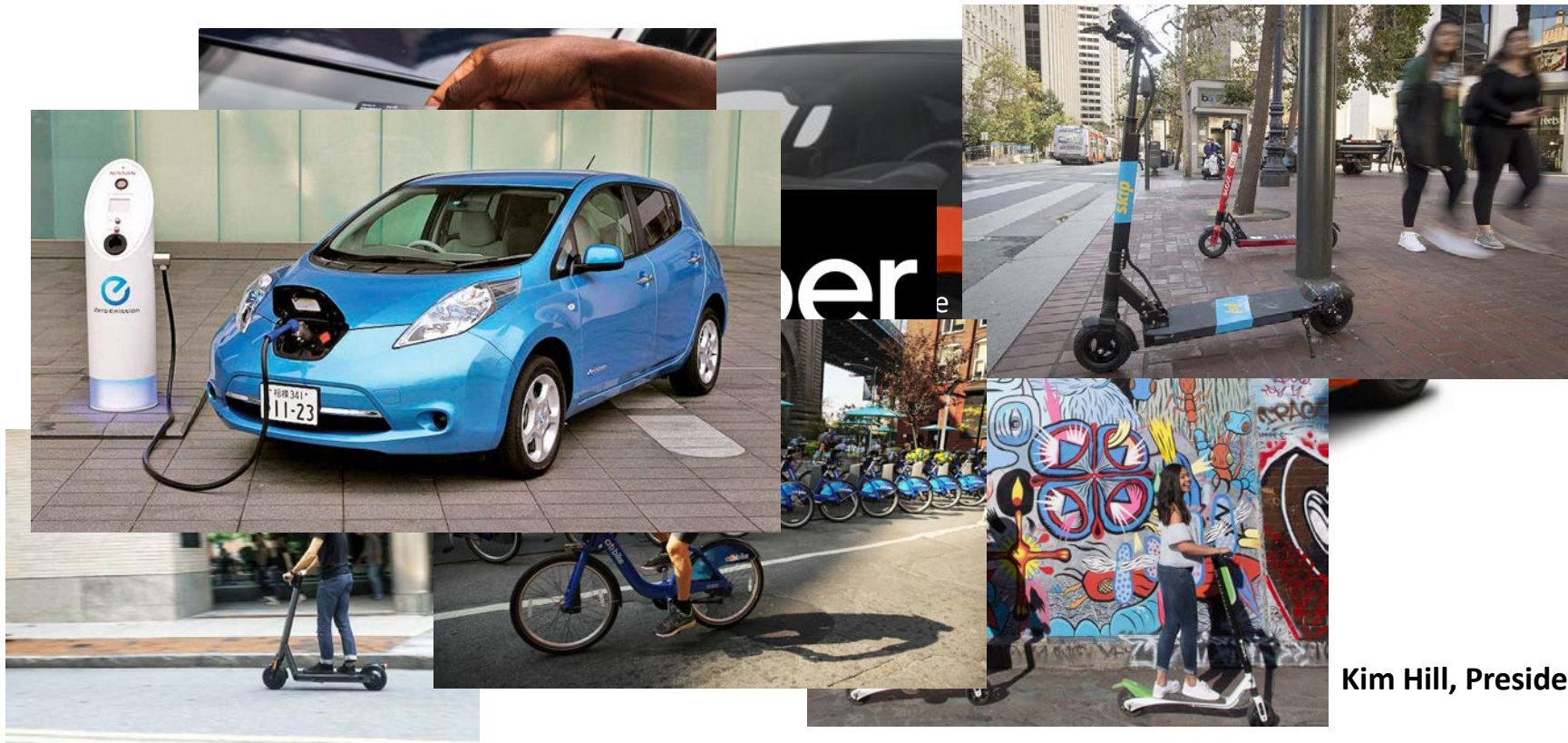


# Automotive Outlook



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# Agenda

- The numbers
- GM-the strike (or not)
- Mexico/trade/tariffs
- Capital investments
- Rivian
- Technology (electrics set to fly?)

A 3D visualization of data. It features a series of seven red cylindrical bars of varying heights, arranged in a line that generally trends upwards from left to right. A thick, light green arrow is superimposed over the bars, starting from the bottom left and pointing towards the top right, indicating a positive trend or growth. The background is a light blue grid pattern that recedes into the distance, creating a sense of depth.

# The Numbers

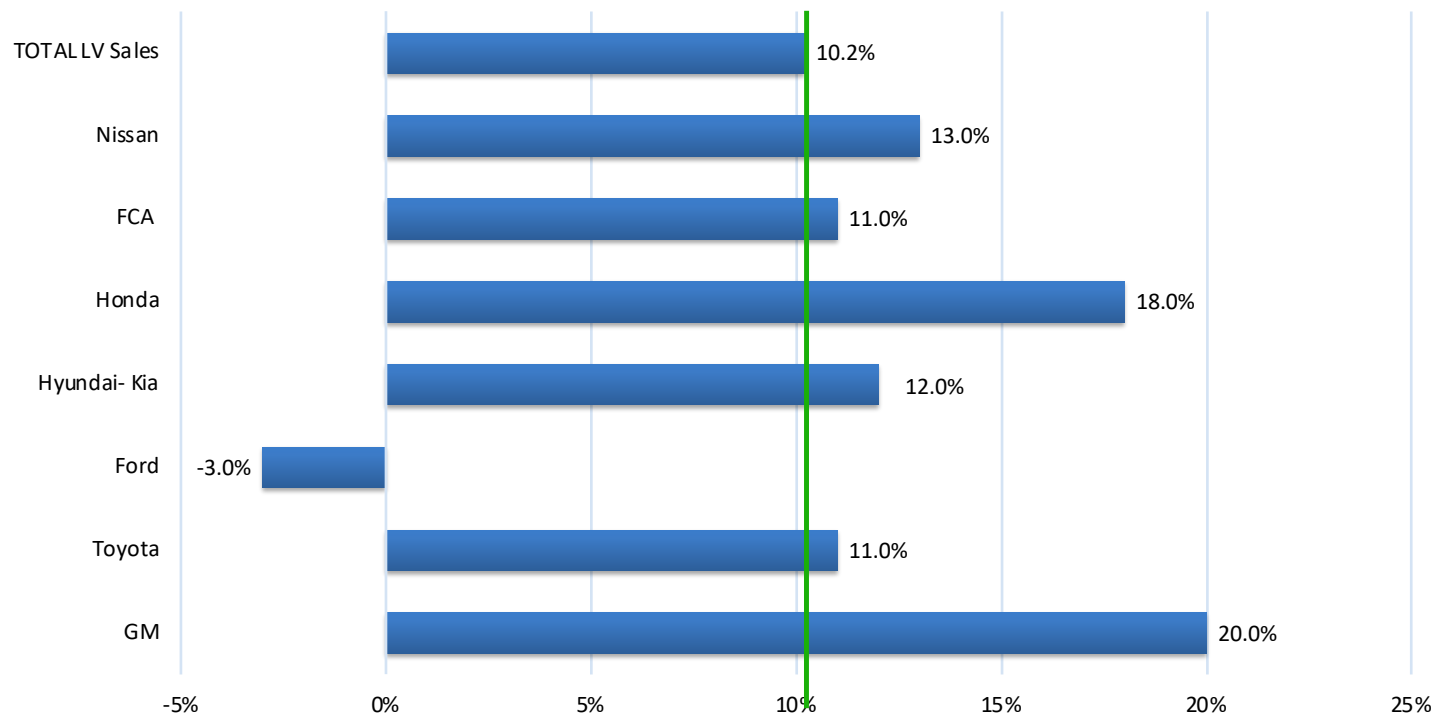
## August truck and car sales

- Ford, GM, Chrysler only report quarterly sales now
- Those who are reporting truck sales show double-digit increases for August
- Total vehicle sales up 0.7% YTD
- Total vehicles up 10% compared to last August
- What role incentives and fleet sales

## August sales indicate momentum

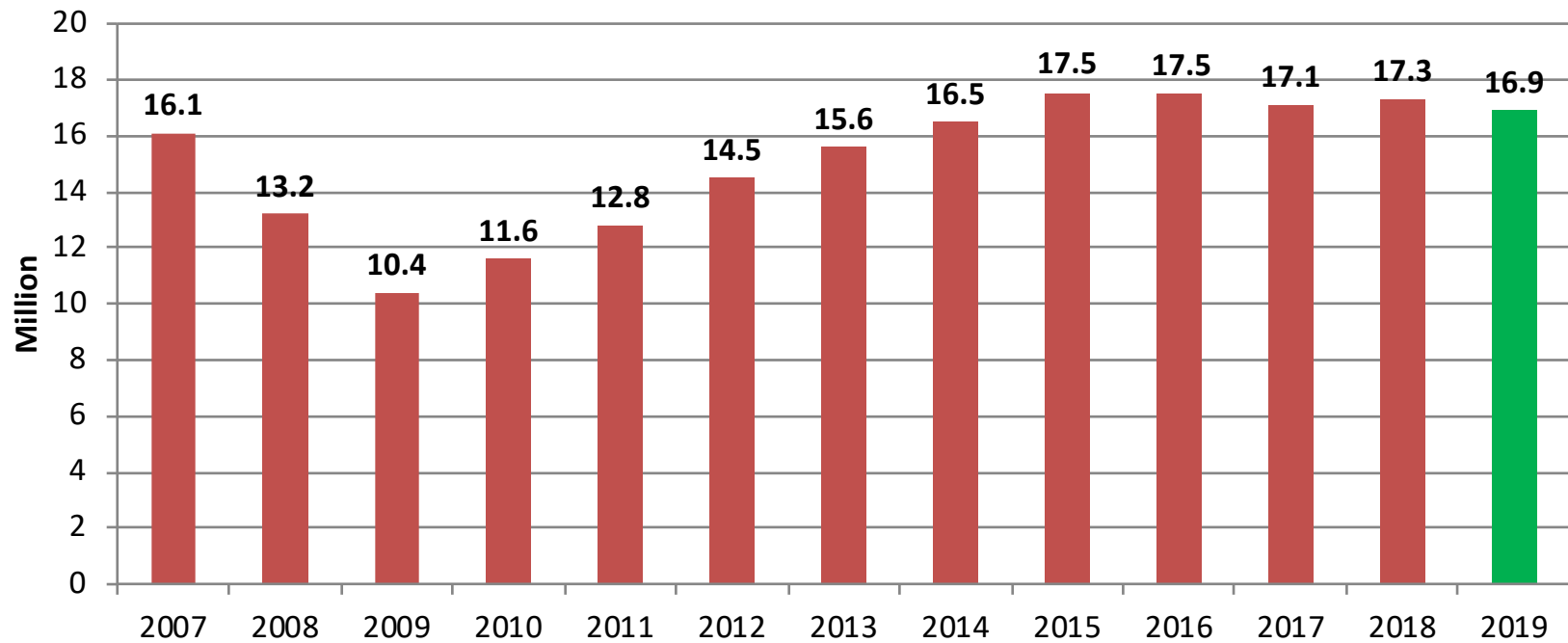
- The seasonally adjusted, annualized sales rate 17.07 million
- It's the fourth time this year at 17 million or more
  - three out of the last four months.
- Across the industry, U.S. light-vehicle sales rose 10.2 percent in August

# Percent Change in Sales of Light Vehicles Per OEM: August: 2019 vs. 2018

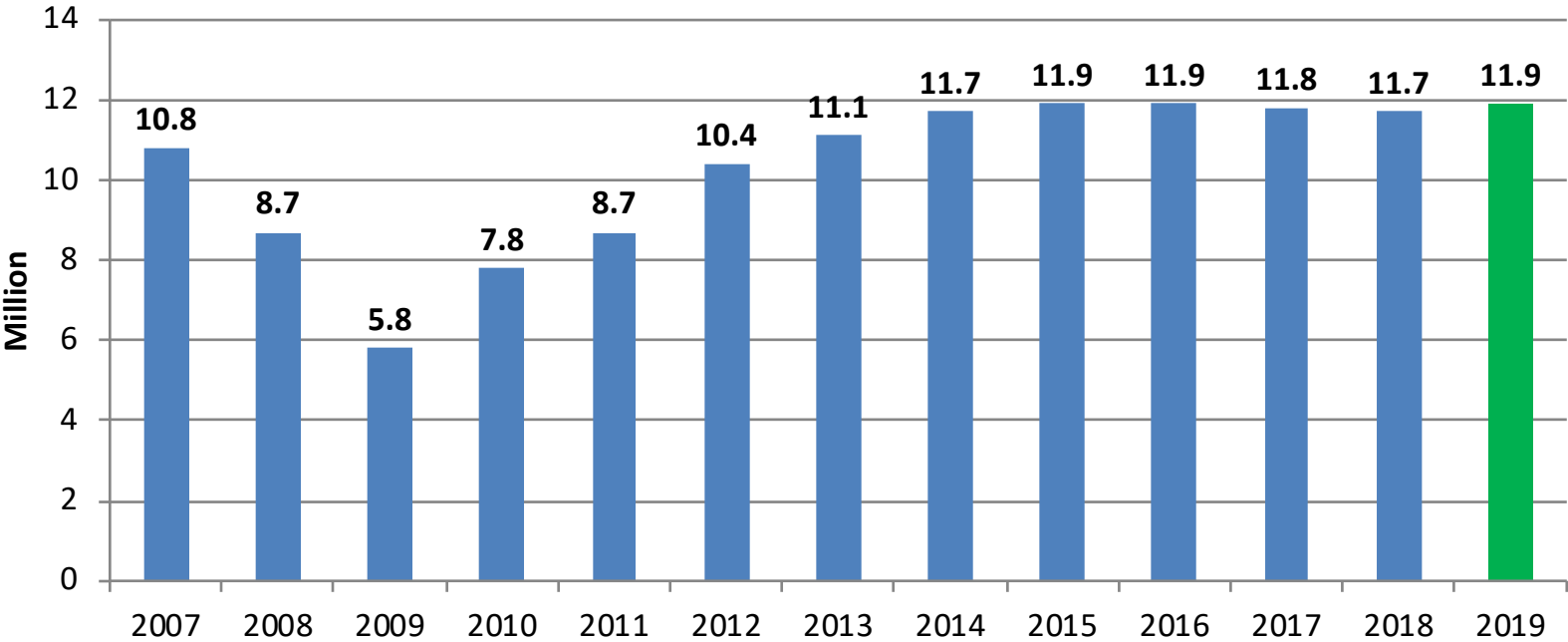


Source: Automotive News

## U.S. Sales: slight decline—upward revision possible ...



# U.S. Vehicle Production remains steady-GM may impact...Soon





# Plant overtime



## FCA

Jefferson North-truck  
Sterling Hts-truck  
Toledo North-truck  
Warren, MI-truck

## Ford

Chicago-truck  
Dearborn-truck  
Kansas City-truck  
Louisville Assembly-truck  
Kentucky Truck-truck

## General Motors

Arlington-truck  
Bowling Green-car  
Ingersoll, Ont-truck  
Lansing-truck  
Wentzville, MO-truck

## Hyundai

Montgomery, AL-car/truck



The trucks are still taking over



## GM-the strike: This will be tough

- Equal pay for recent hires
- Healthcare
  - Area for potential cost savings
- Guaranteed products
- Reopen idled plants
  - Notes from Janesville
  - \$195M subsidies at Lordstown since 2002
  - Estimates say GM has +1 M excess capacity
- Union says they gave a lot post-recession—time for payback





The background of the slide is a repeating pattern of US one hundred dollar bills, oriented vertically. The bills are slightly faded and overlap each other, creating a textured, financial theme.

# Capital Investments



# Or in this case, disinvestment

- Ford and Chrysler have virtually stopped making conventional family sedans and compact cars
  - Except muscle cars—Mustang, Challenger
  - Fusion, Focus gone—\$11 B investment in 40 electrified vehicles, including...a pickup truck!

# Sedans—who needs them?

## Famous last words...

- Ford (and many others) is investing in expanding SUV and pickup lineup, electrified vehicles, autonomous, and connected technologies
  - “...better businesses than traditional sedans...”
  - Ford estimates AVs will last 4 years as a result of shared self-driving, thus replacing more frequently

# Notable investments

- Chrysler building new factory in Detroit
- Mahindra possible at ex-Buick City
- Toyota/Mazda plant opening soon in AL
- SF Motors (Chinese) purchase one half of American General plant in IN.
  - \$100 million for 700,000 sq ft facility
  - Build electric vehicles
- Used plants are becoming a hot commodity
- Fate of Lordstown, Hamtramck?
  - Could be a whipsaw...MI or Ohio
  - sounds like GM/State of Ohio have a buyer—dubious...



# Why is auto important?

- Among countries composing the major economies of the world, the so-called “Group of 20,” every country except one—Saudi Arabia— manufactures autos.\*

G20 members are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States and the European Union.

Source: Alliance of Automobile Manufacturers

# NATIONAL IMPACT

- 17.3 Million New Vehicles Sold in 2018
- 4th Best Sales Year in U.S. History
- 44 States Have 20,000+ Auto Jobs\*
- 24 States Have 100,000+ Auto Jobs\*
- \$205 billion in federal and state revenue from manufacture, sale and maintenance of automobiles

\*Includes assembly, parts operations, and dealers

Source: Alliance of Automobile Manufacturers

## **NINE OUT OF TEN AMERICANS SAY MANUFACTURING IMPORTANT**

- "How important is the link between a country's manufacturing sector and its status as a world power?"
  - 89% say very, or somewhat important
- "How important is it to manufacture cars and light trucks in America?"
  - 92% say very or somewhat important

Source: Alliance of Automobile Manufacturers survey

# Mexico/trade/tariffs



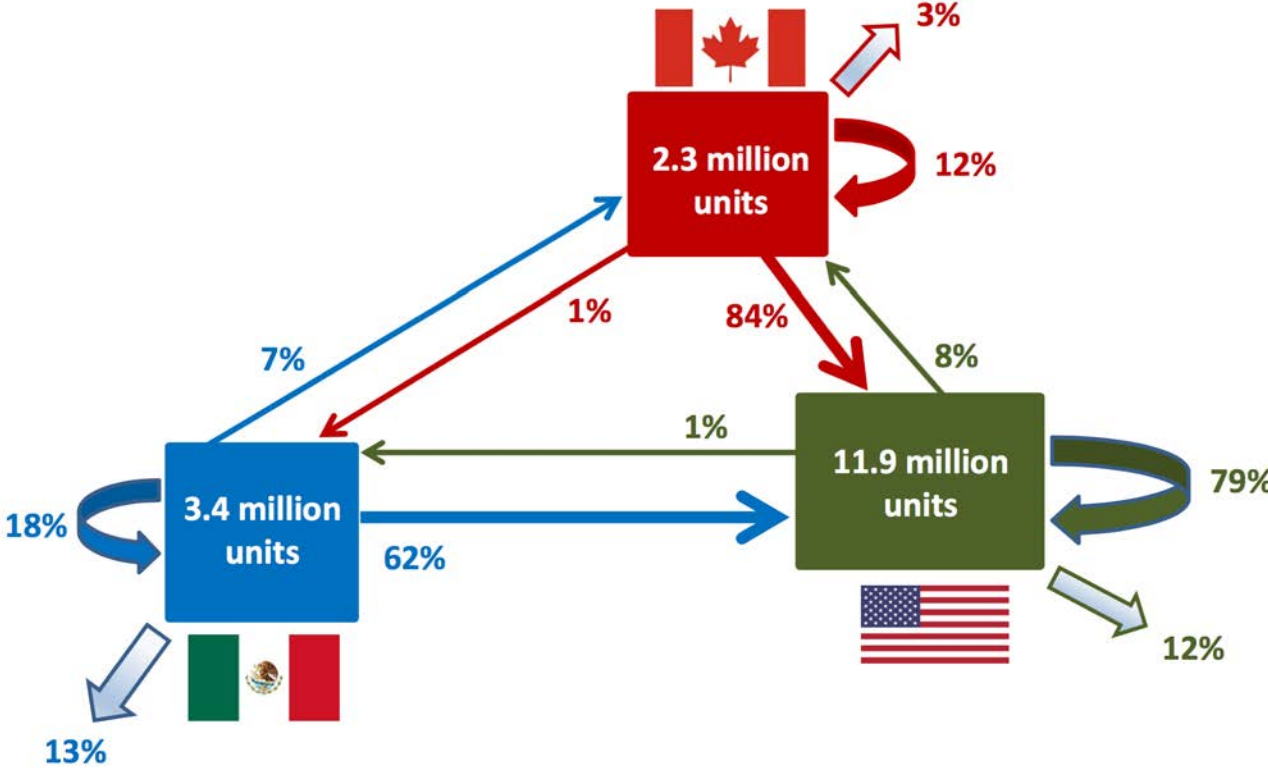
# U.S.-Mexico-Canada Agreement

## Overview

- Replaces NAFTA
- Increases Regional Value Content (RVC) Requirements
  - More engine, transmission production in U.S. to meet content quotas
  - Typically \$300-\$500 million investment in new plant, up to 750 employees
- Adds new requirements for OEMs:
  - Labor Value Content (LVC): 40% - 45% of vehicle made by \$16/hr employees
  - 70% Steel, 70% aluminum N.A. annual purchases
- Target Start Date – Jan. 1, 2020
- • 3-Yr phase-in period with potential 5-Yr transition (“Alternative Staging”)
- Enforced at both Supplier and OEM level
- Goods that fail to meet minimum thresholds subject to prevailing tariff rate (most components, passenger cars 2.5% - pick-up trucks 25%)
- Different rules for categories of vehicles / parts (passenger, light trucks, heavy trucks, “other”)
- Automakers who source a lot of parts from overseas at risk—Hyundai, Kia, VW
- In the end, companies will adjust and more higher margin vehicles will be built in U.S.

Source: MEMA

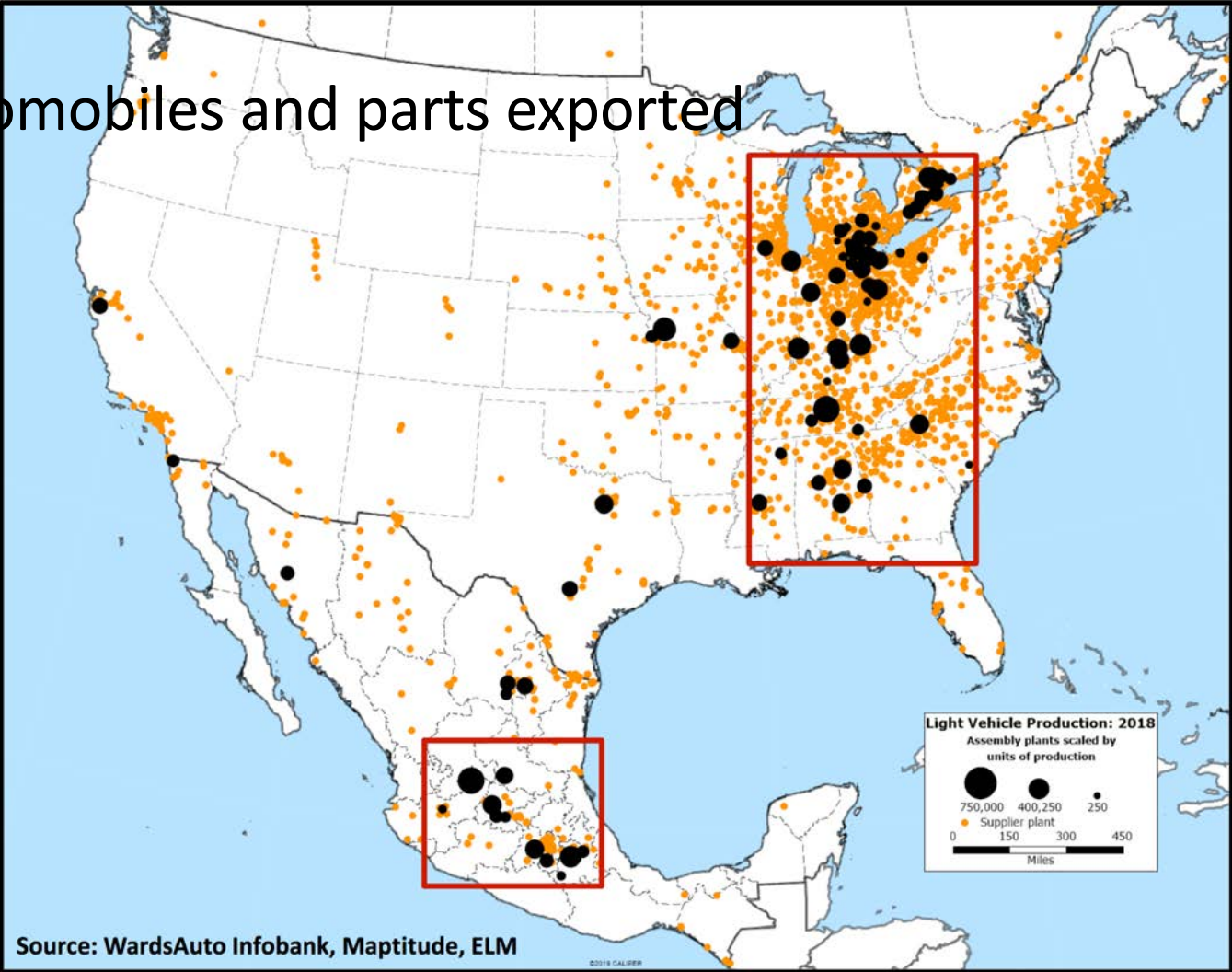
# Where do the vehicles go?



Source: Chicago Fed, Thomas Klier



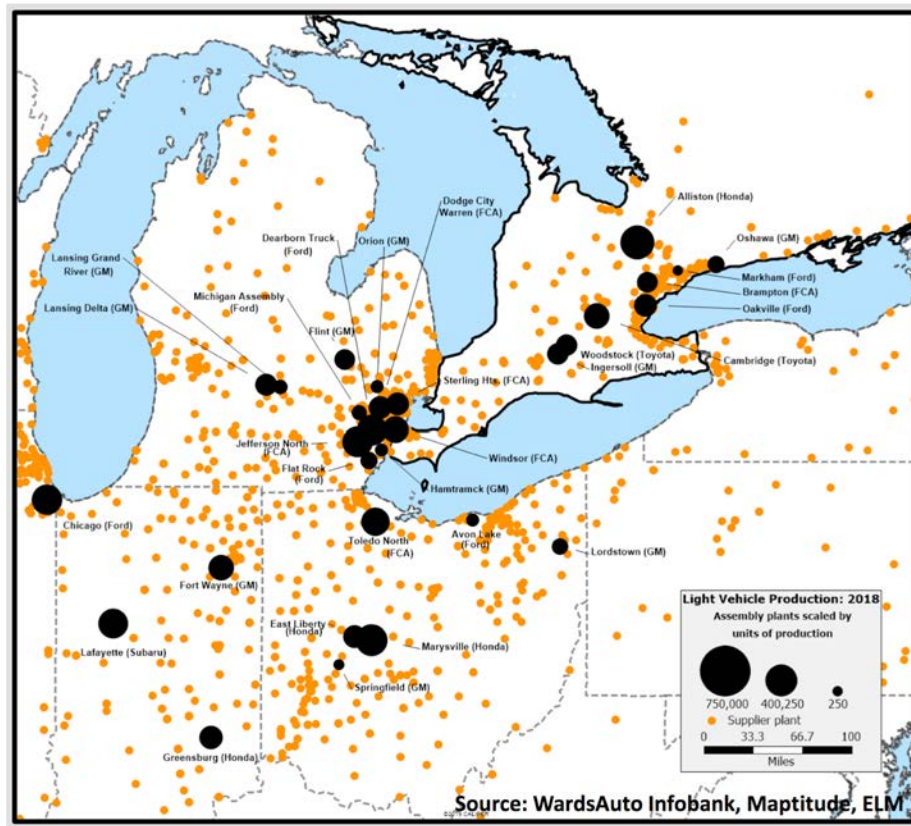
\$98 billion automobiles and parts exported



Source: Chicago Fed, Thomas Klier



# Find the border



Source: Chicago Fed, Thomas Klier



# Rivian (flavor of the month)



# To date

- Bought Mitsubishi plant in Normal, IL., \$16 million
- 2.6 million sq ft facility
- 1,000 employees
- \$175 million investment
- Amazon announces plans to purchase 100,000 vehicles (electric vans)
  - First vehicles on road by 2021
  - \$1.5 billion investments—Ford, Cox Automotive, Amazon
  - No vehicles built as of yet...
  - 10,000 Amazon vehicles on road by 2022
- Cue Tesla



# Electric sales

- **As more EVs hit the market, selling them could be a challenge**
  - At Frankfurt’s 2019 auto show, **Volkswagen Group** CEO Herbert Diess laid it on thick, calling on governments to give up coal-fired power as he unveiled the VW electric ID3
  - Carlos Tavares, CEO of Groupe PSA said “The next big thing is about affordable mobility and about how we make this work for the biggest number of people.”

# Electrics demand

- Electric vehicles have only been popular in countries with significant incentives
  - Without incentives, sales of battery models drop dramatically.
- Demand in China, the world's biggest electric car market, fell 16 percent in August -- its second straight decline -- after the government scaled back subsidies.
- Demand in Denmark collapsed when the government phased out tax breaks in 2016.
- The industry is lobbying hard for governments to step up incentives to get to the "tipping point"
- Max Warburton, an analyst at Sanford C. Bernstein, wrote: "Should we be celebrating these cars, given the poor margins that most will have?"
- To manage investment in new technologies and unproven mobility businesses, OEMs need to increase number of broad-based partnerships

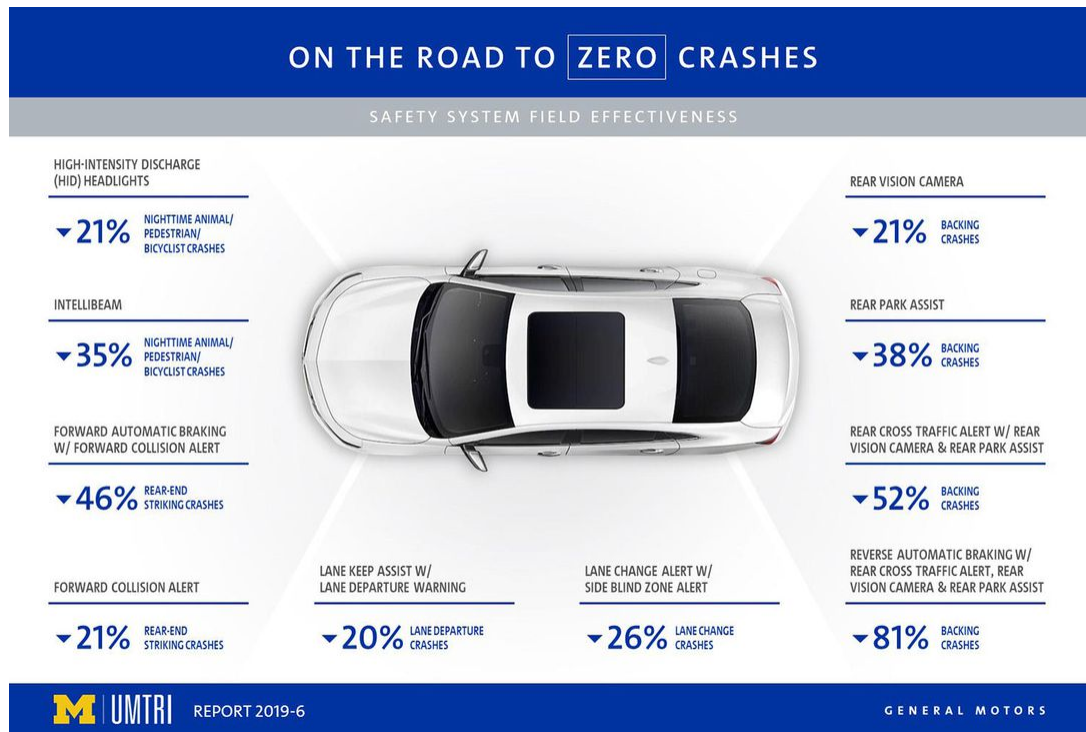
# Registrations 2017

- **Gas 264,363,764 (95.01%)**
- **Diesel 8,489,249 (3.05%)**
- **Hybrid 4,368,232 (1.57%)**
- **Electric 549,400 (0.20%)**
- **Plug-in hybrid 473,191 (0.17%)**

# Fueling infrastructure

- **332,094 Gasoline Stations**
- **21,158 Electric Charging Stations**
- **912 Compressed Natural Gas Stations**
- **66 Liquefied Natural Gas Stations**
- **198 Biodiesel Stations**
- **45 Hydrogen Stations**
- **3,048 Liquefied Petroleum Gas Stations**

# Push to automation and connected is leading to safer cars



- U.S. Department of Transportation called innovations by car manufacturers a “revolution in safety.”
- U-M study

**Rear-end crashes dropped 46%**

**Will affect towing services, bump shops, EMT**

## Things to watch: the good, bad, ugly

- Sales are picking up late in the year—just like last year
- European and global markets declining
- Carmakers betting heavily on electrics—business case?
- Carmakers betting heavily on autonomous and connected vehicles—business case?
- Climate change and the industry—intense political and regulatory pressure
- Trade war is disrupting supply chains—could intensify
- USMCA ratification...
- Incentives on the rise
- Housing market—more houses=more trucks
- Interest rates continue downward trend?
- Consumer confidence
- Gas prices remain stable
- New vehicle pricing increase of 5% could make used vehicles more appealing
- GM strikes goes on as sides become more entrenched, pulls economy down in industrial states



## Mcity: A 32-Acre Outdoor Lab



Mcity is the world's first full-scale simulated urban environment designed expressly for testing the performance and safety of connected, automated, and autonomous vehicles under controlled and realistic road conditions. It is a 32-acre outdoor laboratory for advanced mobility systems that includes:

- Urban and suburban streets, including various lane configurations and sidewalks, pedestrian crossings, bike lanes, ADA ramps, street lights, parallel and diagonal parking, and a bus turnoff/stop.
- Instrumentation throughout, including a control network to collect data about traffic activity using wireless, fiber optics, Ethernet, and a highly accurate real-time kinematic positioning system.

Other features include:

**Straight gravel roadway** with a railroad crossing.

**Traffic circle**, a smaller version of a roundabout that is common in Europe and some older cities in the U.S.

**Signalized intersections** in different configurations, with mast arms, wood and metal poles, and pedestrian crossings.

**Trunk line road**, a rural roadway with a fully equipped railroad crossing, guard rail, and temporary and permanent pavement markings.

**Brick paver road** simulated with stamped concrete.

**Underpass**, simulated by a tunnel that blocks vehicles from wireless and satellite signals.

**Roundabout**, an increasingly common approach to intersection design intended to improve safety.

**Open test area** that can be configured for a wide range of scenarios, including parking lots and novel intersection geometries.

**4-way stop intersection** with straight as well as tight and sweepingly curved approaching roadways.

**Tree canopy**, a simulated tree cover that reproduces the attenuation of signals that pass through trees.

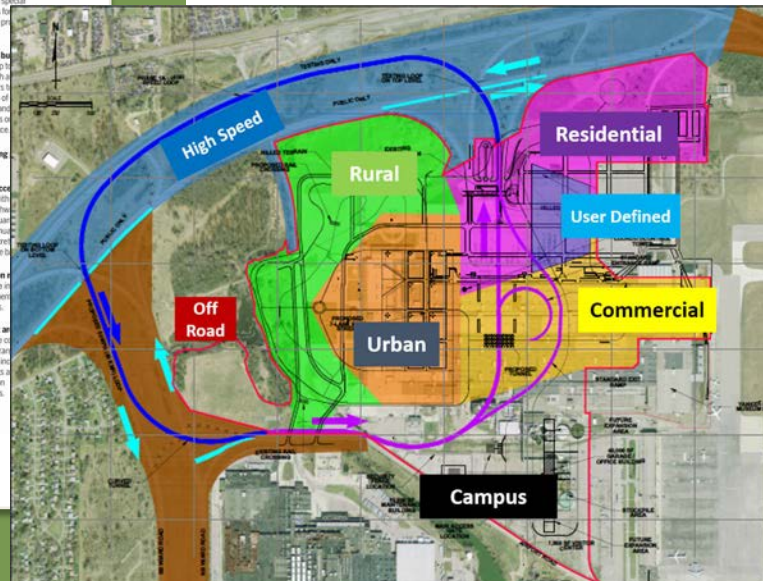
**Metal bridge deck**, a bridge surface that poses special challenges for sensors.

**Movable barriers** up to stores high researchers in the effects of materials and geometries on performance.

**Mandering roadway** with limited access ramps, highway signage, guard crash attenuator, and a concrete jersey style barrier.

**Calibration road** to calibrate measurement on vehicles.

**Open test area** that can be configured for a wide range of scenarios, including parking lots and intersection geometries.



# Thank you

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