Automotive Update

Kristin Dziczek, Senior Vice President

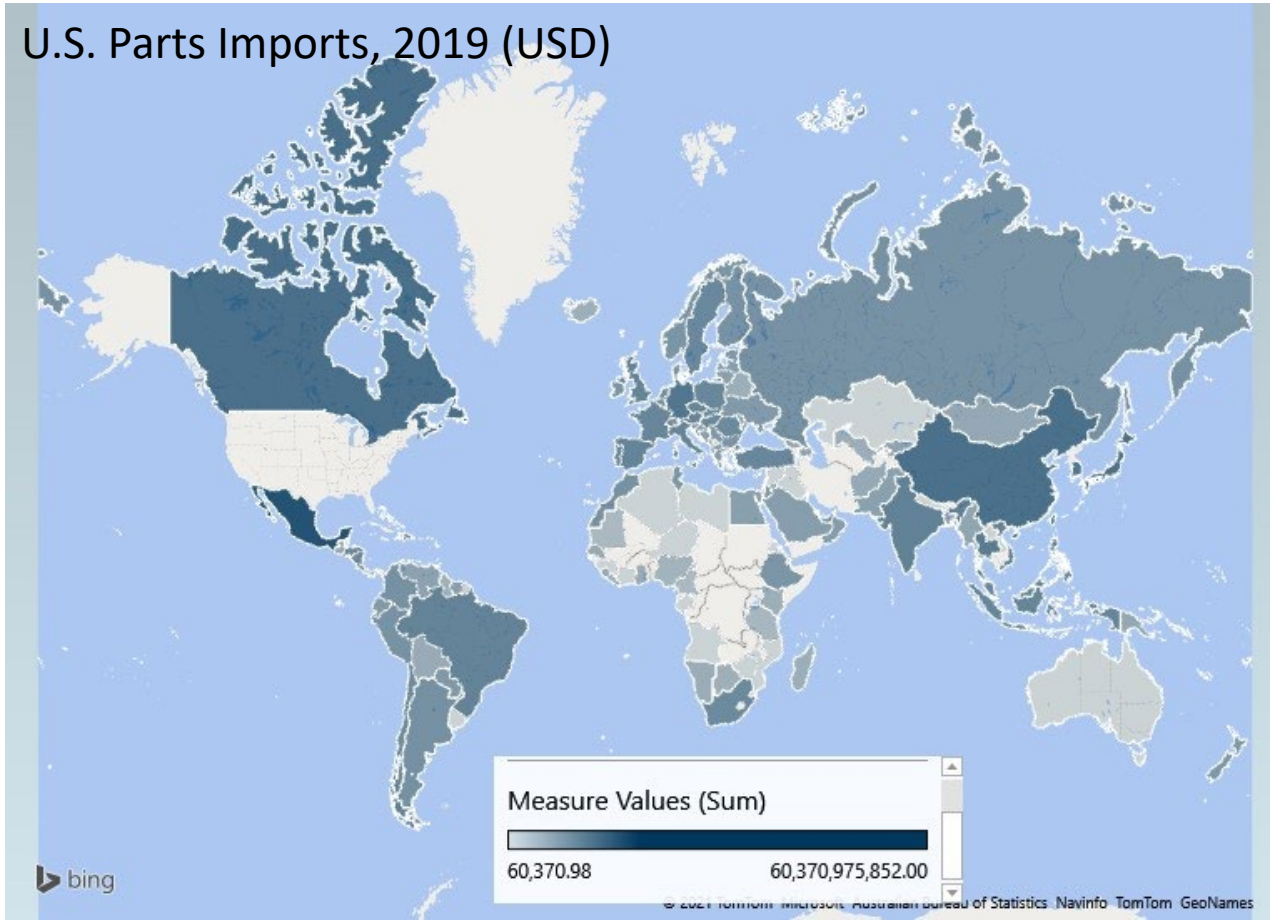
Michigan Consensus Revenue Estimating Committee

14 January 2022

30,000 parts come to the United States from 186 countries/areas to build 10-12 million vehicles/year

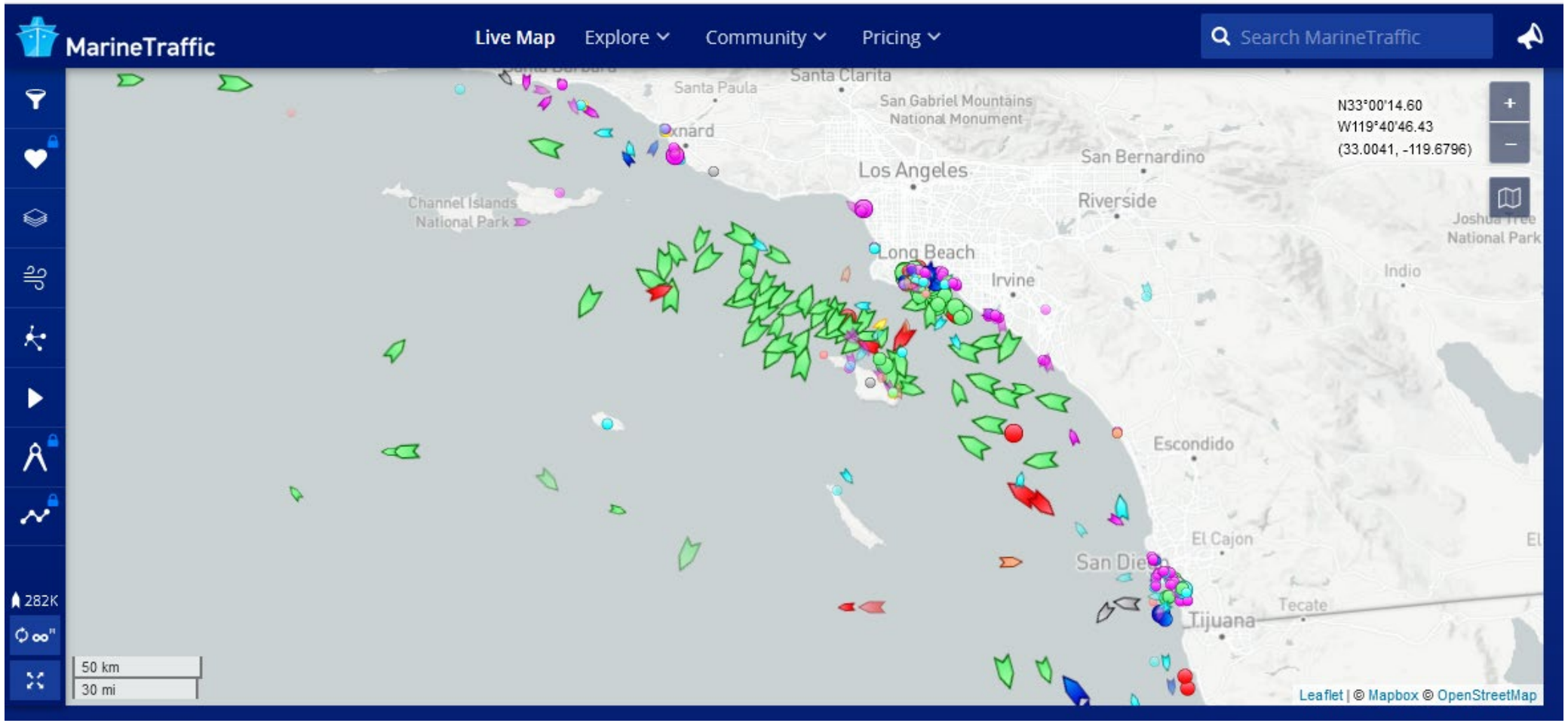
There are many things that can (and often do) go wrong:

- Shipping disruptions
- Parts shortages
- Weather
- Natural disasters
- Finance
- Labor disputes



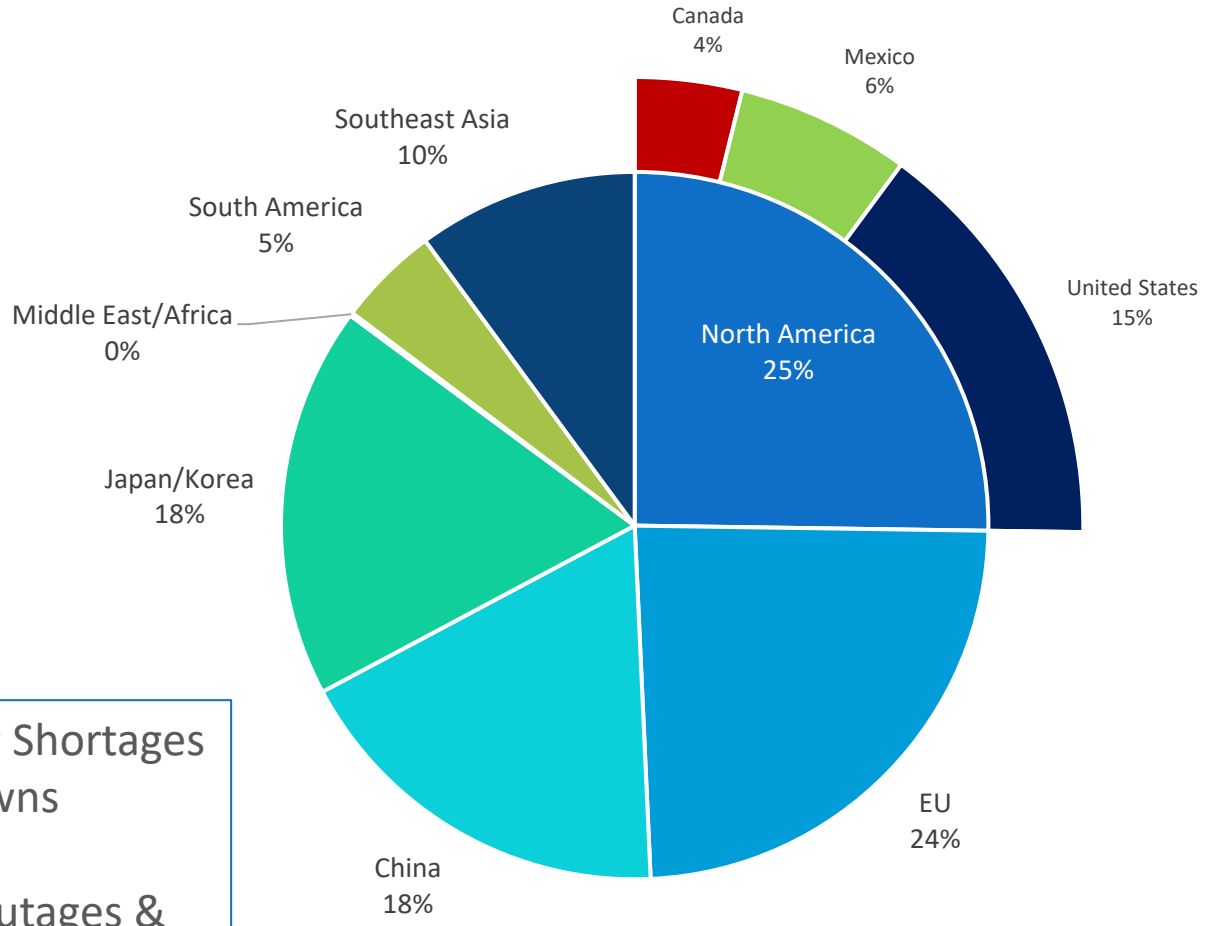
Source: U.S. International Trade Administration

Shipping tie-ups/delays/disruptions impact everything—not just semiconductors

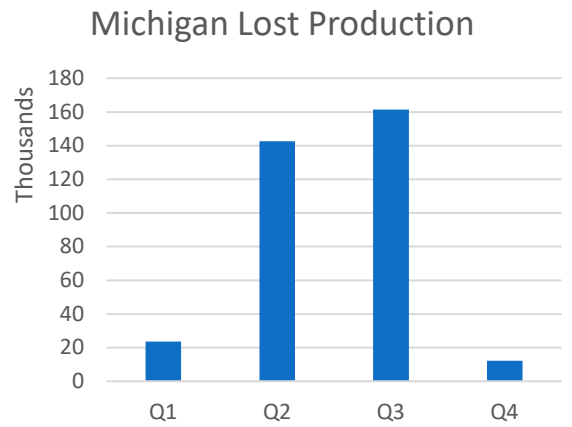


2021 Global Lost Production = 9.6M Light Vehicles (U.S. = 1.5M)
2022 Global Lost Production = 260K Light Vehicles (U.S. = 38K)

Through 9 January 2022, Announced Downtime & Shift Trimming, by Region

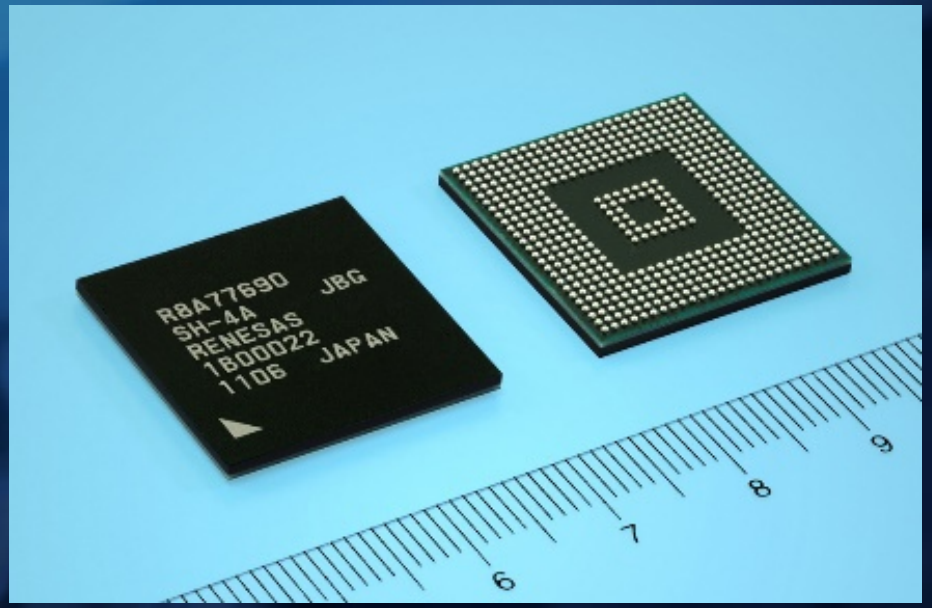


96%	Semiconductor Shortages
4%	COVID Shutdowns
1%	Weather
0.1%	China Power Outages & Malaysian Floods



Source: CAR compilation of IHS data

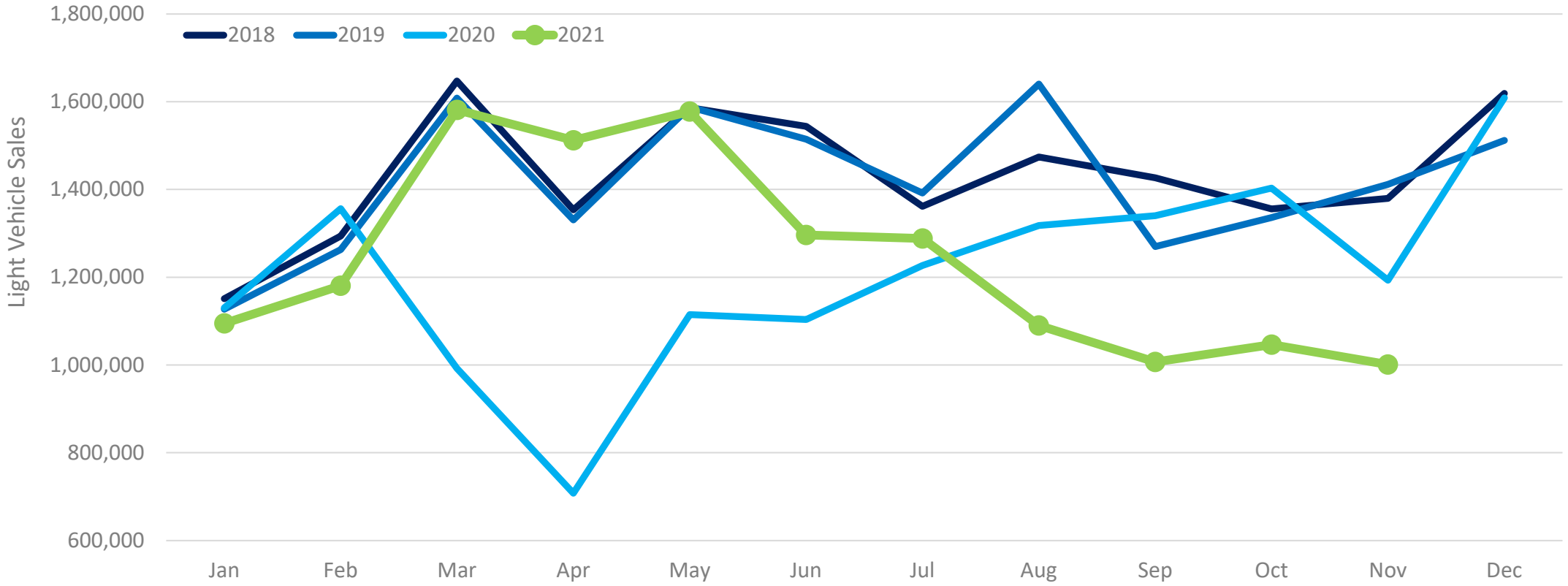
Disruptions mean sales are supply-constrained, not demand-constrained



Monthly sales at a 20-month low

U.S. Light Vehicle Monthly Sales

January 2018 – November 2021

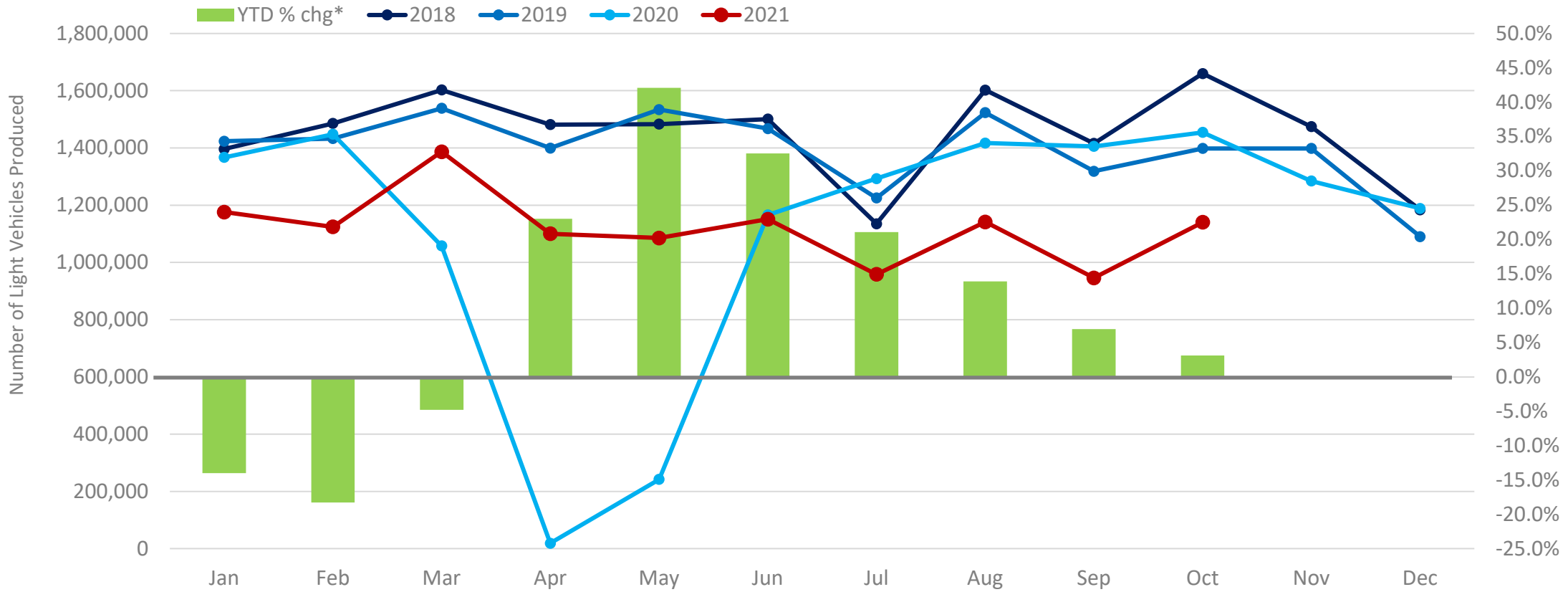


Source: Wards Auto; CAR Research

North American production level is lower than last year for three consecutive months

North America Monthly Vehicle Production

2018 – 2021 YTD Through October



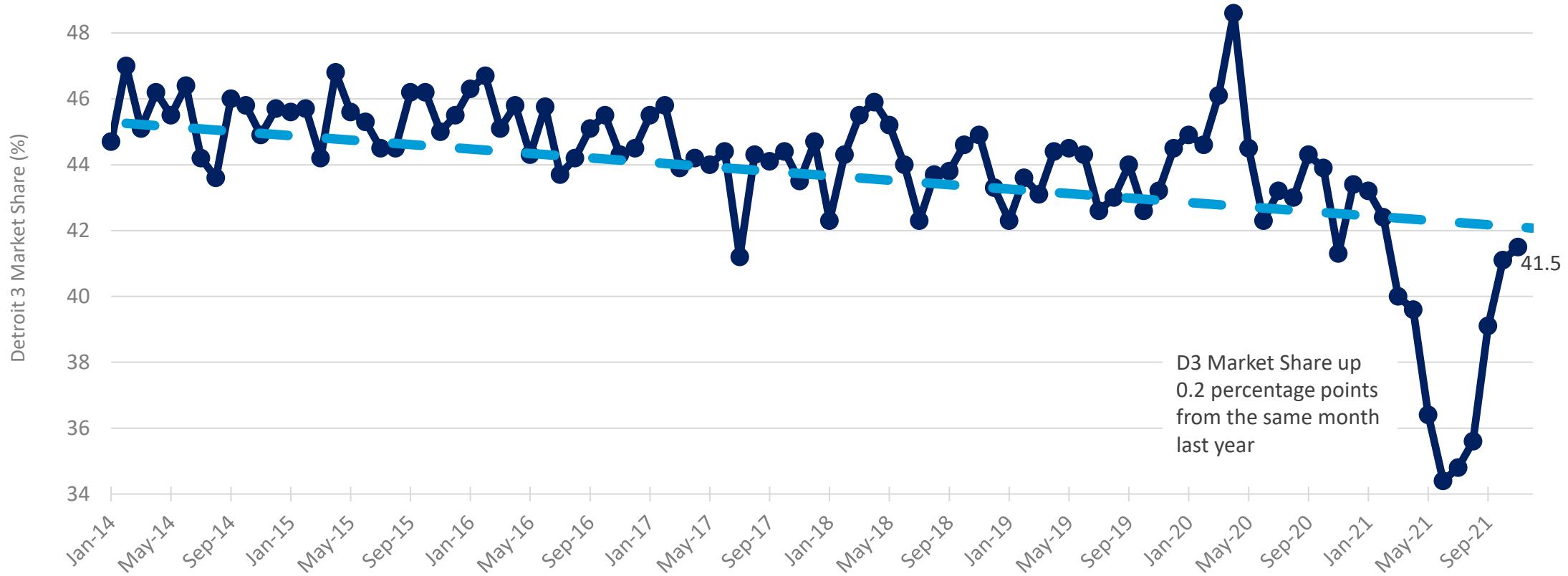
** Includes Medium Duty. YTD % change may not match other estimates due to data availability*

Source: Wards Auto; CAR Research

Detroit 3 monthly market share remains lower than the trend, but sees five-month increase since June 2021

Detroit 3 Monthly U.S. Market Share

January 2014 – November 2021

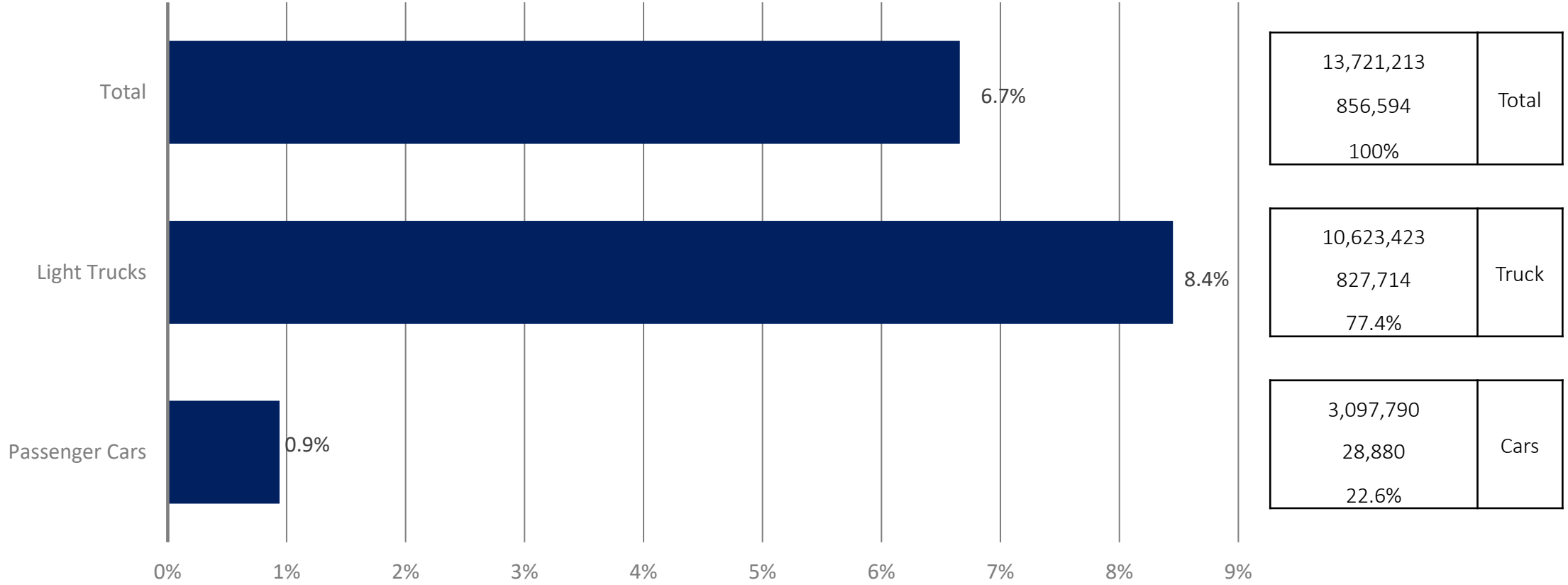


Source: Automotive News; Wards Auto (January 2018 and on); CAR Research

November sales were down, but year-to-date sales are still higher than last year

U.S. Light Vehicle Sales

Percent Change (YTD) Through November: 2021 vs. 2020



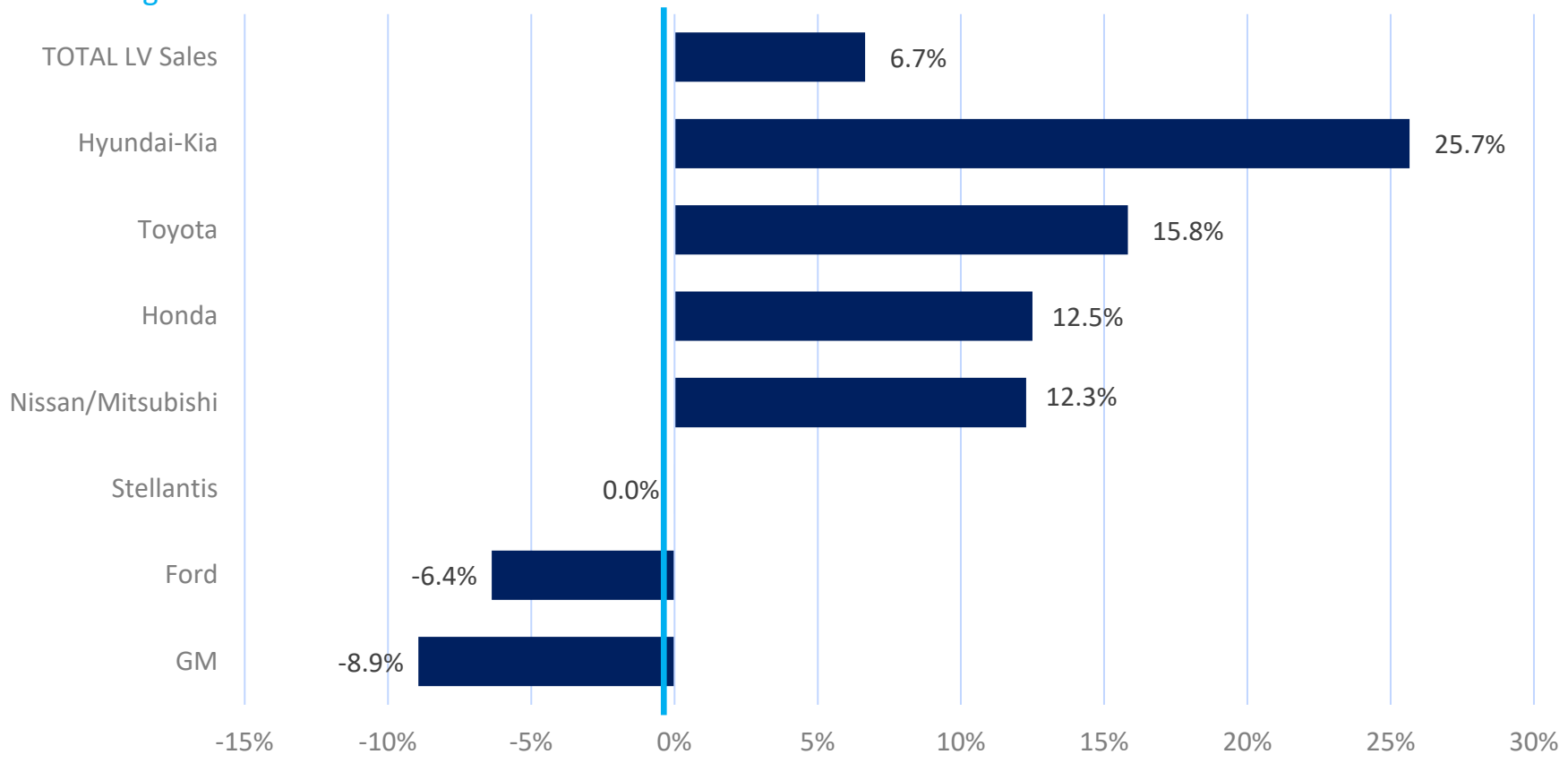
13,721,213 856,594 100%	Total
10,623,423 827,714 77.4%	Truck
3,097,790 28,880 22.6%	Cars

Source: Wards Auto; CAR Research

D3 sales growth year-to-date all negative, being much behind other major automakers

Percent Change in Sales of Light Vehicles Per OEM

YTD Through November: 2021 vs. 2020



13,721,213 856,594 100%	TOTAL LV Sales
1,384,273 282,667 10.1%	Hyundai-Kia
2,158,147 294,807 15.7%	Toyota
1,361,562 151,241 9.9%	Honda
991,101 108,392 7.2%	Nissan/Mitsubishi
1,608,727 -62 11.7%	Stellantis
1,655,874 -112,704 12.1%	Ford
2,037,207 -199,966 14.8%	GM

Source: Wards Auto; CAR Research

EVs are on the rise in the United States

REGULATORY

Global regulations are quickly moving to lower-carbon transportation

TECHNOLOGY

Technology is more capable with longer range & lower costs

PRODUCT

EVs will soon be available in every segment—from compacts to pickups

FINANCE

Investors are rewarding market disruptors & sustainable companies

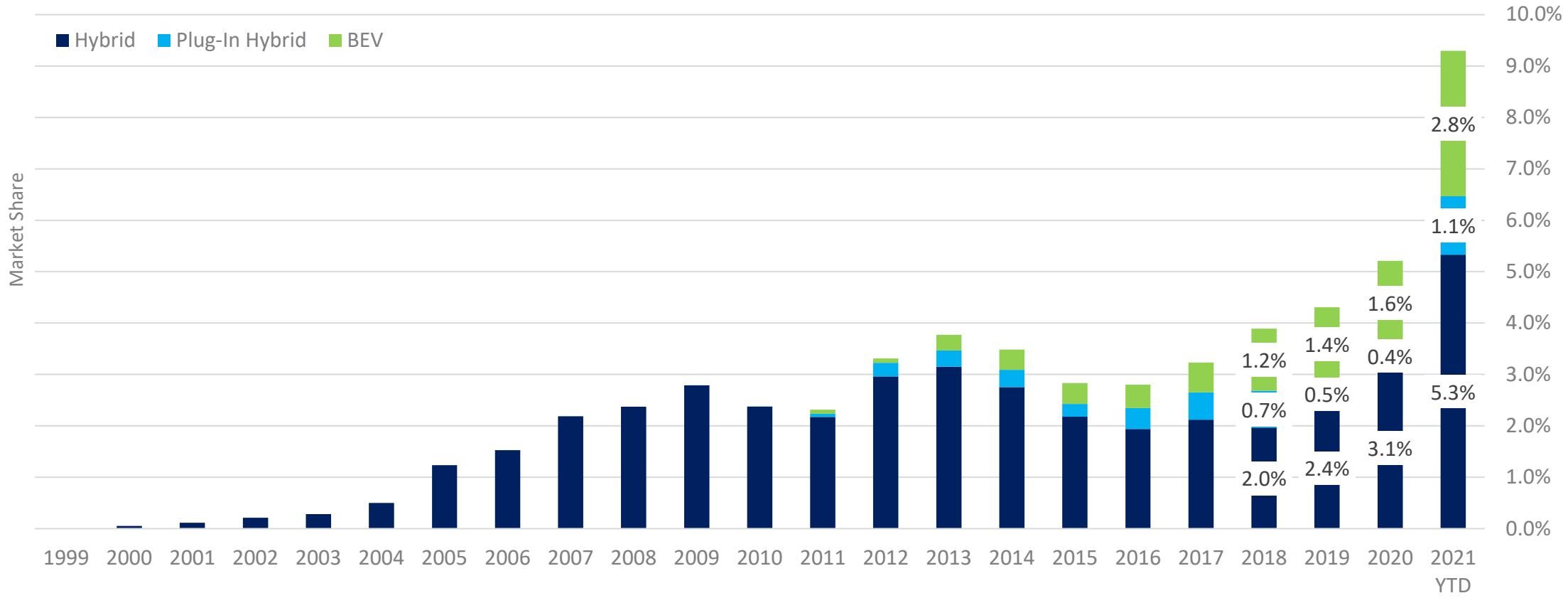
MARKET

EV market share is increasing—unrelated to real gas prices

Hybrid, Plug-In Hybrid, and BEVs are all at historically high market shares

U.S. Electrified Light Vehicle Sales by Propulsion Technologies

1999 – 2021 YTD Through November



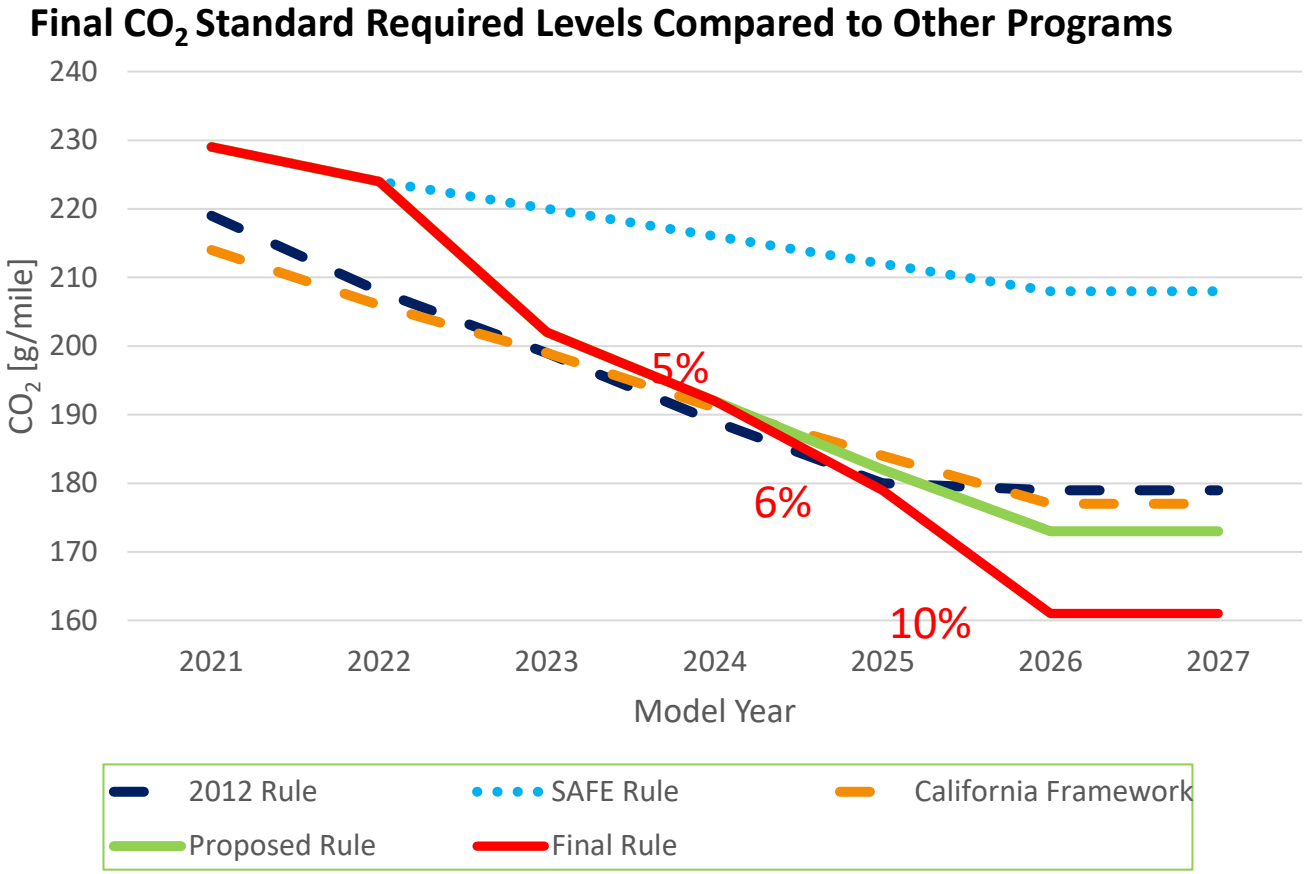
Note: Electrified vehicles consist of BEV, HEV and PHEV

Source: Ward's Automotive Reports (from 2010 and on), HybridCars.com and CAR Research

Biden Administration Executive Order & New GHG Rules

The path to 50%

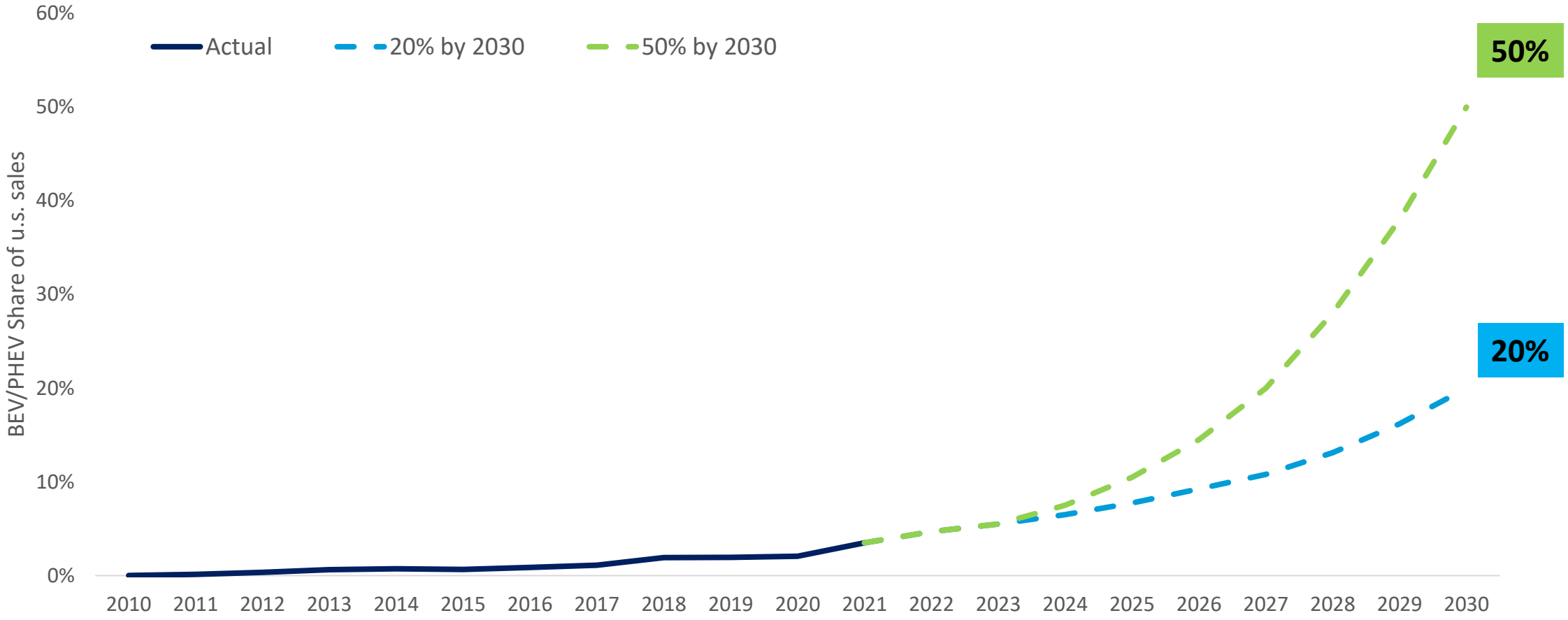
- Announced 5 August 2021 at White House ceremony; final rule December 2021
- Goal of 50% sales of emissions-free vehicles by 2030 (BEV, PHEV, FCEV)
- Automakers' pledges to meet the targets are voluntary
  - Critics point out they will not be held to the commitments
  - But prior company announcements & industry forecasts show the automakers already on a likely path to achieve compliance by 2030



Source: EPA https://www.epa.gov/system/files/documents/2021-12/420r21028.pdf

A long way to go to get to net zero by 2050

BEV & PHEV U.S. Market Share 2010-2021 YTD; 2021-2030 projected

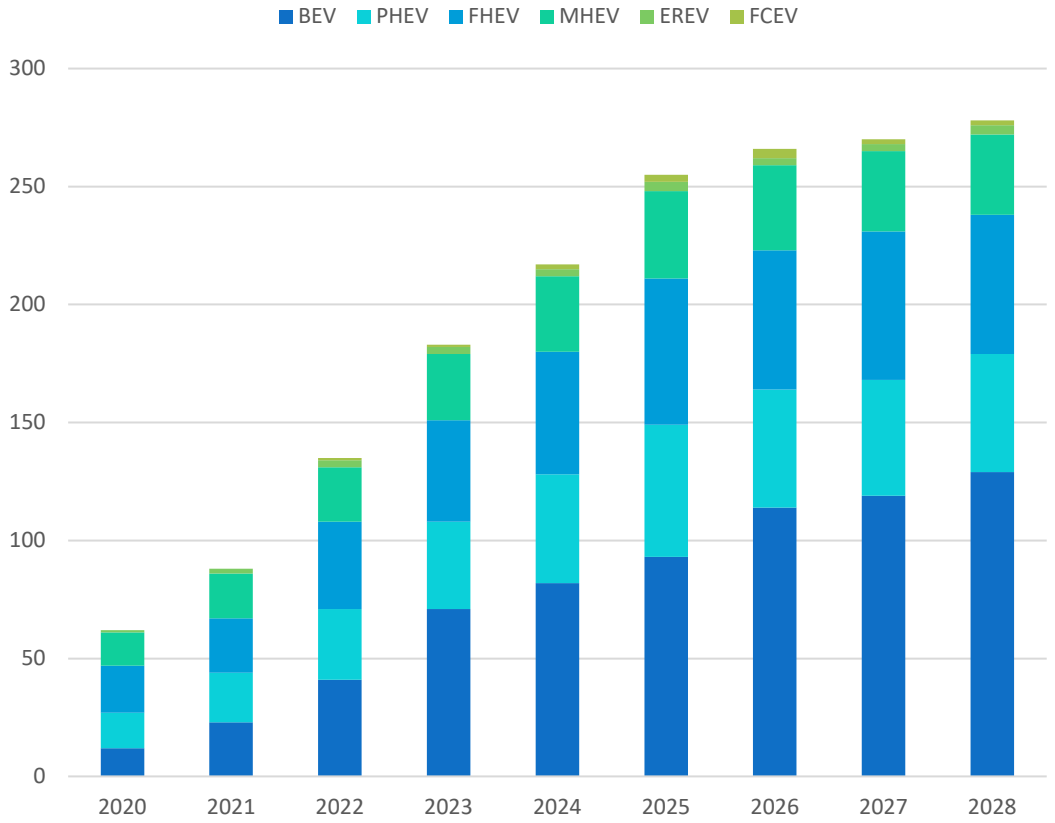


Source: Ward's Automotive Reports (from 2010 & on), HybridCars.com & CAR Research

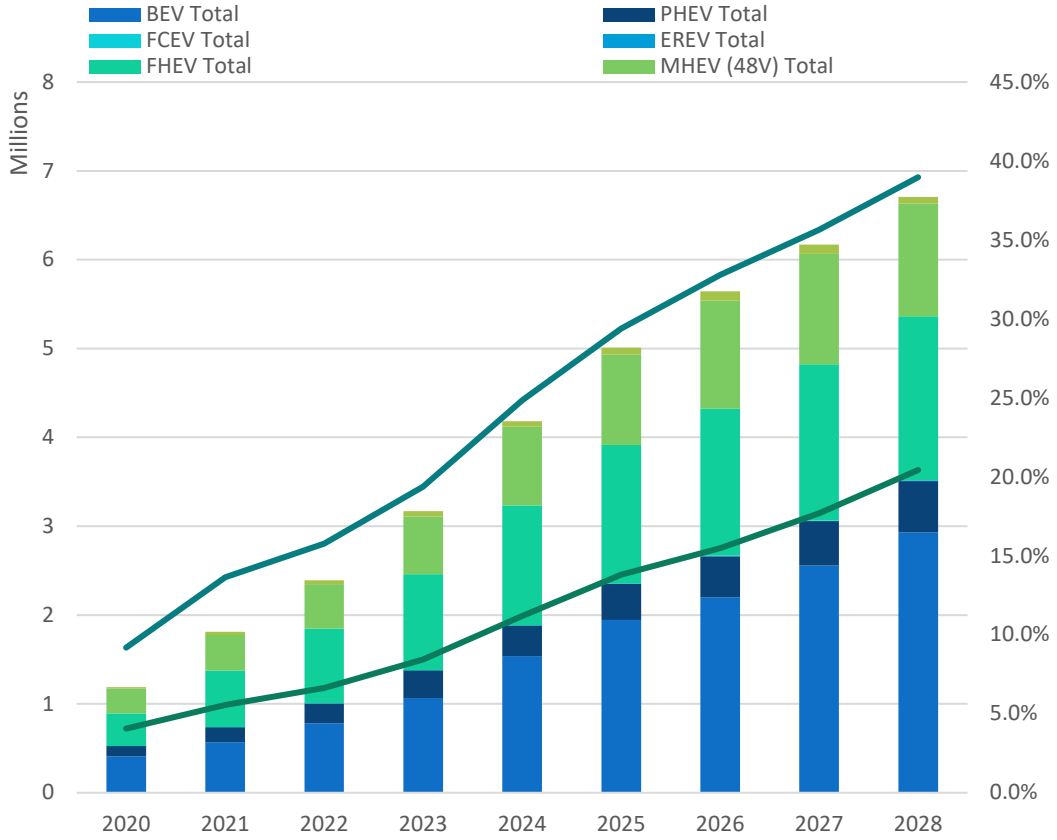
North American Electric/Electrified Vehicle Production Models & Volumes Projected to Grow Substantially

2020 – 2028 Forecast

NUMBER OF ELECTRIC/ELECTRIFIED NAMEPLATES PRODUCED IN NORTH AMERICAN PLANTS



TOTAL ELECTRIC/ELECTRIFIED VEHICLES PRODUCED IN NORTH AMERICAN PLANTS



Source: LMC Automotive

What matters to U.S. consumers?

1

Cost Parity→
Makes consumers indifferent to propulsion system

2

Utility Parity→
A vehicle to fit their needs
& take them where they need to go

3

Convenience Parity→
Does not require extra time
or planning to use

Funding to help reach the 50% target

Infrastructure Investment & Jobs Act

USD 1.2T bipartisan spending bill

- Passed Senate 10 August 2021 (69-30) & House 5 November 2021 (228-2[illegible] including 13 Rs); signed 15 November 2021
- Contains USD 550 billion in new spending for traditional i[illegible] (highways, bridges, waterways, transit, electrical g[illegible] b[illegible]band)
- Of that new spending, USD 7.5 billio[illegible] electric vehicle charging (goal of 500K chargers)
- The funding for public chargers states they must be non-proprietary, meet applicable safety standards, open access, and, use publicly available payment methods
- Also includes funding for vehicle safety & updating the electric grid

PASSED

Source: Wikimedia Commons

Maybe more funding to help reach the 50% target?
Consumer EV incentives

Build Back Better USD 1.75T *(for now)* reconciliation spending bill

- Package of bills to fund a wide array of social, economic programs, & environmental programs
- Replaces existing EV consumer tax credit with an uncapped 10-year program that provides:
  - USD 7500 for most battery electric (BEV) & plug-in hybrids (PHEV)
  - An additional USD 4,500 for U.S.- & union-build BEVs & PHEVs
  - An additional USD 500 if the battery cells are U.S.-made
- Includes FCEVs, 2- and 3-wheel EVs, & used cars for the first time
- Limits on MSRP (USD 55-80K) & excludes high-income buyers
- Imports do not qualify after 2026
- Includes up to 30% credit for public chargers with a prevailing wage requirement

Maybe more funding to help reach the 50% target?
Other Provisions

Build Back Better USD 1.75T *(for now)* reconciliation spending bill

- Includes up to 30% credit for public chargers with apprenticeship & prevailing wage requirements
- Extends 48C (Advanced Energy Project Credit)
  - USD 5B/year 2022-2023, USD 1.875B/year 2024-2031 (expires 2031);
  - Set-aside for Automotive Communities
  - Apprenticeship & prevailing wage requirements
- GHG Reduction Fund: USD 2B grants to states for grants, rebates, or other assistance for ZEV supply equipment
- ZEV Infrastructure Grants: USD 1B for ZEV grants distributed through State Energy Plan formula (USD 600M for public L2 chargers/USD 200M for DCFC/USD 200M for H2 refueling stations in rural, underserved, or disadvantaged communities)
- ATVM: USD 3B for FY2022-2028 (eliminates USD 25M loan cap); Expands program for MD & HD vehicles, trains & locomotives, maritime vessels, aircraft, & hyperloop
- Domestic Conversion Manufacturing Grant: USD 3.5B for FY2022-2028 for grants related to the domestic production of PHEV, BEV, and FCEV vehicles

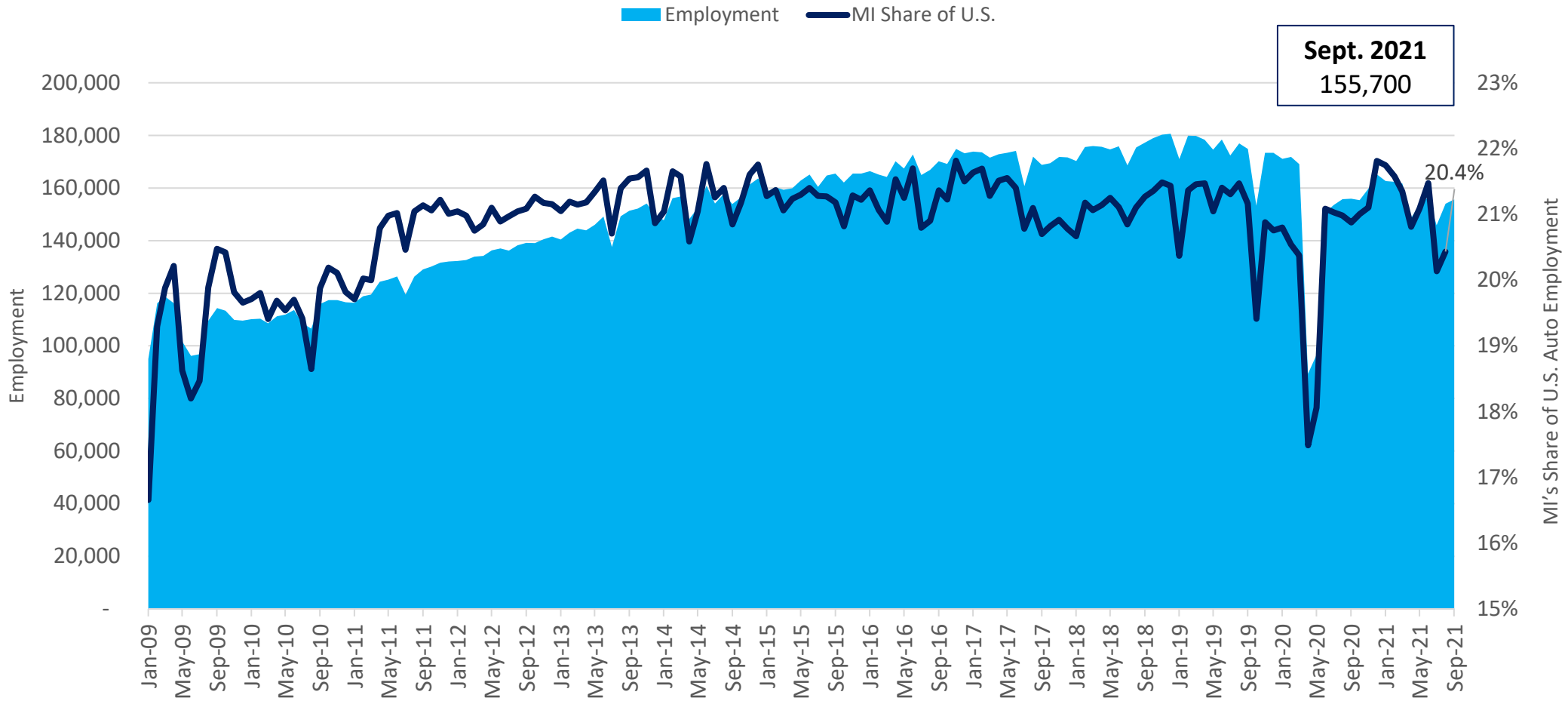
Employment Overview

Areas to Watch:

- At the end of Q3 2021, Michigan auto industry employment decreased by 900 jobs from Q2 2021
- Michigan auto employment as a percentage of the United States was 20.4 percent in Q2 2021, a 0.6 percentage-point decrease from last quarter

Michigan Motor Vehicle & Parts Manufacturing Employment

2009 – Q3 2021



**U.S. data is one month behind state data*

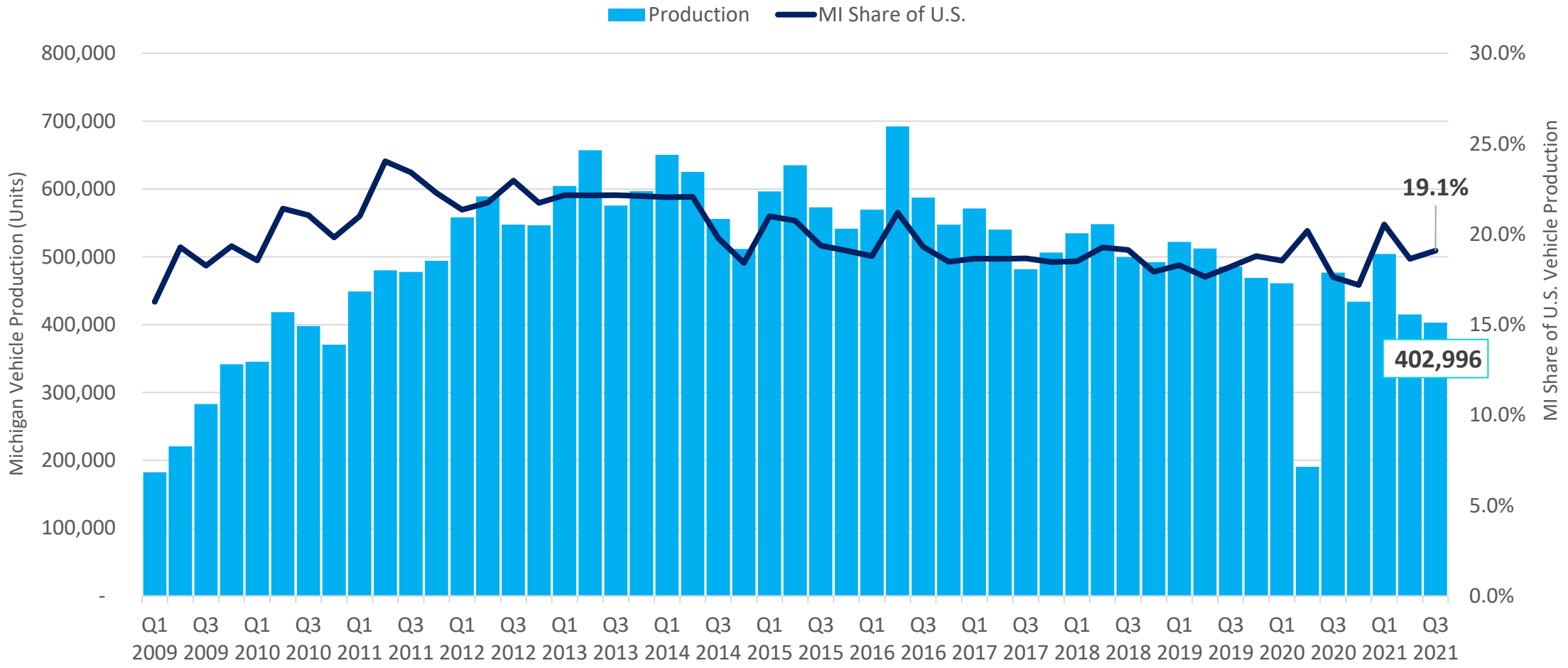
Source: Current Employment Statistics, Bureau of Labor Statistics; NAICS 3361 & 3363

Sales & Production Overview

Areas to Watch

- Michigan's Q3 vehicle output of 402,996 was down 2.9% compared to Q2 2021
- The state's share of U.S. production increased to 19.1%
- Michigan's engine production is expected to decrease by 10.4 percent in 2021
- Michigan's transmission production is expected to increase by 7.4 percent in 2021
- Michigan's engine and transmission production accounts for 9.4% and 24.6% of North American output, respectively

Michigan Motor Vehicle Quarterly Production
Q1 2009 – Q3 2021



Source: Ward's Auto Intelligence

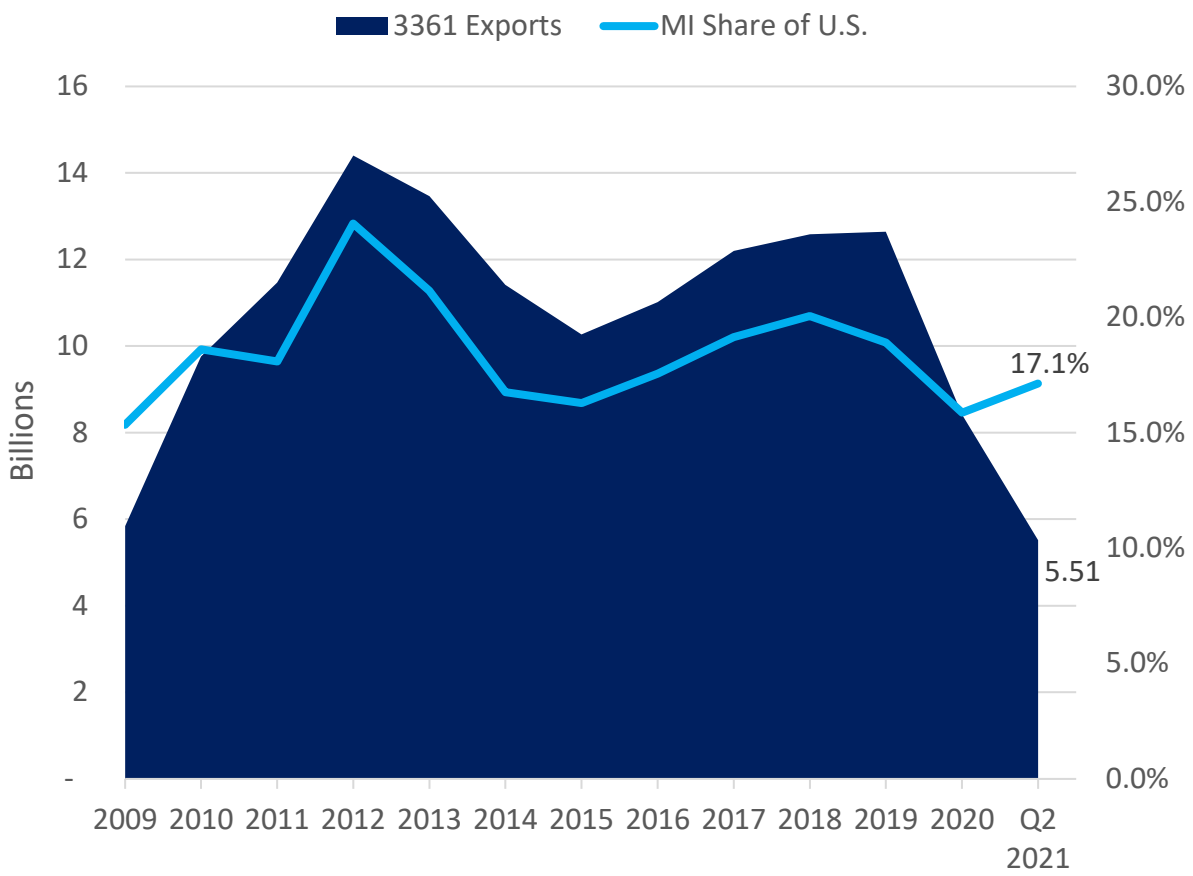
Export Overview

Areas to Watch

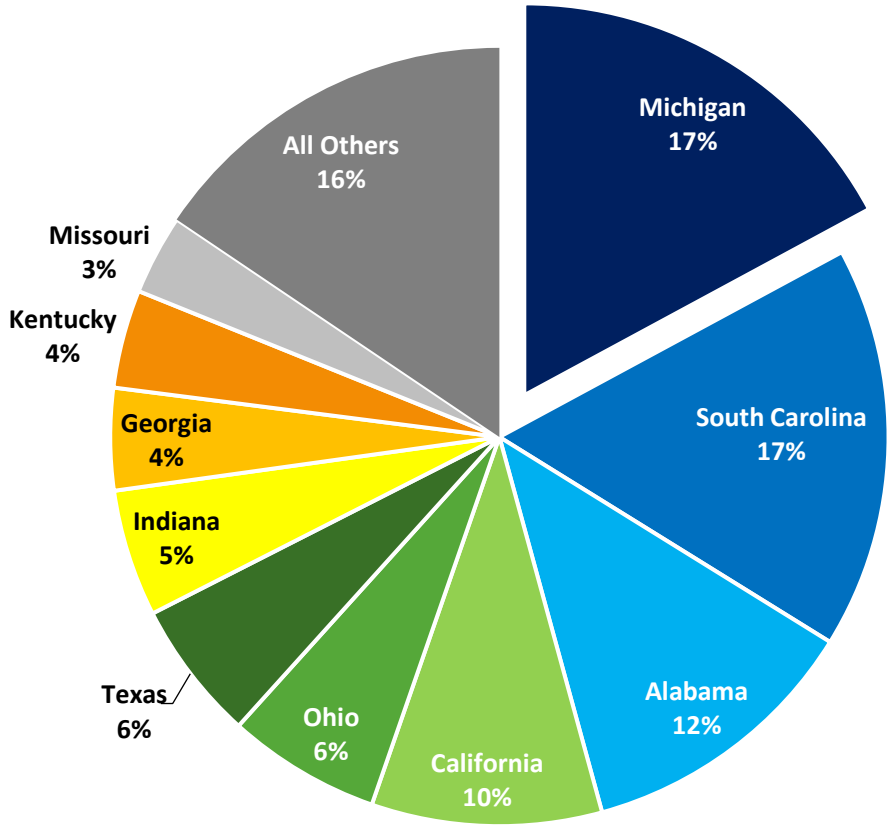
- Michigan automotive exports were USD 10.4 billion in Q2 2021, a 29.1% decrease from Q2 2020
- 68% of Michigan vehicles exports go to Canada; exports to South Korea increased to second place; exports to Mexico, now in third place, rose to 4% in Q2 2021
- 30% of Michigan auto parts exports go to Canada; another 30% of parts exports go to Mexico

3361 – Motor Vehicle Exports in Dollar Terms:
2009 to Q2 2021

Michigan Motor Vehicle Exports, 2009 to Q2 2021

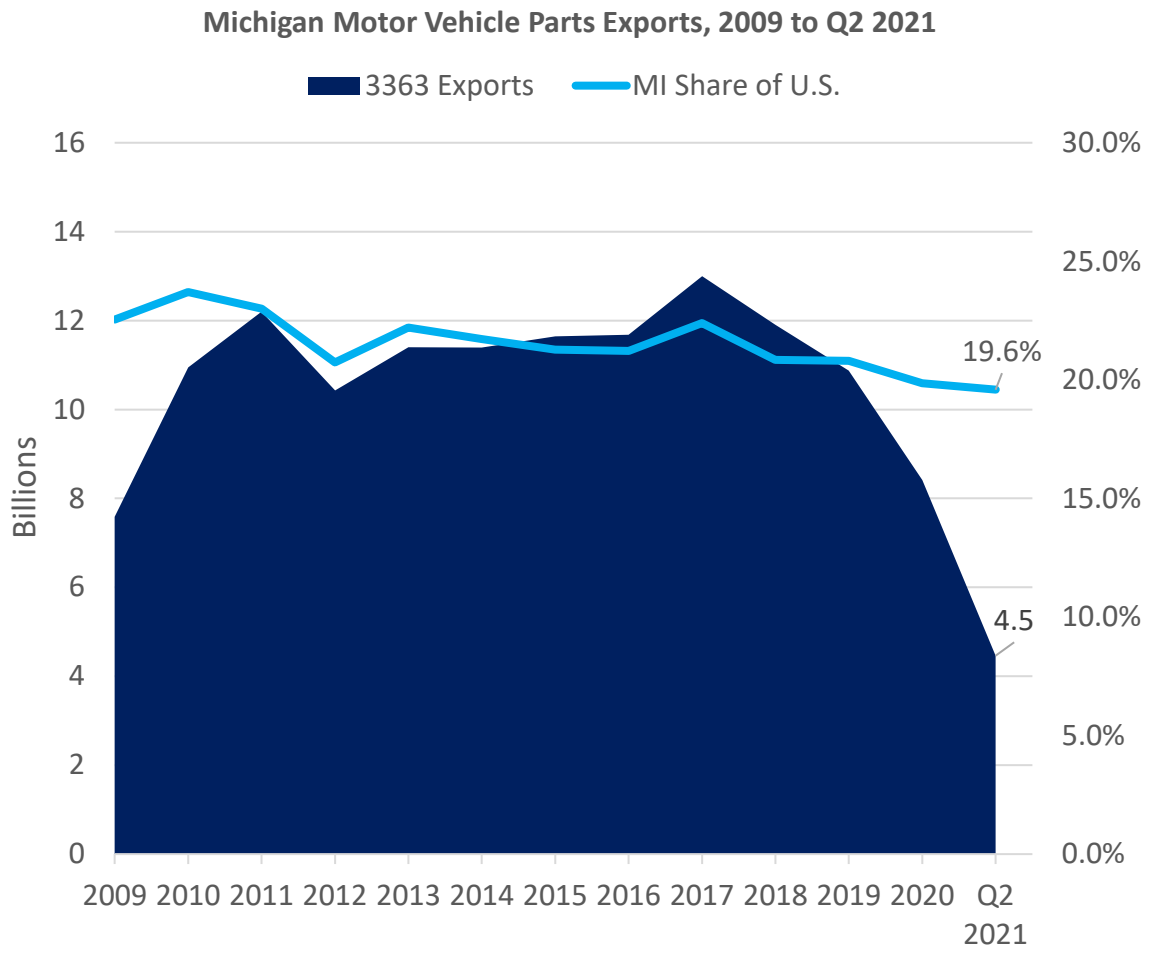


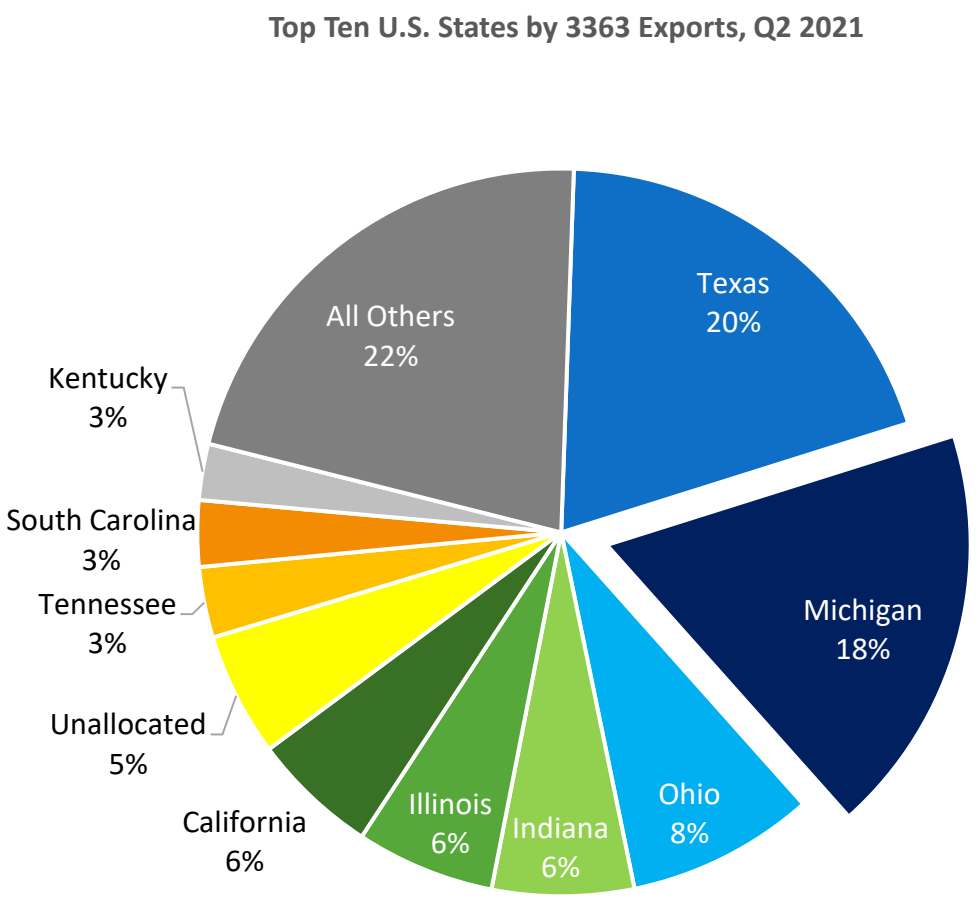
Top Ten U.S. States by 3361 Exports, Q2 2021



Source: International Trade Administration TradeStat Express

3363 – Motor Vehicle Parts Exports in Dollar Terms:
2009 to Q2 2021





Source: International Trade Administration TradeStat Express.

Investment Overview

Areas to Watch

- Since the recession, automakers have announced roughly USD 190B in investments across North America
- So far in 2021, Michigan received roughly 7% of U.S. investment
- The largest investment through Q2 2021 was announced by Stellantis. The company plans to invest USD 1.6B to expand production capacity at Detroit Assembly Complex – Mack.

Note – the following Book of Deals analysis covers publically announced capital investments made by major automakers throughout North America.

Status of Michigan's Plants

Areas to Watch (2021 YTD Summary)

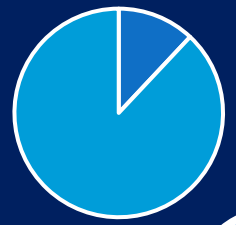
- Michigan has 12 assembly plants, 7 engine/motor plants, and 3 transmission plants, producing 13.4%, 9.4%, and 24.6% of North American output of motor vehicle, engines, and transmissions.
- IHS Markit estimated that Michigan lost 336K units of production due to plant shutdowns in 2021.*

**IHS Markit estimated, October 18, 2021*

North American Production & Michigan Production Share
2021 YTD Summary and 2021 Forecast

Assembly

- 93 Assembly plants produced 9,900,000 vehicles through Q3 2021*
- 12 Assembly plants in Michigan producing 1.3 million vehicles, up 40% through Q3 2020



Michigan Production Share: 13.4%

Engine and Motor

- 39 Engine plants to produce 11,200,000 engines and motors in 2021**
- 7 Michigan engine plants are expected to produce 1.05 million engines and EV motors in 2021

Michigan Production Share: 9.4%

Transmissions

- 23 Transmission plants to produce 8,400,000 transmissions in 2021**
- 3 Transmission plants in Michigan are expected to produce 2.1 million transmissions in 2021

Michigan Production Share: 24.6%

Semiconductor shortage and supply chain disruption hinder North America production recovery. Motor vehicle output in Q3 2021 decreased by 8.1 percent vs. Q2 2021

*Source: CAR Research –*Q3 2021 IHS Markit. **LMC Automotive Forecast, Q3 2021*

1 EV platform = 18+ vehicle models

GM BEV3 Platform

Buick Enspire

Buick D-SUV 3-Row

Cadillac Celestiq

Cadillac Lyriq

Cadillac C-Sedan

Cadillac D-Sedan

Cadillac C-SUV

Chevy Bolt

Chevy Bolt EUV

Chevy Camaro

Chevy Corvette EUV

Chevy B-SUV

Chevy C-SUV

Chevy D-SUV 3-Row

Cruise B-Hatchback AV

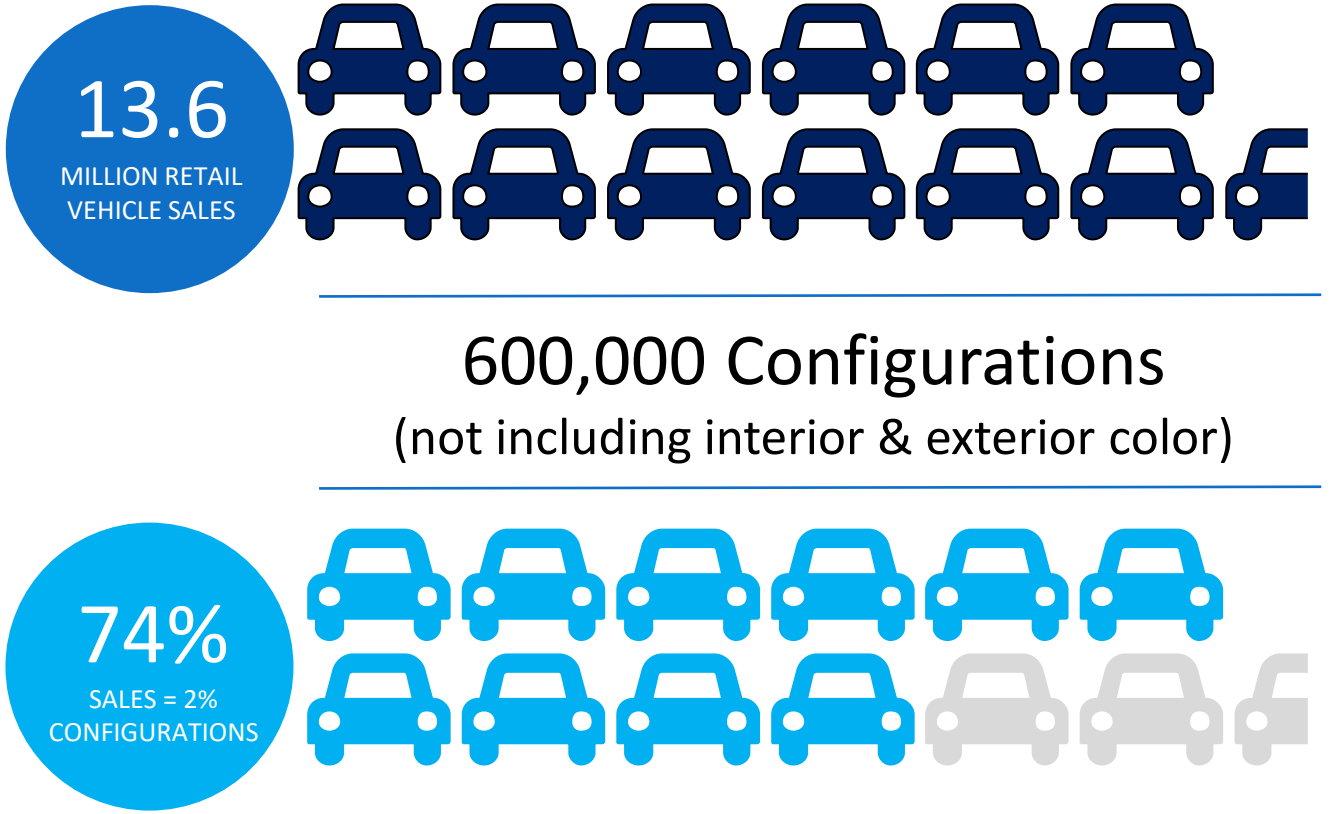
Cruise Origin AV

Acura D-SUV

Honda Prologue

Blank sheet of paper platforms = Less manufacturing complexity

2019 JD Power Data:

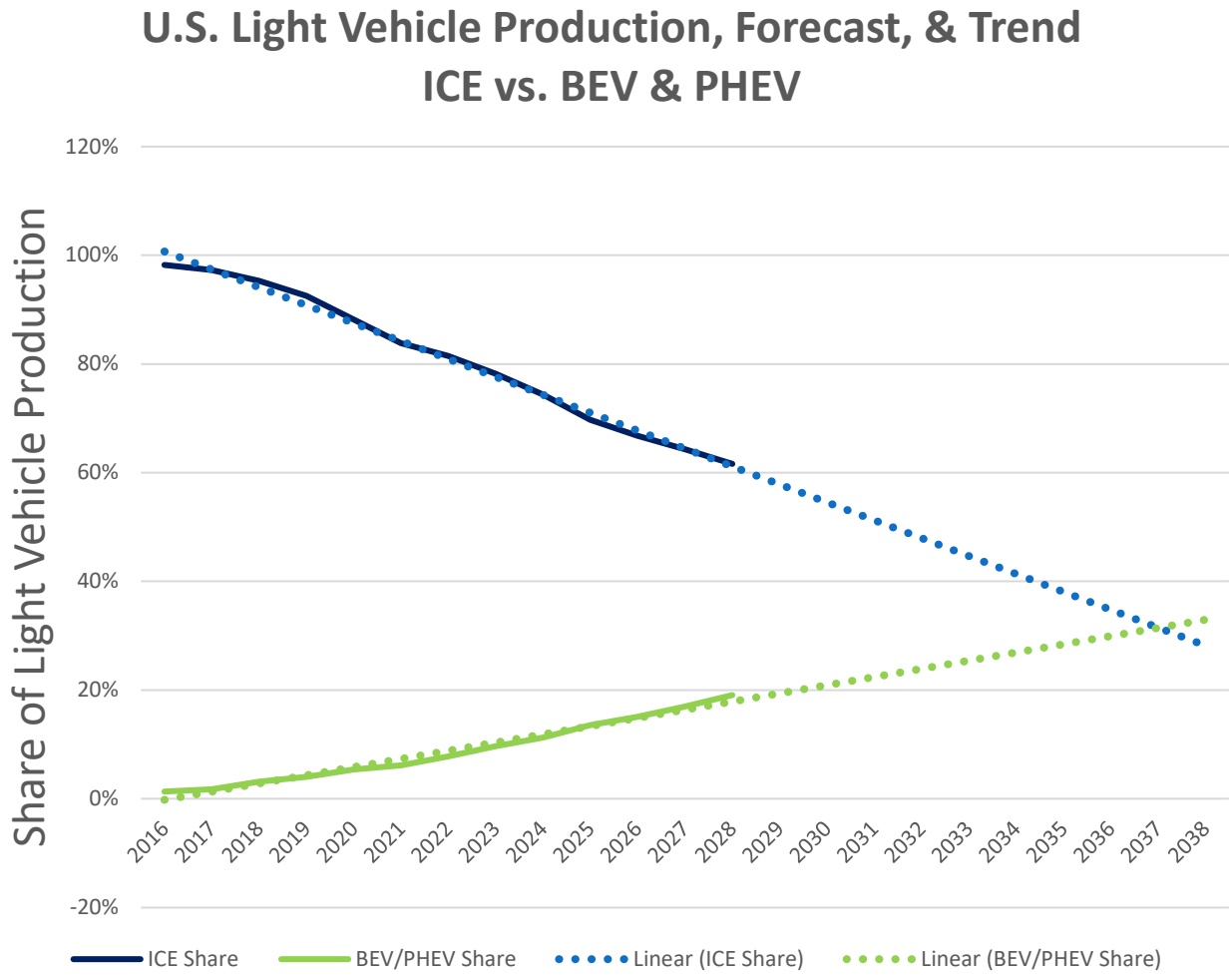


Source: JD Power-CAR Webinar https://www.youtube.com/watch?v=Gj6jJi3iR5M

More common propulsion parts, too

https://www.borgwarner.com/newsroom/press-releases/2020/08/05/borgwarner-enables-high-performance-eco-friendly-driving-with-latest-integrated-drive-module-for-ford-mustang-mach-e

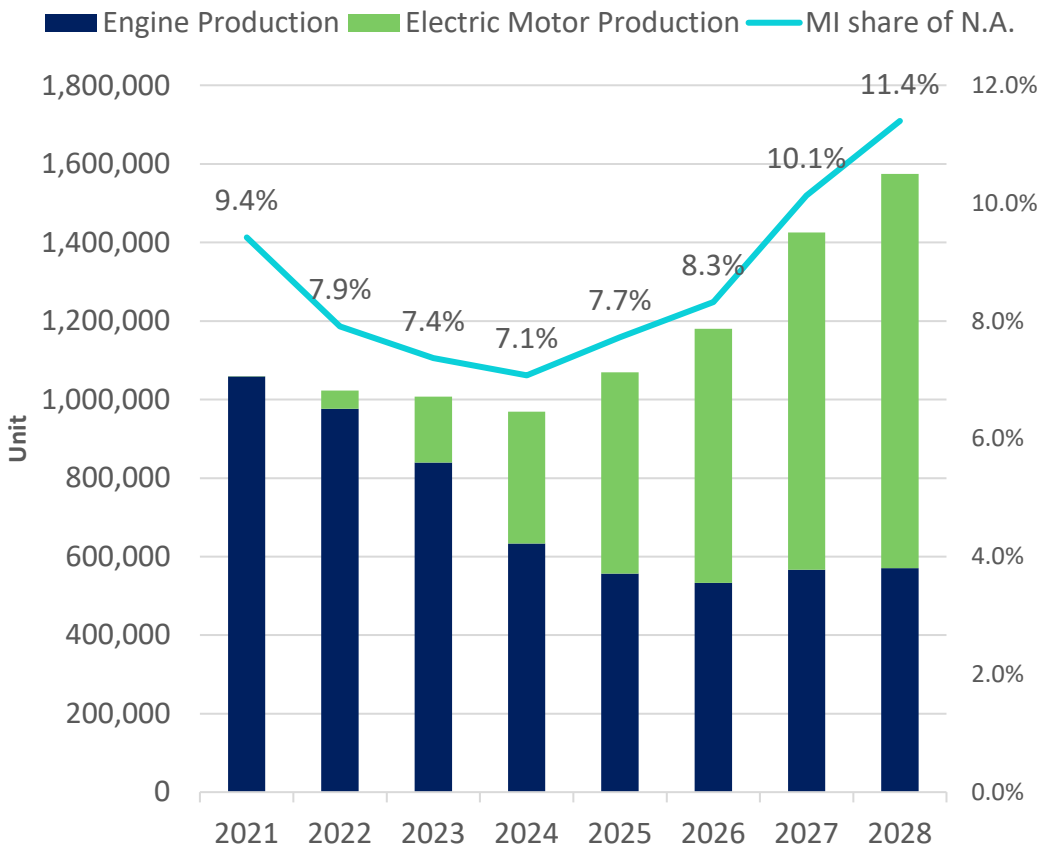
Ramping up EVs & Ramping down ICE = Low productivity & potential for plant shutdowns/consolidation



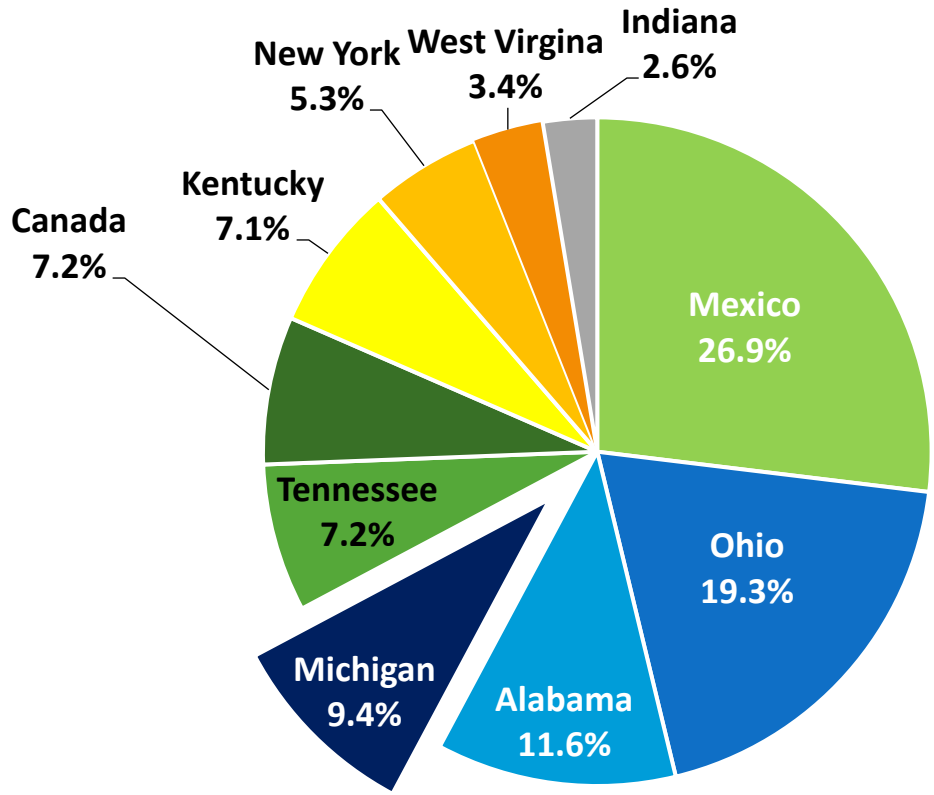
Source: CAR analysis of LMC Automotive data

Engine Production Forecast:
Michigan vs. Top N.A. Production Regions, 2021

Engine and E. Motor Production Forecast, 2021 to 2028



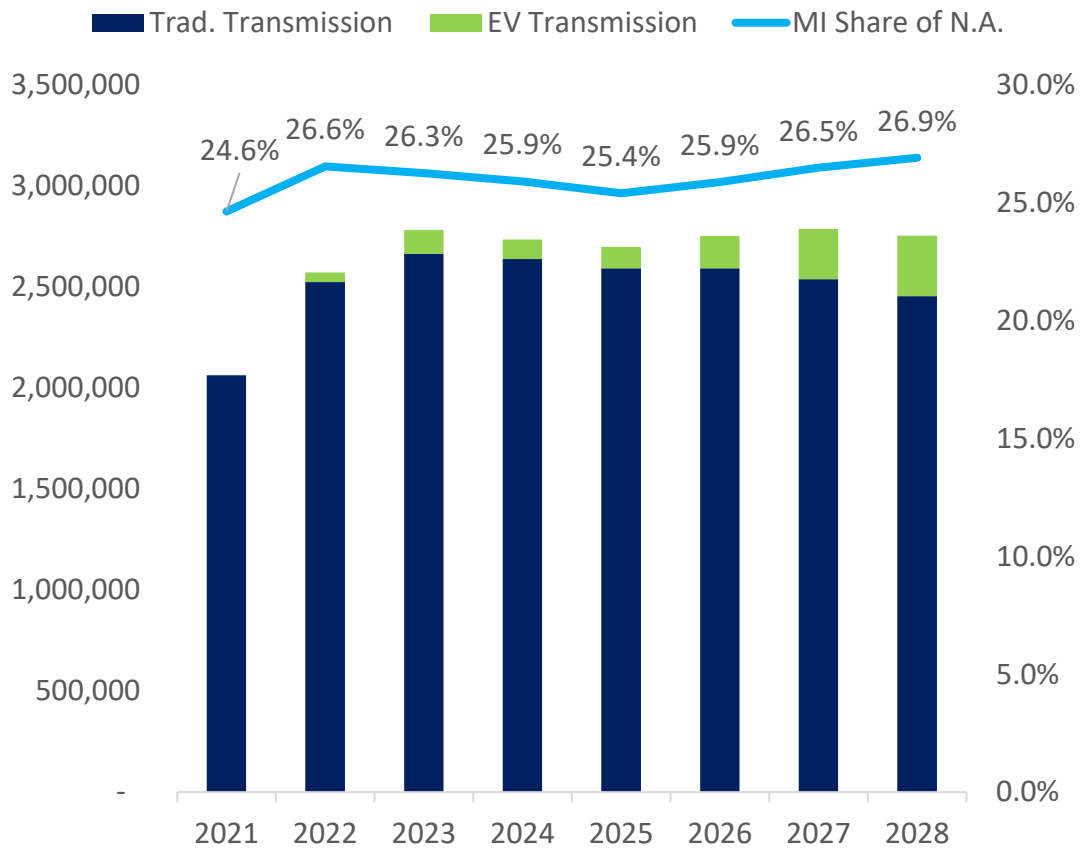
Engine and E. Motor Production by State, 2021



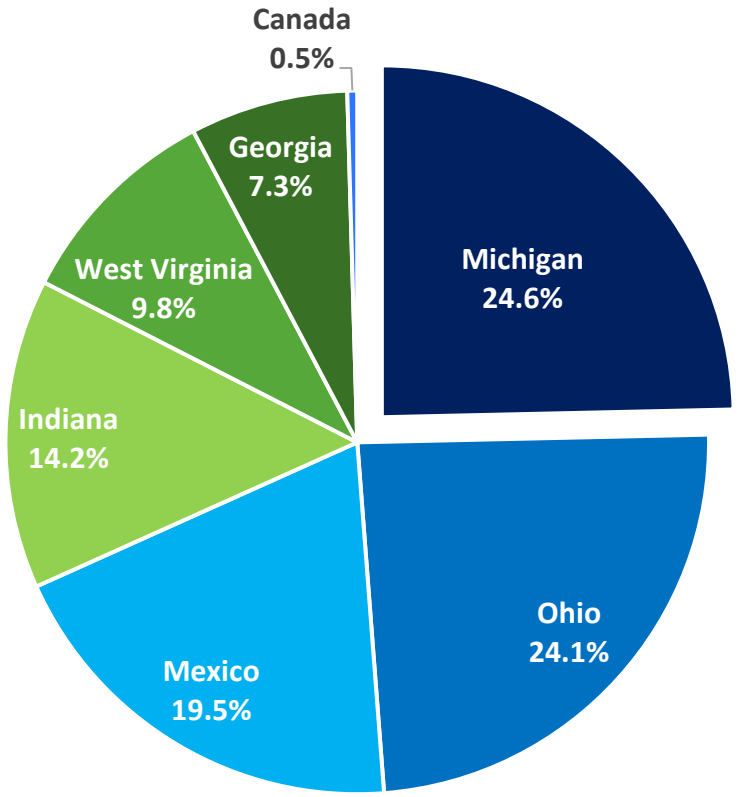
Source: LMC Automotive Q3 2021. Data excludes unknown location output

Transmission Production Forecast:
Michigan vs. Top N.A. Production Regions, 2021

Trad. and EV Transmission Production Forecast, 2021 to 2028



Trad. and EV Transmission Production by State, 2021



Source: LMC Automotive Q3 2021. Data excludes unknown location output

THANK YOU

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