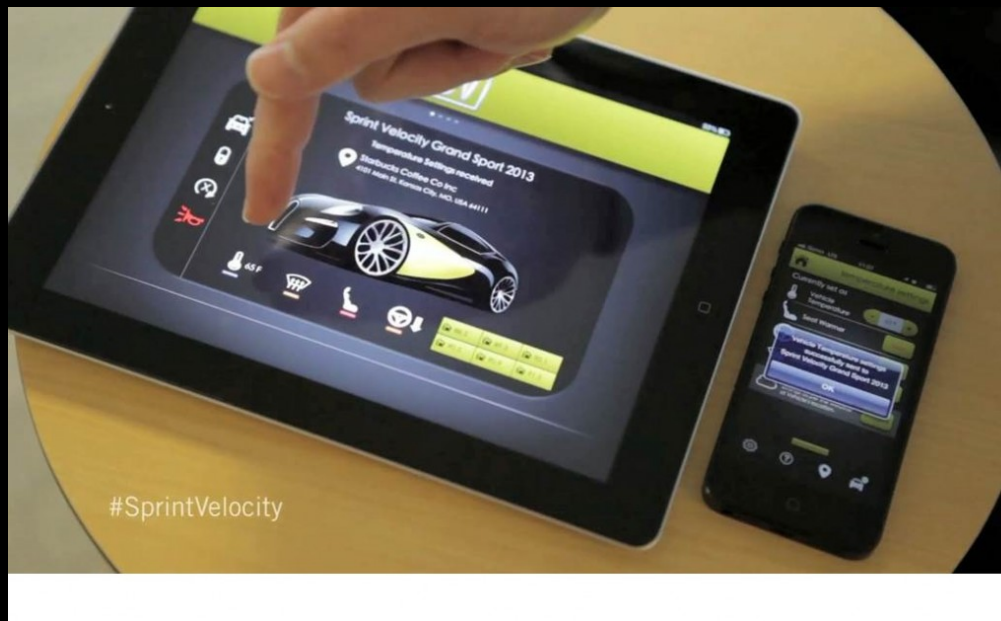
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Sending a location to your car via **Sprint Velocity (Credit: Sprint)**

If you're lucky enough to drive a new luxury car, you're probably used to the idea of the car connecting to your iPhone to play music and of web-connected dashboards that can offer you maps and weather. But that's just the beginning for connected cars that will continue to get more comfortable and safer in the next several years.

Practically every automaker, wireless carrier and tech player is looking to get into the connected car space, says Roger Lancot at Strategy Analytics. The GSMA, a large mobile operator organization, has predicted that **35 million cars will be sold by 2018 with embedded mobile connectivity, representing a \$50 billion market.**





# Rumors going further ...



Building a smarter planet: smarter transportation

(Reuters) - **German automotive parts maker Continental AG is close to agreeing alliances with Google and IBM to develop autonomous driving systems for cars, a German newspaper reported.**

Daily Frankfurter Allgemeine Zeitung cited unspecified sources as saying Continental aims to unveil the two pacts at the Frankfurt Car Show in September.

Continental is already in an alliance with U.S. network equipment maker Cisco Systems to work on systems for automated and driverless automobiles and on data transfer between cars.

A Continental spokesman declined to comment. Spokespeople for Google and IBM in Germany were not immediately available for comment.

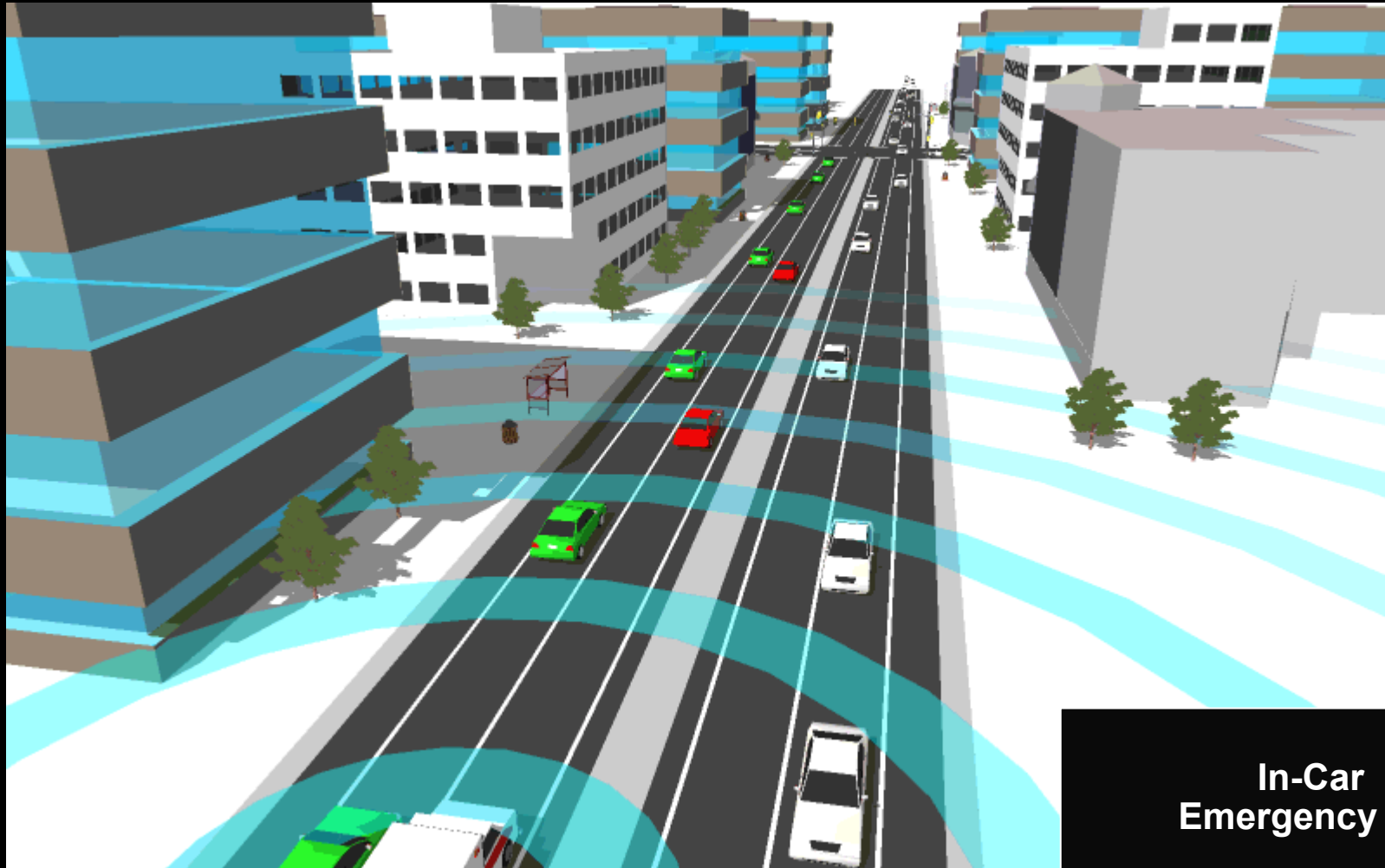
**Systems have been made by various car manufacturers. An overview:**

- [Hyundai Blue Link](#)
- [Kia UVO eServices](#)
- Toyota Entune
- Toyota Monet
- Toyota G-Book and G-Book Mx
- Lexus Enform
- Chrysler UConnect
- Ford SYNC
- Ford Myford Touch
- Audi MMI
- BMW Connected
- MINI Connected
- Tesla (Full web browser in dashboard)
- Volvo Volvo On Call (e-call, b-call plus app handling of the car)
- Volvo Sensus Connected Touch, Spotify, iGo Navigation, webbrowser, Wifi
- And others

In order to ensure System of each individual car manufacturer can cooperate with each other, the European Union has started the [Cooperative Vehicle Infrastructure Systems](#) (CVIS) project.

# C2X – Emergency vehicle warning

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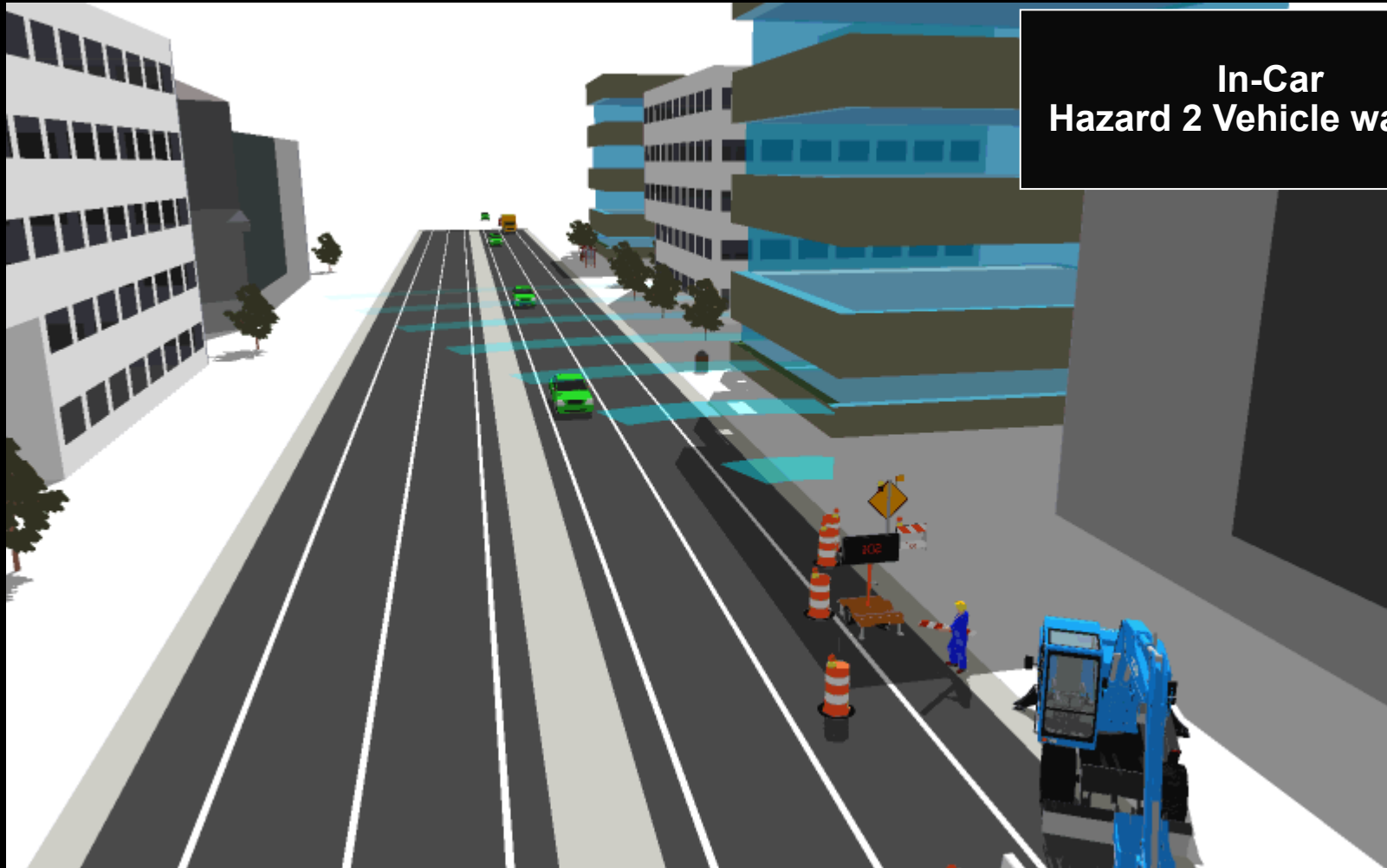


**In-Car  
Emergency car**



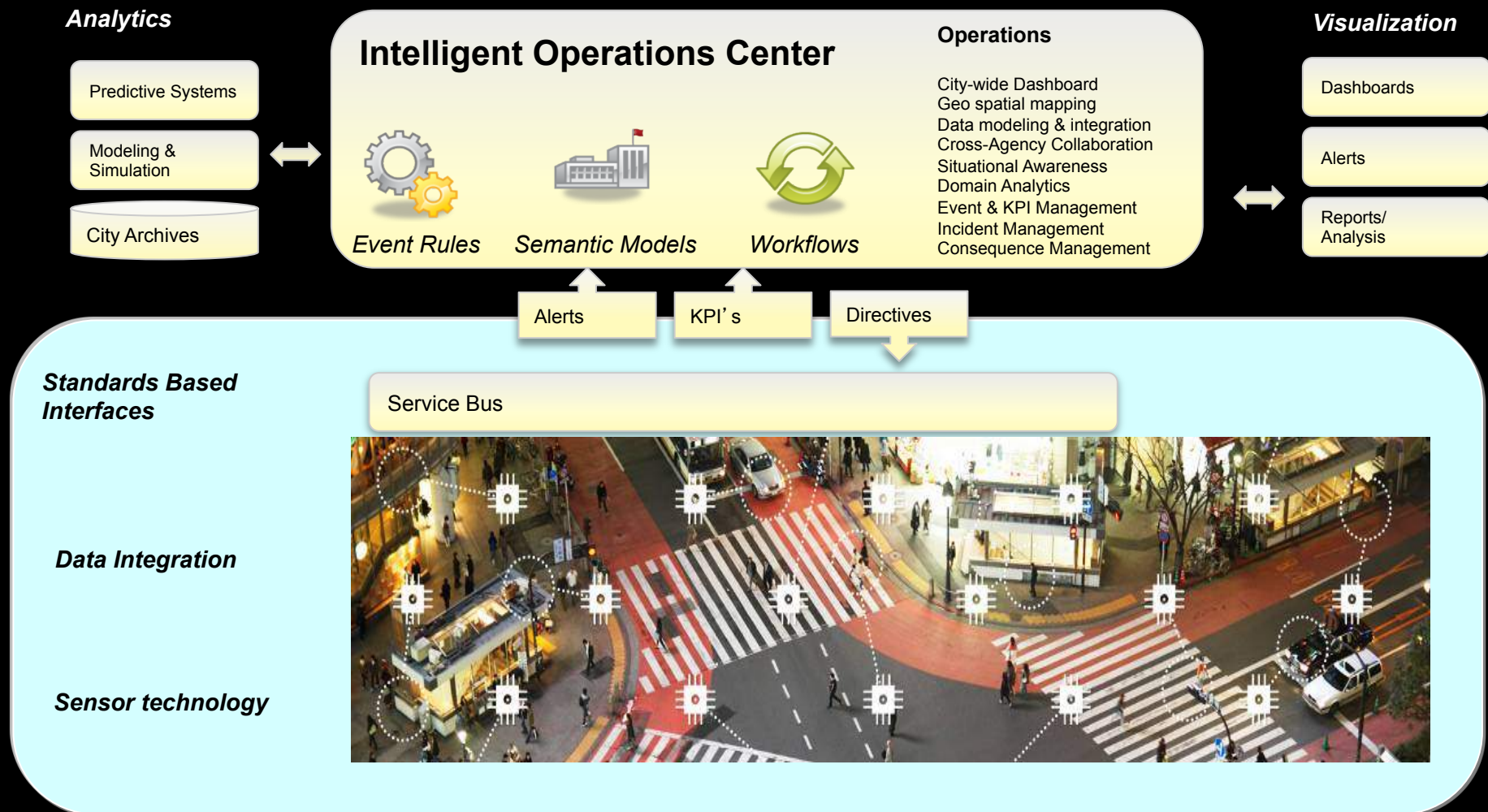
# C2X – Hazard warning

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**In-Car  
Hazard 2 Vehicle warning**

# IBM Intelligent Transportation Center using sensor information





# Social media Intelligent Transportation - How It works

Key Process Indicators are monitored and managed to trigger actions

*Example: Real time monitoring of a bus environment*



	Acceptable	Caution	Critical
1st Responders	Fire	Police	Search and rescue
Environment	Coastal	Pollution	Weather
Public Safety	Crime	Low Events	Infrastructure Failure
Transport	Air / Sea ports	Rail	Roads / Traffic
Utilities	Energy	Fuel	Municipal Water
Water	Flood Met.	Supply	

	Acceptable	Caution	Take Action
PUBLIC SAFETY	ECONOMIC DEV	SERVICES	PUBLIC SCHOOLS
TRANSPORTATION	AIRPORTS	MANAGEMENT	ROADS/TRAFFIC
WATER	FLOOD CONTROL	MANAGEMENT	FIRE
BUILDINGS	EFFICIENCY	PUBLIC BUILDINGS	PUBLIC HOUSING
ENERGY	DISRUPTIONS	MAINTENANCE	SUSTAINABILITY
GOVERNMENT	ECONOMIC DEV	QUALITY	PUBLIC SCHOOLS

**Observational**

	Acceptable	Caution	Take Action
PUBLIC SAFETY	ECONOMIC DEV	SERVICES	PUBLIC SCHOOLS
TRANSPORTATION	AIRPORTS	MANAGEMENT	ROADS/TRAFFIC
WATER	FLOOD CONTROL	MANAGEMENT	QUALITY
BUILDINGS	EFFICIENCY	PUBLIC BUILDINGS	PUBLIC HOUSING
ENERGY	DISRUPTIONS	MAINTENANCE	SUSTAINABILITY
GOVERNMENT	ECONOMIC DEV	SERVICES	PUBLIC SCHOOLS

**Sentiment**



TECHNOLOGY

DISCOVER & EXPLORE with smart visualizations



**Business Analytics** enables you to interact and discover new routes to insight

- **Specialized views**
- **Recommendations and guided analysis**
- **Analysis of raw sources of big data**

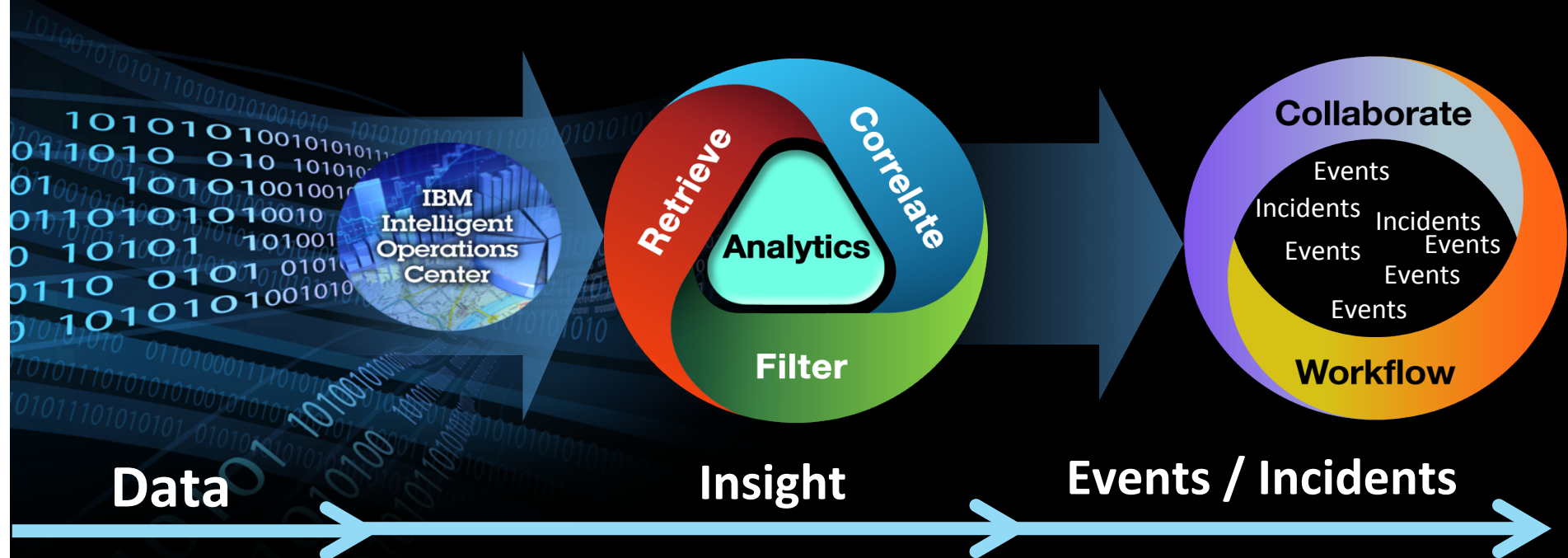


# IBM Intelligent Operations Center for Smarter Transport

*Based on 2400 engagements with municipalities...*



Collecting & analyzing data, while automating a collaborative response



One platform, many use cases:



**Transportation**



**Public safety**



**Water**



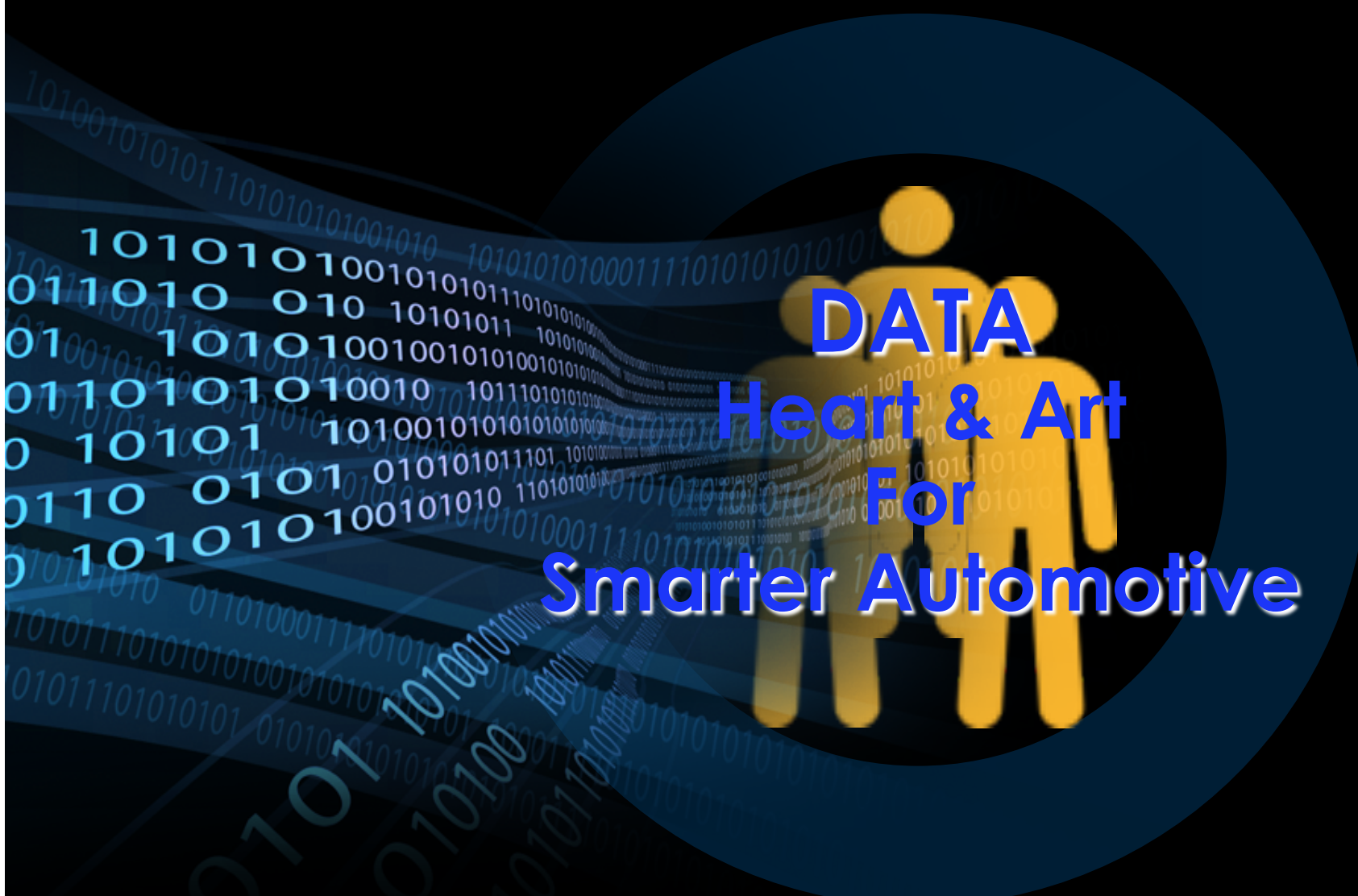
**Health &  
Social welfare**



**Energy & buildings**



**Stadiums, Airports**



# DATA Heart & Art For Smarter Automotive





**THANK YOU !**