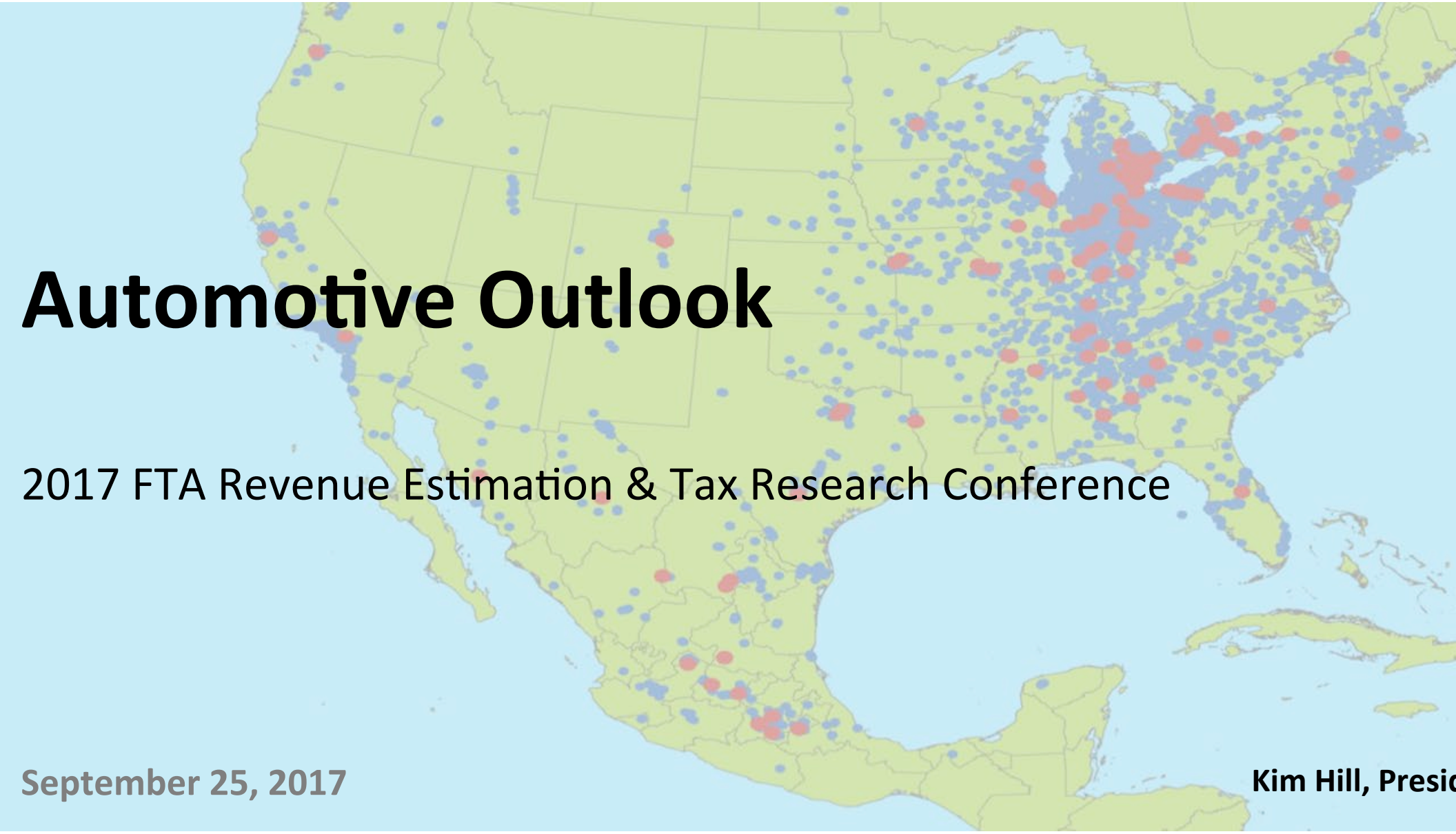


Automotive Outlook

2017 FTA Revenue Estimation & Tax Research Conference

September 25, 2017

Kim Hill, Presid

HWA Analytics LLC
Ann Arbor, Michigan

Agenda

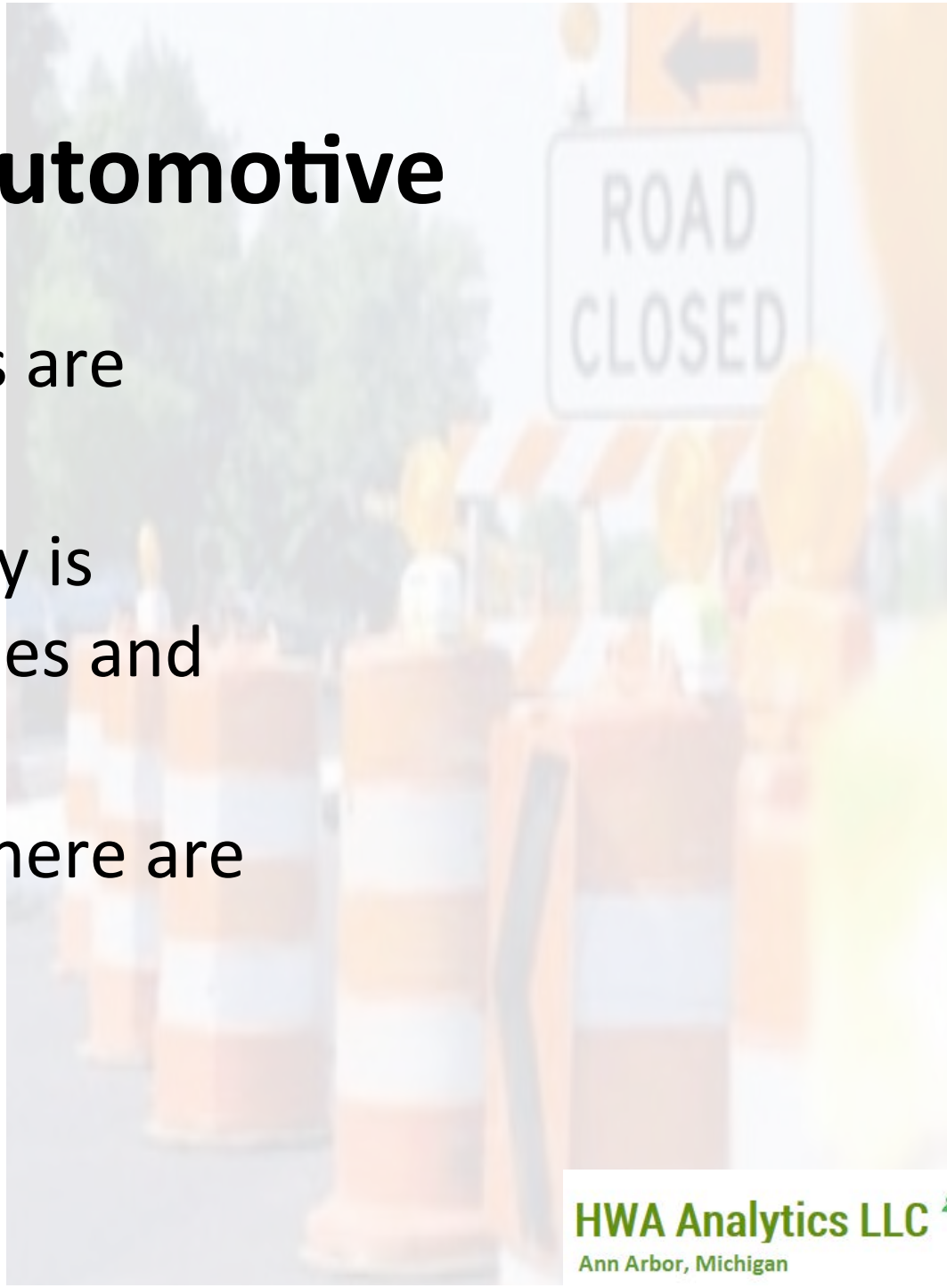
- Forecast of sales – next three years
- The U.S. auto industry/market is changing
- What will happen in next few years, and why
- Special topics on revenue
  - Forecast revenue implications for fuel efficiency/EV/autonomous
  - Revenue estimation in time of uncertainty

State of Automotive

Manufacturing—how vehicles are made and sold

Consumers—How the industry is changing: who's driving vehicles and how they are being driven

Policy—Maintaining roads: where are all the revenues?



A Strong Economy

Household wealth:

- Housing prices fully recovered
- Stock market above pre-recession peak

Economy speeding up:

- GDP growth— was 3% in the last quarter for the first time in a while – 3.5% in 3rdQ?

Unemployment is very low… 4.4% in August,

Tax reform?? Who knows?

- State tax deductions could be eliminated?

Auto Sales Leading Strong Economy

Auto sales have been growing faster than the economy

Affordable borrowing rates, high number of leases

Older market—average buyer is 51 years of age—purchase majority o
light trucks

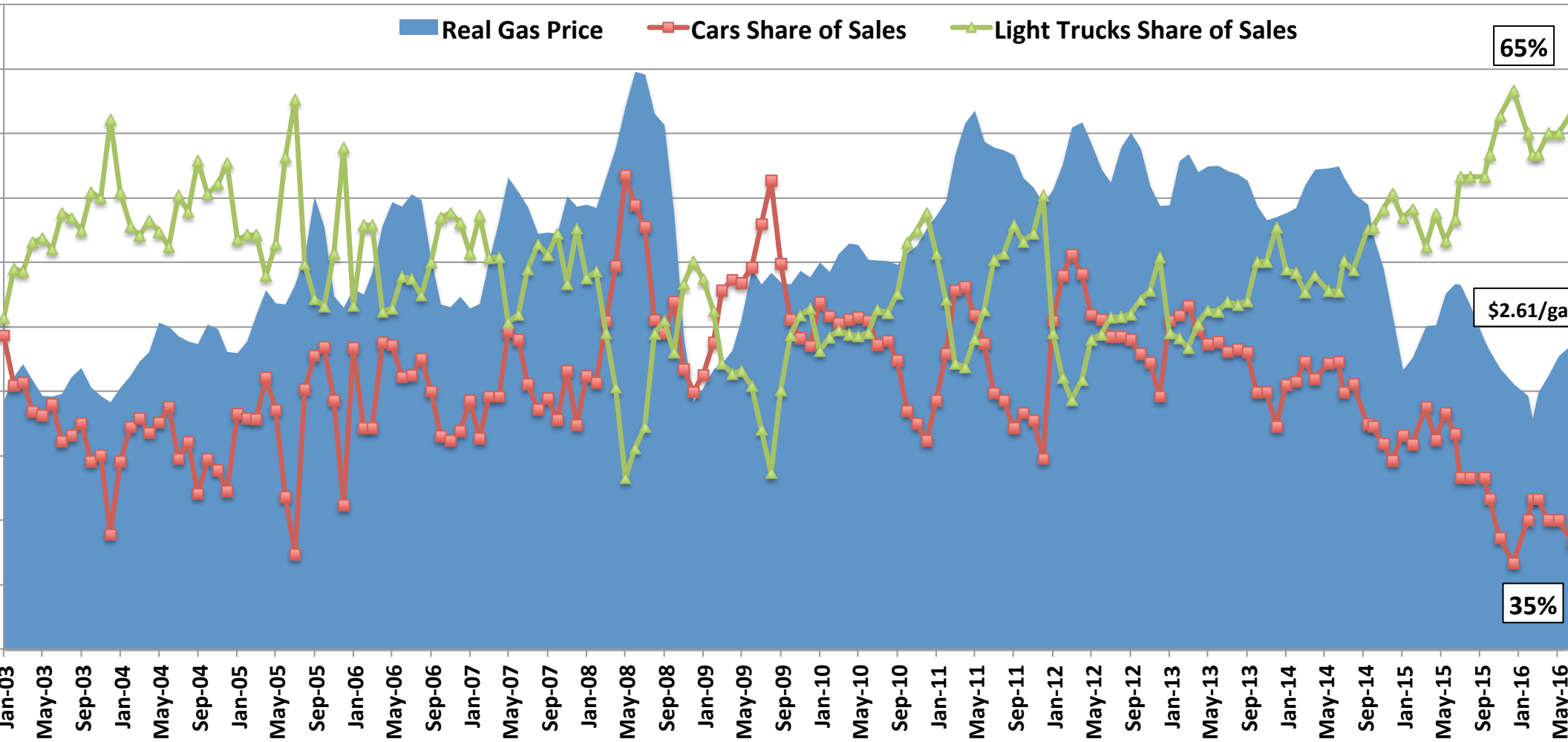
Average price of new vehicle—$33,000

Fleet sales down a lot

Recovery in sales is old and running out but revenue still increasing
(more truck sales)

Uber–Hertz: what are the sales implications?

Low Gas Prices Affecting the Mix



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What Is a Truck
$$$
$$$
$$$
EXTREME TERRAIN
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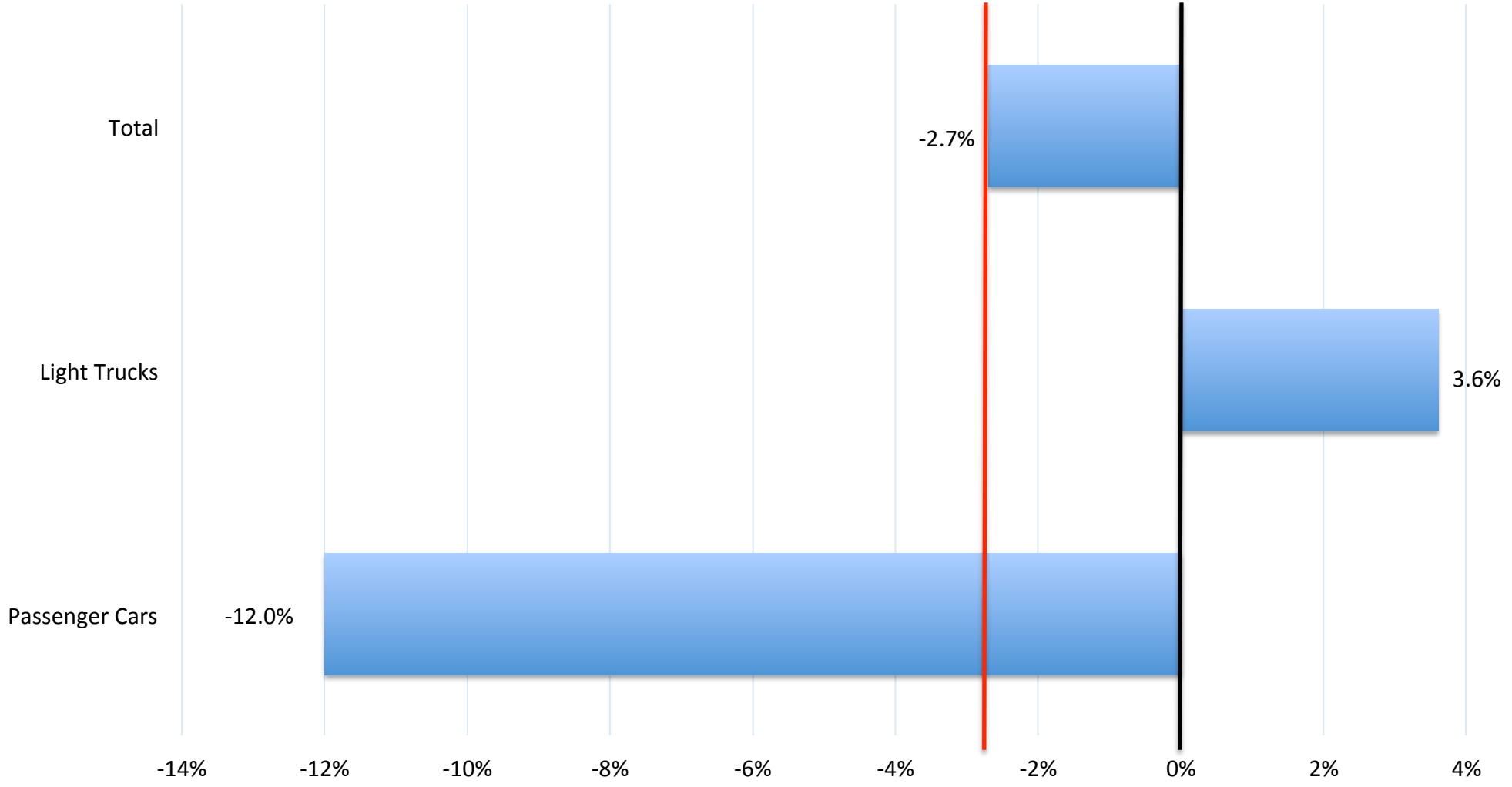
U.S. Light Vehicle Sales
Percent Change YTD Through August: 2016 vs. 2017



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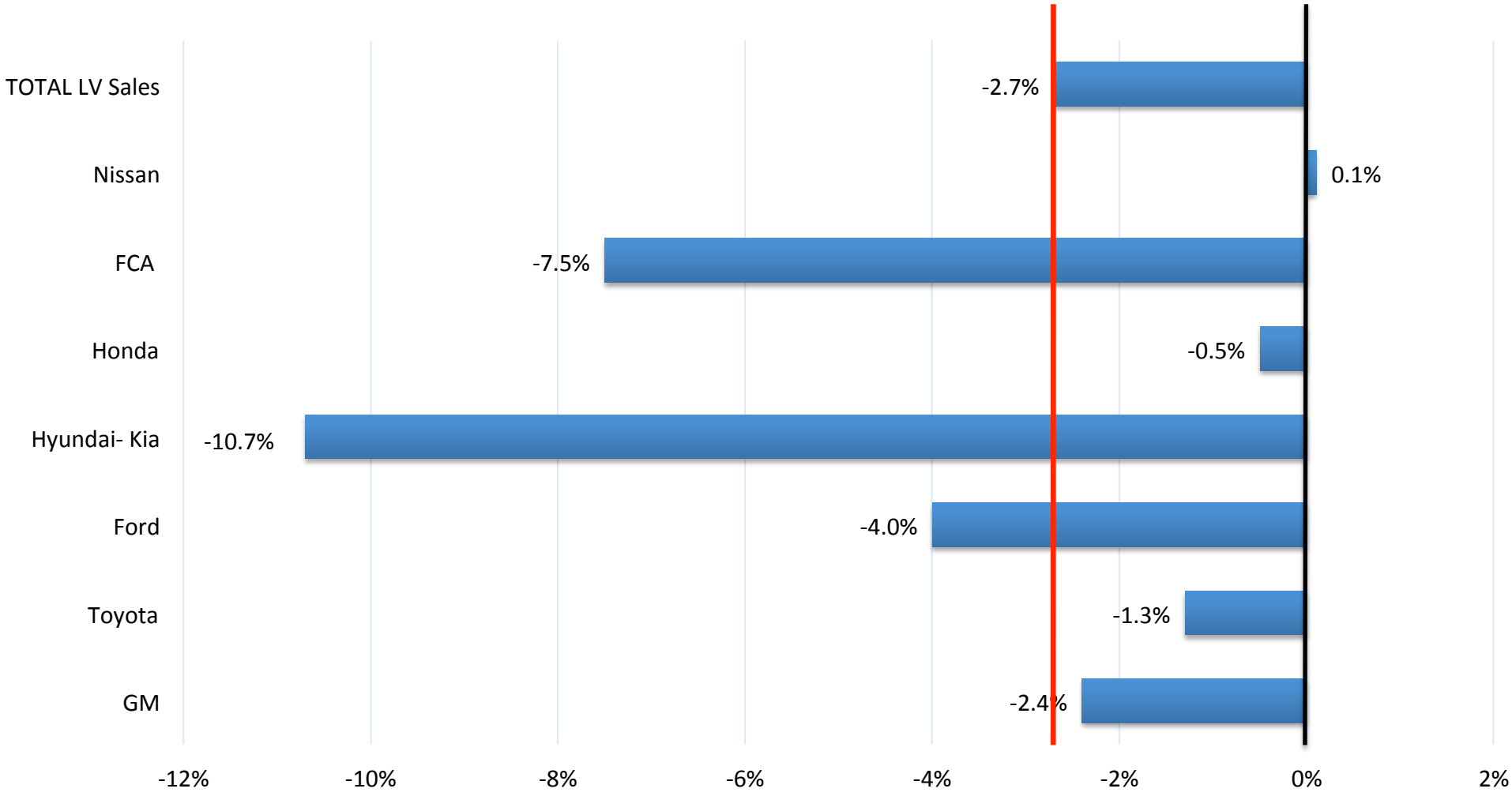
Percent Change in Sales of Light Vehicles Per OEM: YTD Through August: 2017 vs. 2016



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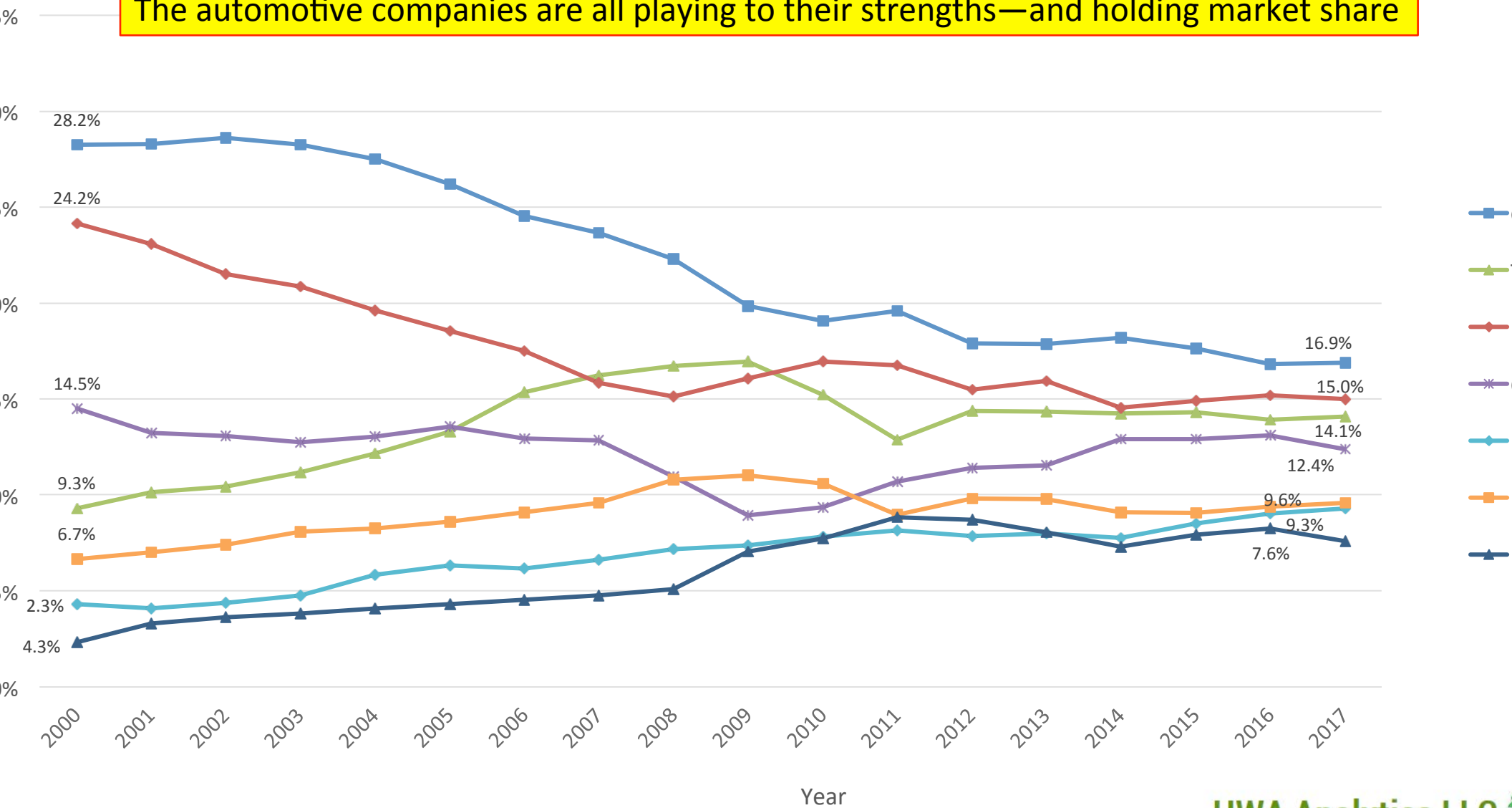
U.S. Market Share 2000 – 2017 YTD

The automotive companies are all playing to their strengths—and holding market share



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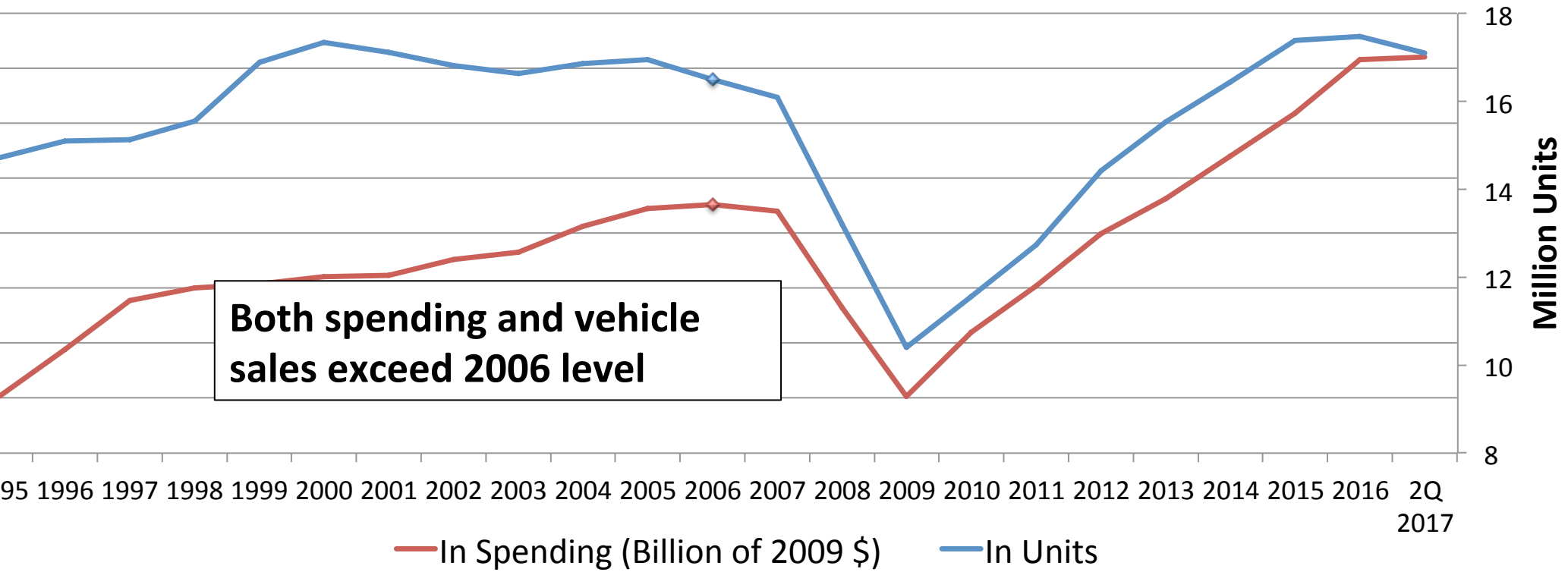
Sales Are Back and Revenues Have Never Been Higher

economy helped sales 99-06; recession took wind out 08-10; post recession growth and efficiencies 2011



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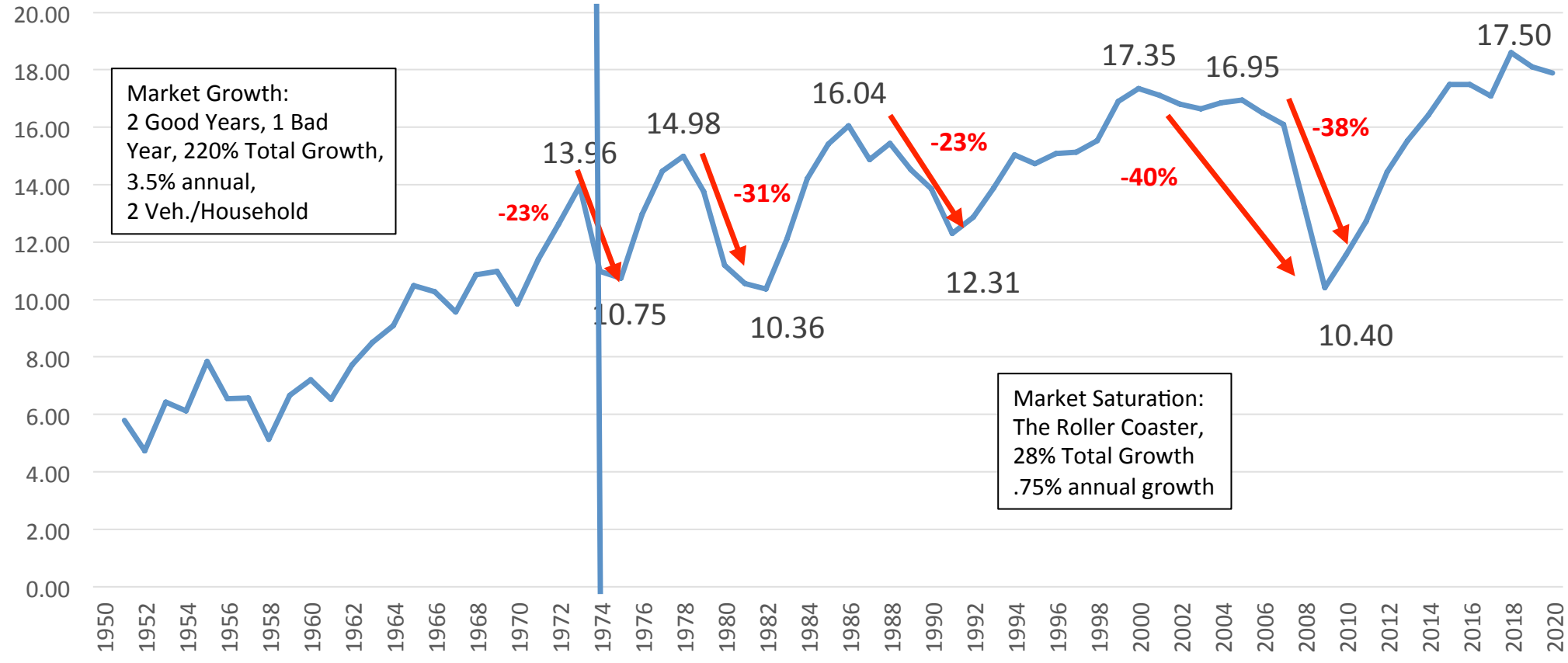
Don’t Really Want to Rain on the Parade . . Average Decline is (29%)



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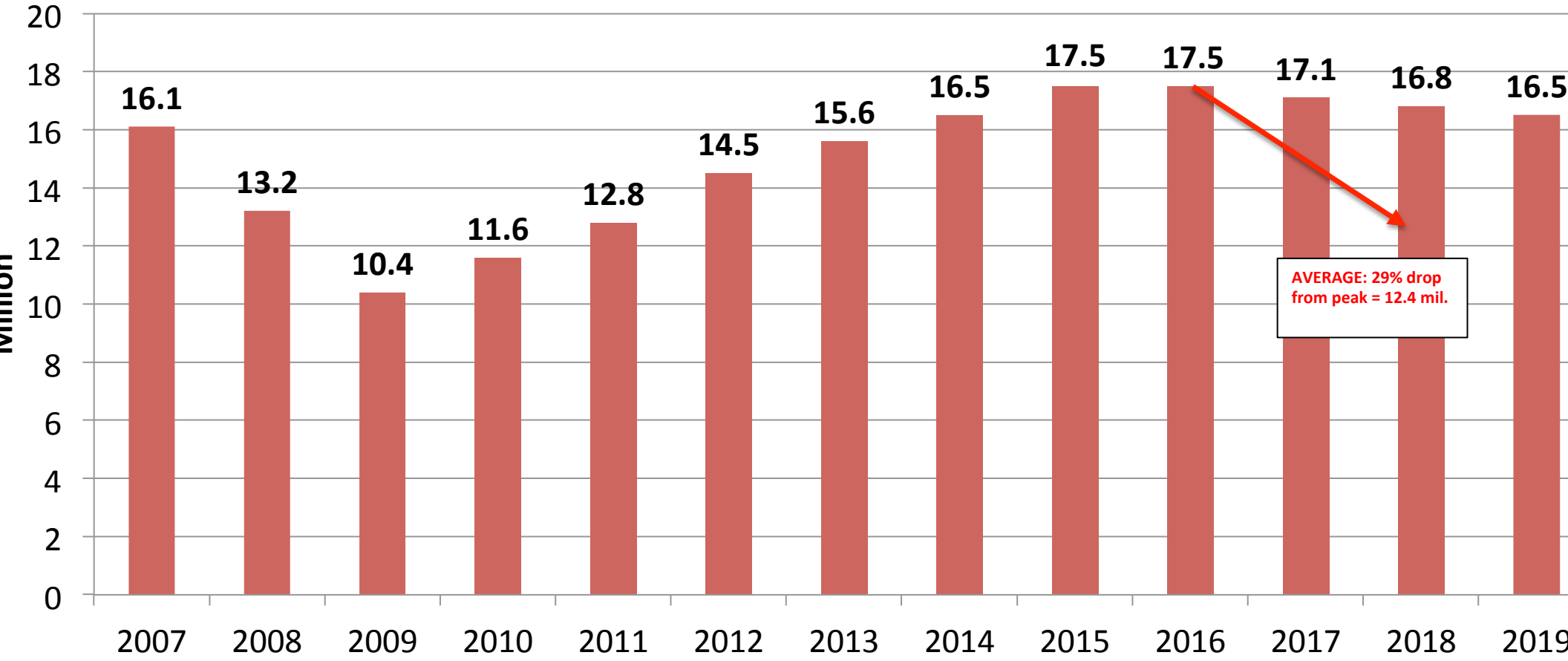
U.S. Sales on a Declining Plateau? We hope…



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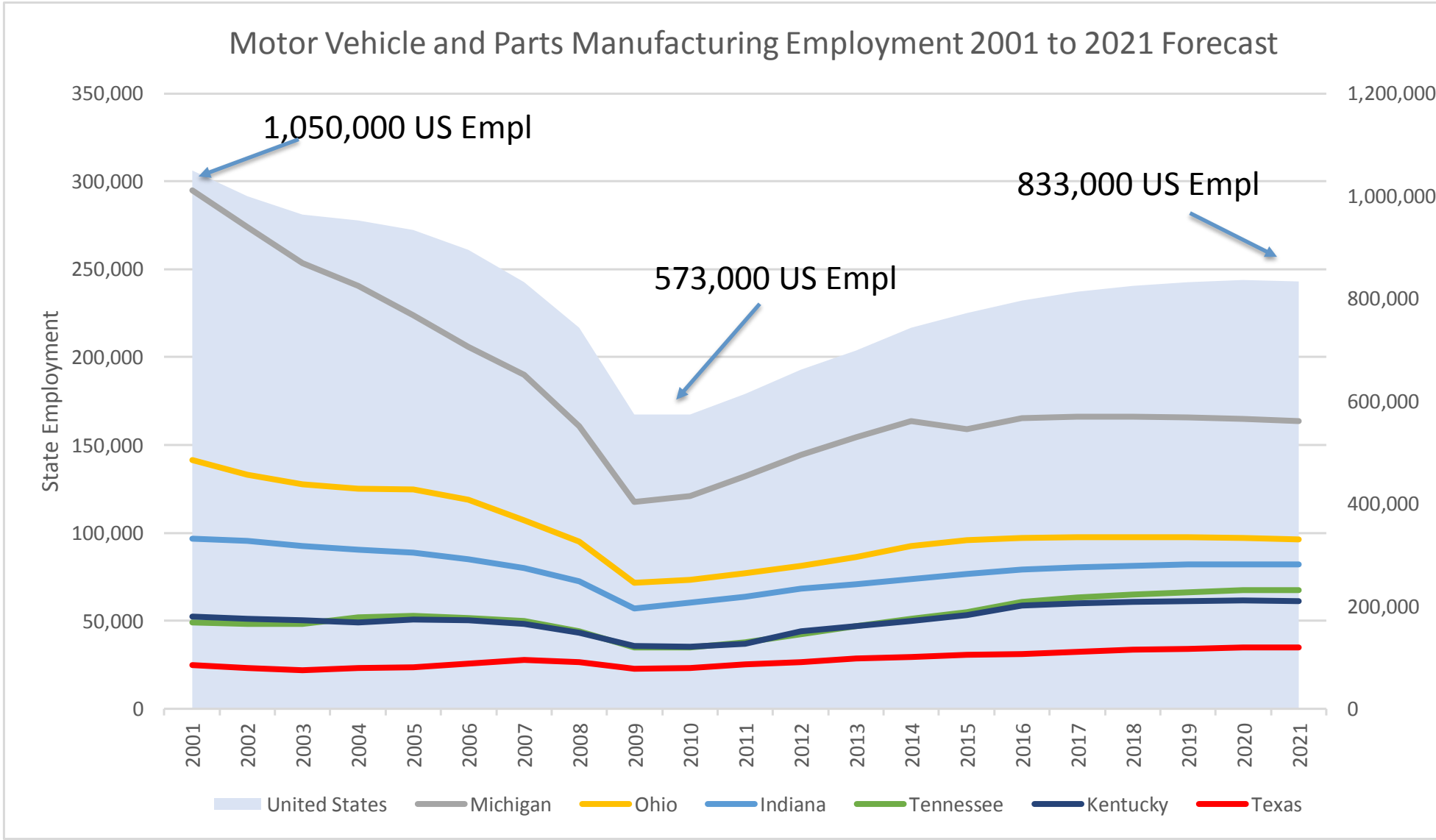
2017 U.S. Sales Forecasts (millions)

HWA Analytics, LLC	17.1	(9/17)
Kelley Blue Book THE TRUSTED RESOURCE	17.0	(8/16)
NADA	17.1	(7/17)
TRUECAR	17.1	(7/17)
WARDSAUTO	16.9	(8/17)
IHS GLOBAL INSIGHT	17.1	(8/17)
LMC AUTOMOTIVE	17.1	(8/17)

Automation threatens jobs in plants and at supplier companies



Source: Emsi 2017

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Other Factors

Implications of NAFTA renegotiations

- What auto plants are building sedans in U.S.? Fewer and fewer . .

What about new pickups coming—Hyundai, Mercedes (Toyota and Nissan tried this)?

Toyota/Mazda plant—where?

Detroit—Pickups—Ford, GM, FCA have almost 90% of market

How the Industry is Changing: Who Is Driving Vehicles and How They Are Being Driven

Automated trucks—Amazon, Uber, UPS

- Drivers needed?

Ride sharing threatening who owns and buys cars (consumers)

- Ride-share, on-demand
  - Maven; Zipcar
- Ride-hail
  - Uber; Lyft; Car2Go

se changes will affect volume of sales, number of vehicles on the road, and number of jo

The Industry Is Changing

What do Boston, Austin, Pittsburgh, San Jose, Waterloo (Ontario), Indianapolis, Columbus have in common (with Detroit)?

Mobility services

Self-driving vehicles

Electric

rrorLink

OTA

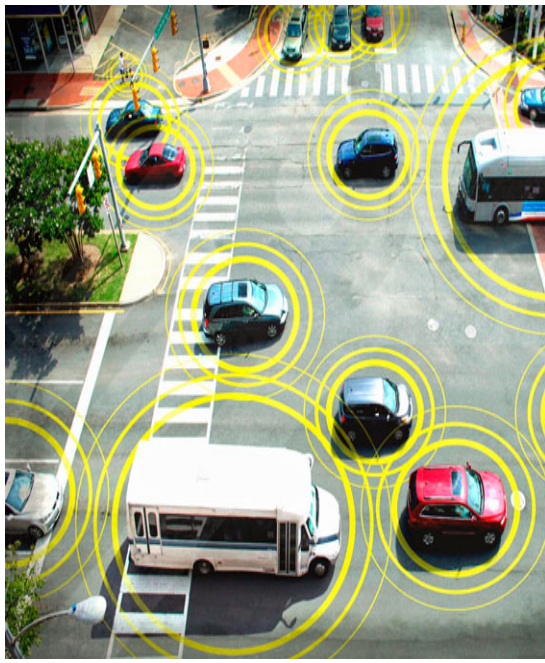
UBER

Apple CarPlay

TESLA

Google

intel



"Revolutionizing transportation for our customers while improving safety on roads is the goal of our autonomous vehicle technology"

Mary Barra, CEO, GM

In an age of constant innovation, mobility has outpaced our definitio the word. Our ability to move ours – and objects – has pushed beyond was previously imagined.

Ford Motor Company: Microtrend

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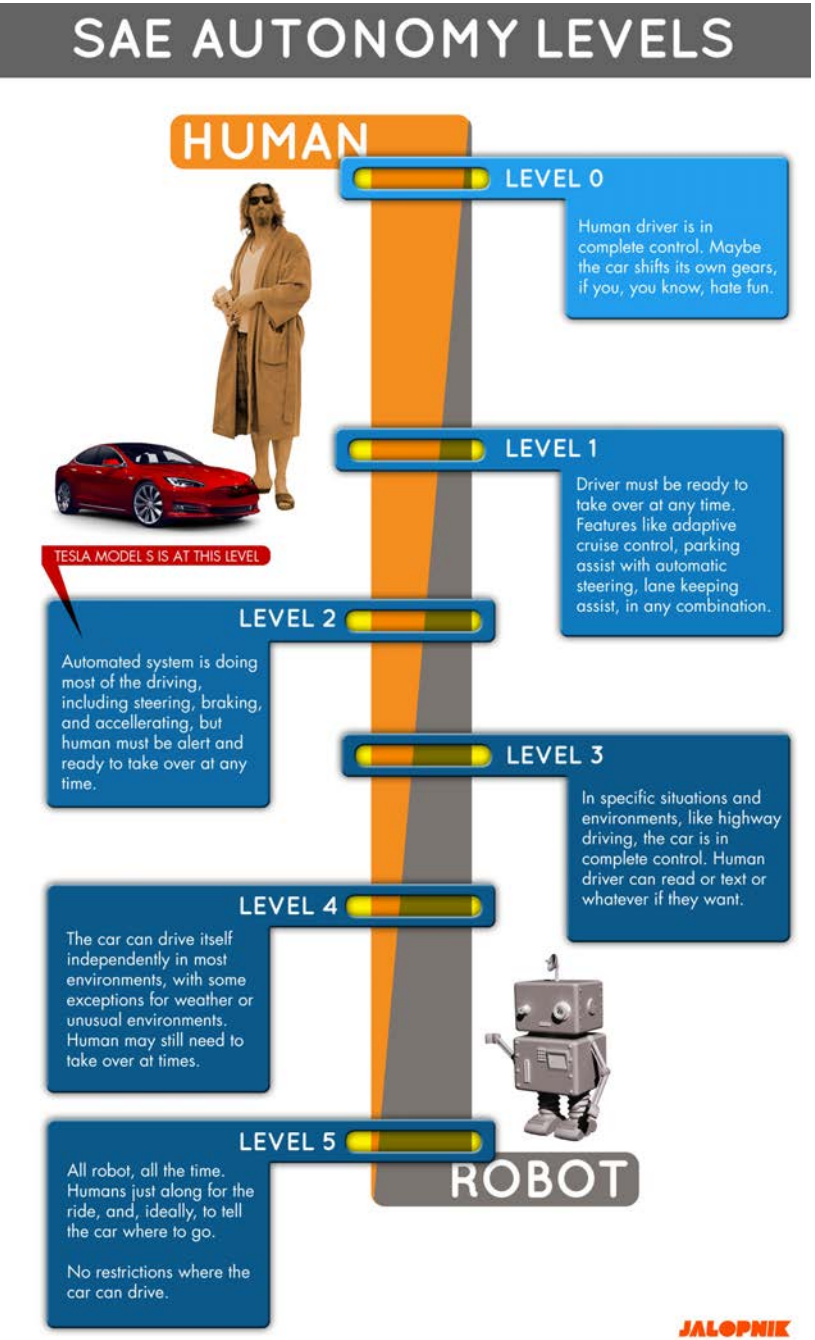

A Driverless Future?

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The Road to Level 5 and Full Battery Electric

Substantial change/new component

- Thermal
- Electrical/power supply
- Steering
- Braking
- Aerodynamics/NVH
- Driveline
- Electronics
- Battery
- Vision/lighting
- ADAS/Active safety
- Wheels/tires

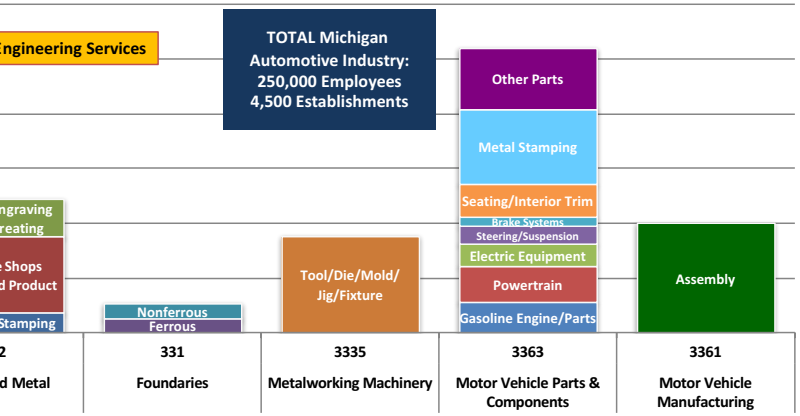
Modest change

- Fuel
- Propulsion
- Exhaust
- Suspension
- Interior
- Seating
- Exterior
- Passive safety

This Is Now…

What is Auto Manufacturing?

utomotive Employment and Establishments in Michigan



Bureau of Labor Statistics, QCEW

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- Computers and semi-conductors
- Professional and Technical Services
- Vehicle IT Platforms
- Advanced driver assistance systems
- Dedicated short range communications
- Autonomous vehicle operating systems
- Collision avoidance
- Connected vehicle services
- Connected vehicle ecosystem
- Navigation
- Systems integration
- Information technologies
- Passive safety
- Sensors
- Proximity sensors
- Microprocessors
- Embedded processors
- Testing services
- Software systems

- Artificial intelligence
- Deep learning
- Autonomous cars
- Haptic touch control
- Haptic feedback techn
- Gesture and motion de systems
- Human-machine interf
- Speech recognition tec
- Machine learning
- After-market autopilot
- Radar
- Lidar—light-based rad
- GPS
- EV charging systems
- Antenna systems
- Onboard communicati
- Computer vision syste
- Vehicle cameras
- Simulation systems

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Suppliers

dapt

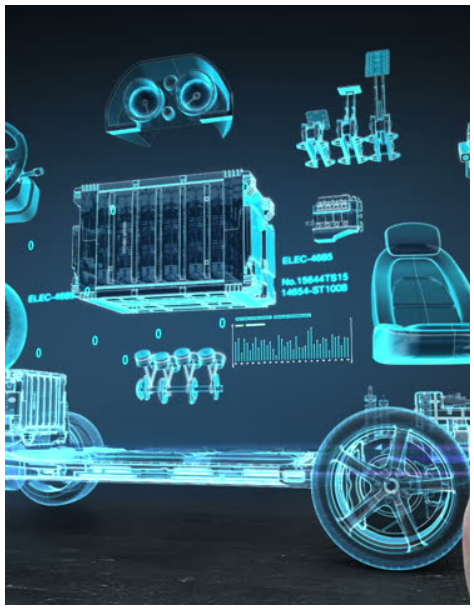
- Was GM, Toyota, etc., now Google, Apple or ??

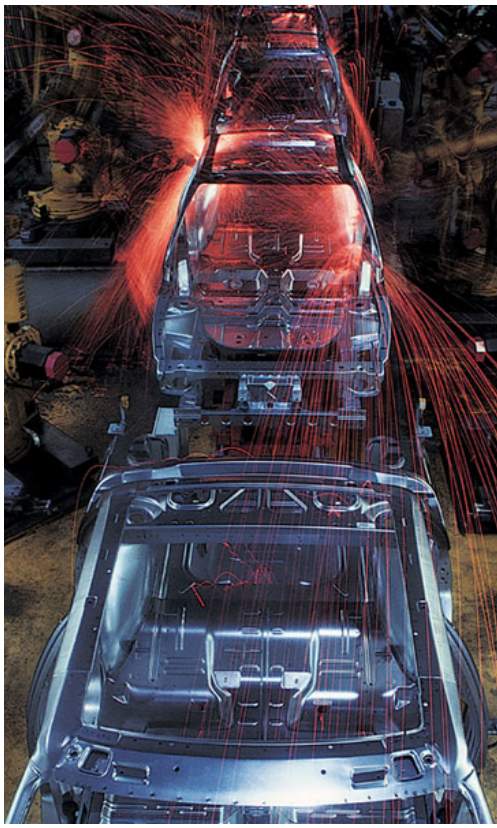
lign

- Tech and Auto do not know each other's industry – they think they do

rategize and Collaborate

- Tech companies looking at component suppliers as a way into the auto industry





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Policy: What About the Revenues?

Who pays taxes for roads (maintenance)

In 2016, state DOT's spent $97 billion on highways while revenues were only $72 billio

- You can't import highways…you either do it, or you don't

But…where does the money come from???

Vehicle Taxes and Fees—How does mobility change this?

Tax Category		State ($M)	Federal ($M)
Sales Tax Revenues ($ Millions)	New Vehicles	21,997	
	Used Vehicles	12,084	
	Parts/Services	4,831	
Use Tax Revenues ($ Millions)	Fuel	40,135	36,000
	Title/Registration	23,304	
	Driver License	2,513	
Business Taxes ($ Millions)	Manufacturers	762	
	Dealerships	995	
ate and Local Employee Personal Income Taxes ($ Millions)	Automaker	1,352	21,883
	Supplier	1,192	20,485
	Dealer	1,108	18,332
L TAXES PAID TO GOVERNMENT ($ Millions)	AUTO SECTOR	**$ 110,273**	**$ 96,700**
	TOTAL	$ 846,214	
	% AUTO	13%	

The production, sale, maintenance, and use of an automobile all contribute to state coffers

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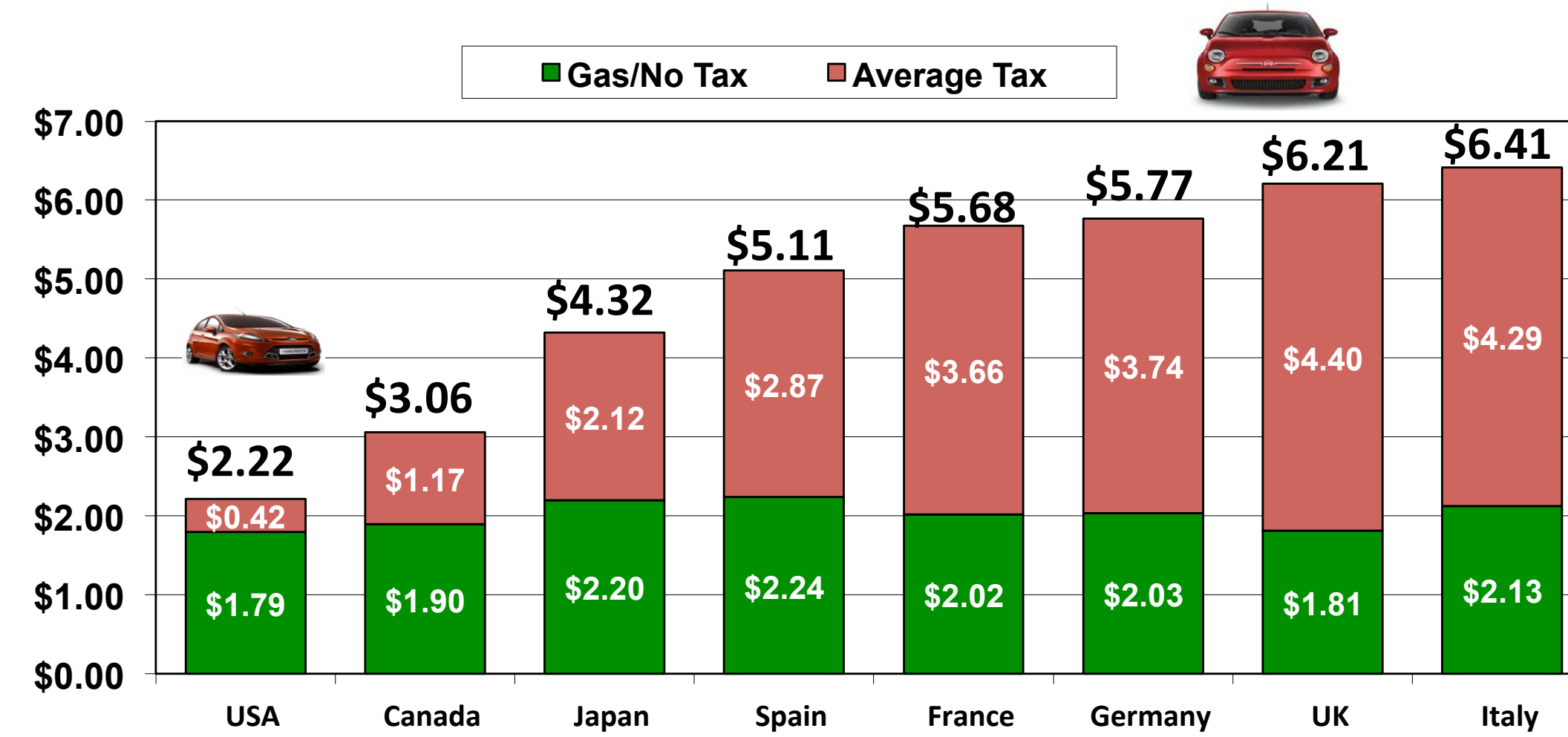
hese Will Affect State Revenue Stream

- Mobility
- Self-driving vehicles
- Electrification

ow much will your state's revenues change?

- $$ millions less in fuel efficiency alone…

Average End User Gasoline Prices per Gallon (USD)



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Mobility Impacts

What will happen to VMT rate? Will people commute further? Will autonomous vehicles increas commuting distances?

Road maintenance could continue to increase

Funding for new infrastructure—hard(roads, bridges) and soft(electronic, sensors, etc.)

Are current roads and highways ready to handle self-driving/connected cars, or are major improvements/modifications necessary?

What is the phase-in rate at current estimates, and once the technology is proven?

What about parking in urban areas? What becomes of parking lots?

What will happen to displaced workers from the trucking, manufacturing, chauffeur industries?

Will self-driving and ride-hailing cars replace mass transit?

- Evidence this is already happening—NYC, WDC, Boston

A lot of cost savings in autonomy, and safety—no accidents, tow trucks, bump shops, speeding tickets

Outlook is Holding

Sales down for the year

- Yet should stay above 16.5 million units in the next three years
- Extended finance terms and high lease rates underscore industry's willingness to assist buyers in getting a new vehicle
- Incentives climbing higher – especially on cars
- Fleet sales down, used vehicles more competitive (lower prices)

Truck-type products are selling well—high margins

- Passenger car sales at recession levels

Car-type products being moved out of country

- Low margins, difficult to build profitably in U.S.

5% of sales will be self-driving in 2025, 30% in 2030

HWA can help sort this out

Forecast realistic transportation changes by state through 2025, 2030

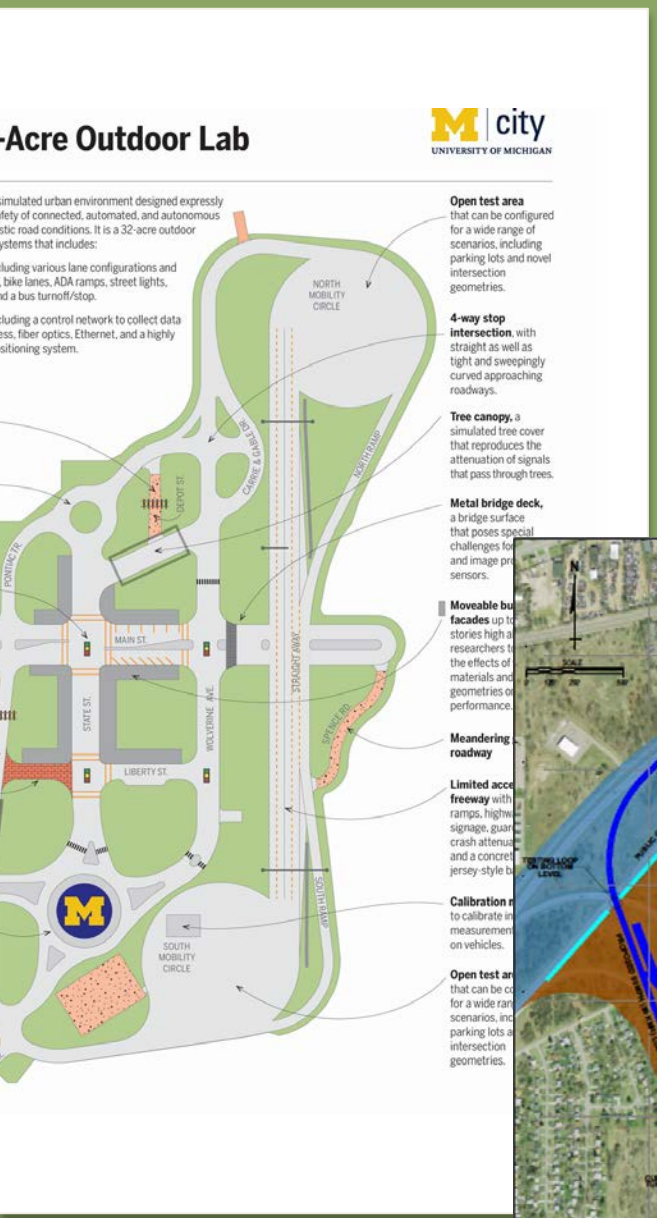
- Construct scenarios for electrification, mobility services, autonomous driving

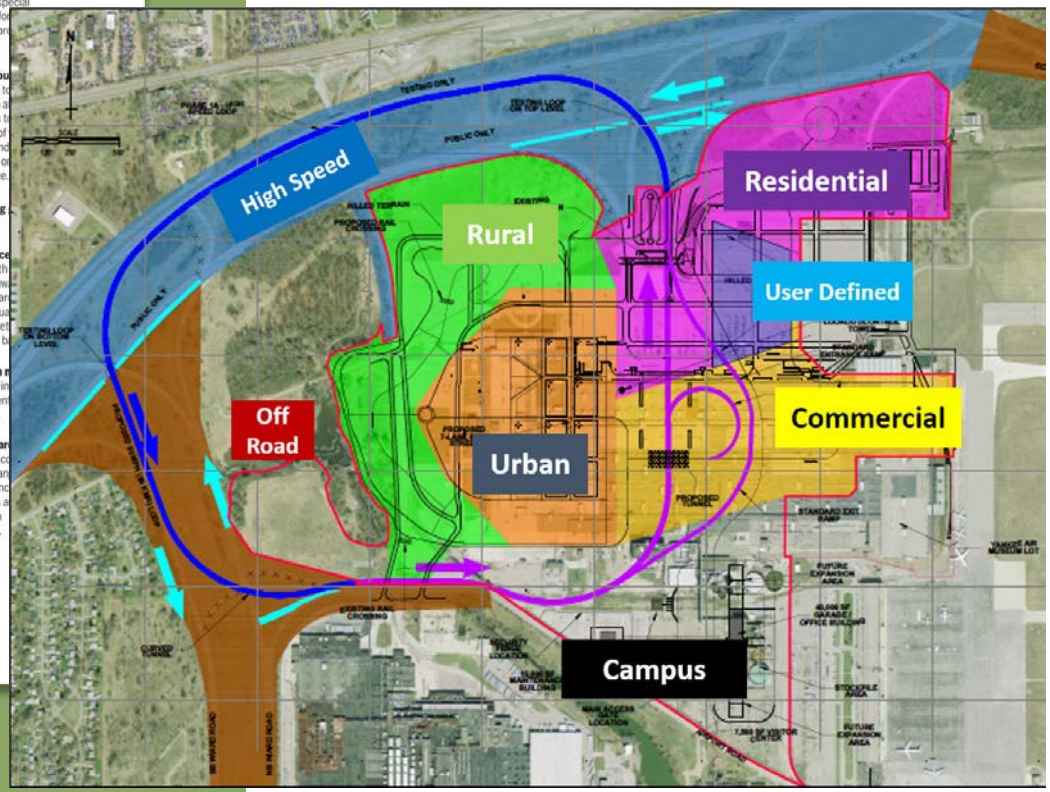
Using scenarios, forecast change in transportation cost/revenue through 2025, 2030 by state:

- Fuel use taxes, operator taxes, registration fees, etc.

Evaluate effect of various revenue policies given changes in transportation activity and modes

Also need direct input from industry





Thank you

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