



IBM Smarter Cities



Miroslav Iwachow
IBM Česká republika



Urban Systems

Fire fighters visibility to traffic and building plans helps mitigate losses in fire accidents

Smarter Transportation helps optimizing energy consumption

Lower crime increases use of public transit system

Easing traffic congestion improves emergency response

Optimizing land use decisions can help better locate schools, bus stops & community facilities

Improving water, waste and logistics systems improves the environment

Improved public health increases early years school attendance

Higher adoption of public transit helps improve air quality

Smarter Transportation
A 'system-of-systems'

Urban Systems

Smarter Cities initiatives produce significant economic results

Healthcare



City of Bolzano used remote monitoring of patients and saved 30% in assistance & care services

Transportation



Stockholm's congestion charge: 15% reduction in CO2 emissions \$92m annual gain in revenue

Public Safety



UK Ministry of Justice improve violent crime recidivism prediction by 10% using predictive analytics

Education



Hamilton County, Tennessee reduced annual student dropout rate by 25% using predictive analytics

Water



Miami-Dade County Parks and Recreation saves \$1m annually with proactive leak detection

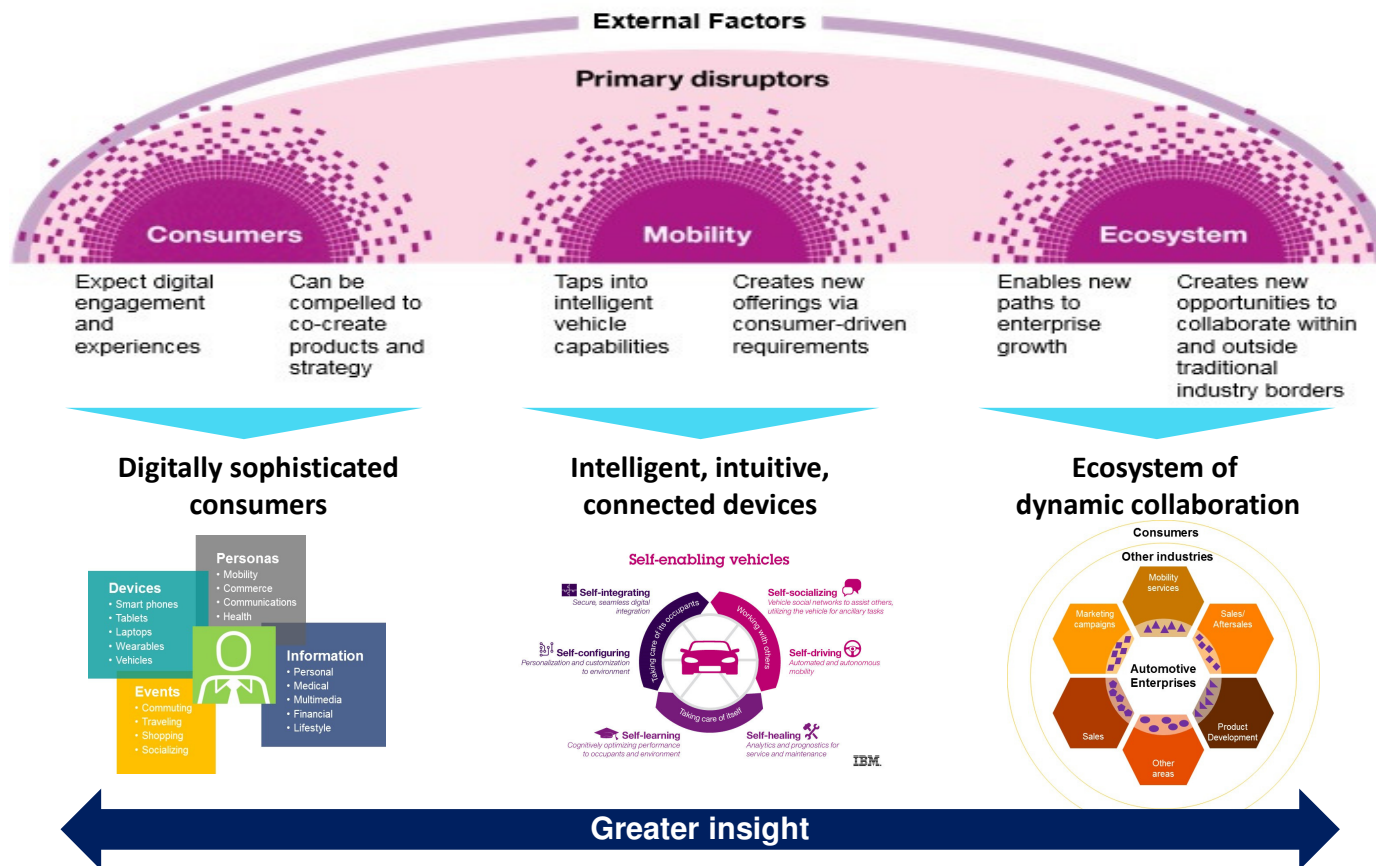
Energy



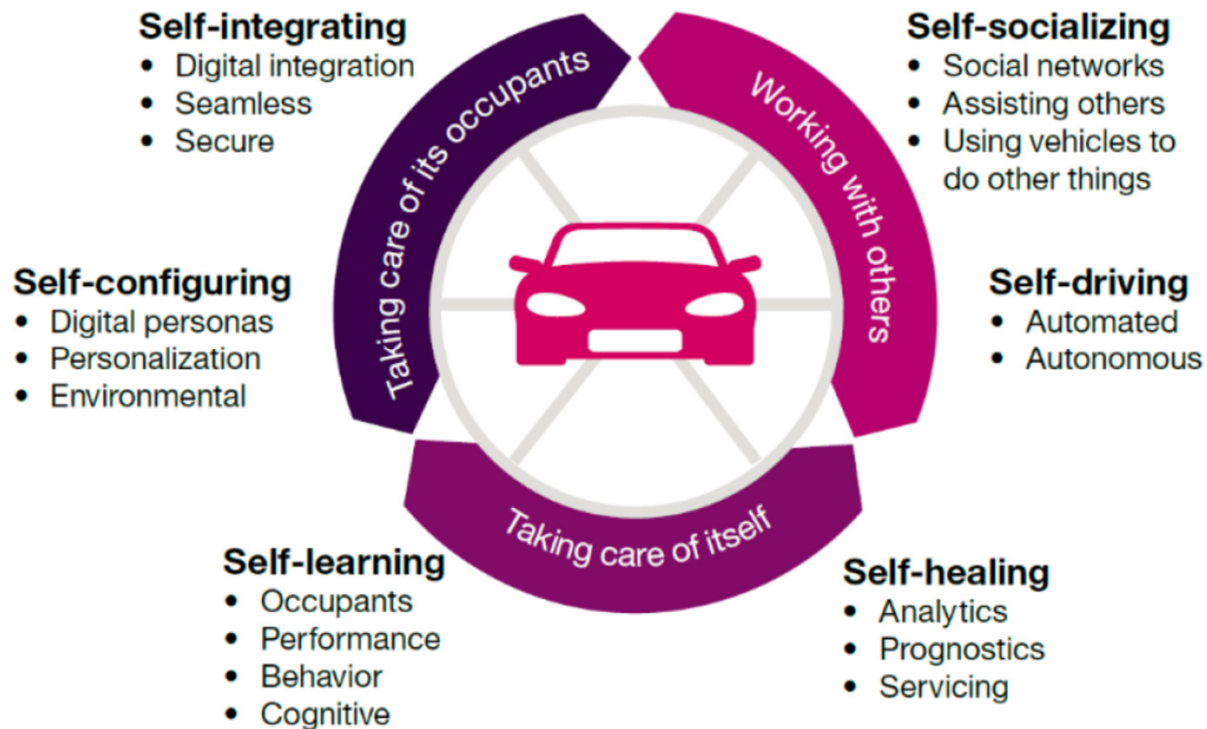
Malta's integrated energy & water systems transformed the consumer relationship. Water consumption reduced 15% and energy by 25%



New industry forces are being shaped from the disruption caused by consumers, mobility and the changing ecosystem



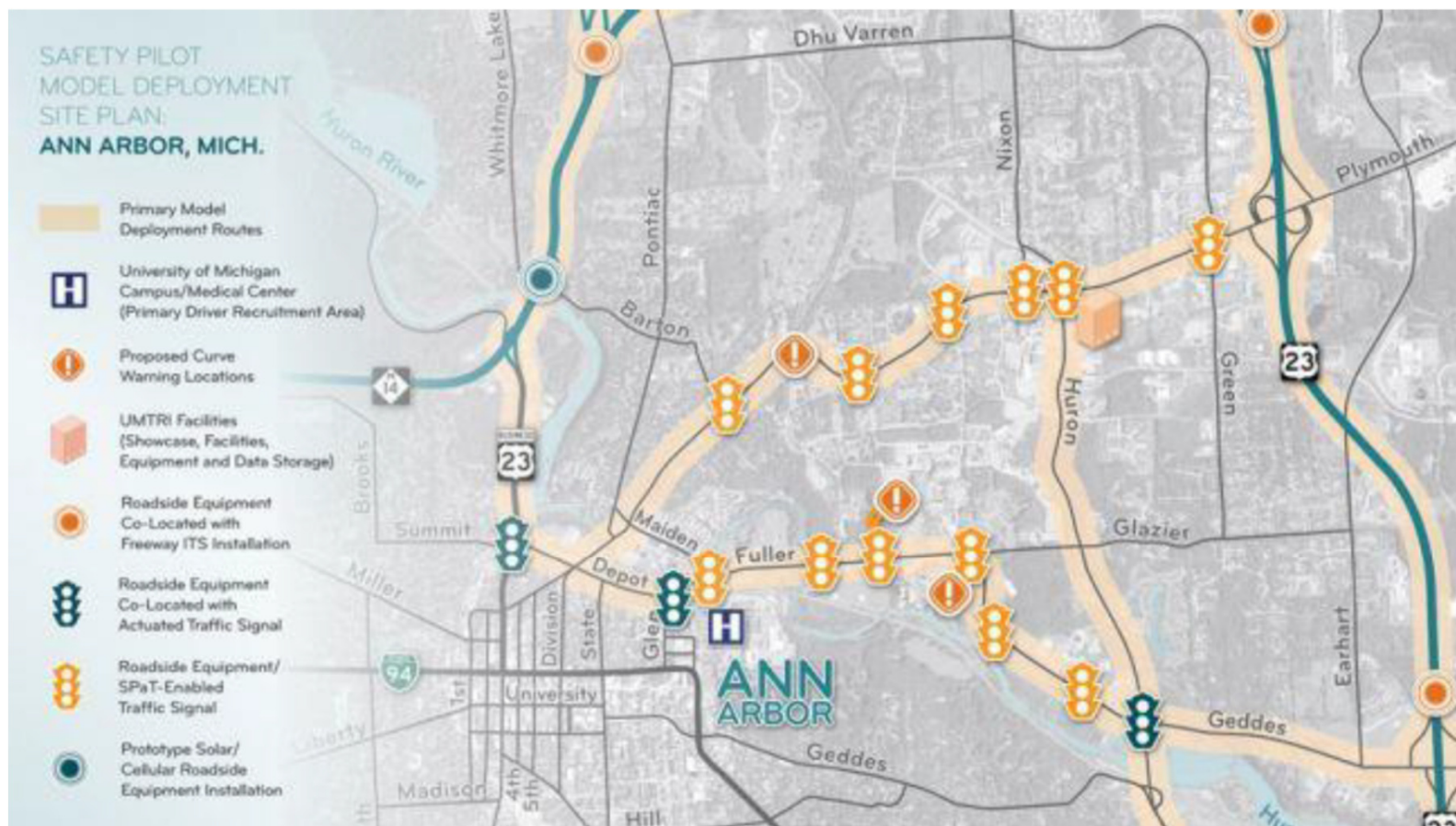
Cars are getting smarter and Interconnected. What about Cities?



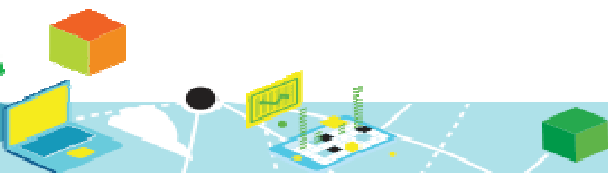
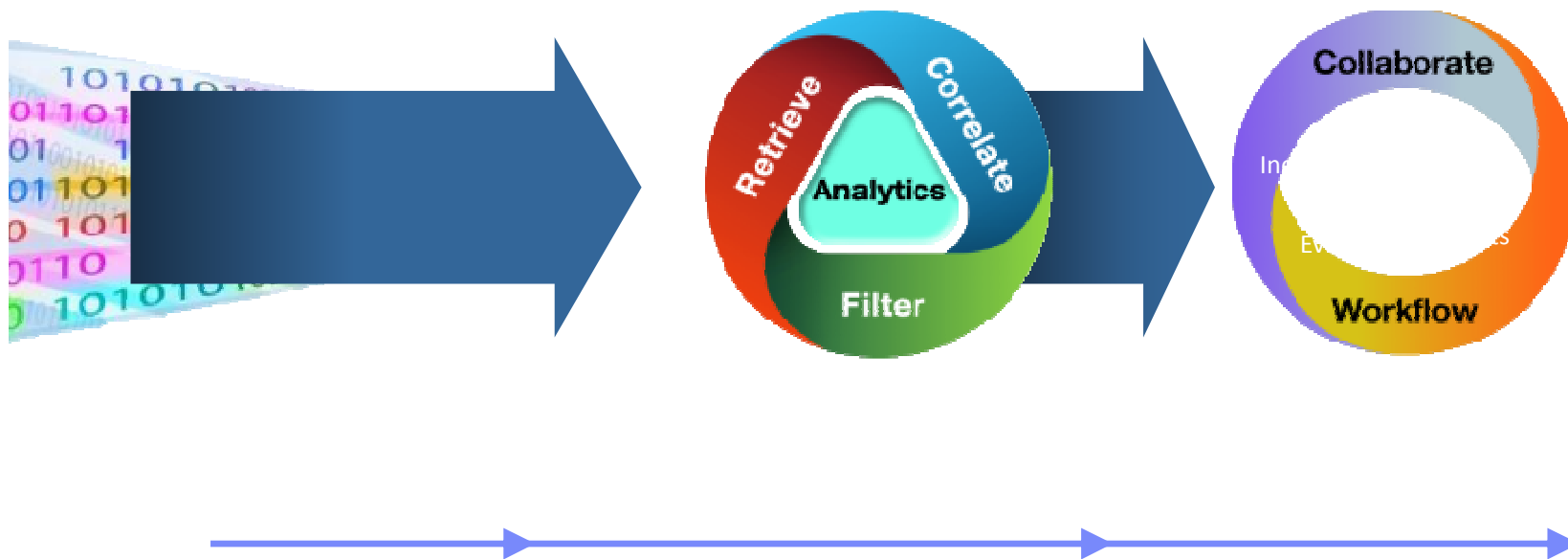
Dedicated Short-Range Communications (DSRC)-enabled vehicle-to-external-communications systems (V2X)



Vehicle-to-Vehicle (V2V)



Being Smarter means turning DATA into INSIGHTS
- which drives timely ACTIONS



Singaporeans benefit from experiences and innovations of the many thousands of IBM Smarter Cities engagements

- **Sensing transportation systems**
- Open data and collaboration
- Insight-driven government
- Citizen engagement
- Cleaner environment
- Secure and safe nation
- Remote healthcare services



City of Cologne, Germany creates actionable insight from the traffic monitoring data

10%

reduction in traffic congestion

Predict traffic patterns

up to an hour in the future, enabling the city to respond to anticipated congestion

Improves

traveler satisfaction by providing a more predictable journey

Solution Components

- IBM® Global Services – Global Business Services*
- IBM Research Traffic Prediction Tool
- IBM Intelligent Operations Center for Smarter Cities
- IBM Intelligent Transportation
- IBM Software Group – IBM Software Services



Business Challenge: The City of Cologne, Germany wanted to find a solution that would help address its ongoing traffic congestion before it occurs, enabling it to take concrete action to improve traffic flow, alert and reroute drivers, and even avoid traffic tie-ups altogether.

The Smarter Solution: The City of Cologne piloted a traffic prediction tool that uses historical and near-real-time road-sensor data and a powerful First-of-a-Kind algorithm to project and predict traffic patterns up to 60 minutes out. Knowing when and where congestion is likely to occur gives transportation planners the ability to take preventive action, such as resetting traffic light timing or modifying speed limits on certain roads, to keep traffic moving. The tool not only helps city traffic planners predict near-future traffic patterns, but it also automatically recognizes and warns them of anomalies, such as an early start to rush-hour traffic or unanticipated congestion from an accident.

“Having the ability to create actionable insight from the traffic monitoring data gives us an ability to better manage congestion as well as provide citizens with more precise traffic information. Our Traffic Command Center would be able to optimize current traffic flow while anticipating and planning for potential traffic incidents.” - Thomas Weil, Head of Traffic Management Center, Cologne





Miami Dade uses KPI analyses, geospatial maps and auto alerts to detect, identify and prevent Bus bunching quickly, dramatically improving public transport efficiency.

>USD1 million

estimated savings related to public transport efficiency and bus bunching detection

>95%

reduced waiting time for busses. And detecting bus bunching in minutes

40 minutes

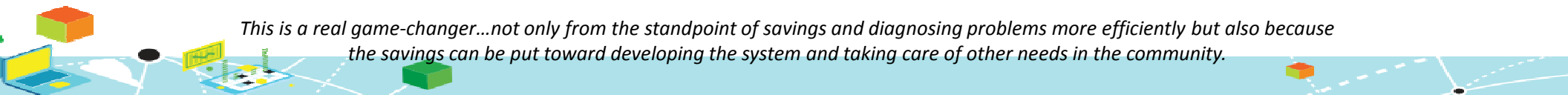
Reduction in total travel time on major bus lines as a result of route and bus bunching analytics.



Business Challenge: The bus system, the third-largest in the United States, was inefficient during peak hours as busses were not staying on their schedule and were clustering together. Citizens had to wait for 44 minutes on a bus that was supposed to arrive every 15 minutes. This was a result of full busses slowing down to take extra passengers while the next bus was empty and therefore catching up with the full bus. Finding the exact location of a bus bunching incident however, and diagnosing the problem was extremely labor-intensive and costly.

The Smarter Solution: The department deployed a solution that tracks and monitors busses. If, when analyzing data against key performance indicators (KPIs), the system detects a delay and slowdown, it issues an alert so that bus operators can quickly warn drivers to slow down and speed up.

This is a real game-changer...not only from the standpoint of savings and diagnosing problems more efficiently but also because the savings can be put toward developing the system and taking care of other needs in the community.



A city in China uses analysis and predictive modeling to help reduce traffic congestion and optimize public transit routes

Aggregates

traffic and transit data providing citywide views of traffic conditions

Analyzes

bus data against KPIs, uncovering scheduling and routing shortfalls

Reveals

areas prone to congestion, facilitating future transit planning

Solution Components

- IBM® Intelligent Operations Center
- IBM SPSS® Modeler
- IBM InfoSphere® DataStage®
- IBM DB2®
- IBM WebSphere® Application Server
- IBM System z®
- IBM China Research Lab
- IBM Business Partner Jiangsu Posts and Telecommunications Planning and Designing Institute Co. Ltd.
- IBM Business Partner Esri
- Government: Intelligent Transportation Systems



Business Challenge: In this large city where buses and taxis are the predominant modes of travel, traffic congestion was becoming a serious problem. Lacking insight into road conditions or the tools to analyze and model traffic patterns, officials struggled to identify areas prone to congestion, optimize bus routes and effectively manage the urban transport system.

The Smarter Solution: The city built an intelligent traffic system that collects, aggregates and analyzes static and near-real-time traffic and transit data, providing a city-wide view of conditions that helps planners predict traffic jams and optimize public transit routes and assets. In addition, transit origin-destination estimation algorithms and traffic key performance indicator (KPI) analysis provide insight into popular travel patterns and passenger bus loads, helping authorities adjust the number of buses in service according to commuter demand.

With the rollout of its intelligent traffic system, the city takes a giant step toward achieving its goal of becoming one of the world's smartest cities.



Rio's City operations agency in Brazil uses Transportation and video analytics to keep people moving during major events

More rapid detection

of transport incidents and security threats through deep rules-based analysis of near-real-time video content

Faster response

with automated, event-driven alerts to proper personnel

Better coordination

of response to traffic incidents and potential security threats through dashboard-enabled collaboration across agencies

Solution Components

- IBM® Intelligent Operations Center
- IBM i2® Analyst's Notebook®
- IBM Video Correlation and Analysis Suite
- IBM System x3550 M4
- IBM Storwize® V7000
- IBM Business Partner Six Automation



Business Challenge: For Brazil's city operations personnel, keeping people safe during major events such as the 2016 Olympics and the World Cup takes more than additional eyes on screens. It takes smarter and more automated monitoring capabilities and the means to analyze and act on traffic incidents and threats in a coordinated fashion.

The Smarter Solution: This consortium of security agencies in Brazil is deploying video analytics tools that uncover potential threats from deep within monitoring footage or from near-real-time streaming and issue automatic alerts. Dashboard tools help the agencies track and address issues collaboratively for an effective and coordinated response.

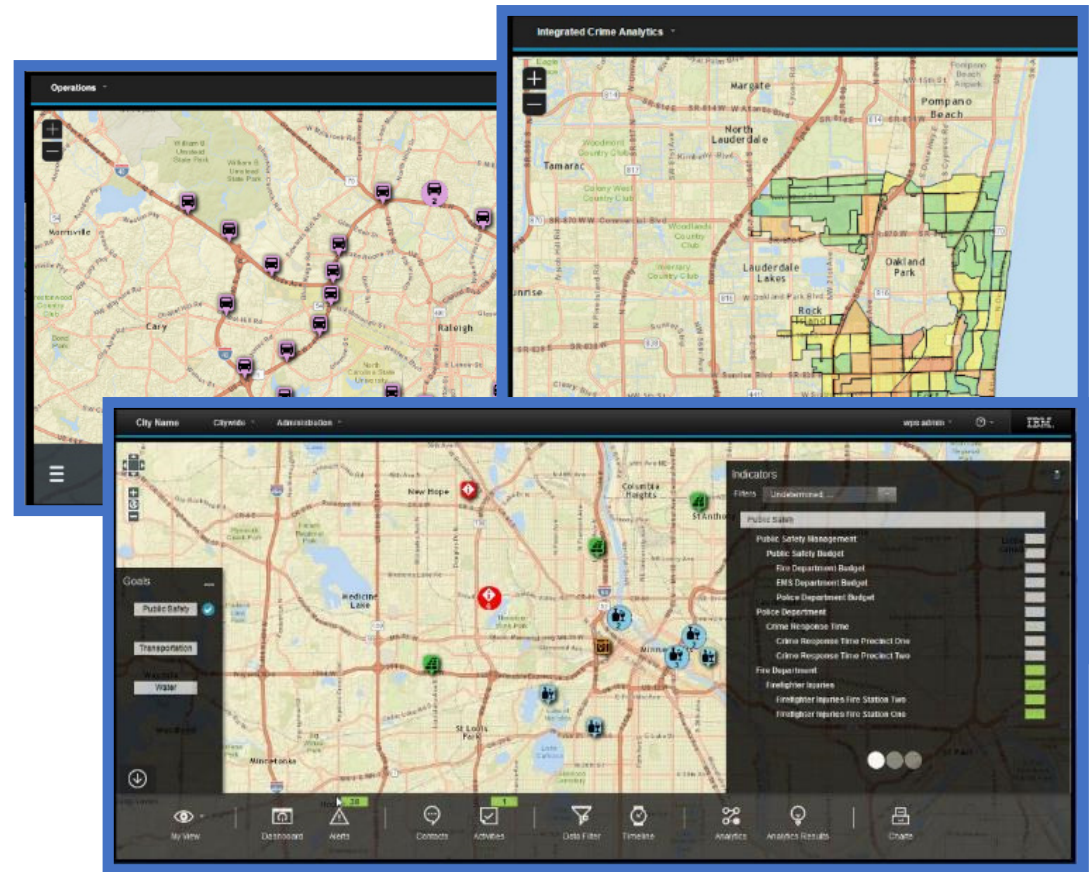
"Video analytics gives our public safety personnel a huge edge in identifying potential security risks; the ability to act on them collaboratively, across agencies, ensures a coordinated and effective response."

—Project manager

Smarter Cities / Intelligent Operations solution

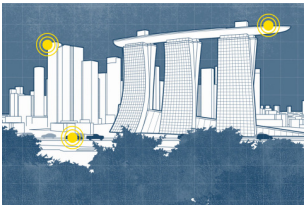
City Manager, Government Leaders, Agency Heads, CIO
-economic vitality, quality of life, system-wide efficiencies

- Intelligent Operations Center
- Intelligent Video Analytics
- Intelligent Transportation



The Journey Towards Smarter Cities

Sensors make
cities aware



Cloud
Computing



Big Data
Analytics



Consumer
Expectations



Mobile
Computing



Digital data

Collect data on
all the variables
that have an
effect on running
a city

Platform

A scalable
platform to store
correlate and
evaluate the data

Insights

Provide insights
and create value
out of the
streams of data

Smoother
operations

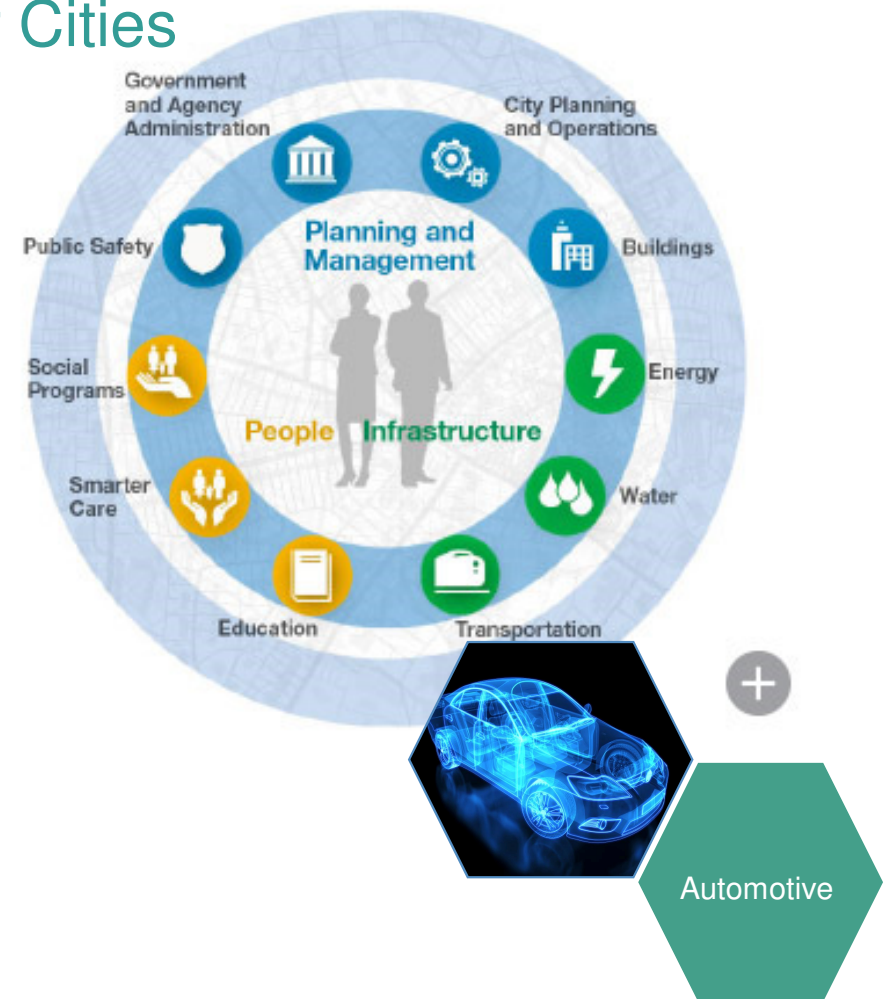
By being
informed citizens
have a better
experience in the
cities

Service to
citizens

Tailored and
immediate
access to
information

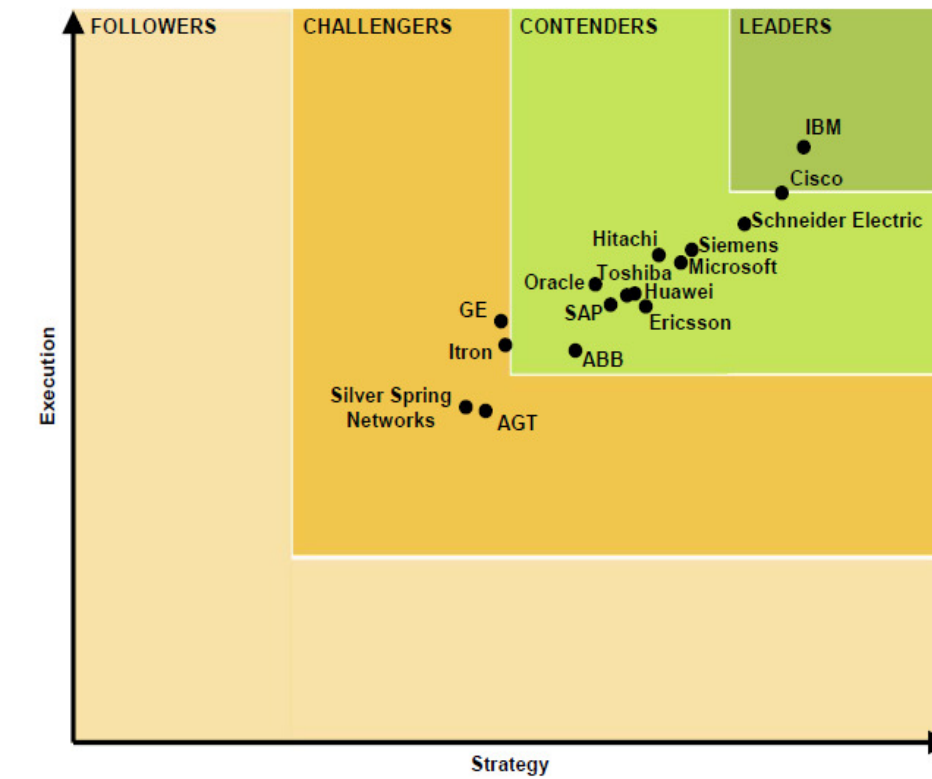


IBM Bluemix as a platform for Smarter Cities



https://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

IBM ranked #1 in the \$8.8B smart city technology market by Navigant Research



(Source: Navigant Research)

<https://www.navigantresearch.com/research/navigant-research-leaderboard-report-smart-city-suppliers>



Bold Leadership Builds Smarter Cities



It takes strong leadership to seamlessly bring together the physical infrastructure, operations and people to make change happen.

Leadership

vision

Commitment

plan

Accountability

results

