



Industry Review

Economics, Transportation,
&
Commercial Vehicles

Presented by Penske Transportation Solutions



Webinar Overview



Kenny Vieth,
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Steve Tam,
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Jim Meil,
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Jennifer McNealy,
Director, CV Market
Research & Publications

NA Economy – Jim Meil

Class 8 – Eric Crawford

Freight Transportation – Kenny Vieth

Used Trucks & Medium Duty – Steve Tam

Trailers – Jennifer

Q & A – All



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**DRIVING
AUTOMATION**

COMMERCIAL TRANSPORTATION'S PURSUIT OF
LEVEL 4 AUTONOMY



CHARGING FORWARD

NOW ONBOARDING MULTI-CLIENT PARTICIPANTS FOR THE THIRD EDITION OF *CHARGING FORWARD*

PROJECT COVERAGE:

BATTERY, FUEL CELL, NATURAL GAS, H2 ICE, AND GASOLINE.

PROJECT SIGN-ON:

THRU JANUARY 15, 2023

PROJECT COMPLETION:

JULY 2023

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HOLIDAY HOURS

CLOSED - 11.24-11.25 IN OBSERVANCE OF THANKSGIVING

CLOSED - 12.26-01.02 FOR INDUSTRY SHUTDOWN

The office will reopen on Tuesday, January 3rd, 2023, with regular business hours.





ACT
Research

DRIVING DECARBONIZATION

THE FUTURE OF
COMMERCIAL
VEHICLES

FEBRUARY 21-23, 2023
COLUMBUS, INDIANA

SPEAKERS:
KINGSLEY AFEMIKHE, XOS
DEAN CROKE, DAT
ROBERT RAGAN, METLON TRUCK LINES
DEAN VICHA, NATIONALLEASE... AND MORE!

AGENDA AVAILABLE

2 WORKSHOPS:
FORECASTING 101
EXECUTIVE STRATEGY

SPONSORED:



Eight Essentials on the Economy at Close of 2022

1. Inflation not yet tamed, here or globally
2. Central bankers determined to reverse, so more tightening ahead
3. NA housing and EU mfg (impact NA exports) in recession
4. Other rate-sensitive sectors (freight generating) to follow?
 - cap goods, consumer durables, nonresi constr, auto, tech
5. Inventories too high & need to be slashed
6. Still selective strength – notably motor veh, labor markets
7. All this spells 2-3 quarter mild recession, starting now or 1st half '23
8. COVID and Ukraine-Russia war...
 - ... these shaped last 3 years; still pose risks going forward



Inflation Benchmarks

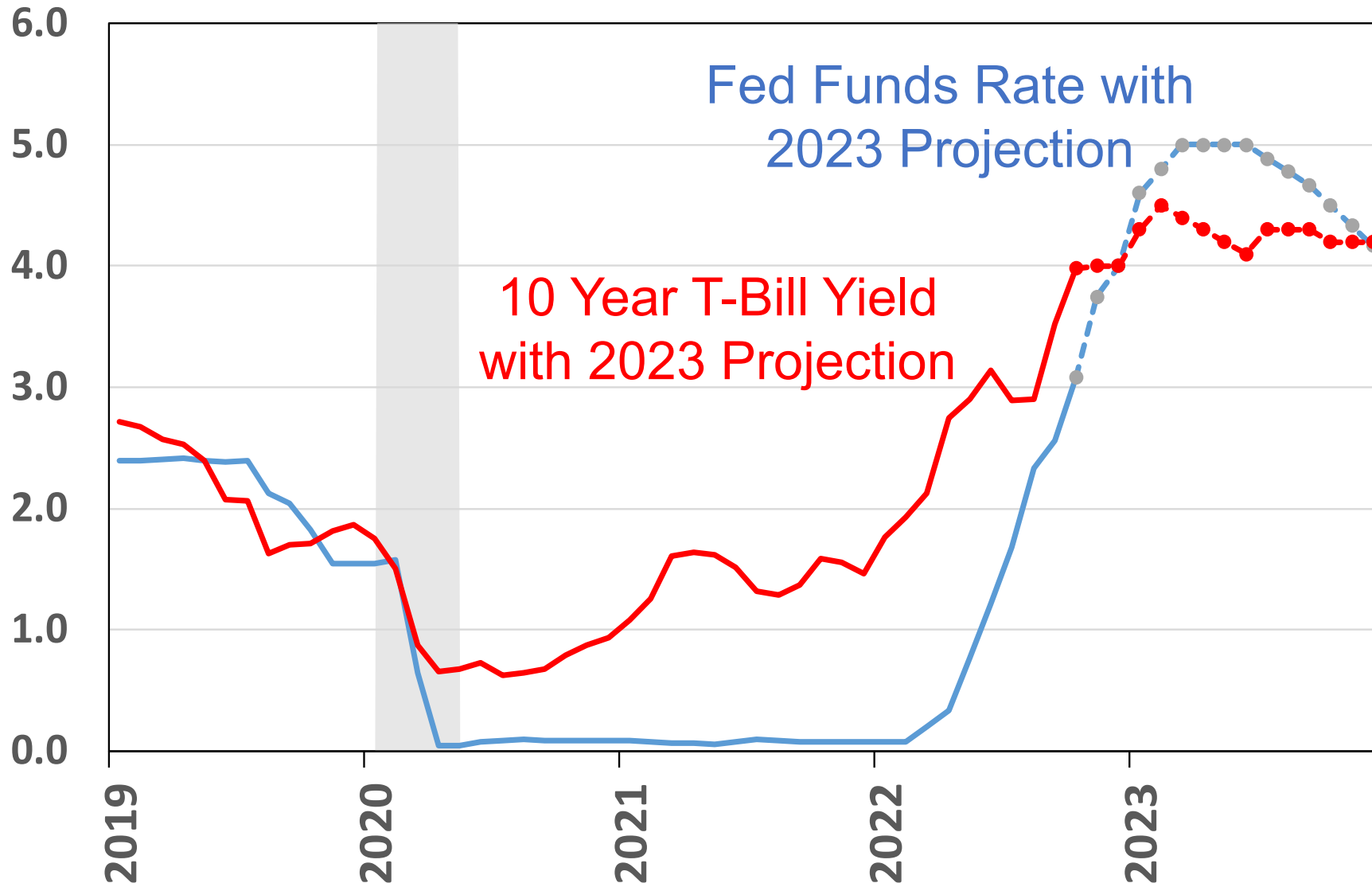
All Y/Y unless indicated	Latest	Peak
CPI Top Line	7.7%	9.0 (Jun)
CPI Top Line M/M	0.4%	1.3 (Jun)
CPI Core (ex food, energy)	6.3%	6.7 (Sep)
PCE Deflator(ex F&E)	5.1%	5.4 (Feb)
PPI Capital Equipment	8.8%	9.5 (May)
CPI - European Union	10.0%	10.0 (Sep)

**Down from peak
May be good news
May be noise
around 7-8% trend**

Note: PCE (Personal Consumption Expenditures) Deflator excl Food & energy is the FRB preferred inflation measure. Latest data is October except PCE-Deflator & Europe CPI, both Sept.



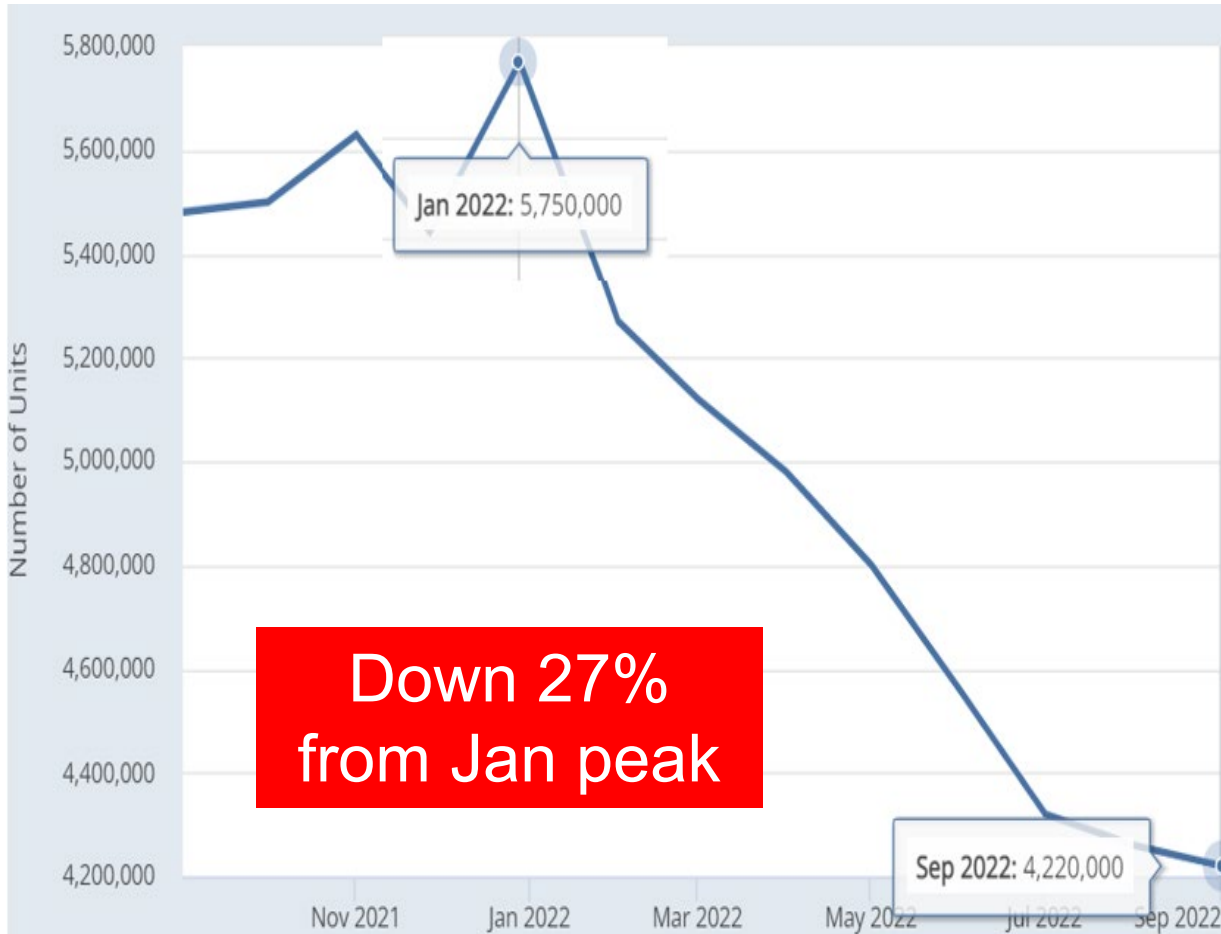
Fed Funds and 10-year Treasury Rate Graph



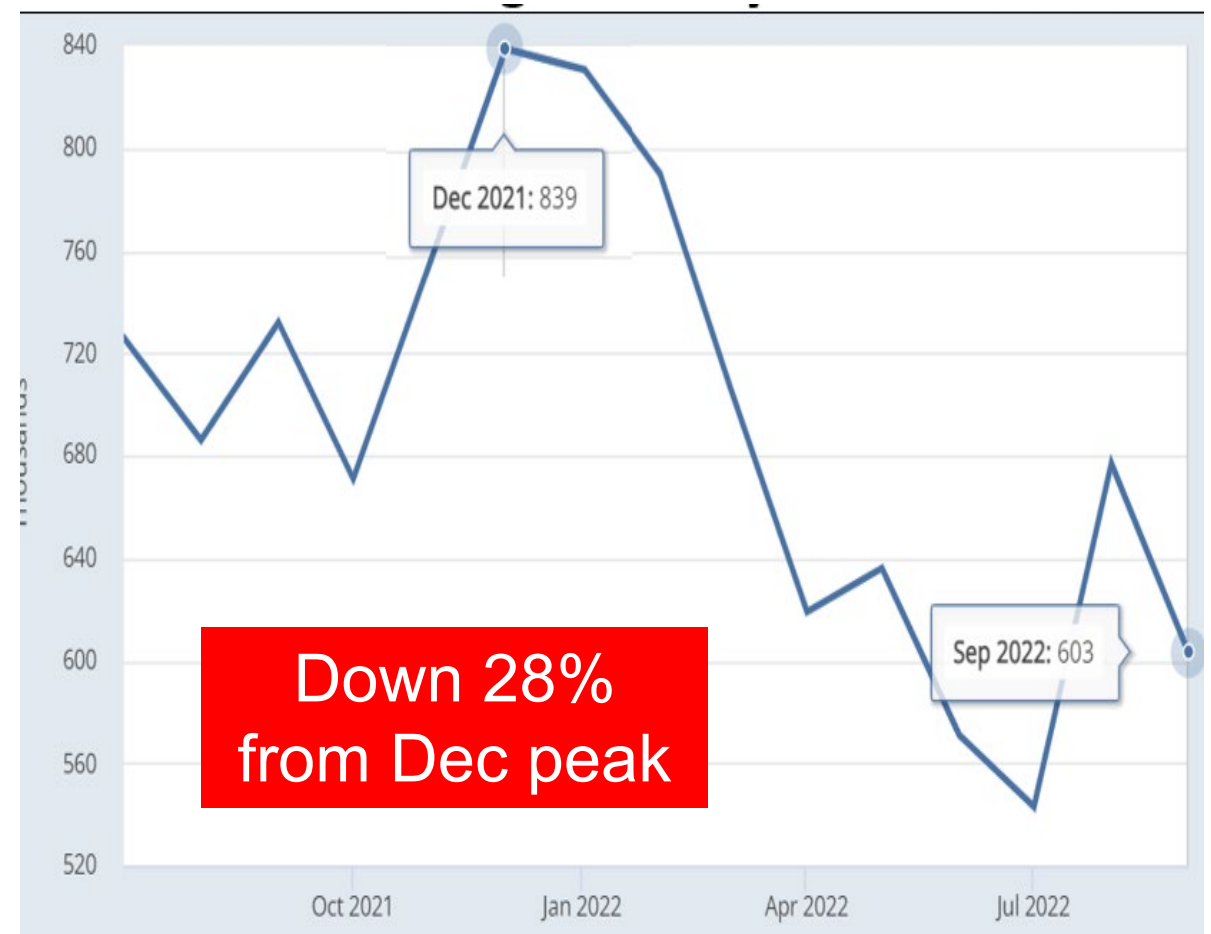
**Our forecast:
Fed Funds
peaks at 5%
early 2023
10-year T-Note
yield topping out
just over current
~4% levels but
stable through
2023**

Mired in Recession – Part I NA Housing

Existing home sales



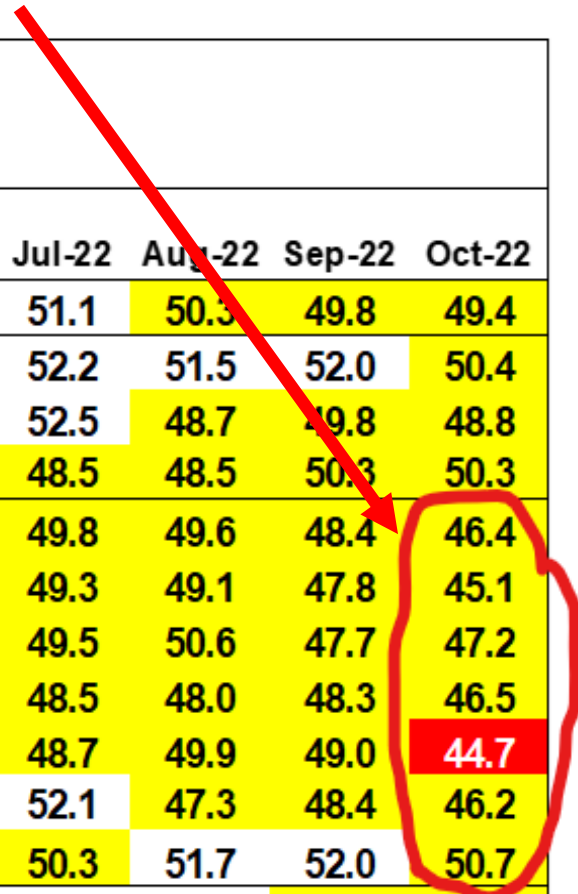
New home sales



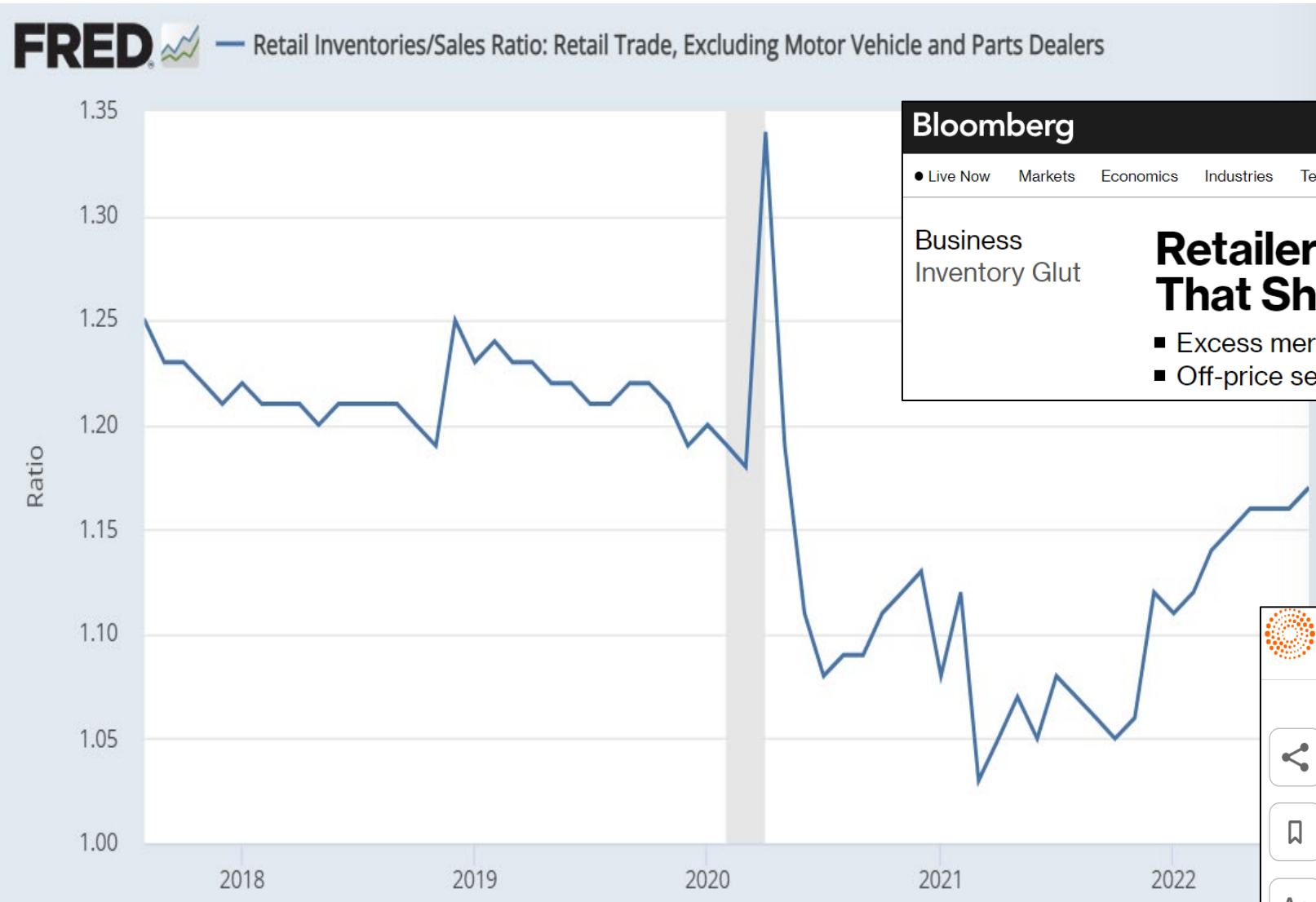
Mired in Recession Part II – Europe PMI Manufacturing

	Last 12 Months												
	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22
Global	54.3	54.2	54.2	53.2	53.6	52.9	52.3	52.3	52.2	51.1	50.3	49.8	49.4
United States	58.4	58.3	57.7	55.5	57.3	58.8	59.2	57.0	52.7	52.2	51.5	52.0	50.4
Canada	57.7	57.2	56.5	56.2	56.6	58.9	56.2	56.8	54.6	52.5	48.7	49.8	48.8
Mexico	49.3	49.4	49.4	46.1	48.0	49.2	49.3	50.6	52.2	48.5	48.5	50.3	50.3
Eurozone	58.3	58.4	58.0	58.7	58.2	56.5	55.5	54.6	52.1	49.8	49.6	48.4	46.4
Germany	57.8	57.4	57.4	59.8	58.4	56.9	54.6	54.8	52.0	49.3	49.1	47.8	45.1
France	53.6	55.9	55.6	55.5	57.2	54.7	55.7	54.6	51.4	49.5	50.6	47.7	47.2
Italy	61.1	62.8	62.0	58.3	58.3	55.8	54.5	51.9	50.9	48.5	48.0	48.3	46.5
Spain	57.4	57.1	56.2	56.2	56.9	54.2	53.3	53.8	52.6	48.7	49.9	49.0	44.7
UK	57.8	58.1	57.9	57.3	58.0	55.2	55.8	54.6	52.8	52.1	47.3	48.4	46.2
Russia	51.6	51.7	51.6	51.8	48.6	44.1	48.2	50.8	50.9	50.3	51.7	52.0	50.7
Japan	53.2	54.5	54.3	55.4	52.7	54.1	53.5	53.3	52.7	52.1	51.5	50.8	50.7
China	50.6	49.9	50.9	49.1	50.4	48.1	46.0	48.1	51.7	50.4	49.5	48.1	49.2
India	55.9	57.6	55.5	54.0	54.9	54.0	54.7	54.6	53.9	56.4	56.2	55.1	55.3
Brazil	51.7	49.8	49.8	47.8	49.6	52.3	51.8	54.2	54.1	54.0	51.9	51.1	50.8

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



Inventory Overhang at Retailers (Non-auto)



Bloomberg US Edition

• Live Now Markets Economics Industries Technology Politics Wealth Pursuits Opinion Businessweek Equality Green

Business Inventory Glut

Retailers Still Have a Lot of Extra Stuff That Shoppers Don't Want

- Excess merchandise, weaker consumer demand to fuel promotions
- Off-price sellers win as brands seek buyers for unwanted goods

REUTERS World Business Legal Markets More

With less than 10 weeks to go before Christmas 2022, major retailers including Costco, Kohl's and Express Inc. are peddling holiday sweaters, artificial trees and other decor that had been stuck in transit or packed in warehouses during the supply chain crisis that threw a wrench into Christmas 2021.



Potential for Recession Slump – Rate-Sensitive Sectors

- Capital goods/machinery
- Non-residential construction
- Non-auto consumer durables (furniture & appliance, home entertainment, DIY tie to housing)
- Motor vehicles – Pent-up demand cushions to “best recession ever”
- Technology – layoffs (Meta, Twitter, Amazon, Stripe, Shopify, et al)

Remember – higher interest rates hurt long horizon activities, over-leveraged enterprises, and the credit-needy



Holding Their Own for Now (Why a Mild Recession)

- Services (transportation, travel, eds & meds, professional)
- Motor vehicles
- Consumer nondurables (nonfood, nonenergy)
- Job/employment markets, workers are in the drivers seat
 - Low unemployment, low labor force participation
 - The implicit threat of China offshoring is fading
- Have jobs, stimulus saving, asset gains (appreciated home values, stocks)



For the Record - Metrics

	2021 Actual	2022 Near Actual	2023 FORECAST					Full Year
			Qtr 1	Qtr 2	Qtr 3	Qtr 4		
Real GDP	5.9	1.9	-2.7	-1.6	-0.6	0.4	-0.5	
Consumer Spending	8.3	2.7	0.6	0.4	0.3	0.9	0.9	
Capital Spending	6.4	3.4	-8.6	-6.2	-2.5	-1.7	-2.9	
Equipment	10.3	4.4	-8.4	-5.5	-2.4	-2.6	-2.2	
Residential Investment	10.7	-10.3	-20.0	-15.0	-8.0	-2.0	-17.2	
Mfg Industrial Production	5.8	3.8	-4.6	-4.8	-4.0	0.0	-2.0	
Housing Starts (M)	1.61	1.56	1.34	1.31	1.30	1.29	1.31	
US Light Vehicle Sls (M)	14.9	13.8	14.8	14.6	14.6	14.4	14.6	
WTI Oil Price (\$/bbl)	67.5	95.7	81.0	84.0	86.0	80.3	82.8	
90 Day Treasury Yield (%)	0.0	2.1	4.6	4.7	4.5	4.0	4.5	
10 Year Treasury Yield (%)	1.4	3.0	4.4	4.2	4.3	4.0	4.2	
CPI Inflation (% y/y)	4.7	8.1	6.5	4.5	3.7	3.0	4.4	

Percent Changes except where indicated; quarterly on a seasonally adjusted annual rate basis

Updated Nov 10, 2022

This is what a mild recession looks like

NOT 2008-09 redux

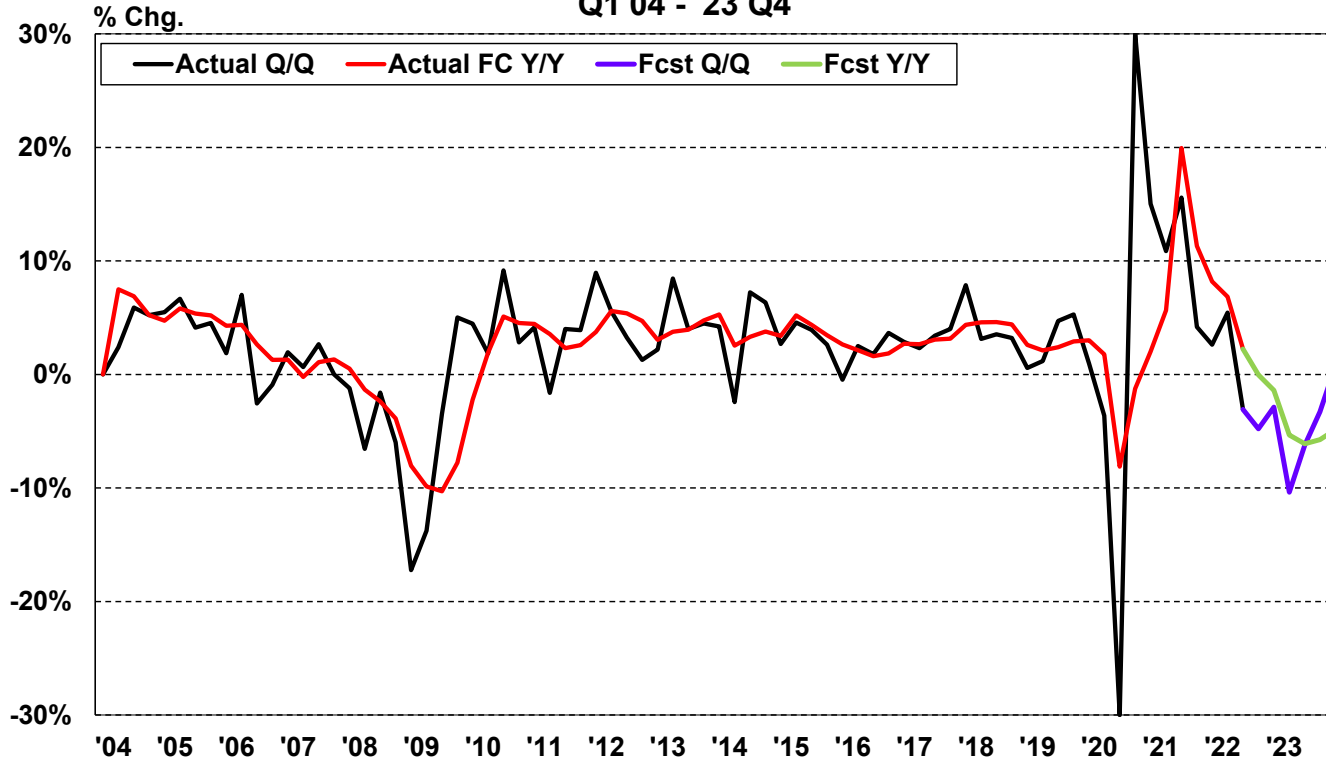
Similar to 2001 (dot com bubble burst) or 1990-91 (Gulf War)



Freight Recession Commencing

ACT's Freight Composite is a weighted, GDP-based metric that recognizes different economic segments create freight at different rates

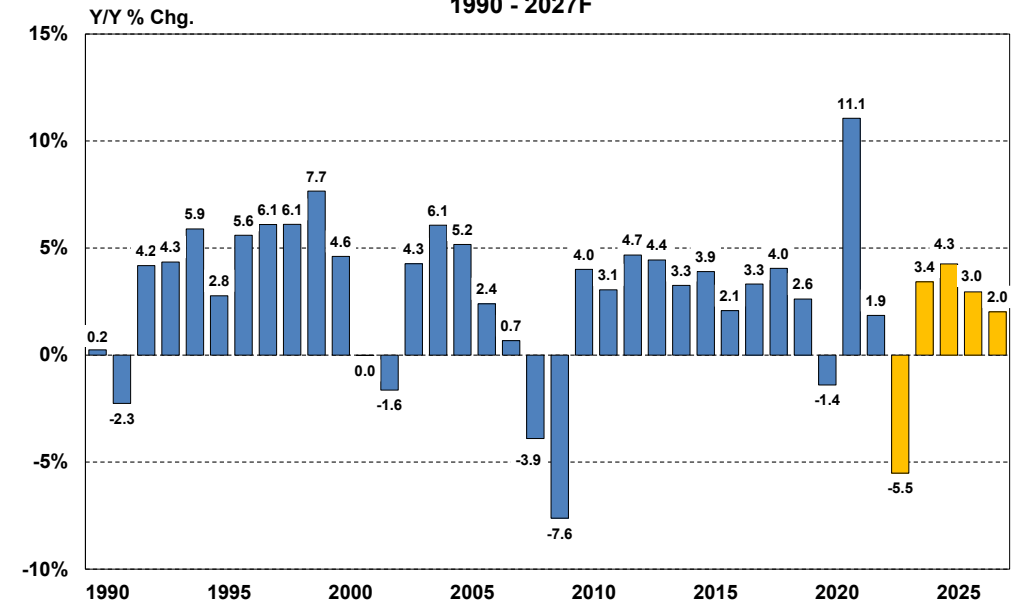
ACT U.S. Freight Composite
Q/Q at SAAR, Y/Y
Q1'04 - '23 Q4



Source: ACT Research Co. © 2022

Freight Composite flips negative q/q in Q3

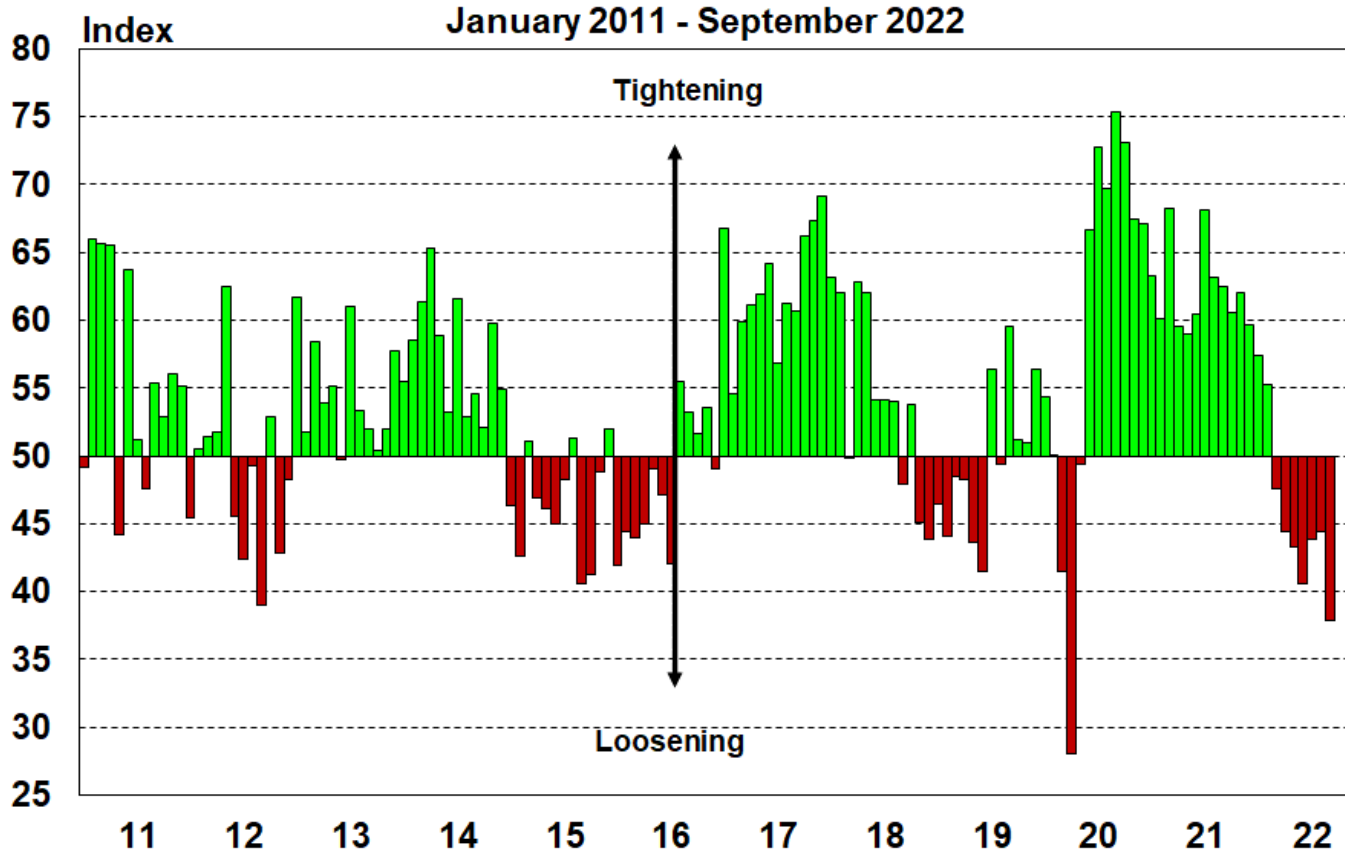
ACT U.S. Freight Composite
Year Over Year
1990 - 2027F



Source: ACT Research Co. © 2022

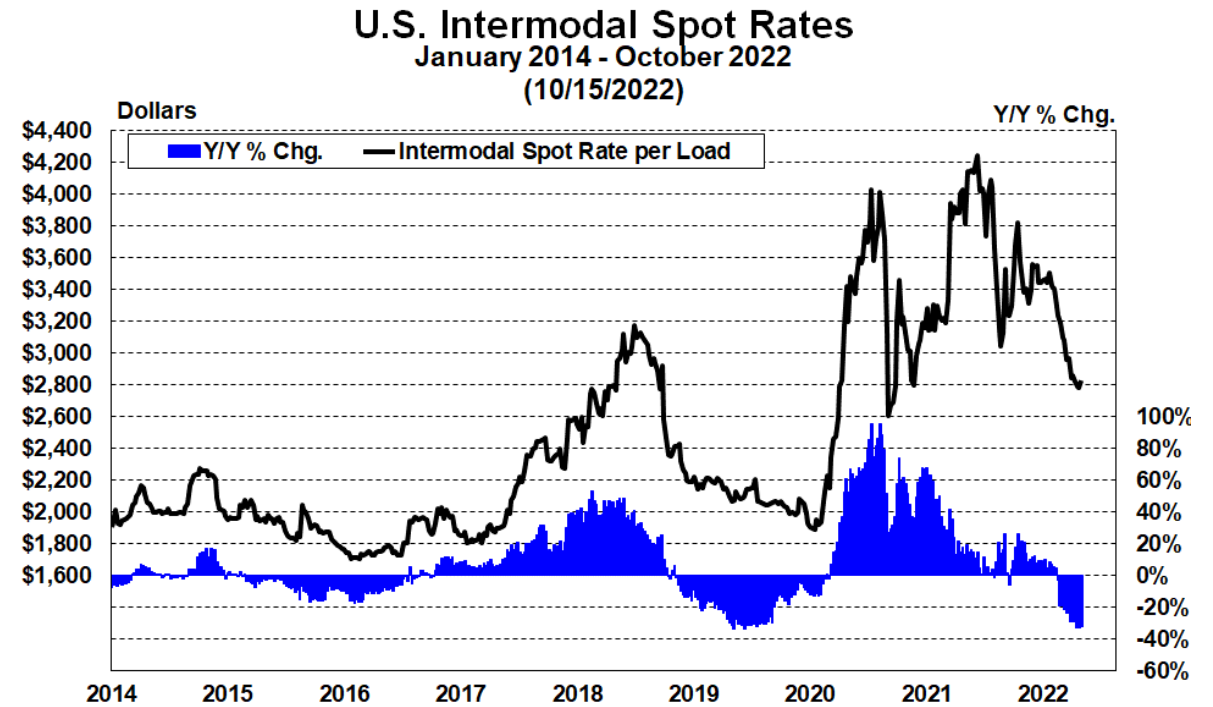
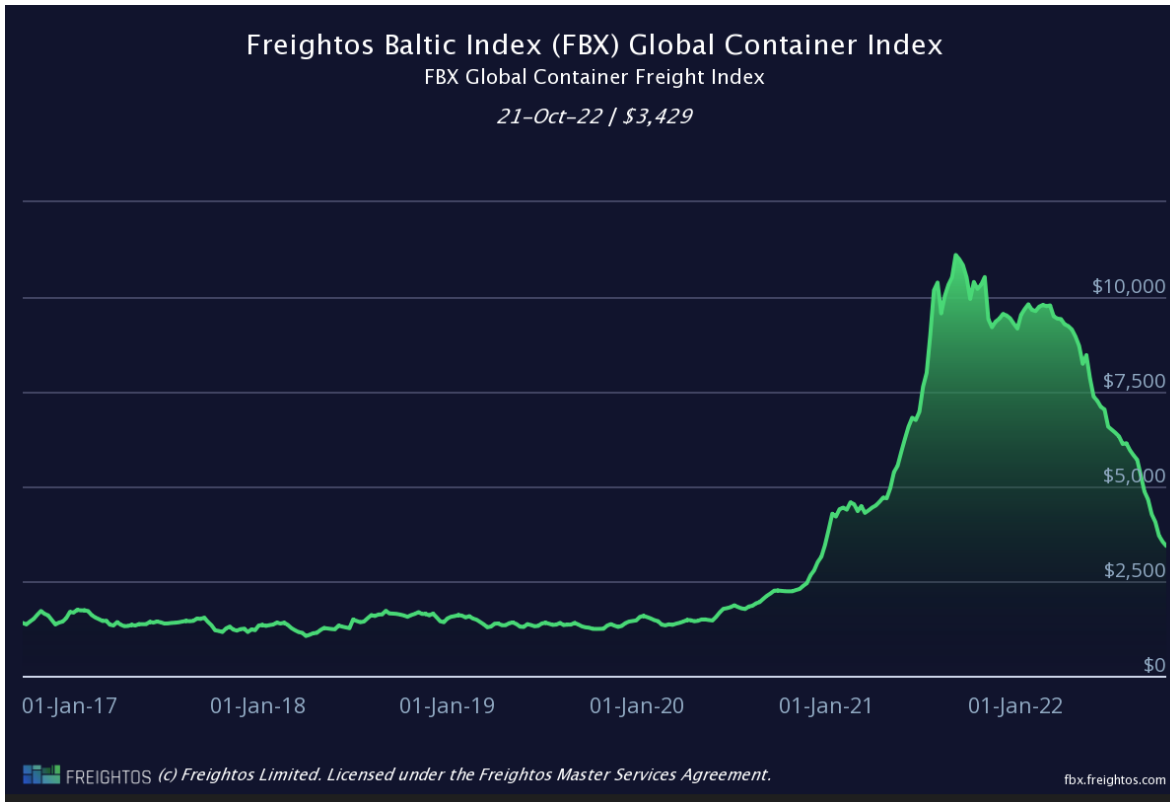
Supply-Demand Balance Turns Loose

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



Source: ACT Research Co. © 2022

Freight Slowdown Broad Based

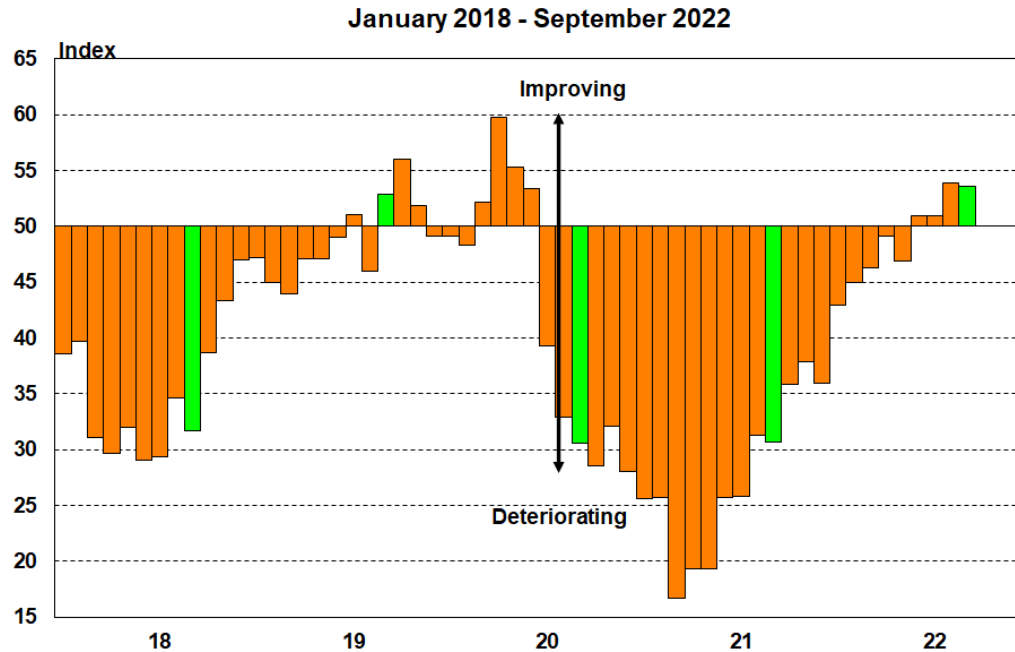


Source: InTek Freight & Logistics Inc., ACT Research Co. © 2022



From DRIVER SHORTAGE! to driver shortage

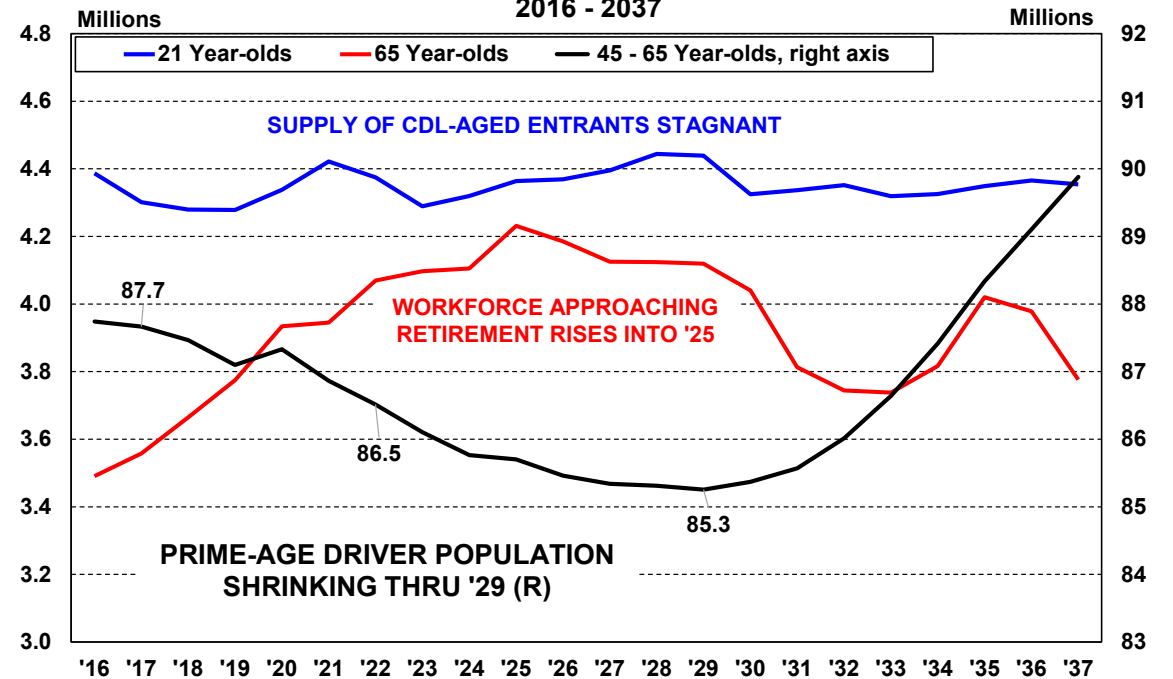
ACT For-Hire Trucking Index: Driver Availability



Source: ACT Research Co. © 2022

5-year average: 40
September: 53.6
Sep. 2021: 30.4

U.S. Demographics
 Potential Hires & Impending Retirees



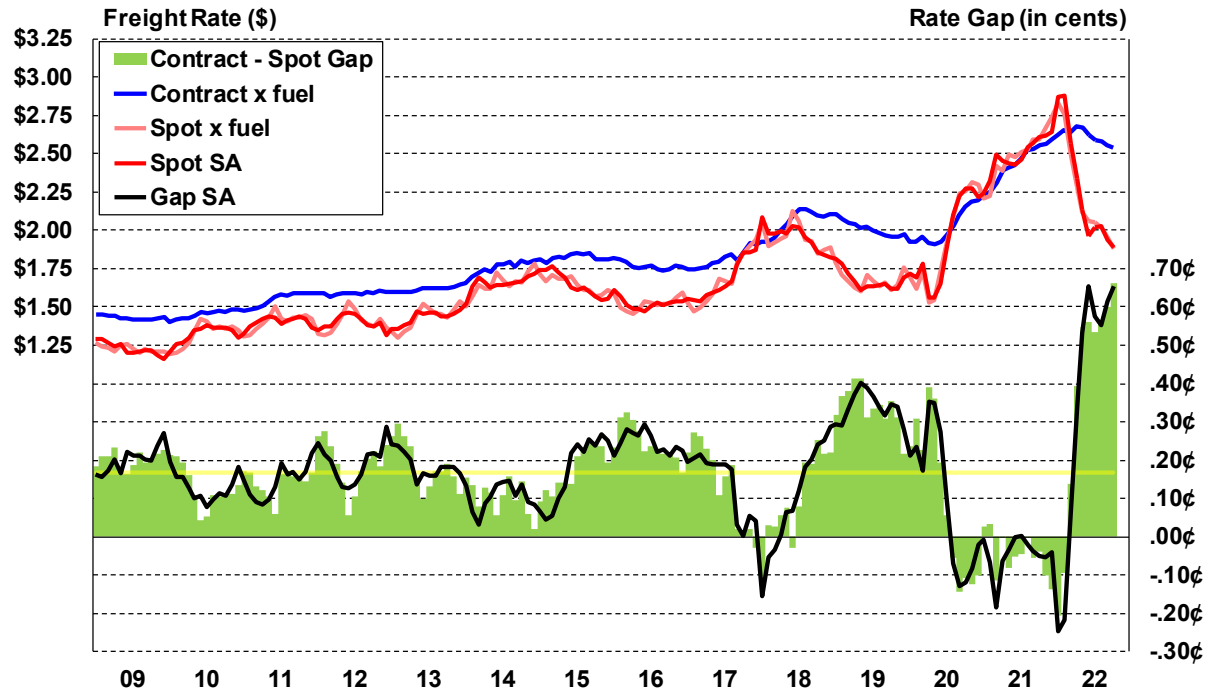
Source: U.S. Census Bureau, ACT Research Co. © 2022

Demographics will sharpen the edges of truckload rate cycles

Truckload Contract Rate Outlook

DAT Trendlines: Aggregate Truckload Rate per Mile

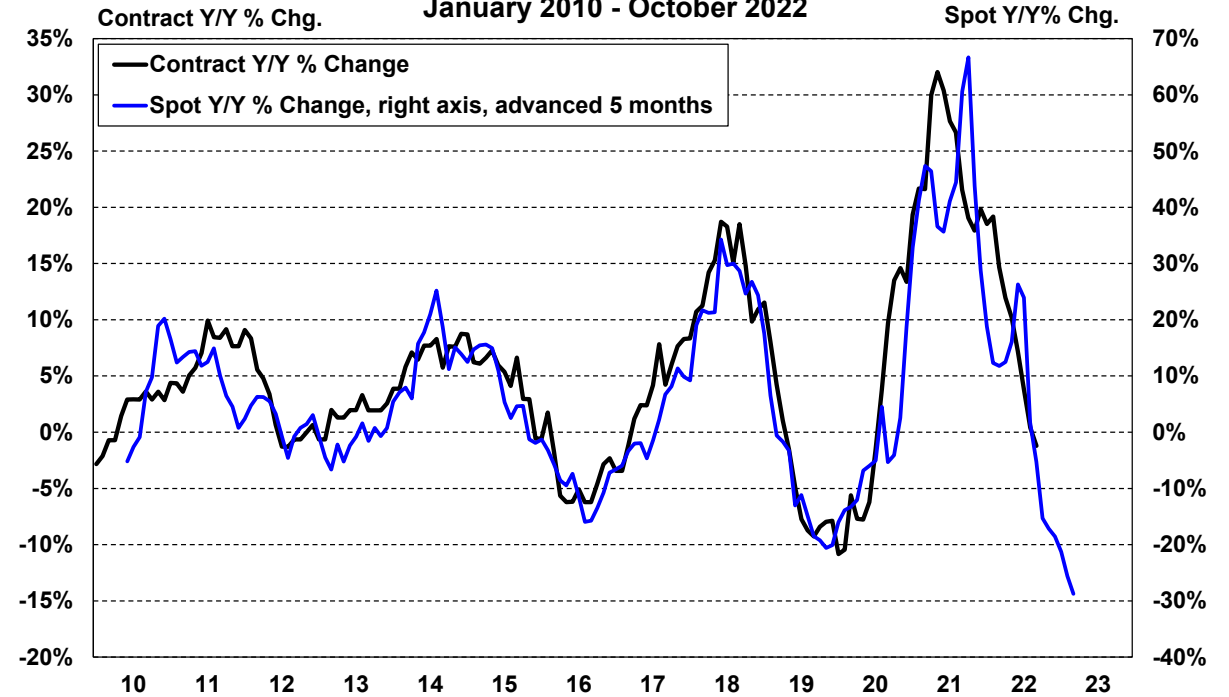
January 2009 - October 2022



Source: DAT Freight & Analytics, ACT Research Co. © 2022

DAT Trendlines Spot & Contract Rates: Dry Vans (net fuel)

January 2010 - October 2022



Source: DAT Freight & Analytics, ACT Research Co. © 2022

Profits Drive Vehicle Demand



Public For-Hire Truckload Carrier Database

\$ in millions, except as noted

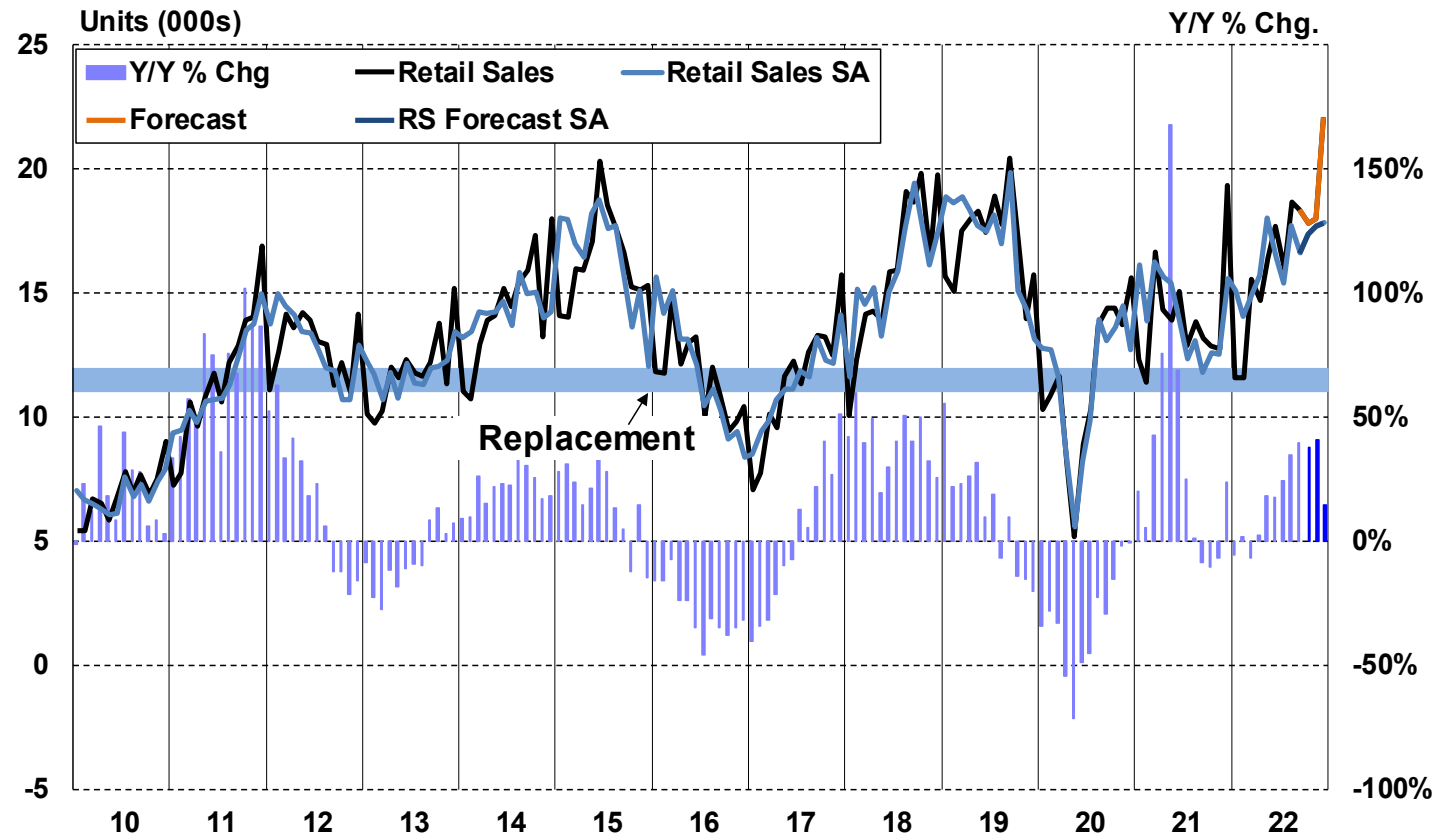
	2018	2019	2020	2021	2022E	2023E	2024E
Transportation Revenue, net fuel	30,411	30,104	30,520	37,814	42,559	40,099	44,755
y/y	17%	-1%	1%	24%	13%	-6%	12%
Acquisitions	870	434	127	470	1,073	349	0
Organic revenue ex-acquisitions, y/y	13.5%	-2.4%	1.0%	22.4%	9.7%	-6.6%	11.6%
Fuel Surcharge	3,425	3,140	2,199	3,294	6,262	5,881	5,445
y/y	36%	-8%	-30%	50%	90%	-6%	-7%
Other Revenue	477	818	706	1,343	1,573	1,106	1,100
Total Revenue	34,313	34,062	33,425	42,450	50,394	47,087	51,299
y/y	18%	-1%	-2%	27%	19%	-7%	9%
Total Operating Expenses	31,388	31,496	30,862	38,382	45,611	43,619	46,816
Operating Income	2,925	2,566	2,562	4,068	4,783	3,468	4,484
y/y	52%	-12%	0%	59%	18%	-27%	29%
Pretax Income	2,752	2,363	2,412	3,993	4,642	3,447	4,456
Taxes	648	588	597	967	1,152	891	1,155
Tax Rate	24%	25%	25%	24%	25%	26%	26%
Net Income	2,096	1,755	1,811	3,021	3,480	2,549	3,295
y/y	89%	-16%	3%	67%	15%	-27%	29%



Capacity at the Wrong Time

U.S. Class 8 Tractors: Retail Sales

January 2010 - September 2022



Source: ACT Research Co. © 2022

Current Market Conditions

Upstream:
Demand
Healthy

Orders rebounded
on opening '23

Cancellations
virtually
nonexistent

Mid and
Downstream:
Metrics
Steady

Supply-chain
constraints easing;
Build rates gaining
traction

Inventories in
balance

Relative
Measures
Stable

BL/BU: supportive,
but shortening

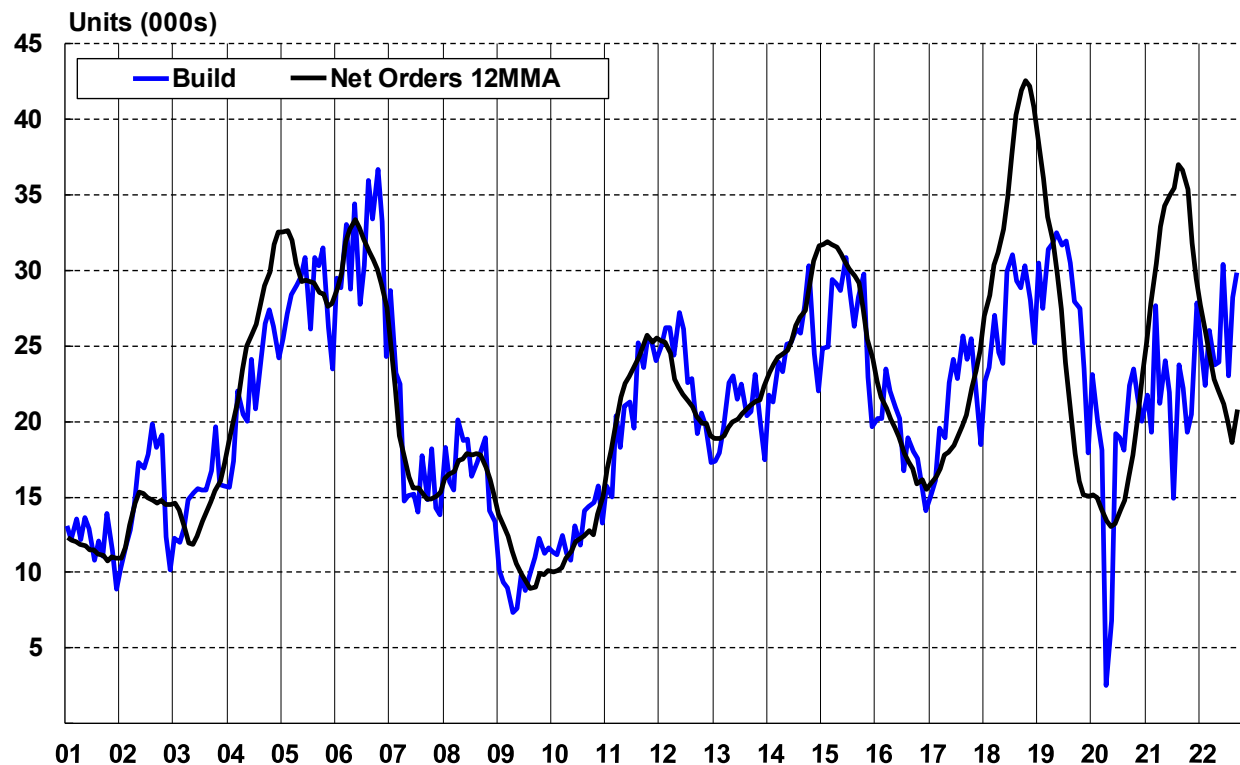
IN/RS comfortable
at 2.3 months



Class 8: Orders vs. Build

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

January 2001 - September 2022



Source: ACT Research Co. © 2022

- Build unable to match demand this cycle
- Expect lower 2023 demand, but builds healthy as playing catch up

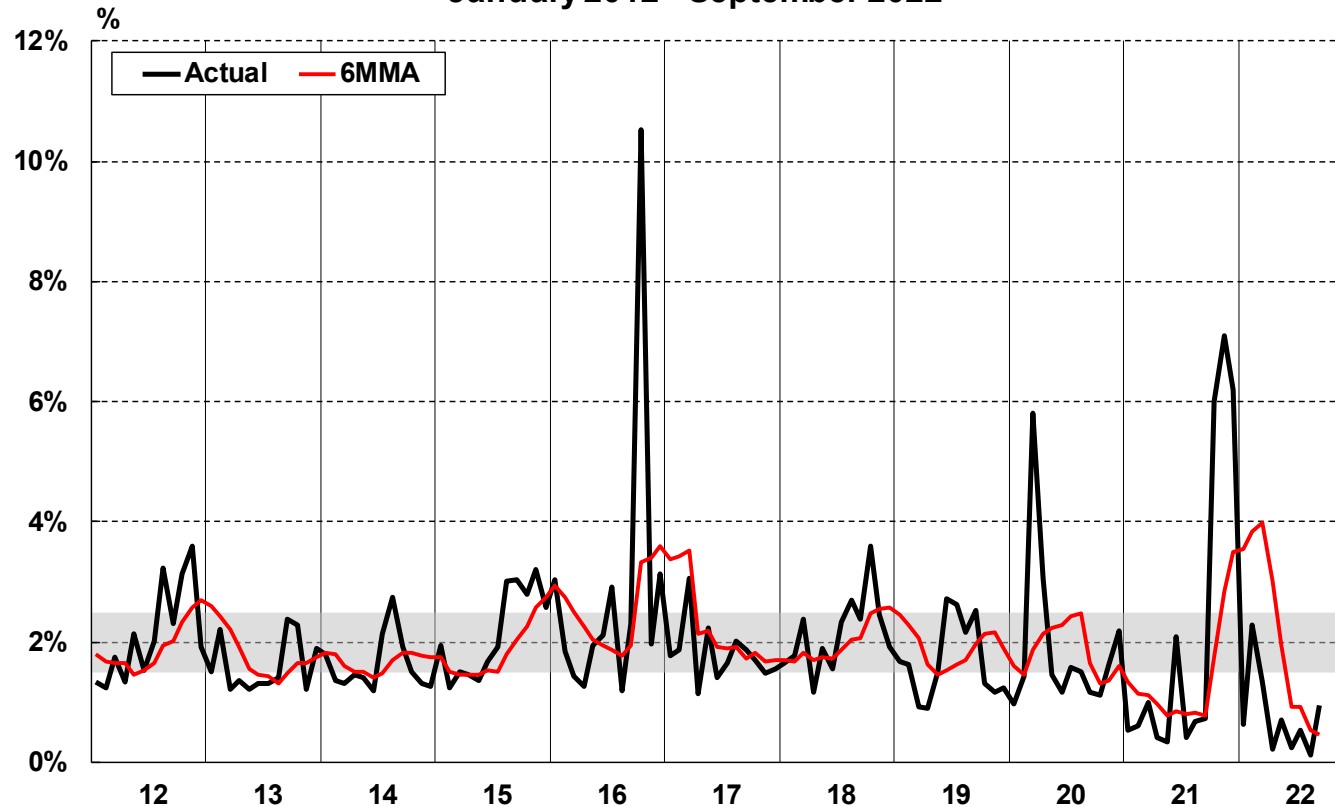


Cancellations

Total Class 8: N.A. Cancellation Rate

Expressed as a percentage of Backlog

January 2012 - September 2022



Source: ACT Research Co. © 2022

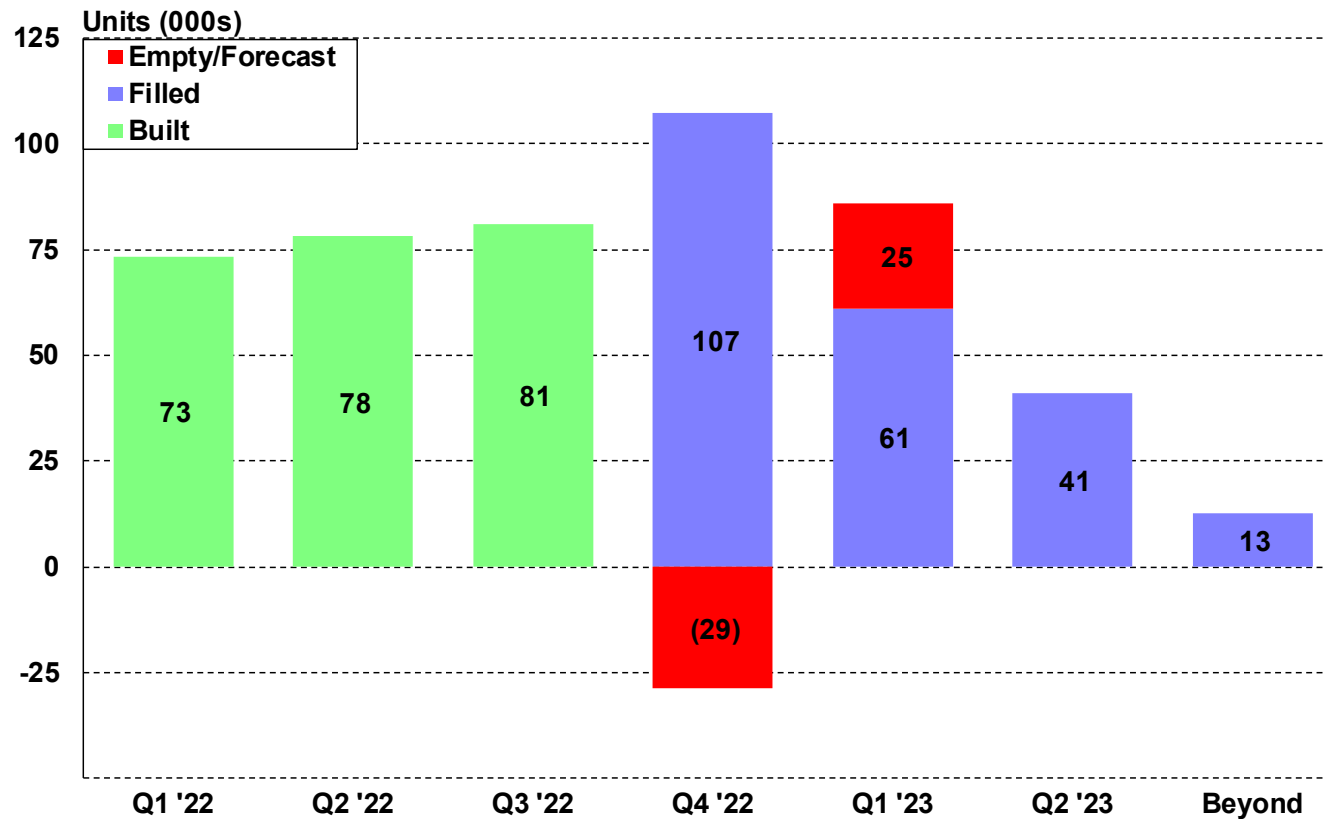
- Miniscule by historical standards



Near-term Backlog: Q4 Oversubscribed

Class 8 Backlog Fill/August Outlook Forecast

September 2022 Ending



Source: ACT Research Co. © 2022

- Q4 oversubscribed
- Expect another wave of cancellations/re-bookings



Build: Plan vs. Actual – Supply-Chain Impact

NORTH AMERICAN TRUCK OEMs' CLASS 8 BUILD PLANS: 2022 SIX MONTH FORECASTS AND ACTUAL BUILD BY MONTH & QUARTER SEPTEMBER 2022

CLASS 8 BUILD:	JAN	FEB	MAR	QI	APR	MAY	JUN	QII	JUL*	AUG*	SEP	QIII	OCT	NOV	DEC	QIV	YEAR
	A	A	A	A	A	A	A	A	A	A	A	A	F	F	F	F	F
TRACTOR	18,846	16,336	18,424	53,606	17,029	17,190	23,435	57,654	17,038	22,031	22,298	61,367	20,479	20,630	18,801	59,910	232,537
STRAIGHT TRUCK	6,131	6,093	7,634	19,858	6,761	6,759	6,934	20,454	6,031	6,208	7,563	19,802	7,216	6,119	5,381	18,716	78,830
TOTAL CLASS 8	24,977	22,429	26,058	73,464	23,790	23,949	30,369	78,108	23,069	28,239	29,861	81,169	27,695	26,749	24,182	78,626	311,367
Days	20	20	23	63	20	21	22	63	20	22	21	63	21	20	17	58	247
Units per day	1,249	1,121	1,133	1,166	1,190	1,140	1,380	1,240	1,153	1,284	1,422	1,288	1,319	1,337	1,422	1,356	1,261
PREVIOUS BUILD PLANS:																	
TOTAL CLASS 8: MONTHS FROM ACTUAL																	
7 MONTHS	-	-	29,014	79,385	-	-	-	-	-	-	-	-	-	-	24,152	81,945	315,953
6	-	24,986	29,233	78,995	25,054	25,836	27,623	78,727	23,221	29,299	28,247	84,152	29,084	28,414	23,690	79,226	313,076
5	25,385	25,060	28,605	76,622	24,763	26,021	28,075	78,632	24,739	30,436	28,391	85,439	29,379	26,416	22,089	77,021	309,797
4	24,702	24,156	28,433	77,570	25,083	25,671	28,203	79,055	25,469	31,077	28,080	83,744	29,120	26,341	24,657	80,762	309,681
3	23,861	24,882	29,384	77,090	24,886	25,999	29,113	80,608	25,971	30,976	28,114	82,278	28,591	28,355	24,182	78,626	311,367
2	24,255	23,609	26,606	73,972	24,853	26,399	29,223	76,216	24,688	30,218	27,614	81,204	27,750	26,749	-	-	-
1	24,097	22,389	25,534	72,940	25,096	23,203	29,061	76,800	23,946	30,521	26,039	77,347	27,695	-	-	-	-
ACTUAL	24,977	22,429	26,058	73,464	23,790	23,949	30,369	78,108	23,069	28,239	29,861	81,169	-	-	-	-	-

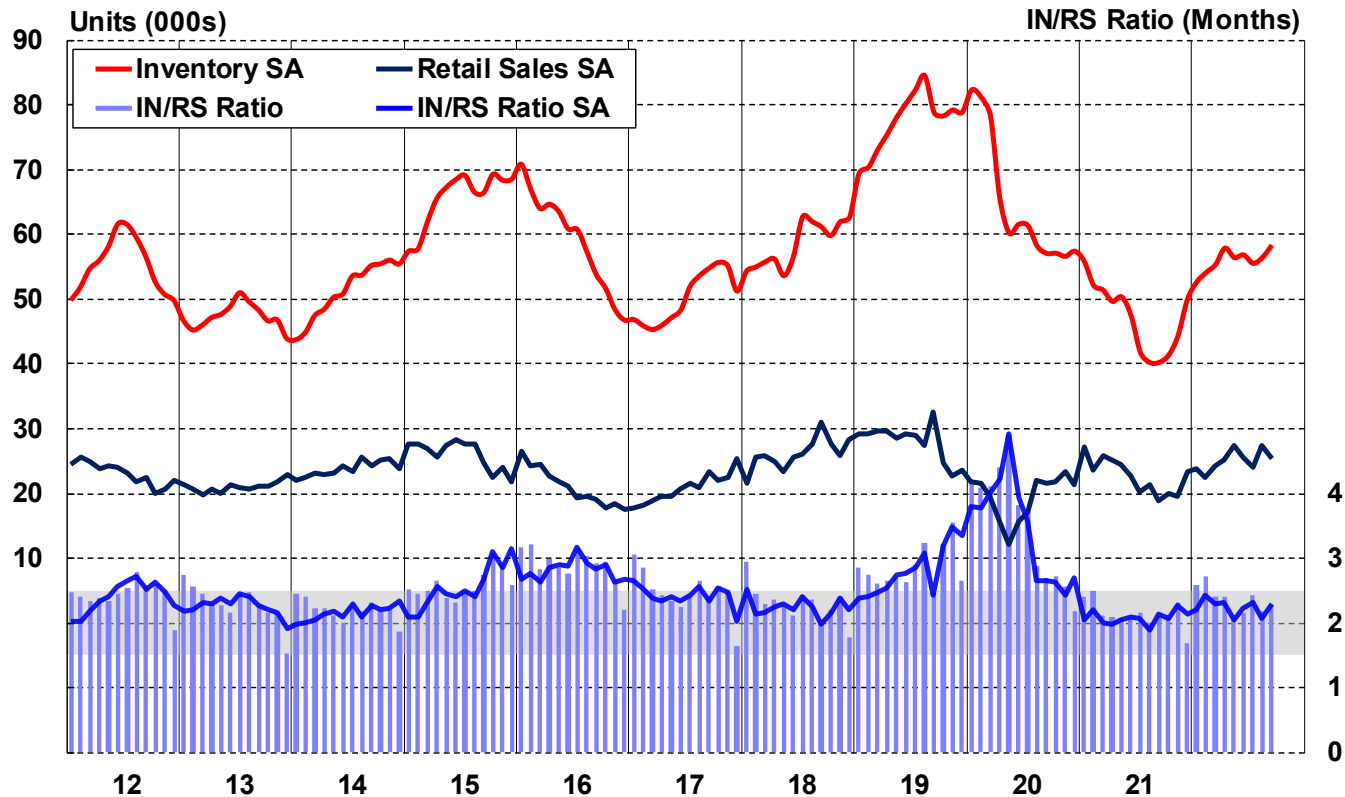
NOTE: A = actual build; F = forecast build plans. Data is not seasonally adjusted. The North American Class 8 build plans are a compilation of actual and estimated build plans from vehicle manufacturers. "Most likely" adjustments are made by the editor.

* Reflects factory shutdowns where applicable

Key Ratio: Inventory/Retail Sales

Total Class 8: N.A. Inventory/Retail Sales Ratio

January 2012 - September 2022



Source: ACT Research Co. © 2022

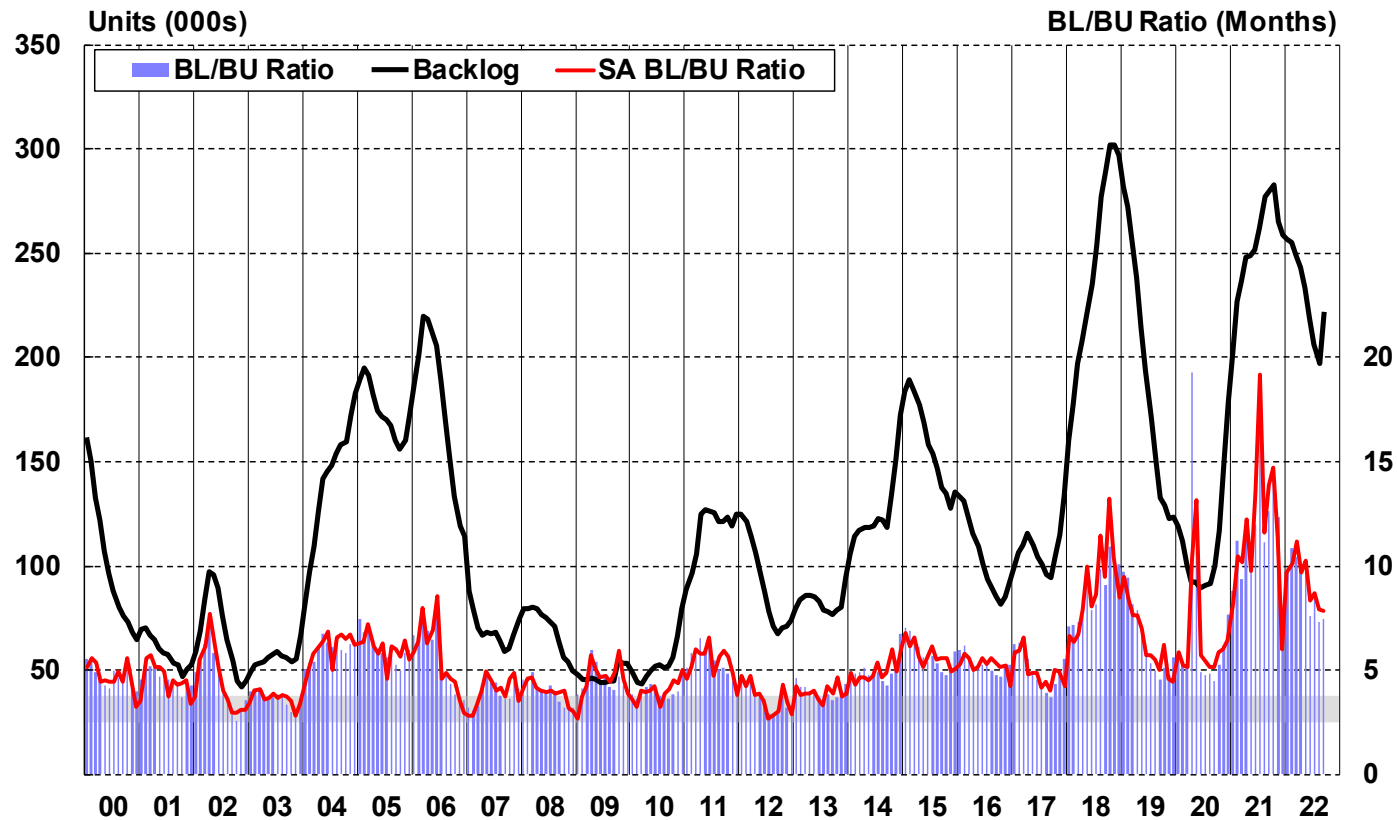
- Inventory up from '21 low, but well below typical cycle-peak levels
- IN/RS ratio within normal range



Key Ratio: Backlog/Build

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

January 2000 - September 2022



Source: ACT Research Co. © 2022

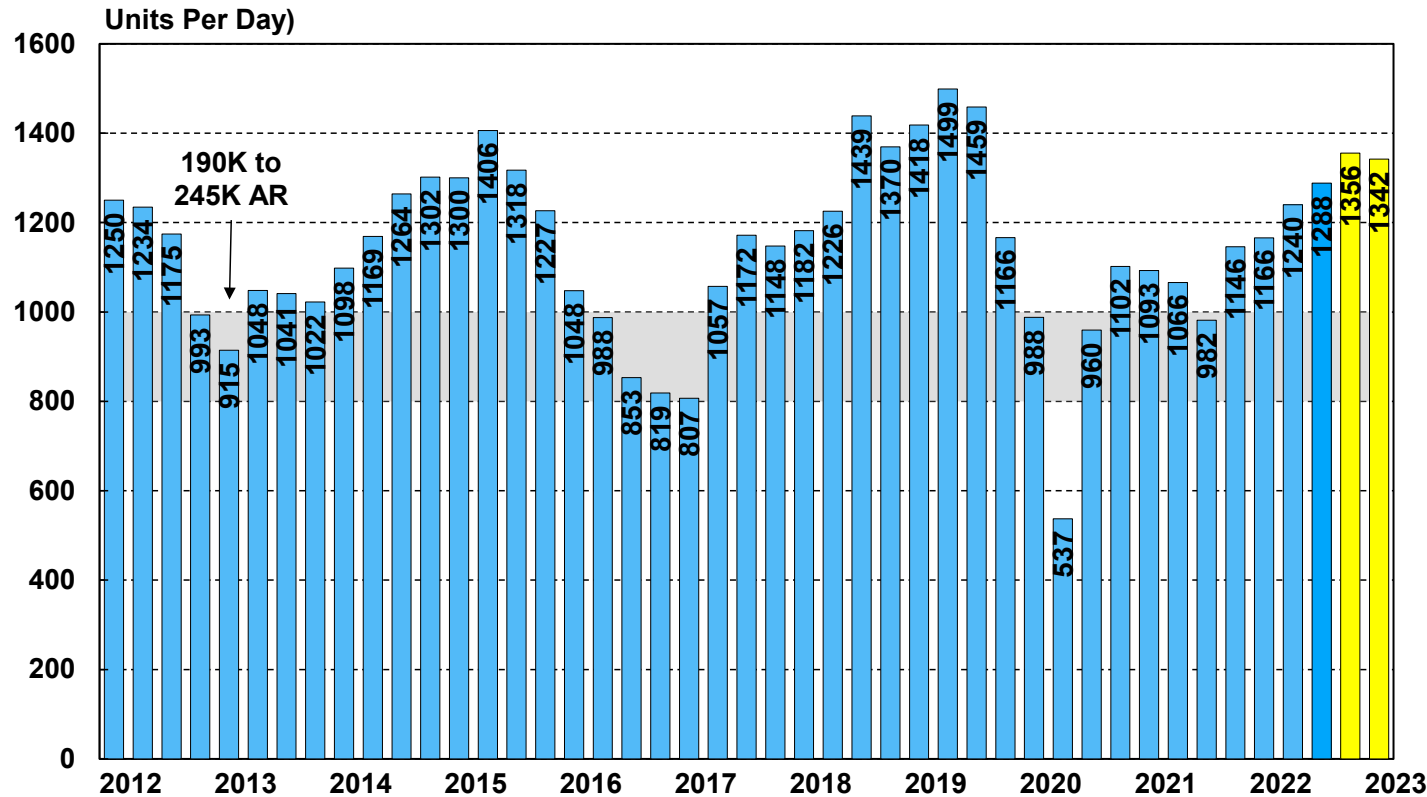
- Elevated, but shortening



What to Expect: 2022/23

Total Class 8: N.A. Build Per Day

Q1 2012 - Q1 2023 Est.



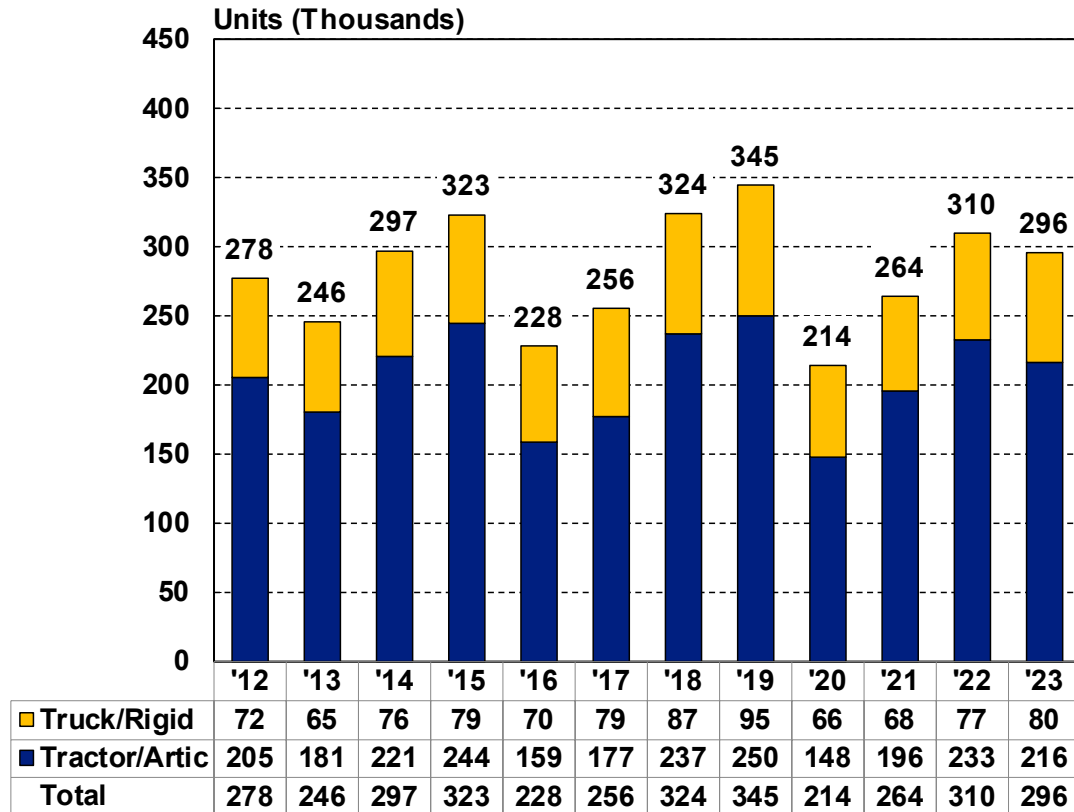
- Q4 '22: +18% y/y
- Q1 '23: +15% y/y

Source: ACT Research Co. © 2022

Class 8 Forecast

N.A. Class 8 Production

2012 - 2027



- Pent-up demand early, prebuying late
 - Prebuy in ~10% of market ahead of CARB's 2024 Clean Truck initiative

Source: ACT Research Co. © 2022

Used Class 8 Trucks

Average retail at \$84,400 in October (P)

➤ +1% m/m, +14% y/y, +53% ytd

Demand lagging, mainly due to slower freight markets

Lack of inventory also challenging volumes, minimally supporting prices

Miles and age continue trending up subtly

Exports challenged by soft demand, elevated prices, scarce stocks

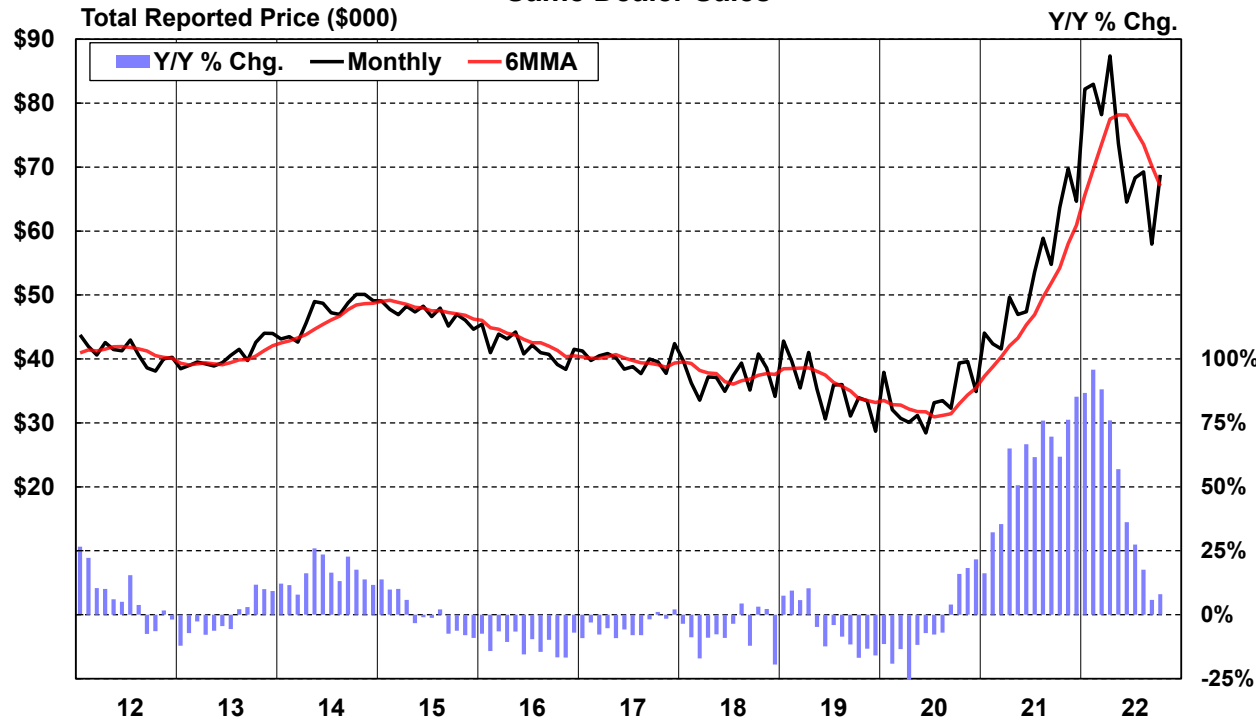
➤ +17% m/m, -33% y/y, -52% ytd



Pricing Nearly at Year-Ago Levels

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

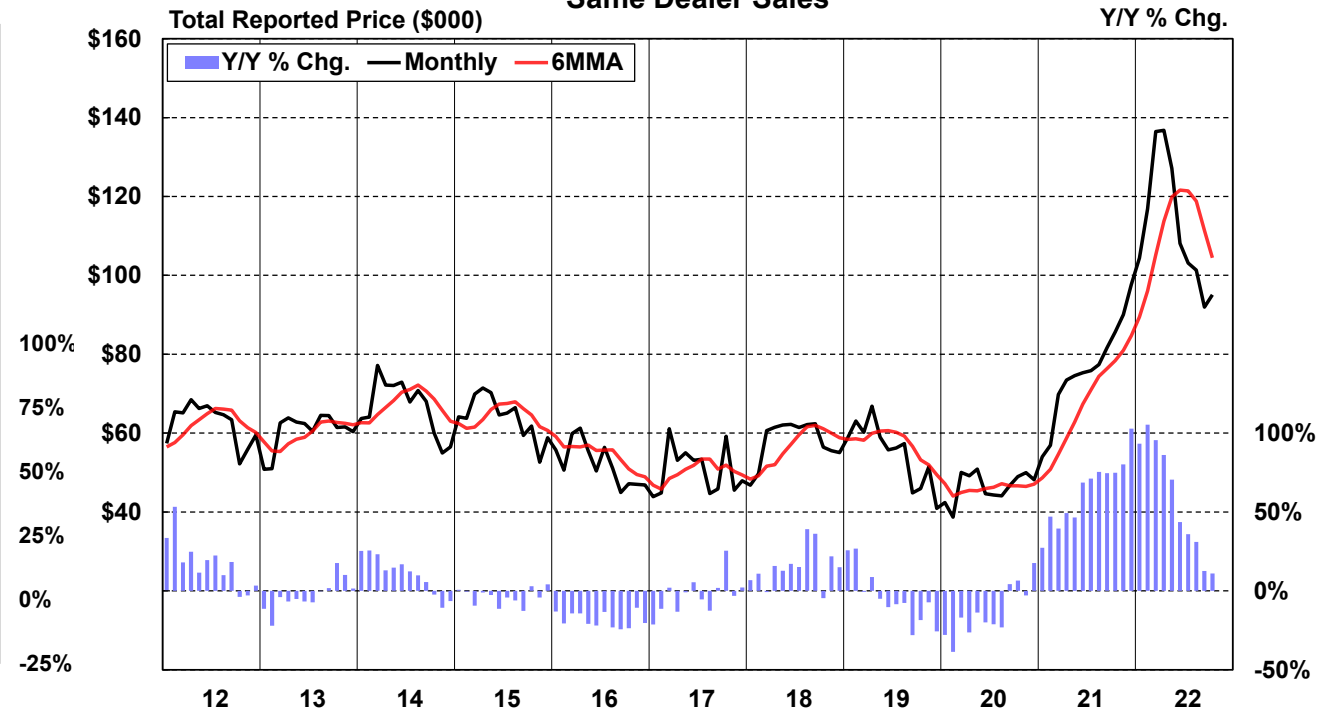
January 2012 - Preliminary October 2022
Same Dealer Sales



Source: ACT Research Co. © 2022

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

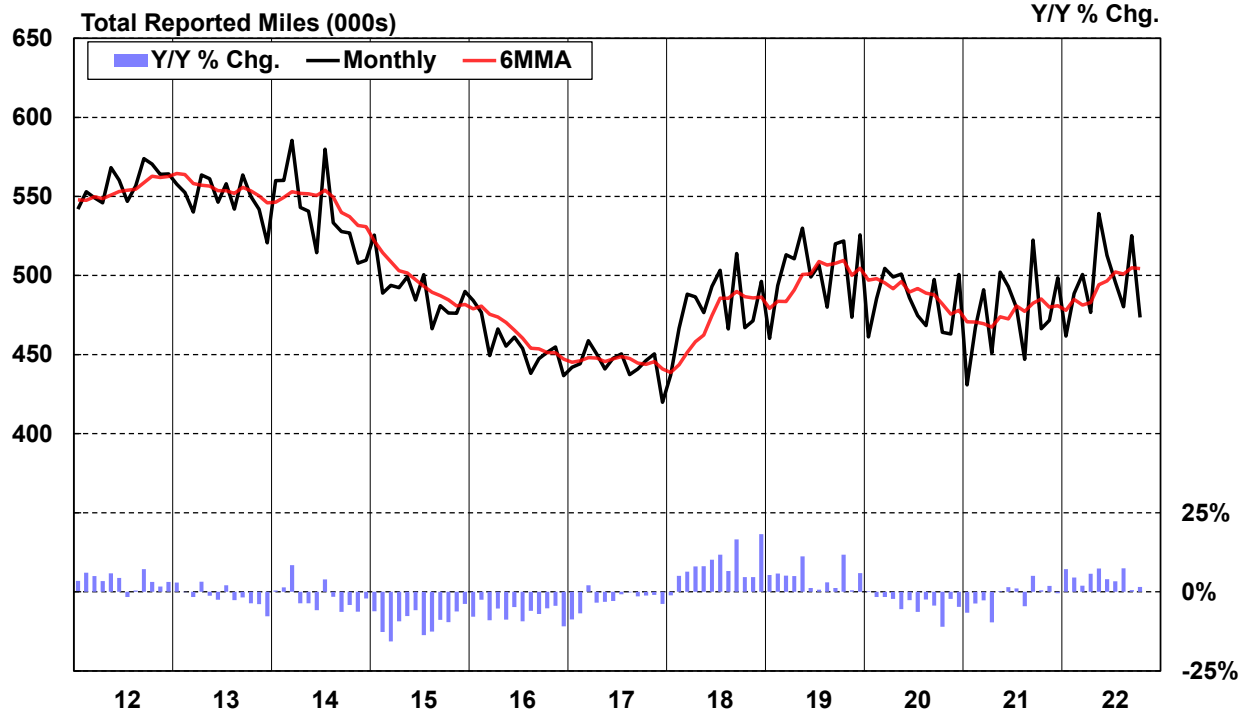
4 to 5 year old, 400-500,000 miles legacy
January 2012 - Preliminary October 2022
Same Dealer Sales



Source: ACT Research Co. © 2022

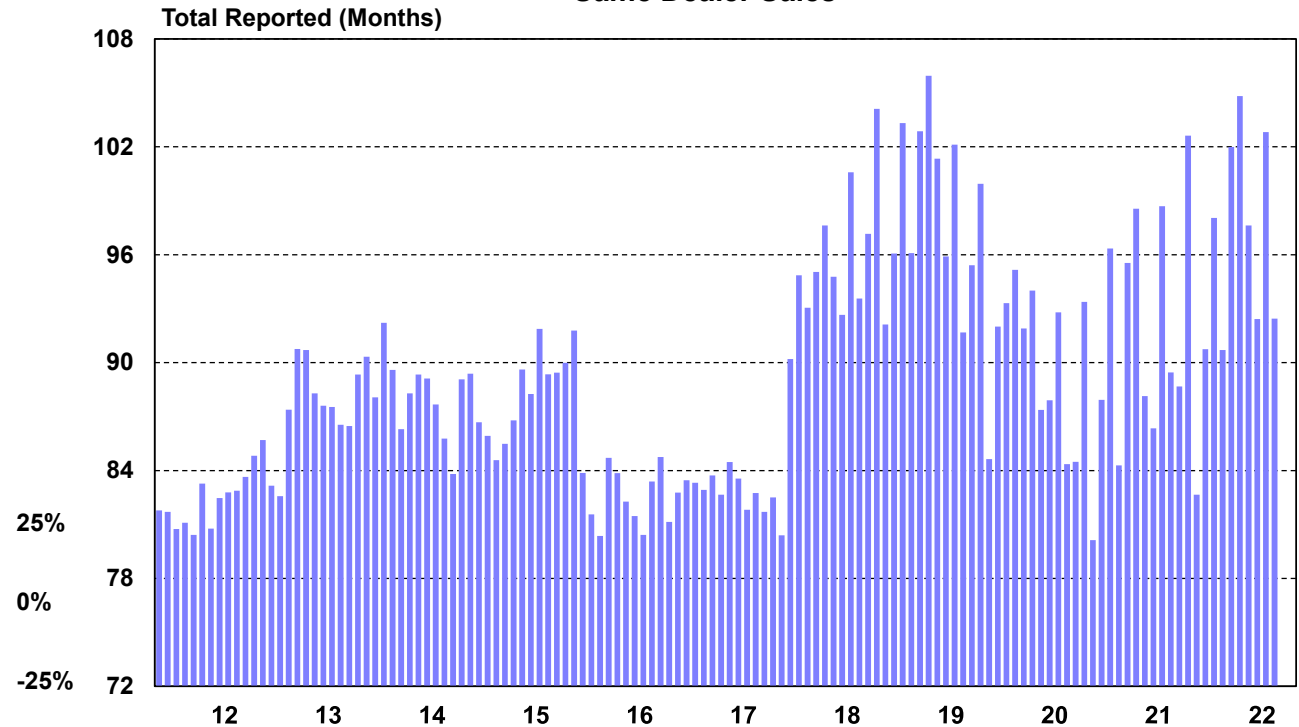
Mile and Age Trends Flattening

Class 8: U.S. Used Truck Average Miles
 January 2012 - Preliminary October 2022
 Same Dealer Sales



Source: ACT Research Co. © 2022

Class 8: U.S. Used Truck Average Age
 January 2012 - Preliminary October 2022
 Same Dealer Sales



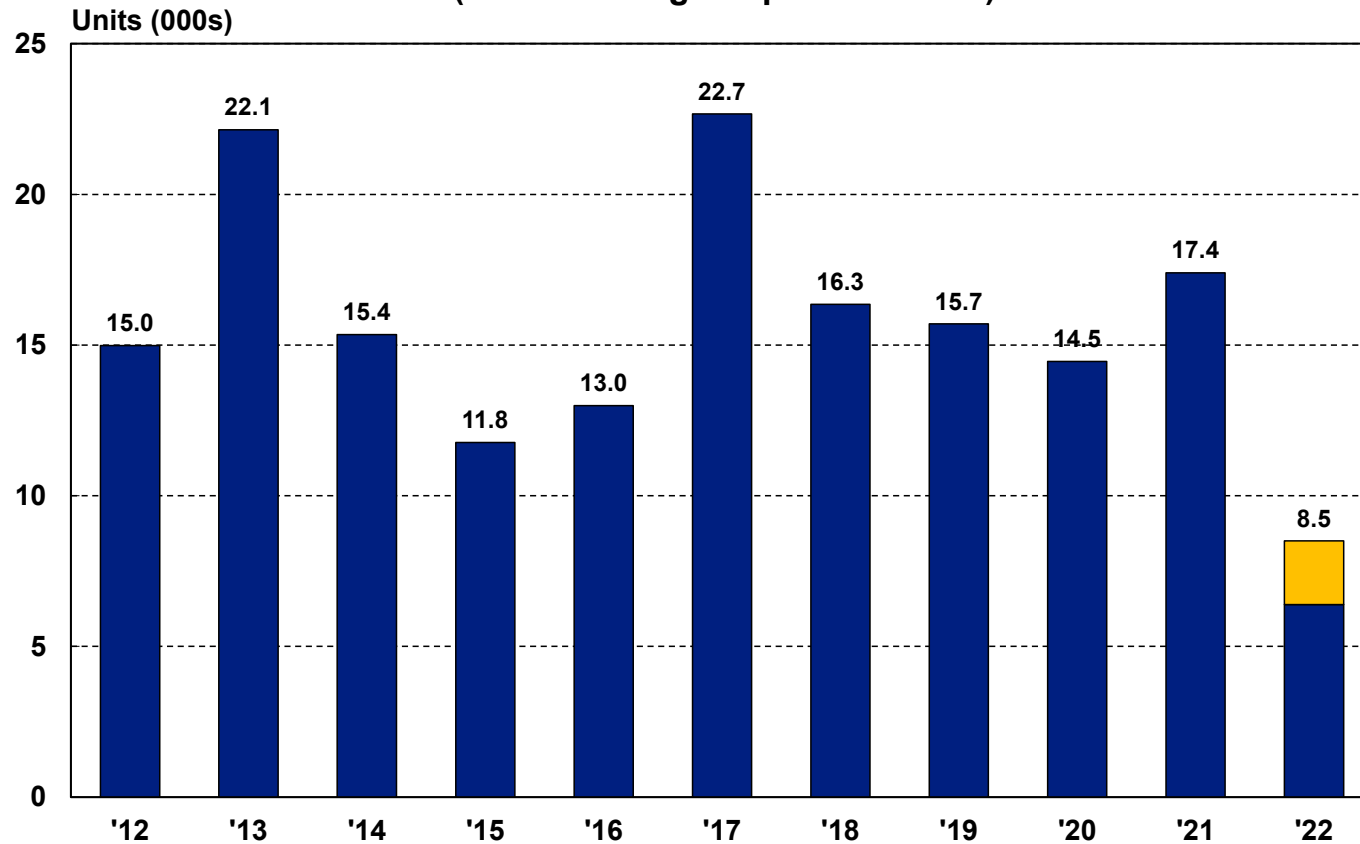
Source: ACT Research Co. © 2022

Exports Highlight Fundamental Challenges

Used Class 8 Tractor Exports

2012 - 2022

(Actual through September 2022)



Source: ITC, ACT Research Co. © 2022



Medium Duty

- MD customers seeing moderate improvement
 - Backlog rolled over, but still nearly 3x average
 - BL/BU elevated, but coming down
 - Still taking a back seat to more profitable trucks, but that should change
- IN/RS ratio going the wrong direction
 - Sales drifting lower, “inventory” decidedly higher
- Market forecast a mixed bag
 - 2022: build (+1%), retail sales (-6%)
 - 2023: build (+1%), retail sales (+11%)
 - Reversal of fortunes sets expectations for 2023 sales growth
- Service-centric economic growth subsidizing MD truck demand



Payroll Employment

Total 3.6% higher y/y (153.3M)

Goods up 3.8% y/y (21.3M)

Services up 4.0% y/y (109.7M)

Government up 1.2% y/y (22.4M)

Employment exceeded pre-COVID
levels in August, sooner than expected



Consumer Spending

Total 1.4% higher in Q3 (advance estimate)

Goods down 1.2%

Services up 2.8%

Activity returned to pre-COVID levels in Q2 2021

Prices are way up; wages also higher, but consumers have lost purchasing power



Retail Sales*

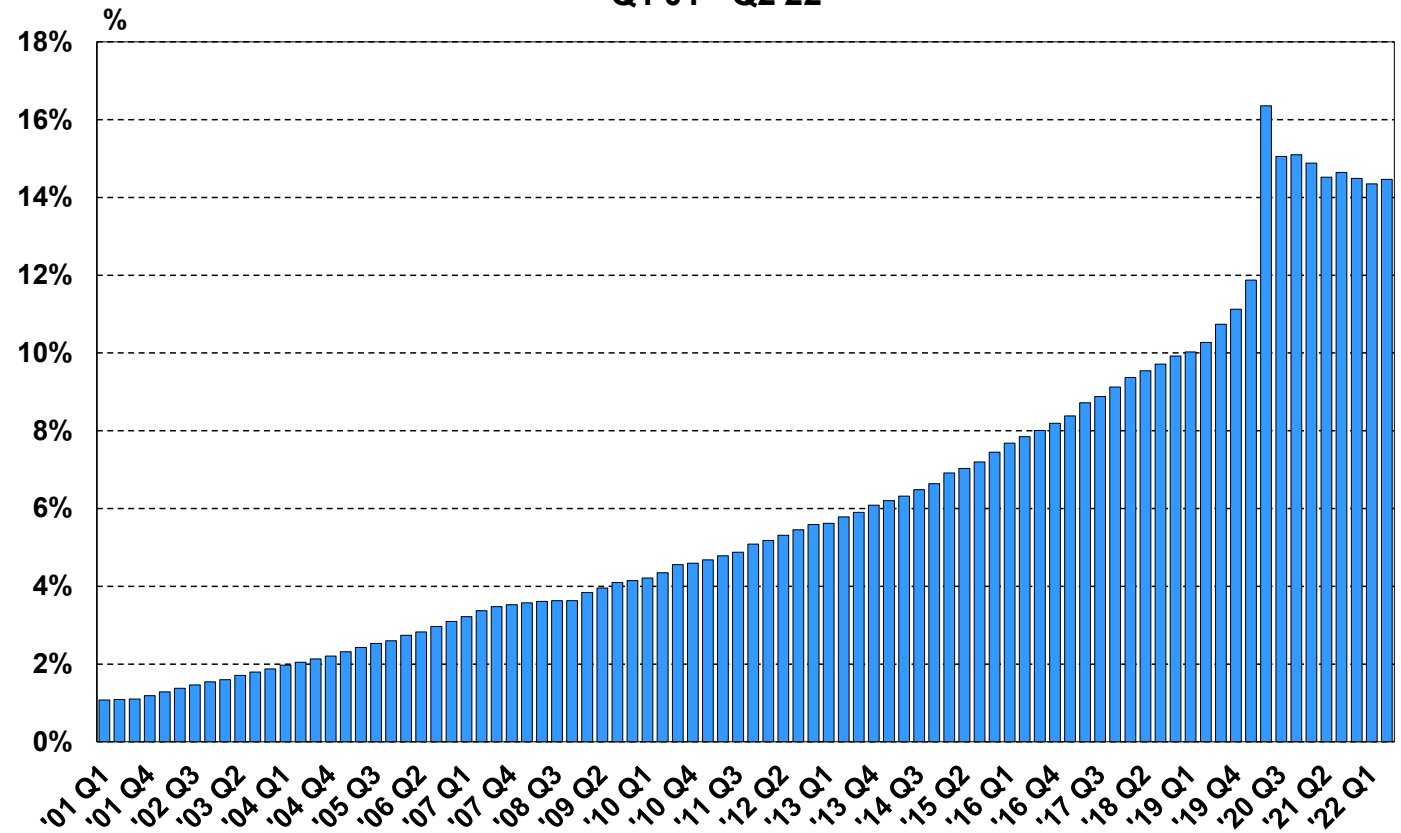
September retail sales flat m/m (+0.0%), but up y/y (+8.2%)

Q2 e-commerce activity ticked up, also higher as a percentage of sales (14.5%)

Full-year 2022 growth expectations range from 6% to 8% - Retail Federation

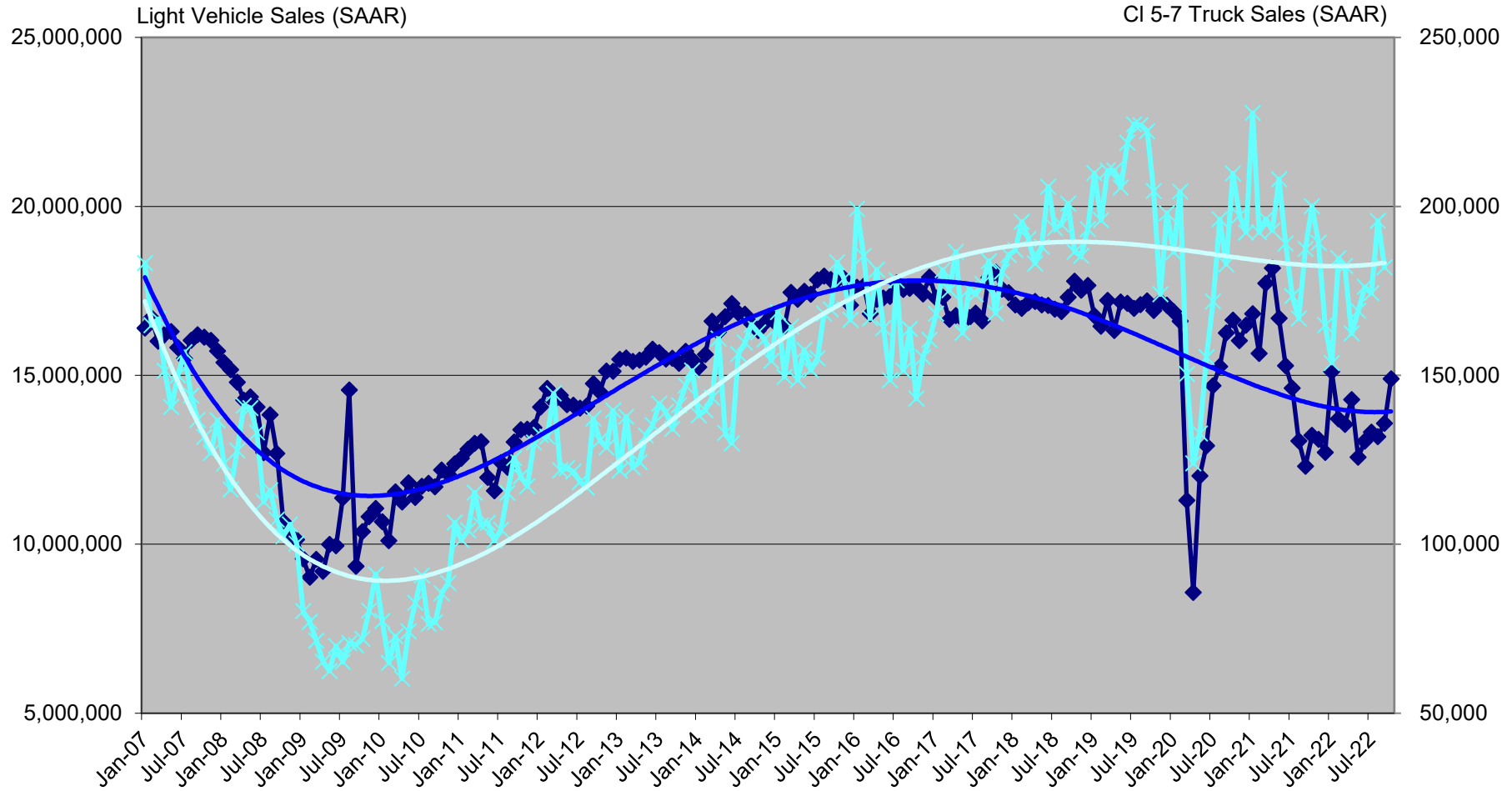
*nominal

E-Commerce as a Percentage of Retail Sales
(Excluding Food Service)
Q1'01 - Q2'22



Source: Federal Reserve Board, ACT Research Co. © 2022

Light Vehicle Sales vs. CI 5-7 Truck Sales



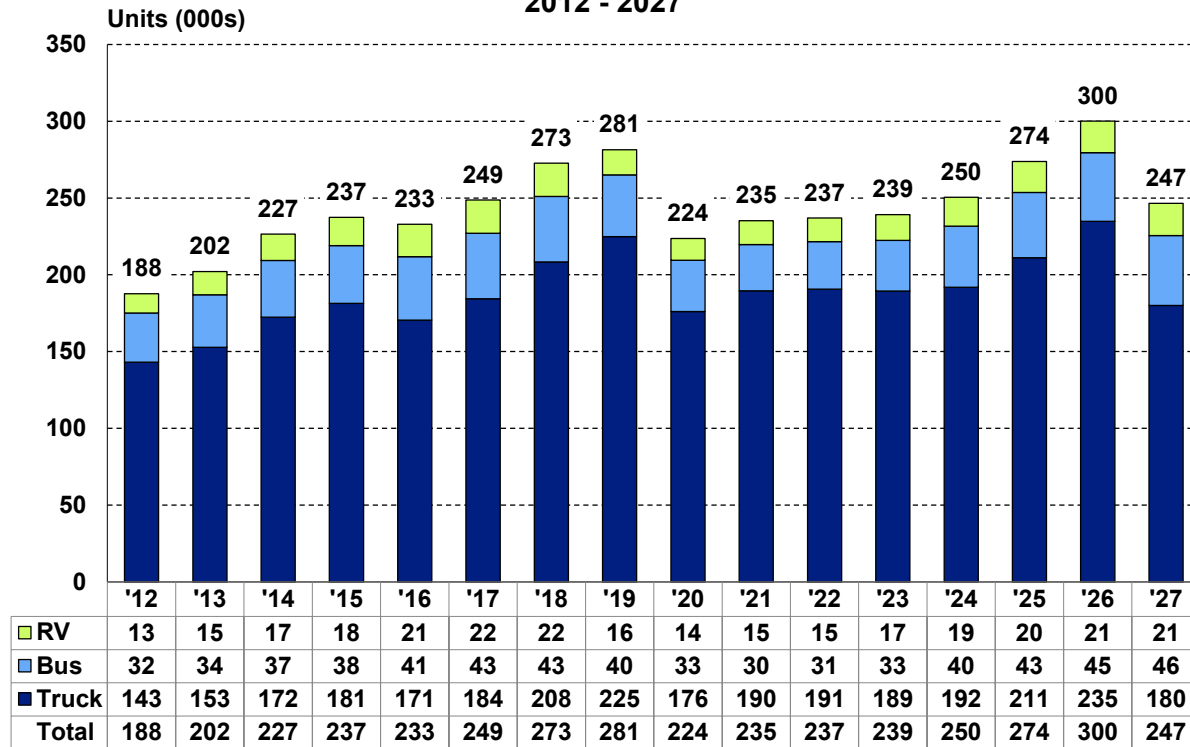
Source: BEA, ACT Research Co. © 2022



MD Forecast

N.A. Classes 5-7 Production

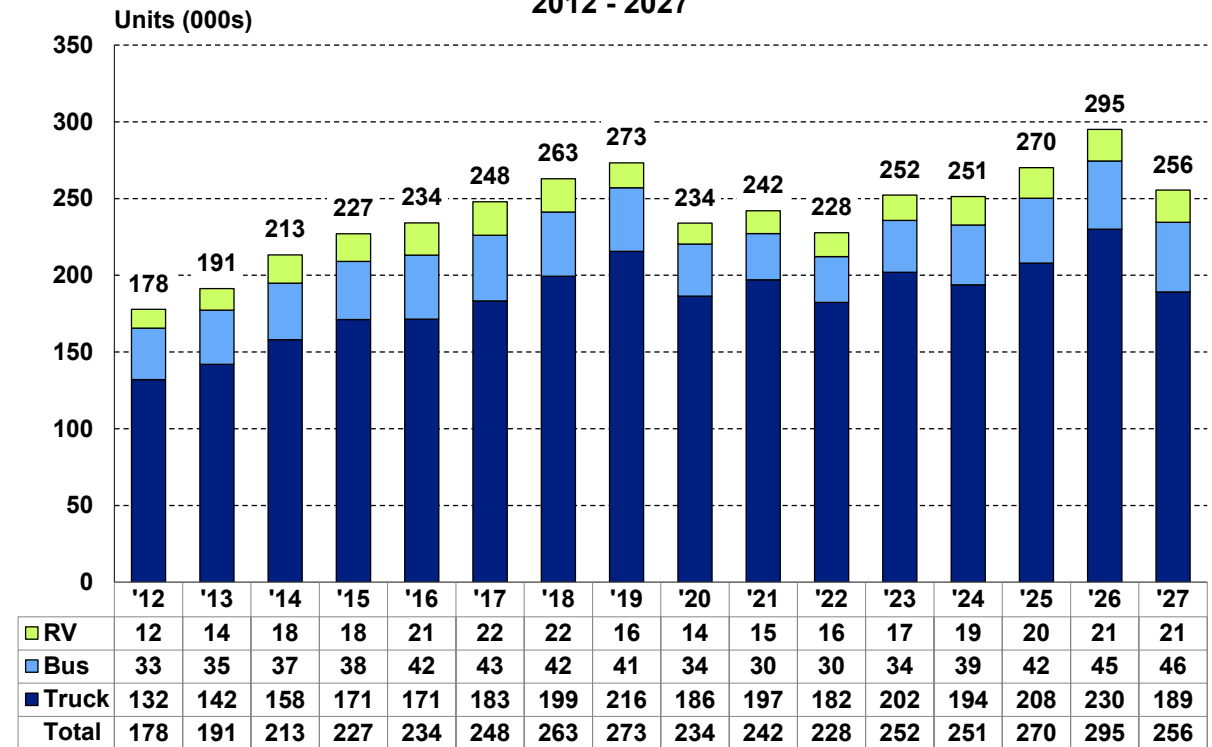
2012 - 2027



Source: ACT Research Co. © 2022

N.A. Classes 5-7 Retail Sales














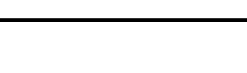
2012 - 2027



Source: ACT Research Co. © 2022

Trailer Market Overview

Total Trailers

Category	Actual		Seasonally Adj.	
	Sep-22	Last 13 Mo	Sep-22	Last 13 Mo
Backlog	175,111		198,782	
Build	27,073		25,652	
Inventory	25,738		24,295	
New Orders	26,734		24,208	
Cancellations	648		614	
Net Orders	26,086		23,637	
Shipments	29,206		25,847	

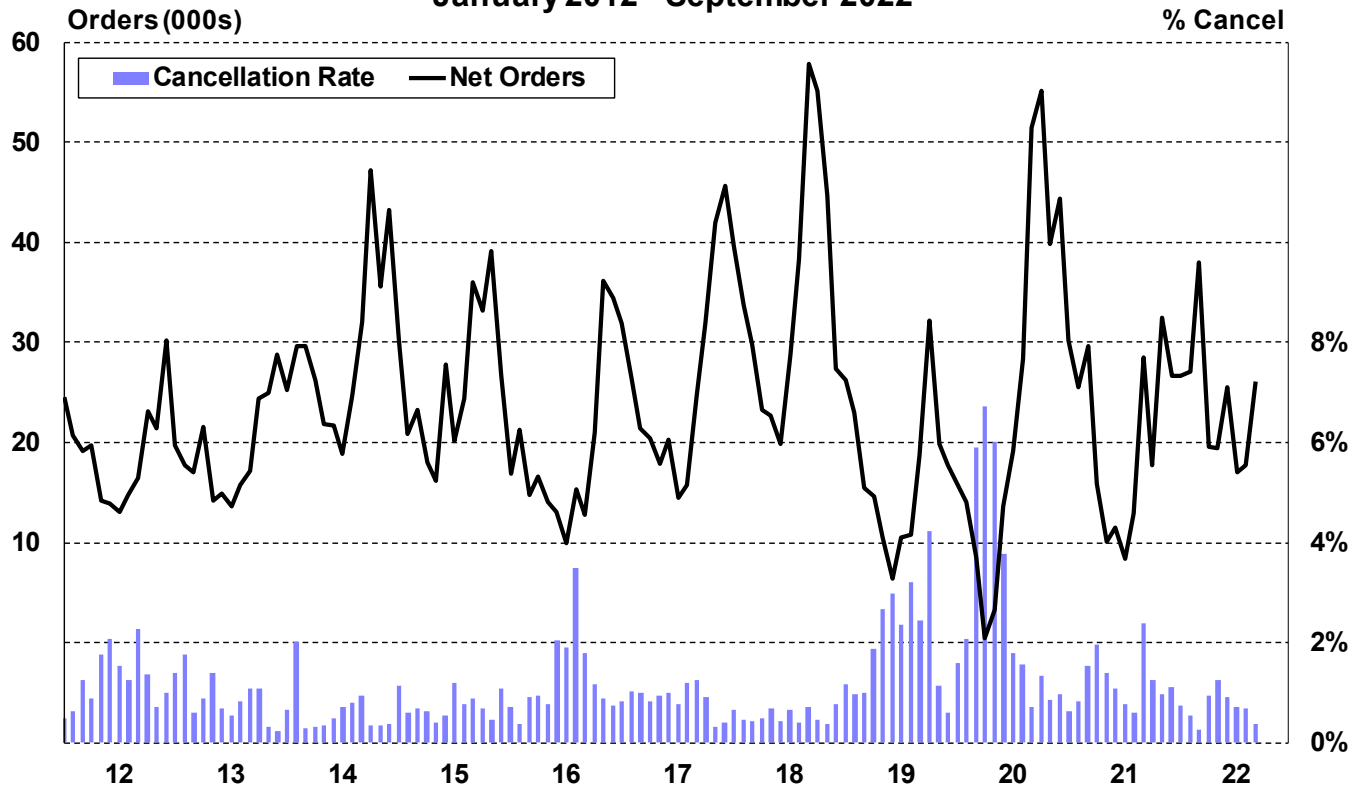
Source: ACT Research © 2022 with all rights reserved

- Strong Demand Continues
- Supply Constraints Easing
 - Materials Supply Improving
 - Labor Remains Challenging
- 2023 Orderboards Open?
 - Already Full
- Inventory Building Seasonal
- Backlogs Well Into 2023
- Cancel/Rebook Sequence



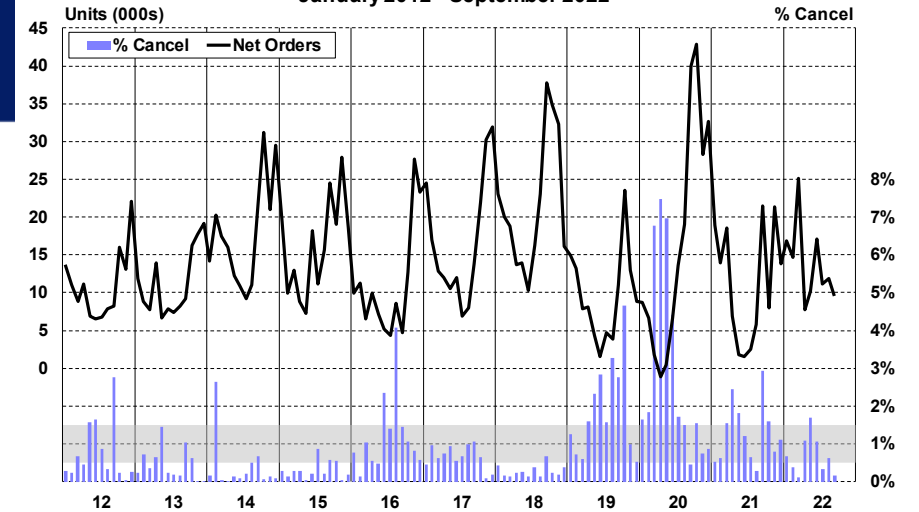
Orders & Cancellation Rates

Total Trailers: Net Orders & Cancellation Rate
Expressed as a Percentage of Backlog
January 2012 - September 2022



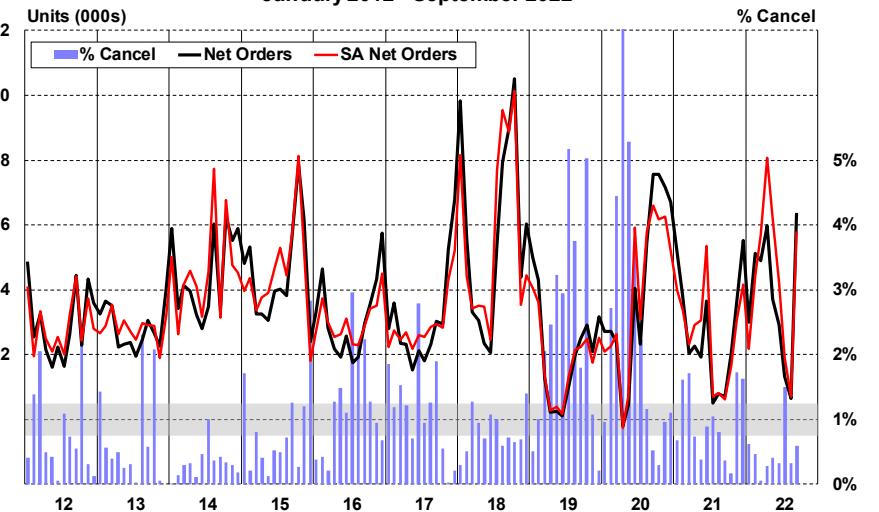
Source: ACT Research Co. © 2022

Dry Van Net Orders & Cancellation Rate
Expressed as a Percentage of Backlog
January 2012 - September 2022



Source: ACT Research Co. © 2022

Reefer Van Net Orders & Cancellation Rate
Expressed as a percentage of Backlog
January 2012 - September 2022

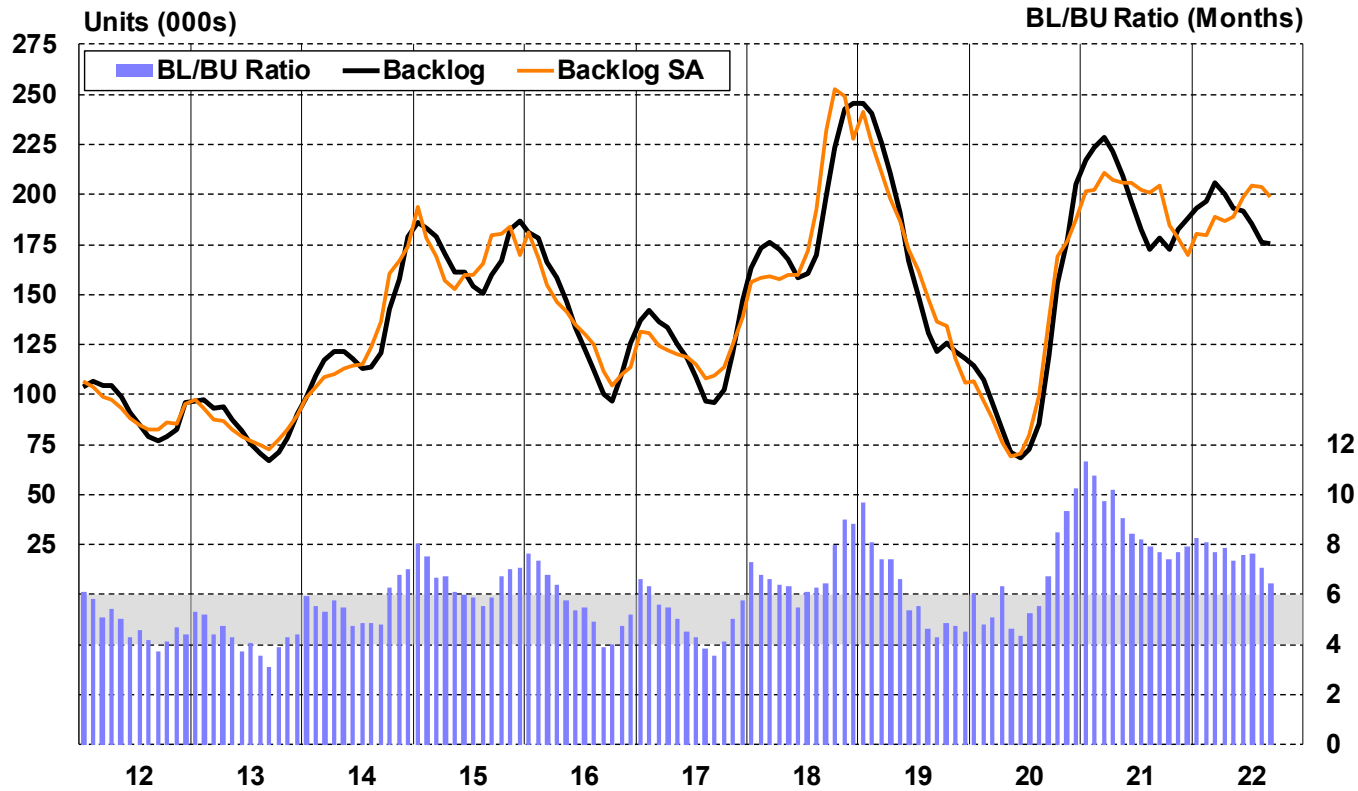


Source: ACT Research Co. © 2022

Backlog & BL/BU Ratio

Total Trailers Backlog & Backlog/Build Ratio

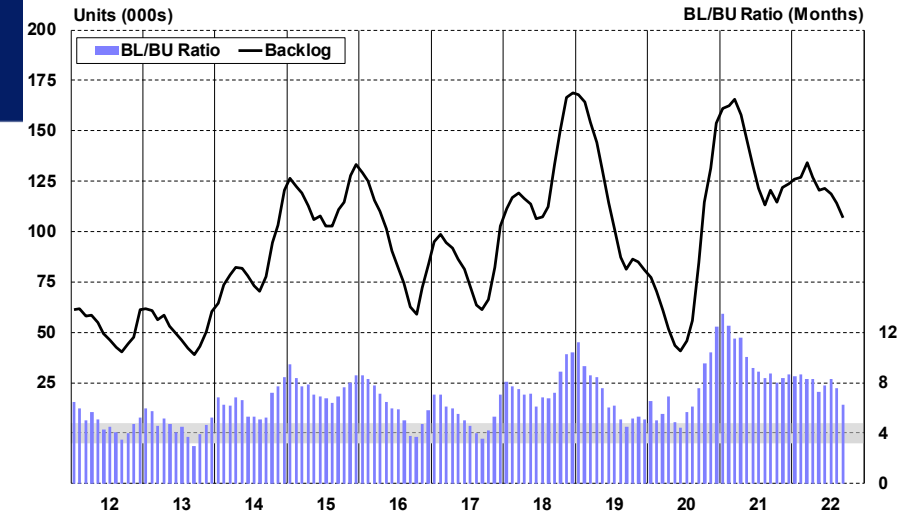
January 2012 - September 2022



Source: ACT Research Co. © 2022

Dry Van Backlog & Backlog/Build Ratio

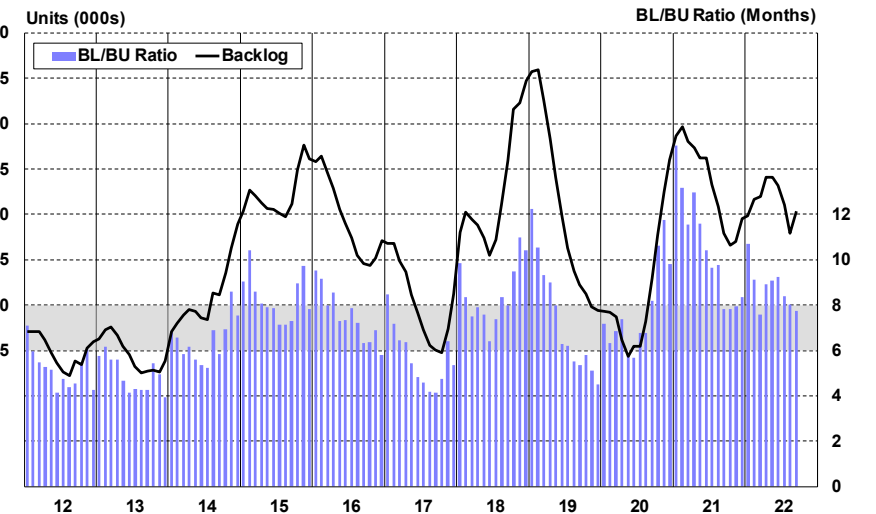
January 2012 - September 2022



Source: ACT Research Co. © 2022

Reefer Van Backlog & Backlog/Build Ratio

January 2012 - September 2022

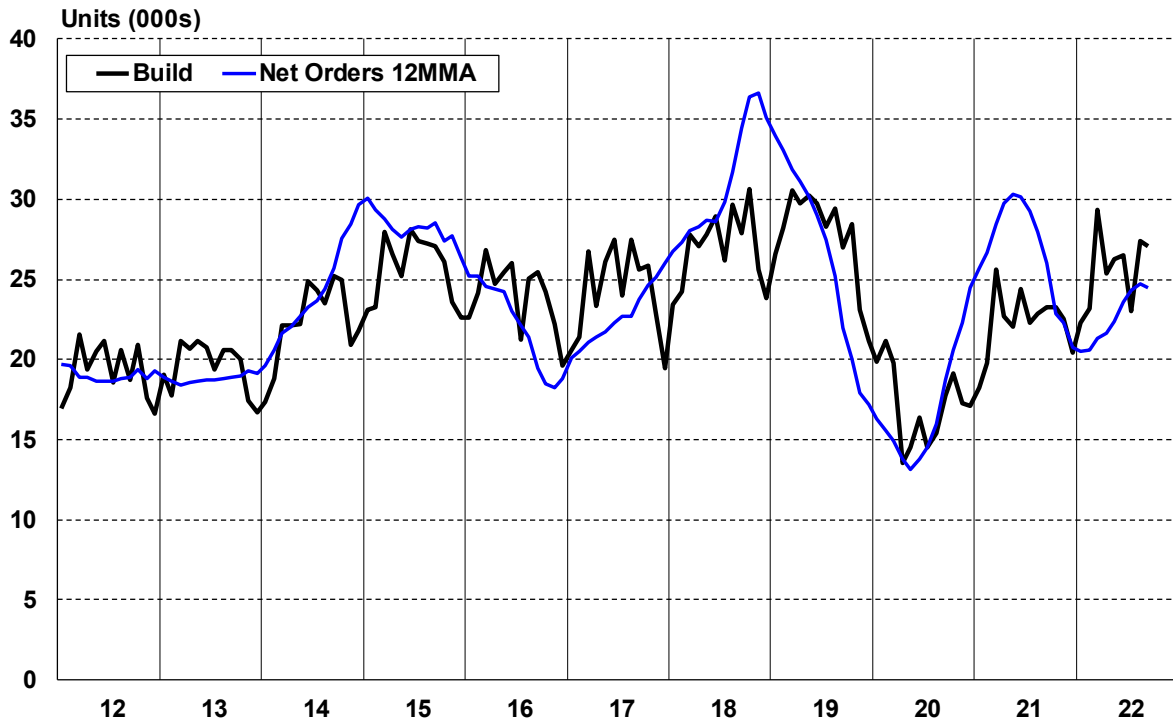


Source: ACT Research Co. © 2022

Trailer Builds Gaining Traction

Total Trailers Net Orders 12 Mo. Avg. and Build

January 2012 - September 2022

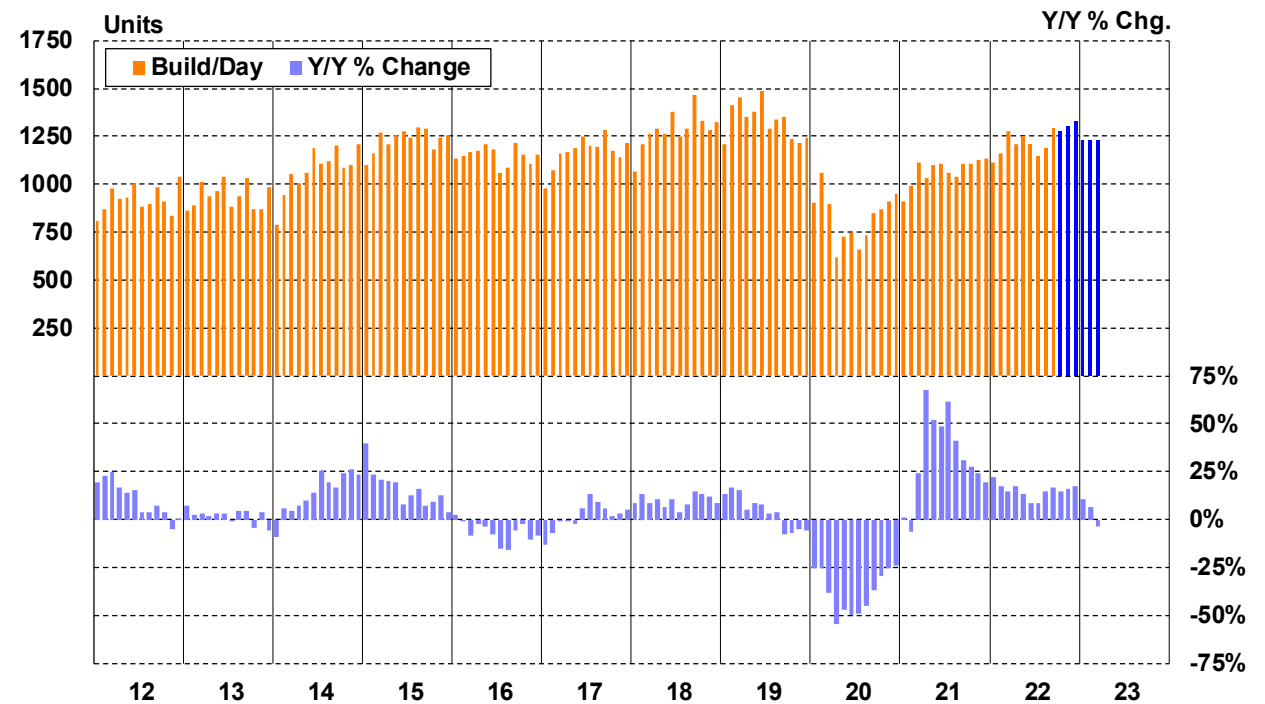


Source: ACT Research Co. © 2022

Total Trailers: Build Per Day

Year Over Year Percent Change

January 2012 - March 2023



Source: ACT Research Co. © 2022



US Trailer Build Rate Assumptions

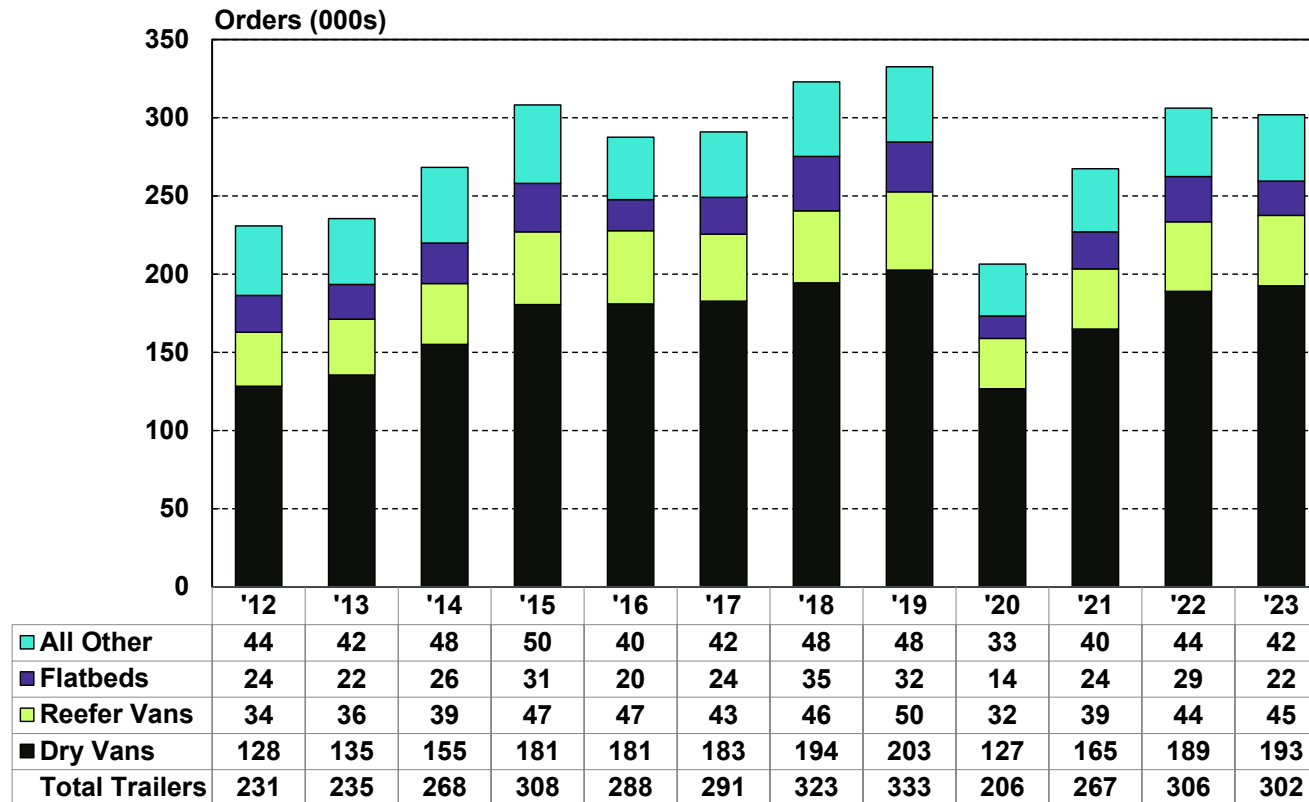
Per Day Build Rate	Q1	Q2	Q3	Q4
2021	1,010	1,080	1,068	1,123
2022	1,187	1,222	1,210	1,281
2023	1,249	1,251	1,180	1,147



November OUTLOOK Forecast

U.S. Trailer Production

2012 - 2023



Source: ACT Research Co. © 2022





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THANK YOU

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