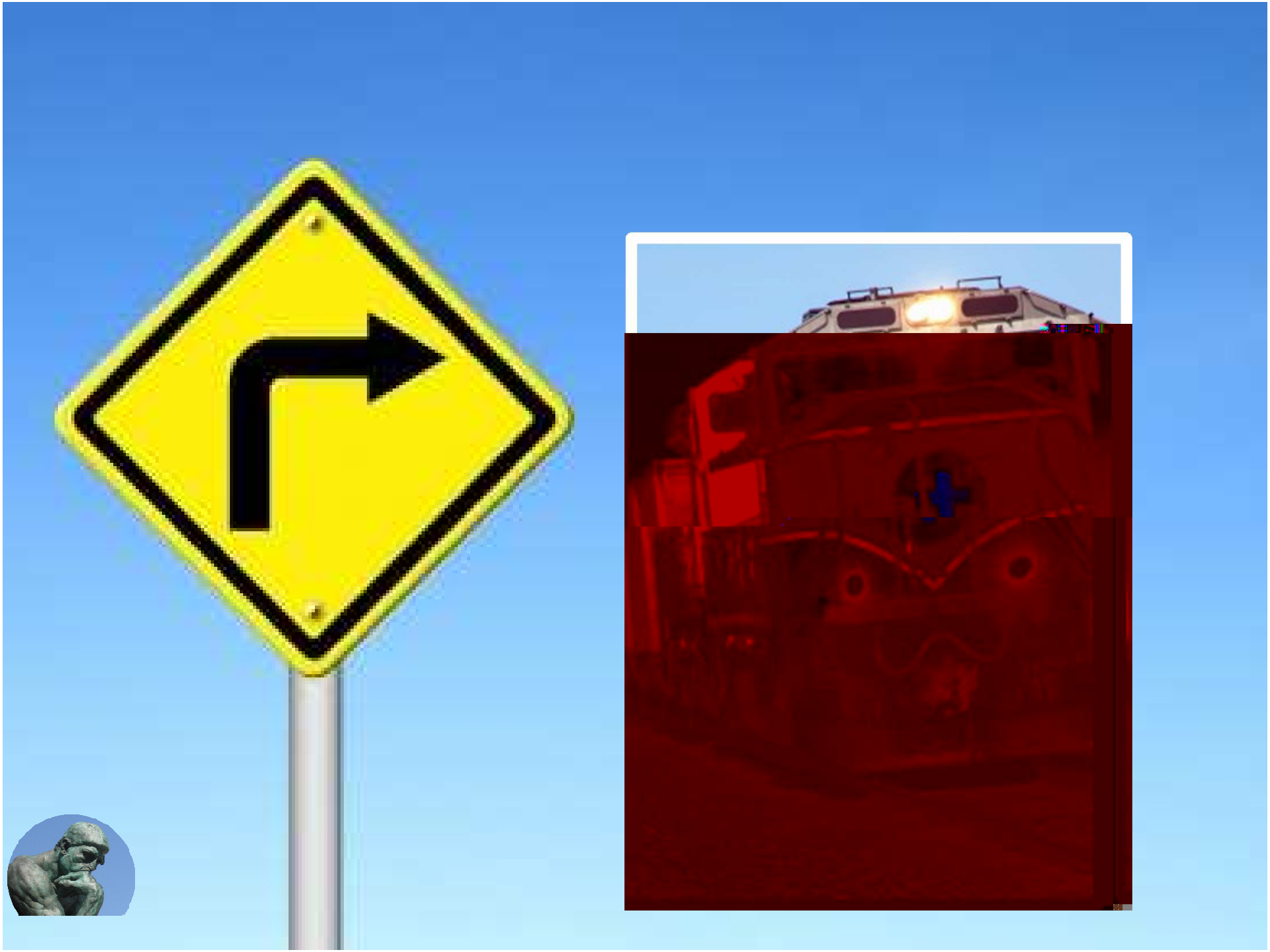
The Future of Transportation:

Can You See Around the Corner?

Shelley Row Associates LLC
www.shelleyrow.com
@shelleyrow

Shelley Row, P.E., PTOE



Transformation of Transportation

Millennials and Transportation

44% of teens obtain a driver's license within 12 months of coming of age

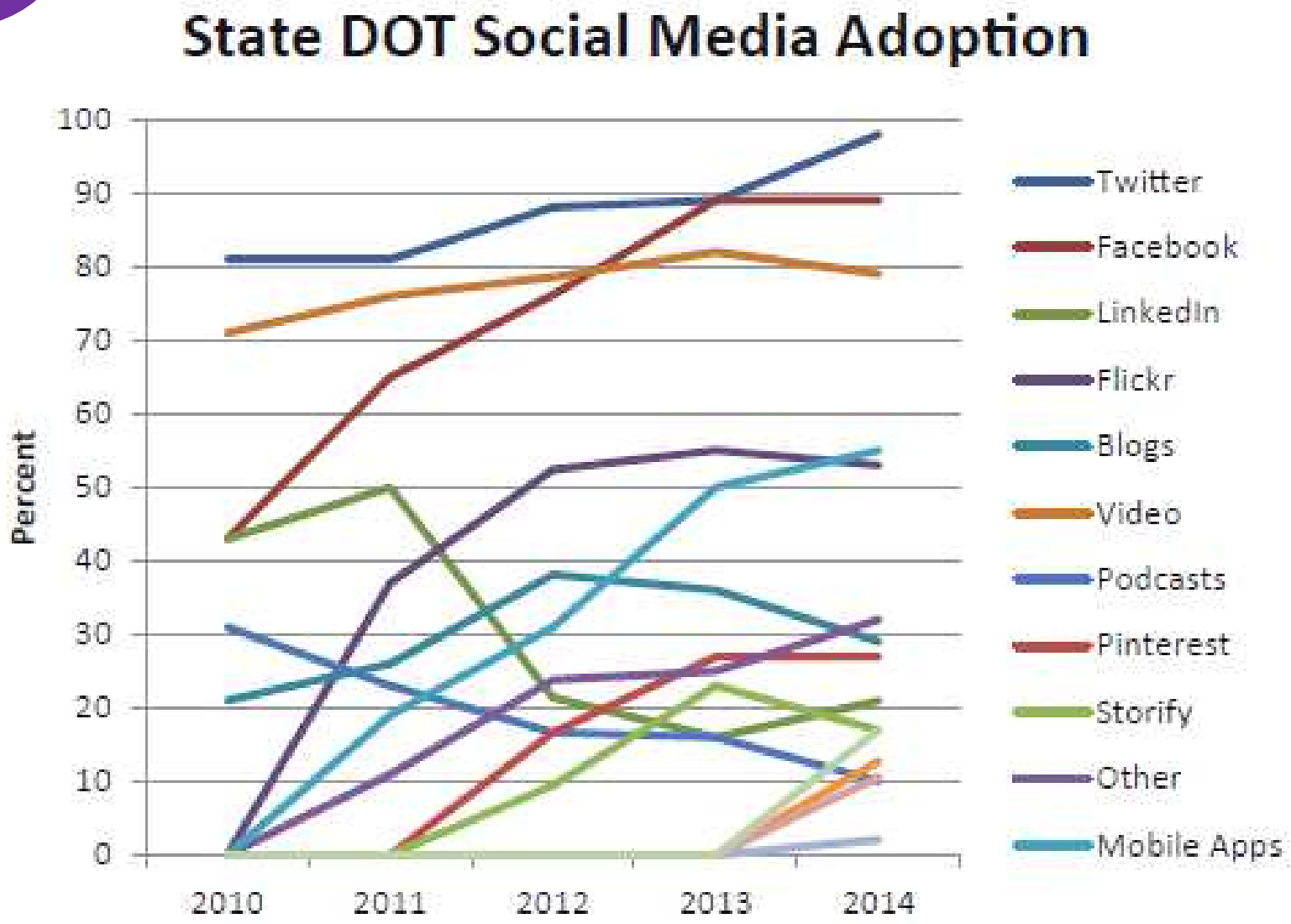
From 2007 to 2011, sales to car buyers aged 18-34 fell

nearly **30%**

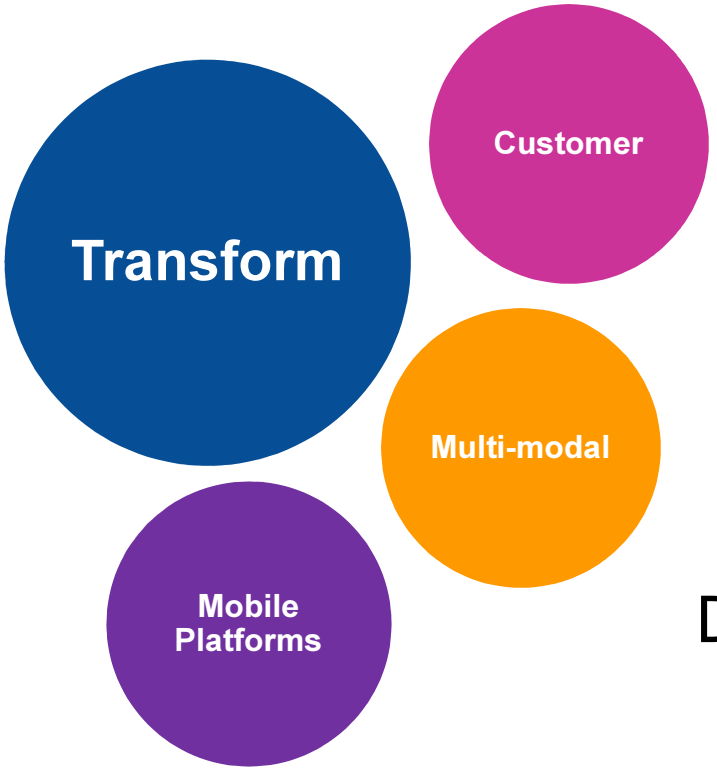

You
Tube

Mobile Platform

There's an app for that



Transformation of Transportation



Connect the dots

Business in a mobile, connected world

Design for **mobile platforms**

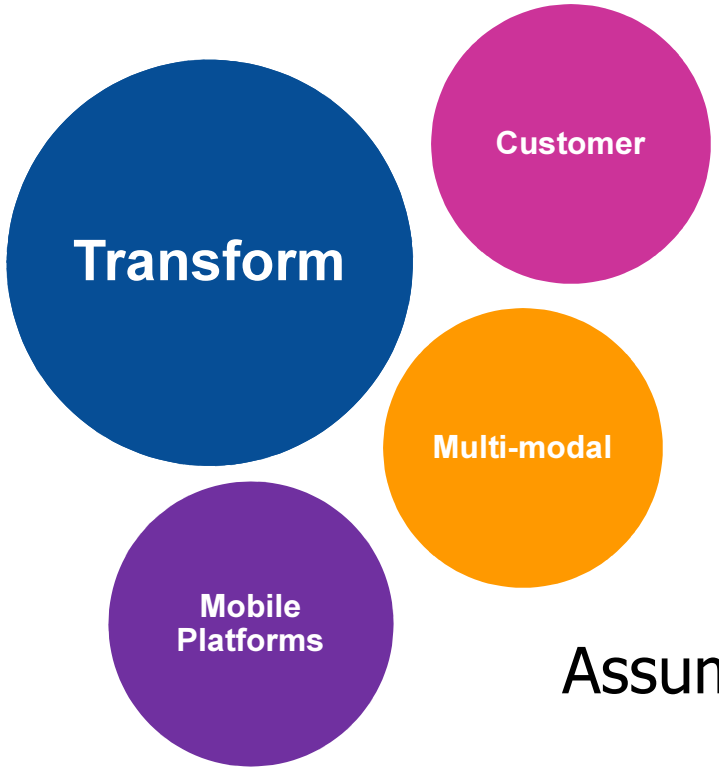
Social media for information distribution & gathering

Pope John Paul II, April 2005

Pope Francis, March 2013

THINK. Feel. **Act.**

Transformation of Transportation



Connect the dots

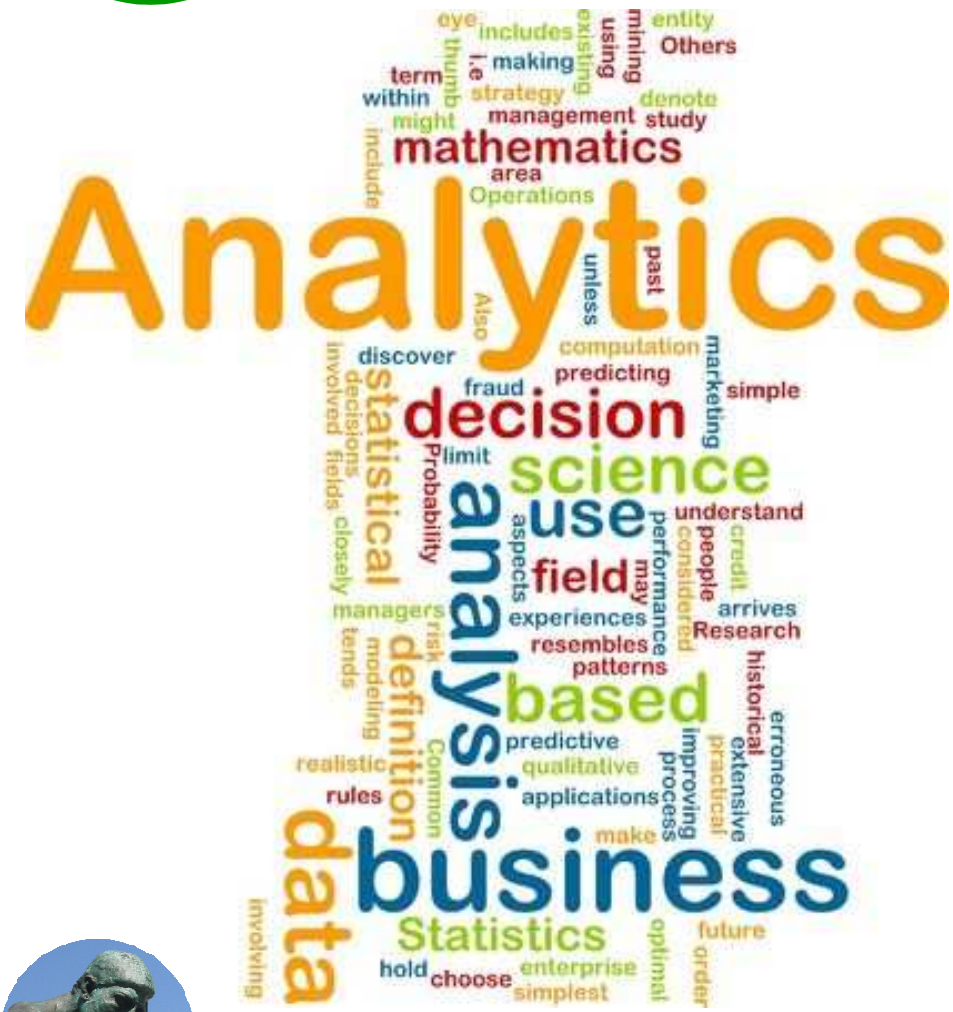
Business in a mobile, connected world

Assume everyone can **comment** on or **photograph** everything you do

Data

Data

Data to Information



Big data analytics market is expected to grow to

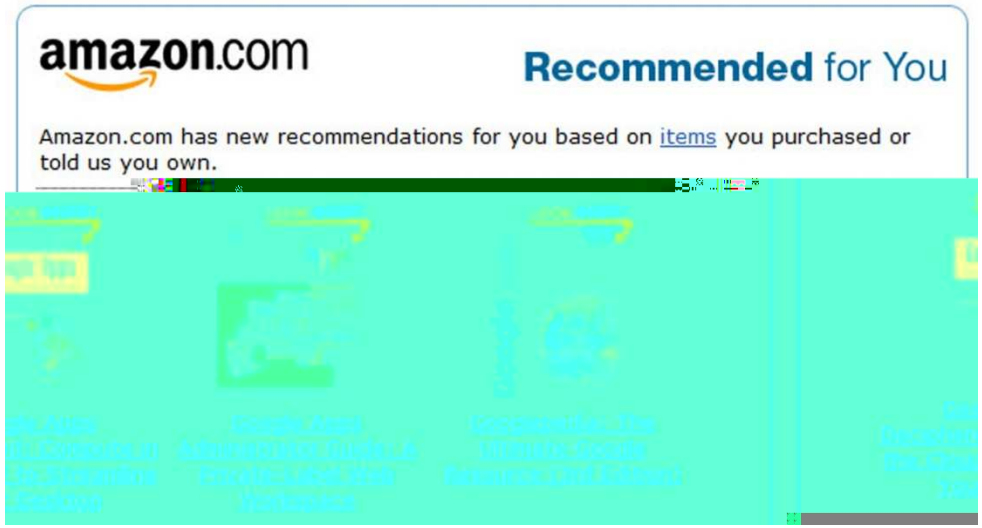
$17.1 billion by 2017*

Safety pilot stat

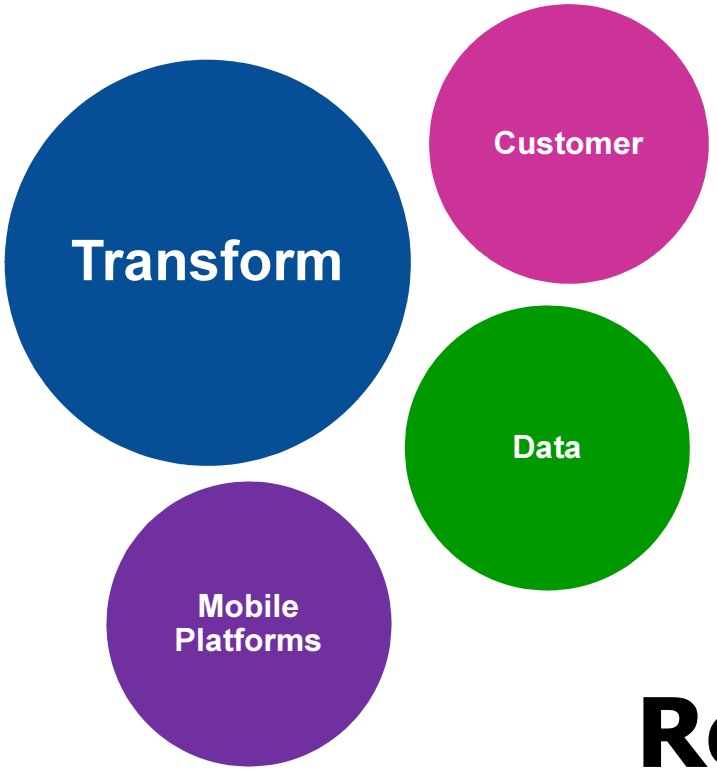
*Marketsandmarkets.com 2013 report


YOUR
MUST SEE MAP
MADE BY FRIENDS


waze
OUTSMARTING TRAFFIC, TOGETHER


amazon.com
Recommended for You
Amazon.com has new recommendations for you based on items you purchased or told us you own.

Transformation of Transportation



Connect the dots

An enabler not a controller

Open source data

Release data to enable creativity

Purchase rather than capture

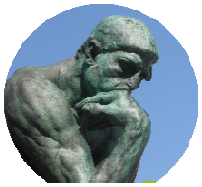
airbnb™

UbiGo

- Bundled service
- Hertz, electric car, carpool, transit, bike, taxi
- 20% cheaper than ownership
- Subscription service

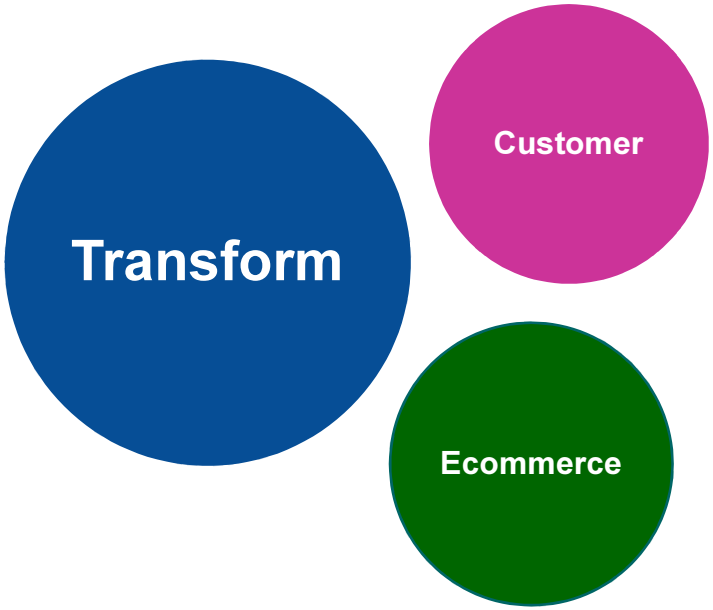
Mu by Peugeot

- Bundled service
- Car, scooter, bike, van, accessories
- Buy credit online to use for any transport option



http://www.mu.peugeot.co.uk/

Transformation of Transportation



Connect the dots

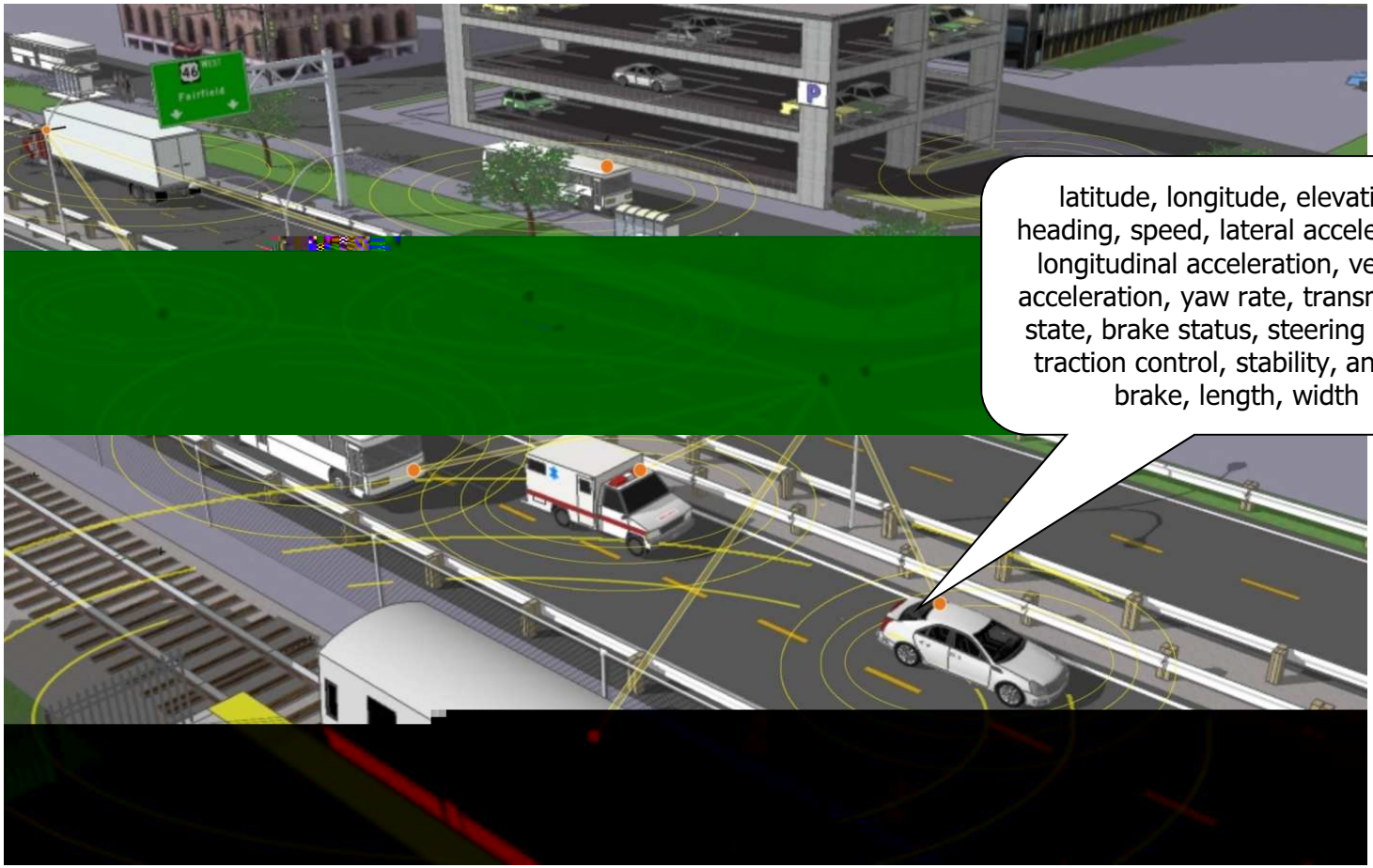
Rethink government's role

The highest and best use of **time** and **resources**

Enable **others** to do the rest

Managing transportation network

Official info, social equity provider


40 WEST
Fairfield
P
latitude, longitude, elevation, heading, speed, lateral acceleration, longitudinal acceleration, vertical acceleration, yaw rate, transmission state, brake status, steering angle, traction control, stability, antilock brake, length, width

Connected Vehicles

Start Now! – It's all about the data

- Know the data you **need**;
- Know the data you **get** from DSRC

Will the BSM meet your needs for DOT apps

Vehicles

Connected Vehicles Create Data

Even more **mobility and environmental services**

Basic Safety Message
1 & 2+

Basic Safety Message
1 & 2
On exception basis

More **mobility and environmental services**

Basic Safety Message 1 via DSRC

Mobility and environmental services

Vehicles

Basic Safety Message I

Part I	
Data Frame (DF)	**Data Element (DE)**
Position (DF)	
	Latitude*
	Elevation*
	Longitude*
	Positional accuracy*
Motion (DF)	
	Transmission state*
	Speed
	Steering wheel angle
	Heading*
	Longitudinal acceleration*
	Vertical acceleration
	Lateral acceleration
	Yaw rate*
	Brake applied status
	Traction control state
	Stability control status
	Auxiliary brake status
	Brake status not available
	Antilock brake status
	Brake boost applied
Vehicle size (DF)	
	Vehicle width
	Vehicle length

*Required in Safety Pilot Model Deployment

Vehicles

Basic Safety Message II

Acceleration set (DF) – same as in Part 1	
	Vertical acceleration threshold (DE)
	Yaw rate confidence (DE)
	Acceleration confidence (DE)
Confidence set (DF)	
	Acceleration confidence (DE)
Speed confidence (speed, heading, and throttle confidences (DF)	
	Time confidence (DE)
Position confidence set (DF)	
	Steering wheel angle confidence (DE)
	Throttle confidence (DE)
Object data, sequence of:	
	Obstacle distance (DE)
	Obstacle direction (DE)
	Time obstacle detected (DE)
Full position vector (DF) – see contents under path history	
	Throttle position (DE)
Speed and heading and throttle confidence (DF) – same as above under "Full position vector"	
	Speed confidence (DE) – same as above under "Speed and heading and throttle confidence"
Vehicle data (referred to as a "complex type" in J2735, rather than an element or frame)	
	Vehicle height (DE)
	Bumper heights (DF)
	Bumper height front (DE)
	Bumper height rear (DE)
	Vehicle mass (DE)
	Trailer weight (DE)
	Vehicle type (DE)
Vehicle identity (DF)	
	Descriptive name (DE) – typically only used for debugging
	VIN string (DE)[143]
	Owner code (DE)[144]
	Temporary ID (DE)
	Vehicle type (DE)

Vehicles

Connected Vehicles

AASHTO

NATIONAL CONNECTED VEHICLE FIELD INFRASTRUCTURE FOOTPRINT ANALYSIS

Design Gaps Analysis

Infrastructure Data Message Standards

Gap 7: Basic Safety Messages are inadequate as a general means for collecting road data

Gap 8: Current messaging standards and data dictionaries may not support current or future needs of infrastructure implementers

Connected Vehicles

AASHTO

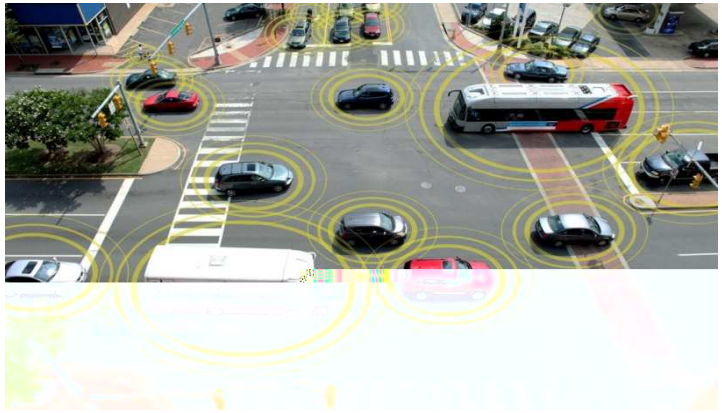
NATIONAL CONNECTED VEHICLE FIELD INFRASTRUCTURE FOOTPRINT ANALYSIS

Design Gaps Analysis

Infrastructure Data Business Models

Gap 28: No Obvious Incentive for Data Providers to Provide Data beyond Any Mandate

Connected Vehicles



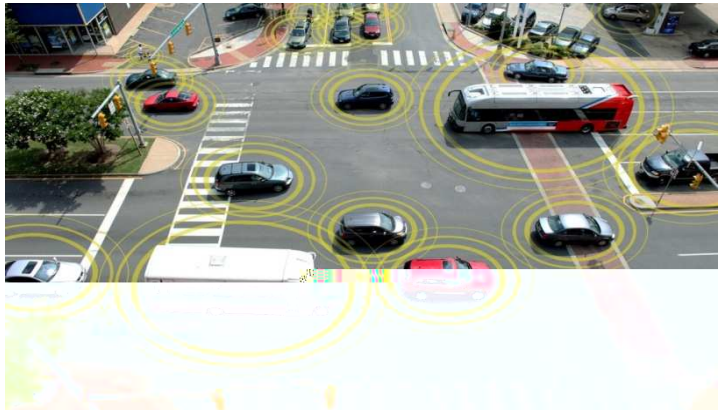
Connected Vehicles

Be a smart investor; **ask questions**

Negotiate while you have leverage; otherwise,

You won't get what you want;

You'll get what you're given



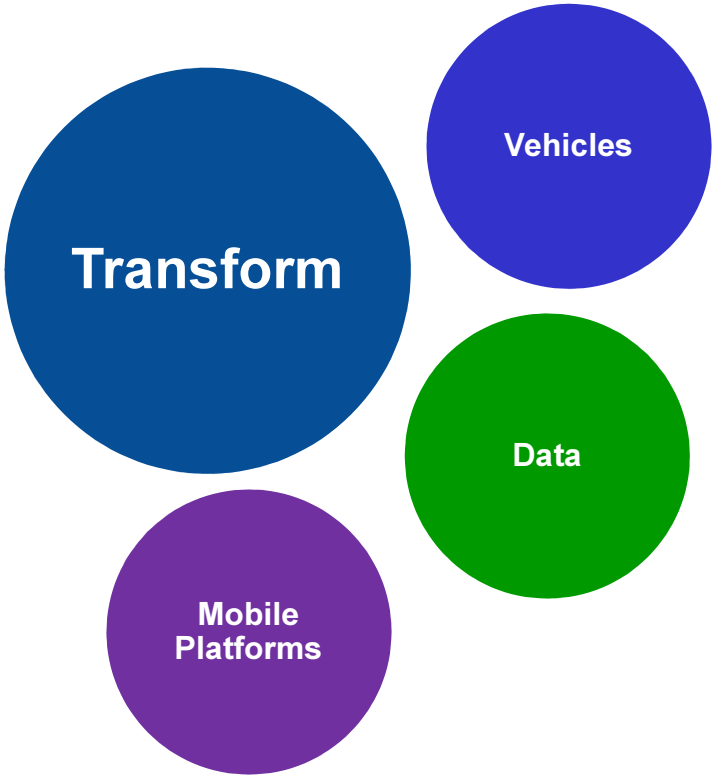
Vehicles

Connected Vehicles

Evaluate **cost-effectiveness** over time

- V2V gains effectiveness along with V2I. Does a V2I investment hold its value?
- Could you get 80% value now via cellular?
- Know the cost of security

Transformation of Transportation



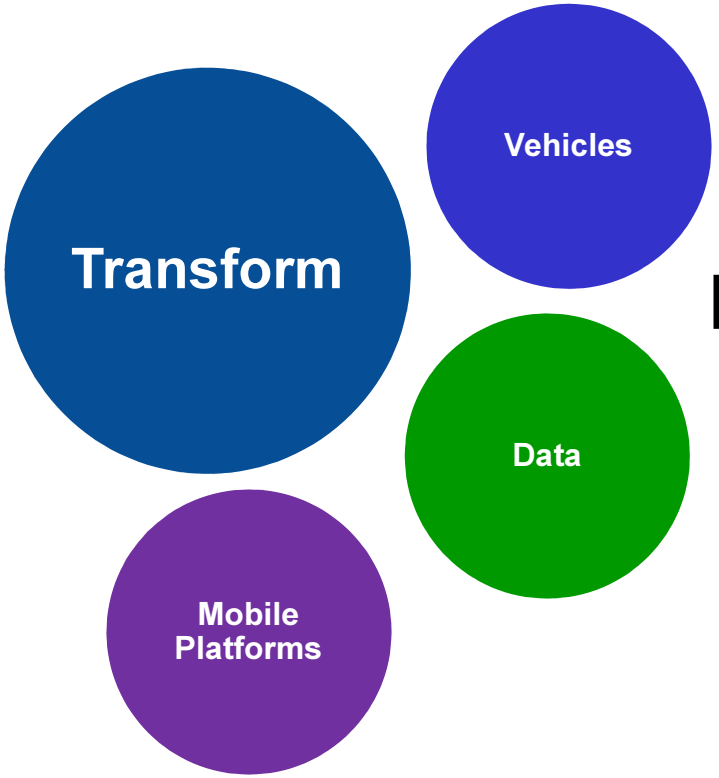
Connect the dots

Plan for connected vehicles now

Analyze **data** and data needs

Study if **DSRC data** meets your needs

Transformation of Transportation

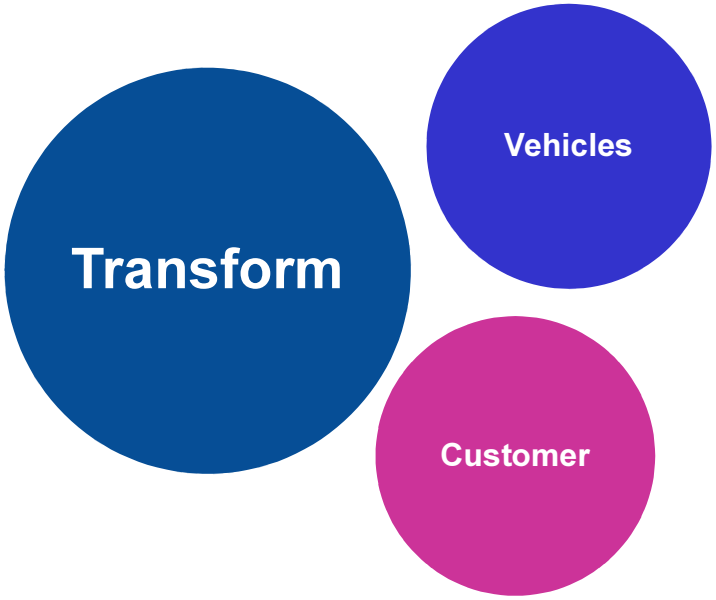


Start Now!

DSRC planning

- High-crash intersections
- Planned signal system upgrades
- Unexpected curves or alignment changes
- Corridors with intense data needs
- Locations where DSRC fills a unique data need
- See AASHTO Infrastructure Footprint Analysis

Transformation of Transportation



Connect the dots

Plan for flexibility

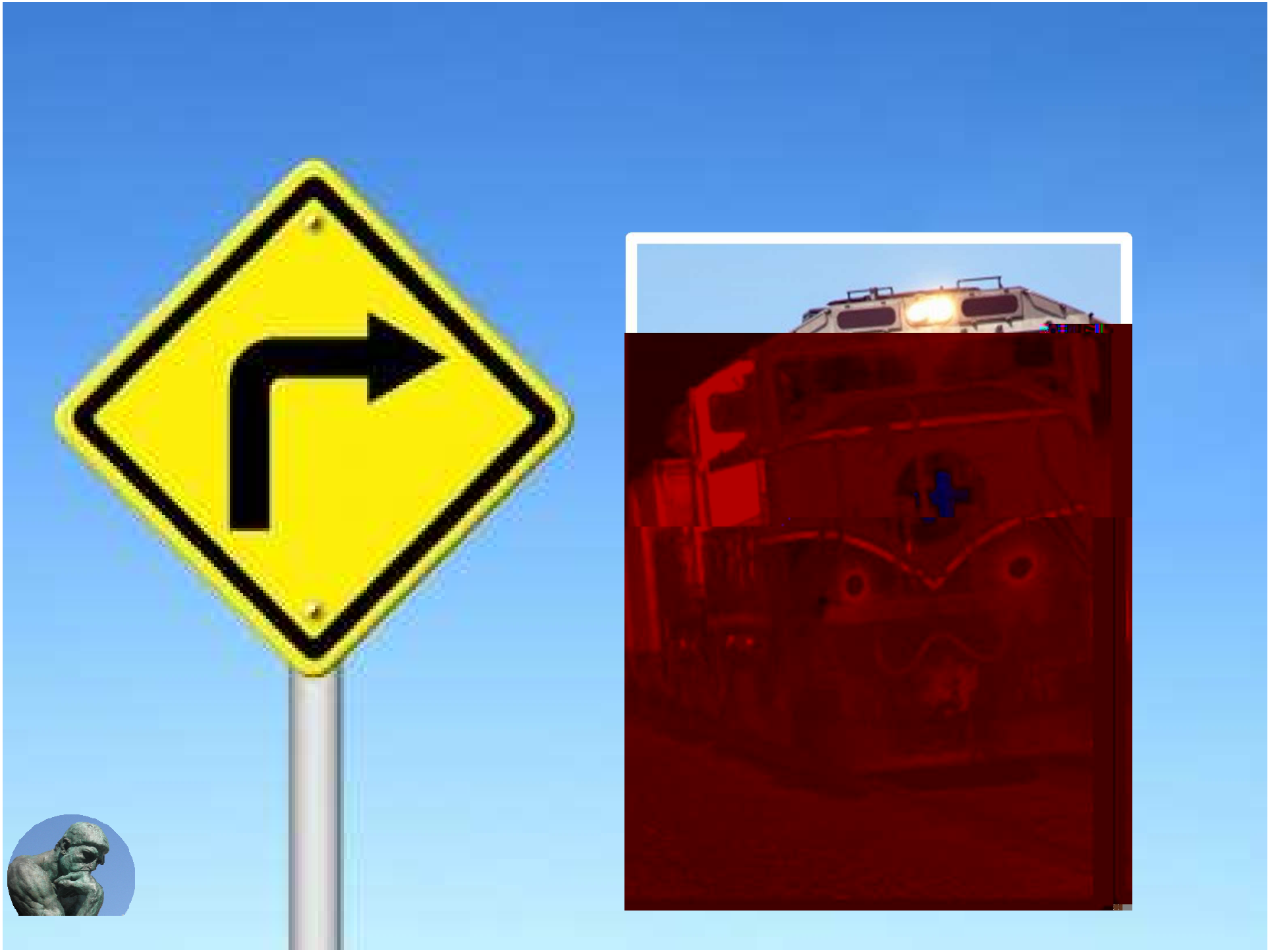
Automated vehicles in 10-20 years
Connected vehicles in 20-30 years
Life span of new roadway or bridge 20-40 years

Build in **pause points** in the planning and design process for large investments

Assess **options** for technology investments

Transformation of Transportation

Transformation of Transportation



The Future of Transportation

Prepare now for what' around the corner

Shelley Row Associates LLC
www.shelleyrow.com
@shelleyrow