



Industry Review

Economics, Transportation
&
Commercial Vehicles

Presented by Penske Transportation Solutions



Webinar Overview

Introduction – Ian McGriff

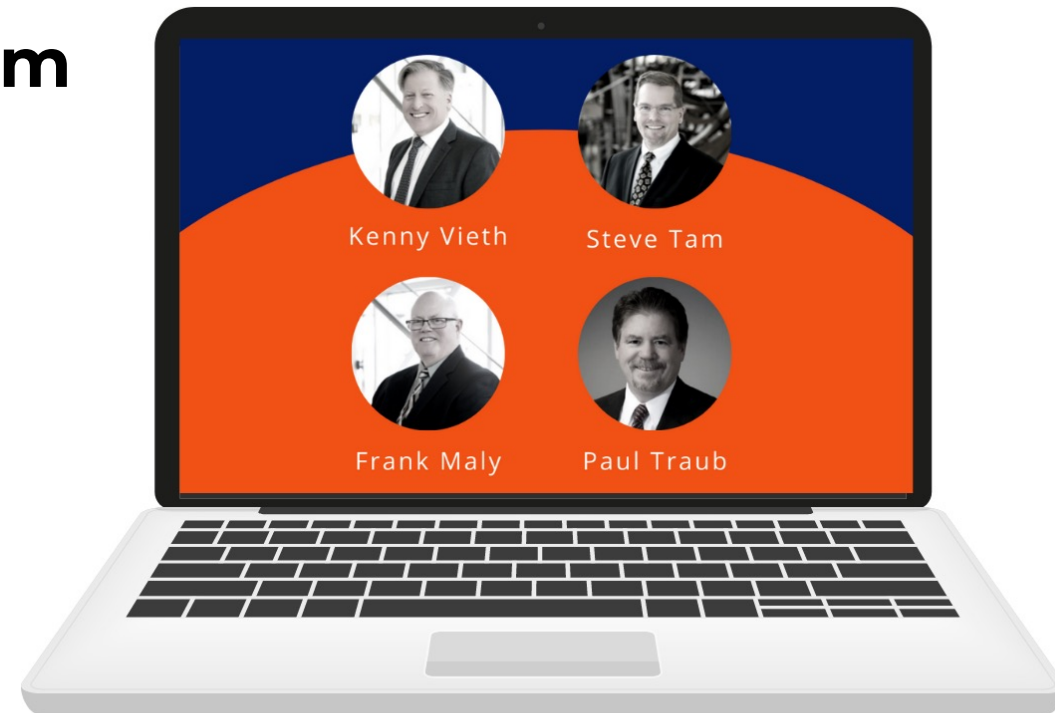
N.A. Economy – Paul Traub

Freight Transportation & Class 8 – Kenny Vieth

Used Trucks & Medium Duty – Steve Tam

Trailers – Frank Maly

Q&A– All



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



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REGISTRATION IS NOW OPEN

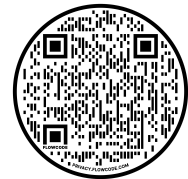
FEBRUARY 22-24, 2022

**IN PERSON || LIVESTREAM
COLUMBUS, IN**

FEATURED GUESTS FROM:

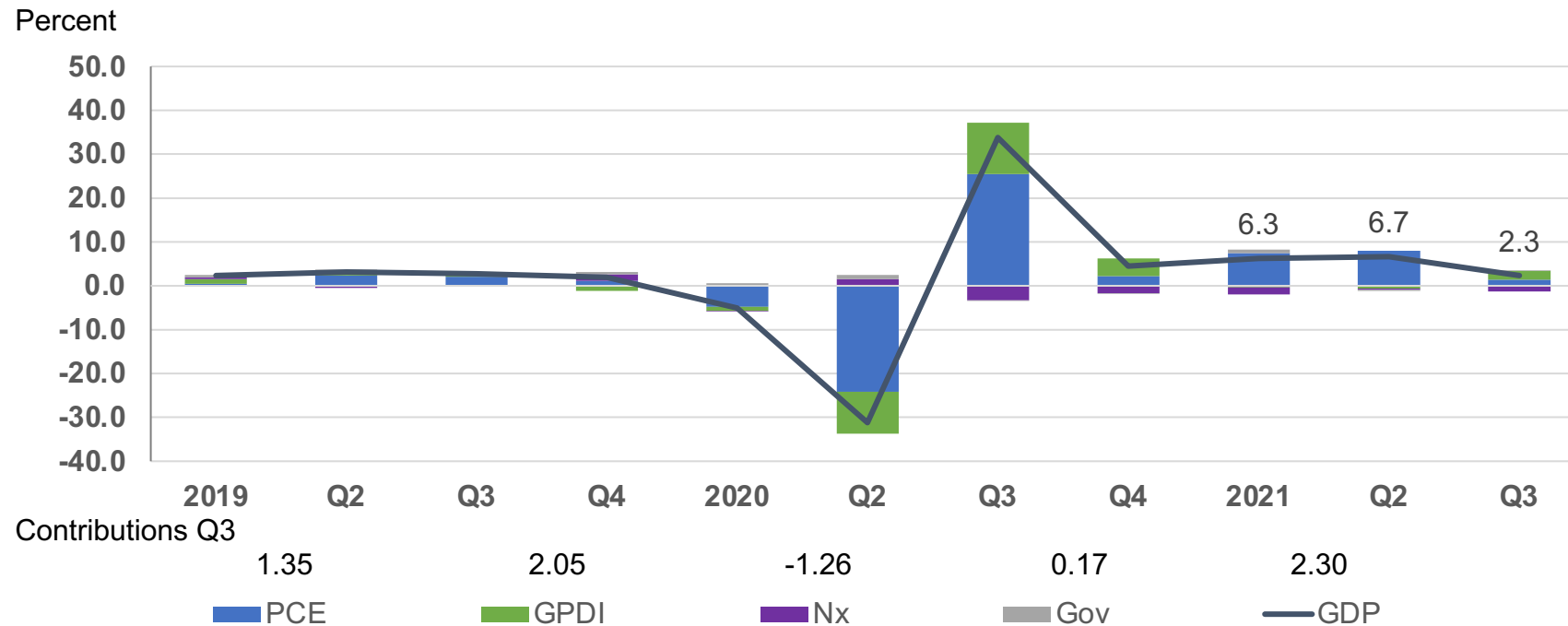
**FORD
TUSIMPLE
TRANSPLACE
RYDER
VOLVO
THERMO KING
BLUE BIRD
EPA**

REGISTER NOW:



U.S. Real Gross Domestic Product

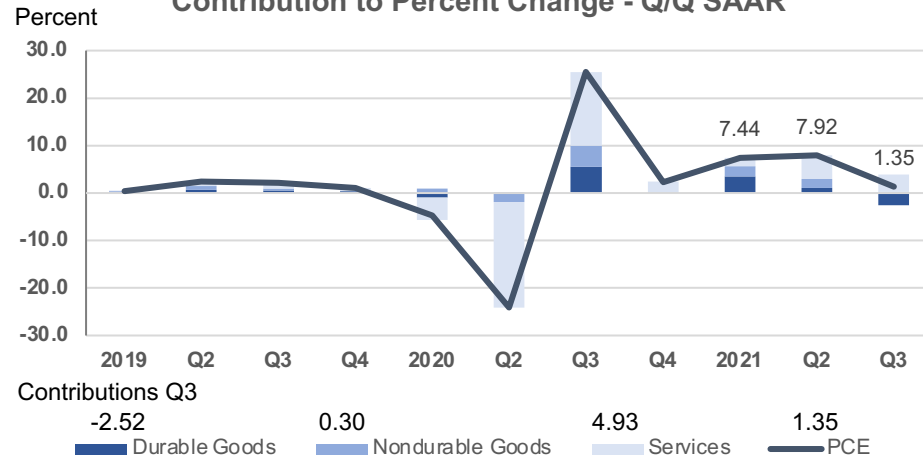
Contribution to Percent Change - Q/Q SAAR



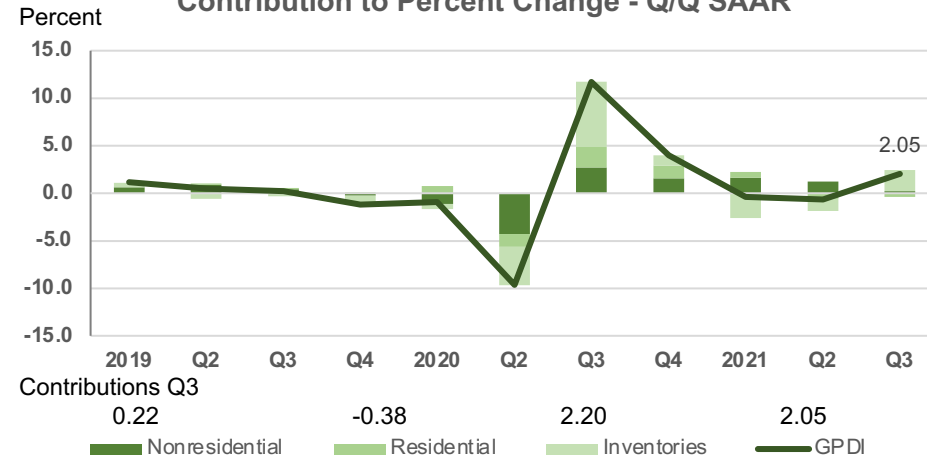
Source: BEA, ACT Research, LLC Copyright 2021

Contribution by Sector

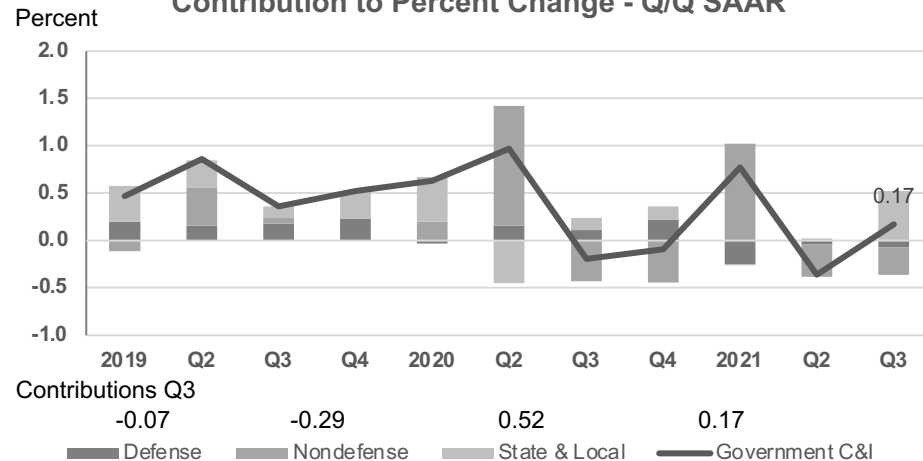
**Real Personal Consumption Expenditures
Contribution to Percent Change - Q/Q SAAR**



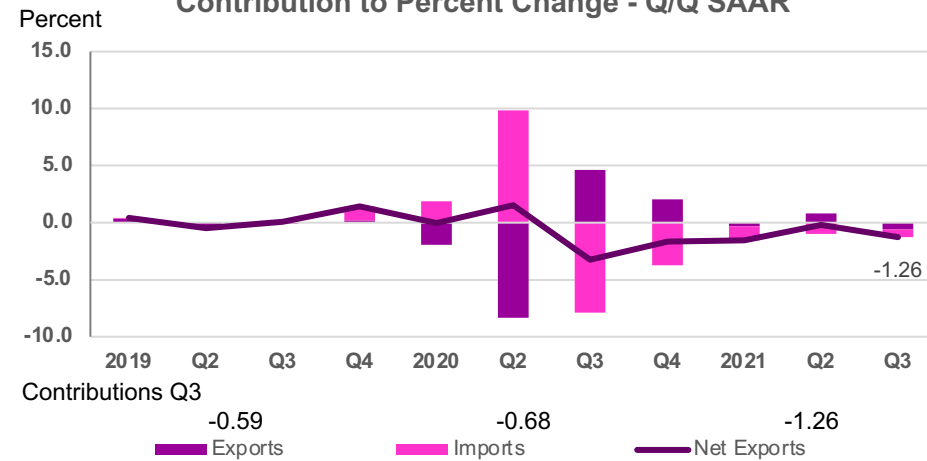
**Real Gross Private Domestic Investment
Contribution to Percent Change - Q/Q SAAR**



**Real Government Consumption & Investment
Contribution to Percent Change - Q/Q SAAR**



**Real Net Exports
Contribution to Percent Change - Q/Q SAAR**

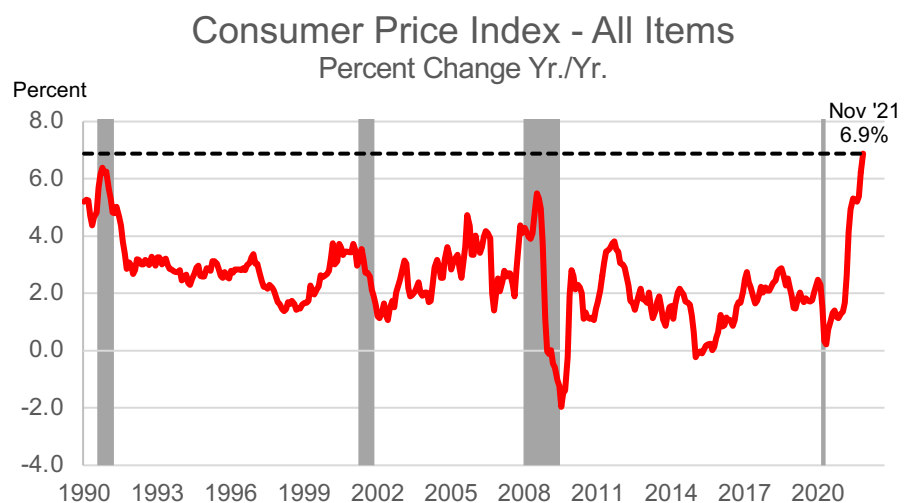
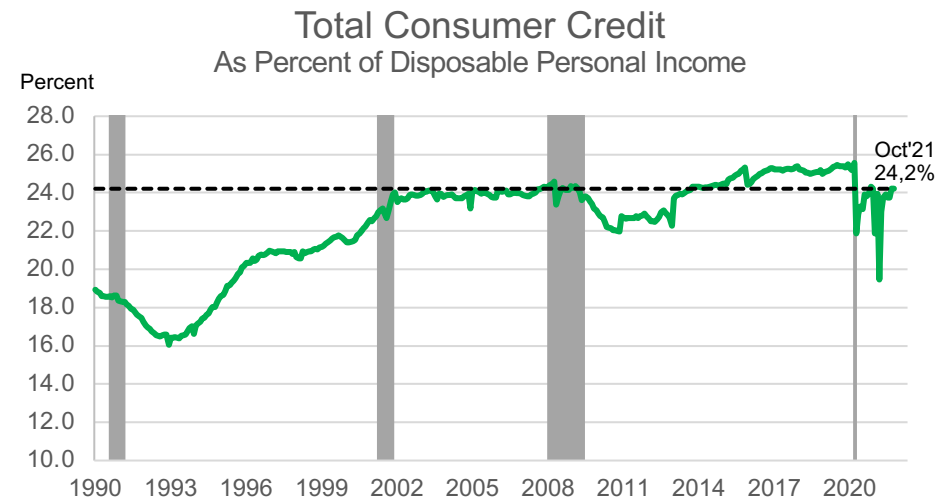
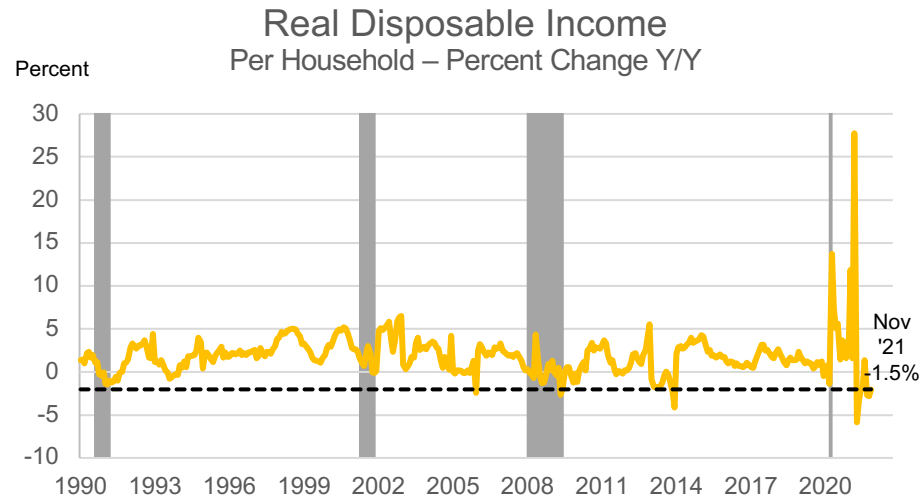


Ability and Willingness Indicators

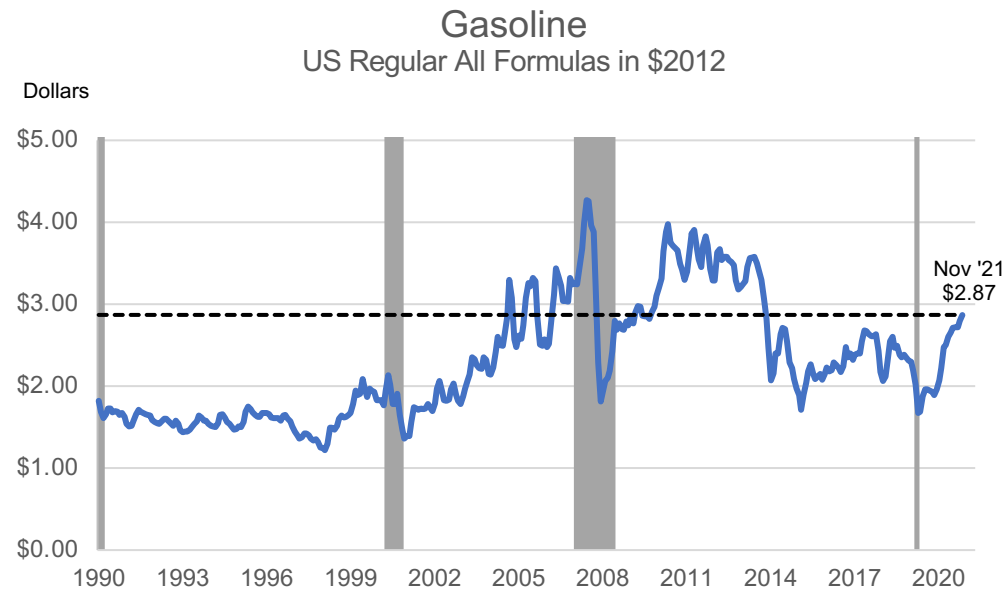
Ability to Consume	<u>Dec '21</u>	<u>Dec '20</u>
Disposable Income	Yellow	Green
Household Debt	Green	Green
Inflation	Red	Green
Yield Curve	Green	Green
Composite	Yellow	Green
 Willingnes to Consume	 <u>Dec '21</u>	 <u>Dec '20</u>
Consumer Attitudes	Red	Yellow
Unemployment Claimis	Green	Red
Workweek	Yellow	Yellow
Stock Market	Green	Green
Composite	Yellow	Yellow



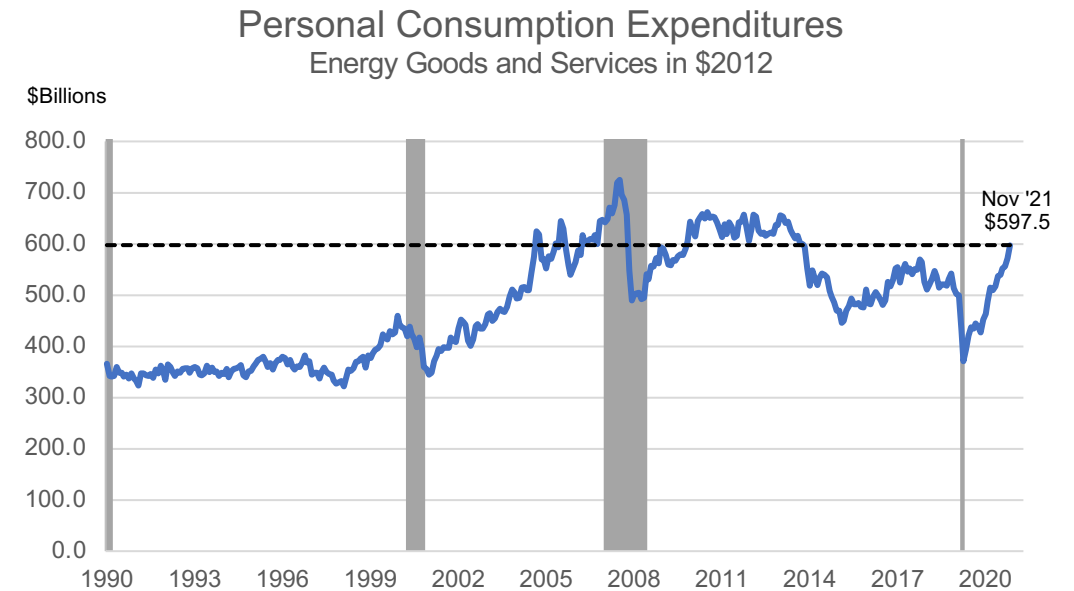
Ability Indicators



Real PCE Inflation Energy



Source: Energy Information Agency, ACT Research LLC



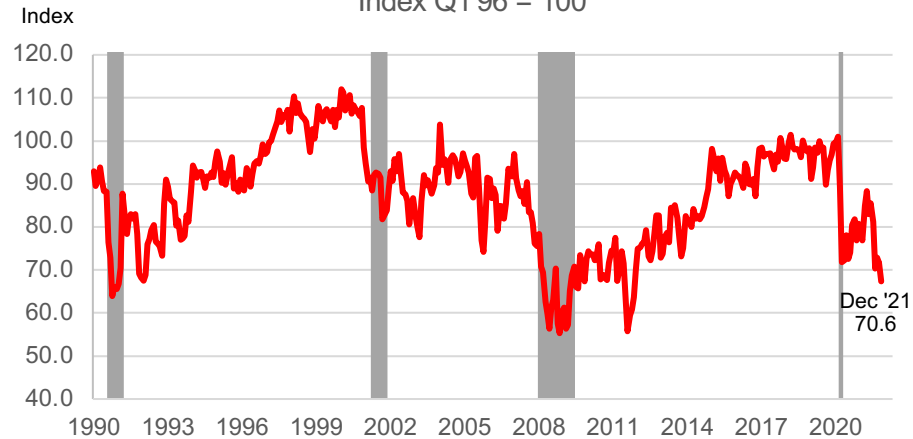
Source: Bureau of Economic Analysis, ACT Research LLC



Willingness Indicators

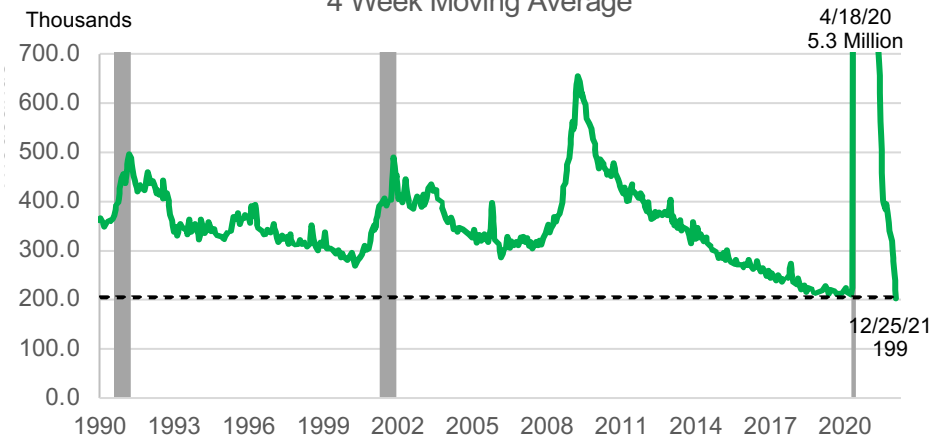
Consumer Sentiment

Index Q1'96 = 100



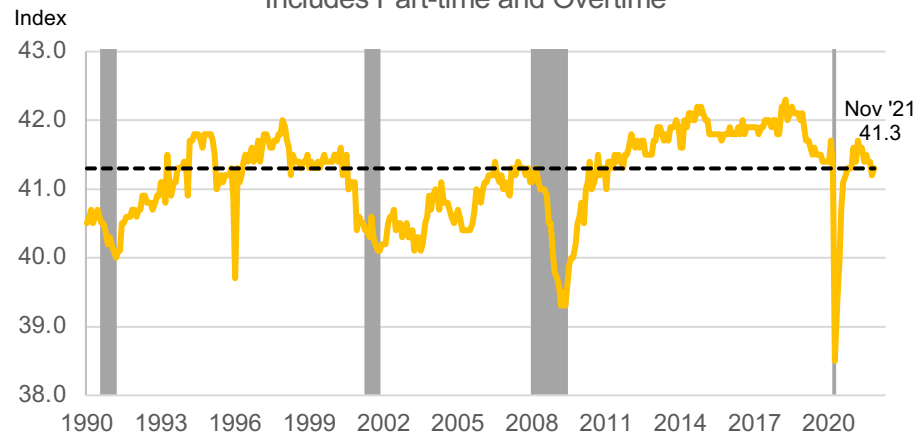
Initial Claims

4 Week Moving Average



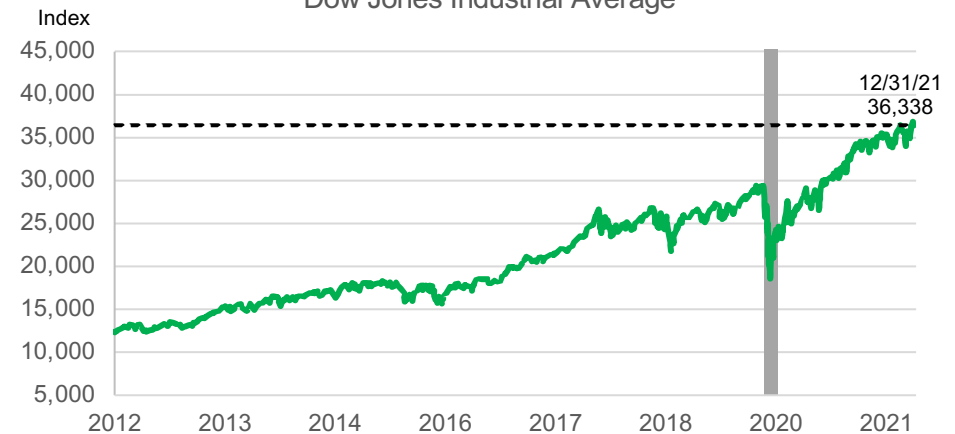
Manufacturing Workweek

Includes Part-time and Overtime



Stock Market

Dow Jones Industrial Average



Employment Data

Employment Data

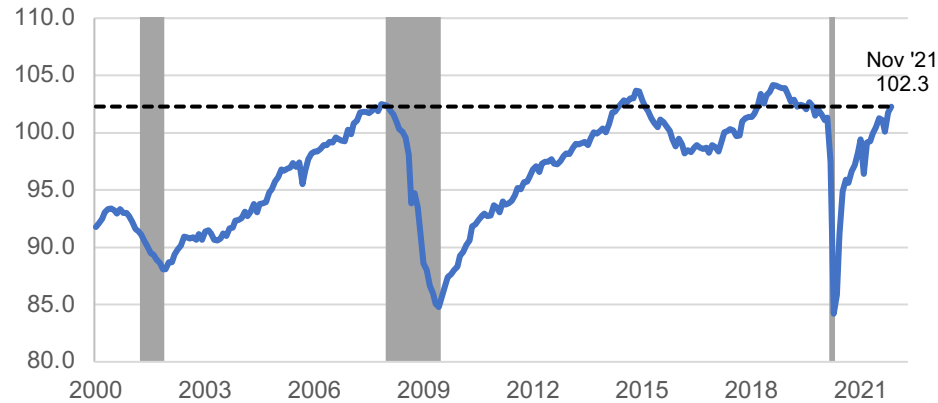
In Thousands and Percent

	Establishment Survey				Household Survey			
	Change in Nonfarm Employment	Change in Goods-Producing Employment	Change in Service-Providing Employment	Change in Government Employment	Change in Household Employment	Change in Labor Force	Labor Force Participation Rate	Unemployment Rate
Dec '20	-306	82	-356	-32	122	-295	61.5	6.7
Jan '21	233	-7	129	111	121	132	61.4	6.4
Feb '21	536	-20	642	-86	363	-487	61.5	6.2
Mar '21	785	159	565	61	573	175	61.5	6.0
Apr '21	269	-41	267	43	319	272	61.7	6.0
May '21	614	16	539	59	291	347	61.6	5.8
Jun '21	962	42	766	154	62	-177	61.6	5.9
Jul '21	1,091	74	742	275	1,092	313	61.7	5.4
Aug '21	483	54	450	-21	463	261	61.7	5.2
Sep '21	379	65	359	-45	639	130	61.7	4.7
Oct '21	648	100	614	-66	428	-34	61.7	4.6
Nov '21	249	72	198	-21	1,090	139	61.9	4.2
Dec '22	199	54	157	-12	651	516	61.9	3.9
Higher / Lower than Peak								
Workers	-3,572	-341	-2,304	-927	-2,891	-2,289	-1.5	0.4
Percent	-2.3	-1.6	-2.1	-4.1	-1.8	-1.4	--	--

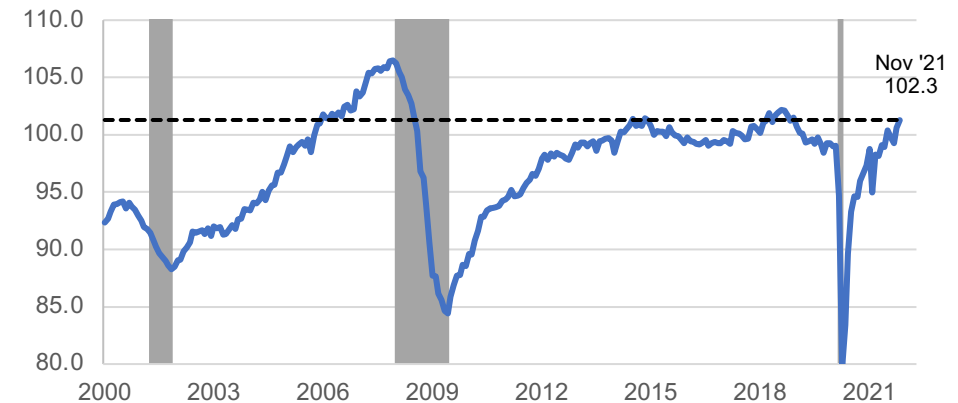


Industrial Production and New Orders

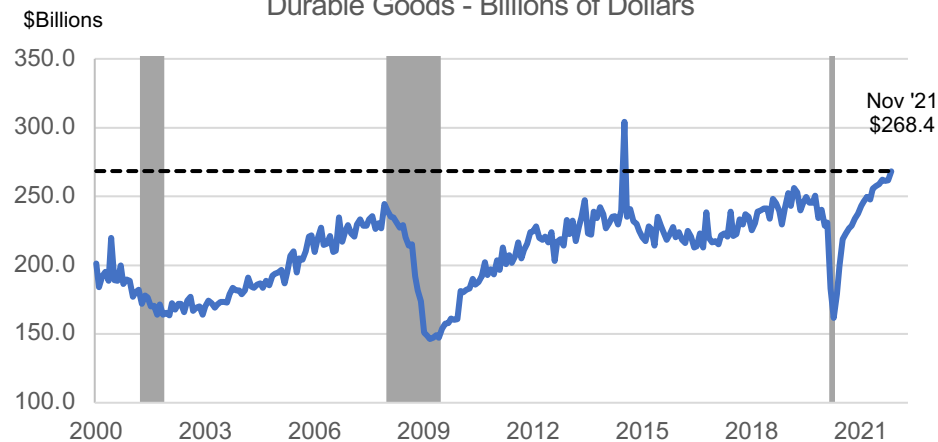
Industrial Production - Total
Index - 2017 = 100



Industrial Production - Manufacturing
Index - 2017 = 100



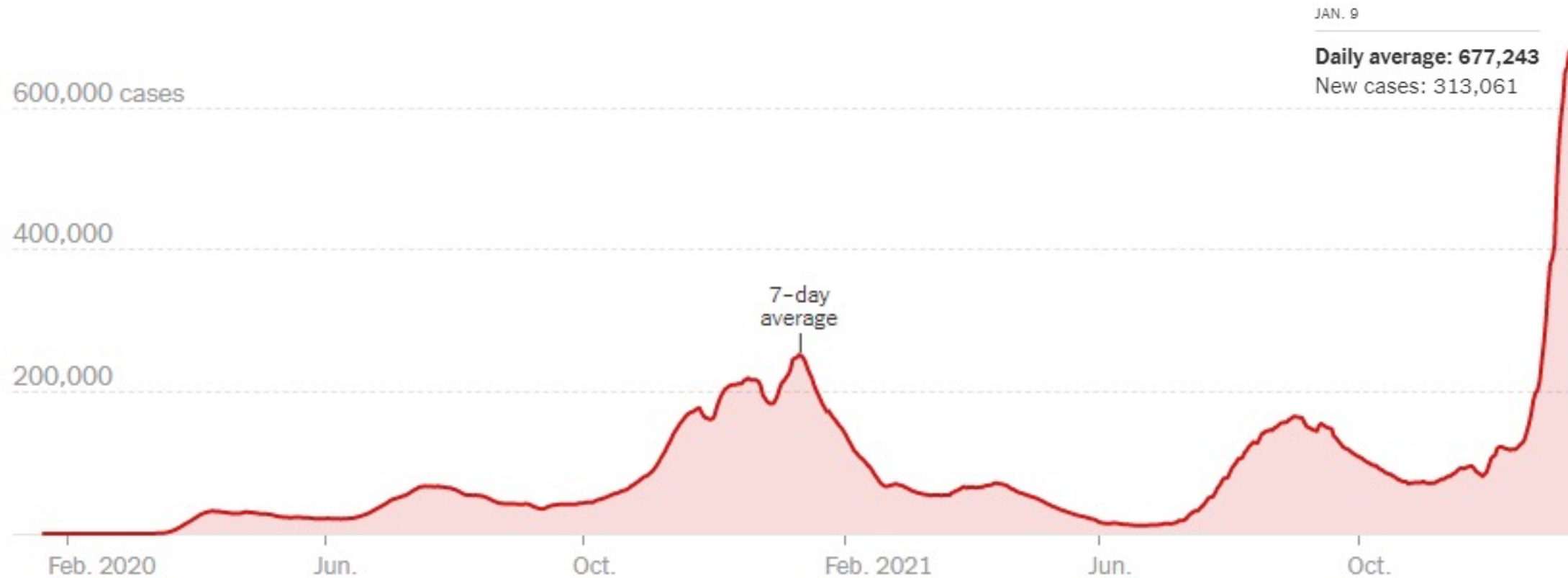
New Orders
Durable Goods - Billions of Dollars



New Orders



U.S. COVID Cases – 7-Day Moving Average



Summary

- The U.S. Economy continues to expand at above trend rates.
- Ability to Consume Indicators have weakened slightly in recent weeks, but consumer demand remains strong.
- The Current Risks to Economic Expansion are
 - The COVID Omicron Variant
 - Supply Chain Related Inflation
- GDP growth is expected to remain above trend, but expectations for Q1'22 quarter have declined slightly due to the Omicron variant
- The outlook remains positive for Transportation and Freight Activity



Freight Overview: Constraints Across Modes

Trucking:
great visibility
continues

- Stronger-for-longer freight cycle: consumer/restock
- Volumes capacity-constrained
- Longer-term fiscal support & pent-up demand

Ocean:
freight as far as the
eye can see

- At/Near record containership queues
- Port congestion exacerbating freight flows
- Extreme imbalance part of rate spike

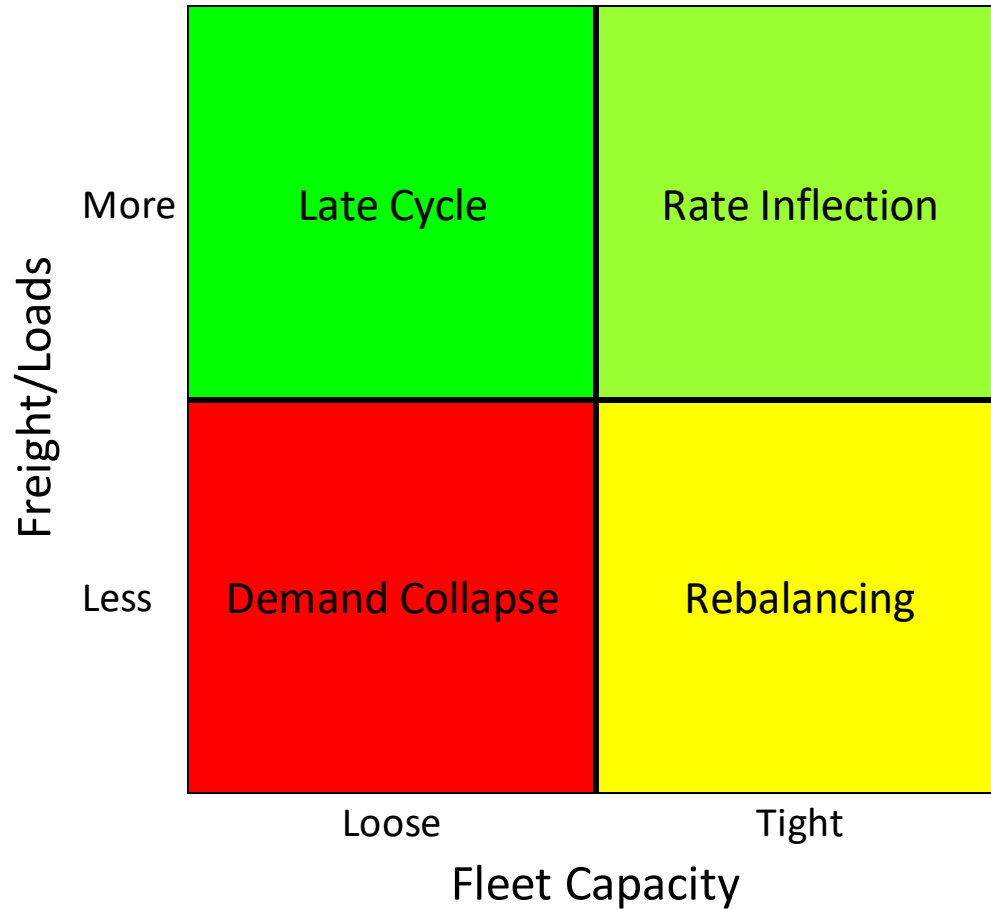
Rail / Intermodal:
stymied by chassis
shortage

- Intermodal downturn on network constraints
- Auto production issues ongoing but improving
- Chassis shortage 6-12 month problem



As Good As It Gets

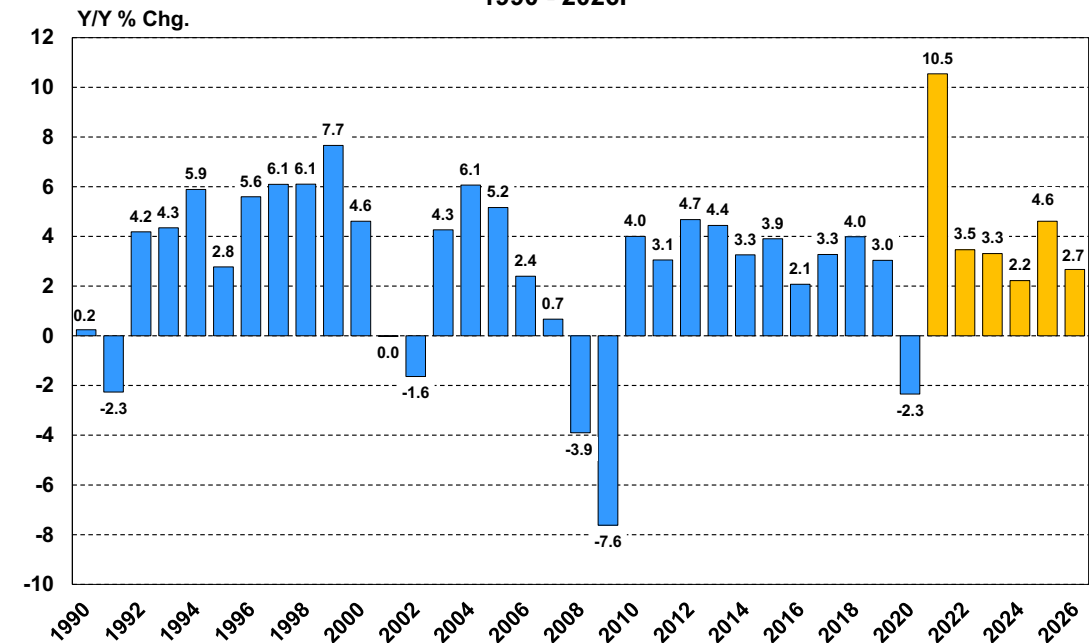
Freight & Carrier Profit Cycle



**WE ARE
HERE**

**Record Freight Creation
Substantive Driver Capacity
Constraints**

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

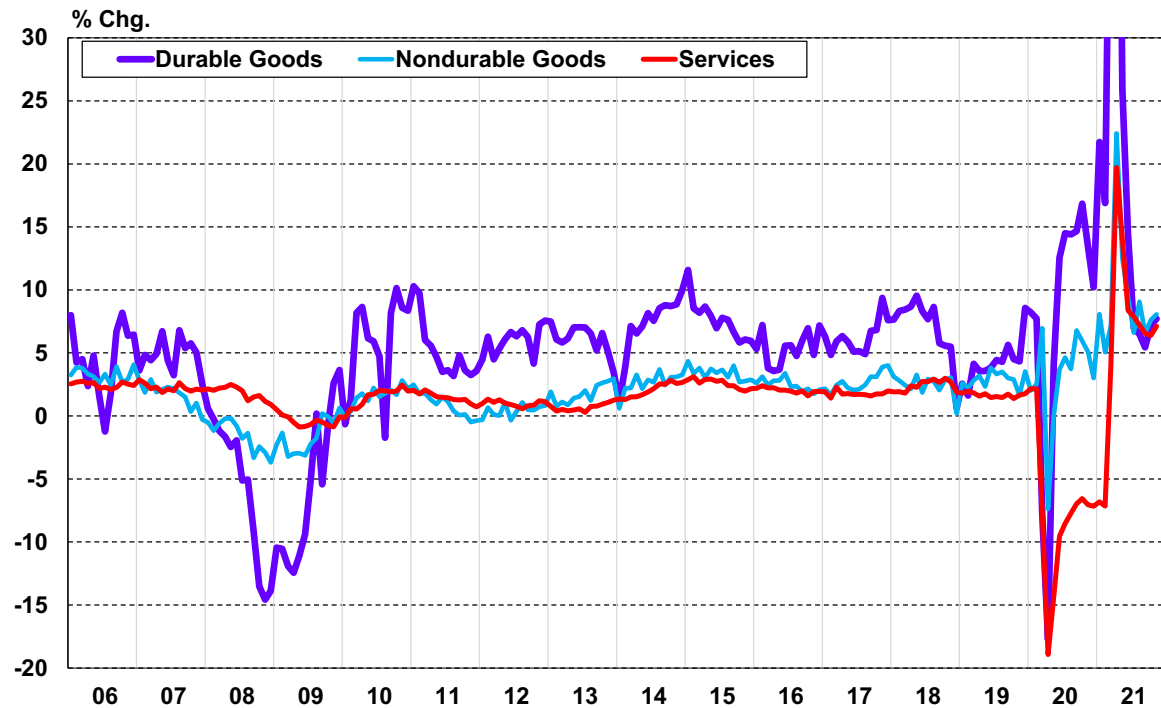


Source: ACT Research Co., LLC: Copyright 2022

Omicron Lengthens Legs on Goods Demand

Real Personal Consumption Expenditures

January 2006 - November 2021

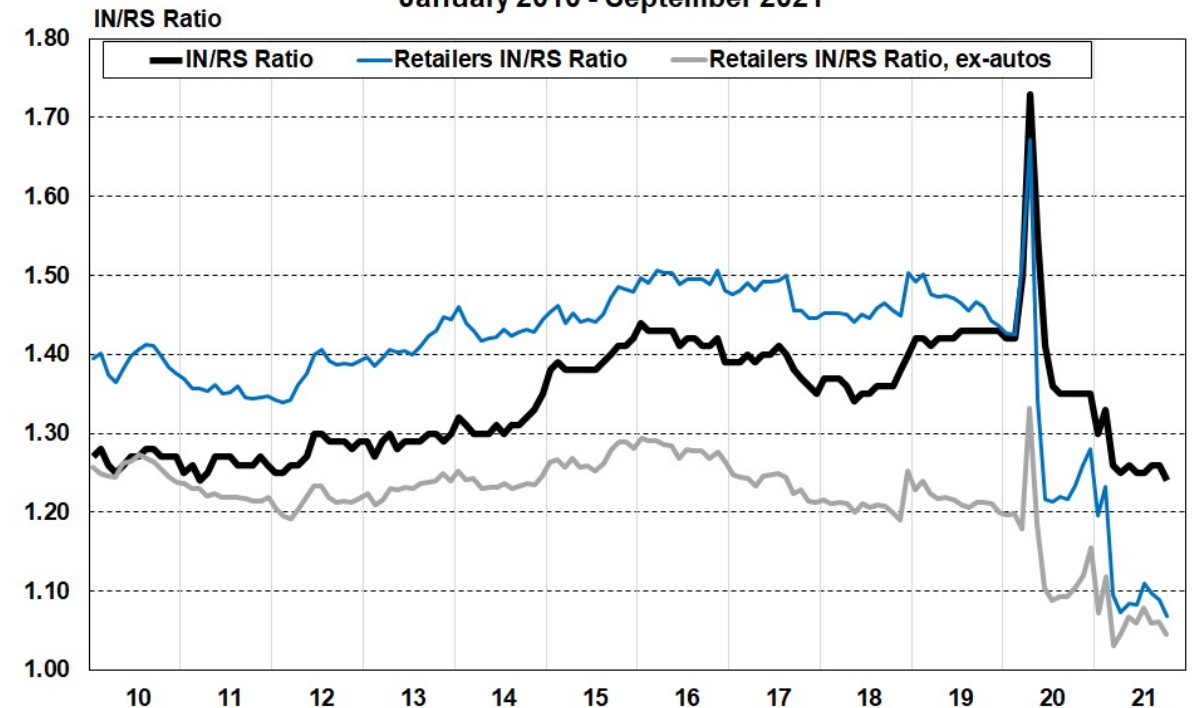


Source: US Bureau of Economic Analysis, ACT Research Co., LLC: Copyright 2022

Inventory to Sales Ratio: Total Business

Index - SAAR

January 2010 - September 2021

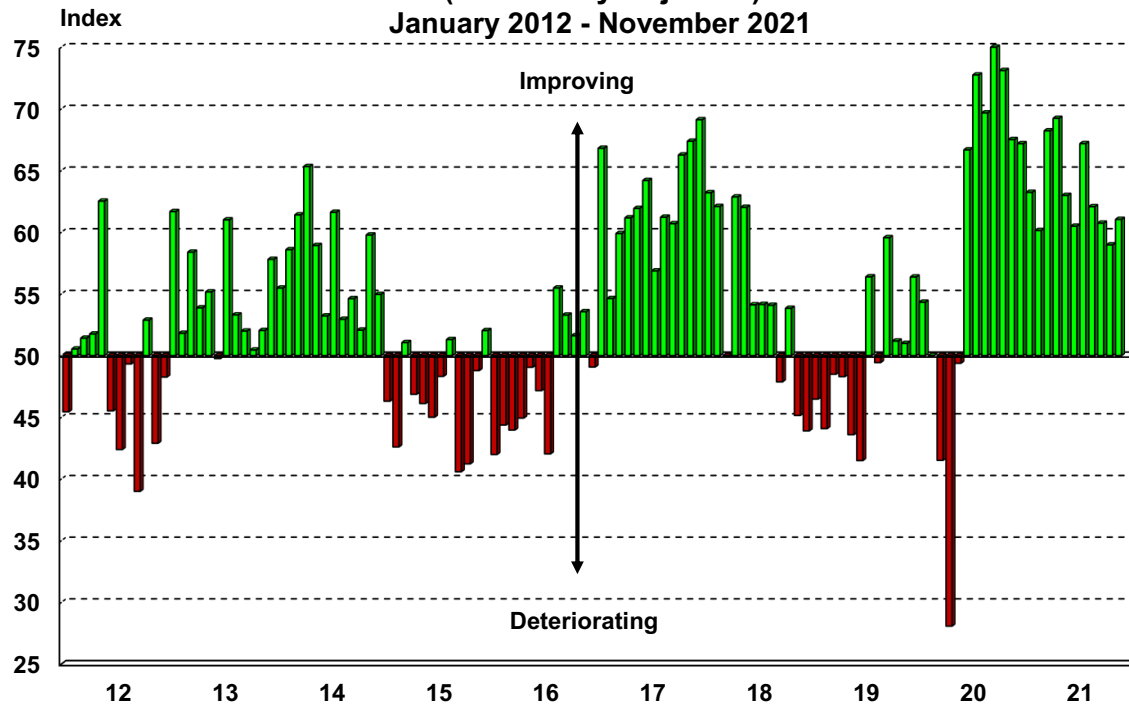


Source: Census Bureau, ACT Research Co., LLC: Copyright 2022



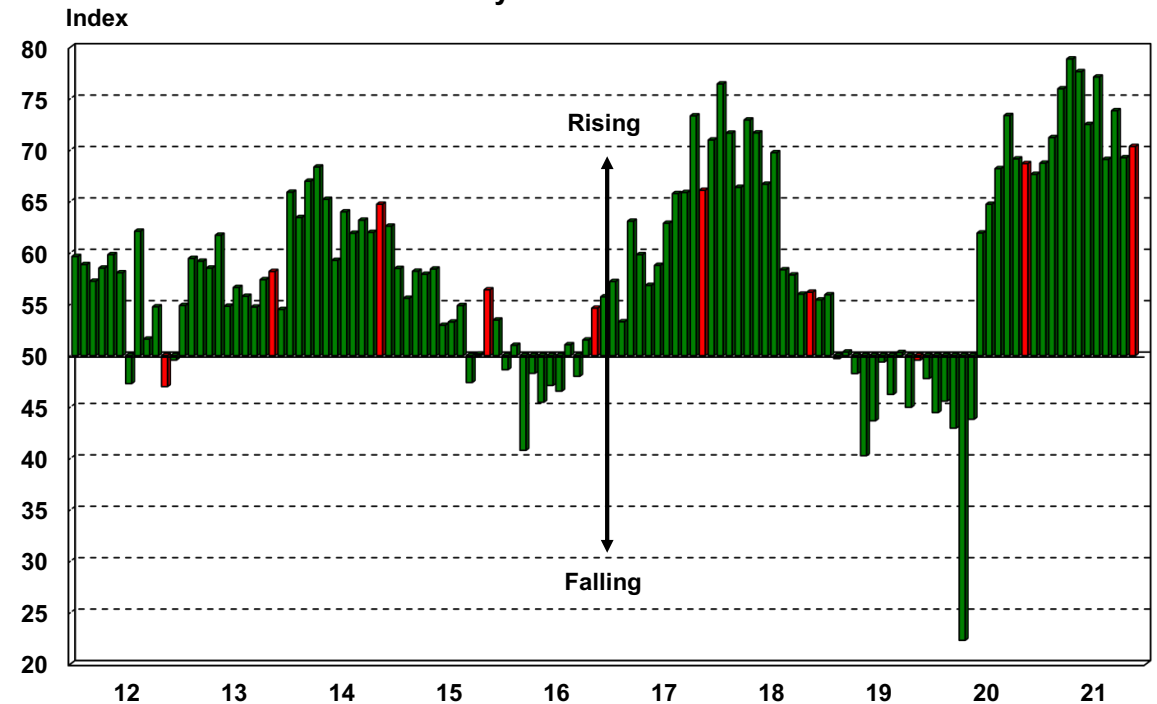
ACT For-Hire Index Continues Strong

ACT For-Hire Trucking Survey: Supply-Demand Balance
Freight (Demand) Index Less Capacity (Supply) Index
(Seasonally Adjusted)
January 2012 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

ACT For-Hire Trucking Index: Freight Rates
(Seasonally Adjusted)
January 2012 - November 2021



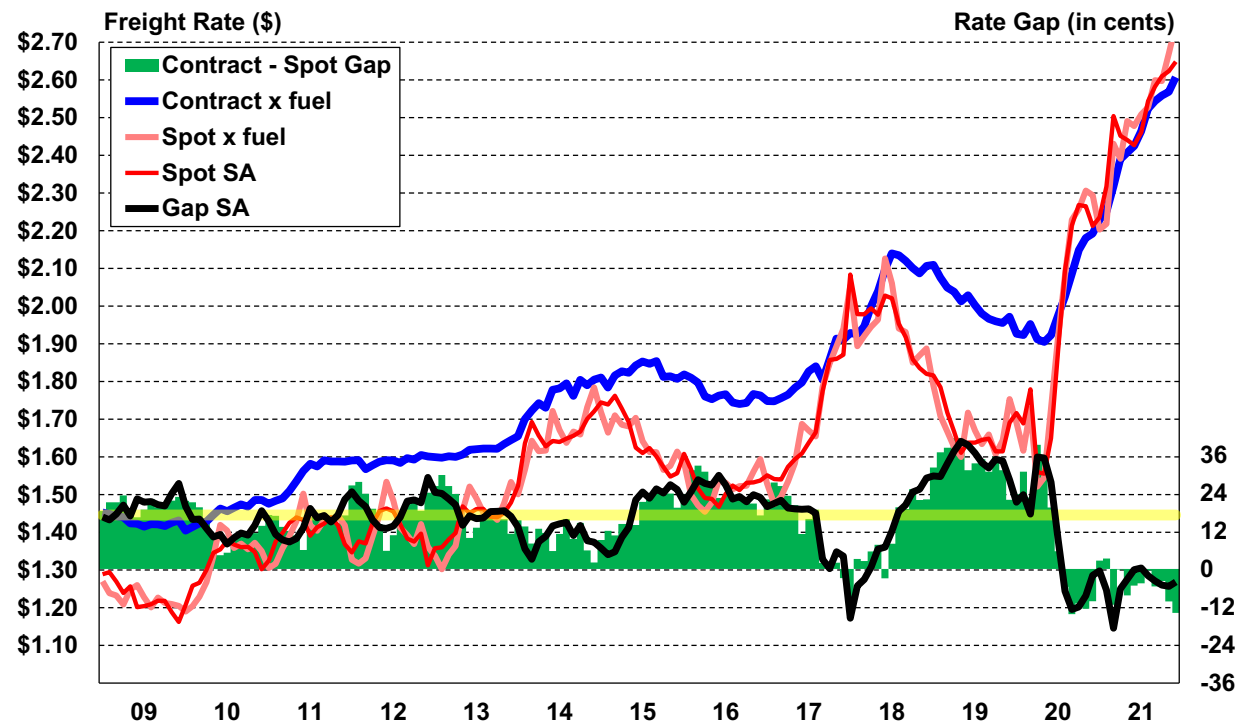
Source: ACT Research Co., LLC: Copyright 2022



Rate Inversion Bodes Well For Profitability

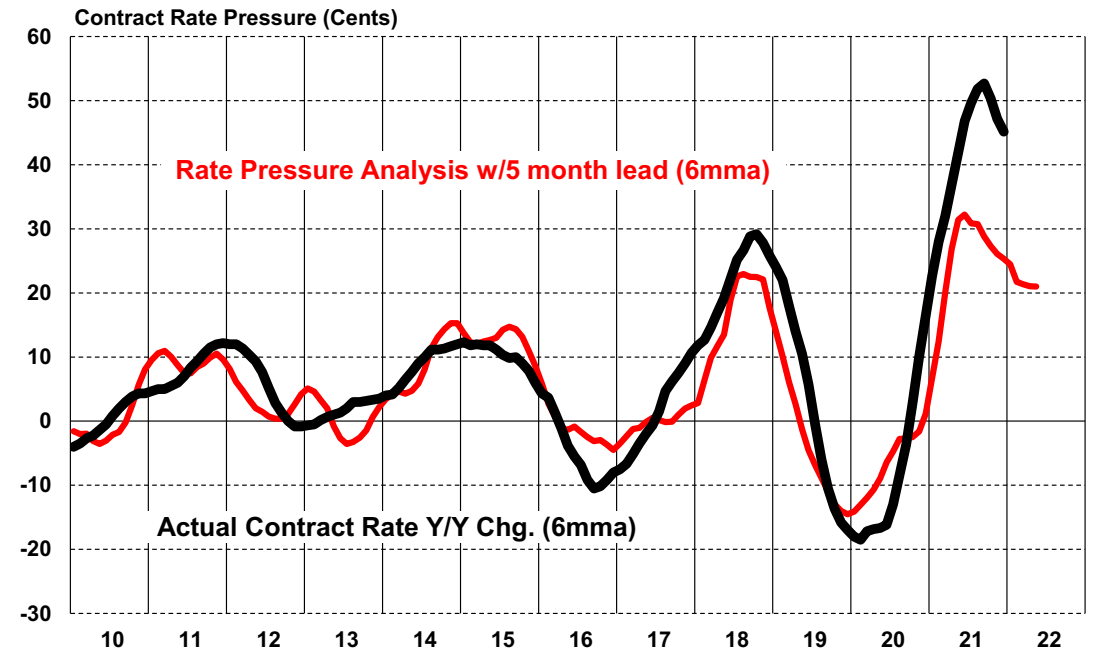
DAT Trendlines: Aggregate Truckload Rate per Mile

January 2009 - December 2021 (2000=100)



Source: DAT Solutions, ACT Research Co., LLC: Copyright 2022

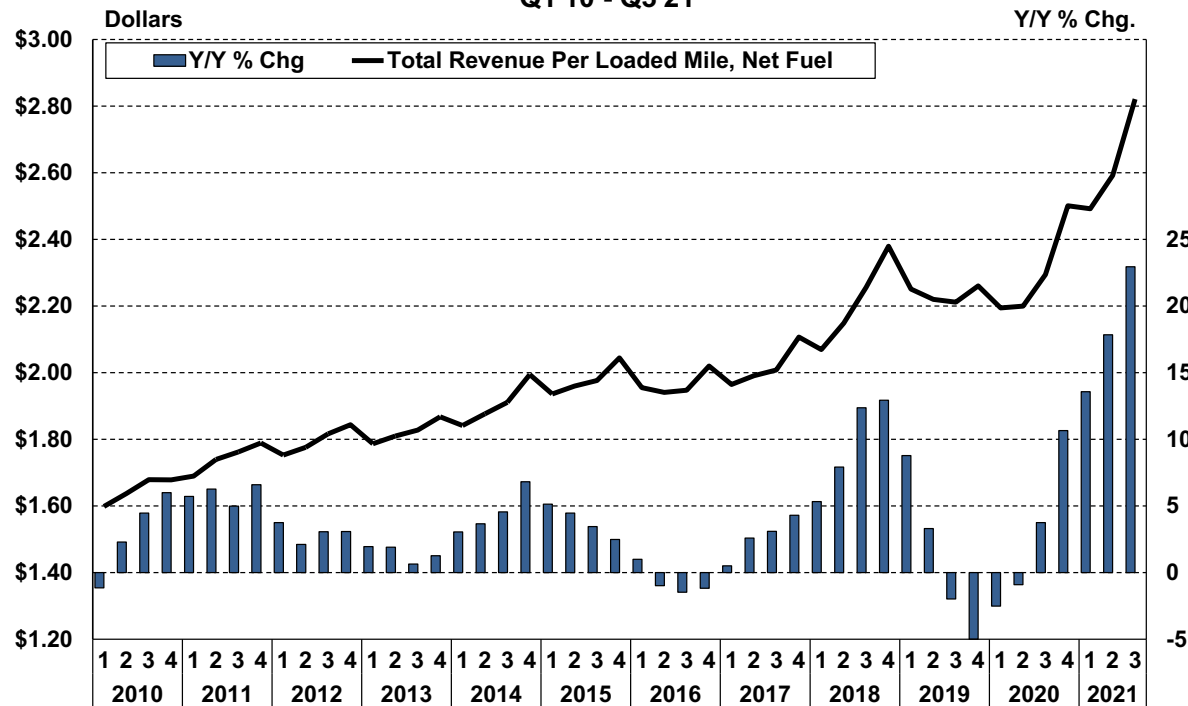
Dry Van Rate Pressure Analysis: Contract less SA Spot rate relative to target rate spread January 2010 - December 2021



Source: DAT Solutions, ACT Research Co., LLC: Copyright 2022

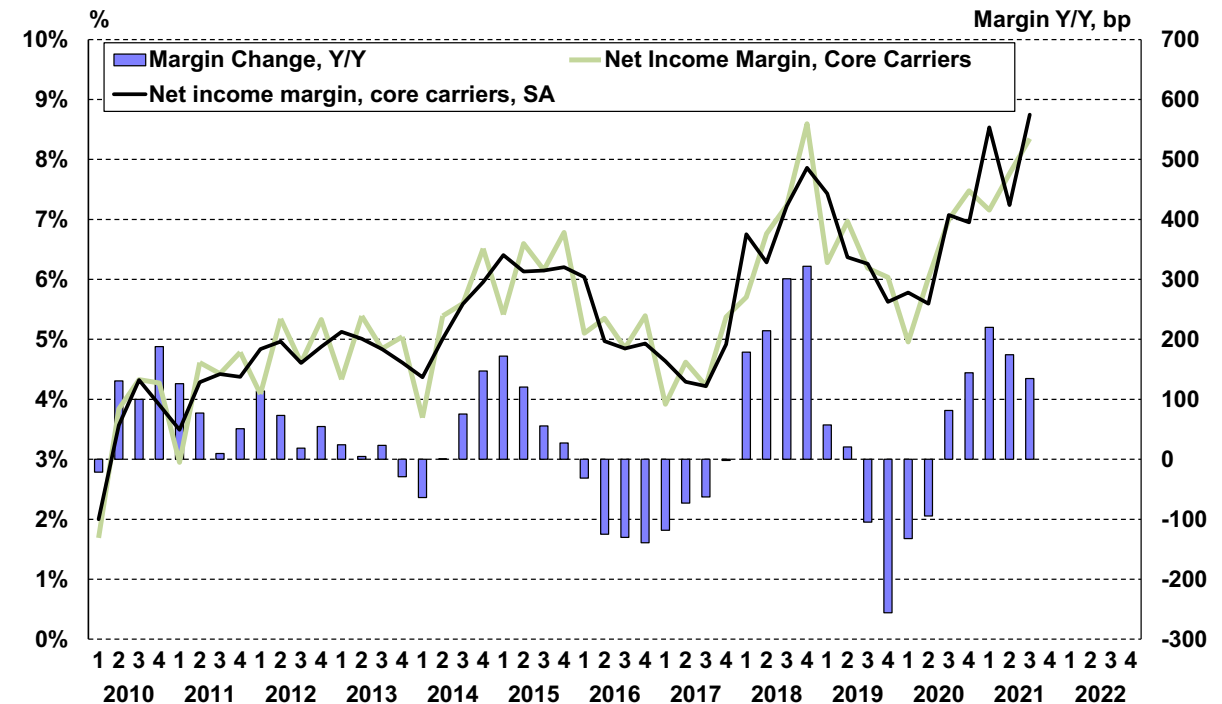
When Truckers Make Money ...

TL Carrier Database: Total Revenue Per Loaded Mile, Net Fuel
Q1'10 - Q3'21



Source: ACT Research Co., LLC: Copyright 2022

TL Carrier Database: Net Income Margin, Core Carriers
Q1'10 - Q3'21



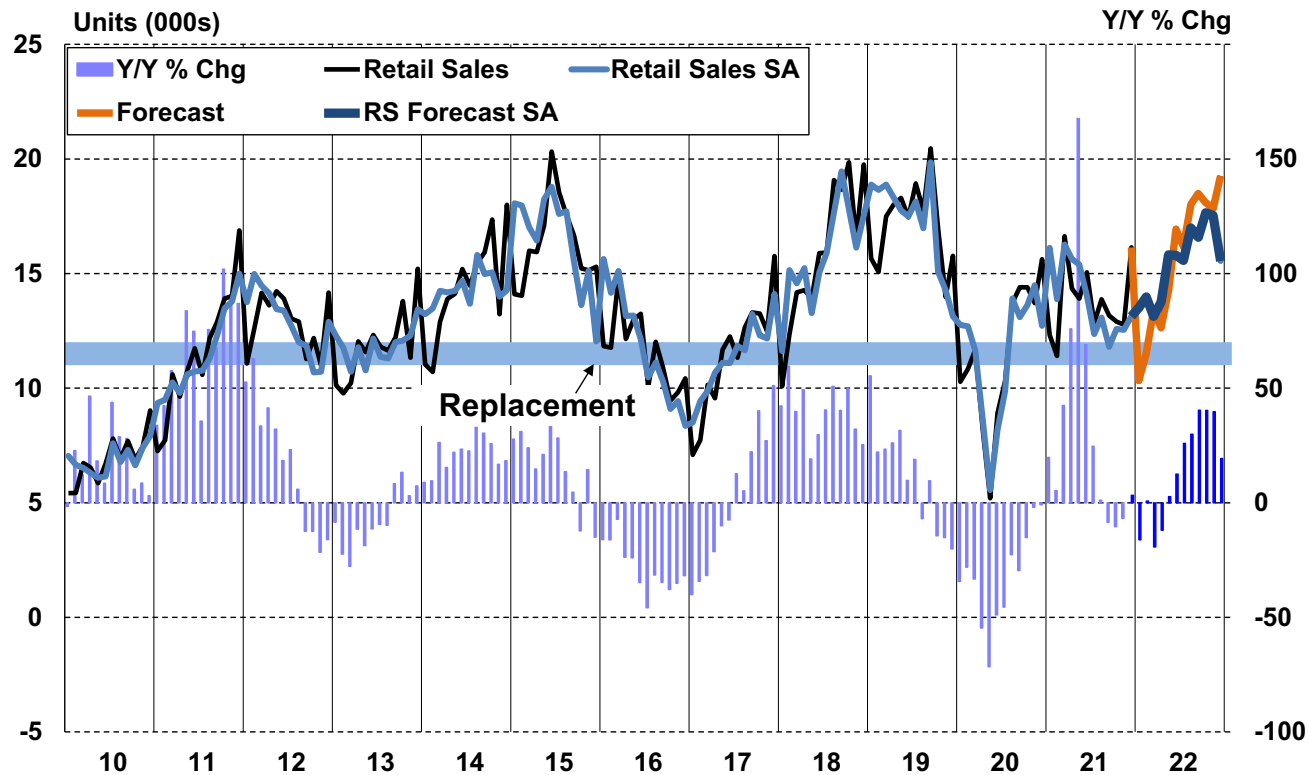
Source: ACT Research Co., LLC: Copyright 2022



Slow Additions Continue Capacity Imbalance

U.S. Class 8 Tractors: Retail Sales

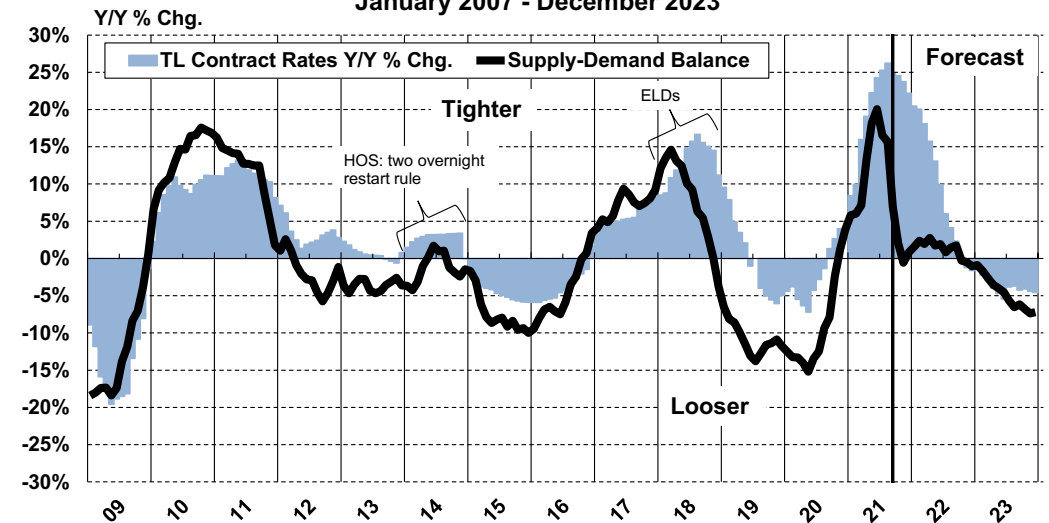
January 2010 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

Truckload Rate Gauge

January 2007 - December 2023

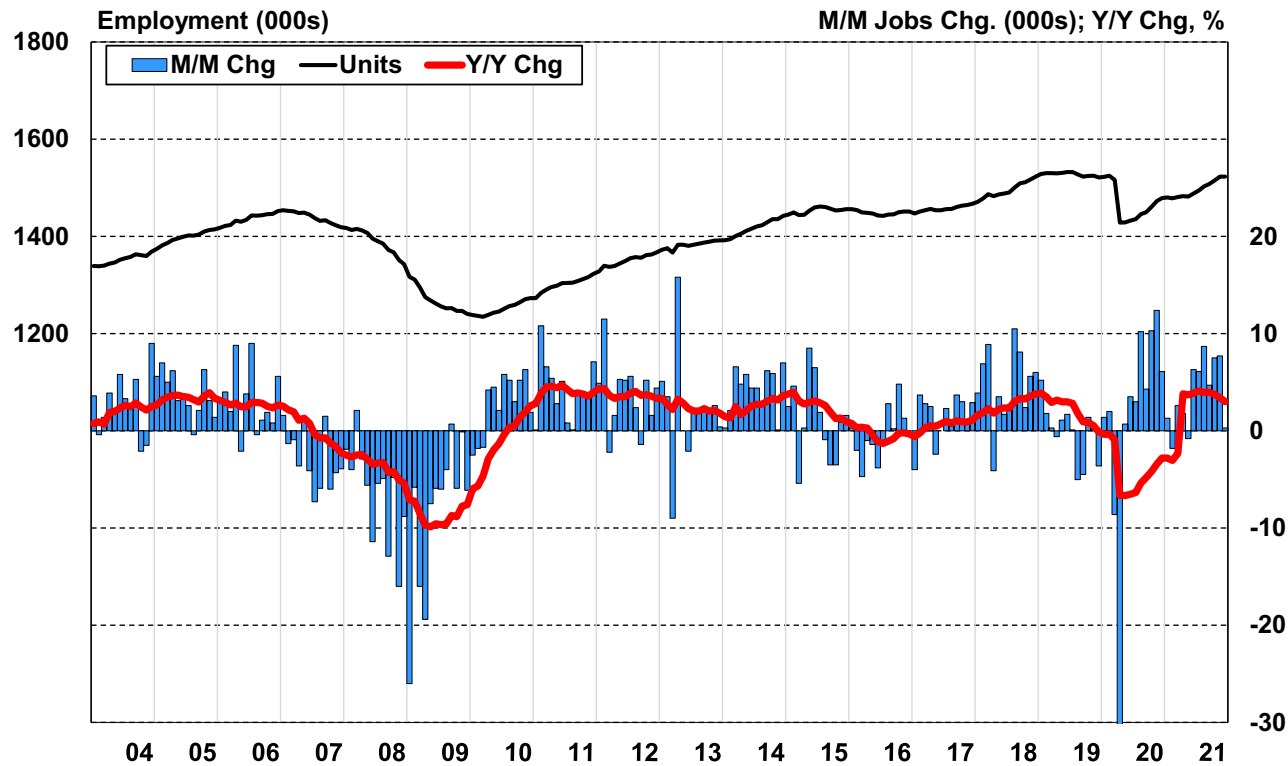


Note: Supply is Tractor Population, Demand is the Cass Shipments Index, TL Contract Rates, incl fuel, based on ACT Public TL Carrier Database.
Source: ACT Research Co., LLC: Copyright 2022

Driver Supply Less Constrained

Truck Transportation Employment

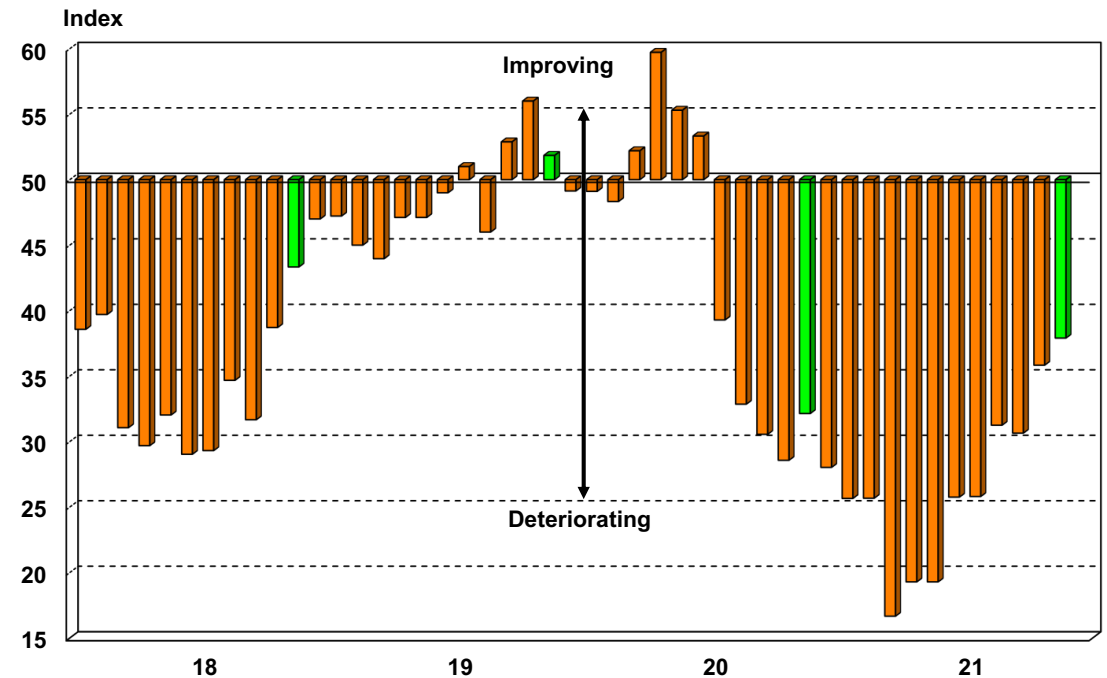
January 2004 - December 2021 (SA)



Source: BLS, ACT Research Co., LLC: Copyright 2022

ACT For-Hire Trucking Index: Driver Availability

January 2018 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

Heavy-Duty Overview

- Backlogs in place. “Everything shortage” constrains build
 - Demand potential remains at record levels
- IN/RS ratio for tractors at particularly low levels
 - Vocational Class 8 inventories at the low end of normal
 - Inventory as misnomer: *Built but not delivered*
- Modeling indicates large under-build in 2021 and 2022
 - **Per current assumptions, pent-up NA demand ~150k units ending 2022**
- 2023: Pent-up demand early, prebuying late
 - CARB Clean Truck: Potential for 2023 prebuy in 6 states/~20% of market
 - **Raises potential for production cliff in Q1'24**
- Question for 2023: **What is sustainable industry capacity?**



Tractor Dashboard: Indicator of Indicators

ACT Research Class 8 Tractor Dashboard																
Category	Metric	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	RED LIGHT SIGNAL	GREEN LIGHT SIGNAL
	Green Minus Red Tally	10	8	13	14	13	15	15	12	14	15	10	11	11	-3 or less	3 or more
	Positive Indicators (Green)	11	11	13	14	13	15	15	13	14	15	10	11	11		
	Neutral Indicators	3	1	2	1	2	0	0	1	1	0	5	4	4		
	Negative Indicators (Red)	1	3	0	0	0	0	0	1	0	0	0	0	0		
Macro & Financial	ISM Mfg PMI Index	57.5	60.7	58.7	60.8	64.7	60.7	61.2	60.6	59.5	59.9	61.1	60.8	61.1	Value under 50	Value over 53
	Non-Auto Durables Mfg Output**	-5.0	-0.8	5.0	9.7	15.8	19.9	15.1	11.5	9.8	8.6	7.9	6.9	6.4	Value under 0	Value over 3.5
	Consumer Spend, Goods only**	12.3	12.5	15.5	16.1	20.6	22.9	15.4	13.1	11.4	10.6	9.1	8.8	7.6	Below 2.5% growth	Above 4% growth
	Residential Const Expend (real) **	8.8	13.7	19.3	24.5	29.3	32.4	31.4	26.9	20.6	14.5	10.6	6.0	2.9	Below 2% growth	Above 8% growth
	Dow Jones Trucking Stock Index	1112.6	1102.4	1073.9	1175.9	1293.1	1340.4	1357.0	1293.7	1331.4	1399.2	1345.7	1563.1	1555.8	-10% from recent peak	+10% from recent trough
Freight	Cass Freight Shipments**	8.6	14.1	15.7	16.3	22.0	26.5	24.6	19.7	12.7	9.1	6.3	6.5	7.4	Below 0%	Above 8%
	DAT Loads/Truck	6.4	7.3	8.5	14.9	9.7	9.0	10.7	7.5	10.0	11.2	8.9	8.6	8.1	Below 2.75	Above 4.75
	DAT Aggregate Contract/Spot Spread	-13	-10	3	3	-11	0	-8	-5	-4	0	-5	-4	-3	Above 20	Below 15
	DAT Dry Van Spot Rate*	40.3	30.8	30.3	37.2	40.7	57.2	61.2	43.3	30.7	21.4	16.6	15.1	12.7	Below 0	Above 8
	Cass Freight/US Cl8Tractor Pop Growth Gap	11.0	16.0	17.1	17.1	22.1	25.7	23.1	17.7	10.4	6.8	4.0	4.3	5.4	Below -5	Above 5
ACT data	Cl 8 Cancellations (SA)	2600	4019	1017	1520	2427	1954	1215	5628	1044	1809	2013	2500	2500	Over 3000	Under 2000
	Cl 8 I/S ratio (SA)	2.32	2.83	1.95	2.10	2.21	2.00	1.97	2.23	2.18	2.00	2.25	2.07	2.30	Over 2.6	Under 2.1
	Class 8 Inventory Level (000 SA)	56.7	57.5	56.0	52.2	51.9	50.3	51.1	48.0	42.2	40.6	40.5	41.6	44.7	Over 65K	Under 52K
	Class 8 Net Orders to Build (6mma,SA)	1.58	1.69	1.70	1.82	1.78	1.81	1.62	1.57	1.63	1.59	1.58	1.48	1.38	Under 1.00	Over 1.15
	ACT For Hire - Volume less Capacity	67.5	66.6	63.9	60.1	68.1	69.3	63.0	60.5	67.2	62.1	60.8	58.9	61.0	Under 48	Over 58

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

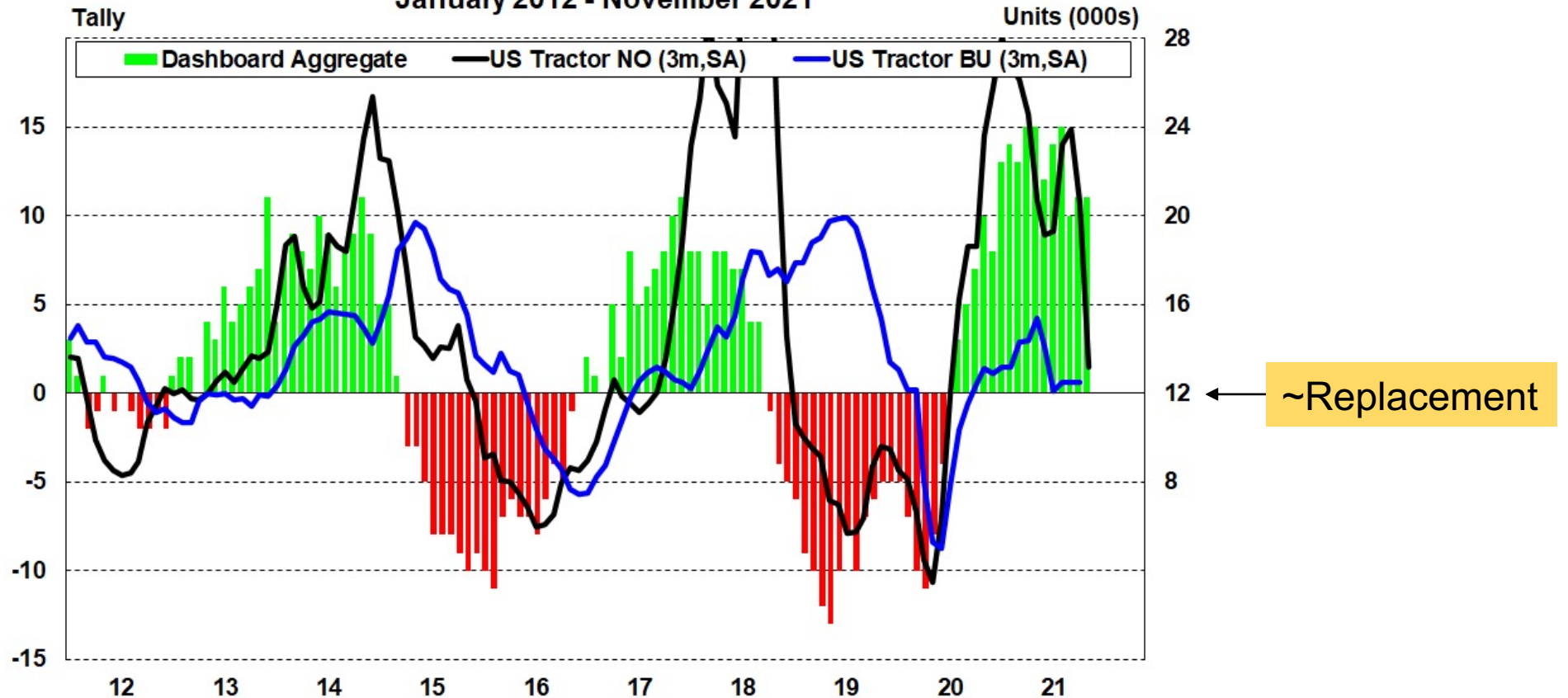
*Italics denotes special
cancellation treatment*



Dashboard Provides Long Production Leads

ACT Research Tractor Dashboard: Aggregate Tally & USC8 Tractor Net Orders (SA)

January 2012 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

OEMS, Reporting Rules Constraining Orders

Class 8 Tractor: N.A. Net Orders

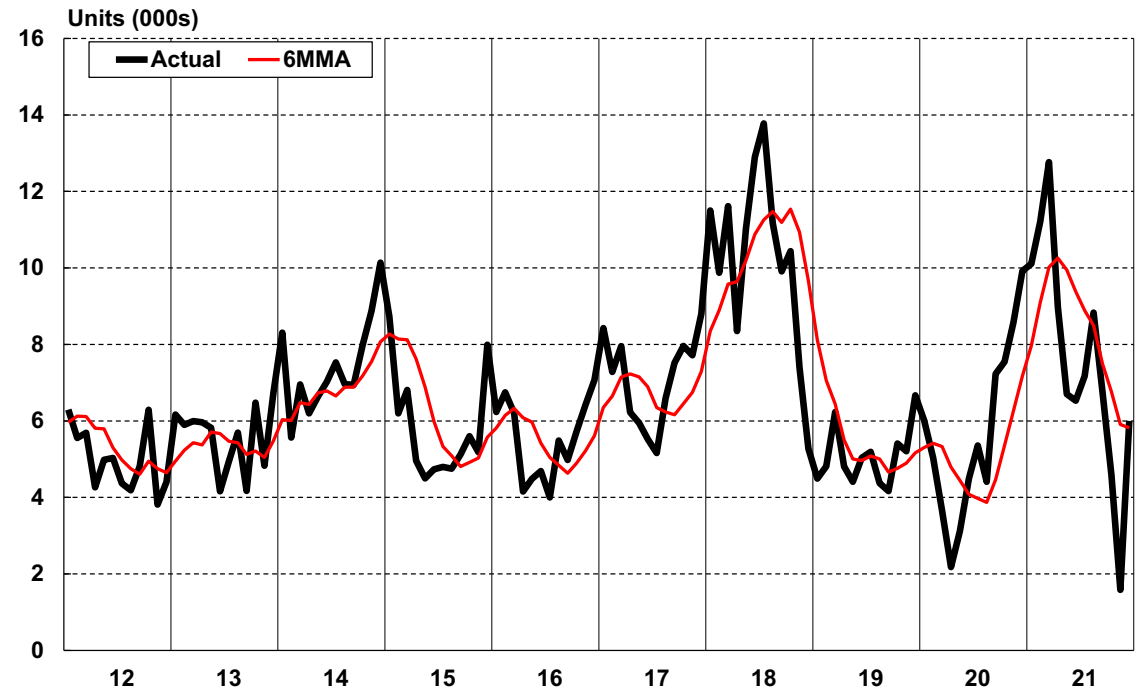
January 2012 - December 2021



Source: ACT Research Co., LLC: Copyright 2022

Class 8 Straight Truck with Day Cab: N.A. Net Orders

January 2012 - December 2021



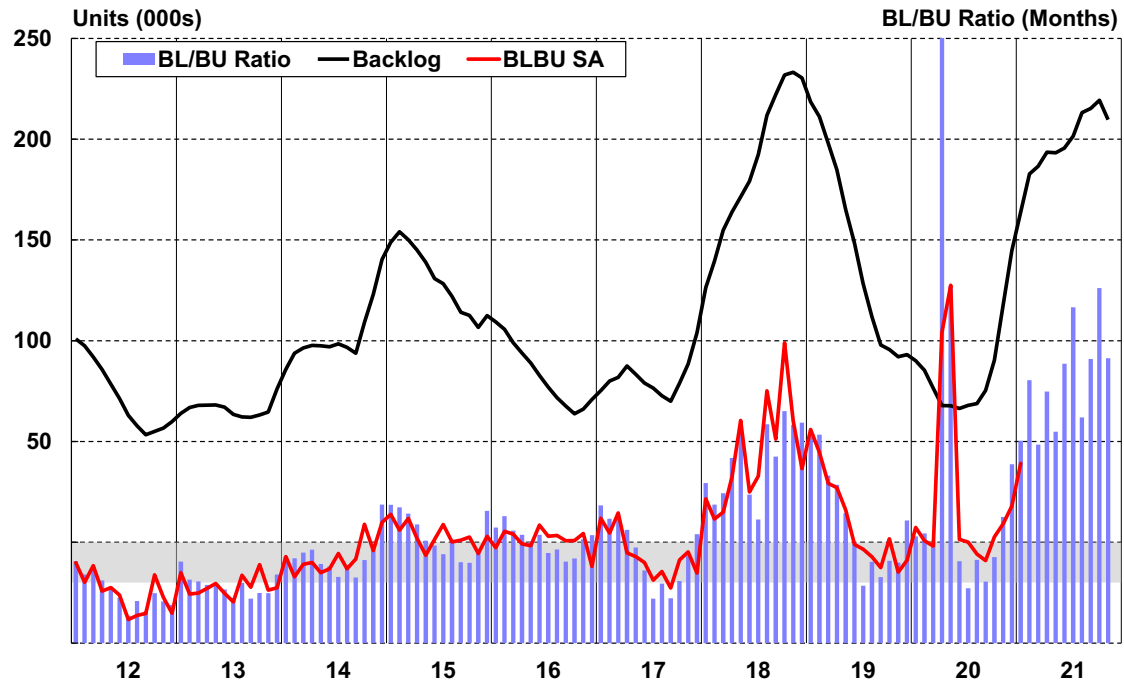
Source: ACT Research Co., LLC: Copyright 2022

Rudimentary December splits based on preliminary C8 orders of 22,800 units

Key Ratios: Backlog & BL/BU

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

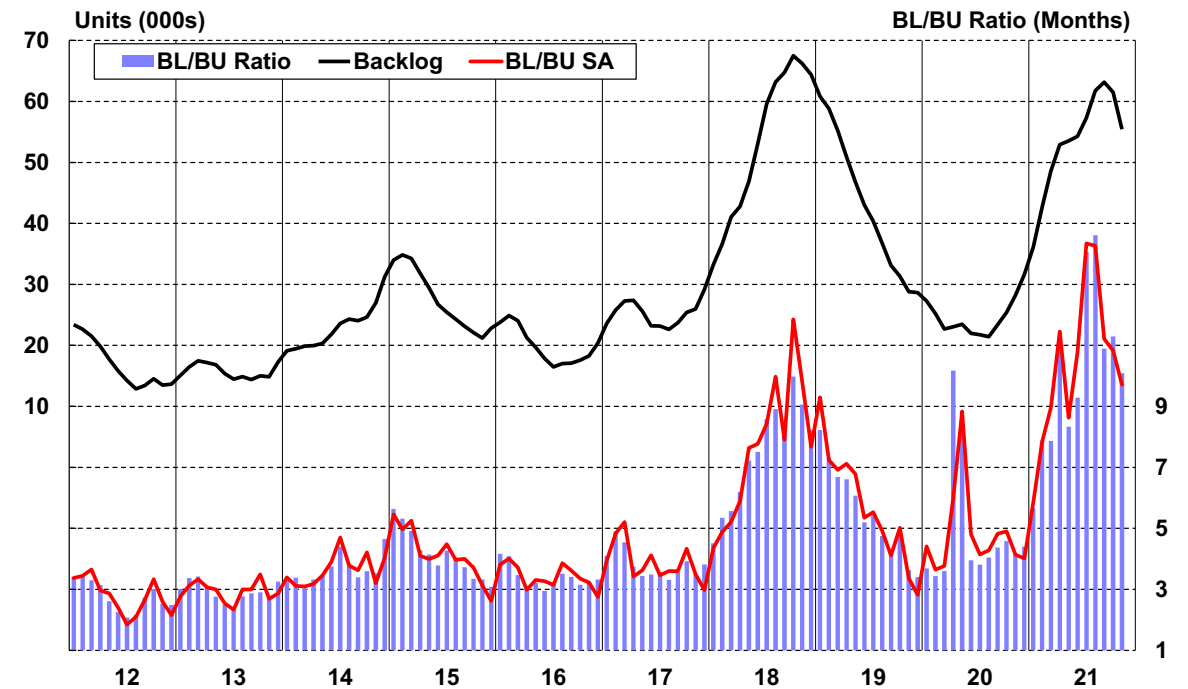
January 2012 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

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

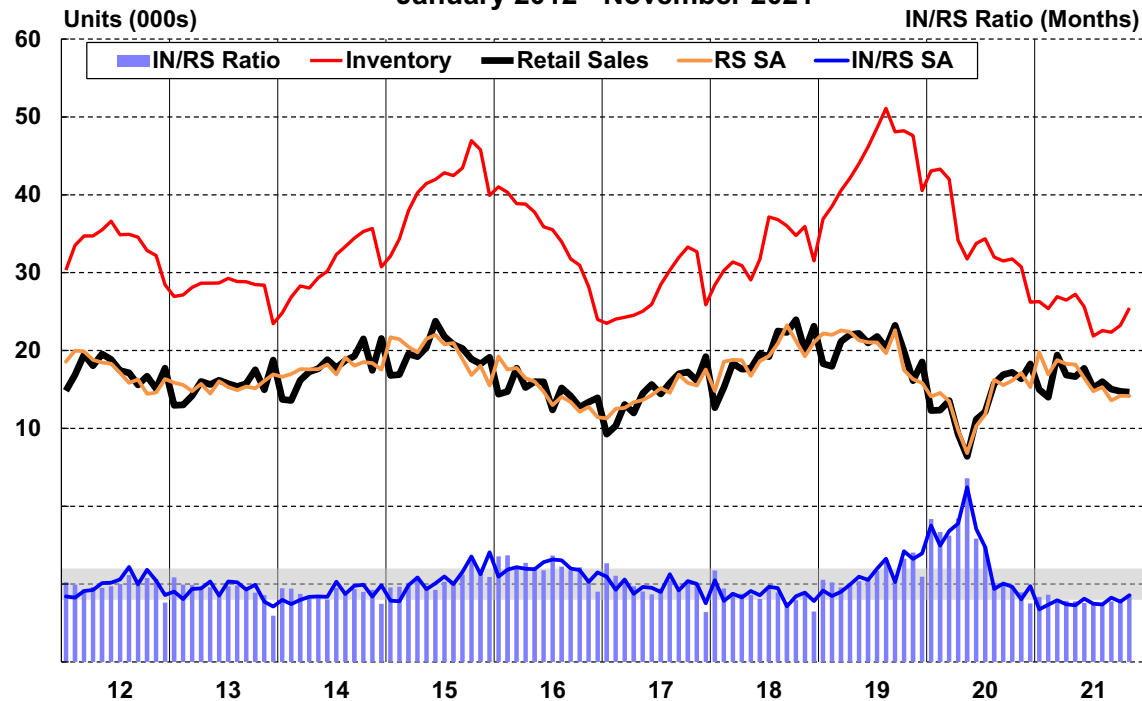
January 2012 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

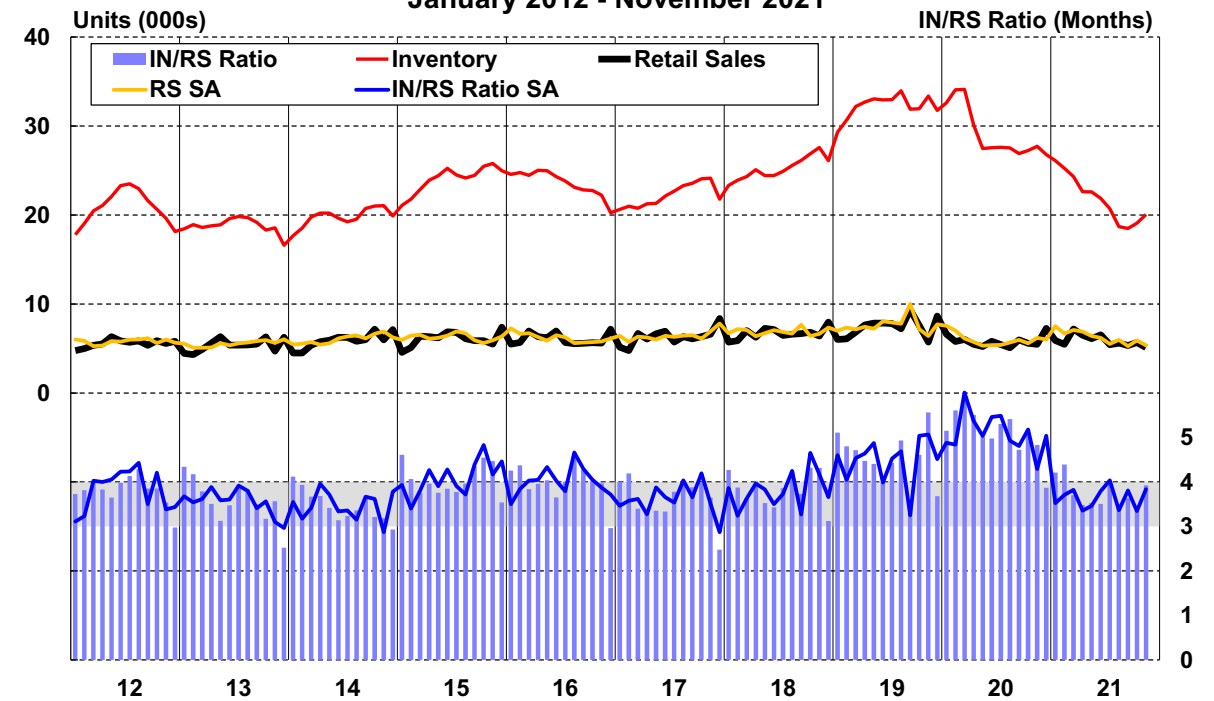
Key Ratios: IN, RS and IN/RS

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



Source: ACT Research Co., LLC: Copyright 2022

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

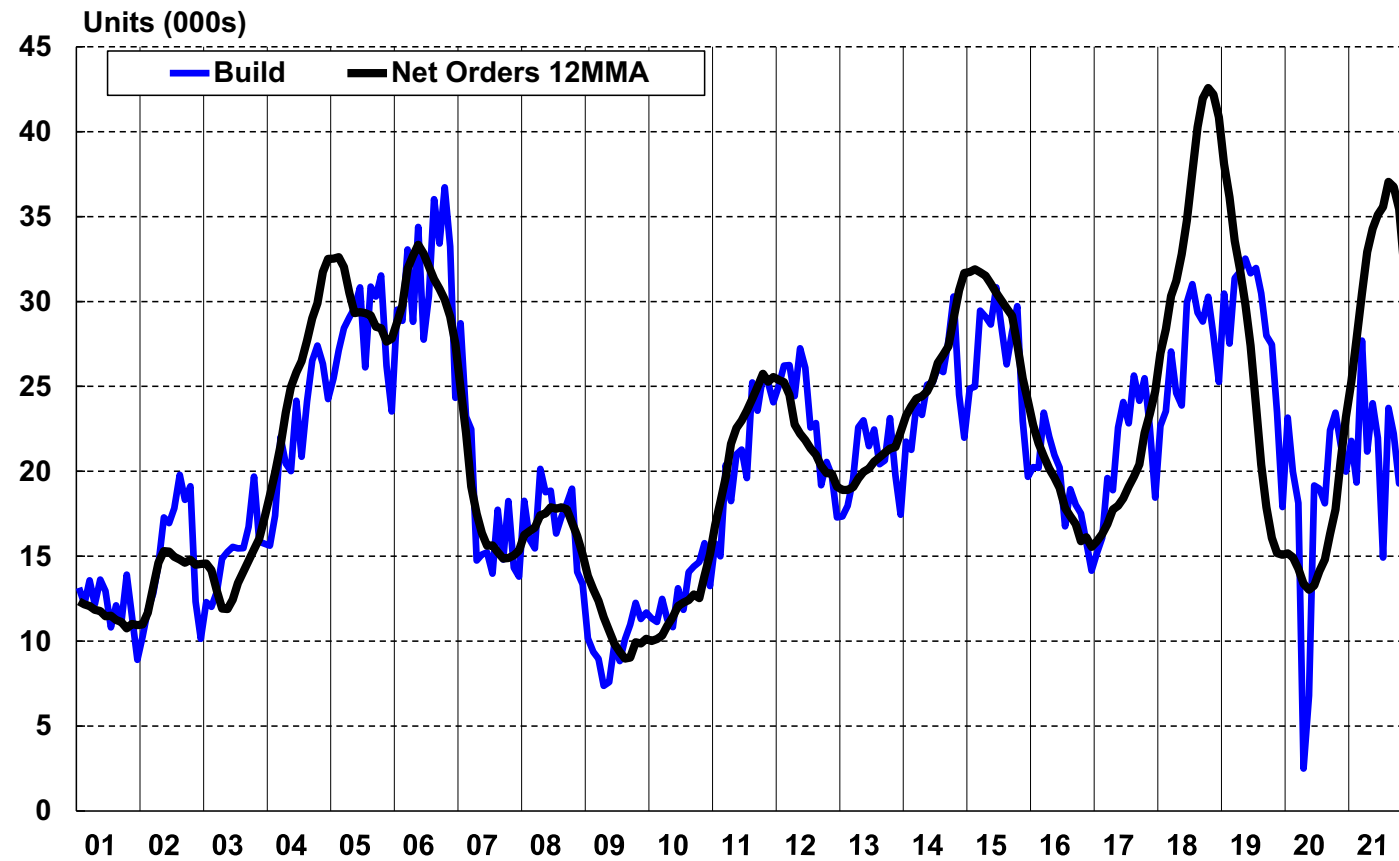


Source: ACT Research Co., LLC: Copyright 2022

Unprecedented Supply-Demand Spread

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

January 2001 - November 2021

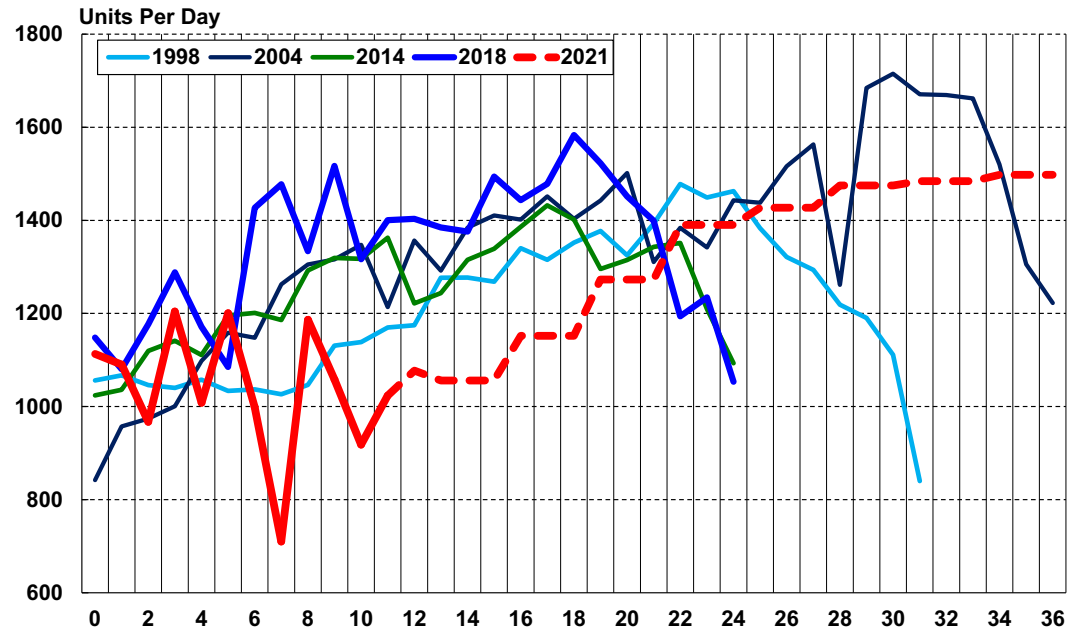


Source: ACT Research Co., LLC: Copyright 2022

Build Rate Assumptions

Total Class 8: Arc & Duration of Peak Demand Cycle

Build rate progression following cycle-initiating order trend shift



Source: ACT Research Co., LLC: Copyright 2022

Per Day Build Rate	Q1	Q2	Q3	Q4
2021	1,093	1,066	982	997
2022	1,056	1,152	1,273	1,390
2023	1,427	1,475	1,484	1,498

Used Class 8 Trucks

Average retail at \$80,800 in November (F)

➤ +12% m/m, +68% y/y, +38% ytd

Demand is following white-hot freight markets

Lack of inventory is THE story

Miles and age trending up subtly

Exports reflecting a stronger global market, beholden to ocean shipping

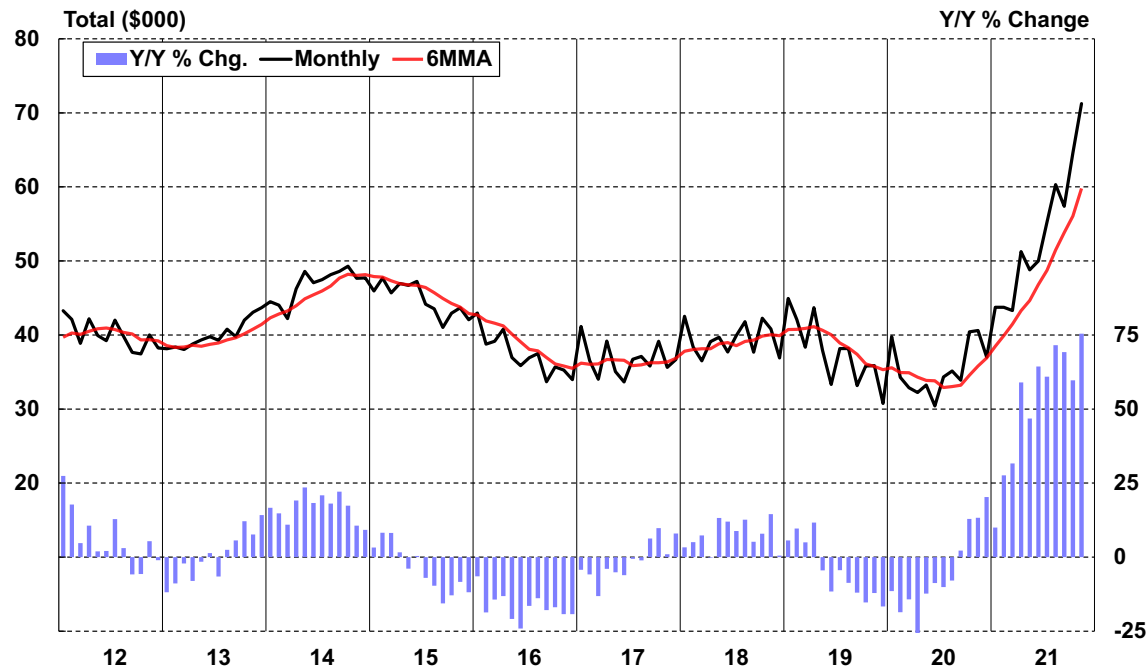
➤ +9% m/m, -14% y/y, +26% ytd



Prices Exhibit Staying Power

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

January 2012 - November 2021

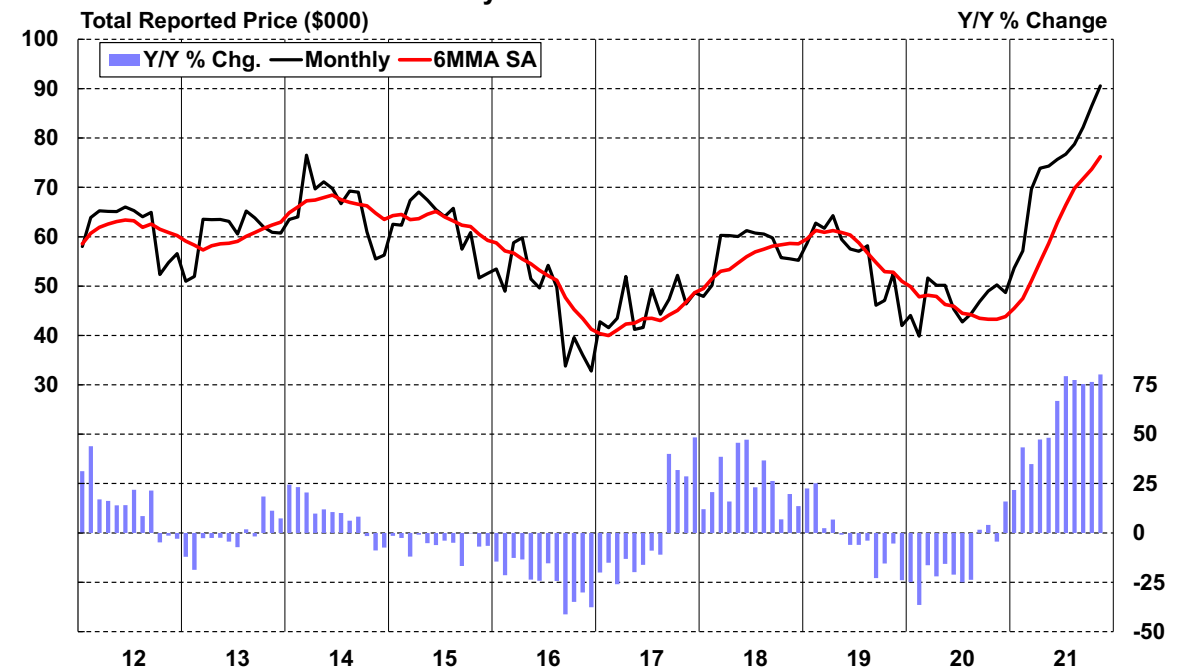


Source: ACT Research Co., LLC: Copyright 2022

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 - November 2021

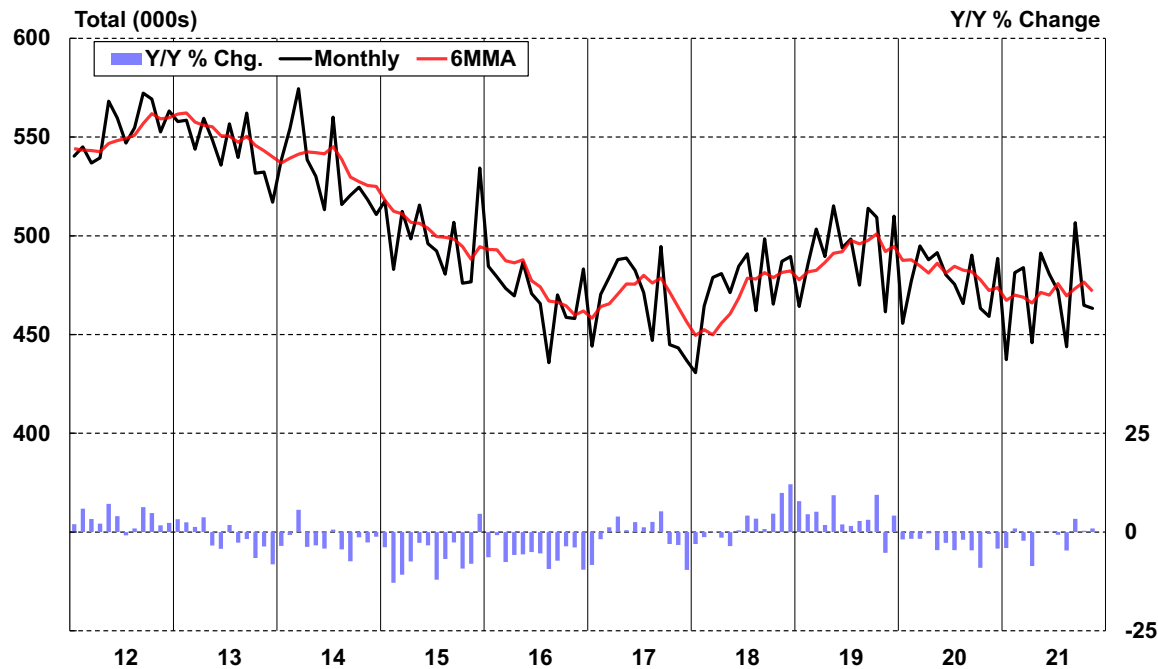


Source: ACT Research Co., LLC: Copyright 2022

Miles and Age Trending Subtly Higher

Class 8: U.S. Used Truck Average Miles

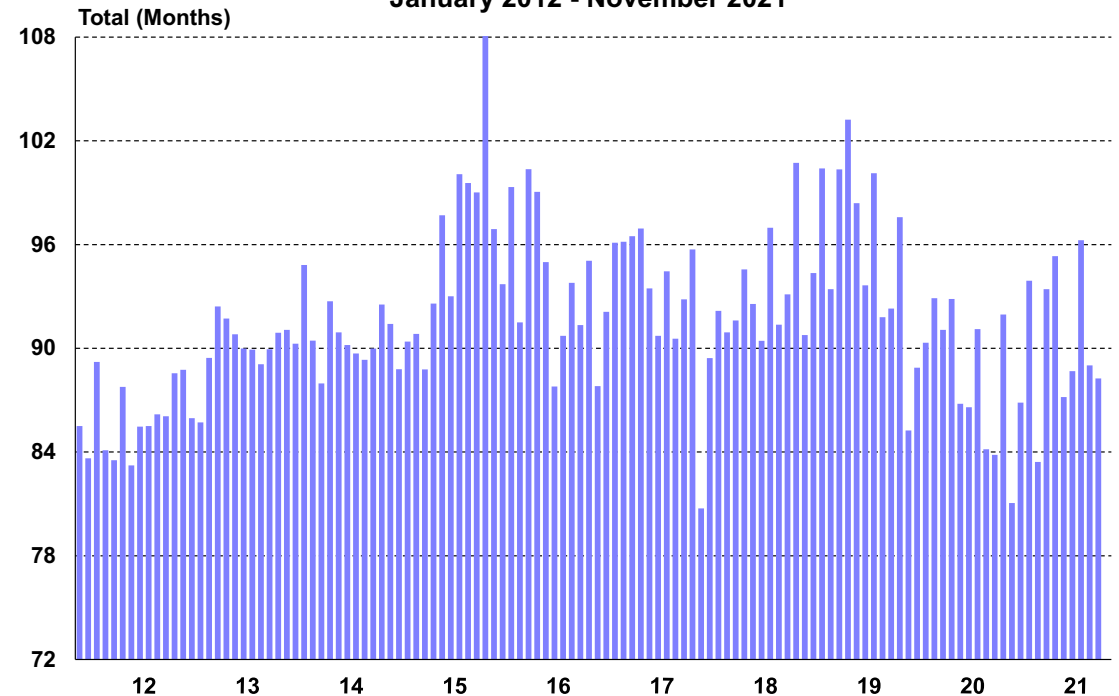
January 2012 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

Class 8: U.S. Used Truck Average Age

January 2012 - November 2021



Source: ACT Research Co., LLC: Copyright 2022

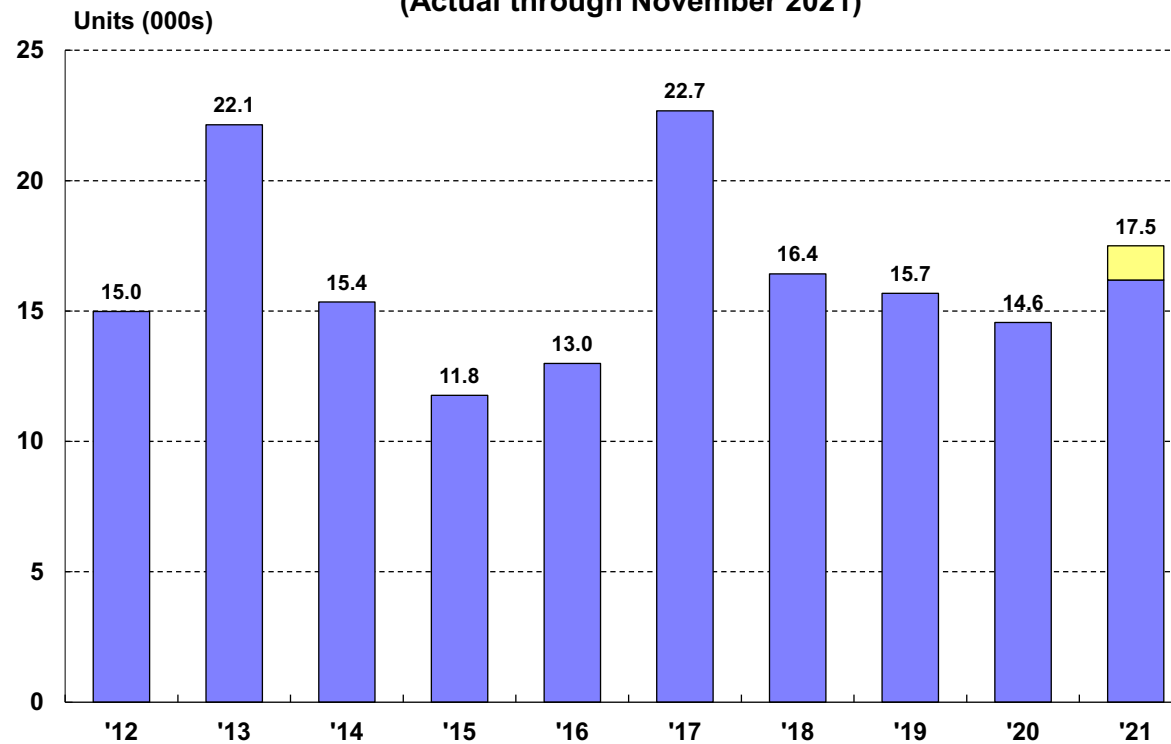


Exports Expected To Top 17K for 2021

Used Class 8 Tractor Exports

2012 - 2021

(Actual through November 2021)



Source: ITC, ACT Research Co.: Copyright 2022

Medium Duty

- BL/BU ratio screaming for increased production
 - Supply chain hardship and deference to profits denying response
- IN/RS ratio normalizing
 - Below replacement build has reduced inventory until October
- Market forecast calls for moderate improvement
 - 2021: Build (+4%) and retail sales (+4%)
 - 2022: Build (+13%) and retail sales (+6%)
- Service-centric economic strength driving majority of MD truck demand improvement



Payroll Employment

Total 3.7% higher Y/Y (149.0M)

Goods up 3.1% Y/Y (20.8M)

Services up 4.5% Y/Y (106.2M)

Government up 0.5% Y/Y (21.9M)

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



Consumer Spending

Total 2.0% higher in Q3

Goods down 8.8%

Services up 8.2%

Activity returned to pre-COVID levels in Q2 2021

Prices are up, but so are wages



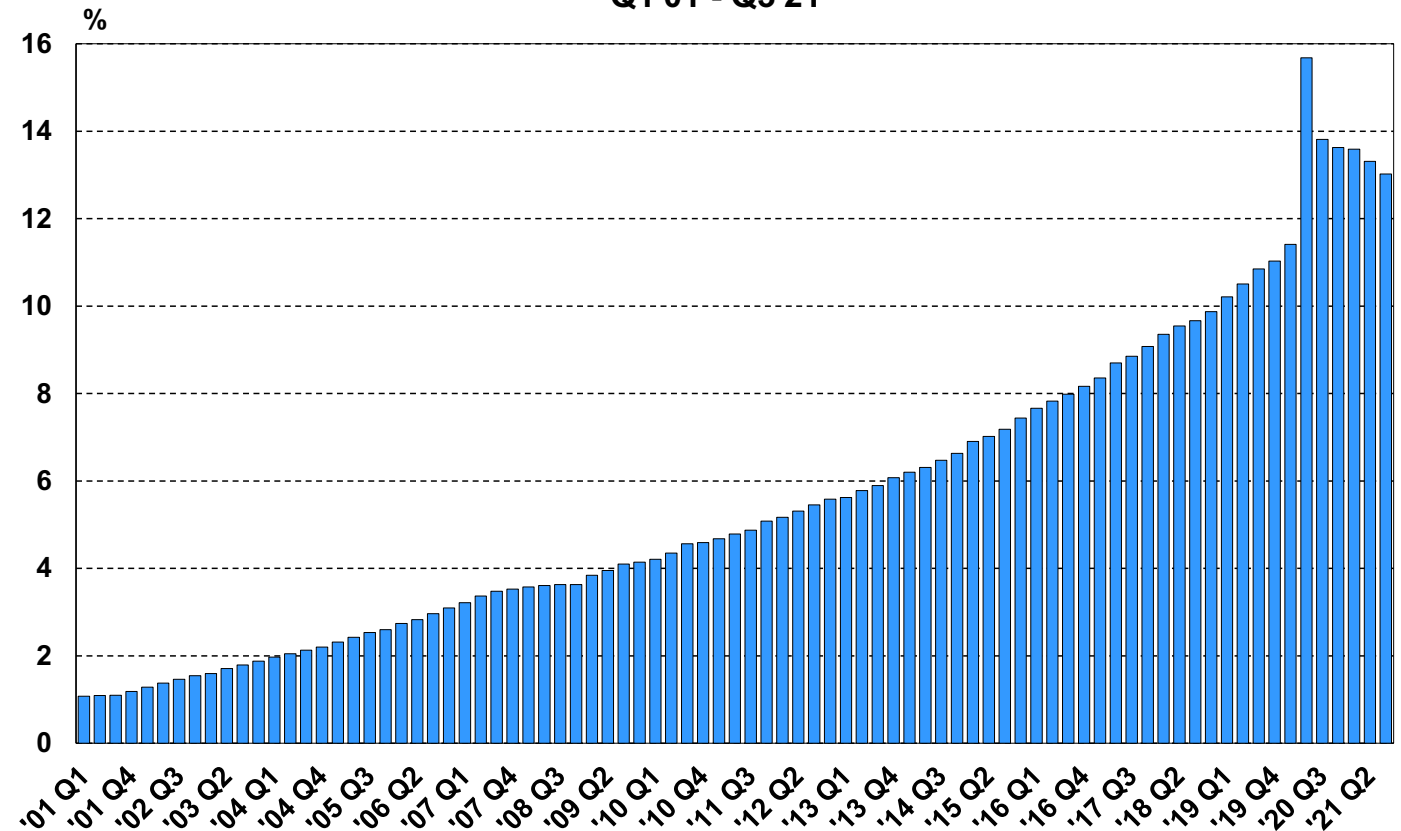
Retail Sales

November retail sales up sequentially (+0.3%), but well above 2020 level (+17.9%) nominally. Inflation adjusted results also higher, but trimmed by inflation (+0.3% m/m and +10.6% y/y).

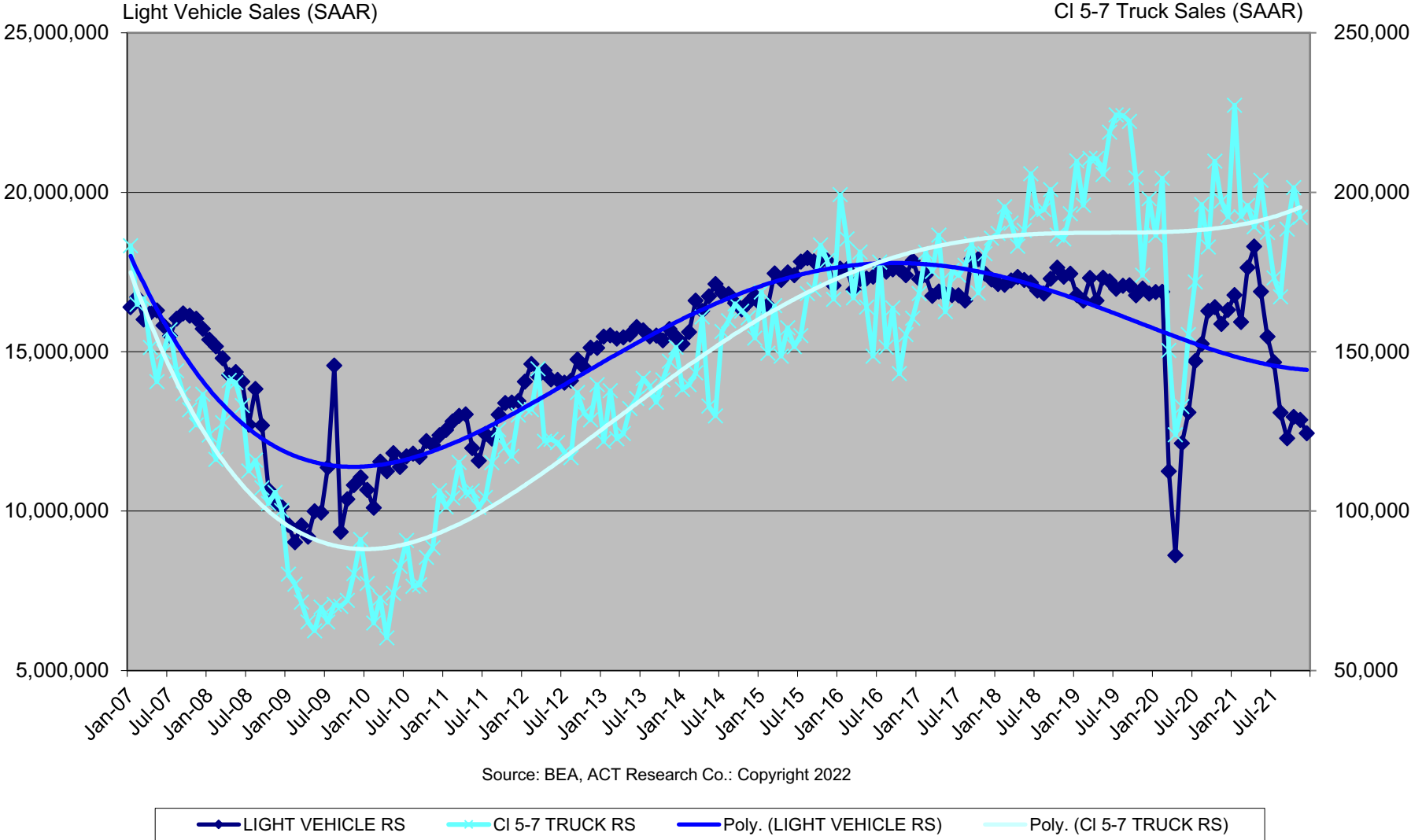
Q3 e-commerce activity, as a percentage of sales, continued to subside, slipping to 13.0%.

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 - Q3'21

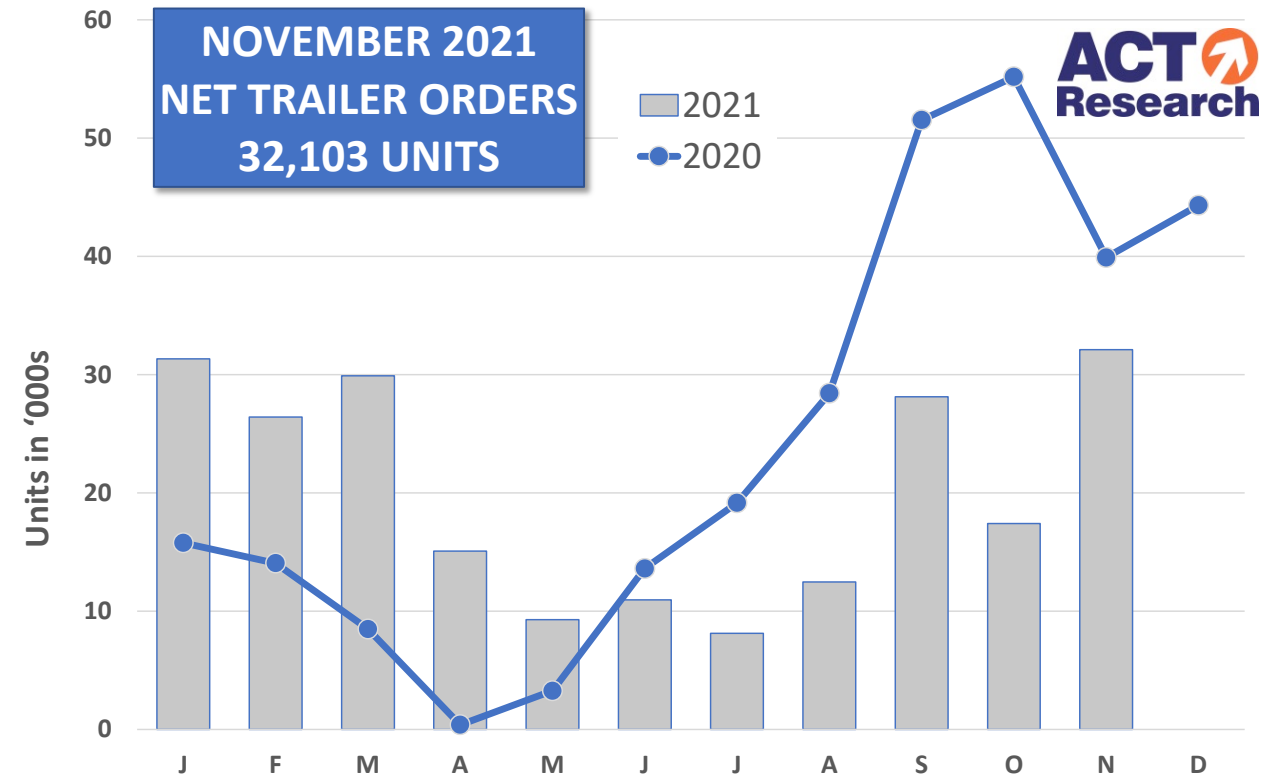


Light Vehicle Sales vs. CI 5-7 Truck Sales



Better...and Nov'21 Near a “Regular” Order Level

- Balancing BL/BU and fleet demand
- Supply chain and staffing
- Seeking solid pricing
- Strategy varies across the industry
- Order acceptance supply impacted, not demand driven

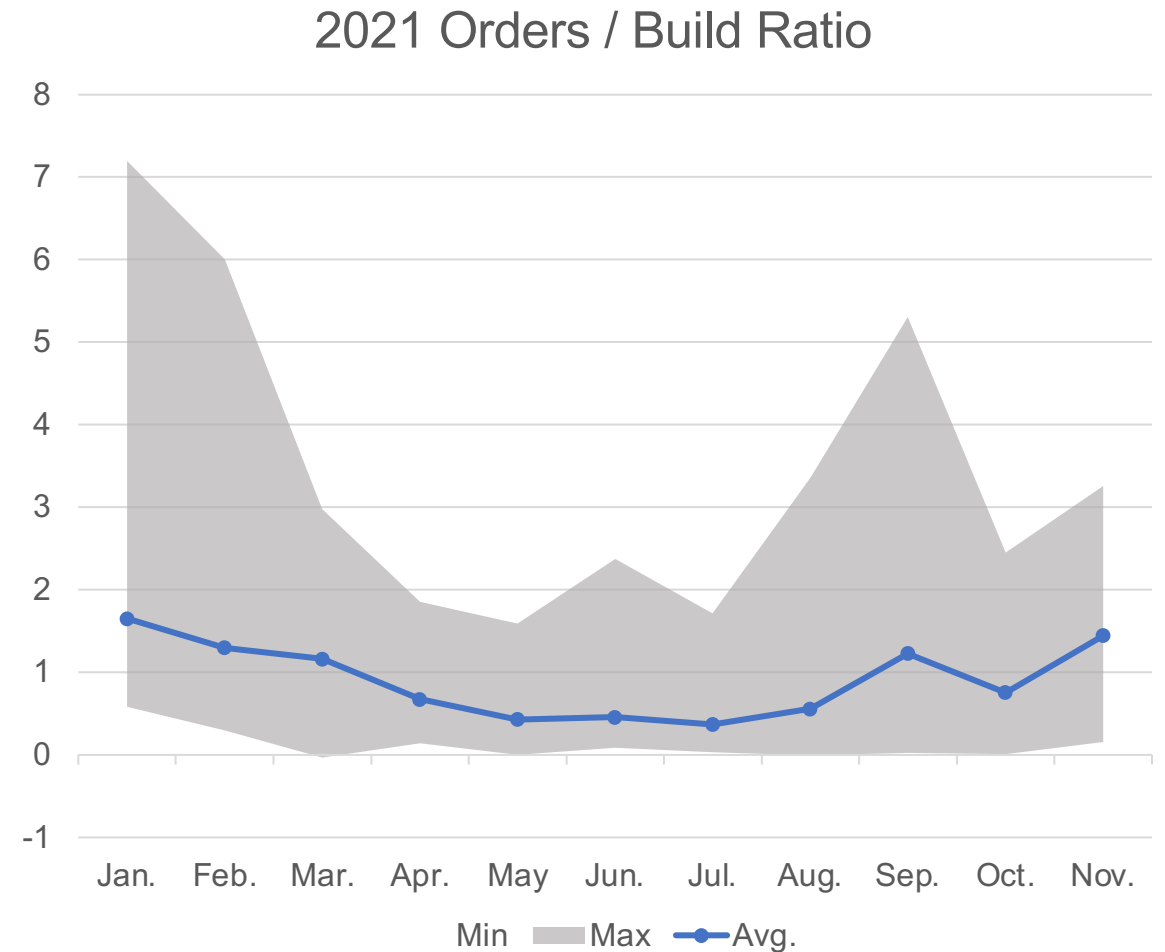


Source: ACT Research Co., LLC Copyright 2022



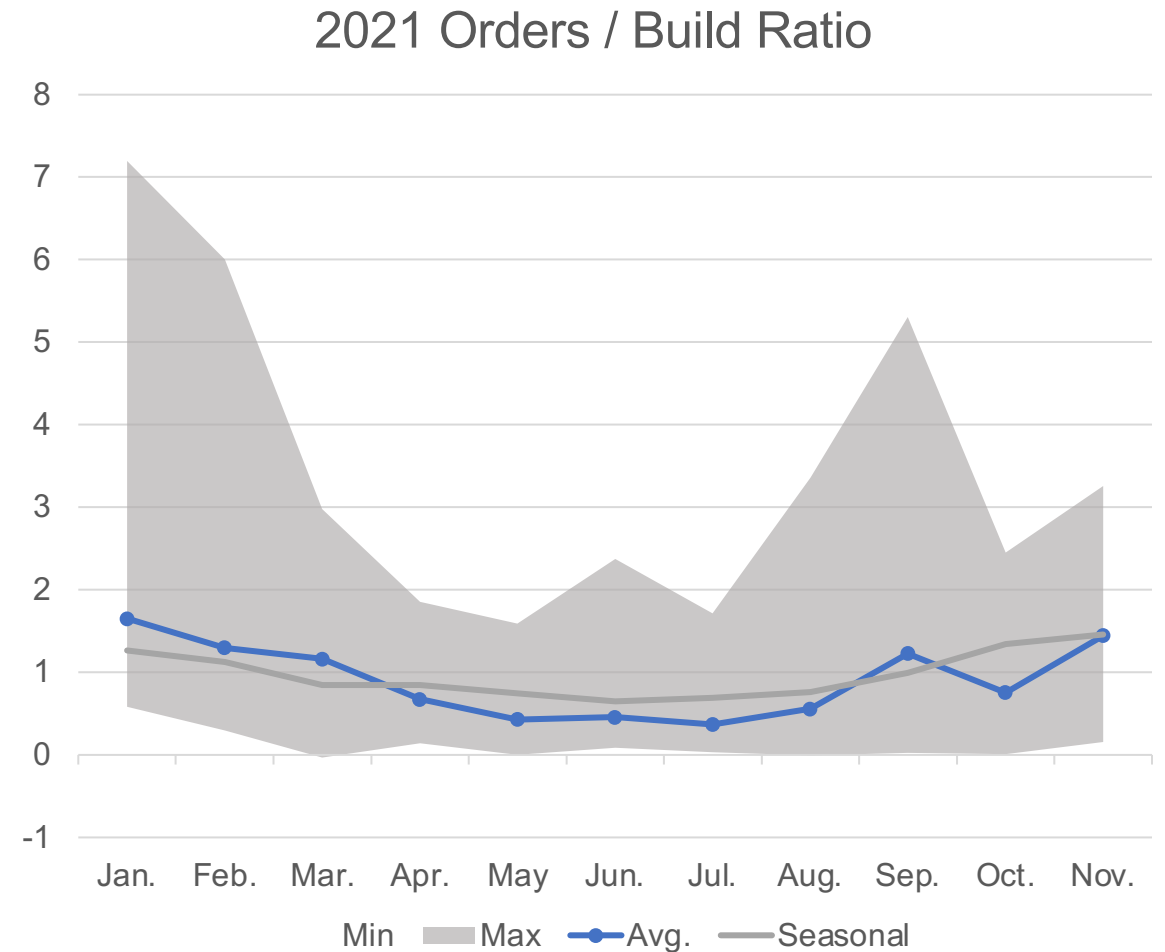
Order Acceptance Rollercoaster

- A different measure... Orders/Build Ratio
- Market “aggressiveness”
- Willingness to increase BL or extend orderboard
- Wide range of OEMs
- Obviously, strategy varies across the industry



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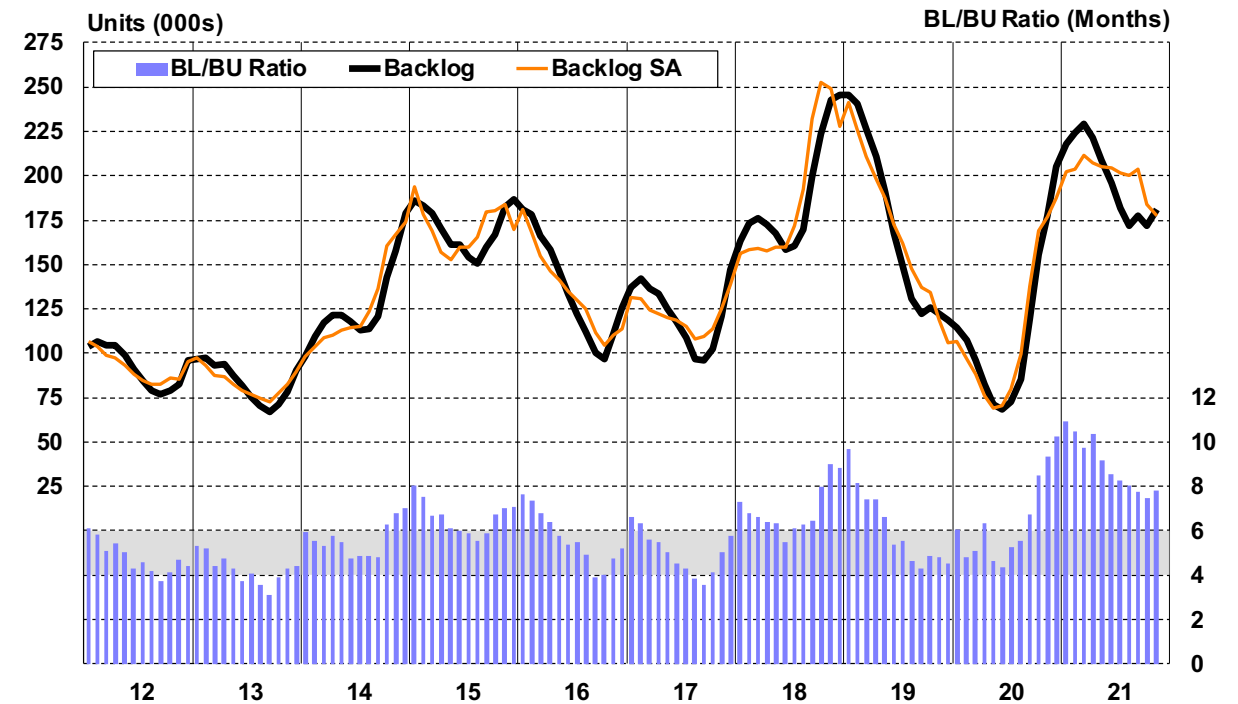


Where Could Backlog/Build Go...

- Nov'21 BL/BU uptick
- Total Trailer late Jul'22
- Dry Van mid-Aug'22
- Reefer through Jul'22
- Likely another uptick in December
 - Push BL/BU to nearly Q4'22

Total Trailers Backlog & Backlog/Build Ratio

January 2012 - November 2021

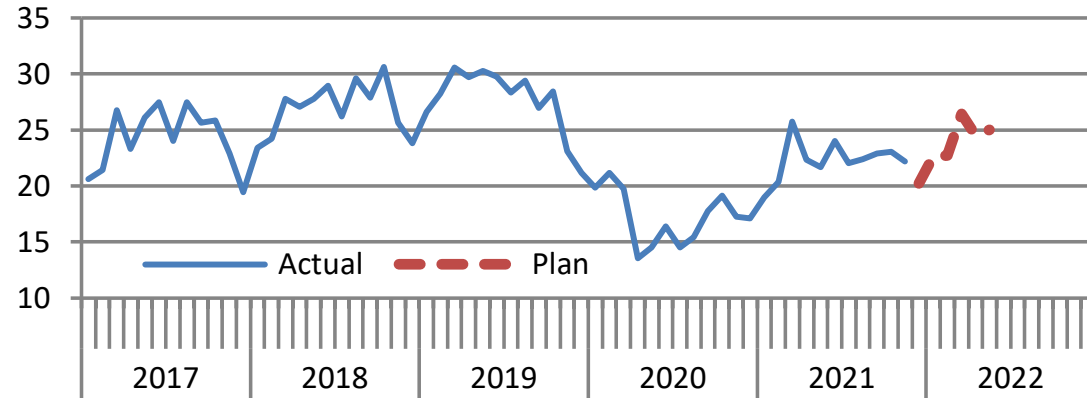


Source: ACT Research Co., LLC: Copyright 2022

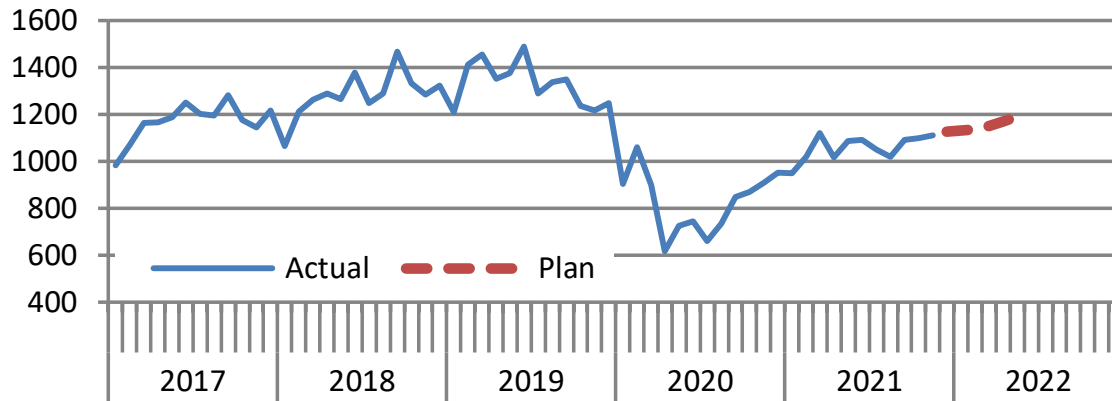


Build Rate Ramp-Up Remains Elusive

Build - Total Trailer Monthly Units in 000's



Build - Total Trailer Units per Day



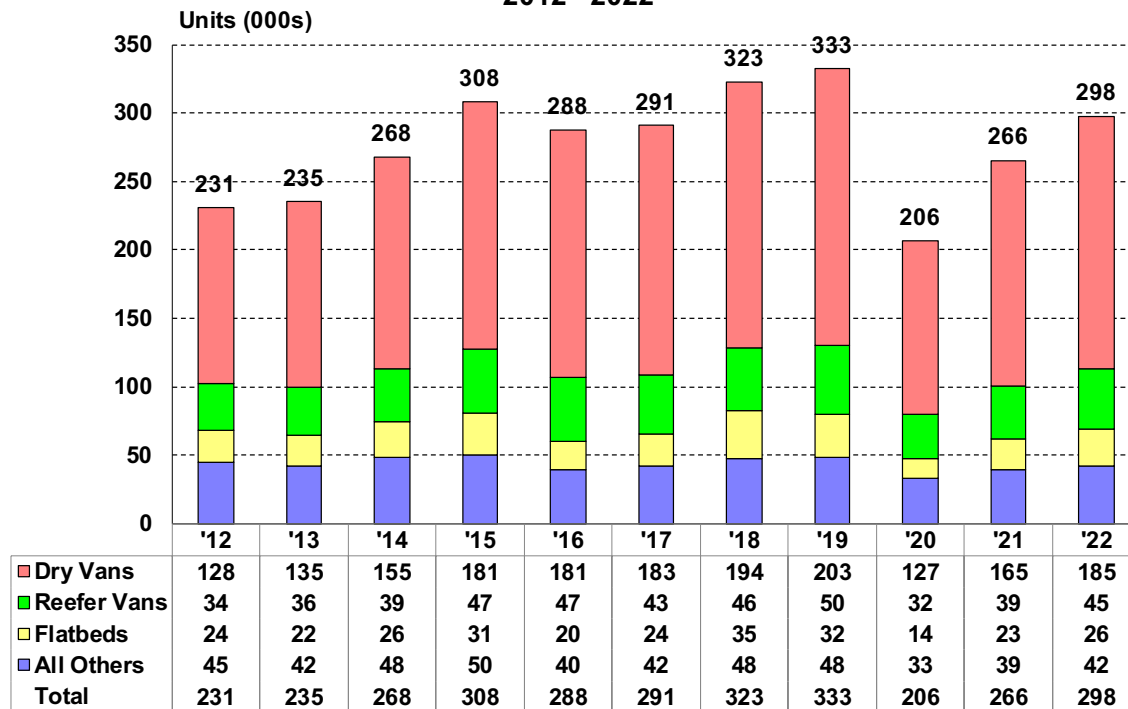
- UPD still trails Mar'21 peak
- Over 20% below 2019 levels
- Less labor pressures reported
- Supply chain headwinds
- Added capacity on board later in '22 and into '23



January '22 OUTLOOK Forecast

U.S. Trailer Production

2012 - 2022



Source: ACT Research Co.: Copyright 2022

- 2021 adjusted for actuals
- Red tags remain a challenge
- Total '22 unchanged
- Box trailers continue strong
- Vocational segments improving
- OEMs continue to struggle to ramp
- Fleet demand outpaces OEM production

THANK YOU

Presented by Penske Transportation Solutions

