Georgia Planning Association Spring Conference 2019

Won't You Be My Neighbor?

A discussion about the great communities of tomorrow and the future of mobility

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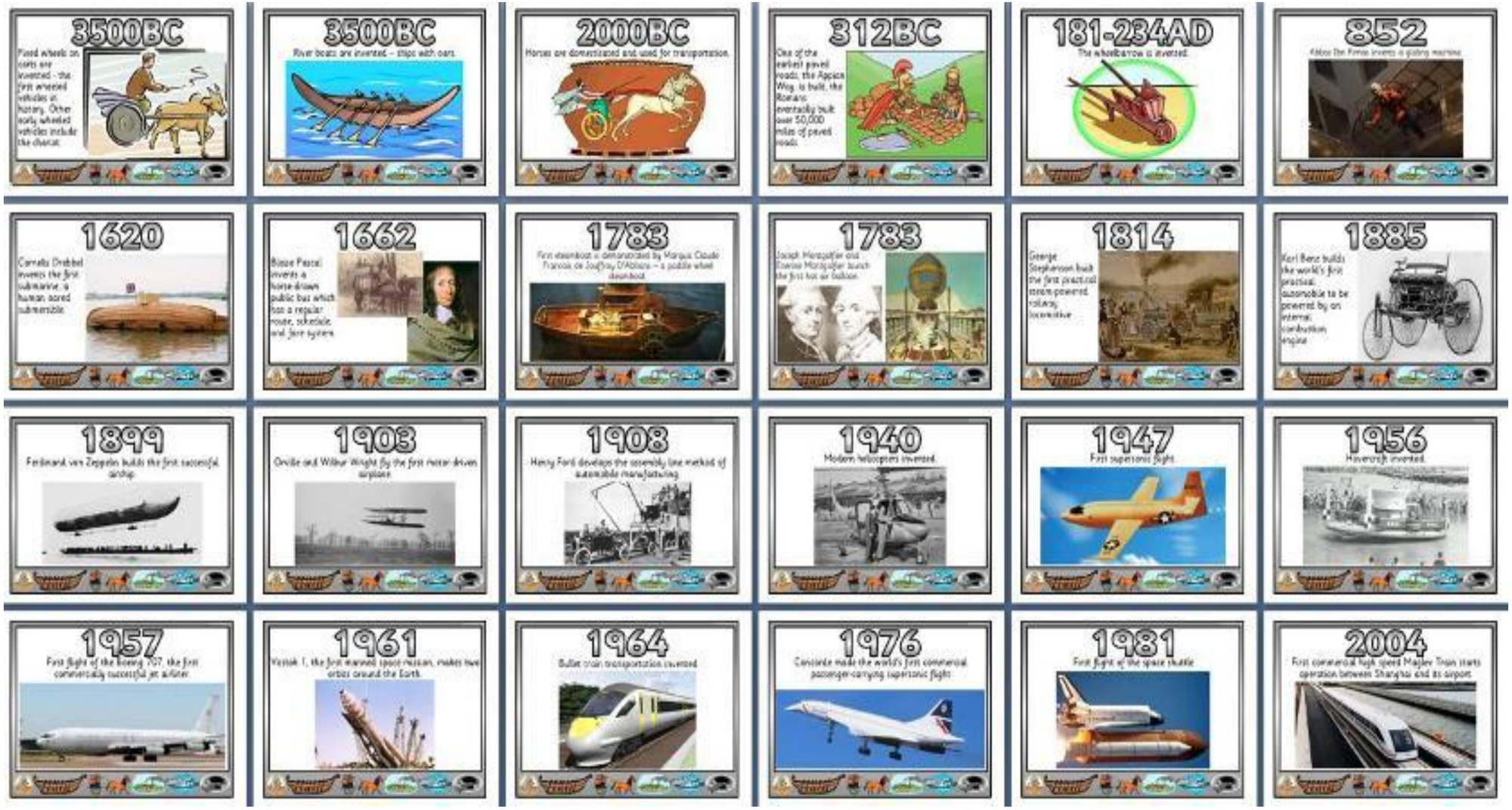
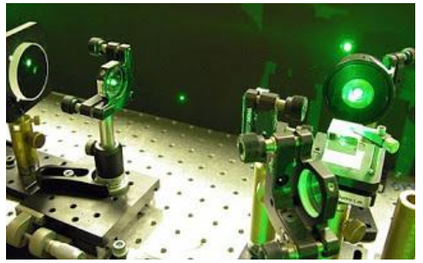
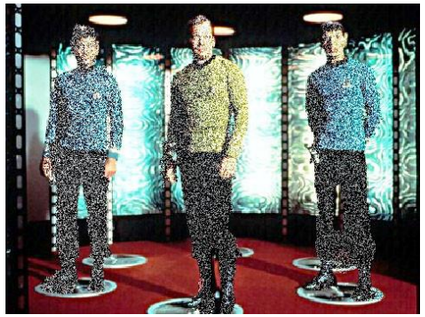
People on the move is the history of our civilization….and very little will change…but we must adapt to a new paradigm







A motorization "saturation" level is emerging in mature economies

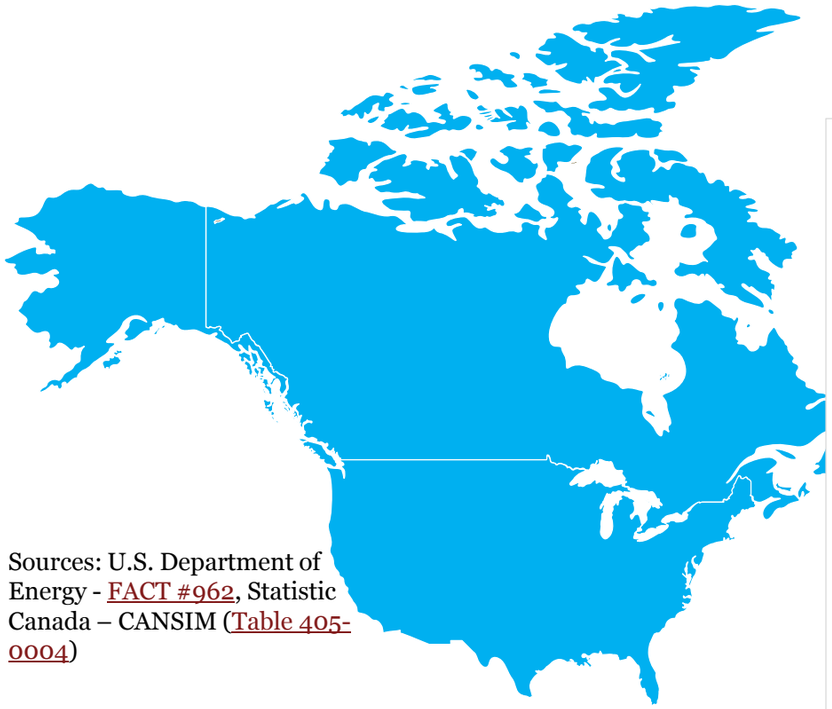
Canada

2014 motorization rate
(Vehicles / 1000 inhabitants)

655

12.9%

2004-2014 motorization rate variation

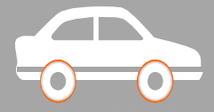


Sources: U.S. Department of Energy - FACT #962, Statistic Canada – CANSIM (Table 405-0004)

USA

2014 motorization rate
(Vehicles / 1000 inhabitants)

816

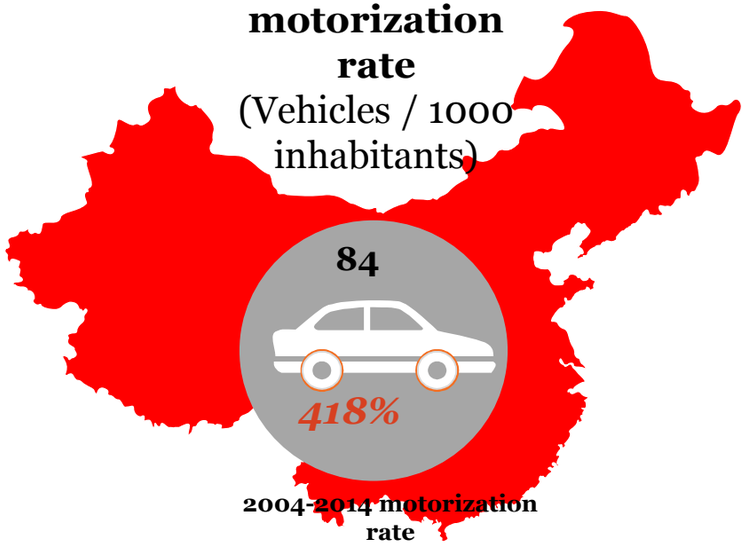


-1.6%%

2004-2014 motorization rate variation

CHINA

2014 motorization rate
(Vehicles / 1000 inhabitants)



2004-2014 motorization rate variation

But the global motorization trends are still evolving

Regions with high motorization rate, but with tendency to stabilize / reduce	**Regions with medium/high motorization rate, but still significant growth**	**Regions with low motorization rate, and very fast growth**	**Regions with low motorization rate, and moderate growth**

Ride hailing is increasing (doubling?) every year…a business & tech trend

More than 5 bn trips / year (despite regulatory constraints in many Countries), mainly sourced by 5 big players

UBER	592 cities	70 countries	900 M rides / year
lyft	300 cities	1 country	160 M rides / year
Grab	30 cities	6 countries	840 M rides / year
DiDi More than a journey	400 cities	1 country	2,4 bn rides / year
OLA	110 cities	1 country	300 M rides / year

Estimated 2016

Estimates based on press releases

Complication comes with urbanization: variability of trips is increasing

share of stable "home ⇔ work/school" trips less dominant in the total mobility

USA

% of commute vehicle miles of travel (VMT) on total VMT

1969 34% → **2009 28%**

Source: NHTS, 2011

ITALY

% of trips repeated 5 days / week (urban mobility)

2004* **40%** → **2014 27%**

* Max level in the last 15 years

Source: Isfort, 2017

LONDON

% of trips to "usual workplace" on mechanised trips

1971 56% → **2012 29%**

Source: Travel in London, Rep.6

Trends: How we move (US DOT)

Population Increase

2015: **320 million people**
2045: **390 million people**

In 30 years our population is expected to grow by about

70 million

... that's more than the current populations of

Bumper-to-Bumper

On average, we spend

over **40** hours

stuck in traffic each year

The annual financial cost of congestion is

$121 billion

Older Americans — Redefining Longevity

By 2045, the number of Americans over age 65 will increase by

77%

About **one-third of people over 65** have a disability that limits mobility. Their access to critical services will be more important than ever.

Millennials — Shaped by Technology

There are **73 million Millennials** aged 18 to 34. They are the first to have access to the internet during their formative years and will be an important engine of our future economy.

Millennials are driving less. By the end of the 2000s, they drove over **20% fewer** miles than at the start of the decade.

Income Inequality

10% of the population takes home **one-third** of our national income.

Transportation is the **second-largest** expense for U.S. households.

Megaregions and Shifts in Population Centers

11 megaregions are linked by transportation, economics, and other factors.

They represent over **75%** of our population and employment.

In 2014, **365,000** people moved to the South—up **25%** from 2013—and moves to the West doubled.

Trends: how we move better (US DOT)

More and more, the transportation sector is relying on data to drive decisions, and on technology to reimagine how we move people and goods.

Connected Vehicles

Vehicles that communicate are the latest innovation in a long line of **successful safety advances**.

The motor vehicle fatality rate has dropped by

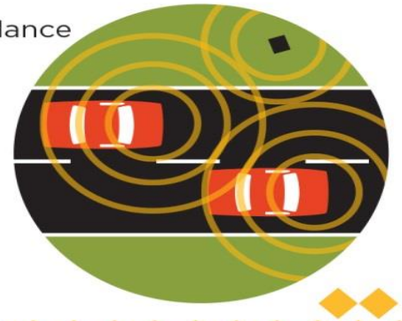
80%

over the past 50 years.

Connected vehicles and new crash avoidance technology could potentially address

81%

of crashes involving unimpaired drivers.



Robotics

Advances in robotics are changing transportation operations and will impact **the future transportation workforce**.

Robots will perform vital transportation functions, such as critical infrastructure inspection.

NextGen

GPS and new technologies are leading to a **safer, more efficient** U.S. airspace.

By 2020, **one-second updates** will pinpoint the **aircraft location and speed** of 30,000 commercial flights daily.

Real-time Travelers

Mobile access to everything from **traffic data** to **transit schedules** informs our travel choices.

90% of American adults own a mobile phone.

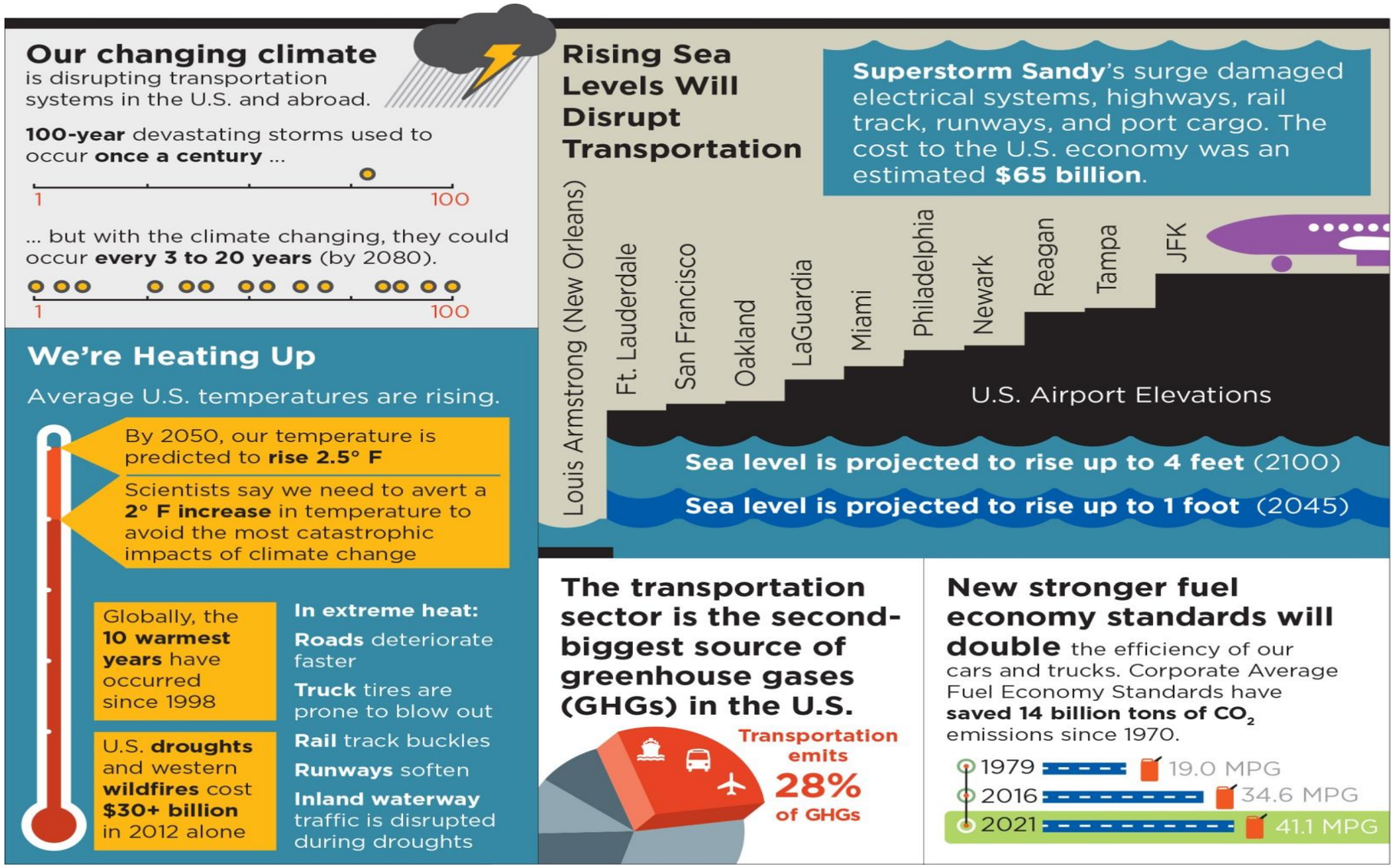
20% use their phones for **up-to-the-minute** traffic or transit information.

Smartphones are regularly used for **turn-by-turn navigation**.

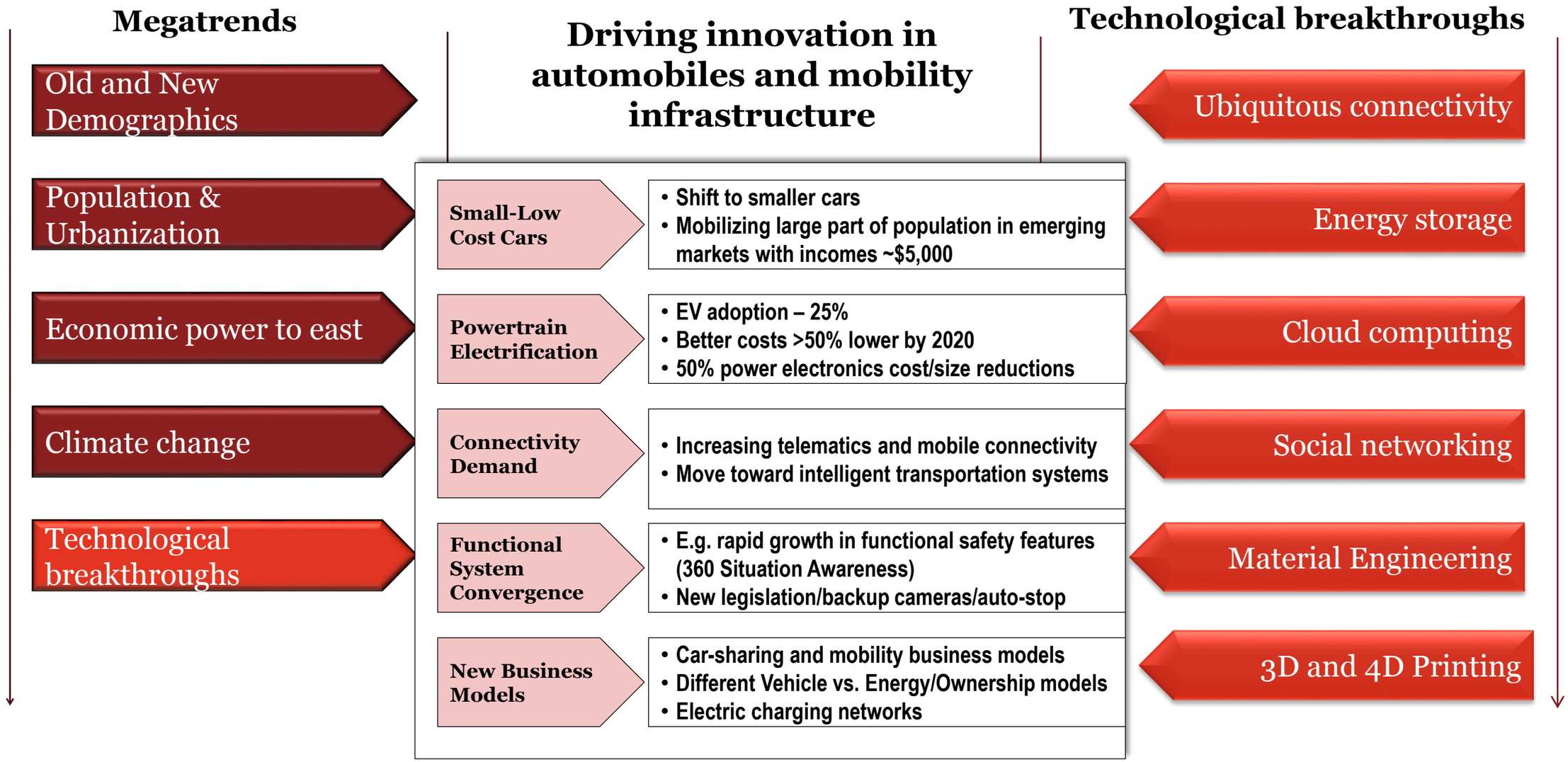
Big data is all around us. Global data generated is projected to grow by **40%** annually.

Data enables innovative transportation options, such as **car-sharing**, **ride-sharing**, and **pop-up bus services**, and more **rapid delivery of goods**.

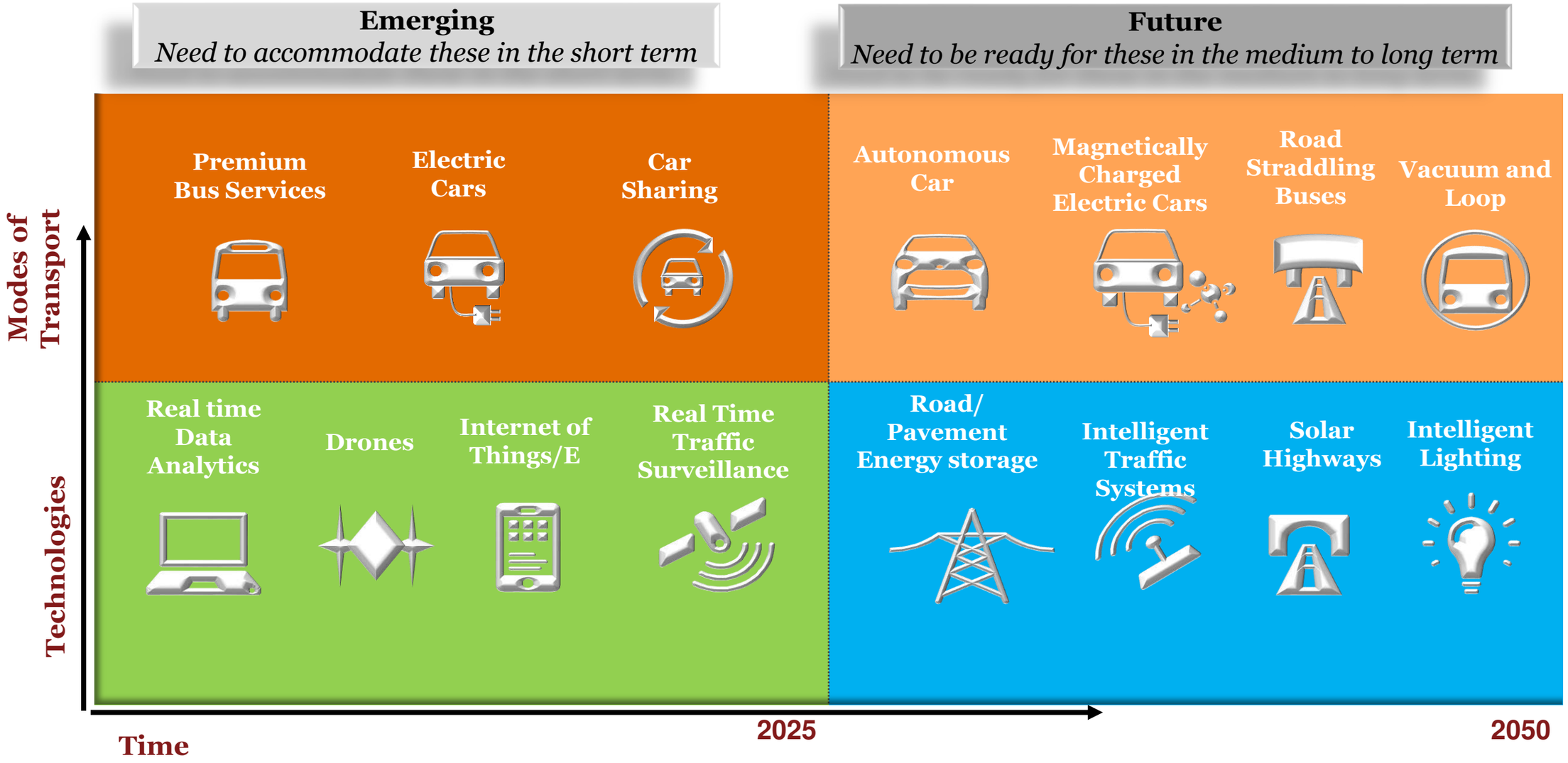
Trends: How we adapt (US DOT)



In cities, technological breakthroughs will spur an avalanche of automotive innovation to address mobility issues and create new value chains

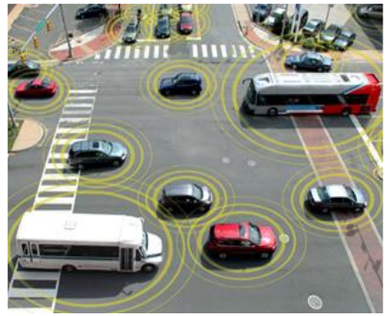


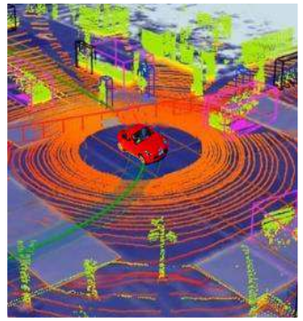
Innovations will change how we view mobility within a few decades



Connected and autonomous vehicles will fundamentally change the mobility character of the smart“er” city and the user experience

- Connected Vehicles
- Vehicle Automation
- Internet of Things
- Machine Learning
- Big Data
- Mobility on Demand





Connected-Autonomous Vehicles and Instrumented Street Furniture

Benefits

- Order of magnitude safety improvements
- Reduced congestion
- Reduced emissions and use of fossil fuels
- Improved access to jobs and services
- Reduced transportation costs for gov’t and users
- Improved accessibility and mobility

EV vehicles integration can further the adoption of a GREEN economy and drive user adoption of beneficial mobility solutions

Data analytics via OnStar or vehicle to grid communication

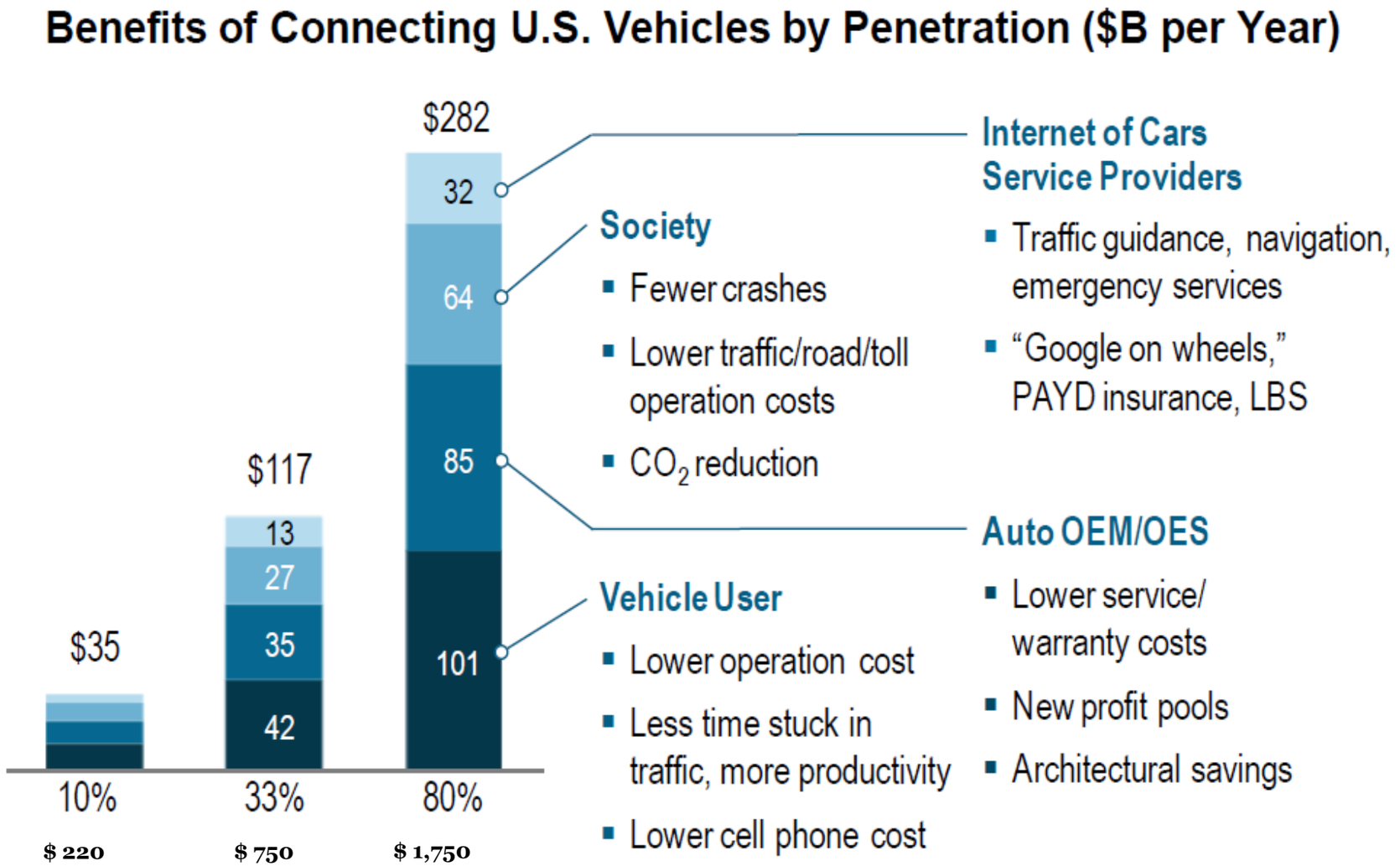
Transient power needs can be balanced to cut peaks and decrease rates

Power from solar parking arrays or building mounted panels stored in vehicle batteries

Chevy Volt powertrain with 100kW generation capability

Chevy Volt battery with over 16kW of grid balancing capacity

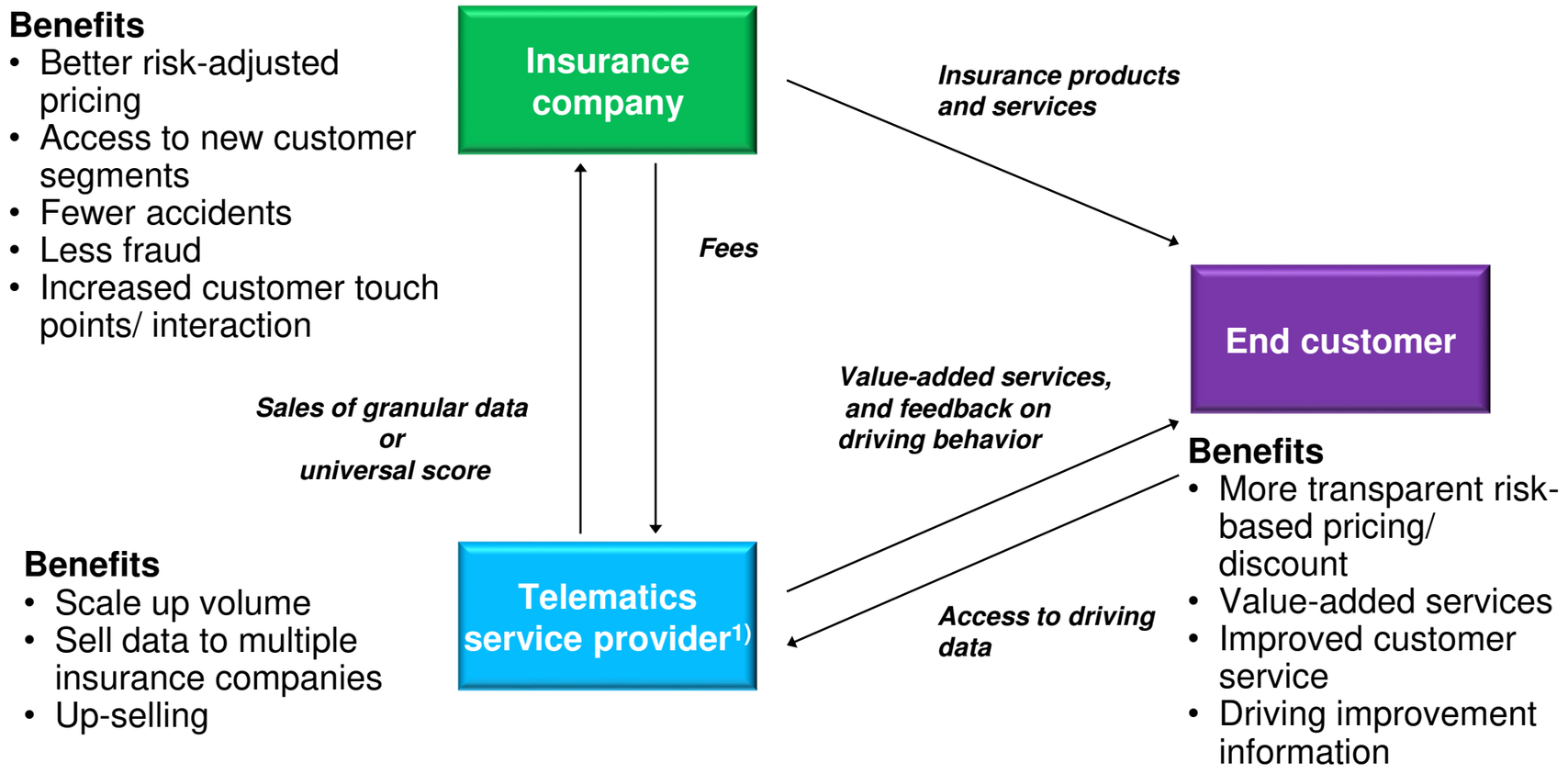
Total Eco-System Benefits of Connected Cars Can Be Substantial…



Benefits Per Car	**$ 220**	**$ 750**	**$ 1,750**

...If implemented correctly a connected car service programs can create value for all players involved...

Value creation across telematics based insurance eco-system



ILLUSTRATIVE

Government and society

Benefits
- Safer roads, resulting from fewer accidents
- Environmental benefits from decreased driving
- Reduced costs from public property damage
- Government resource reduction (less law enforcement, reduced accidents, etc.)
- Improved driving experience and road safety through real-time accident information

*1) Can be **third party providers, auto OEMs or even insurance companies***
2) Value creation for this segment is driven by choice of go-to-market strategy (not detailed in this phase).

… But Key Barriers for Wider Adoption Still Need to Be Addressed

Consumer Readiness (Demand)

1 Consumer Acceptance
- HMI / Driver Education
- Trust in assist / control functions
- Cost

3 Privacy
- Customer data including location and travel data

Vehicle/Technology (Supply)

2 Technology
- Differing vehicle and connectivity lifecycles
- Unpredictable vehicle operations
- Cost-effective, scalable, fault tolerant architectures

4 Liability
- Security - Hacking, viruses, hijacking
- Distraction
- Safety

5 End-End Eco-System Integration
- Technical Integration – Roads, Vehicles, Data, etc…
- Business Integration and Profitability
- Eco-system Roles and Ownership
- Investment Risk
- Political/Regulatory Alignment

High Risk/ Barrier – Partial/No Solutions
Moderate Risks- Only Partial Solutions
Moderate Risk – Plans in Place

Smart Urban Mobility must the SUM of many parts and inclusive for all through equity in development and design