



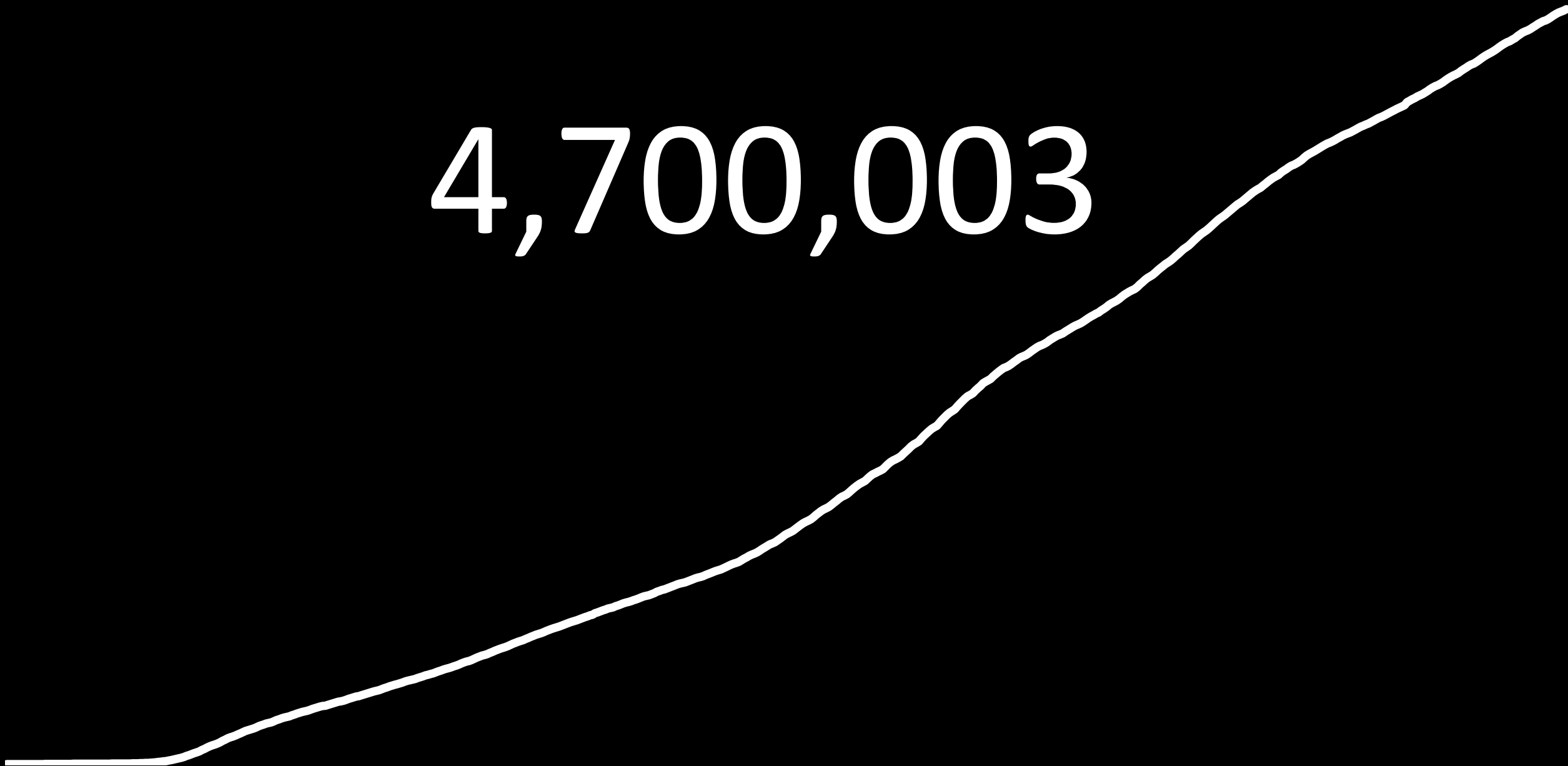
# Industry Review

Economics, Transportation  
&  
Commercial Vehicles

Presented by Penske Transportation Solutions



4,700,003



# Webinar Overview

- Introduction – Steve Tam
- N.A. Economy – Jim Meil
- Freight Transportation – Tim Denoyer
- Class 8 – Kenny Vieth
- Used Trucks & Medium Duty – Steve Tam
- Trailers – Frank Maly
- Q&A – All







# WE'RE TAKING ON THE WORLD

In partnership with Knibb, Gormezano & Partners, we're utilizing the foundation of our North American results from CHARGING FORWARD to deliver a global BEV and FCEV forecast.

With a focus on 4 regions and more than 20 countries, this study will work to understand the dynamics of electrification for the global commercial vehicle market.

- Infrastructure
- Battery Technology
- Fuel Cell Technology
- Hydrogen Technology
- Regulations
- Comprehensive TCO Model

Are you interested in participating?  
Contact Ian McGriff, [imcgriff@actresearch.net](mailto:imcgriff@actresearch.net)



# CHARGING FORWARD

## 2020 - 2040 BEV & FCEV FORECAST & ANALYSIS

Classes 4-5 Vehicles

14 Market Sub-Segments

23 Application Types

275+ Page Written Analysis Covering:

Infrastructure

Battery Technology

Fuel Cell Technology

Hydrogen Technology

Regulations

and More...

Comprehensive Plug & Play TCO Model

AVAILABLE NOW

Contact Ian McGriff, [imcgriff@actresearch.net](mailto:imcgriff@actresearch.net)





# It's still good, but a cloud or two on the horizon

1. Bad news and good news  
*Right now forecasting is about supply, not demand*
2. Signs of strength
3. The downside of good
  - a. Supply struggles
  - b. Inflation
4. COVID up, now down?
5. Signals to watch
6. Eye chart (statistics)



# Bad news, good news and in-between

## Bad news

- Vendor & inventory strain not easing
  - Oil at \$70/bbl (\$40/bbl in Sept 2020)
  - Semiconductors, steel, aluminum, natural gas & other – price up, supply issues
- Covid-Delta was up (may be past peak)
- Inflation is a Main Street worry; not on Wall Street radar, not much at the Fed
- Faint sniff (maybe more) of a bubble...

## Good news

- The 2020 COVID recession -- just 2 mos
- NA, global data solid (jobs up tho Aug so-so)
- Sugar rush – Fed, fiscal stim still @work
- COVID vax's protect enough, Pfizer for five-year and older set
- Asset & commodity prices remain high
- Trucking indicators still great

## In the middle

- Biden Admin really needs wins on infra, reconciliation & tax legislation, thread the needle between Manchin, Sinema, & AOC (watch for Sept 27 House vote)



# Super-strong: Global purchasing mgrs. survey

	Pre-COVID to August 2021 (mid quarter month excluded Q3'20, Q4'20, Q1'21, Q2'21)														
	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Sep-20	Oct-20	Dec-20	Jan-21	Mar-21	Apr-21	Jun-21	Jul-21	Aug-21
Global	47.2	47.6	39.6	42.4	47.8	50.3	52.3	53.0	53.8	53.5	55.0	55.8	55.5	55.4	54.1
United States	50.7	48.5	36.1	39.8	49.8	50.9	53.2	53.4	57.1	59.2	59.1	60.6	62.1	63.4	61.1
Canada	51.8	46.1	33.0	40.6	51.0	52.9	56.0	55.5	57.9	54.4	58.5	57.2	56.5	56.2	57.2
Mexico	50.0	46.9	35.0	38.3	38.6	40.4	42.1	43.6	42.4	43.0	45.6	48.4	48.8	49.6	47.1
Eurozone	48.7	44.5	33.4	39.4	47.4	51.8	53.7	54.8	55.2	54.8	62.5	62.9	63.4	62.8	61.4
Germany	48.0	45.4	34.5	36.6	45.2	51.0	56.4	58.2	58.3	57.1	66.6	66.2	65.1	65.9	62.6
France	49.8	43.2	31.5	40.6	52.3	52.4	51.2	51.3	51.1	51.6	59.3	58.9	59.0	58.0	57.5
Italy	48.7	40.3	31.1	45.4	47.5	51.9	53.2	53.8	52.8	55.1	59.8	60.7	62.2	60.3	60.9
Spain	50.4	45.7	30.8	38.3	49.0	53.5	50.8	52.5	51.0	49.3	56.9	57.7	60.4	59.0	59.5
UK	51.7	47.8	32.6	40.7	50.1	53.3	54.1	53.7	57.5	54.1	58.9	60.9	63.9	60.4	60.3
Russia	48.2	47.5	31.3	36.2	49.4	48.4	48.9	46.9	49.7	50.9	51.1	50.4	49.2	47.5	46.5
Japan	47.0	44.8	41.9	38.4	40.1	45.2	47.7	48.7	50.0	49.8	52.7	53.6	52.4	53.0	52.7
China	40.3	50.1	49.4	50.7	51.2	52.8	53.0	53.6	53.0	51.5	50.6	51.9	51.3	50.3	49.2
India	54.5	51.8	27.4	30.8	47.2	46.0	56.8	58.9	56.4	57.7	55.4	55.5	48.1	55.3	52.3
Brazil	52.3	48.4	36.0	38.3	51.6	58.2	64.9	66.7	61.5	56.5	52.8	52.3	56.4	56.7	53.6

>54
Above Trend
51-54
Trend
45-51
Flat
<45
Recession



# COVID Delta peaked?

## UNITED STATES

New cases confirmed  
each day (7-day-average)

▼ DOWN

The first case of COVID-19 in United States was reported 606 days ago on 1/21/2020. Since then, the country has reported 42,087,432 cases, and 673,763 deaths.

Delta variant **may** have peaked

- above June trough
- below January peak
- New cases running ~120k



# Materials prices up

## SEMICONDUCTORS:

Technology analytics/consultants /C Insights expect microprocessor prices to rise 4% this year.

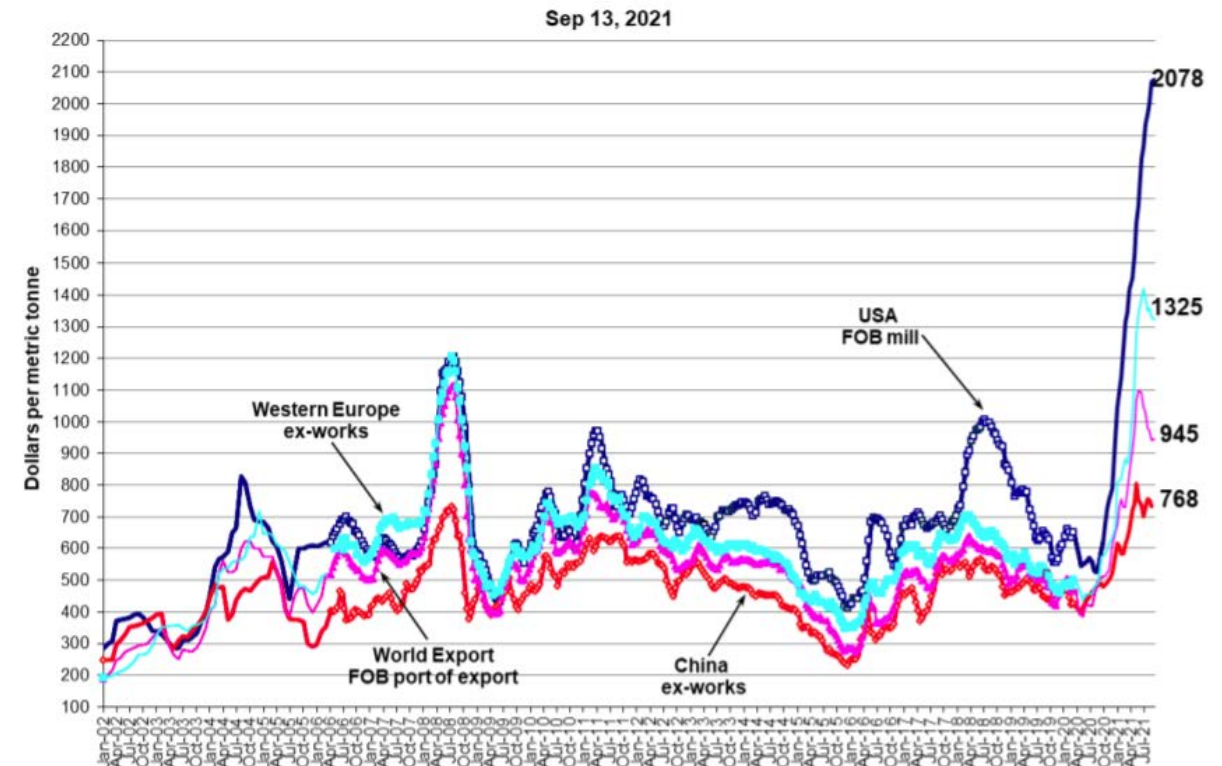
*Remember MPUs ordinarily decline in price, contributing to deflationary trends seen over years (decades) in PCs, cellphones, consumer electronics, and even helping constrain motor vehicle prices... until 2021.*

## STEEL 2002 to 2021:

SteelBenchmarker™ HRB Price

USA, China, Western Europe and World Export

(WSD's PriceTrack data, Jan. 2002 - March 2006; SteelBenchmarker data begins April 2006)



# Shortages have consequences – the headlines

BBC Sign in

NEWS

## Chip shortage could last into 2023, says car boss

© 17 hours ago | Comments

**The chip shortage that is disrupting global car production could continue into 2022 and even 2023, a leading German car industry figure has said.**

Covid had been a stress test for the industry, which needed a thorough review of its supply chains, Daimler chairman Ola Källenius said.

THE WALL STREET JOURNAL.

By [Asa Fitch](#)

Sept. 4, 2021 12:00 pm ET

TECH

## The Chip Shortage Has Made a Star of This Little-Known Component

Sourcing a low-margin part called the substrate has become a priority for Intel, Nvidia and AMD

Citing a challenging demand environment, Intel CEO Pat Gelsinger expects the semiconductor crunch to last into 2023.

PHOTO: INTEL/REUTERS

MARKETS | COMMODITIES

## High Steel Prices Have Manufacturers Scrounging for Supplies

Companies hunt for metal and hire help to find supplies; steel industry says 'we are producing as much as we can'

By [Austen Hufford](#)

Sept. 15, 2021 5:30 am ET

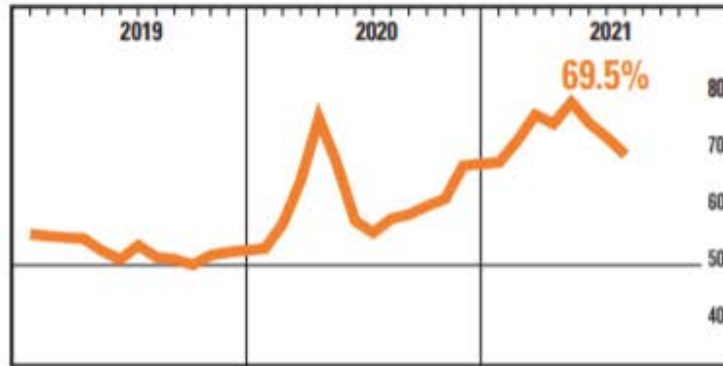
Manufacturers are facing the highest steel and aluminum prices in years, another hurdle for U.S. companies already struggling to make enough cars, cans and other products.

Rapidly [increasing metal costs](#) are pushing manufacturers to take what steel they can get and hire more people to seek out available supplies, company executives said. The rising costs are flowing through to some producers of consumer goods: [Campbell Soup Co.](#) [CPB -1.07% ▼](#) is paying more to get the cans it fills with tomato soup; [Peloton Interactive Inc.](#) [PTON -2.70% ▼](#) is seeing prices rise for parts that go into its stationary bikes; and [Steelcase Inc.](#) [SCS -0.37% ▼](#) is paying more to make metal desks and filing cabinets. Car makers like [Ford Motor Co.](#) [F -1.00% ▼](#) and [General Motors Co.](#) are also dealing with rising metal prices.

"It's crazy for steel," said Brian Nelson, president of HCC Inc., which sells large metal accessories to tractor manufacturers. "I can't even get material at times."

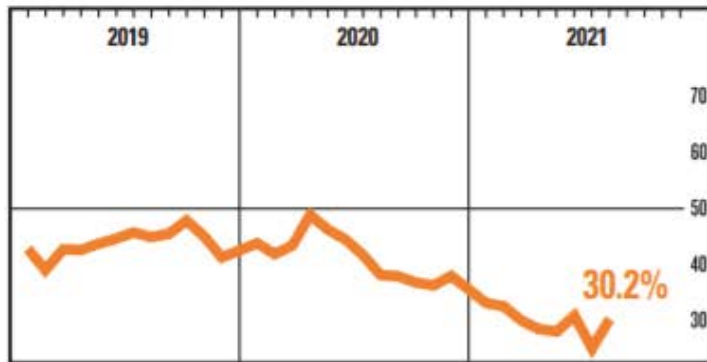
# Why trends to continue 1 – Purchasing Managers

The purchasing managers say so – near-record slow deliveries  
Customers' inventories keep declining



## Supplier Deliveries

The delivery performance of suppliers to manufacturing organizations was slower in August, as the Supplier Deliveries Index registered 69.5 percent. The 16 industries that reported slower supplier deliveries in August, in the following order: Apparel, Leather & Allied Products; Textile Mills; Furniture & Related Products; Paper Products; Machinery; Fabricated Metal Products; Miscellaneous Manufacturing<sup>†</sup>; Printing & Related Support Activities; Food, Beverage & Tobacco Products; Computer & Electronic Products; Electrical Equipment, Appliances & Components; Plastics & Rubber Products; Chemical Products; Primary Metals; Nonmetallic Mineral Products; and Transportation Equipment.



## Customers' Inventories

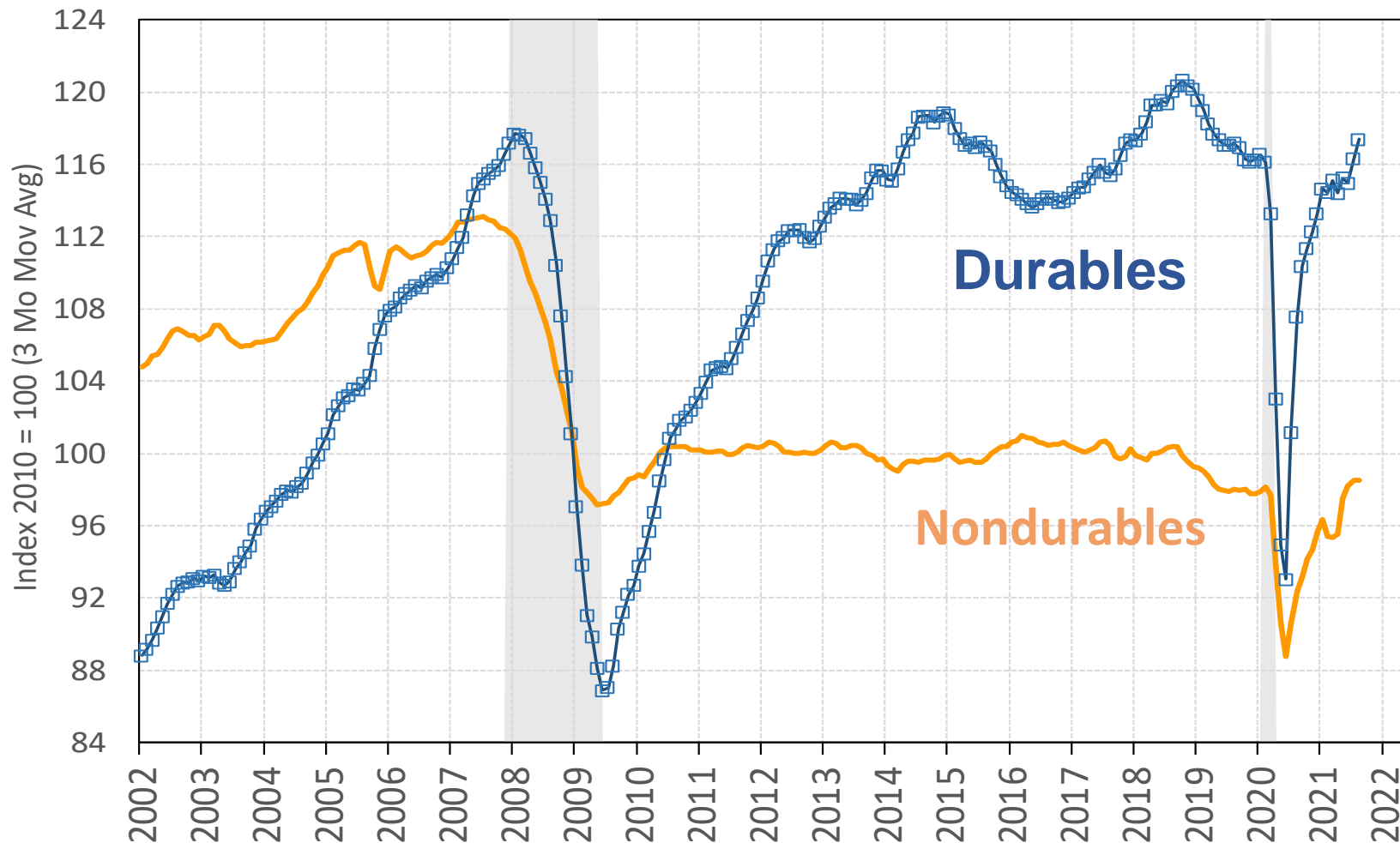
ISM's Customers' Inventories Index registered 30.2 percent. No industries reported higher customers' inventories in August. The 15 industries reporting customers' inventories as too low during August — listed in order — are: Nonmetallic Mineral Products; Textile Mills; Primary Metals; Furniture & Related Products; Machinery; Miscellaneous Manufacturing<sup>†</sup>; Chemical Products; Paper Products; Wood Products; Food, Beverage & Tobacco Products; Fabricated Metal Products; Computer & Electronic Products; Plastics & Rubber Products; Electrical Equipment, Appliances & Components; and Transportation Equipment.





# Why trends to continue 2 – Mfg Industrial Production

Cycle time duration, peak to trough & back, ~30% of 2008-2012



Why supply chain strain?

**SUPER  
COMPRESSED  
REBOUND**

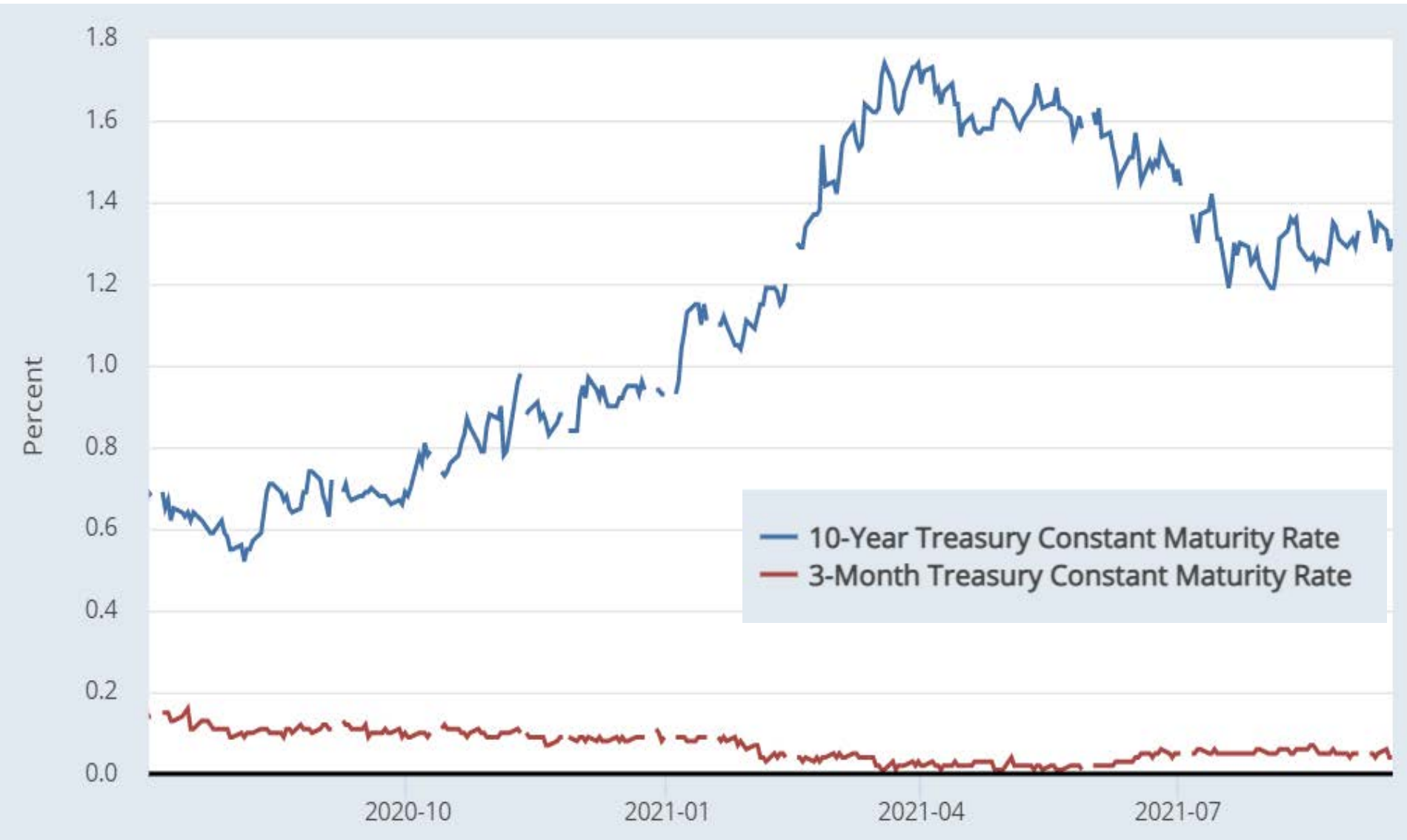
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This cycle – 4 mos  
down, 12 mos up

2008-09 -- 16 mos  
down, 42+ months  
up to prior peak

# Signals to watch #1 – Stock market



# Signals to watch #2 – yield curve since mid-2020



Rapid rise in LT Treasury rates Q4, Q1 stopped in Q2, reversed in Q3

Will rates rise again?

# The Eye-chart – Economy & forecast in numbers

	2018 Actual	2019 Actual	2020 Actual	FORECAST	
				2021 Forecast	2022 Forecast
Real GDP	2.9	2.3	-3.4	6.1	6.1
Consumer Spending	2.9	2.3	-3.4	8.1	5.7
Capital Spending	6.4	2.9	-4.0	9.6	10.7
Equipment	6.4	2.1	-5.0	11.0	13.0
Structures	4.0	-0.6	-10.5	5.0	6.0
Intellectual Property	8.1	6.4	1.5	9.5	9.5
Residential Investment	-0.6	-1.7	5.9	10.6	1.6
Government Consumption	1.4	2.3	1.1	2.5	2.6
Net Exports (2012 \$B)	-864	-905	-943	-1268	-1335
Mfg Industrial Production	2.7	0.1	-6.3	7.0	6.5
Housing Starts (M)	1.25	1.29	1.38	1.56	1.49
US Light Vehicle Sls (M)	17.2	17.0	14.5	15.5	17.4
NA Lt Veh Production (M)	16.8	16.8	13.0	15.2	17.2
Unemployment Rate (%)	3.9	3.7	8.1	5.6	4.3
90 Day Treasury Yield	1.9	2.1	0.4	0.1	0.1
10 Year Treasury Yield	2.9	2.1	0.9	1.5	2.0
GDP Deflator	2.4	1.8	1.2	3.8	2.5

Big growth

- for the economy
  - For investment
- For the next 6 qtrs

Percent Changes except where indicated

Updated Sept 10, 2021





# Freight Overview

## **Trucking:** great visibility continues

- Stronger-for-longer freight cycle
- Slowdown as volumes back to pre-pandemic levels
- Longer-term fiscal support & pent-up demand

## **Ocean:** all the ports can handle

- Restocking demand / record containership queues
- Record NA port backlogs
- Extreme imbalance driving rate spike

## **Rail / Intermodal:** stymied by chassis shortage

- Slowdown largely due to chassis shortage
- Auto production issues ongoing
- Chassis shortage 6-12 month problem



# Ocean Spot Rates Off the Charts

Freightos Baltic Index (FBX) Global Container Index

FBX Global Container Freight Index

17-Sep-21 / \$11,047



FREIGHTOS (c) Freightos Limited. Licensed under the Freightos Master Services Agreement.

fbx.freightos.com

- ~7x pre-pandemic levels
- **Strong peak season and major imbalances**
- **Small fraction of containers ship via spot, but...**

Bloomberg Businessweek

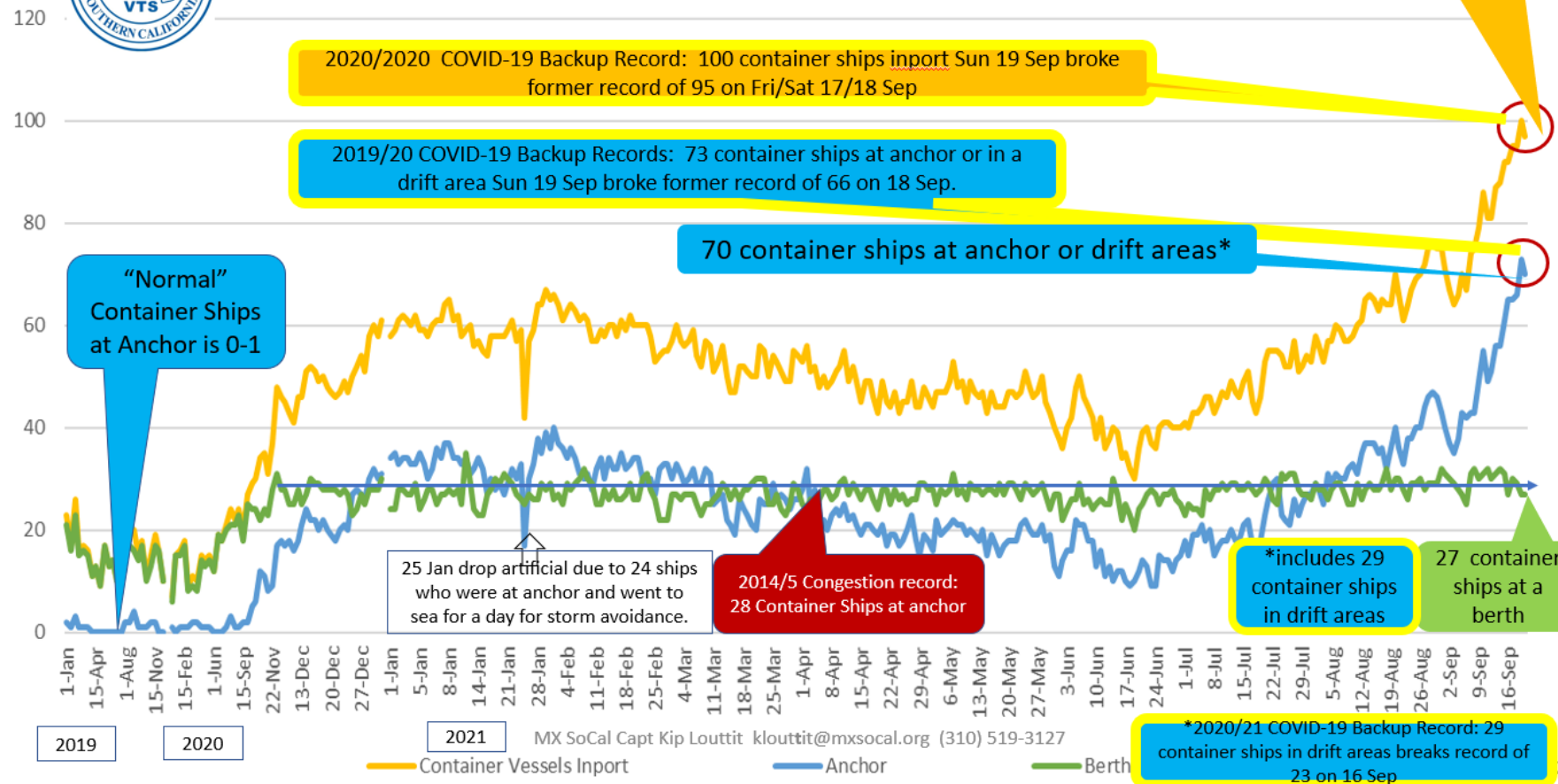
## ‘Just Get Me a Box’: Inside the Brutal Realities of Supply Chain Hell

Logistics managers are battling the pandemic, a labor shortage, and huge demand to get goods to your front door.

# Port Congestion Provides Freight Visibility



Total Container Ships in Los Angeles and Long Beach  
1 Jan 2019 through Mon 20 Sep per 1200 report



## Ports Swamped

**167 Container ships anchored off NA ports on 9/16/21**

In addition to record numbers in port

***Decline likely as ship delays impact Chinese exports***

**Freight backlog into 2022**

# Slowdown Reflects Supply Bottlenecks

## Weekly North American Rail Volumes by Segment

Week ending:	y/y % change														
	6/5/21	6/12/21	6/19/21	6/26/21	7/3/21	7/10/21	7/17/21	7/24/21	7/31/21	8/7/21	8/14/21	8/21/21	8/28/21	9/4/21	9/11/21
Intermodal	13.3%	16.8%	11.1%	9.9%	11.4%	-3.5%	3.0%	2.8%	2.6%	-0.2%	-1.0%	-2.6%	-3.2%	-5.7%	-6.6%
Chemicals	20.9%	18.5%	13.7%	9.1%	15.7%	4.4%	10.0%	10.7%	5.8%	8.1%	4.7%	4.1%	4.7%	-4.7%	0.9%
Metals	41.5%	32.9%	31.3%	38.8%	41.2%	47.5%	44.0%	32.3%	35.9%	27.0%	25.9%	23.5%	24.4%	14.9%	18.7%
Automotive	43.0%	11.6%	-2.7%	-6.8%	-2.7%	-16.5%	-17.3%	-27.7%	-23.5%	-22.8%	-24.5%	-20.5%	-23.9%	-32.6%	-36.1%
Petroleum	30.2%	20.1%	20.1%	24.8%	18.1%	11.8%	10.7%	17.7%	16.7%	12.5%	10.4%	18.3%	21.1%	11.4%	16.4%
Minerals/Sand	8.5%	11.5%	10.3%	15.0%	21.3%	5.2%	3.6%	12.4%	12.3%	12.4%	12.4%	12.9%	12.1%	11.1%	11.8%
Paper/Lumber	16.5%	14.7%	11.5%	15.6%	12.7%	2.6%	5.3%	7.8%	5.1%	4.2%	4.9%	1.0%	7.5%	3.1%	5.4%
Grain/Food	3.0%	4.6%	-2.7%	4.4%	-3.4%	-12.7%	-7.7%	-8.4%	-8.1%	-12.5%	-13.9%	-15.1%	-15.5%	-16.7%	-12.8%
Coal	36.3%	38.4%	34.3%	32.0%	35.0%	16.8%	18.6%	16.6%	12.8%	18.3%	22.0%	5.7%	15.8%	13.5%	18.3%
<b>Total</b>	<b>17.2%</b>	<b>17.5%</b>	<b>12.2%</b>	<b>12.6%</b>	<b>14.1%</b>	<b>0.4%</b>	<b>4.9%</b>	<b>4.5%</b>	<b>4.2%</b>	<b>2.5%</b>	<b>1.6%</b>	<b>-0.4%</b>	<b>0.3%</b>	<b>-3.3%</b>	<b>-2.2%</b>
Carloads, ex-Intermodal	21.3%	18.2%	13.3%	15.5%	16.9%	4.3%	6.9%	6.2%	5.8%	5.2%	4.3%	1.9%	4.1%	-0.7%	2.2%

Source: Company reports; ACT Research Co. LLC. Copyright 2021

## Weekly North American Intermodal Volumes by Railroad

Week ending:	y/y % change														
	6/5/21	6/12/21	6/19/21	6/26/21	7/3/21	7/10/21	7/17/21	7/24/21	7/31/21	8/7/21	8/14/21	8/21/21	8/28/21	9/4/21	9/11/21
BNSF	15.3%	20.7%	13.2%	13.6%	16.4%	5.7%	8.6%	10.0%	9.5%	2.4%	4.6%	2.5%	3.1%	-1.1%	-2.3%
CN	19.1%	13.1%	8.9%	11.9%	5.1%	-17.4%	-9.1%	-0.2%	0.1%	-5.4%	4.0%	0.0%	-6.9%	-10.5%	-20.9%
CP	12.6%	18.9%	20.9%	12.7%	6.3%	-28.5%	3.7%	2.1%	10.6%	10.9%	18.0%	28.5%	11.3%	17.7%	16.6%
CSX	17.4%	23.3%	14.7%	13.1%	16.6%	3.9%	11.5%	10.4%	8.2%	7.3%	1.9%	-1.3%	0.8%	-1.1%	1.1%
KCS	15.4%	21.9%	1.1%	6.6%	3.4%	-6.2%	-2.1%	-2.7%	-0.7%	-13.6%	-16.6%	-15.1%	-15.1%	-19.0%	-19.3%
NS	9.9%	11.4%	8.7%	3.6%	8.8%	-1.2%	3.5%	0.1%	-1.0%	0.5%	-6.4%	-7.7%	-10.4%	-12.0%	-5.4%
UP	6.8%	13.5%	9.8%	8.1%	11.2%	-6.5%	-1.8%	-5.1%	-5.8%	-5.1%	-8.4%	-10.3%	-4.4%	-7.6%	-10.8%
<b>Total</b>	<b>13.3%</b>	<b>16.8%</b>	<b>11.1%</b>	<b>9.9%</b>	<b>11.4%</b>	<b>-3.5%</b>	<b>3.0%</b>	<b>2.8%</b>	<b>2.6%</b>	<b>-0.2%</b>	<b>-1.0%</b>	<b>-2.6%</b>	<b>-3.2%</b>	<b>-5.7%</b>	<b>-6.6%</b>

Source: Company reports; ACT Research Co. LLC. Copyright 2021

- Chassis shortage, terminal congestion, protests in Mexico slowing intermodal volume

- Chip shortages slowing auto & truck manufacturing rebound

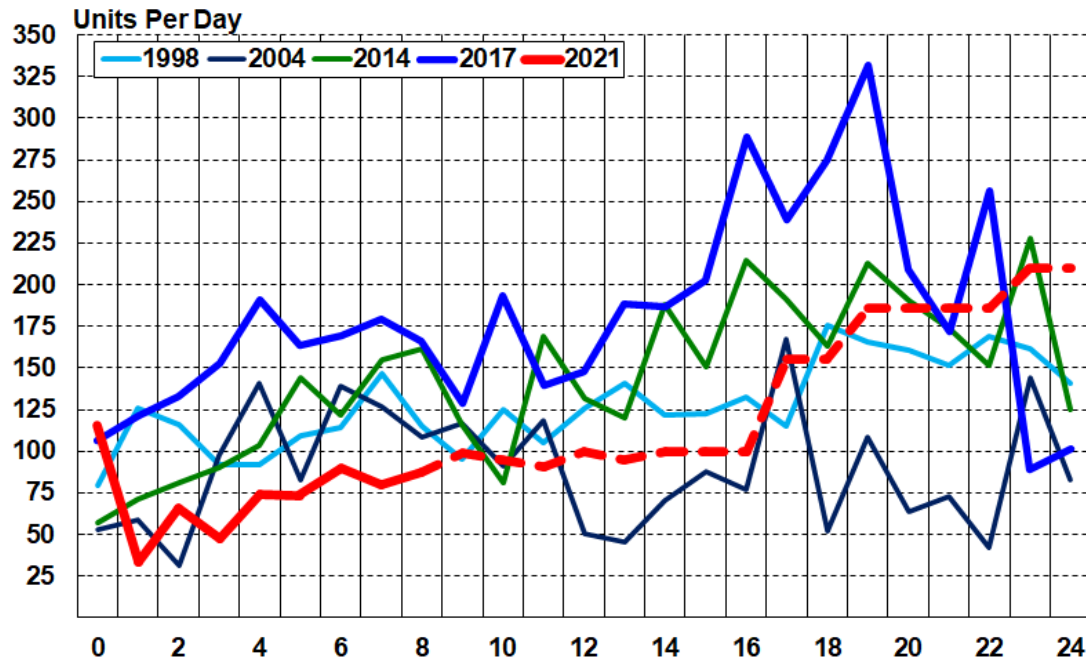
- Moderate impact from Hurricane Ida early-Sept



# Chassis Shortage Snarls Intermodal Traffic

## US Chassis: Arc & Duration of Peak Demand Cycle

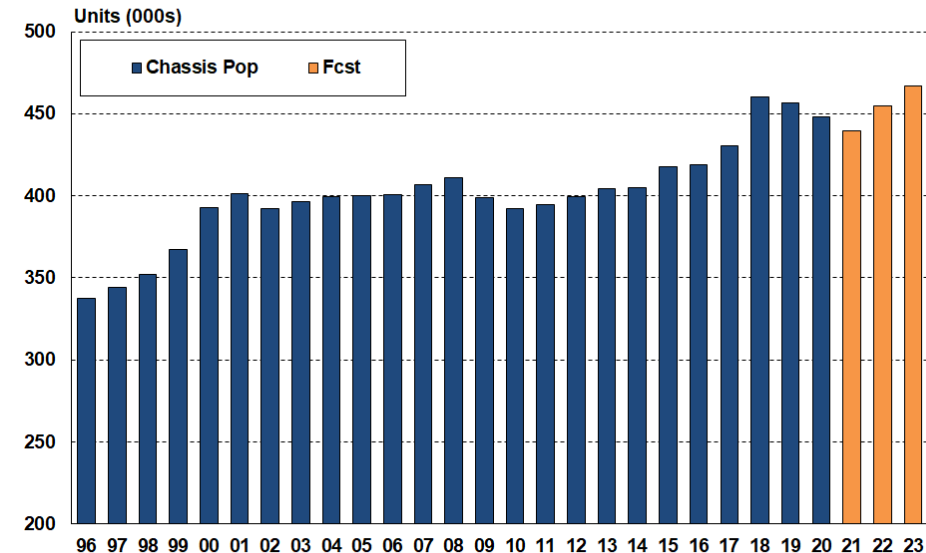
Build rate progression following cycle-initiating order trend shift



Source: ACT Research Co., LLC: Copyright 2021

## U.S. Chassis Population

1996 - 2023E



Source: ACT Research Co., LLC: Copyright 2021

**2021 YTD build 35% below historic average**

### ACT Fleet Forecasts:

2% decline in 2021

5% drop since 2018

3% growth in 2022 & 2023

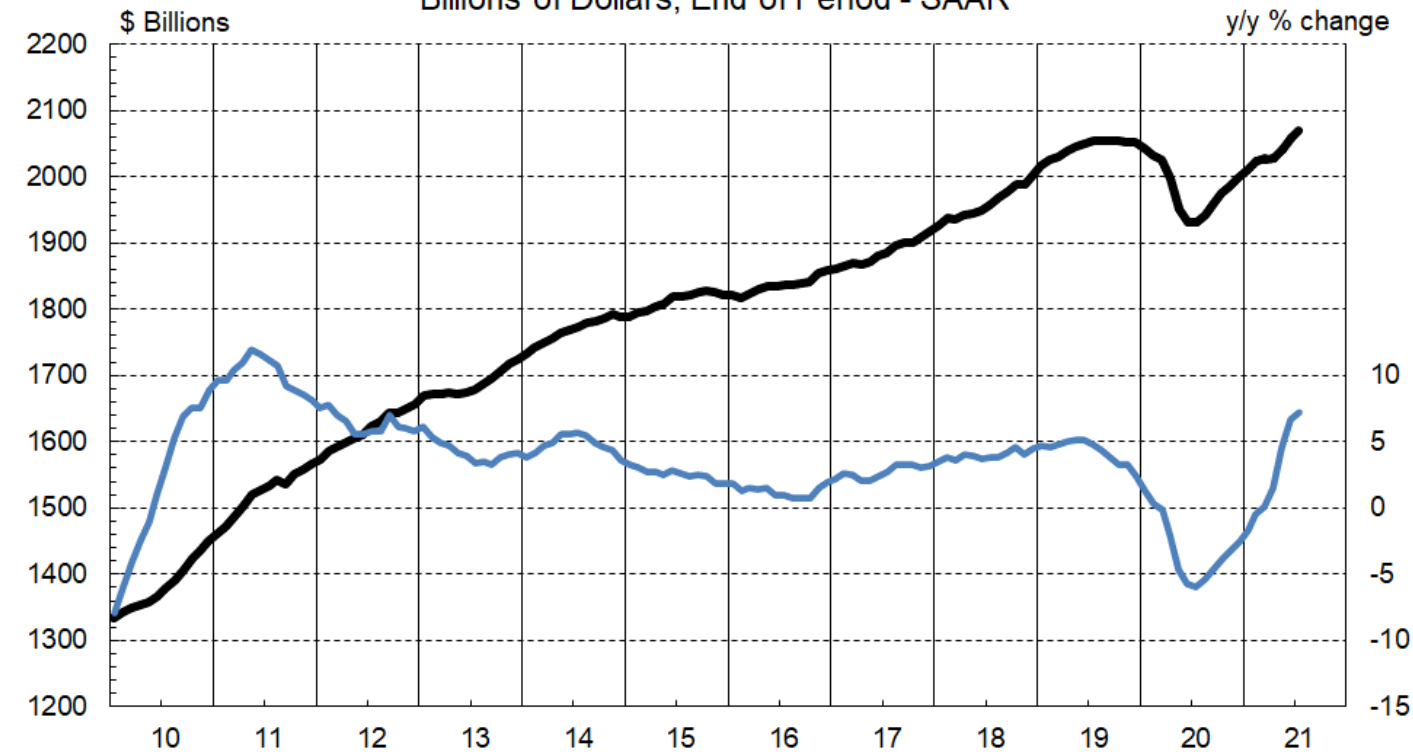
**Implication:** more freight on the highways

# Inventory Spring Uncoiling

## Inventories: Total Business

January 2010 - July 2021

Billions of Dollars, End of Period - SAAR



Source: Census Bureau, ACT Research Co., LLC: Copyright 2021

Inventories back to record levels

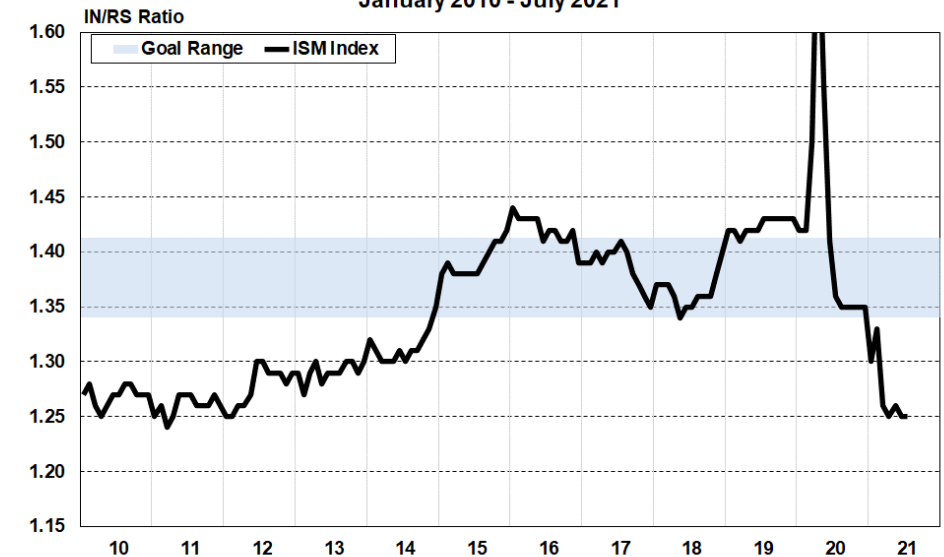
Restock driving ~2%-3% US freight volume growth in 2021

- continuing into 2022

## Inventory to Sales Ratio: Total Business

Index - SAAR

January 2010 - July 2021

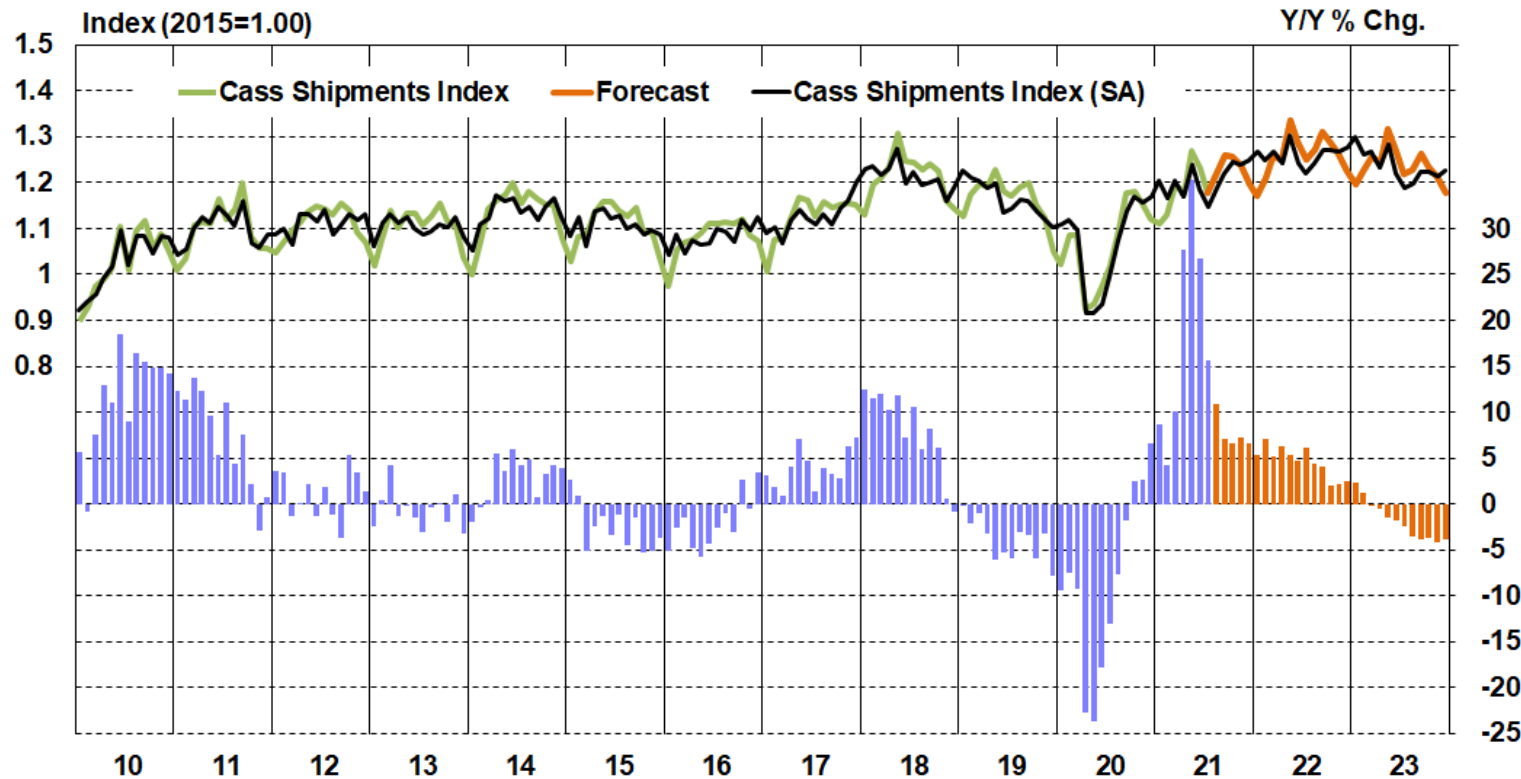


Source: Census Bureau, ACT Research Co., LLC: Copyright 2021

# Freight Volume Outlook

## Cass Shipments Index <sup>(R)</sup>

January 2000 - December 2023 Forecast



Source: Cass Information Systems, Inc., ACT Research Co., LLC: Copyright 2021

### Stronger-for-longer freight cycle

Led by goods demand, inventory restock

Pent-up demand building in manufacturing

Truck picking up slack from rail

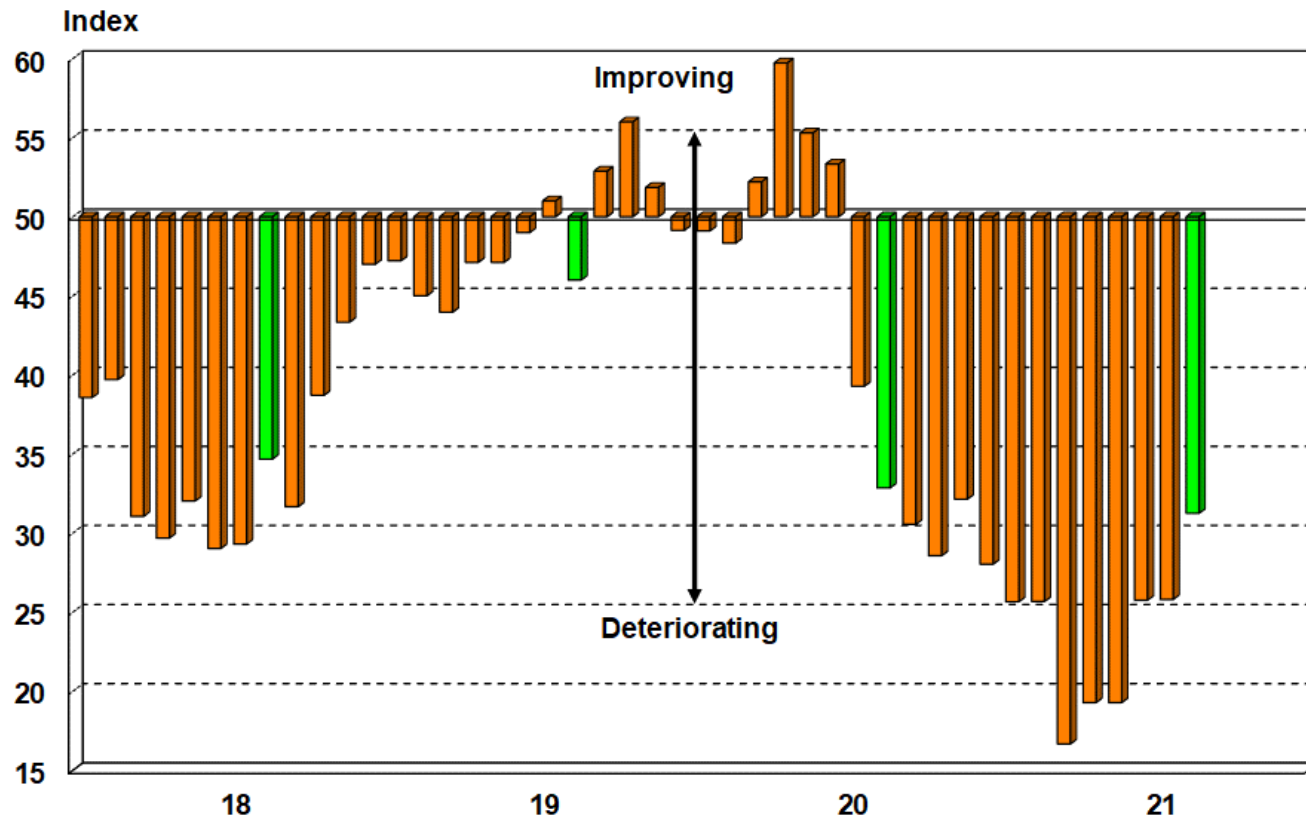
Fiscal stimulus partly factored in

***Substitution of spending back to services, private fleet growth, eventual end of restock to slow for-hire freight cycle in '22/'23***

# Driver Availability Gradually Improving

## ACT For-Hire Trucking Index: Driver Availability

January 2018 - August 2021



Source: ACT Research Co., LLC: Copyright 2021

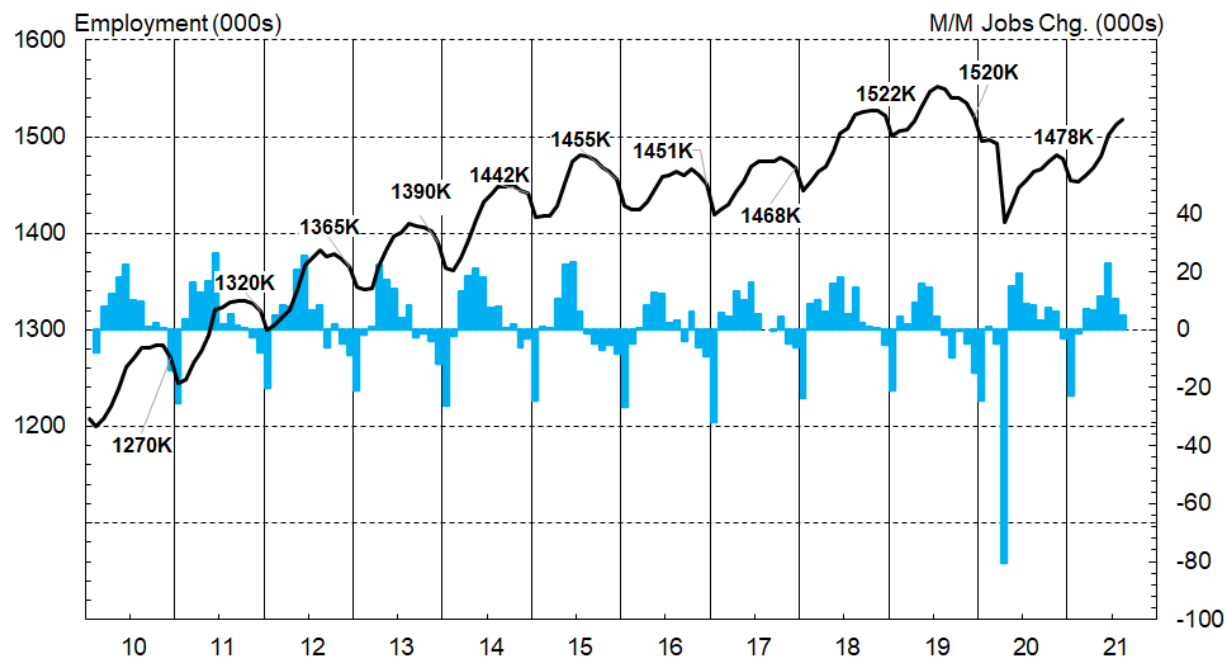
**Considerable rise since curtailment of extended unemployment in June. Trend maybe slowed by Delta variant**



# Improving Employment Trend

## Truck Transportation Employment

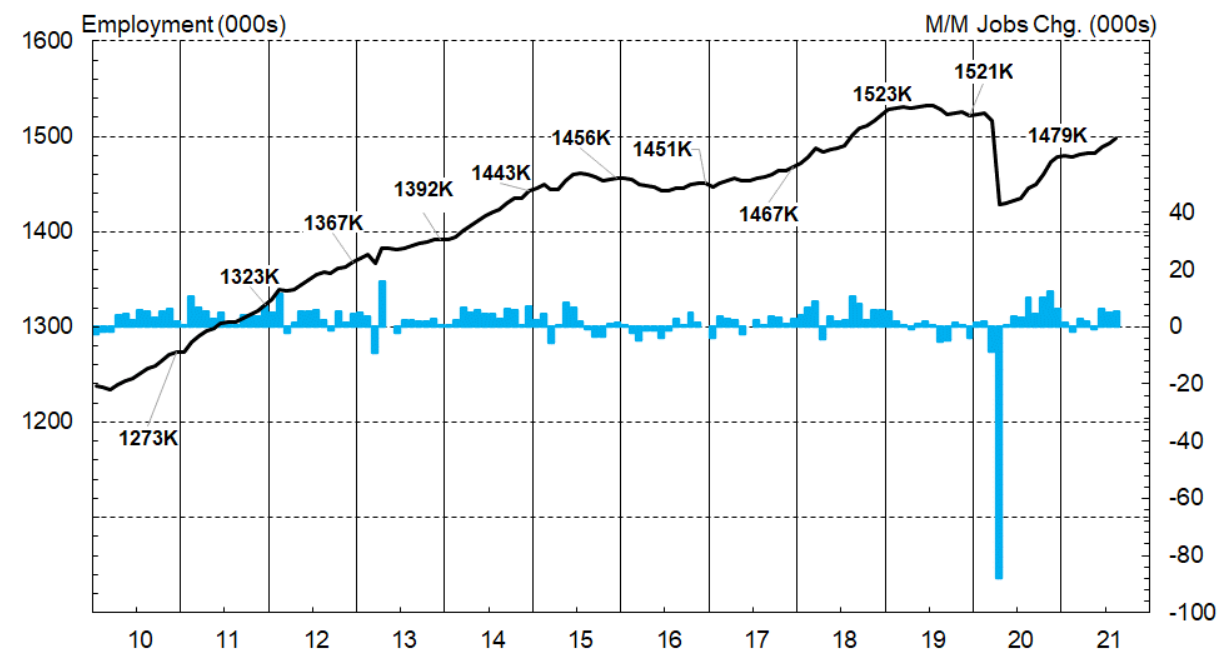
January 2010 - August 2021 (NSA)



Source: BLS, ACT Research Co., LLC: Copyright 2021

## Truck Transportation Employment

January 2010 - August 2021 (SA)

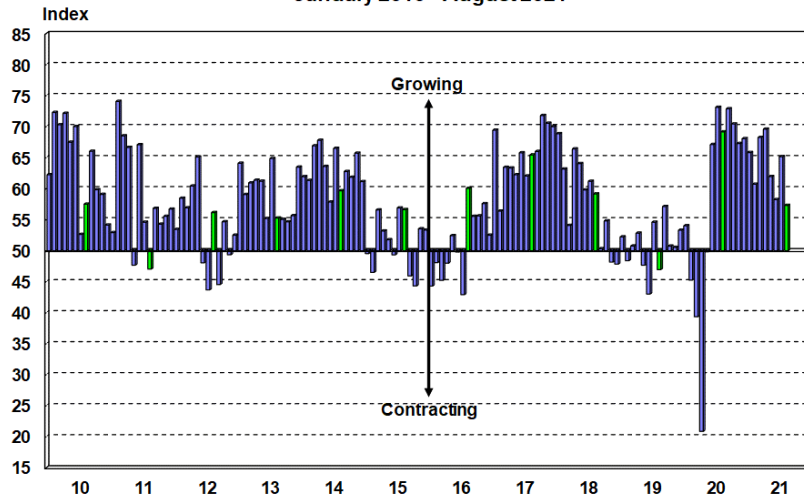


Source: BLS, ACT Research Co., LLC: Copyright 2021

- August 2021 in line with December 2019 (NSA)
- 4.5% growth rate in June-Aug (SAAR)

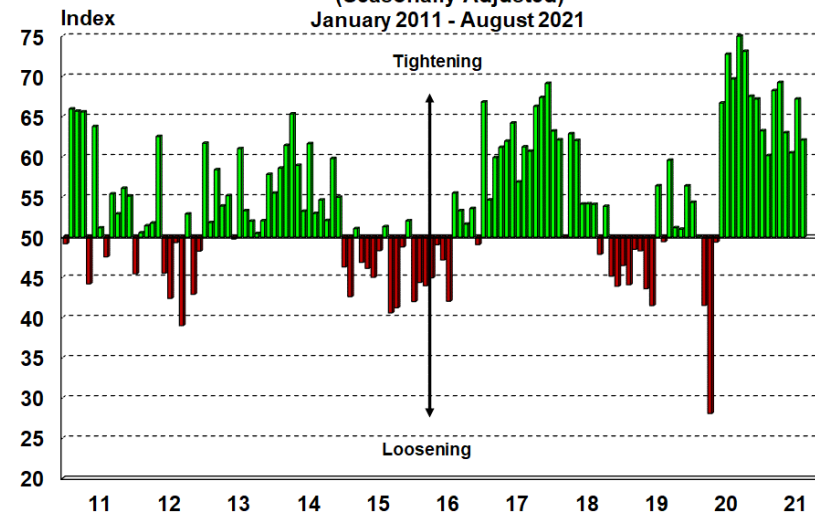
# Carrier Survey Shows Early Signs of Rebalancing

ACT For-Hire Trucking Index: Volumes  
(Seasonally Adjusted)  
January 2010 - August 2021



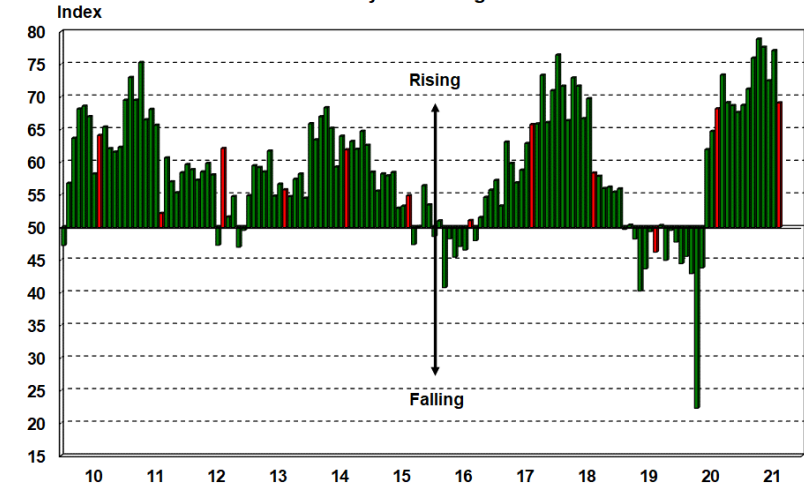
Source: ACT Research Co., LLC: Copyright 2021

ACT For-Hire Trucking Survey: Supply-Demand Balance  
Freight (Demand) Index Less Capacity (Supply) Index  
(Seasonally Adjusted)  
January 2011 - August 2021



Source: ACT Research Co., LLC: Copyright 2021

ACT For-Hire Trucking Index: Freight Rates  
(Seasonally Adjusted)  
January 2010 - August 2021



Source: ACT Research Co., LLC: Copyright 2021

- Volumes partly slowed by capacity
- Supply/Demand pretty tight, rebalancing still in early days
- Slower demand / capacity recovery to drive peak in rate cycle

# Freight Forecasts

**Volume Drivers:**  
economic growth  
very supportive

- Healthy US consumer/unprecedented freight backlog
- New stimulus coming
- Manufacturing recovery on the way

**Capacity Constraints:**  
no quick solutions

- Strong truck demand meets constrained supply
- Drivers & chips key to rebalancing
- Production bottlenecks into 2022

**Rate increases:**  
plateau phase

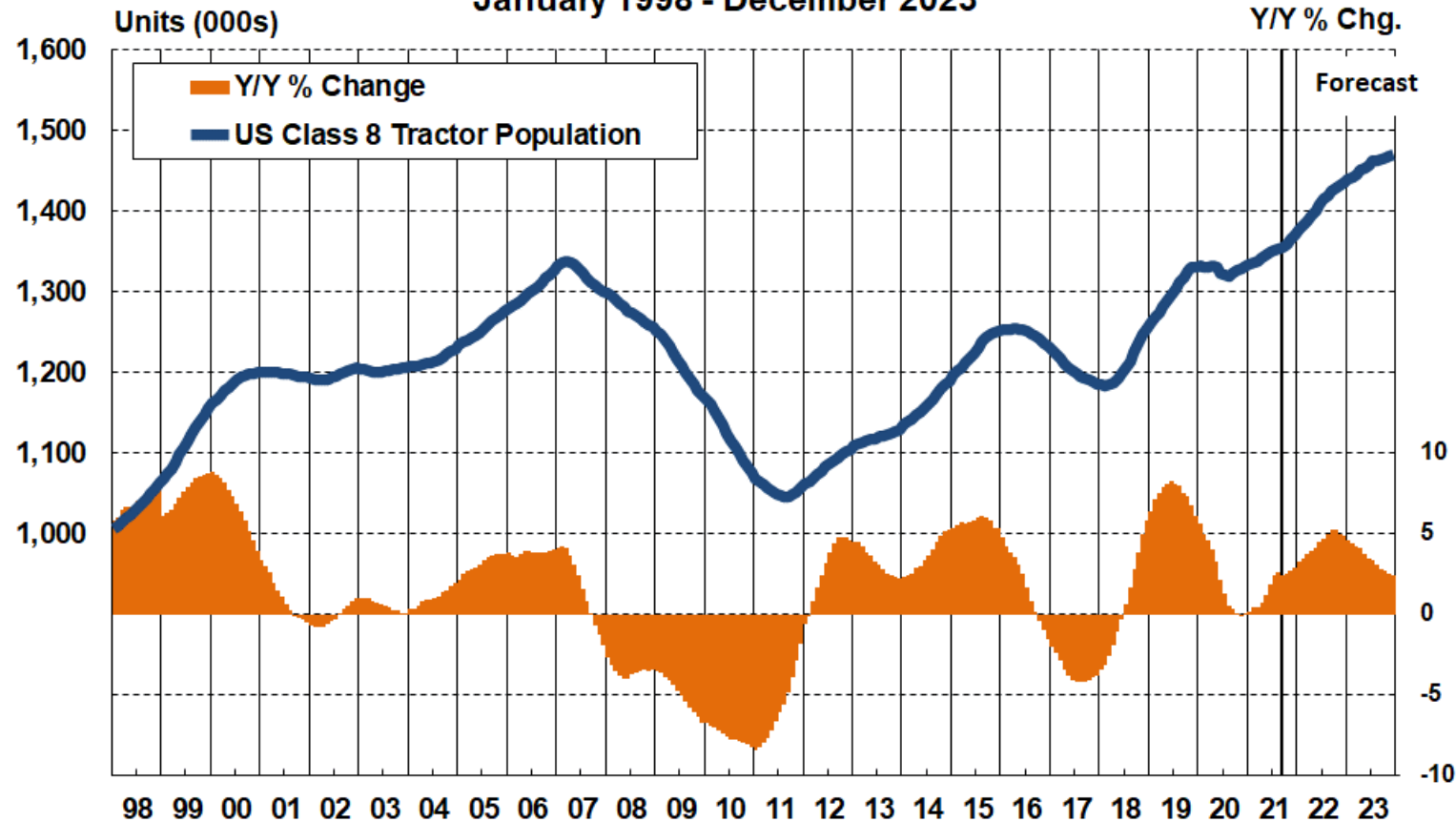
- Double digit TL contract increases in 2021
- Sharp slowdown in 2022 with relief for shippers likely
- Highways and oceans very different



# Tractor Population Growth Constrained Near-Term

## U.S. Class 8 Active TL & LTL Tractor Population

January 1998 - December 2023



Source: ACT Research Co., LLC: Copyright 2021

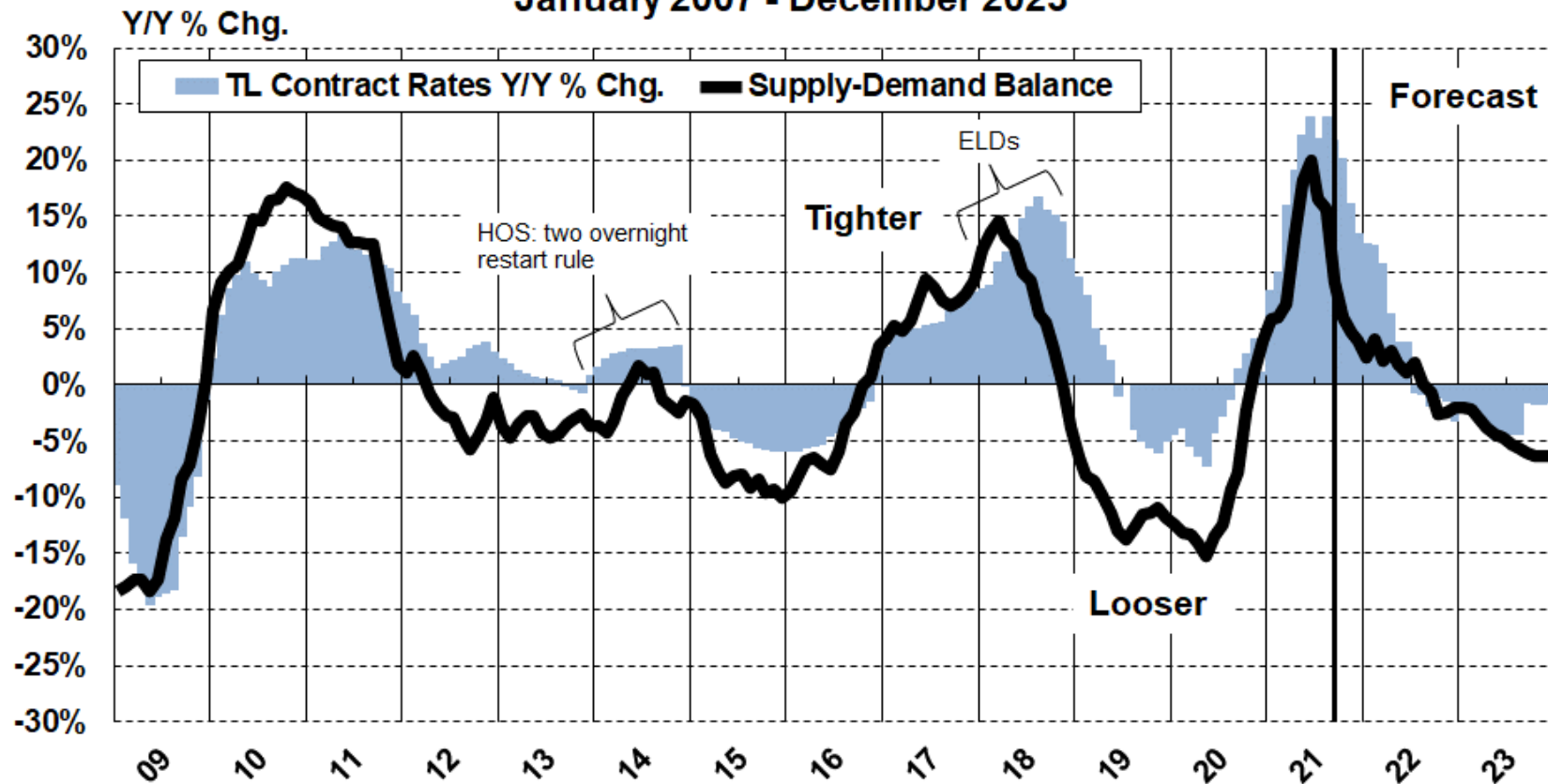
**Chip shortages slowing production and aftermkt, sidelining equipment**

**Capacity growth will accelerate into 2022**



# Tying the Threads Together

**Truckload Rate Gauge**  
January 2007 - December 2023



Note: Supply is Tractor Population, Demand is the Cass Shipments Index, TL Contract Rates, incl fuel, based on ACT Public TL Carrier Database.

Source: ACT Research Co., LLC: Copyright 2021

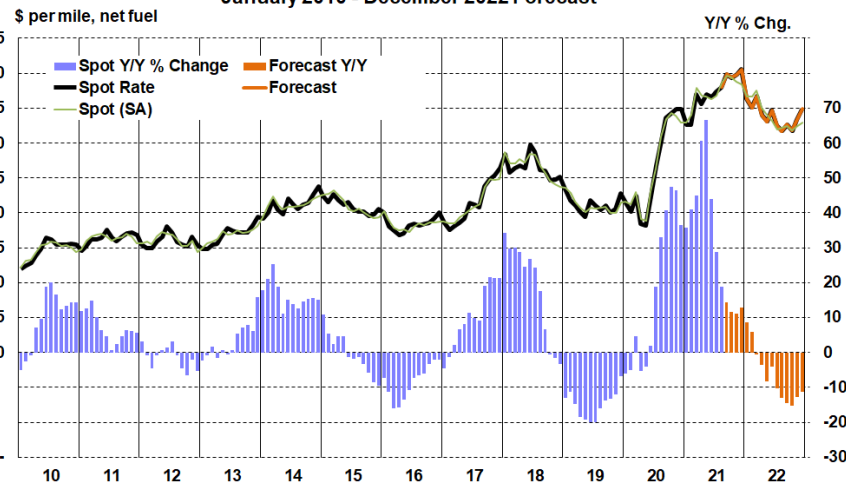
**2H'21: Market re-balancing begins**

**2022-23: Pendulum swings back to shippers**

# Truckload Spot Rate Forecasts by Trailer Type

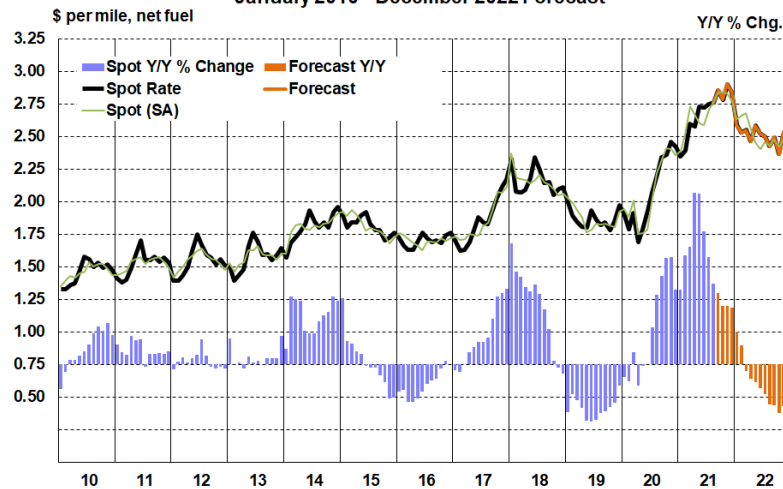
DAT Trendlines Spot Rates: Dry Vans

January 2010 - December 2022 Forecast



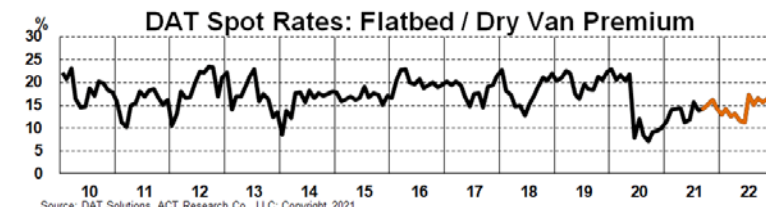
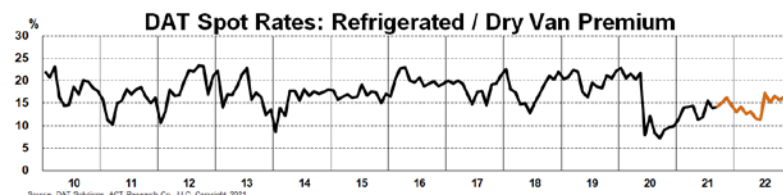
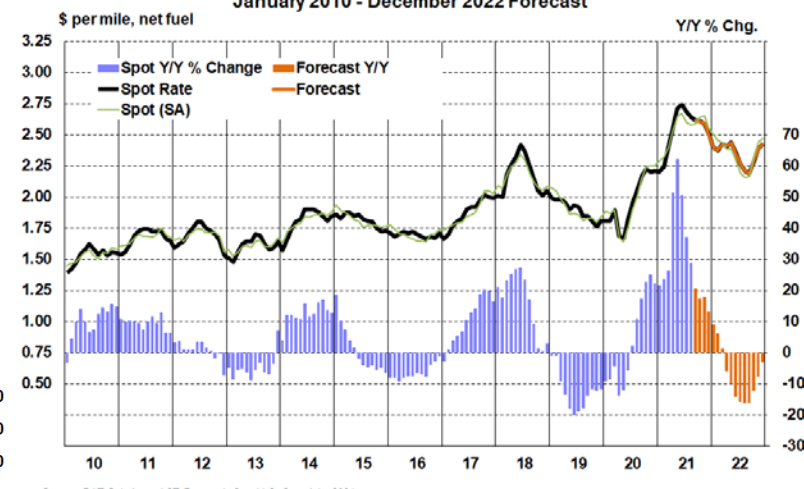
DAT Trendlines Spot Rates: Refrigerated

January 2010 - December 2022 Forecast



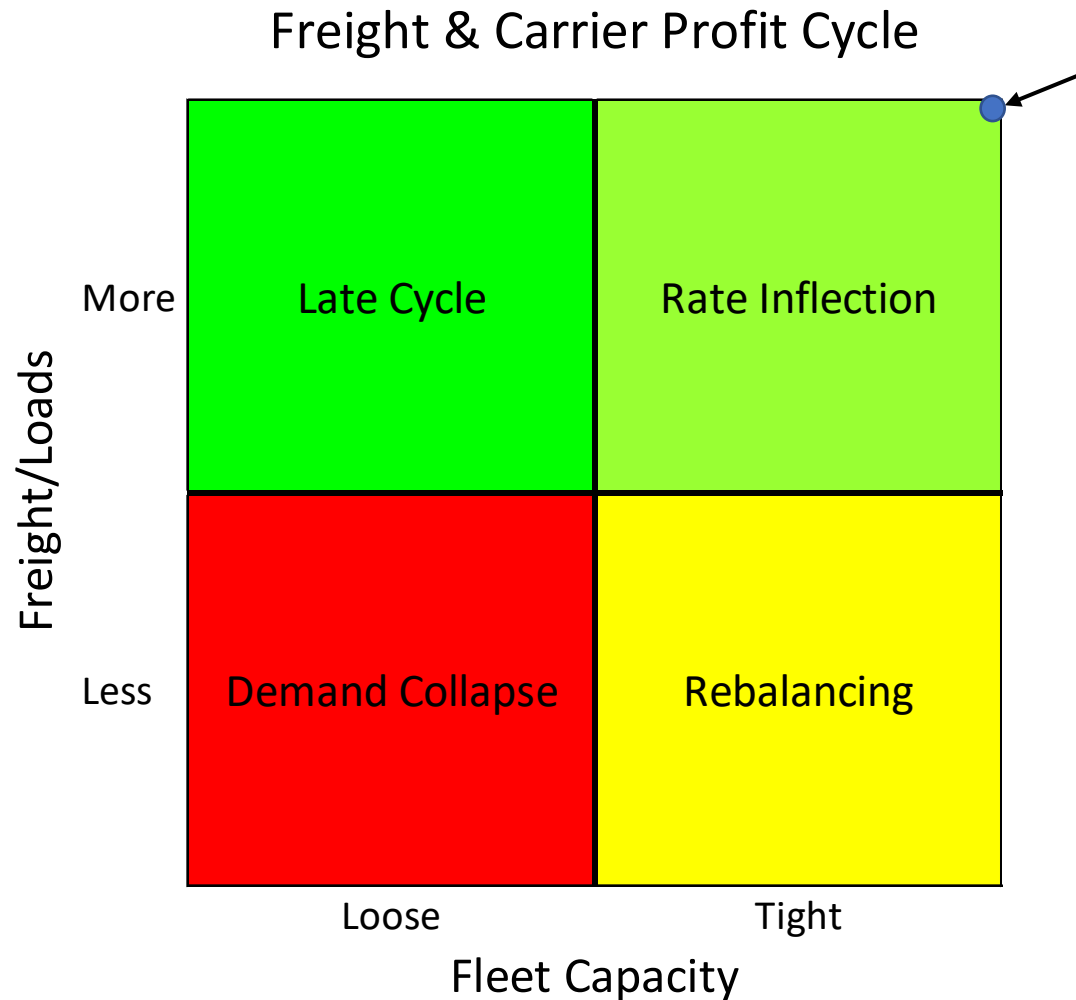
DAT Trendlines Spot Rates: Flatbed

January 2010 - December 2022 Forecast



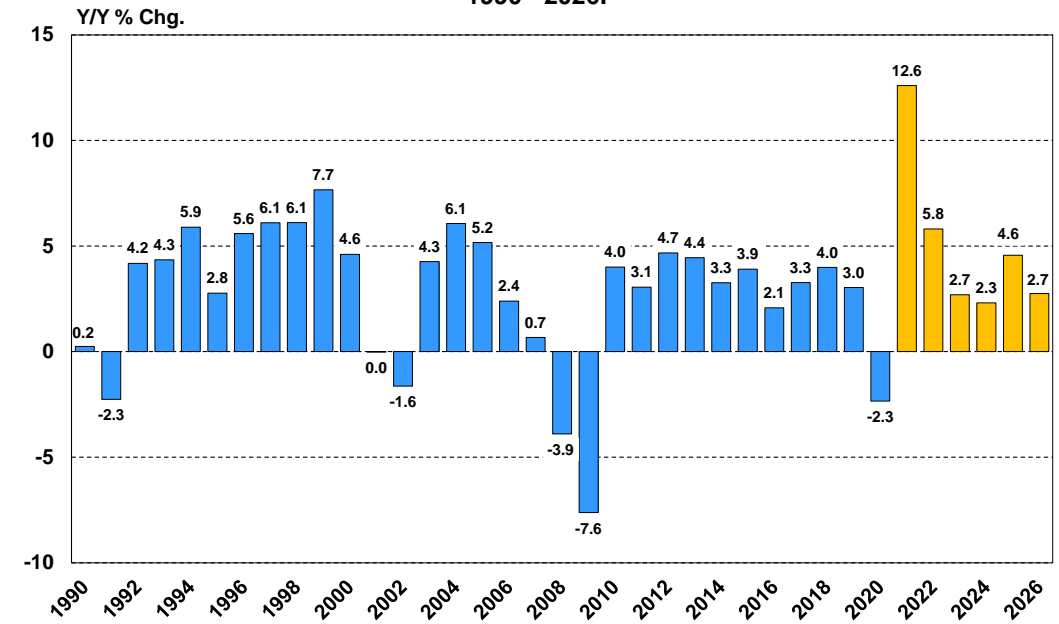
- Reefer and flatbed at below-average premia to dry van
- Spreads tend to compress around cyclical peaks and widen near troughs

# As Good as It Gets



**Record Freight Creation  
Substantive Driver Capacity  
Constraints**

**ACT U.S. Freight Composite**  
Year Over Year  
1990 - 2026F



Source: ACT Research Co., LLC: Copyright 2021



# Tractor Dashboard: Indicator of Indicators

*Designed to provide 3-6 months of forward visibility on orders*

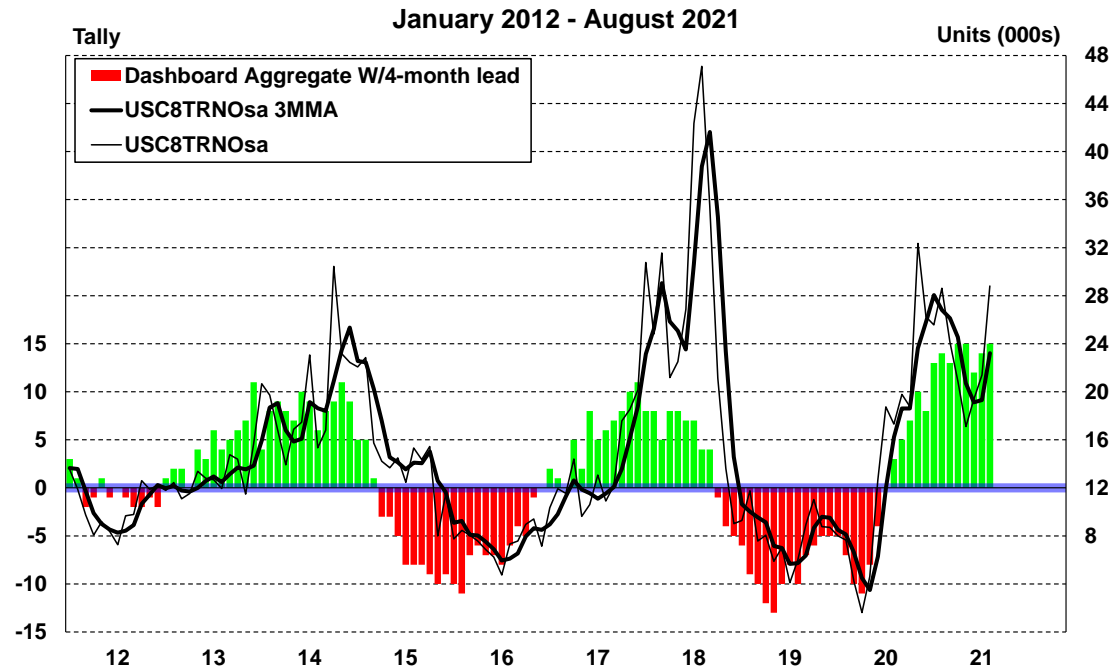
ACT Research Class 8 Tractor Dashboard																				
Category	Metric	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21
	<b>Green Minus Red Tally</b>	<b>-7</b>	<b>-10</b>	<b>-11</b>	<b>-8</b>	<b>-4</b>	<b>0</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>10</b>	<b>8</b>	<b>13</b>	<b>14</b>	<b>13</b>	<b>15</b>	<b>15</b>	<b>12</b>	<b>14</b>	<b>15</b>
	Positive Indicators (Green)	2	1	2	2	3	7	8	9	9	11	11	13	14	13	15	15	13	14	15
	Neutral Indicators	4	3	0	3	5	1	2	2	4	3	1	2	1	2	0	0	1	1	0
	Negative Indicators (Red)	9	11	13	10	7	7	5	4	2	1	3	0	0	0	0	0	1	0	0
Macro & Financial	ISM Mfg PMI Index	50.1	49.1	41.5	43.1	52.6	54.2	56.0	55.4	59.3	57.5	60.7	58.7	60.8	64.7	60.7	61.2	60.6	59.5	59.9
	Non-Auto Durables Mfg Output**	-1.4	-2.6	-9.5	-13.5	-15.1	-14.9	-13.6	-11.5	-8.5	-5.0	-0.8	5.0	9.7	15.8	19.9	15.0	11.4	9.7	8.7
	Consumer Spend, Goods only**	3.8	2.6	-3.4	-3.2	-0.7	2.2	4.8	8.0	10.7	12.3	12.5	15.5	16.1	20.6	22.9	15.4	13.0	11.7	10.0
	Residential Const Expend (real) **	10.8	10.9	8.4	4.4	1.3	-0.1	1.1	2.5	5.4	8.7	13.6	18.0	21.7	25.8	28.6	28.2	23.7	18.7	14.0
	Dow Jones Trucking Stock Index	779.5	766.6	840.2	974.0	963.4	1058.7	1143.3	1069.3	1034.0	1112.6	1102.4	1073.9	1175.9	1293.1	1340.4	1357.0	1293.7	1331.4	1399.2
Freight	Cass Freight Shipments**	-12.7	-13.8	-19.1	-22.3	-22.2	-20.8	-16.4	-8.3	1.1	8.6	14.1	15.7	16.3	22.0	26.5	24.6	19.7	12.7	9.1
	DAT Loads/Truck	3.4	3.9	1.3	2.3	3.6	6.0	7.4	6.7	6.0	6.4	7.3	8.5	14.9	9.7	9.0	10.7	7.5	10.1	9.0
	DAT Aggregate Contract/Spot Spread	31	23	39	36	19	6	-6	-14	-11	-13	-10	3	3	-11	0	-9	-5	-4	-3
	DAT Dry Van Spot Rate*	-5.4	3.6	-6.4	-3.4	0.7	14.9	27.3	34.4	40.5	40.3	30.8	30.3	37.2	40.7	57.4	61.5	43.3	31.0	30.0
	Cass Freight/US Cl8Tractor Pop Growth Gap	-17.2	-17.3	-21.5	-23.5	-22.1	-19.6	-14.4	-5.8	3.7	11.0	16.0	17.1	17.1	22.1	25.7	23.1	17.7	10.4	6.8
ACT data	Cl 8 Cancellations (SA)	1781	5962	3334	1465	1117	1431	1330	1146	916	2600	4019	1017	1520	2427	1954	1215	5628	1044	1882
	Cl 8 I/S ratio (SA)	3.60	4.19	4.22	4.69	4.12	3.75	2.66	2.78	2.76	2.32	2.83	1.95	2.10	2.21	2.00	1.97	2.23	2.18	2.00
	Class 8 Inventory Level (000 SA)	81.3	78.4	65.7	60.3	61.6	61.5	58.3	57.2	57.2	56.7	57.5	56.0	52.2	51.9	50.3	51.1	48.0	42.2	40.5
	Class 8 Net Orders to Build (6mma,SA)	0.66	0.66	0.65	0.69	0.76	0.92	1.06	1.38	1.42	1.58	1.69	1.70	1.82	1.78	1.81	1.62	1.57	1.63	1.59
	ACT For Hire - Volume less Capacity	48.8	44.9	26.9	50.2	71.1	66.3	69.0	74.1	74.9	67.5	66.6	63.9	60.1	68.1	59.2	63.0	60.5	67.6	65.0

All measures are levels, except \*=Year/Year %  
Change and \*\*=12 month CAGR Rate of Change



# Dashboard Provides Long Production Leads

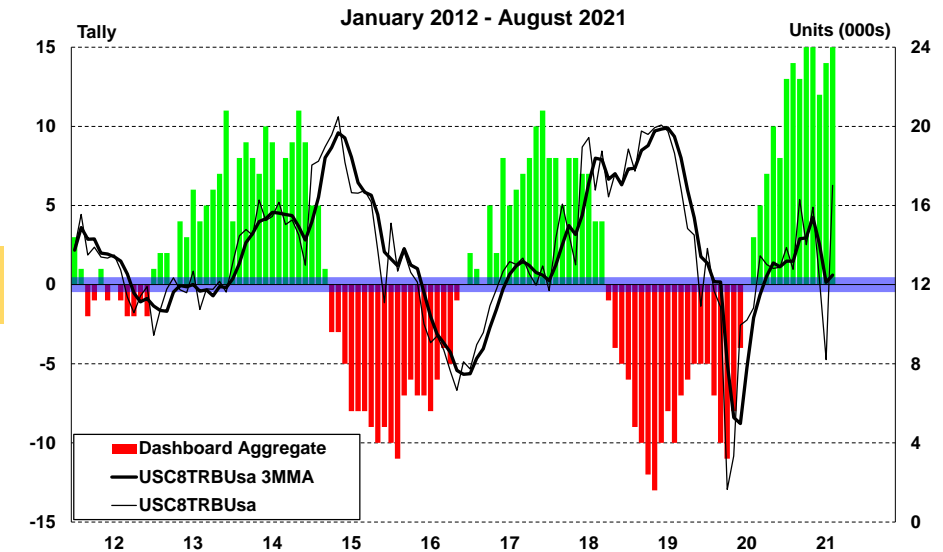
**ACT Research Tractor Dashboard:  
Aggregate Tally w/4-Mo Lead & USC8 Tractor Net Orders**



Source: ACT Research Co., LLC: Copyright 2021

~Replacement

**ACT Research Tractor Dashboard:  
Aggregate Tally w/4-Mo Lead & USC8 Tractor BUILD (SA)**



Source: ACT Research Co., LLC: Copyright 2021



# Class 8 Heat Wave!

Data through  
August

Orders (000s)	NA C8 Tractor	NA C8 Truck	NA C8 TOTAL
Past 12 Mo.	335	110	<b>445</b>
Past 6 SAAR	300	111	411
Past 3 SAAR	320	105	425
August SAAR	407	117	<b>528</b>
BL/BU Ratio	<b>11.1m</b>	<b>14.2</b>	<b>11.6</b>
IN/RS Ratio	<b>1.5</b>	<b>3.4</b>	<b>2.0</b>

SA

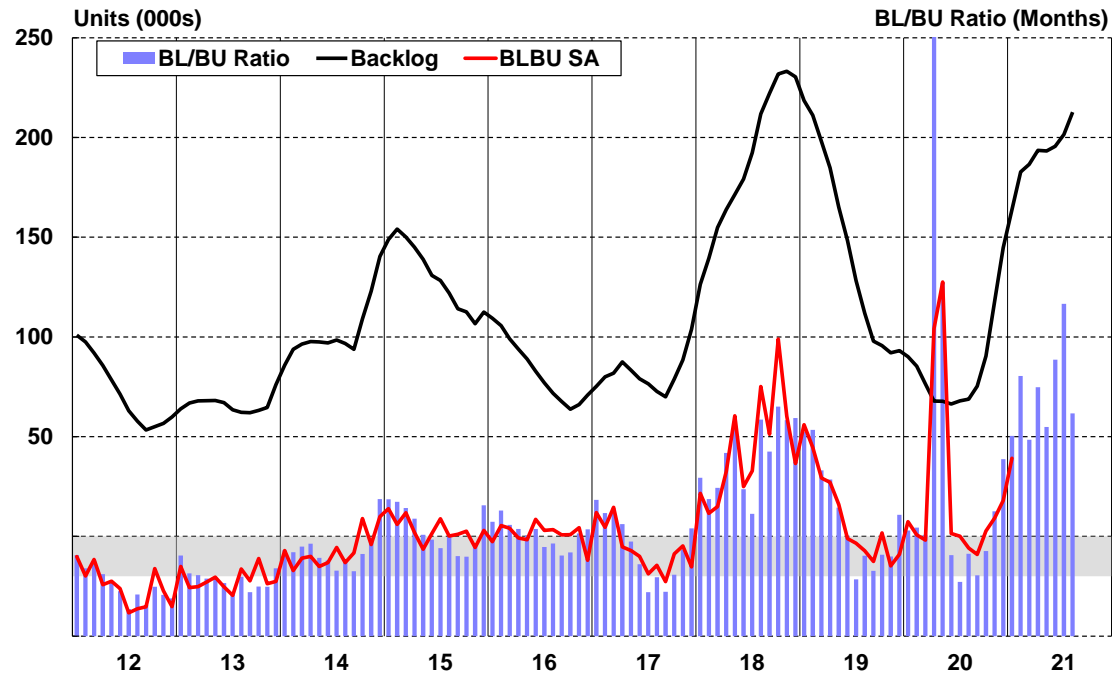
SA



# Key Ratios: Backlog & BL/BU

## Class 8 Tractor: N.A. Backlog & BL/BU Ratio

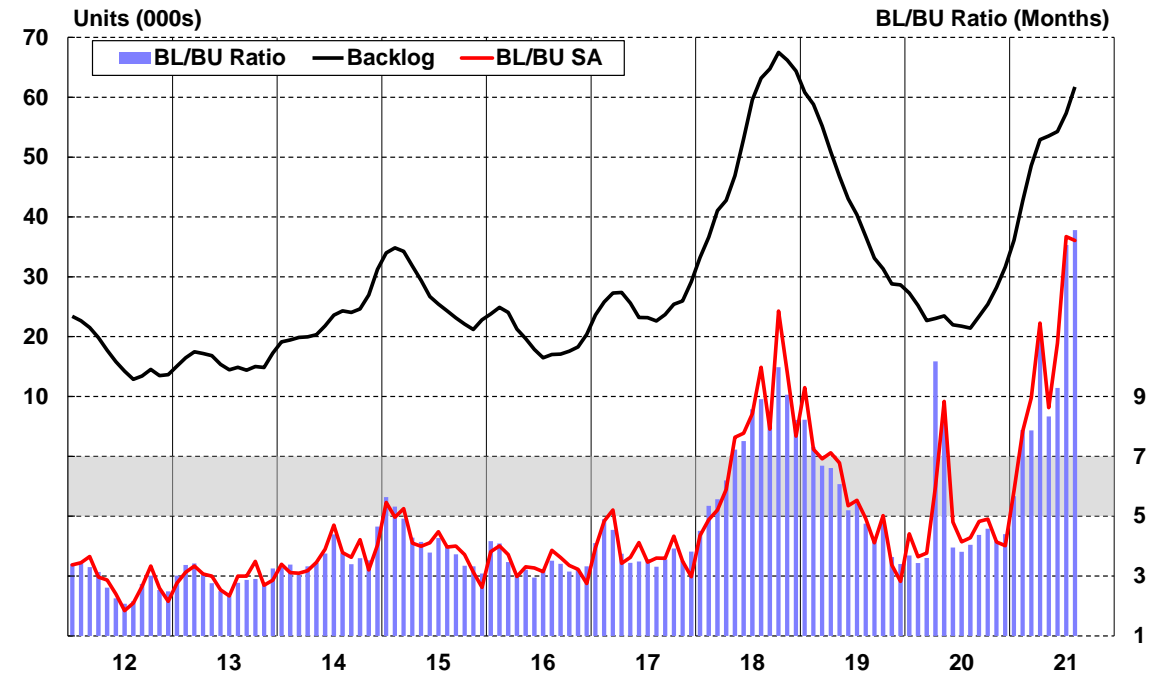
January 2012 - August 2021



Source: ACT Research Co., LLC: Copyright 2021

## Class 8 Straight Truck with Day Cab: N.A. Backlog & BL/BU

January 2012 - August 2021

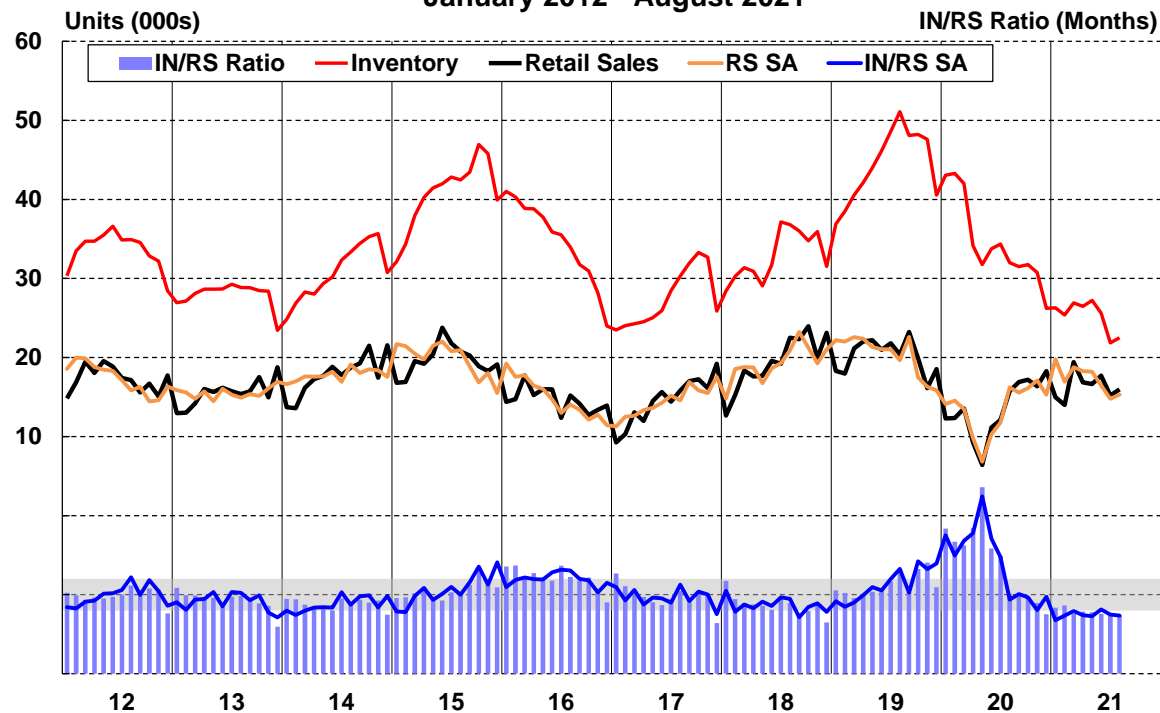


Source: ACT Research Co., LLC: Copyright 2021



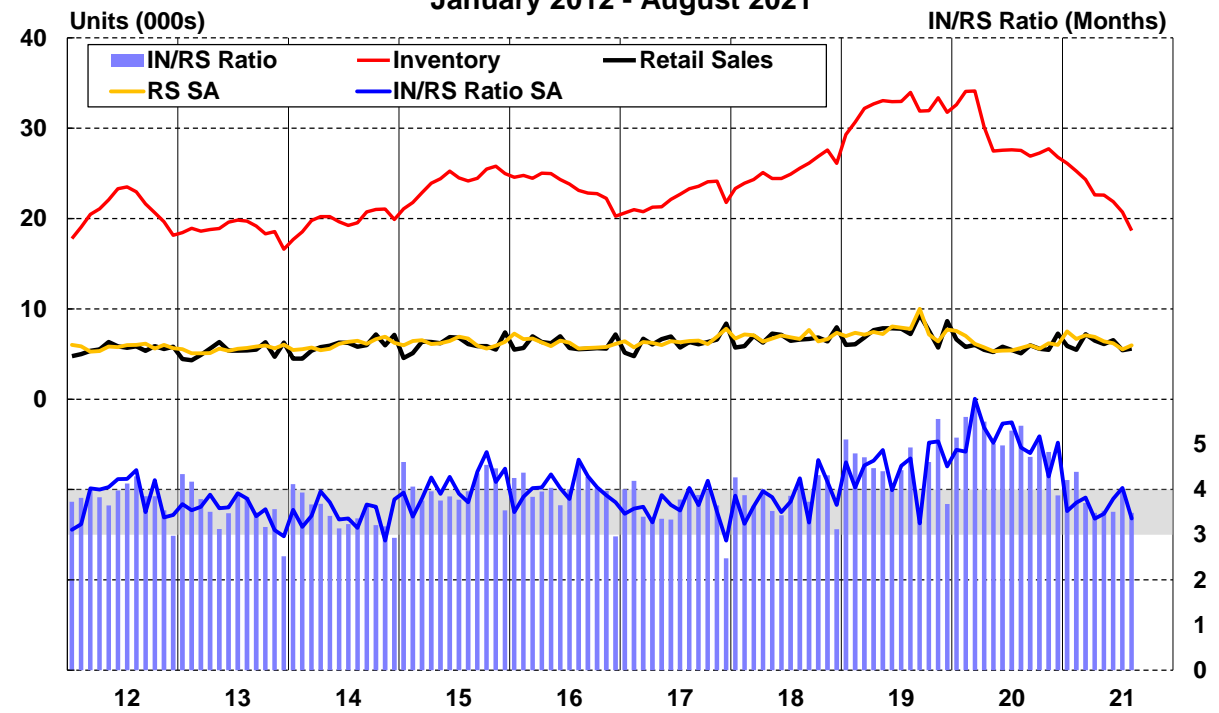
# Key Ratios: IN, RS and IN/RS

**Class 8 Tractor:**  
**N.A. Inventory/Retail Sales Ratio**  
January 2012 - August 2021



Source: ACT Research Co., LLC: Copyright 2021

**Class 8 Straight Truck with Day Cab:**  
**N.A. Inventory/Retail Sales Ratio**  
January 2012 - August 2021



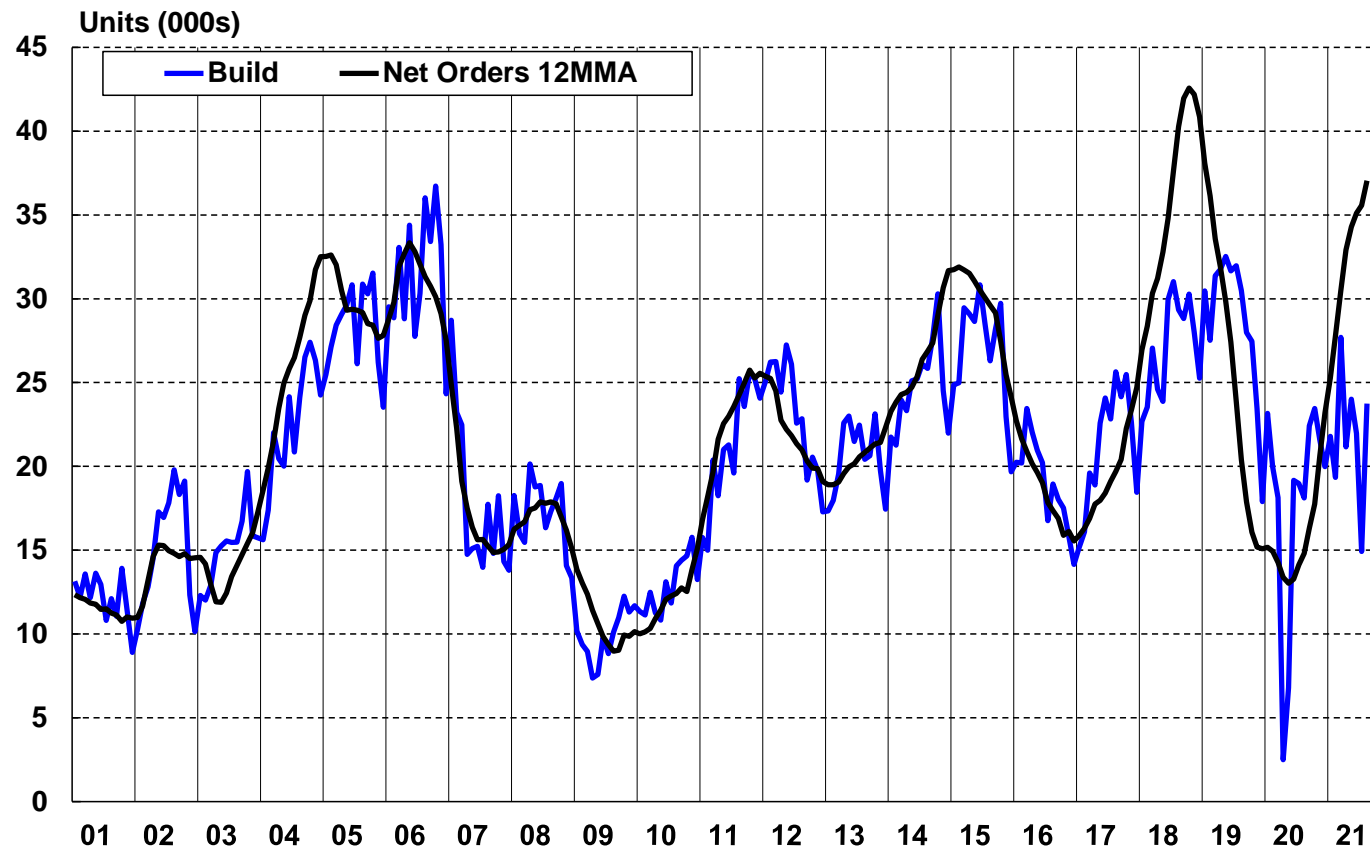
Source: ACT Research Co., LLC: Copyright 2021



# Unprecedented Supply-Demand Spread

## Total Class 8 N.A.: Net Orders 12 Mo. Avg. & Build

January 2001 - August 2021



Source: ACT Research Co., LLC: Copyright 2021



# Big Misses Reshape Expectations

## NORTH AMERICAN TRUCK OEMs' CLASS 8 BUILD PLANS: 2021 SIX MONTH FORECASTS AND ACTUAL BUILD BY MONTH & QUARTER AUGUST 2021

	JAN	FEB	MAR	QI	APR	MAY	JUN	QII	JUL*	AUG*	SEP	QIII	OCT	NOV	DEC	QIV	YEAR
<b>CLASS 8 BUILD:</b>	A	A	A	A	A	A	A	A	A	A	F	F	F	F	F	F	F
TRACTOR	15,552	13,998	20,691	50,241	16,145	17,718	15,653	49,516	10,640	19,458	16,259	46,357	18,495	19,176	17,589	55,260	201,374
STRAIGHT TRUCK	6,245	5,339	7,003	18,587	5,024	6,295	6,320	17,639	4,280	4,283	5,212	13,775	6,077	6,167	4,997	17,241	67,242
<b>TOTAL CLASS 8</b>	<b>21,797</b>	<b>19,337</b>	<b>27,694</b>	<b>68,828</b>	<b>21,169</b>	<b>24,013</b>	<b>21,973</b>	<b>67,155</b>	<b>14,920</b>	<b>23,741</b>	<b>21,471</b>	<b>60,132</b>	<b>24,572</b>	<b>25,343</b>	<b>22,586</b>	<b>72,501</b>	<b>268,616</b>
Days	20	20	23	63	21	20	22	63	21	20	21	62	21	20	18	59	247
Units per day	1,090	967	1,204	1,093	1,008	1,201	999	1,066	710	1,187	1,022	970	1,170	1,267	1,255	1,229	1,088
<b>PREVIOUS BUILD PLANS:</b>																	
<b>TOTAL CLASS 8: MONTHS FROM ACTUAL</b>																	
7 MONTHS	-	-	21,003	58,751	-	-	-	-	-	-	-	-	-	-	28,000	90,761	319,756
6	-	18,764	23,064	62,804	22,260	21,112	26,419	75,975	26,389	25,553	25,954	78,513	28,688	30,728	28,008	91,592	314,265
5	18,984	20,096	24,311	65,617	22,425	24,148	28,138	79,846	26,721	25,627	28,745	81,892	32,033	30,823	27,301	86,827	283,421
4	19,644	20,710	24,580	65,856	25,408	25,290	29,726	82,181	26,932	25,967	30,670	86,022	32,761	30,332	22,586	72,501	268,616
3	20,596	20,752	27,497	73,040	26,418	26,203	30,052	76,648	27,180	28,190	33,081	86,690	29,194	25,343	-	-	-
2	20,524	23,002	25,459	69,178	26,252	25,695	29,317	74,146	27,162	28,603	24,473	60,611	24,572	-	-	-	-
1	22,541	21,922	26,774	67,908	20,901	23,660	28,963	74,145	25,006	21,218	21,471	60,132	-	-	-	-	-
<b>ACTUAL</b>	<b>21,797</b>	<b>19,337</b>	<b>27,694</b>	<b>68,828</b>	<b>21,169</b>	<b>24,013</b>	<b>21,973</b>	<b>67,155</b>	<b>14,920</b>	<b>23,741</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

NOTE: A = actual build; F = forecast build plans. Data is not seasonally adjusted. The North American Class 8 build plans are a compilation of actual and estimated build plans from vehicle manufacturers. "Most likely" adjustments are made by the editor.

\* Reflects factory shutdowns where applicable

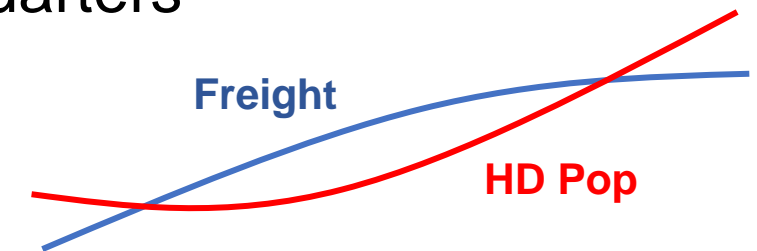
# “Hope” for Chip Shortage Easing

- **Series of supply shocks – not just chips**
  - WFH, SFH, fire(s) in Japan, COVID shutdowns in SE Asia, Texas blackouts, labor, transportation
- **Long-planned capacity coming online**
  - New Bosch 300mm wafer capacity in Dresden, Germany started in June
  - Intel chip production in Ireland recently repurposed to auto
  - Daimler CEO sees hope of shortage easing in Q4, effects lasting into 2023
- **Roughly 15% chip capacity additions scheduled in 2021 and 2022**
  - Per *IEEE*, *SEMI*, *Statista* information
  - VW Purchasing head indicates current semiconductor shortfall around 10%



# Short-Term Class 8 Outlook

- **Best freight economy in history** with US economy hitting on all cylinders
  - Industrial/manufacturing cycles typically last 6-8 quarters
  - Secular demographic trends
  - Strong consumer economy
- **Capacity growth will accelerate rapidly**
  - *When semi-conductor supplies loosen, **Class 8 production will go vertical***
- **It is hard to stop a pendulum**
  - Supply-demand balance expected to swing back into line by late 2022
  - Pent-up demand and expected CARB-state prebuy support demand into 2023



# Used Class 8 Trucks

Average retail at \$68,000 in August (P)

➤ +7% m/m, +47% y/y, +33% ytd

Lack of inventory is THE story

Miles and age trending up subtly

Demand is following white-hot freight markets

Exports reflecting a stronger global market, beholden to ocean shipping

➤ -1% m/m, +44% y/y, +57% ytd

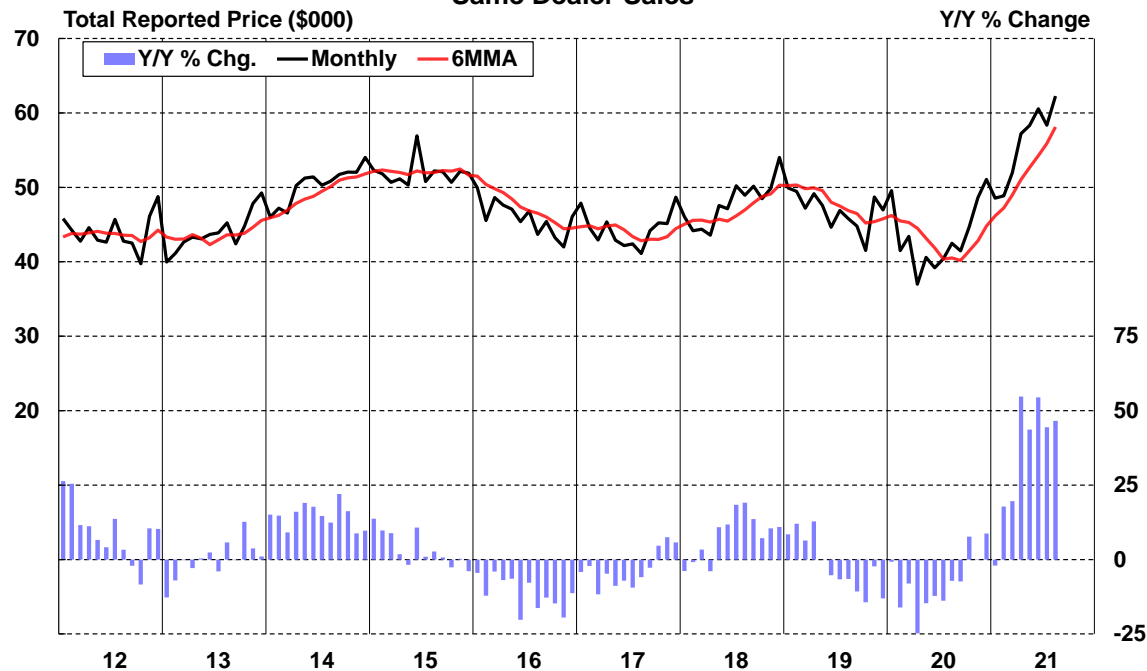


# Prices Strongly Positive Y/Y

## Class 8: U.S. Used Truck Average Sale Price

January 2012 - Preliminary August 2021

Same Dealer Sales



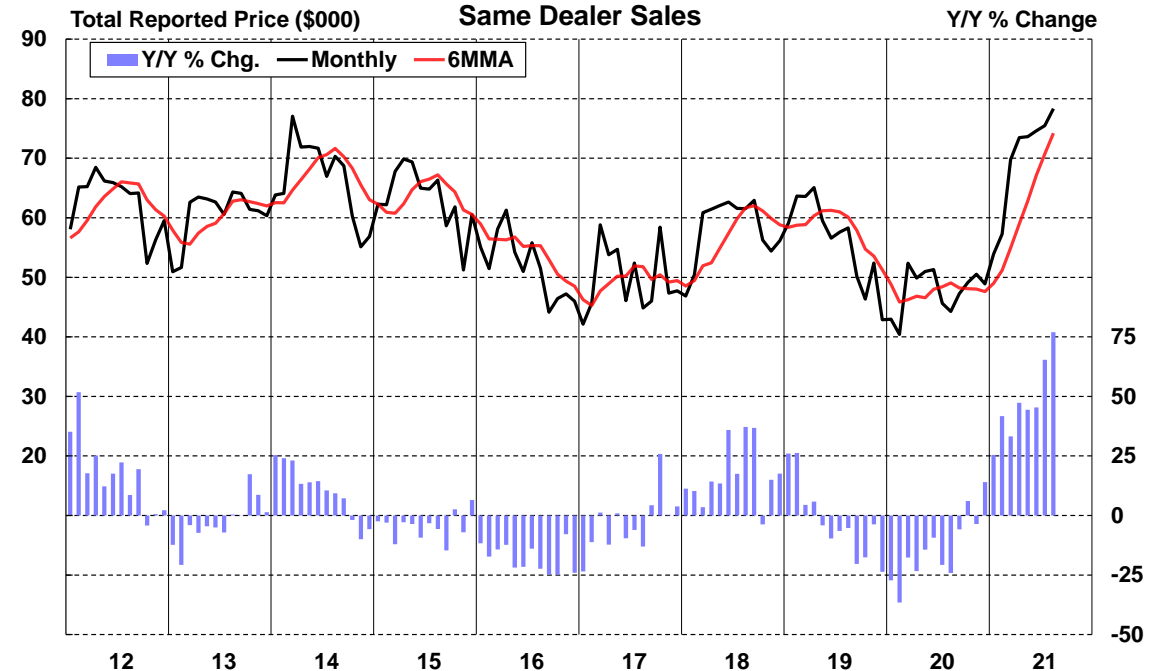
Source: ACT Research Co., LLC: Copyright 2021

## Class 8: U.S. 4 to 5 Year Old Used Truck Average Sale Price

4 to 5 year old, 400-500,000 miles legacy

January 2012 - Preliminary August 2021

Same Dealer Sales



Source: ACT Research Co., LLC: Copyright 2021

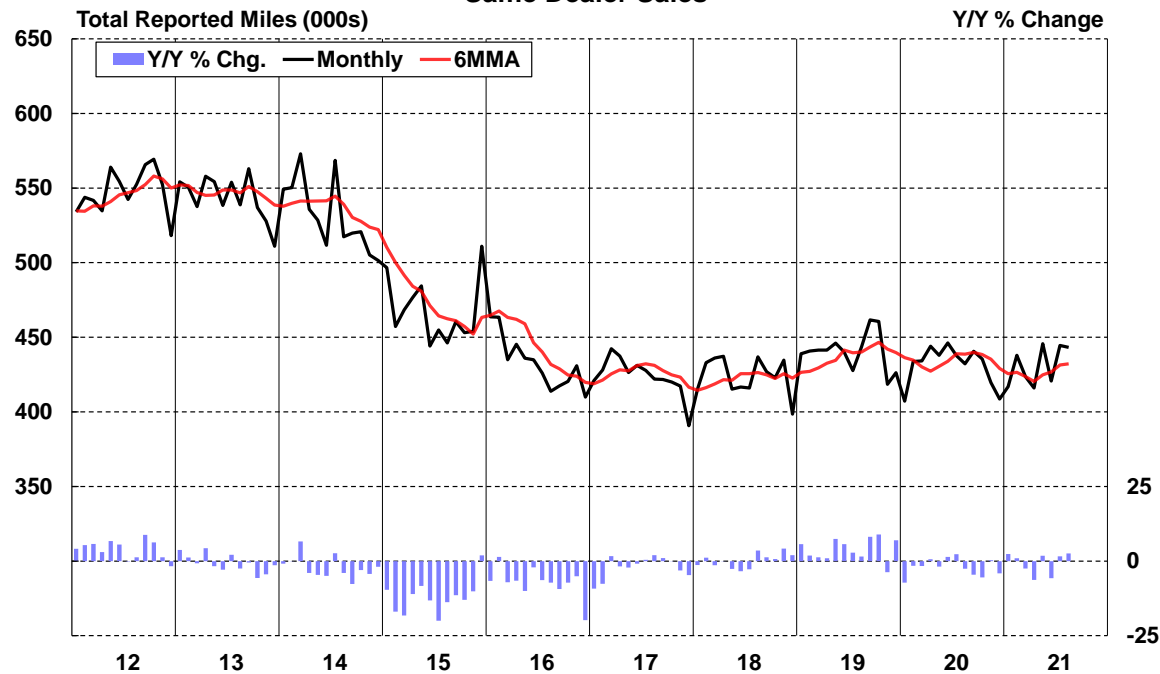


# Miles and Age Trending Subtly Higher

## Class 8: U.S. Used Truck Average Miles

January 2012 - Preliminary August 2021

Same Dealer Sales

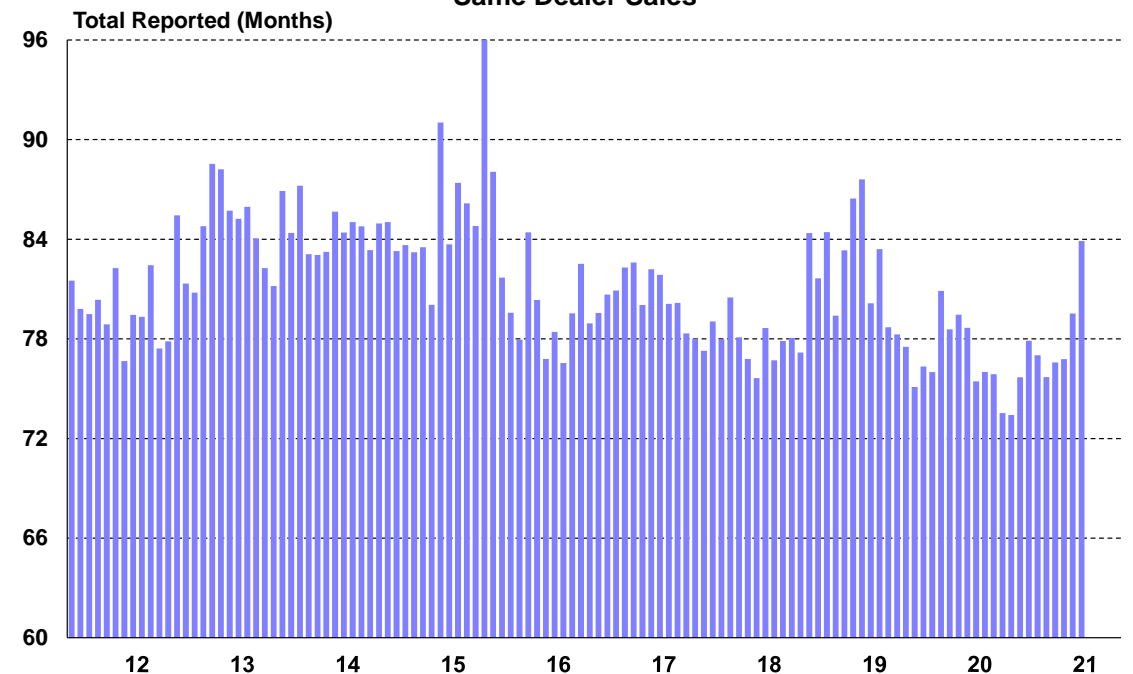


Source: ACT Research Co., LLC: Copyright 2021

## Class 8: U.S. Used Truck Average Age

January 2012 - Preliminary August 2021

Same Dealer Sales



Source: ACT Research Co., LLC: Copyright 2021

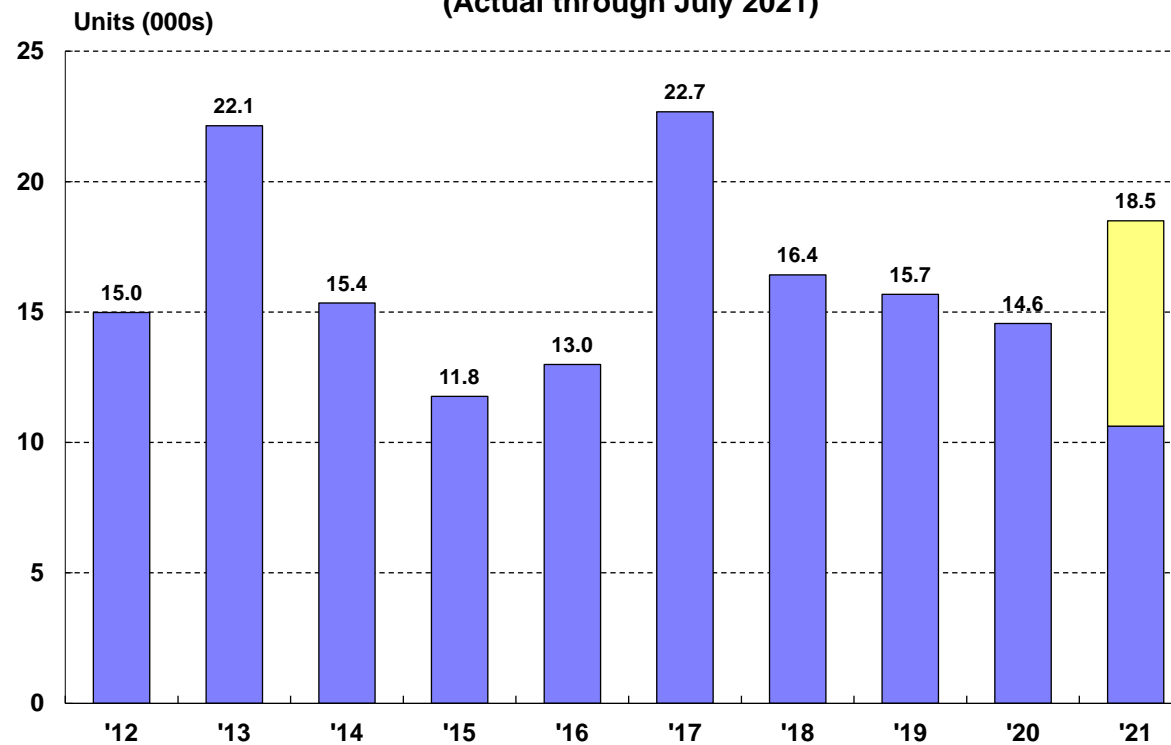


# Exports Top 10K Through July

## Used Class 8 Tractor Exports

2012 - 2021

(Actual through July 2021)



Source: ITC, ACT Research Co., LLC: Copyright 2021

# Medium Duty

- BL/BU ratio screaming for higher build
  - Supply chain woes will not permit increased output
- IN/RS ratio at upper limit of target range
  - Increased since December on soft sales
  - Below replacement build has reduced inventory
- Market will see moderate improvement in 2021
  - Build (+7%) and retail sales (+7%)
- Service-centric MD truck demand driving majority of improvement



# Payroll Employment

Total 4.3% higher Y/Y (147.2M)

Goods up 3.0% Y/Y (20.5M)

Services up 5.5% Y/Y (104.7M)

Government down 0.1% Y/Y (22.1M)

Employment will not return to pre-  
COVID levels until 2024 at the soonest



# Consumer Spending

Total 11.9% higher in Q2

Goods up 12.8% (+27% in Q1)

Services up 11.3% (+4% in Q1)

Activity returned to pre-COVID levels in Q2 2021

Inflation is the new hurdle





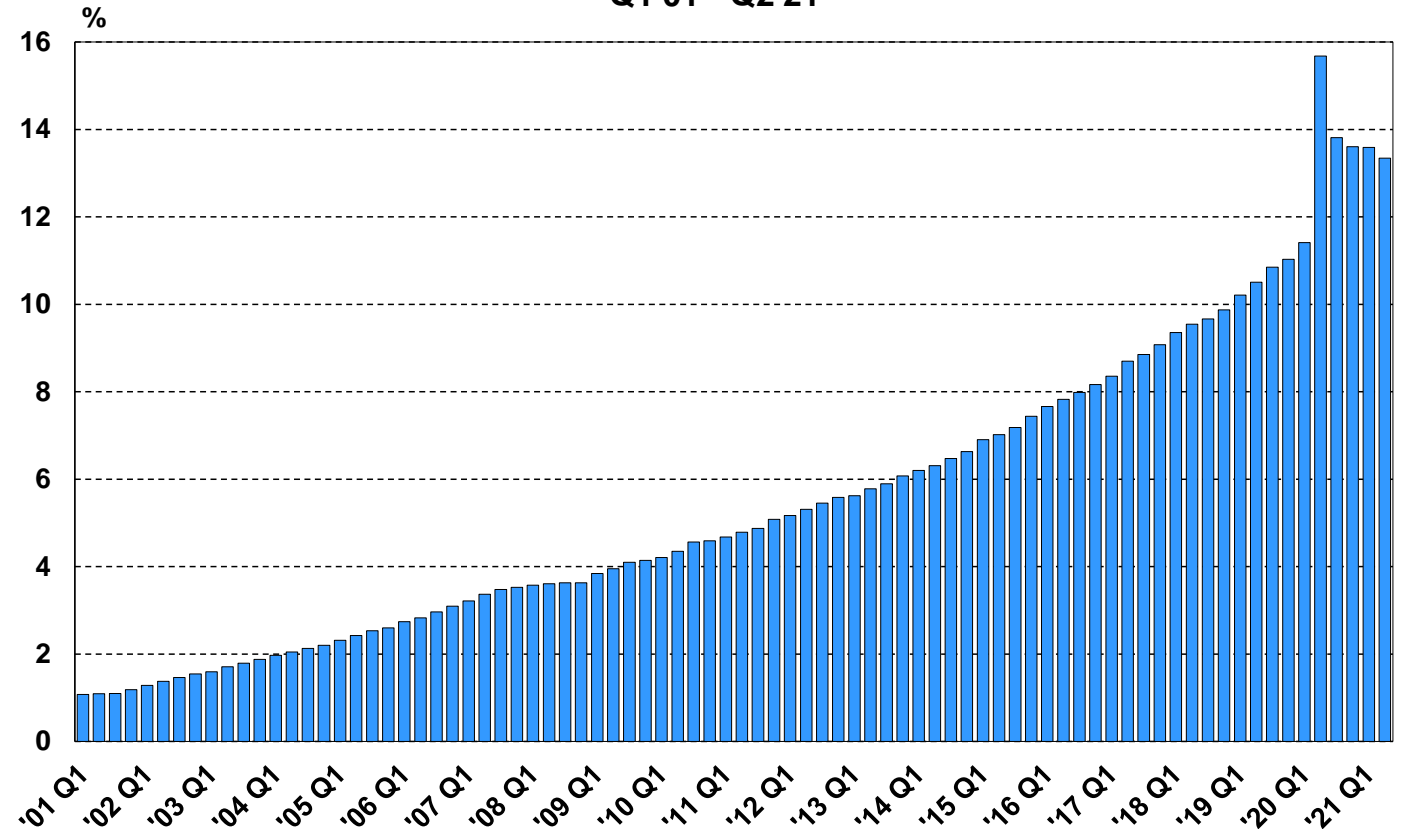
# Retail Sales

August retail sales up sequentially (+0.7%), but well above 2020 level (+15.1%) nominally. Inflation adjusted results also higher, but trimmed by inflation (+0.4% m/m and +9.4% y/y).

Q2 e-commerce activity ebbed lower from Q1, to 13.3% of retail sales as consumers venture out post-pandemic. Despite change and nominal decline, some degree of behavior changed may be permanent.

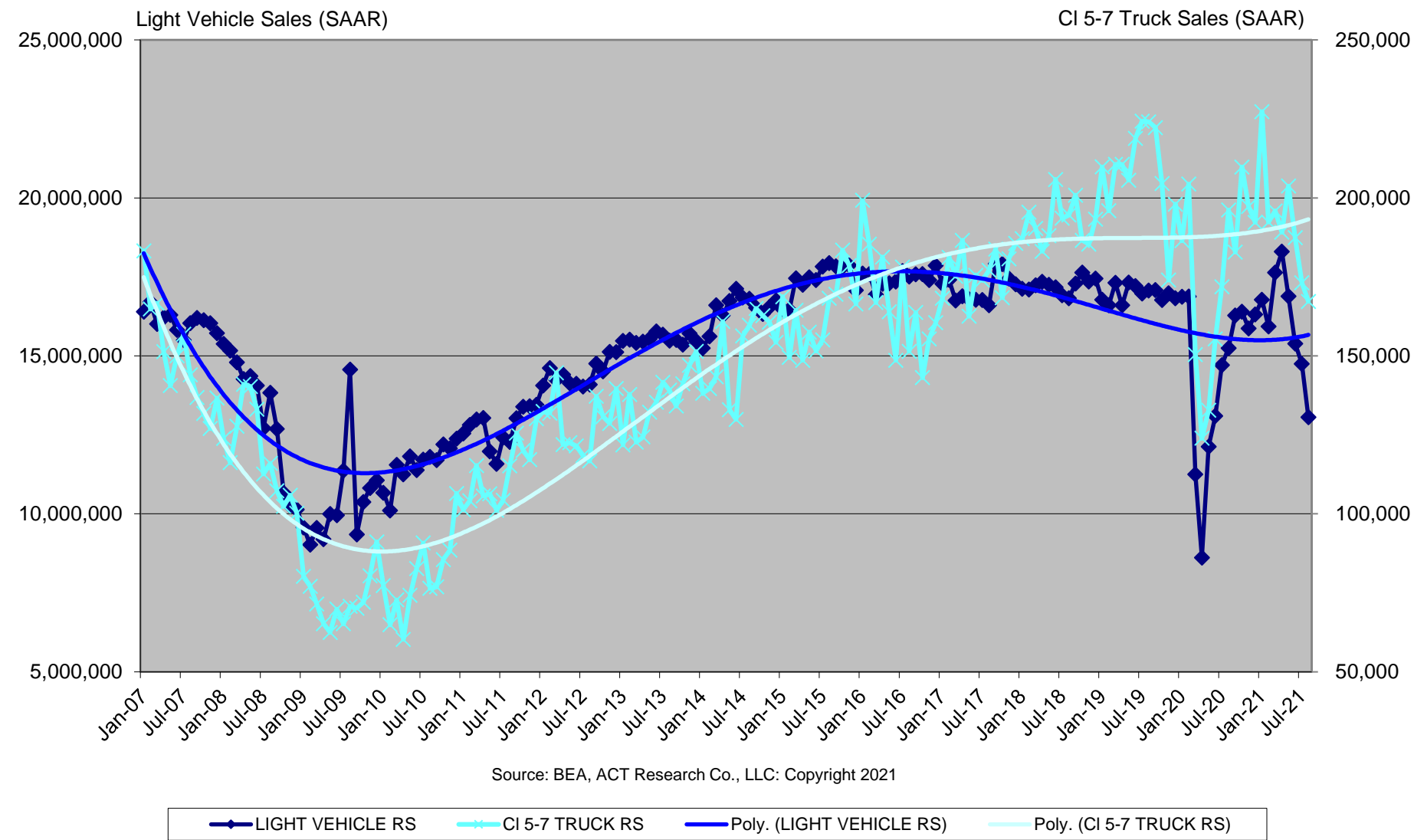
Full-year 2021 growth expectations range from 10.5% to 13.5% - Retail Federation

**E-Commerce as a Percentage of Retail Sales**  
(Excluding Food Service)  
Q1'01 - Q2'21



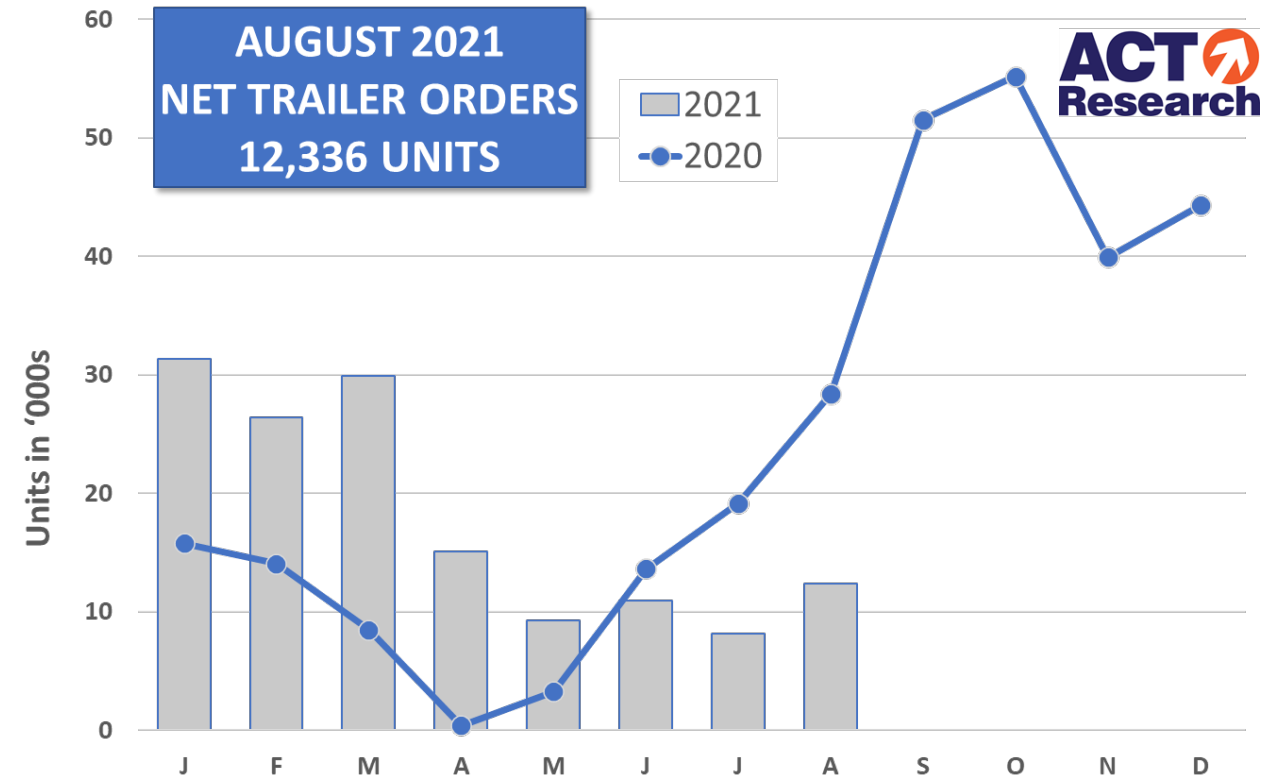
Source: Federal Reserve Board, ACT Research Co., LLC: Copyright 2021

# Light Vehicle Sales vs. CI 5-7 Truck Sales



# Closed Orderbooks & Full Orderboards

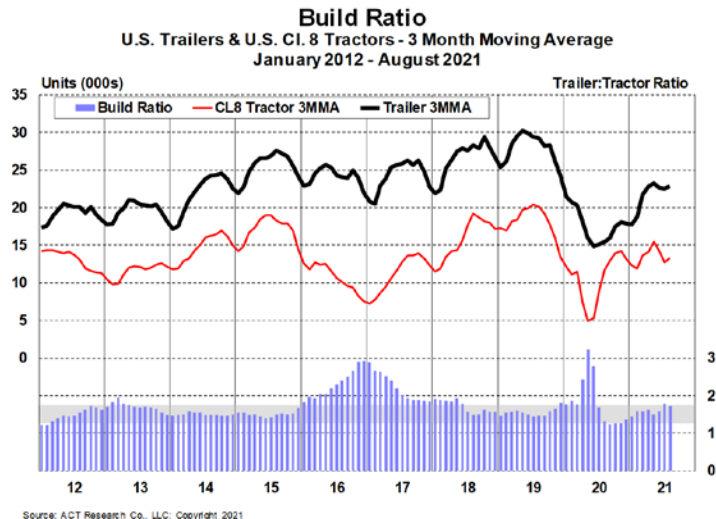
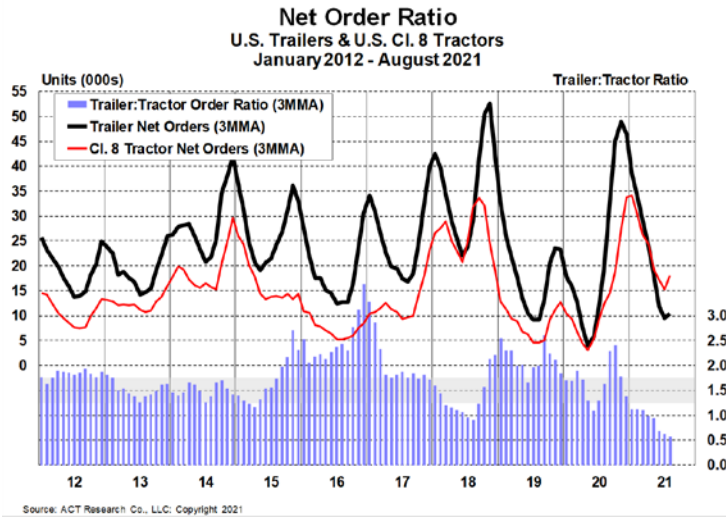
- Obviously more than the normal seasonal lull
- Pricing/Staffing/Build Plans
- Dry van and reefer impact
- Vocational categories relatively solid
- Record order volumes when the orderbooks open?



Source: ACT Research Co., LLC Copyright 2021



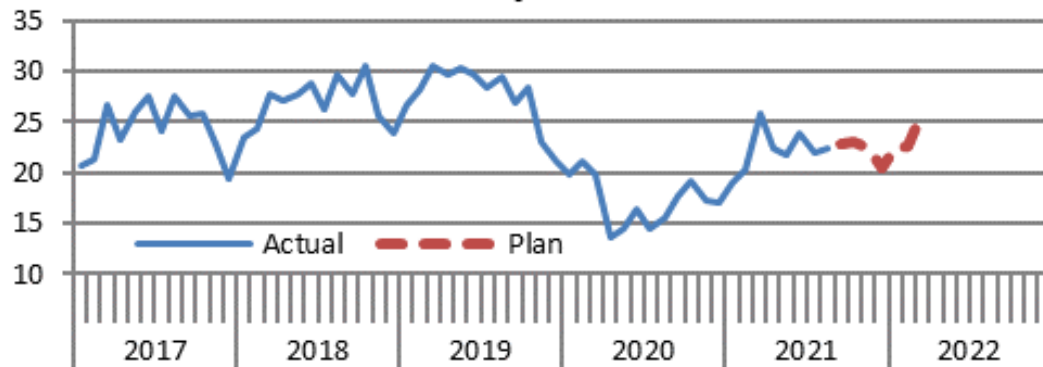
# Orders Out of Balance, Build Trending Upward



- Fleet investment – demand strong
- Build ratio trending upward
  - Despite trailer OEM challenges
  - C8 OEMs production headwinds
- Orders well below trailer/tractor op ratios
- Cost pressures (steel, aluminum, etc.)
- Component and material availability
  - Red tagged units
- OEMs challenged on 2022 pricing & production plans

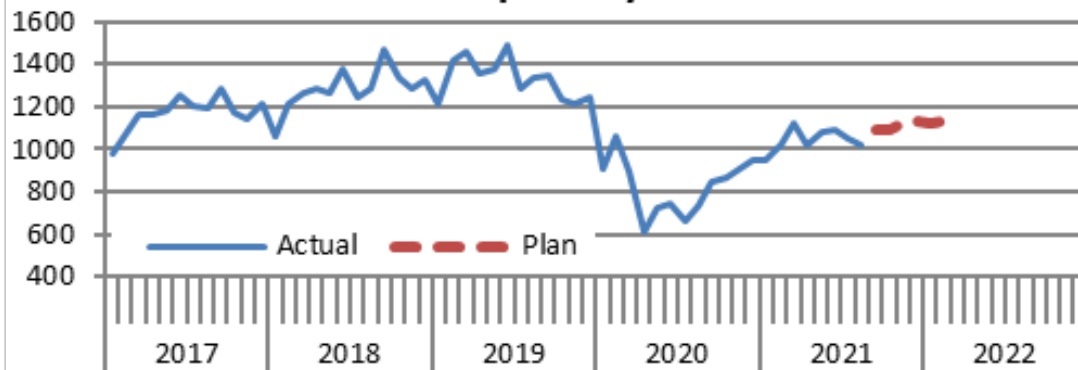
# Build Rates Well Under Full Capacity

Build - Total Trailer Monthly Units in 000's



- Down from Q1 pace
- Supply chain and staffing
- Add shifts to match 2019 levels
- Compare performance
  - 2017 1,169upd
  - 2018 1,284upd
  - 2019 1,330upd (1,487 peak)
  - 2020 826upd
  - 2021ytd 1,044upd
  - Plan avg 1,120upd
- Added capacity has been announced

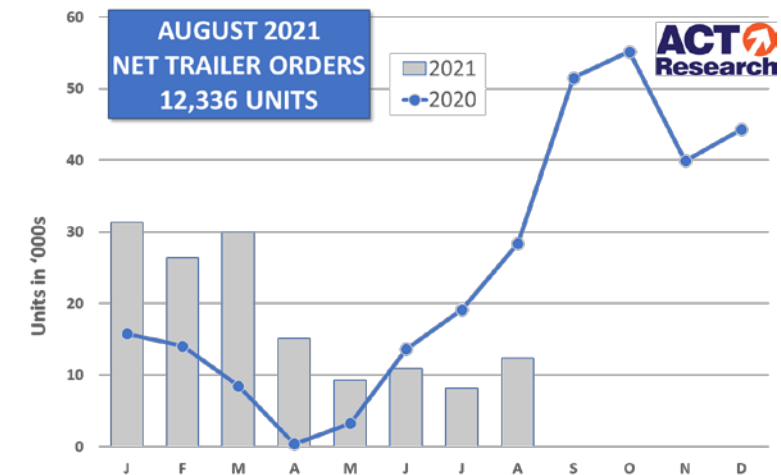
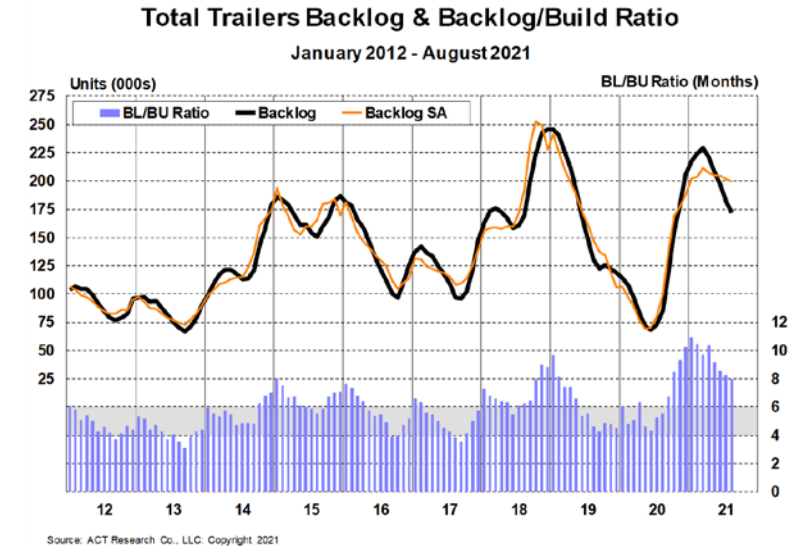
Build - Total Trailer Units per Day





# Where Could Backlog/Build Go...

- Current BL/BU 8.0 Months – extends through April
- “Catch-up” of delayed order acceptance
- Ongoing demand
- Sep-Dec 2020 Order Season – 190k
- Assume current Build Plan
- 2021 would close with a BL/BU of 13.4 months
- 2/3rds of 2020 Order Season generates a 10.3 month BL/BU

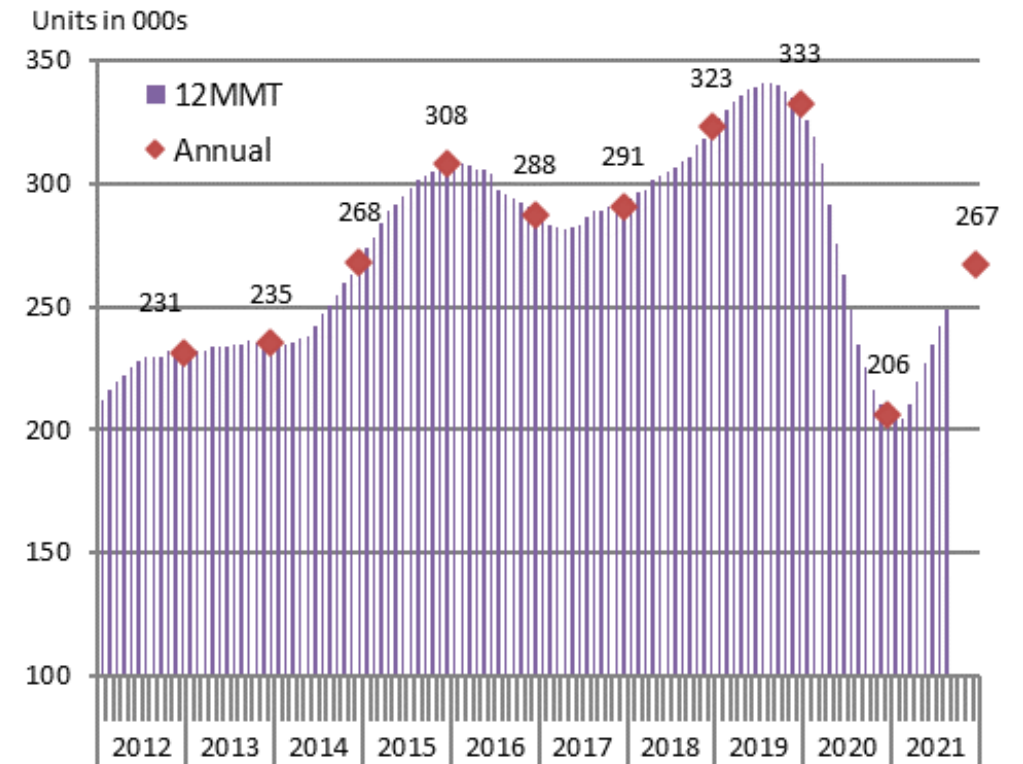


Source: ACT Research Co., LLC. Copyright 2021

# The Build Cycle – a Slower Paced Upturn

- Bottomed out at 205k in Feb'21
- 249k for last 12 months
- Upturn roughly 15% slower
- Slightly eased forecast with June  
OUTLOOK
- Further easing with September  
issue
- Supply, not demand driven

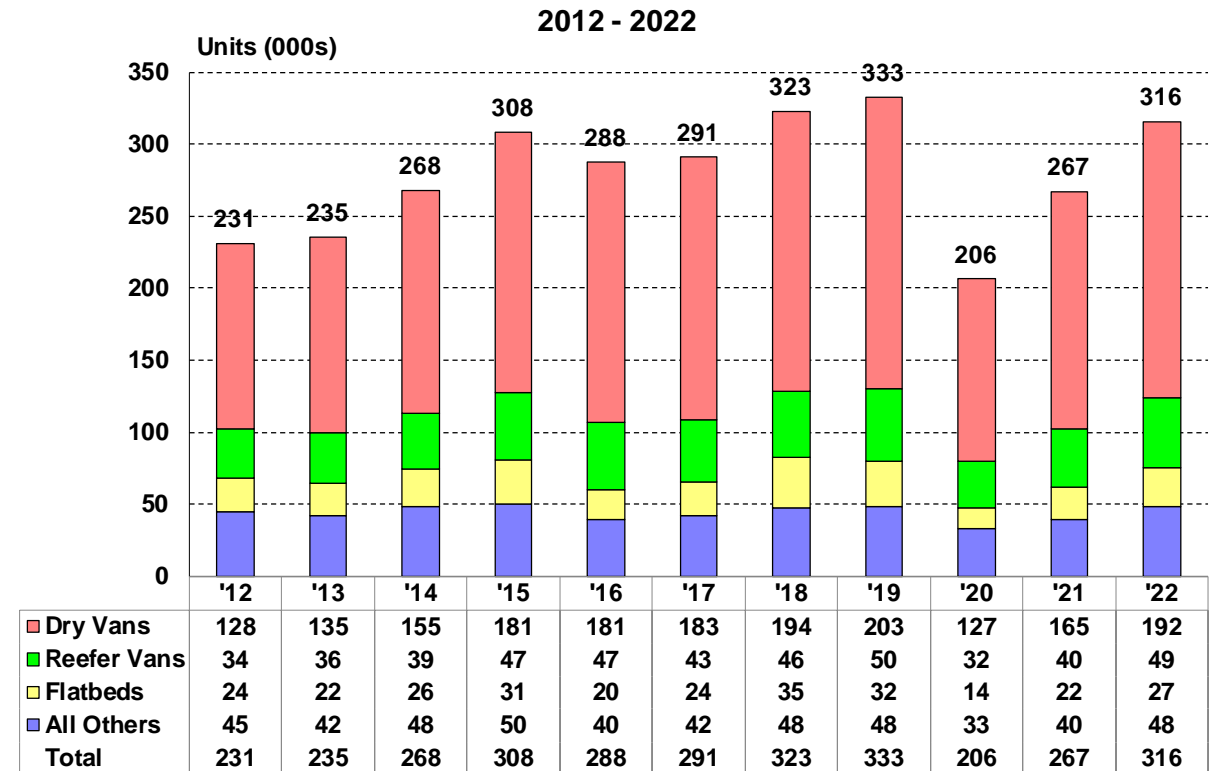
**Total Trailer Cycle - BU 12MMT**



# September '21 OUTLOOK Forecast

- Total backlog through Apr'22
- 2022 to be 3rd highest in history
- Expect cancel churn in Q4'21
- Red tags could underpin shipments
- Box trailers demand strong
- Vocational segments improving
- Supply vs demand headwinds

## U.S. Trailer Production



Source: ACT Research Co., LLC: Copyright 2021

# Build Forecasts

	2018	2019	2020	2021	2022
NA Class 8 (000s)	324.5	344.6	214.3	265.6	335.3
NA Classes 5-7 (000s)	272.7	281.4	223.7	239.9	268.8
US Trailer Total Trailers (000s)	323.0	332.6	206.3	267.3	315.6



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## Upcoming speaking engagements:

### HDMA Pulse Webinar

Featuring: Steve Tam & Jim Meil

Wednesday, September 29, 2021 @ 1PM ET

### Diesel Progress Summit

Featuring: Ann Rundle

Monday, October 25, 2021 @ 12:20PM CT

### Argus Vehicle Emissions and DEF Summit USA

Featuring: Steve Tam

Tuesday, October 26, 2021 @ 2:40PM CDT





# SAVE THE DATE

# OUTLOOK WEBINAR

# 11/12

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# THANK YOU

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