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## The Connected Vehicle—A Worldwide Priority

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*The Fully Connected Vehicle:  
International Collaboration Mandatory!*

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# Population Shifts Demand New Solutions

- In 2007 the majority (3.3B) of the world's population (51%) lived in cities
- In 2050, 70% of total population (6.4 B) will live in cities



## Market forces require a smarter approach to transportation.

### DRIVERS OF CHANGE

#### Population explosion

World population is growing and transportation providers will need to expand capacity to keep up.

#### Urbanization

As the number and size of cities grows, pressure on transportation systems to move people and materials between and within those cities grows.

#### Funding gap is Growing

Many important needs with limited financial resources. Gas tax no longer a reliable source of sustained funds

#### Technology

Technology now enables the capture and analysis of real-time information about the status, location and condition of everything.

### CHALLENGES

#### Capacity and congestion

Meet the growing, changing demand efficiently, consistently and profitably

#### Empowered customers

Deliver transportation choices and information in the way that end customers value.

#### Efficient, green operations

Reduce cost and dependency on scarce resources while reducing environmental impact.

#### Safety and security

Unobtrusively reduce exposure to security risks and increase the safety of operations, with less cost and impact on customers.

# What Impact Can Connected Vehicles Make?

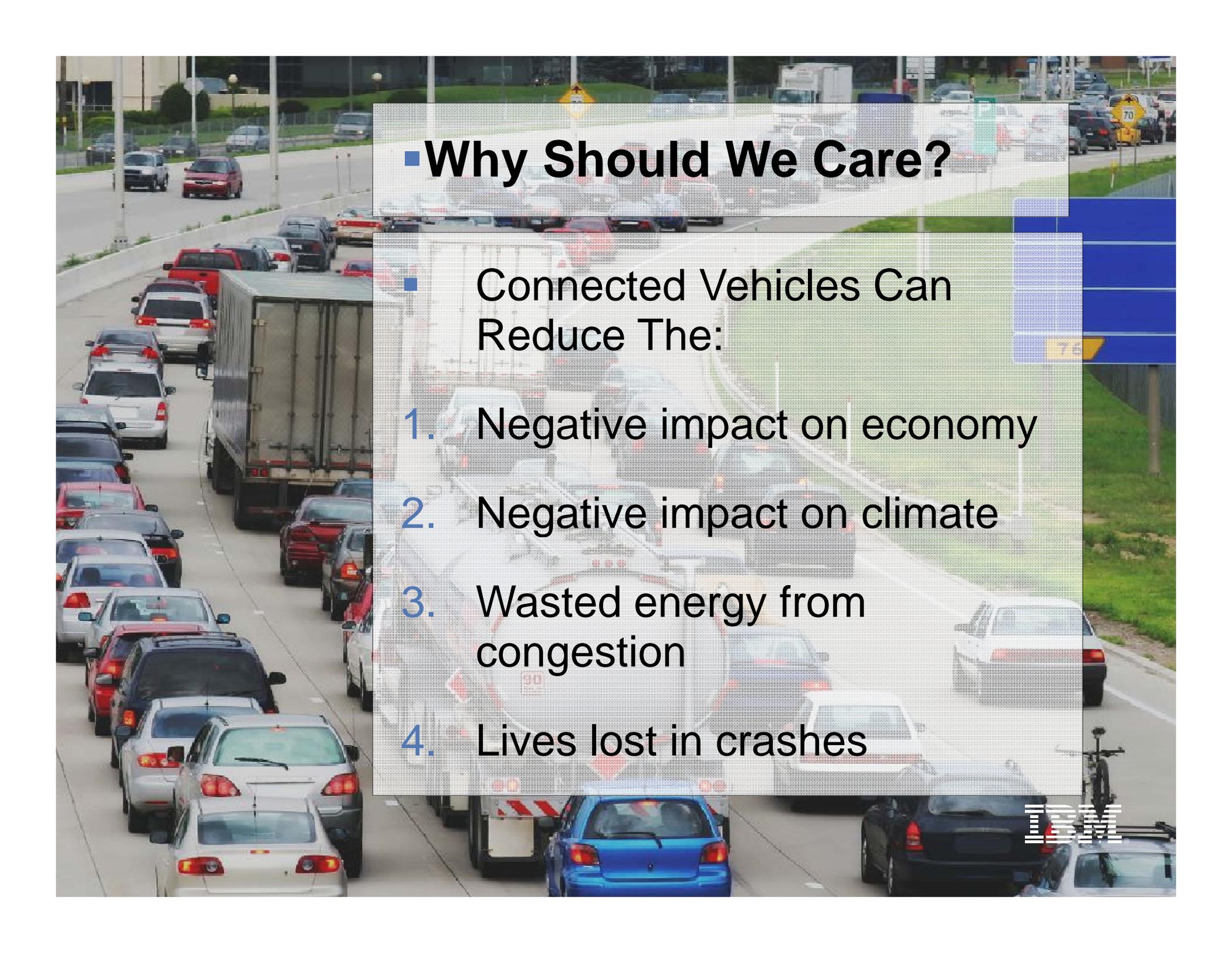


**Predict demand and optimize capacity and assets.**

**Dramatically improve the end-to-end traveler or customer experience.**

**Improve operational efficiency while reducing environmental impact.**

**Assure safety and security.**

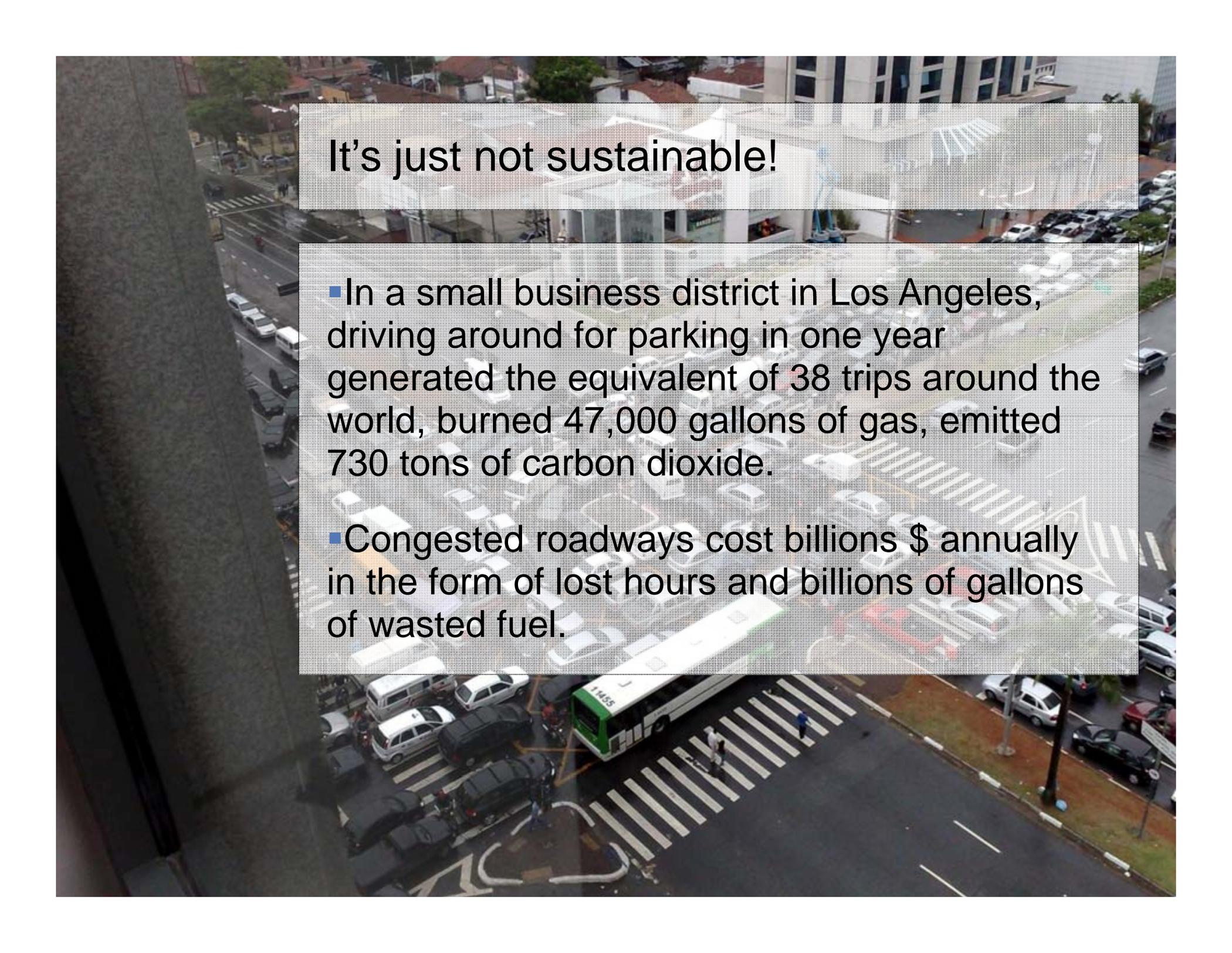


## ■ Why Should We Care?

- Connected Vehicles Can Reduce The:
  1. Negative impact on economy
  2. Negative impact on climate
  3. Wasted energy from congestion
  4. Lives lost in crashes

## Congestion's not just annoying, it's expensive

- The annual Urban Mobility Report from the Texas Transportation Institute, a part of Texas A&M University, found that, despite the slow economy of two years ago, congestion caused 3.7 billion hours of travel delay and 2.3 billion gallons of wasted fuel -- an increase of 79 million hours and 69 million gallons over 2002. The total cost of congestion in the 85 urban areas studied: \$63.1 billion.

An aerial photograph of a busy city street intersection. A white and green bus with the number 14455 is stopped at a crosswalk. Several cars are also stopped at the intersection. The background shows a mix of residential and commercial buildings, including a large multi-story building with a glass facade. The overall scene depicts a congested urban environment.

It's just not sustainable!

- In a small business district in Los Angeles, driving around for parking in one year generated the equivalent of 38 trips around the world, burned 47,000 gallons of gas, emitted 730 tons of carbon dioxide.
- Congested roadways cost billions \$ annually in the form of lost hours and billions of gallons of wasted fuel.

# The Crash Epidemic in the US

Fatal Crashes



43,443  
Fatalities  
(2005)

\*Police-Reported

# How People Die on the US Roadways

## Single Vehicle 20%

- Front 13%
- Side 5%
- Other 2%

*~117/day*

## Single Vehicle Rollover 20%

- Pass Car 10%
- Light Truck 9%
- Heavy Truck 1%

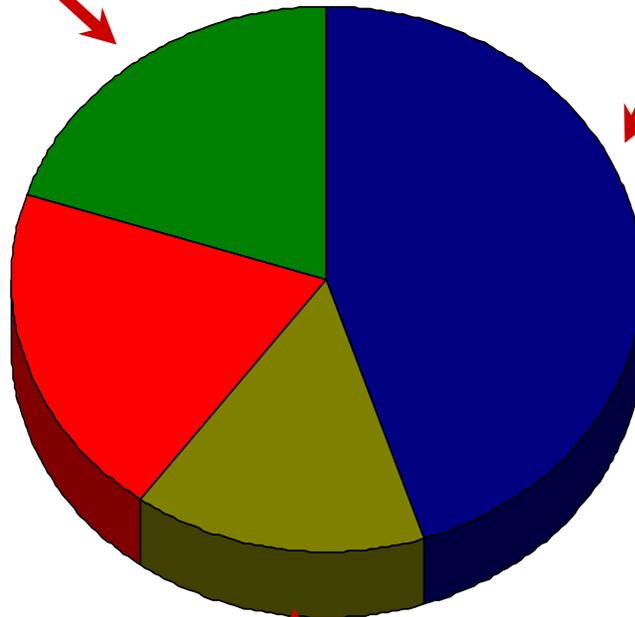
## Multi-Vehicle 45%

- Frontal 25%
- Side 17%
- Rear 3%

*42,000 deaths per year on average*

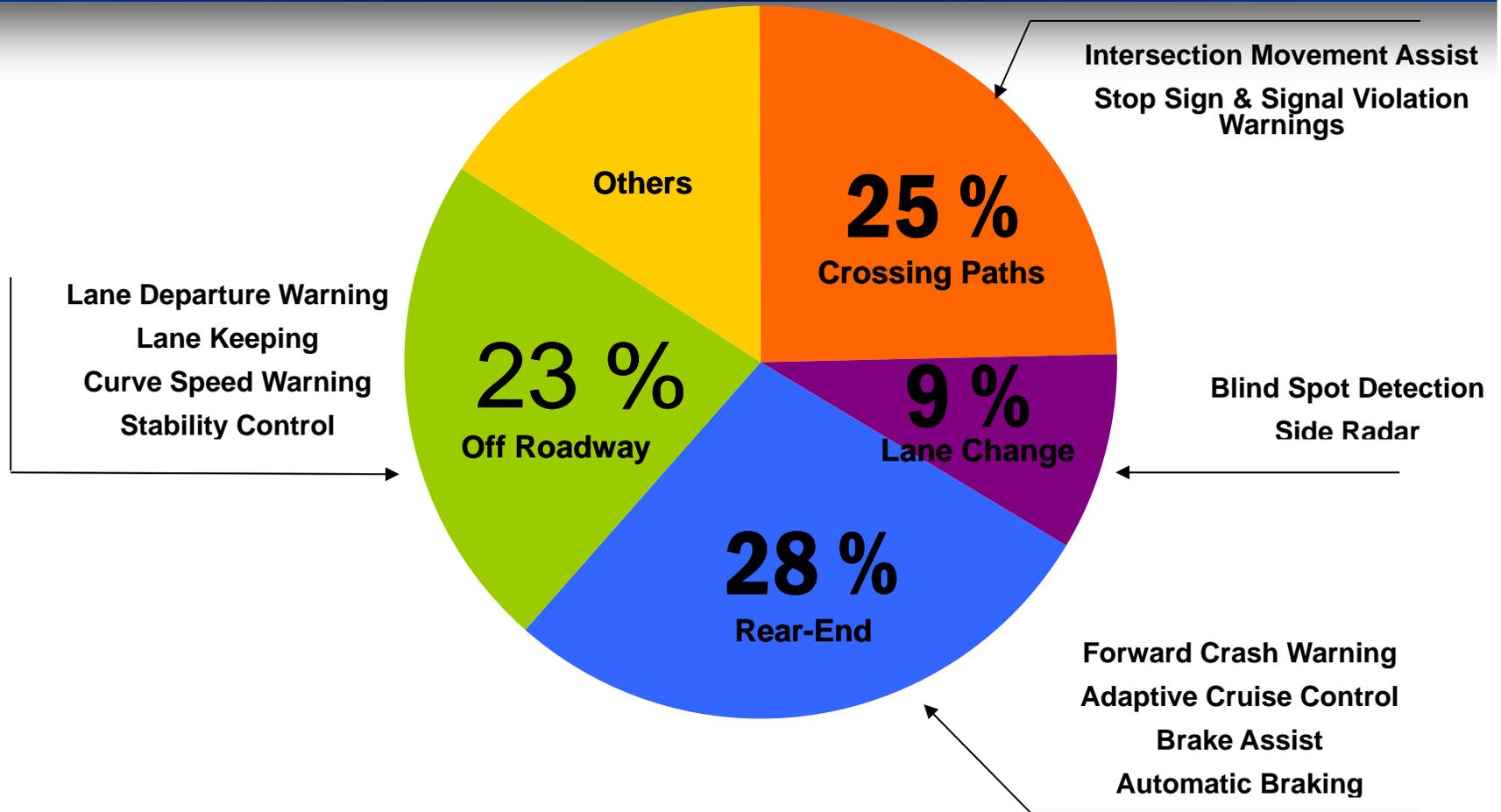
## Non-Occupant 15%

- Pedestrian 13%
- Pedal cyclist 2%



# Crashes of all Severities

2007 GES



**These 4 crash types = 85% of all crashes and ~75% of all fatalities**

# Economic Cost Per Year of Crashes in US

- **\$230 billion total**
  - \$32 billion medical cost
  - \$51 billion for impaired driving
  - \$20 billion failure to use belts



# Summary

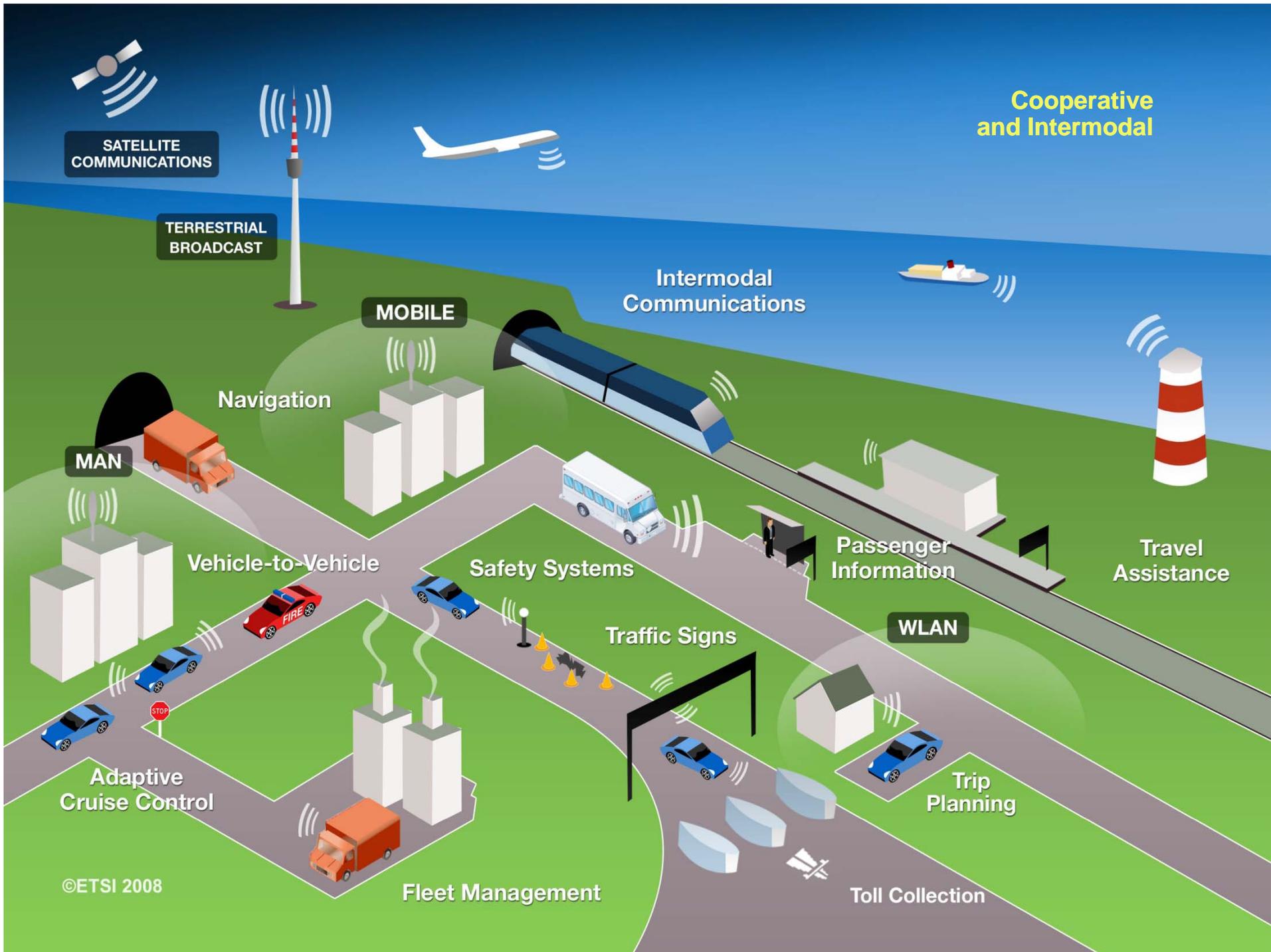
- Population shifts and market forces are changing the way we must think about providing transportation.
- The impact of doing business as usual is not sustainable and the thinking that created the problems we have is not going to be able to solve them. We need to think differently about transportation
- We have to weigh the cost of transportation in both human and energy terms
- Cities need to think and act in new ways to make transportation systems more efficient, productive, intelligent and safer...
- This is a global issue and the global community is working on solutions
- As leaders in transportation and energy, you have opportunities today to innovate and collaborate across the public and private sectors build a smarter solutions for the future

*Thank You*

[www.linkedin.com/pub/michael-noble/1a/81/b4](http://www.linkedin.com/pub/michael-noble/1a/81/b4)

[www.linkedin.com/in/pickeral](http://www.linkedin.com/in/pickeral)

## BACKUP SLIDES



Over 21 billion passengers travel by rail each year and significant growth is inevitable....

# Smarter Transportation



Rapid growth of cities



Projected number of air travelers by 2020....7 billion

Projected airport and airline capacity in 2020....6 billion



Traffic and air quality

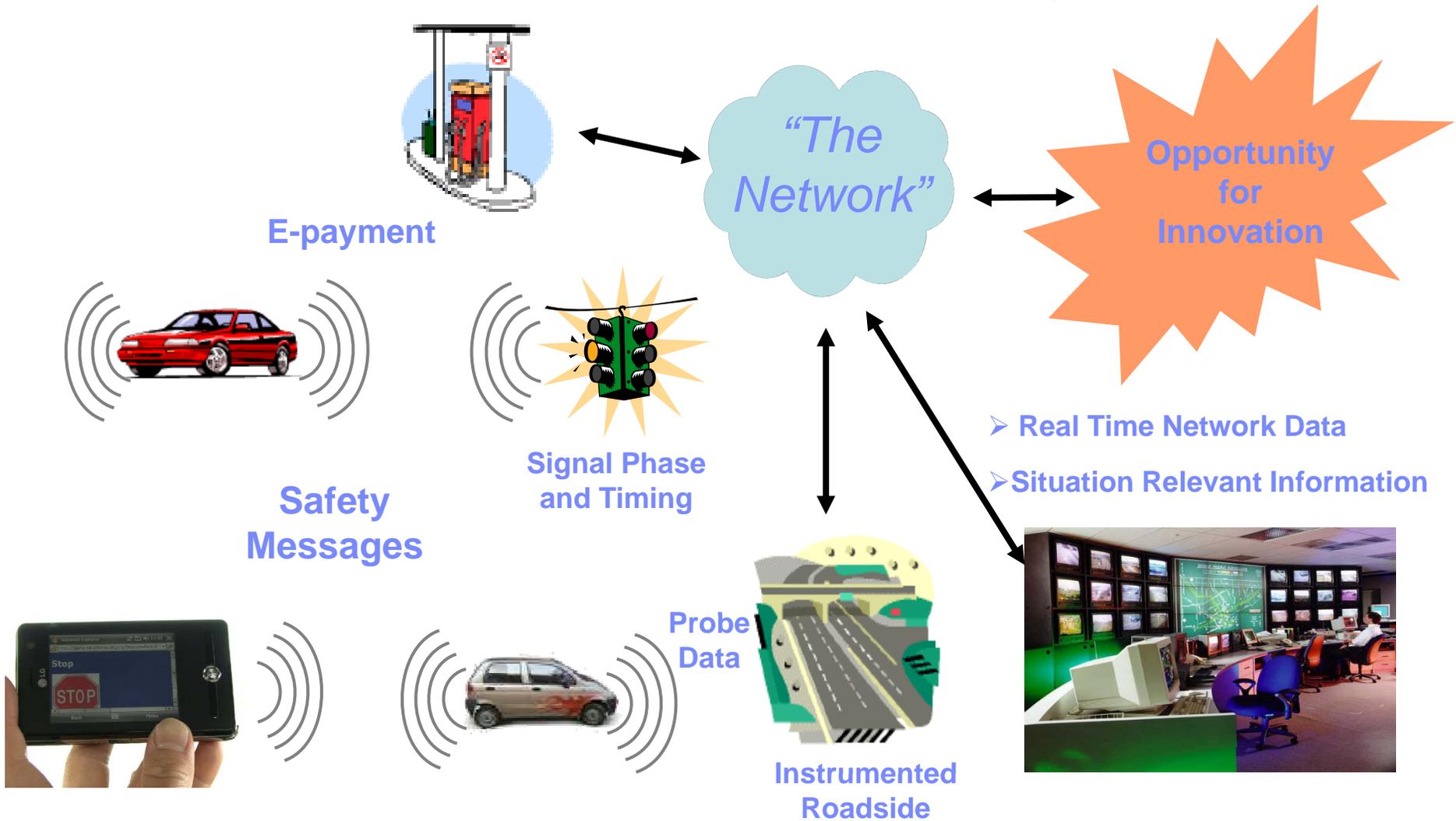
Deteriorating infrastructure

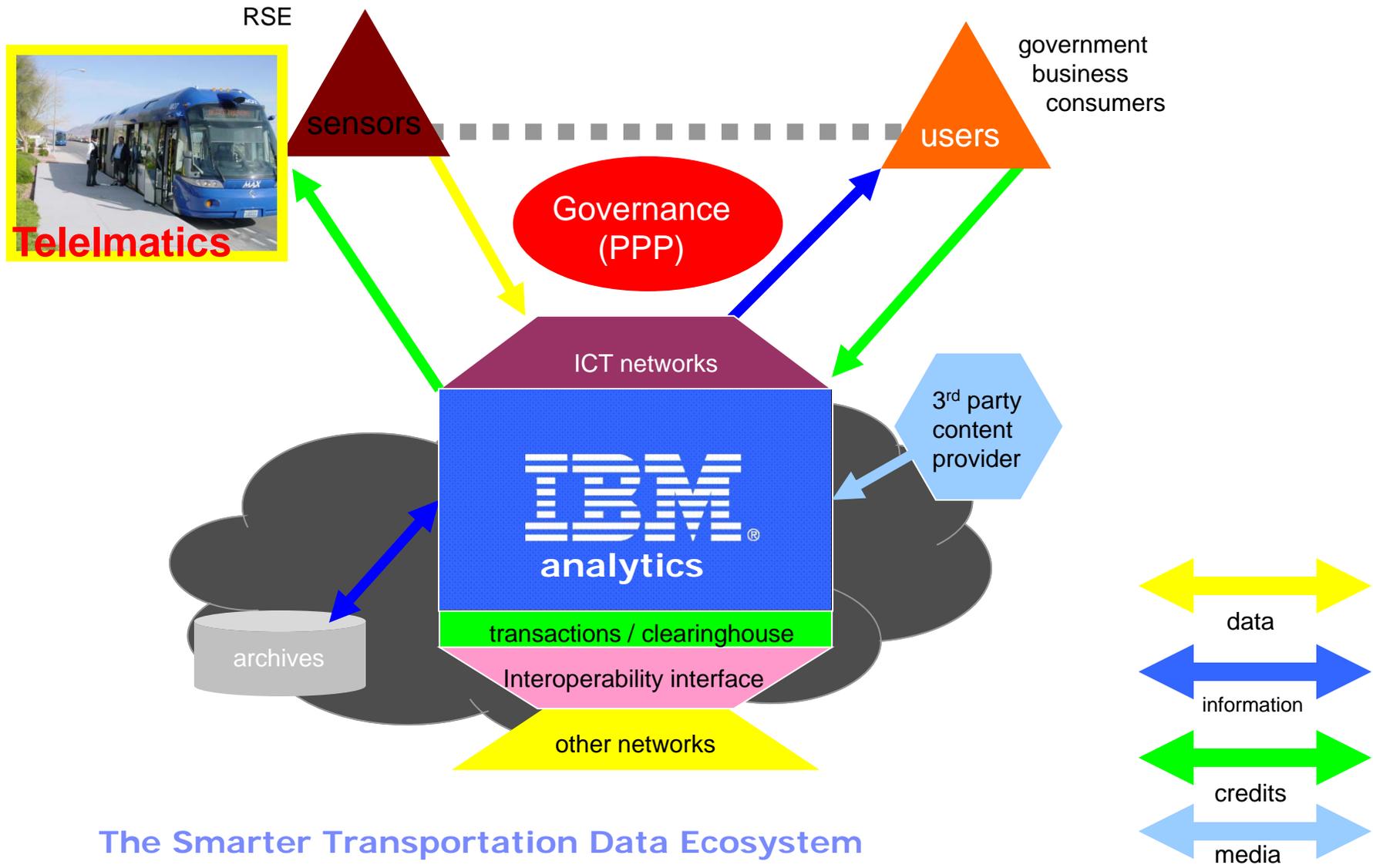
Shrinking revenue base

Congestion impacts economic development



# It's All About Connectivity





The Smarter Transportation Data Ecosystem

## IBM Intelligent Transportation: Primary Focus

Real-Time, System-Wide Visibility of a traffic network

Insights into Patterns of traffic network enabling the creation of performance improvement

Pro-Active Management of traffic reducing negative economic impact & citizen aggravation

## Additional Benefits

Intra & Inter Agency Collaboration involving the implementation of best practice & auditable processes

Making transportation data available to value added citizen-facing applications and to private businesses

Timely availability of performance indicators, alerts and inferences to help decision making & loss minimization

Leveraging current investments in instrumentation to produce valuable and actionable information

Integrated dashboards that combine decision support with control

## Primary Use Cases

### Leverage Information

- *Traffic Awareness*
- *External Data Feeds*
- *Real-Time Data Collection*
- *Traffic Data Gateway*
- *Traffic Information Hub*

### Anticipate Problems

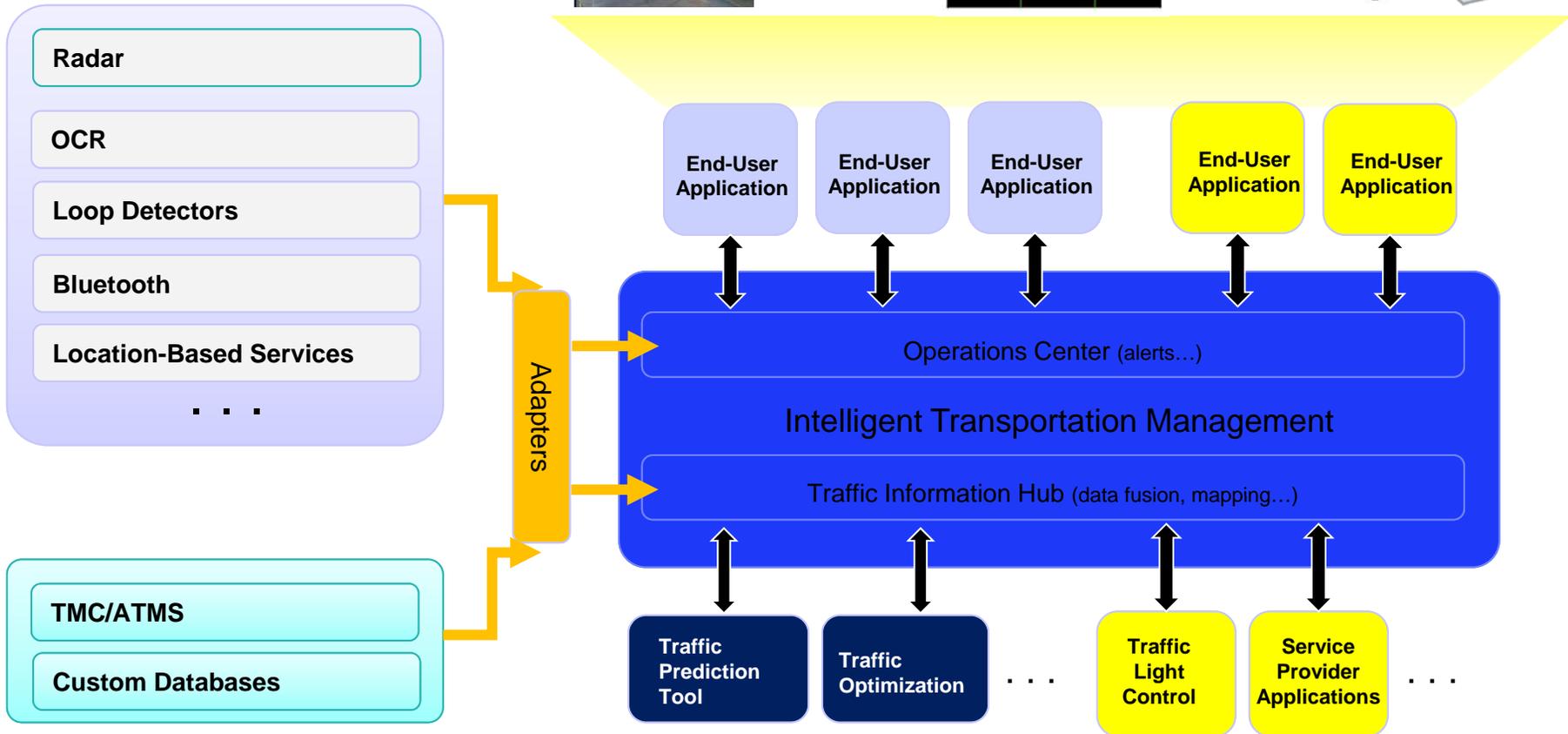
- *Traffic Analytics*
- *Traffic Prediction*
- *Real-Time Incident and KPI Detection*

### Coordinate Resources

- *Implementing Operational Procedures*
- *Integrated monitoring and control*
- *Network-wide proactive management*



Bus Line Number	Time to Arrive	Bus Stop
101	5 min	A1
102	12 min	B2
103	10 min	B1



## Solution Architecture

