




Heavy CV Market Outlook

Advantage Shippers

Kenny Vieth
Jennifer McNealy
ACT Research Co.

ACT Seminar 69
August 23, 2023

ACT'S TRAILER TEAM

- 
- A portrait of Ken Vieth, a middle-aged man with light hair, wearing a dark blue blazer over a white shirt. The photo is set within an orange rectangular frame that is slightly tilted.
- **Ken Vieth**
 - **President & Senior Analyst**
 - **Class 8 Current Market Activity**
 - **Class 8 & US Trailer Forecasts**

- 
- A portrait of Jennifer McNealy, a woman with short brown hair and glasses, wearing a grey patterned blazer over a black top and a pearl necklace. The photo is set within an orange rectangular frame that is slightly tilted.
- **Jennifer McNealy**
 - **Director – CV Market Research & Publications**
 - **Current Trailer Market Activity**



Vehicle Demand Talking Points

- **Trailers**

- Small near-term support into 2024 from nearly consumed pent-up demand
- Reefers: Sharp rise in replacements through long-term horizon
- '27 tractor prebuy hangover should divert capex to trailer market

**C8 & Trailer 2024
volumes dependent on
upcoming order season**

- **Class 8**

- Pent-up tractor demand consumed in 2023
- CARB prebuying/stocking into YE2023 adds drag on 2024
- OEMs encouraging customers to think about expensive EPA mandate coming in 2027

- **Misc.**

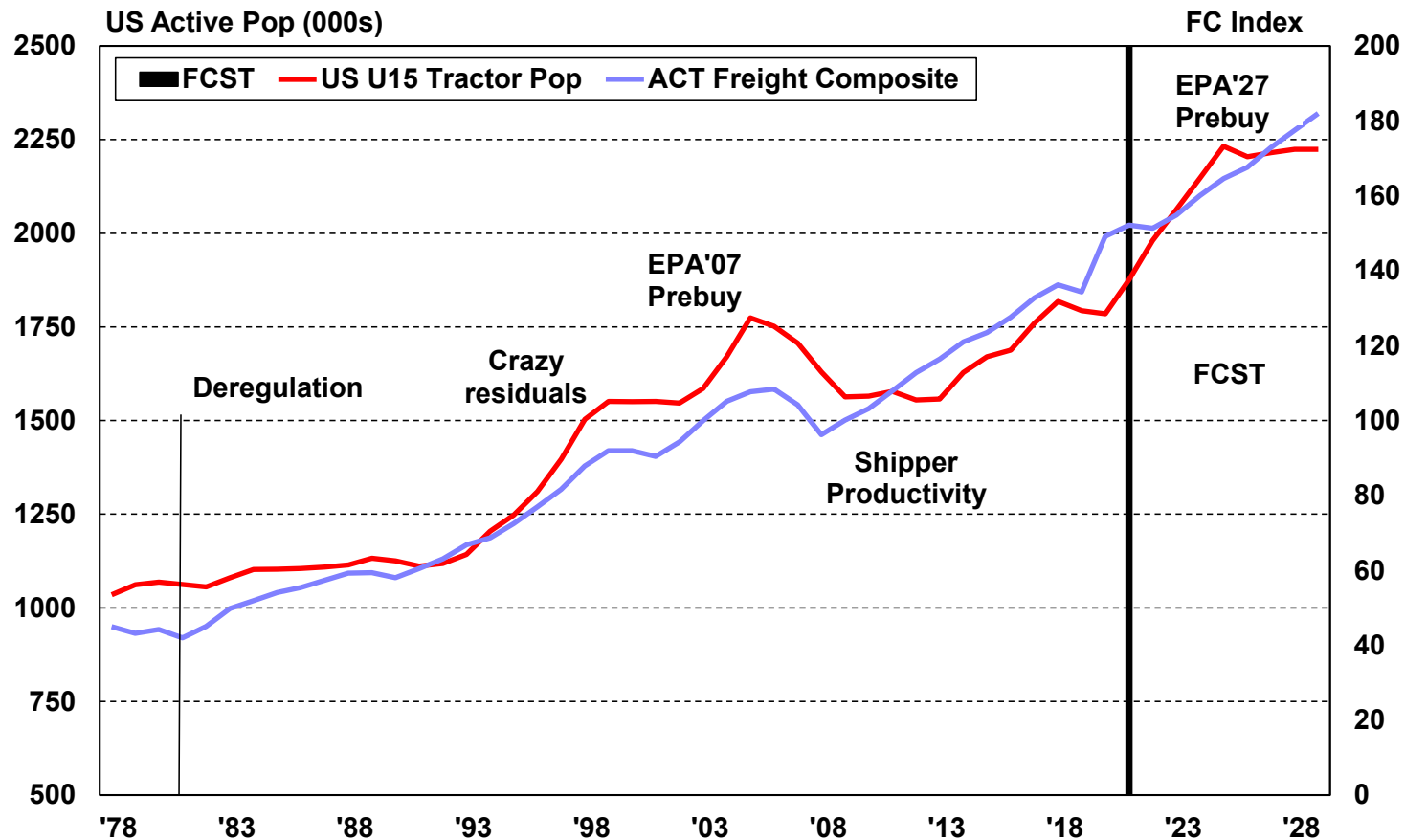
- **Labor strategy induced drag:** OEMs, suppliers, and truckers are holding onto employees
 - Potential for higher than typical trough volumes
- **Supply chain:** Industry production remains top-side constrained
 - The cure for high prices
- **Carrier profits drive demand. Profitability lags the freight cycle.**
 - Weak freight in 2023. Profits at low-ebb in 2H'23/1Q'24



Symbiotic Relationship

Class 8 Active Tractor Pop & ACT Freight Composite

1978 - 2030



Source: ACT Research Co. © 2023

ECONOMICS



Economic Outlook

- US economy beats consensus, achieves soft landing (?), modest growth likely from here
 - Consumers and businesses enjoy strong balance sheets
 - Strong positive RDPI
 - Strong corporate cashflow
 - Late innings of inventory destock
- Reshoring
 - Construction (now), manufacturing (gradually) = increased domestic demand
- Demographics:
 - Boomer wealth transfer
 - Millennials in peak spending years
 - Tight labor supply = labor inflation risk



A Very Soft Landing

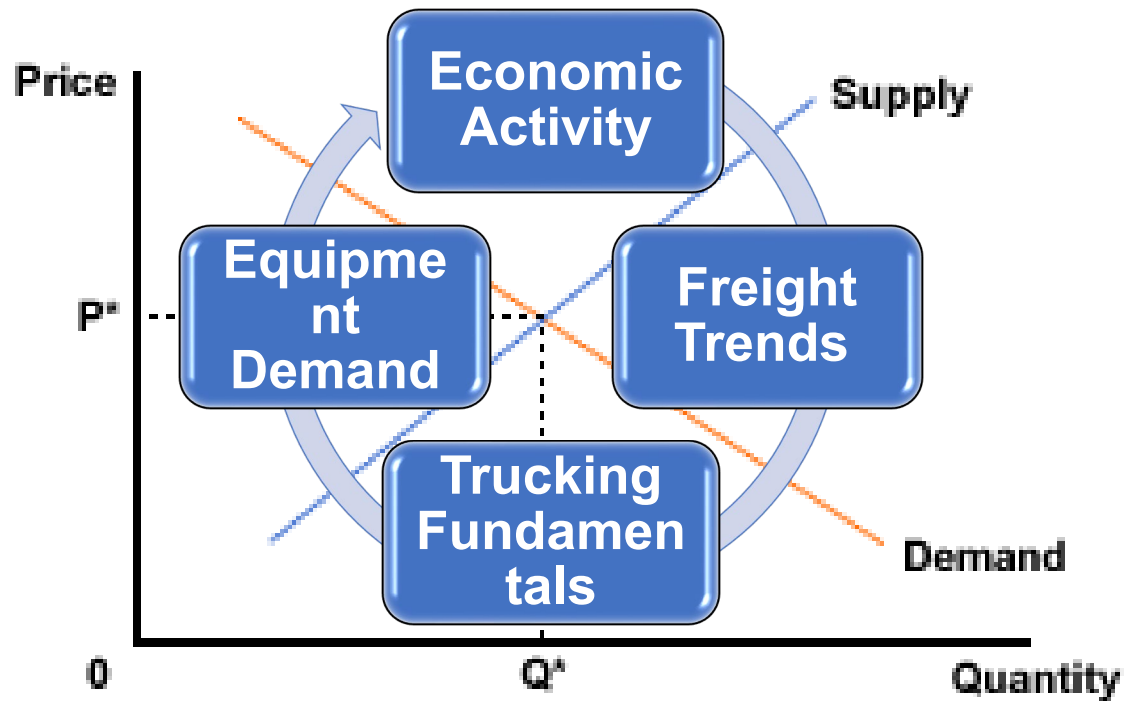
	2021	2022	2023f	2024f	2025f	2026f	2027f	2028f
Economy (Y/Y % Δ)								
GDP	5.9%	2.1	2.3	2.2	2.2	2.0	1.3	2.1
ACT Freight Comp	11.1%	2.0	-0.5	2.3	3.4	3.0	1.8	3.2
Rates (Y/Y % Δ, net fuel)								
DAT TL Spot	30%	-12	-18	21	8	--	--	--
DAT TL Contract	21%	6	-12	2	10	--	--	--

FREIGHT

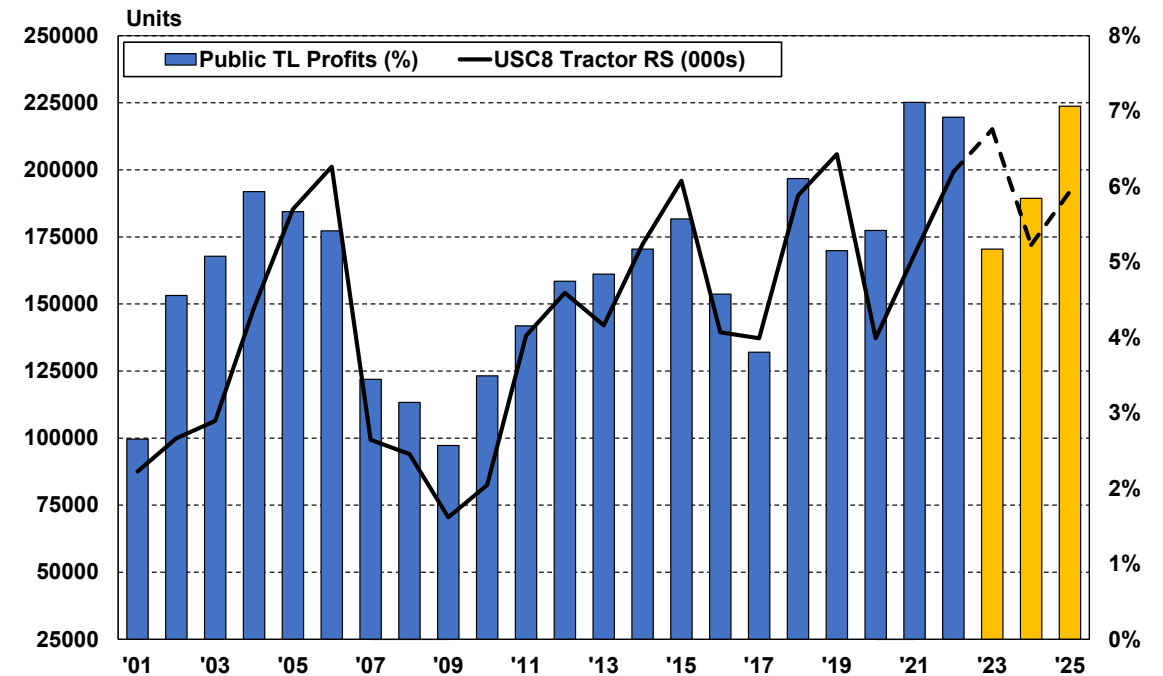


Rinse, Wash, Repeat

History doesn't repeat itself, but the freight cycle rhymes



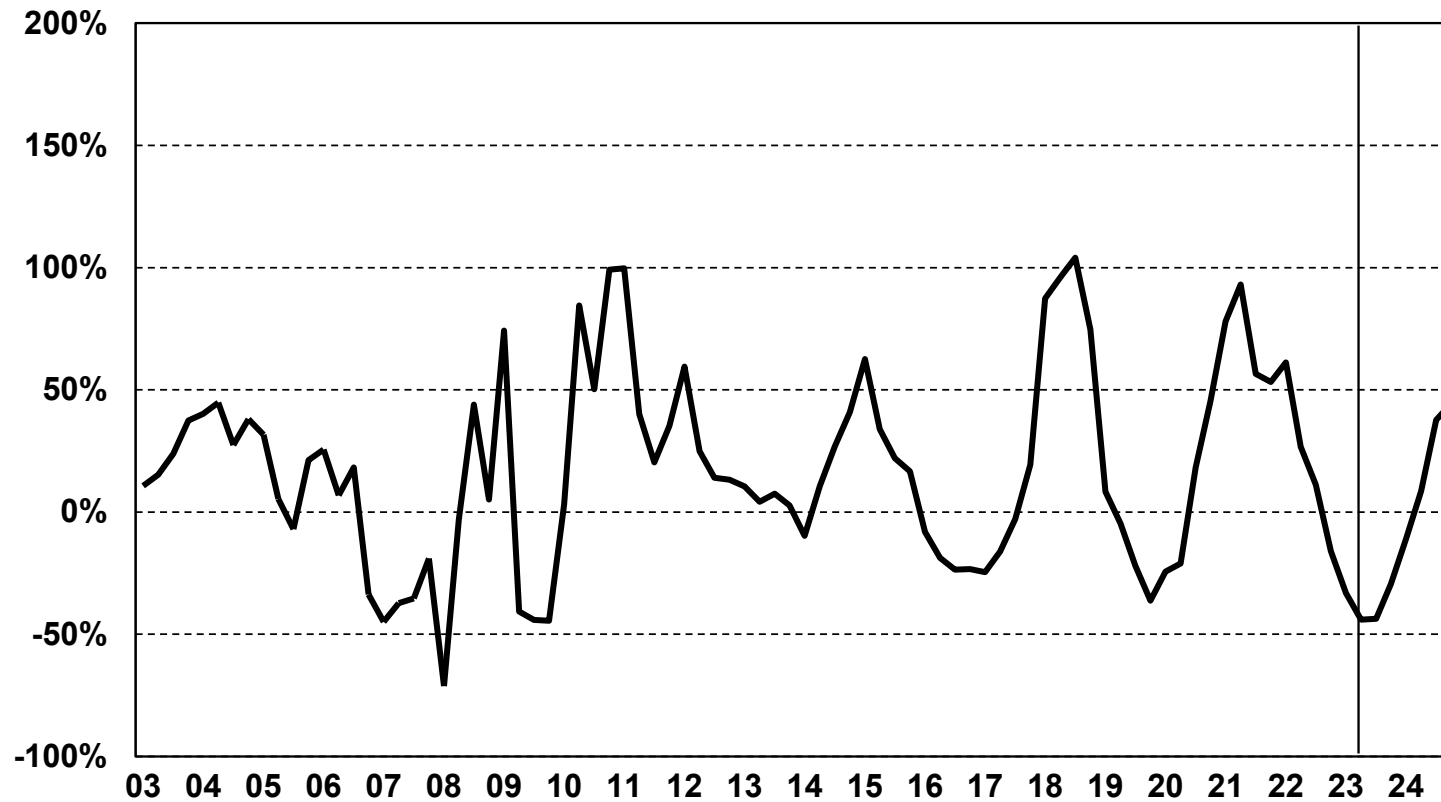
U.S. Class 8 Tractor RS & Carrier Profits
2001 - 2025



Source: ACT Research Co. © 2023

Carrier Profits and HD Demand

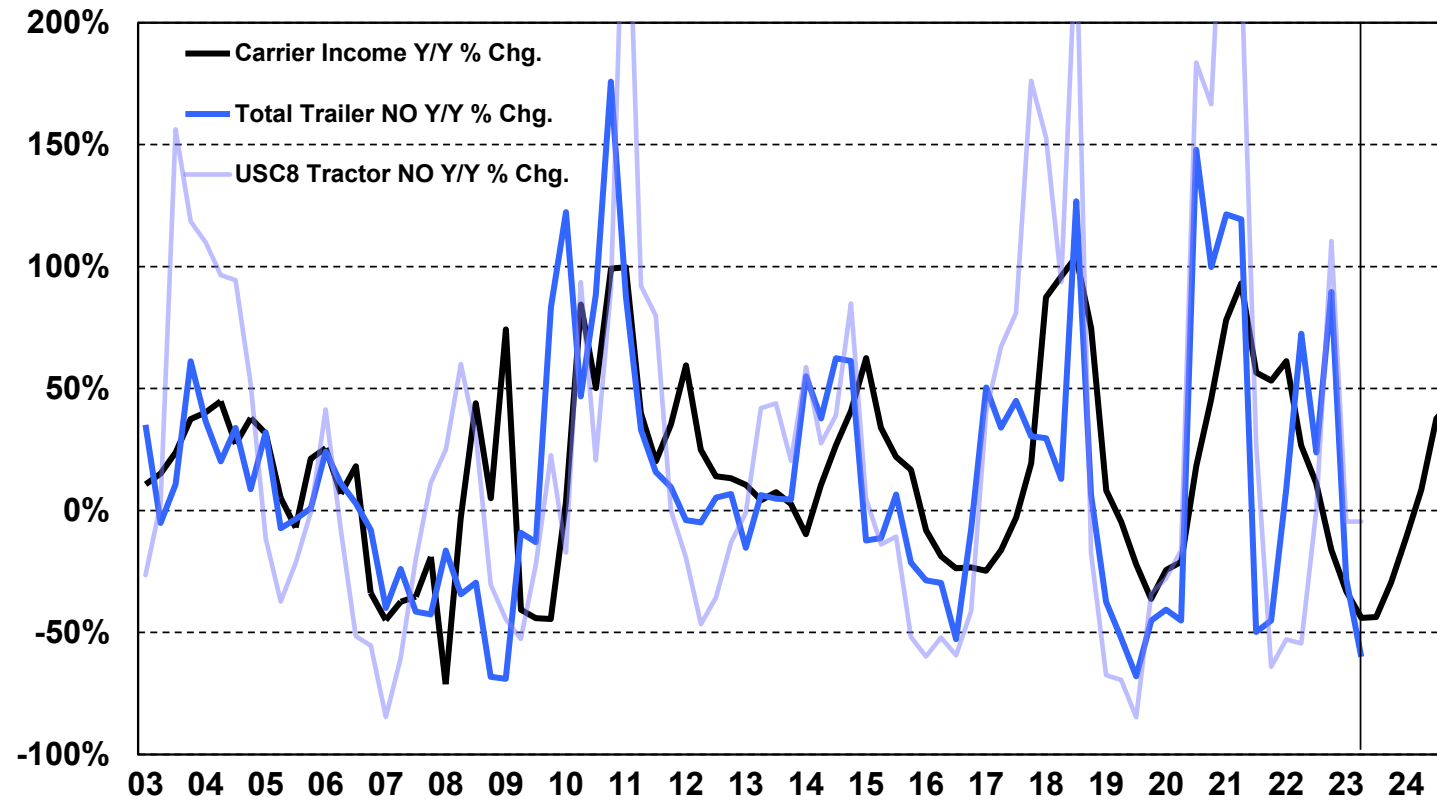
TL Carrier Database:
TL Carrier Net Income, Y/Y % Change
Q1'03 - Q4'24



Source: ACT Research Co. © 2023

Carrier Profits and HD Demand

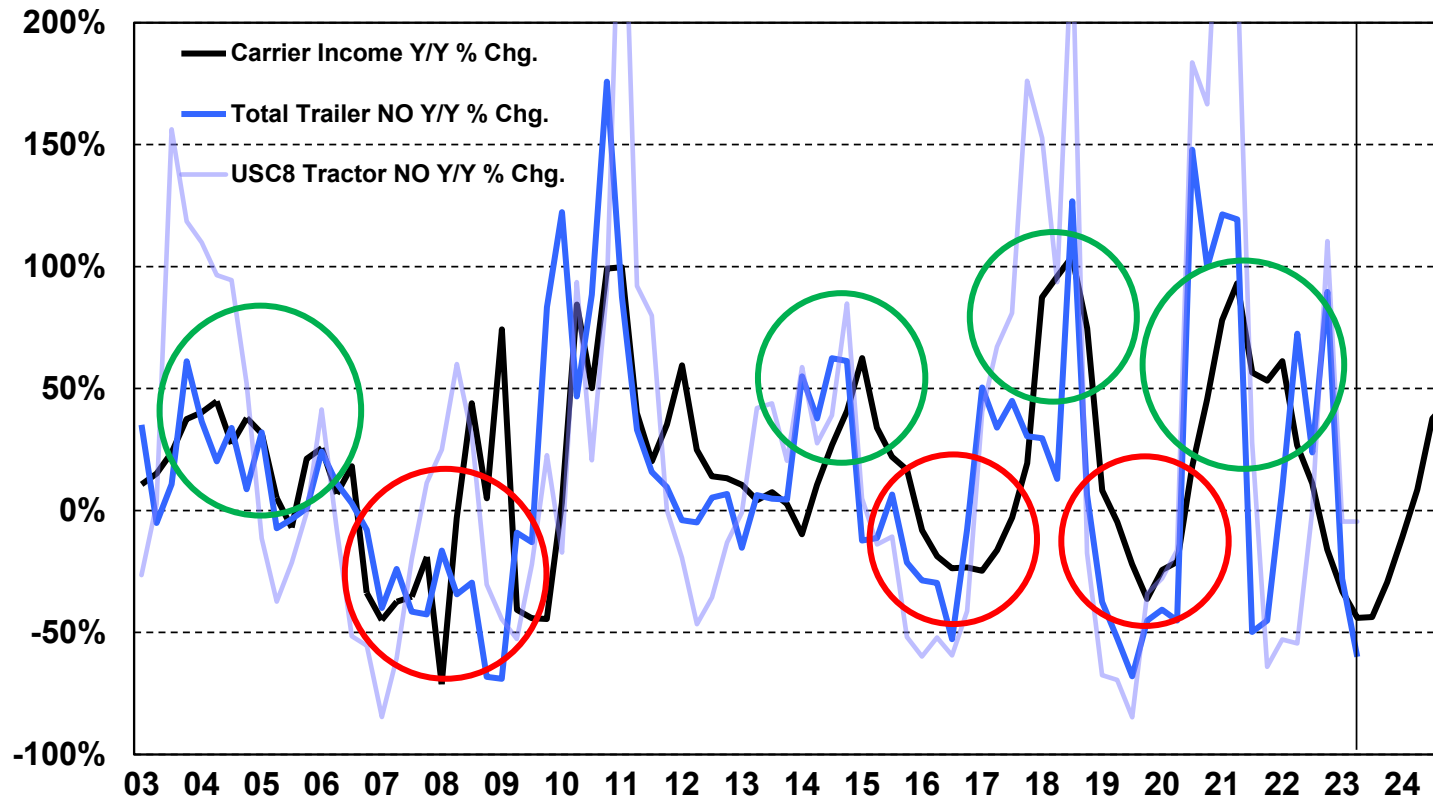
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Source: ACT Research Co. © 2023

Carrier Profits and HD Demand

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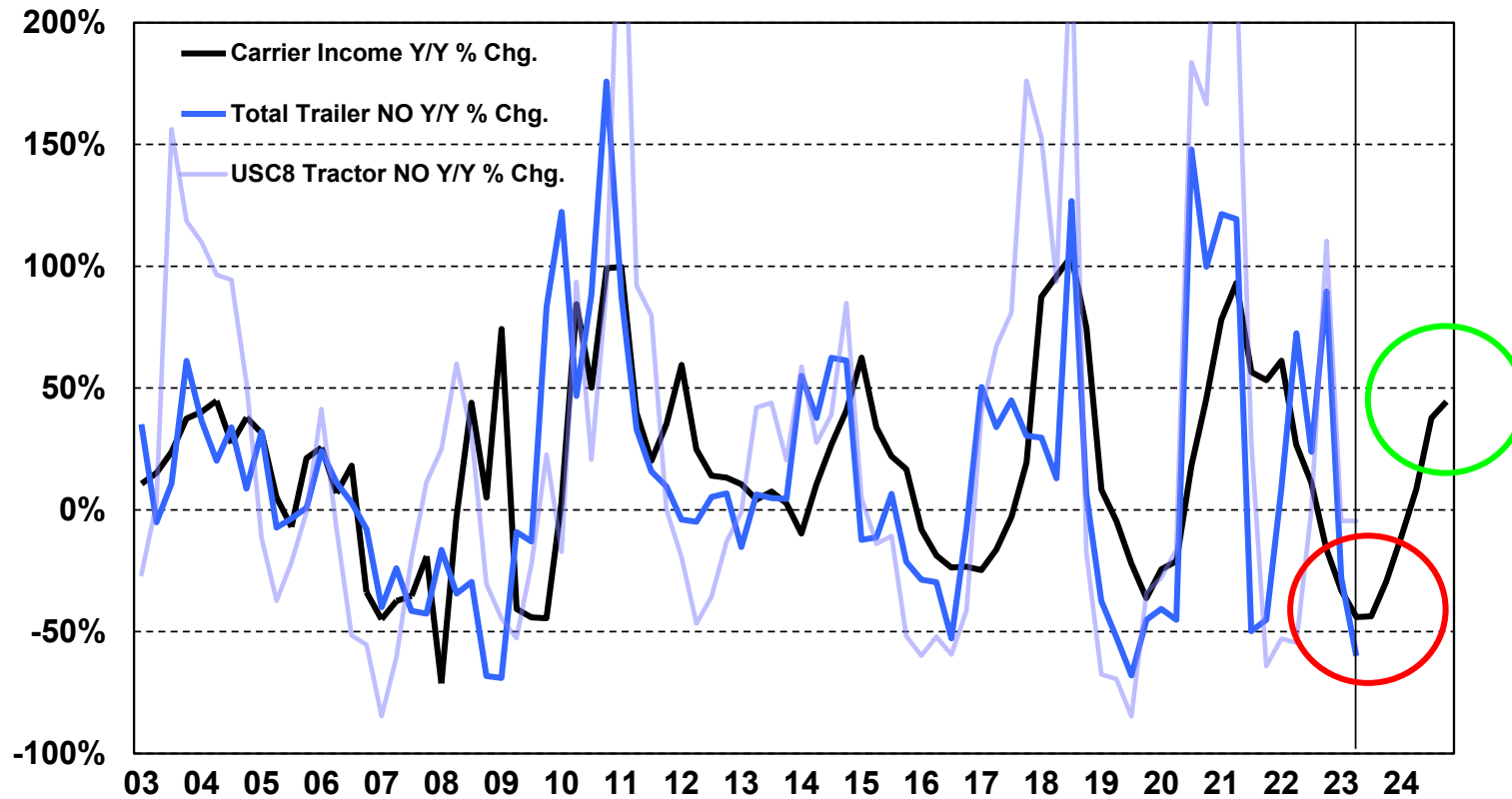
Carrier Profit Margins	
Peaks (Qs)	Troughs (Qs)
Q2'03-Q3'06 (14)	Q4'06-Q4'09 (13)
Q2'14-Q4'15 (6)	Q1'16-'Q3'17 (7)
Q2'18-Q3'19 (6)	Q4'19-Q2'20 (3)
Q3'20-Q1'23 (11)	Q2'23 -

**Down markets clear
excess capacity**

Source: ACT Research Co. © 2023

On the Bottom

TL Carrier Database:
TL Carrier Net Income, Y/Y % Change
Q1'03 - Q4'24



TL Carriers Net Income:

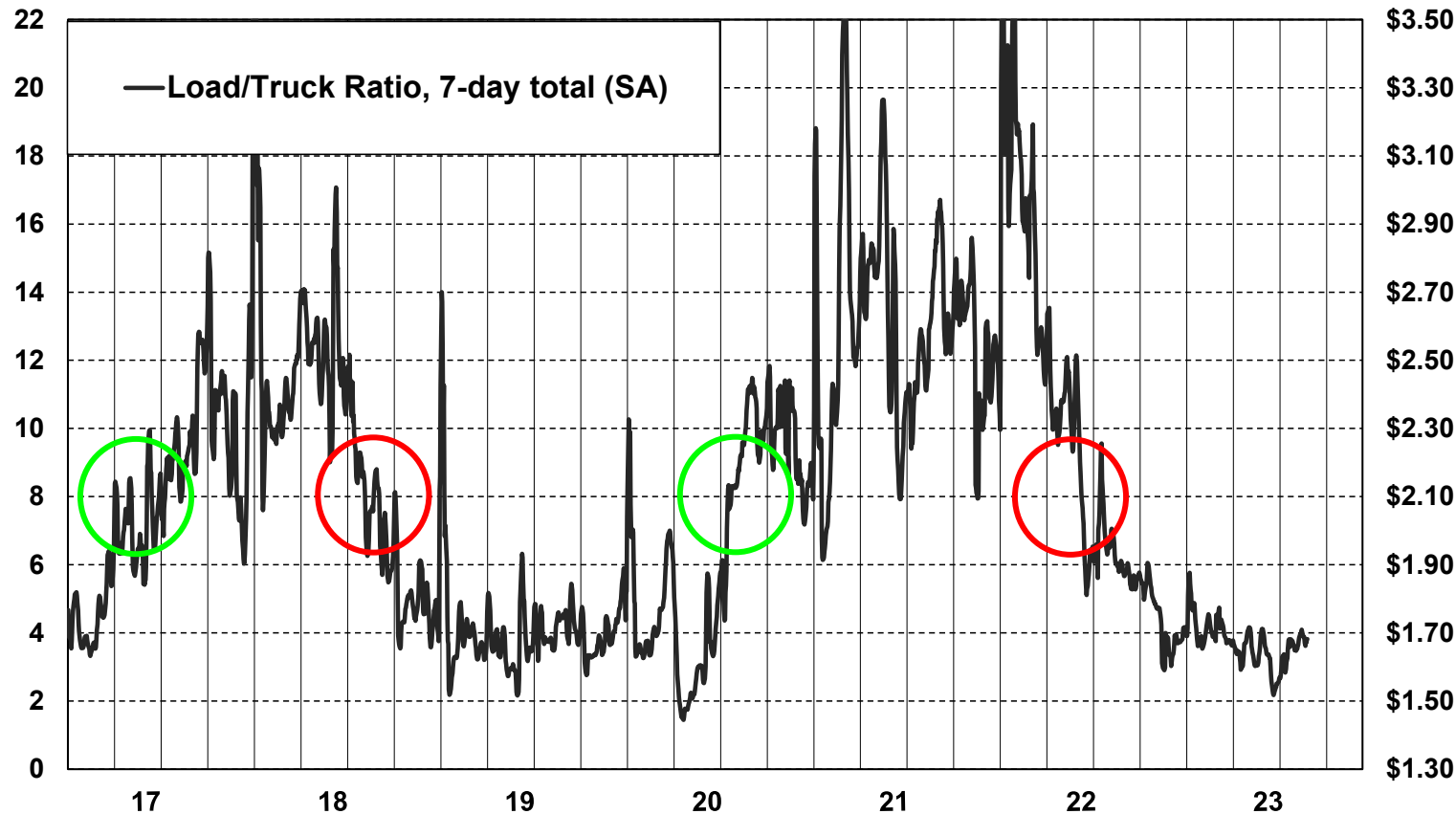
Q2 Actual:	-44% y/y
Q3'23f	-44%
Q4'23f	-29%
Q1'24f	-11%
Q2'24f	+ 9%
Q3'24f	+38%
Q4'24f	+42%

Source: ACT Research Co. © 2023

Supply-Demand Balance Drives Rates

DAT Load/Truck Ratio & Spot Rate

January 2017 - August 17, 2023



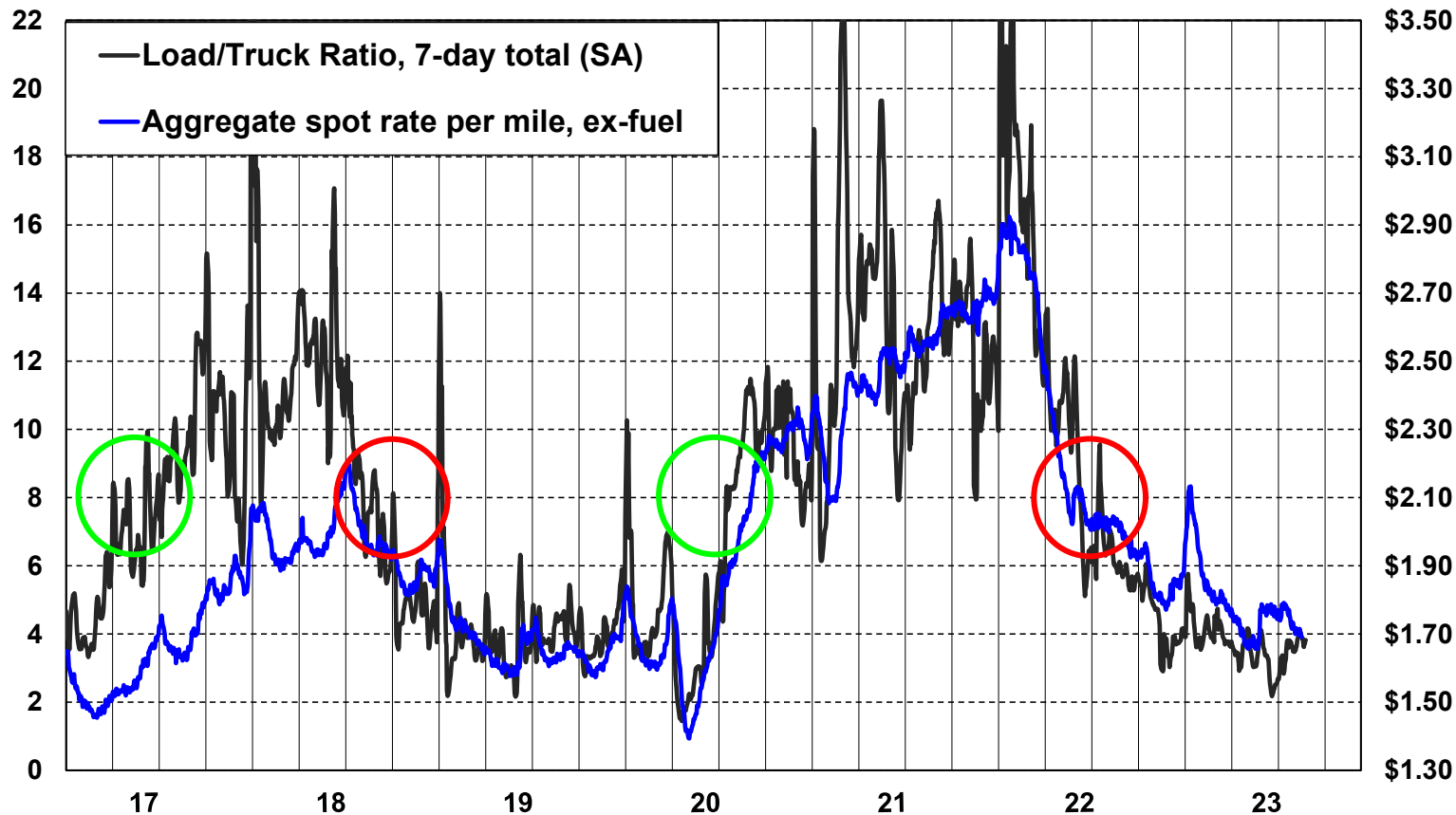
8:1 appears to be the cycle inflector

Source: DAT Freight & Analytics, ACT Research Co. © 2023

Rates are Balance Dependent

DAT Load/Truck Ratio & Spot Rate

January 2017 - August 17, 2023



1 ratio point = ~10¢ in rate

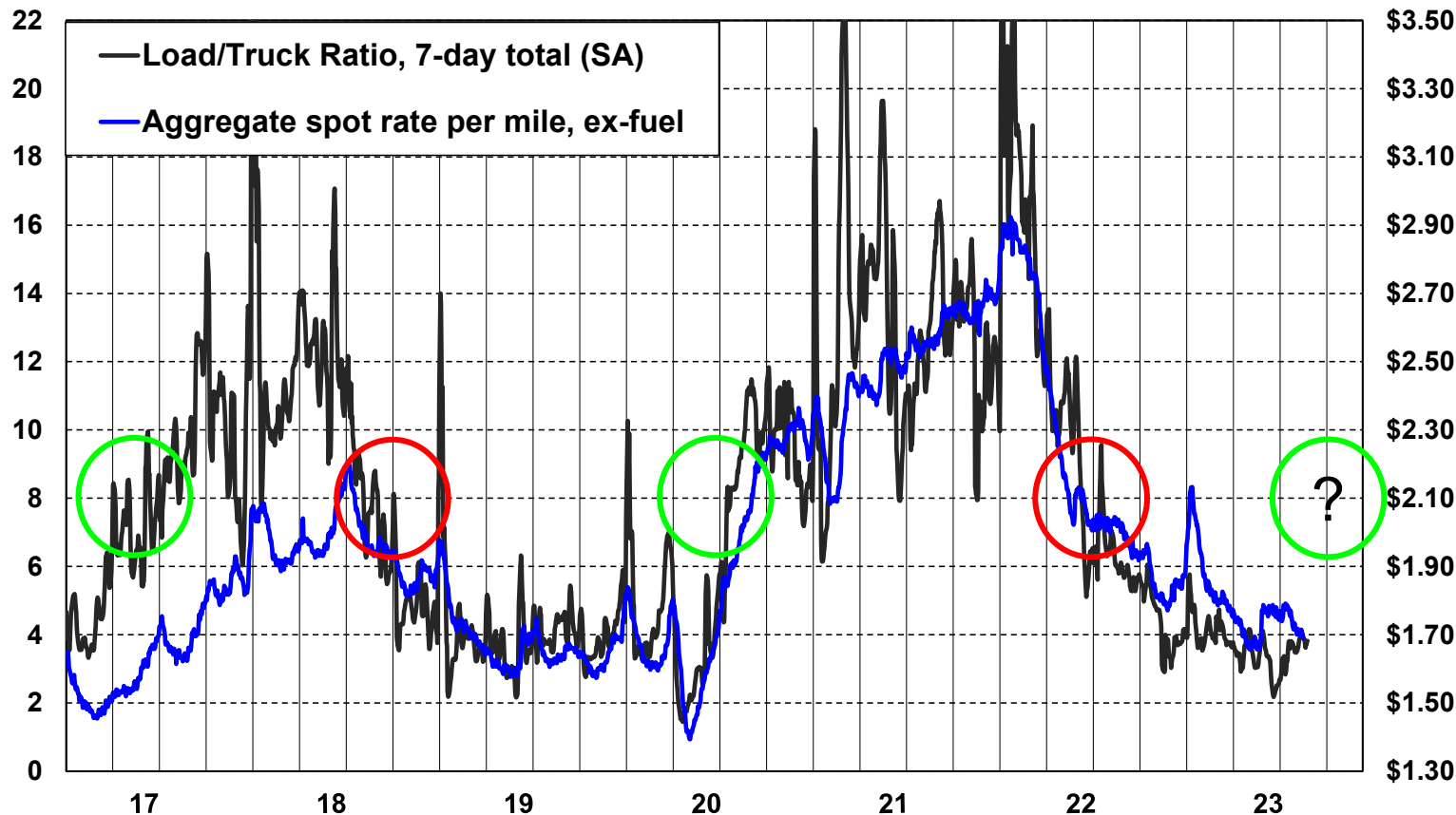
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Rates are Balance Dependent

DAT Load/Truck Ratio & Spot Rate

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1 ratio point = ~10¢ in rate

USC8 Tractor Order Season (Q4+Q1) / (Q4+Q1)

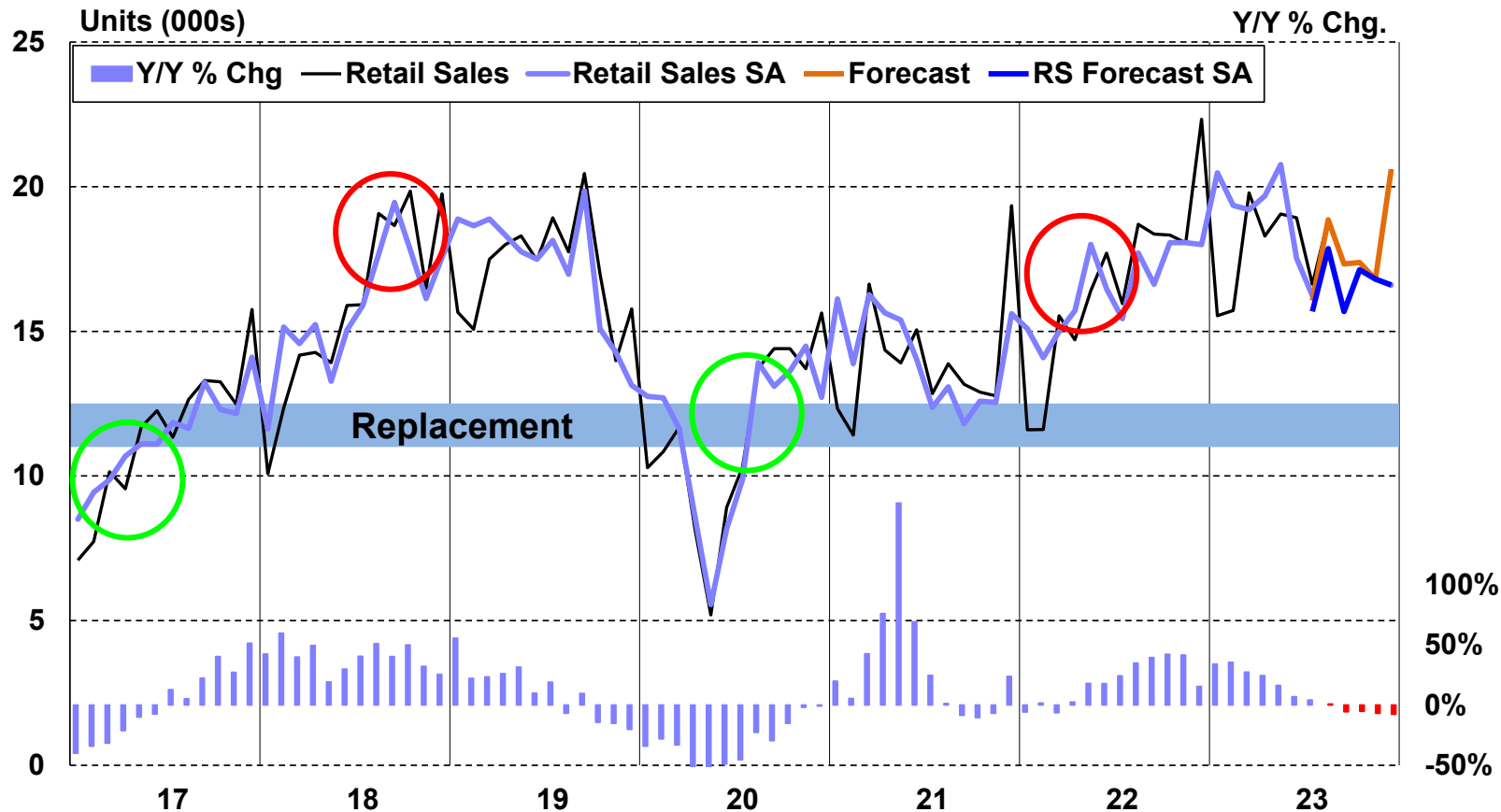
	Current y/y	Next y/y
Q2'17	+58%	+37%
Q3'18	+37%*	-30%
Q3'20	+8%	+111%
Q2'22	+22%*	???

* Pent-up demand, peak rates, carrier profit lag

Capacity Lags the Cycle

U.S. Class 8 Tractors: Retail Sales

January 2017 - December 2023



USC8 Tractor Order Season
(Q4+Q1) / (Q4+Q1)
Current y/y Next y/y

Q2'17	+58%	+37%
Q3'18	+37%*	-30%
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Q2'22	+22%*	???

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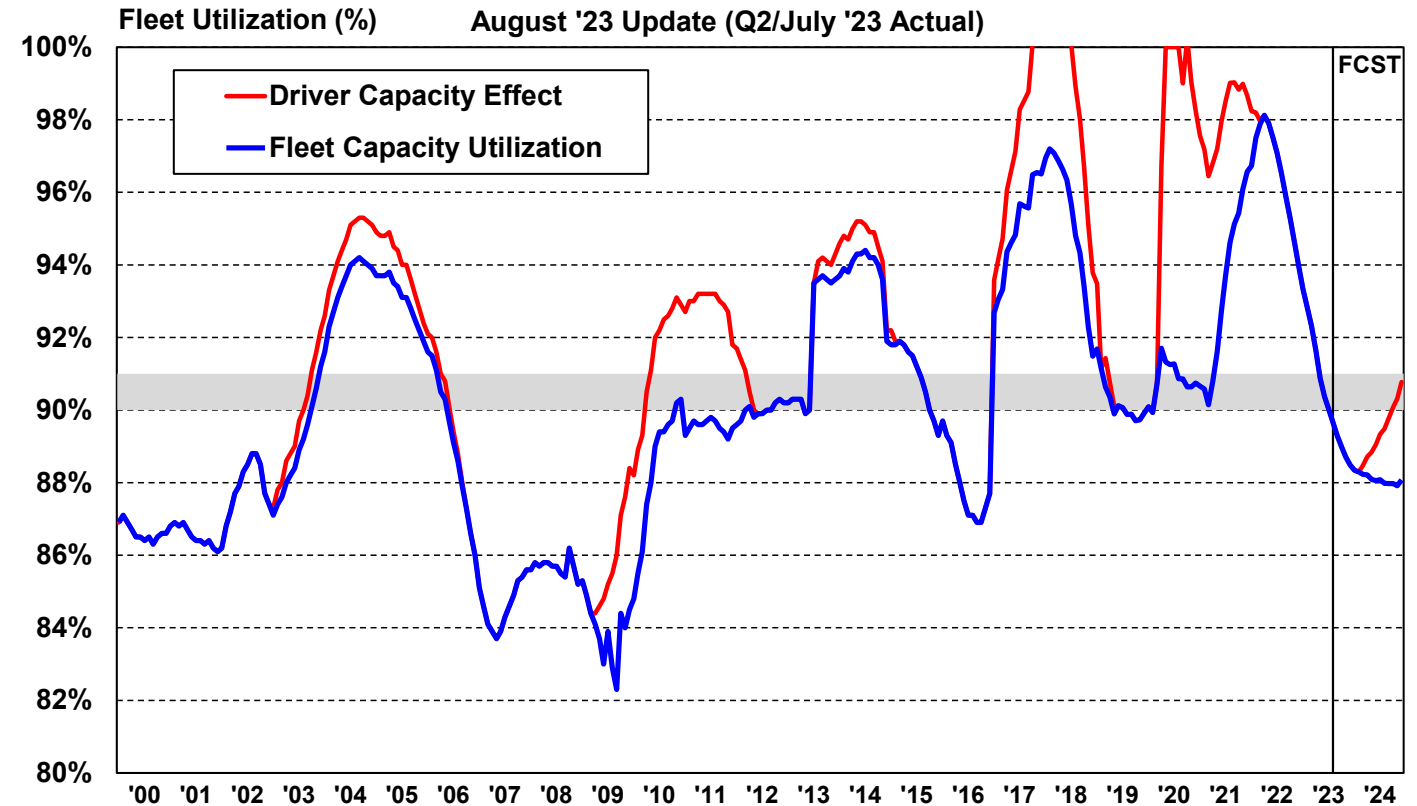
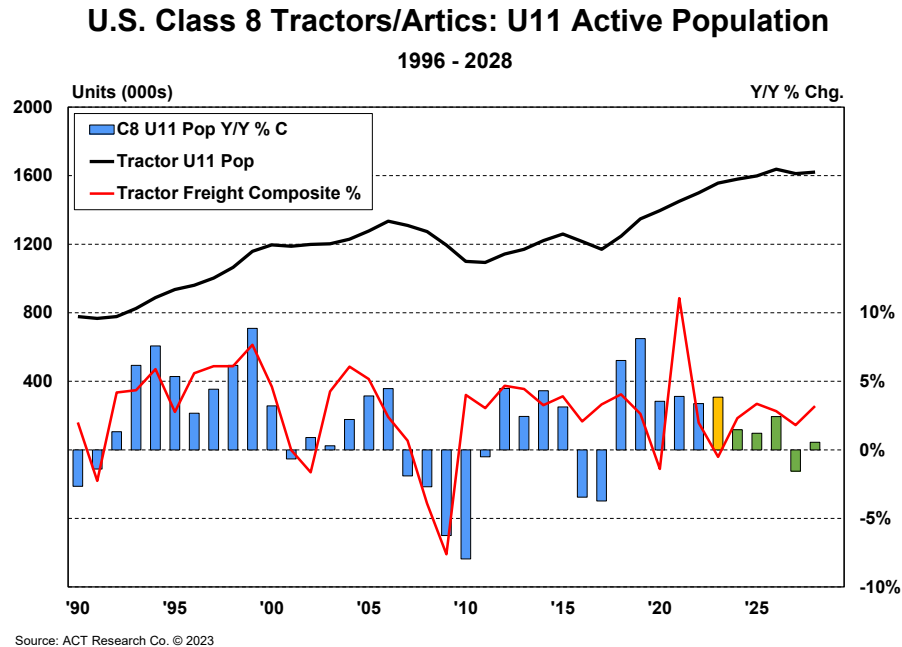
Onboarding Overcapacity

U.S. Class 8

Implied Tractor Fleet Utilization Rate

January 2000 - December 2024F

August '23 Update (Q2/July '23 Actual)



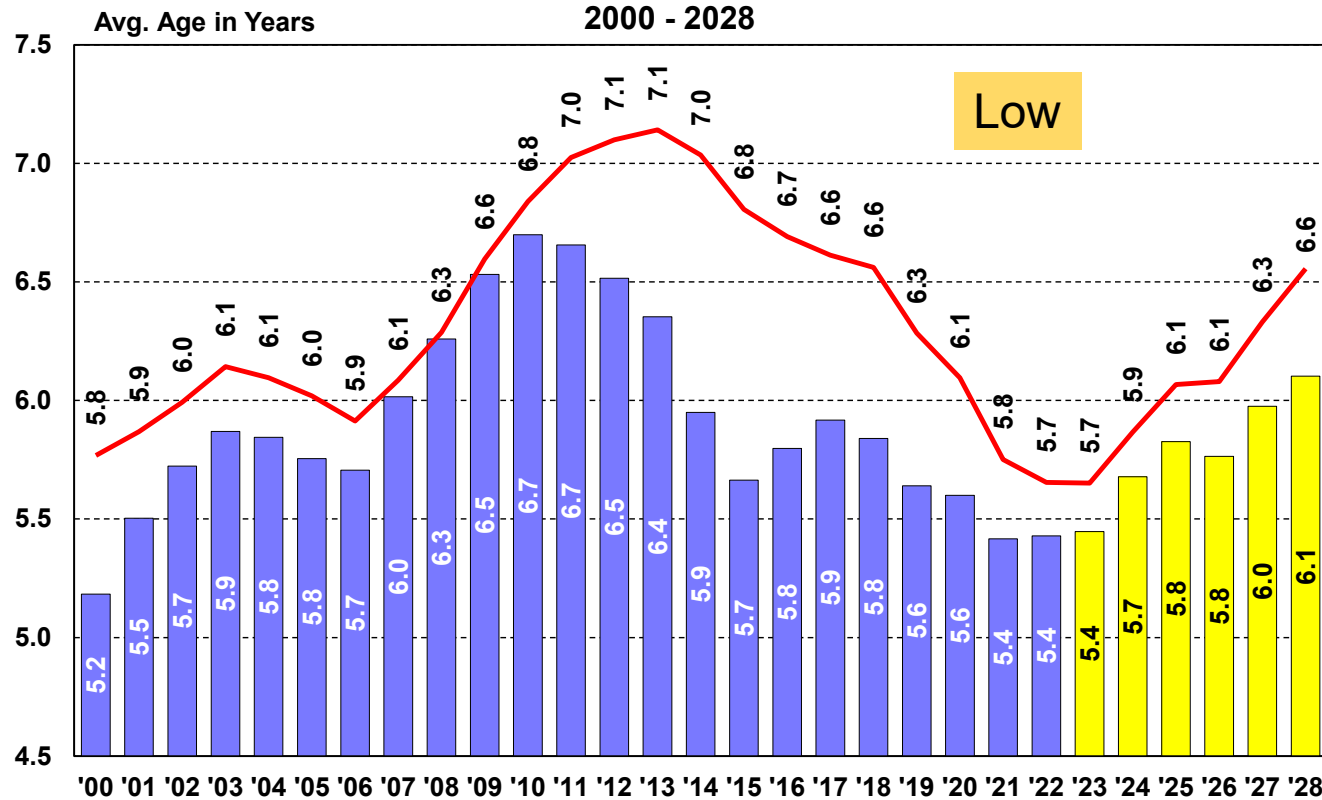
Source: ACT Research Co., LLC: Copyright 2022

POP MODEL OUTPUTS



Pop Model Outputs: Class 8

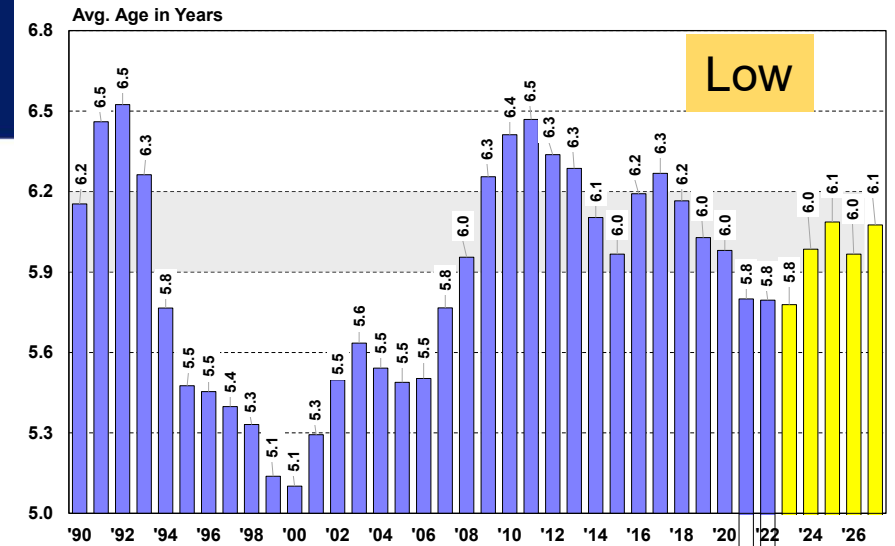
U.S. Class 8 Population Model Outputs: Average Age, Active Population



Source: ACT Research Co. © 2023

Average Age: Canada Class 8 Active Population

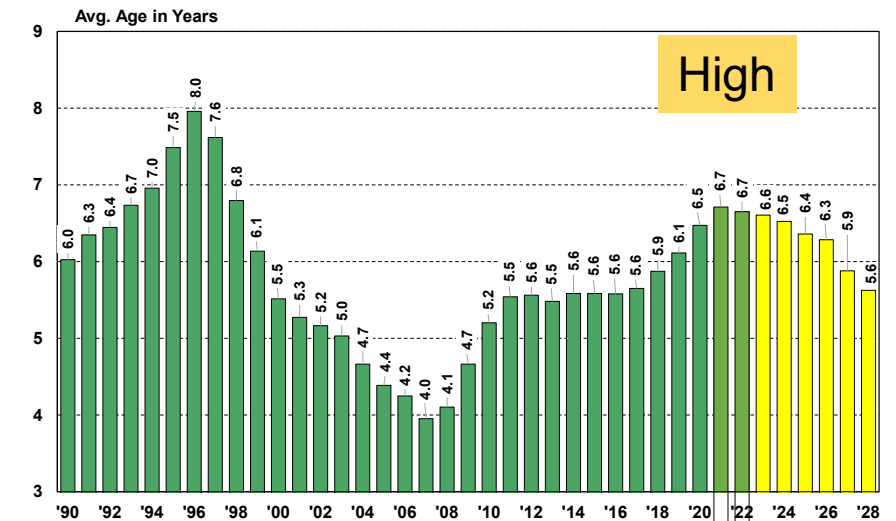
1990 - 2028



Source: ACT Research Co. © 2023

Average Age: Mexico Class 8 Active Population

1990 - 2028

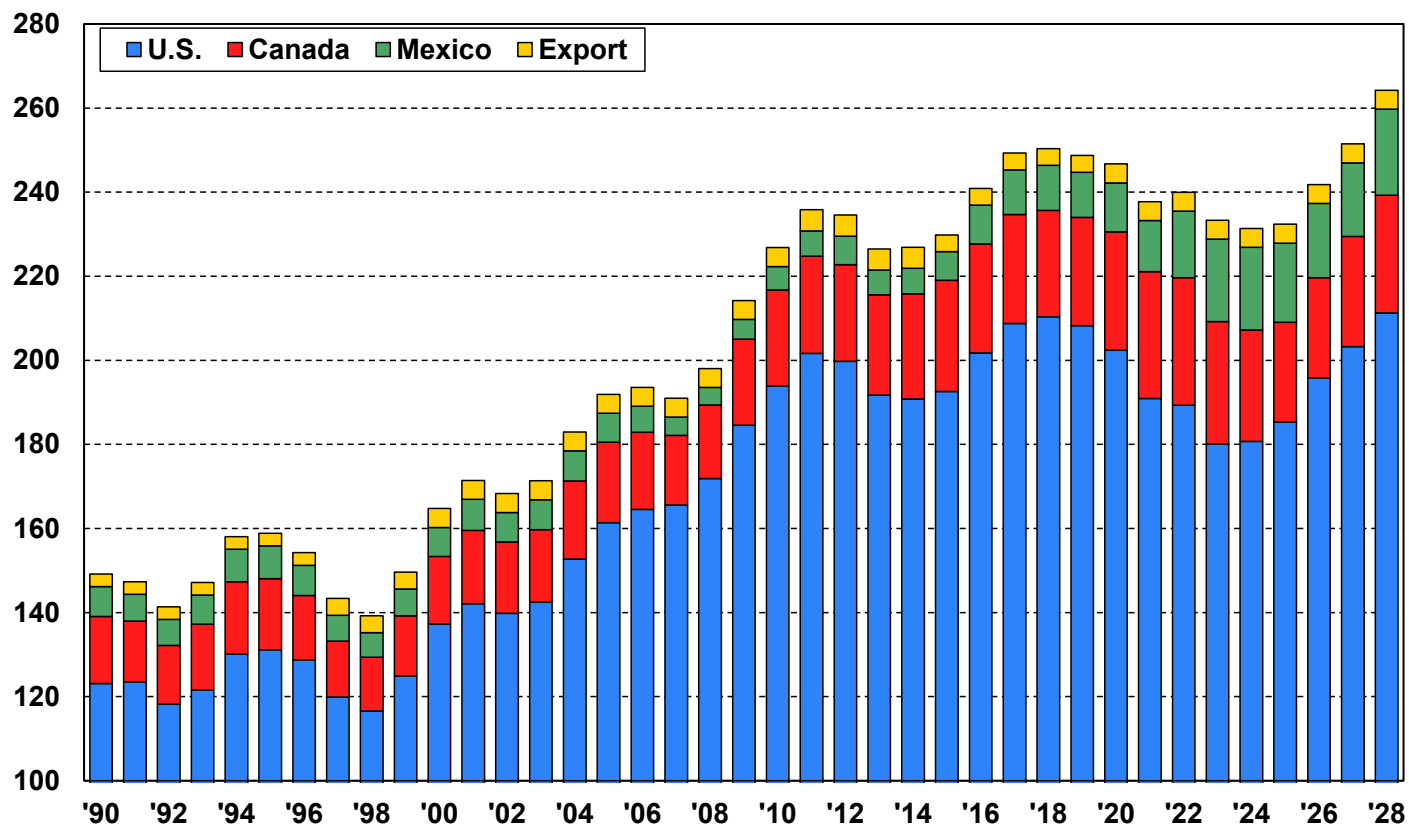


Source: ACT Research Co. © 2023

Pop Model Outputs: Class 8

Replacement: NA Class 8 Active Stock

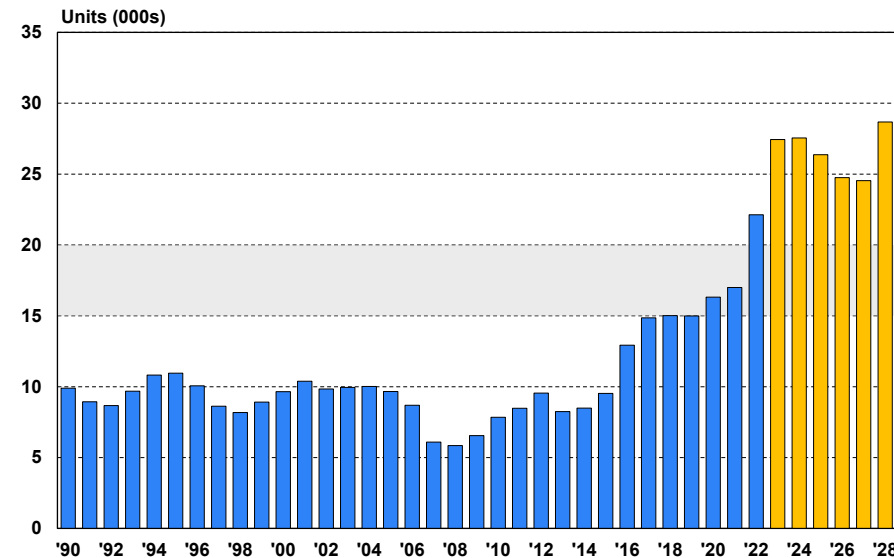
1990 - 2028



Source: ACT Research Co. © 2023

Mexico Class 8: Active Stock Replacement

1990 - 2028



Source: ACT Research Co. © 2023

Pent-Up Demand Analysis: Class 8 Tractor

Pent Up U.S. Tractor Demand: 2022	
Pent-up demand 01-01-2022	110,000
ACT Tractor Freight Composite	1.96%
Units per ppt of activity	5,000
Demand due to freight growth	9,800
Other demand factors*	20,000
Replacement Demand	145,000
Modeled Demand (Replacement + Freight)	174,800
Actual Retail Sales	199,300
Pent-up demand impact	(24,500)
Year-ending pent-up demand	85,500

Pent Up U.S. Tractor Demand: 2023	
Pent-up demand 01-01-2023	85,500
ACT Tractor Freight Composite	-0.54%
Units per ppt of activity	5,000
Demand due to freight growth	(2,700)
Other demand factors*	(10,000)
Replacement Demand	144,000
Modeled Demand (Replacement + Freight)	131,300
Actual/Forecast Retail Sales	215,100
Pent-up demand impact	(83,800)
Year-ending pent-up demand	1,700

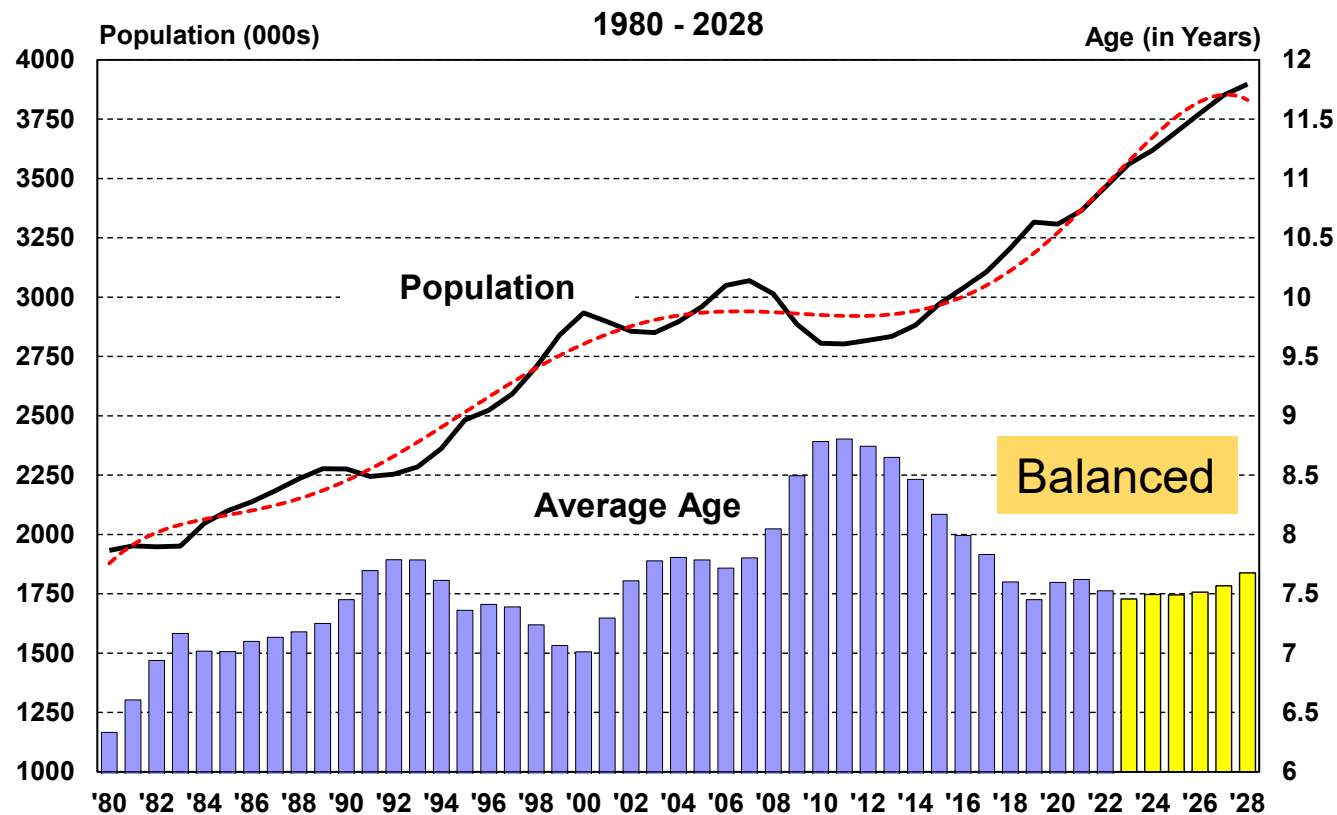
Pent Up U.S. Tractor Demand: 2024	
Pent-up demand 01-01-2024	1,700
ACT Tractor Freight Composite	2.26%
Units per ppt of activity	5,000
Demand due to freight growth	11,300
Other demand factors*	15,000
Replacement Demand	143,000
Modeled Demand (Replacement + Freight)	169,300
Actual/Forecast Retail Sales	169,500
Pent-up demand impact	(200)
Year-ending pent-up demand	1,500

Other demand factors include carrier profits, used equipment values and productivity impacts



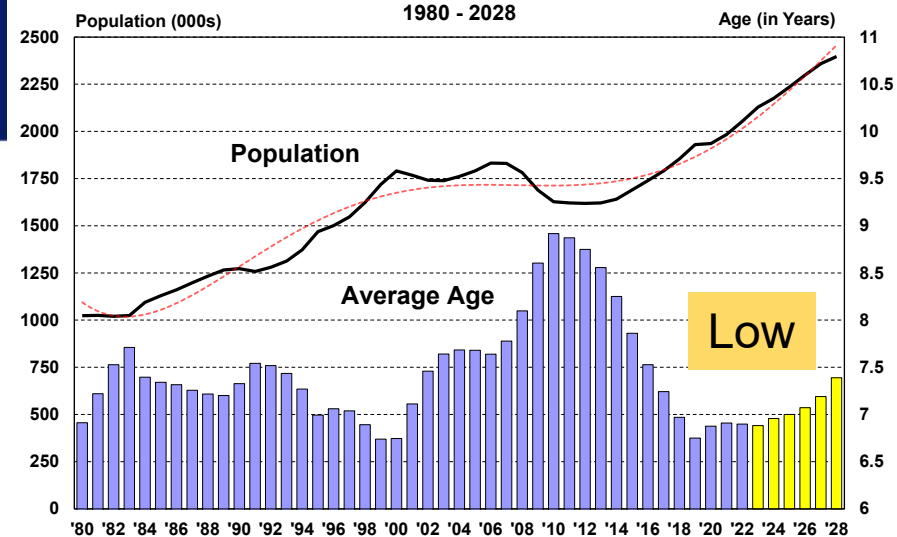
Pop Model Outputs: Trailer

**Total Trailers:
Population & Average Age**



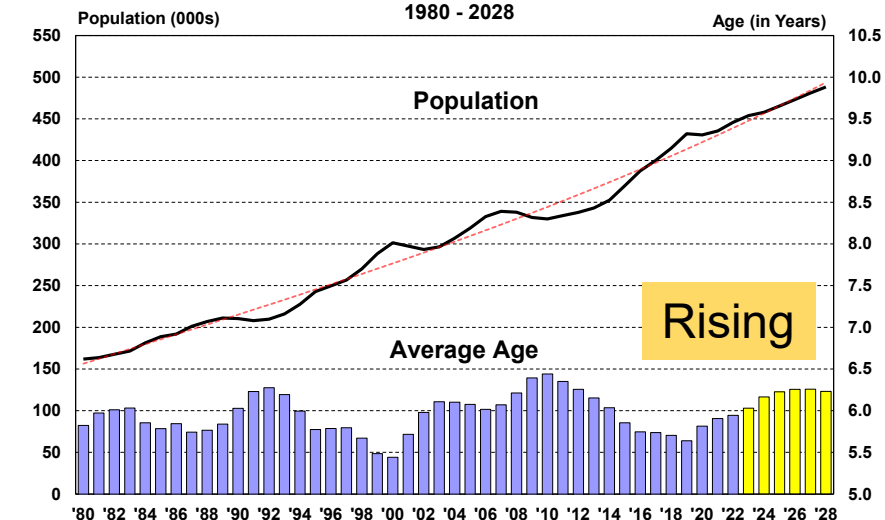
Source: ACT Research Co. © 2023

**Dry Vans:
Population & Average Age**



Source: ACT Research Co. © 2023

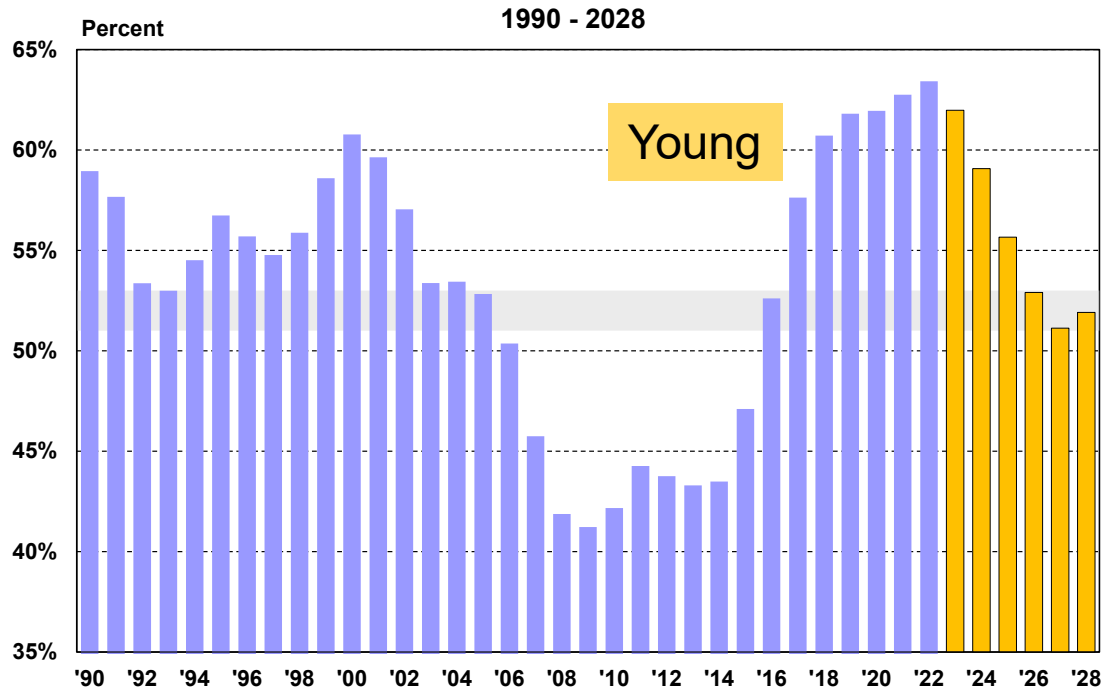
**Reefer Vans:
Population & Average Age**



Source: ACT Research Co. © 2023

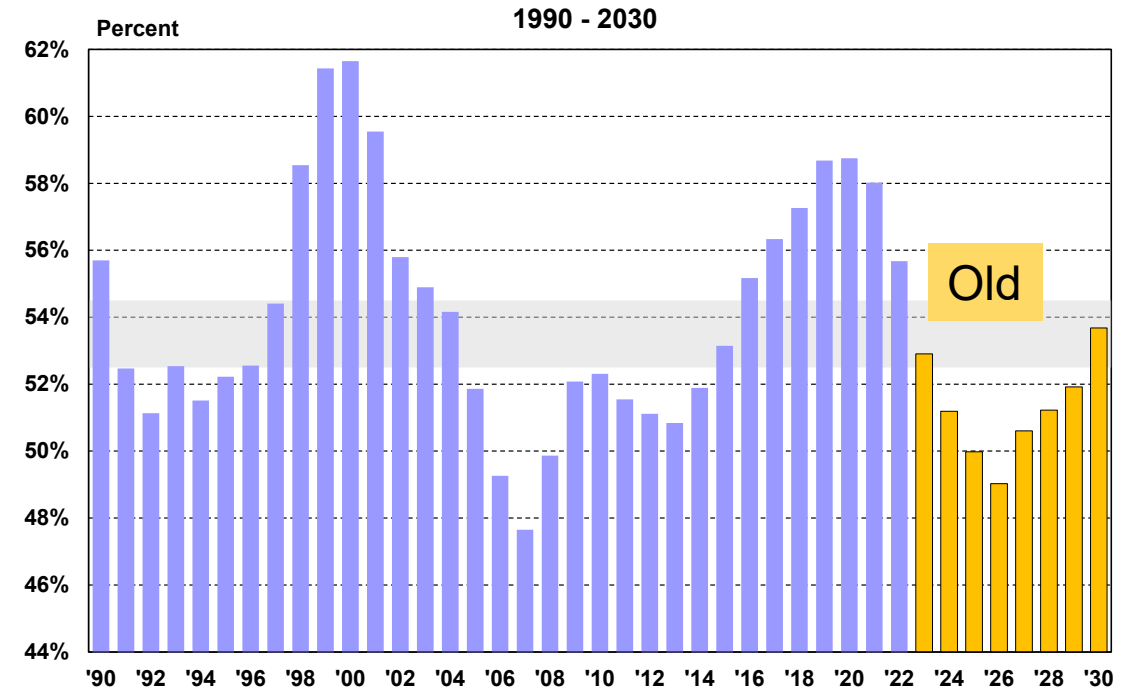
Pop Model Outputs: Trailer

Dry Van Fleet Quality:
Past 8 Years Build/Past 16 Years Build



Source: ACT Research Co. © 2023

Reefer Vans:
Past 7 Years Build/Past 14 Years Build

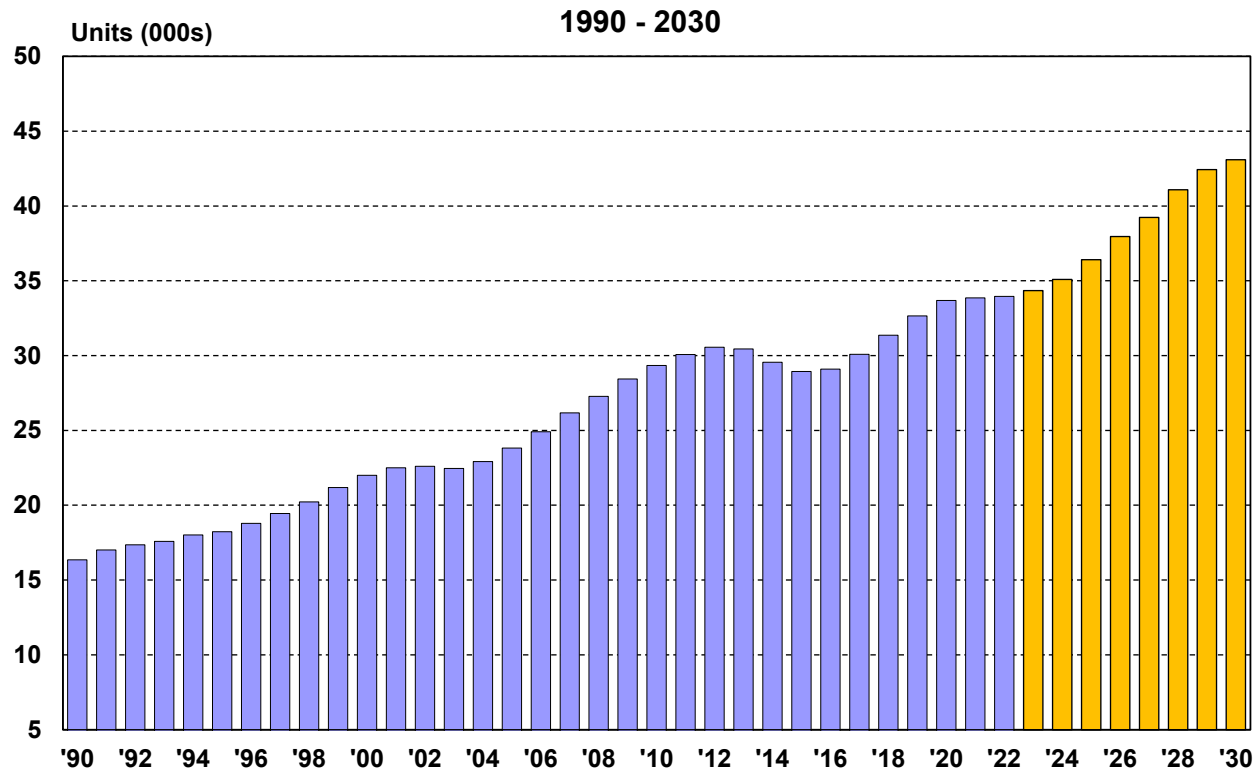


Source: ACT Research Co. © 2023

Fleet age supportive to the forecast upside as
FSMA demand surge ('14-18) ages out

Pop Model Outputs: Trailer

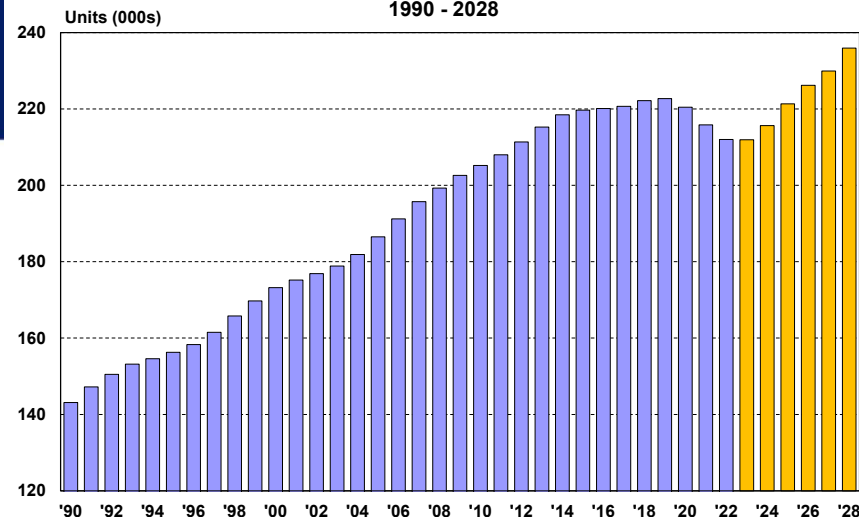
Reefer Vans: Scrappage/Underlying Replacement Demand



Source: ACT Research Co. © 2023

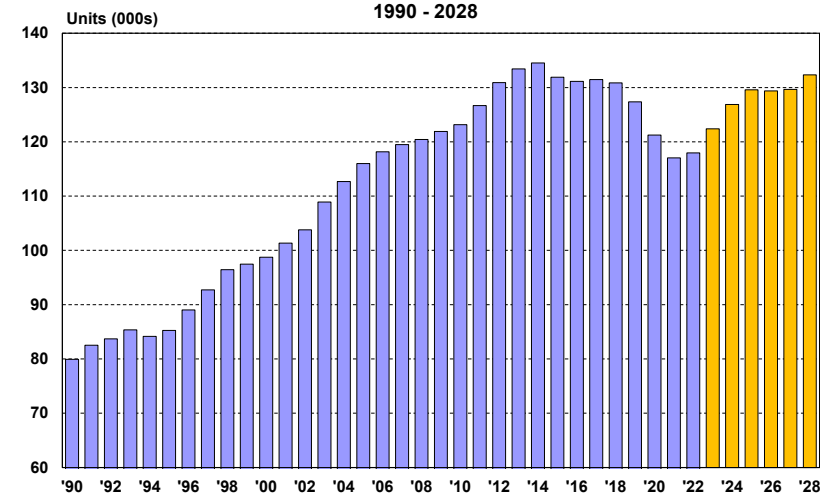
Very supportive underlying fundamentals
as FSMA demand surge ages out

Total Trailers: Underlying Replacement Demand



Source: ACT Research Co. © 2023

Dry Vans: Scrappage/Underlying Replacement Demand

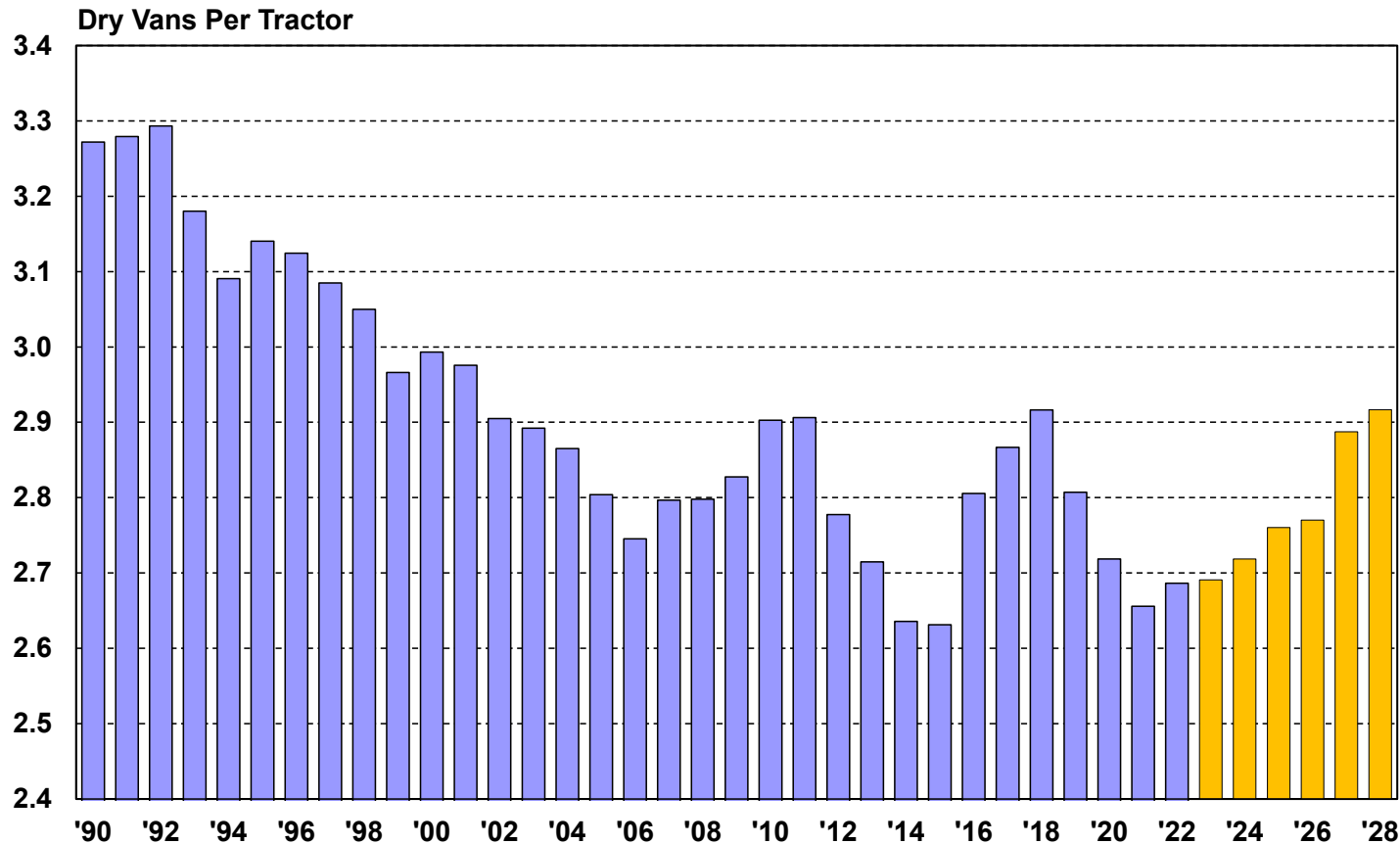


Source: ACT Research Co. © 2023

Pop Model Outputs: Dry Van:C8 Tractor Ratio

U.S. Dry Vans to Adjusted Tractor Population

1990 - 2028



Source: ACT Research Co. © 2023

“Power-only brokerage”

Fleets plan on deploying drop & hook into spot market freight

Ratio bump in '27 stems for lopsided deployment of capital towards trailers post-EPA'27

Pent-Up Demand Analysis: Dry Van

Pent Up U.S. Van Demand: 2022	
Pent-up demand 01-01-2022	135,000
ACT Dry Van Freight Composite	5.18%
Units per ppt of activity	6,000
Demand due to freight growth	31,080
TRLR:TK Ratio Change (1bp = 7.3k)	21,900
Replacement Demand	118,000
Modeled Demand (Replacement + Freight)	170,980
Actual Retail Sales	188,400
Pent-up demand impact	(17,420)
Year-ending pent-up demand	117,580

Pent Up U.S. Van Demand: 2023	
Pent-up demand 01-01-2023	117,580
ACT Dry Van Freight Composite	-3.43%
Units per ppt of activity	6,000
Demand due to freight growth	(20,580)
TRLR:TK Ratio Change (1bp = 7.3k)	(7,300)
Replacement Demand	122,000
Modeled Demand (Replacement + Freight)	94,120
Actual/Forecast Retail Sales	197,000
Pent-up demand impact	(102,880)
Year-ending pent-up demand	14,700

Pent Up U.S. Van Demand: 2024	
Pent-up demand 01-01-2024	14,700
ACT Dry Van Freight Composite	0.90%
Units per ppt of activity	6,000
Demand due to freight growth	5,400
TRLR:TK Ratio Change (1bp = 7.3k)	14,600
Replacement Demand	127,000
Modeled Demand (Replacement + Freight)	147,000
Actual/Forecast Retail Sales	173,600
Pent-up demand impact	(26,600)
Year-ending pent-up demand	(11,900)



Pent-Up Demand Analysis: Reefer Van

Pent Up U.S. Reefer Van Demand: 2022	
Pent-up demand 01-01-2022	16,500
ACT Reefer Van Freight Composite	5.65%
Units per ppt of activity	2,000
Demand due to freight growth	11,300
Replacement Demand	34,000
Modeled Demand (Replacement + Freight)	45,300
Actual Production	44,300
Pent-up demand impact	1,000
Year-ending pent-up demand	17,500

Pent Up U.S. Reefer Van Demand: 2023	
Pent-up demand 01-01-2023	17,500
ACT Reefer Van Freight Composite	-4.04%
Units per ppt of activity	2,000
Demand due to freight growth	(8,080)
Replacement Demand	34,500
Modeled Demand (Replacement + Freight)	26,420
Actual/Forecast Production	42,500
Pent-up demand impact	(16,080)
Year-ending pent-up demand	1,420

Pent Up U.S. Reefer Van Demand: 2024	
Pent-up demand 01-01-2024	1,420
ACT Reefer Van Freight Composite	1.95%
Units per ppt of activity	2,000
Demand due to freight growth	3,900
Replacement Demand	35,100
Modeled Demand (Replacement + Freight)	39,000
Actual/Forecast Production	41,000
Pent-up demand impact	(2,000)
Year-ending pent-up demand	(580)



TRAILERS



CURRENT STATE OF THE INDUSTRY: AGGREGATE

Our key takeaway from July's data remains the same as in June: The clouds on the horizon bear watching, while simultaneously recognizing this is the seasonally weakest time of the year for forward-looking metrics.



OEM DISCUSSIONS: JULY & AUGUST

Step Right Up



- Softening Demand
- Cautiously Optimistic about '24
- Supply Normalizing
- Contingency Management
- Building Supply Resiliency
- Build Improving
- 2023 Build Slots Full
- 2024 Order Books Opening
- Cancels Moderating














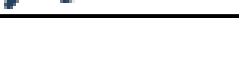
OEM DISCUSSIONS: APRIL RECAP

Weathering the Storm

- Strong Demand
- Supply Constraints
- Bottlenecks Easing
- Build Improving
- Closed Orderboards
- Cancel Opportunities



CURRENT STATE OF THE INDUSTRY: AGGREGATE

Total Trailers				
Category	Actual		Seasonally Adj.	
	Jul-23	Last 13 Mo	Jul-23	Last 13 Mo
Backlog	157,303		173,046	
Build	24,669		25,003	
Inventory	32,456		29,286	
New Orders	12,917		19,730	
Cancellations	2,743		3,063	
Net Orders	10,174		15,687	
Shipments	24,564		25,340	

Source: ACT Research © 2023 with all rights reserved

- Demand Softening
 - Seasonal Slowing
 - Some '24 Books Open
- Build Strong
- Backlogs Lower
- Inventory Higher
- Cancellations Elevated



US TRAILER ACTIVITY: AT A GLANCE Y/Y

Then (Jul '22)

1H'23 Books Full

BL/BU 7.6 / SA 8.4

Cancel Virtually Nonexistent 0.7%

Now (Jul '23)

~30% 1H'24 Open, ~17% 2H'24 Open

BL/BU 6.4 / SA 6.9

Cancel Grabbing Headlines 1.7% (+)

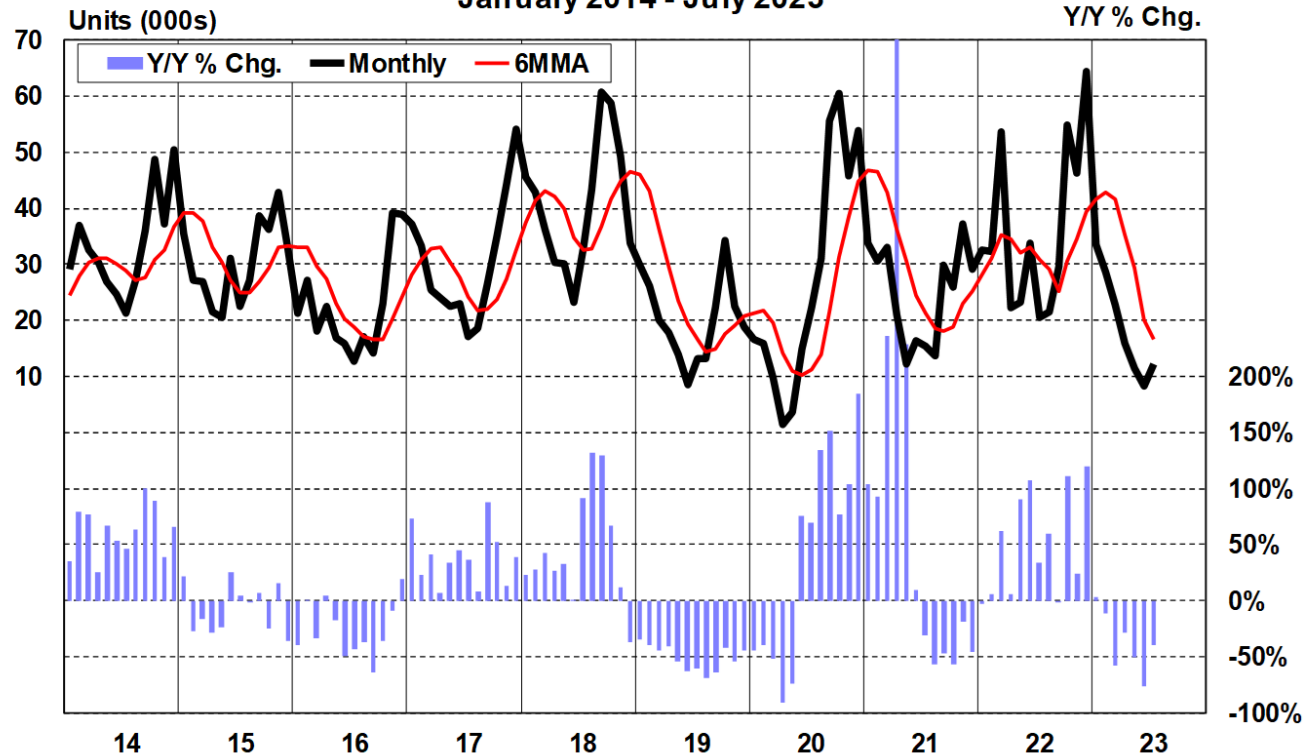
July 2023	Dry Van	Reefers	Flatbed	Dump	Liq Tank	Bulk Tank
Backlog	-15%	-21%	-15%	-16%	+1%	+42%
Build	+11%	+4%	-15%	-3%	+10%	+17%
Inventory	+28%	-6%	+23%	+1%	+3%	+3%
New Orders	-36%	-33%	-41%	-8%	-32%	-40%
Cancel (% of BL)	1.9%	1.0%	3.8%	0.8%	0.9%	0.7%
Net Orders	-51%	-27%	-55%	-4%	-39%	-43%
Shipments	+18%	+1%	-12%	-1%	+13%	+14%

Trailer Orders

Trailer Industry Net Orders

Year Over Year Percent Change

January 2014 - July 2023

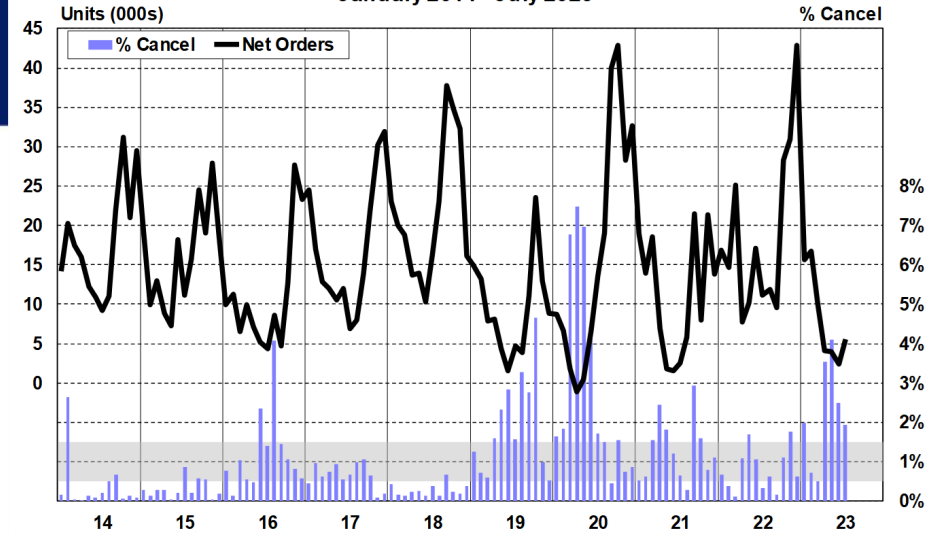


Source: ACT Research Co. © 2023

Dry Van Net Orders & Cancellation Rate

Expressed as a Percentage of Backlog

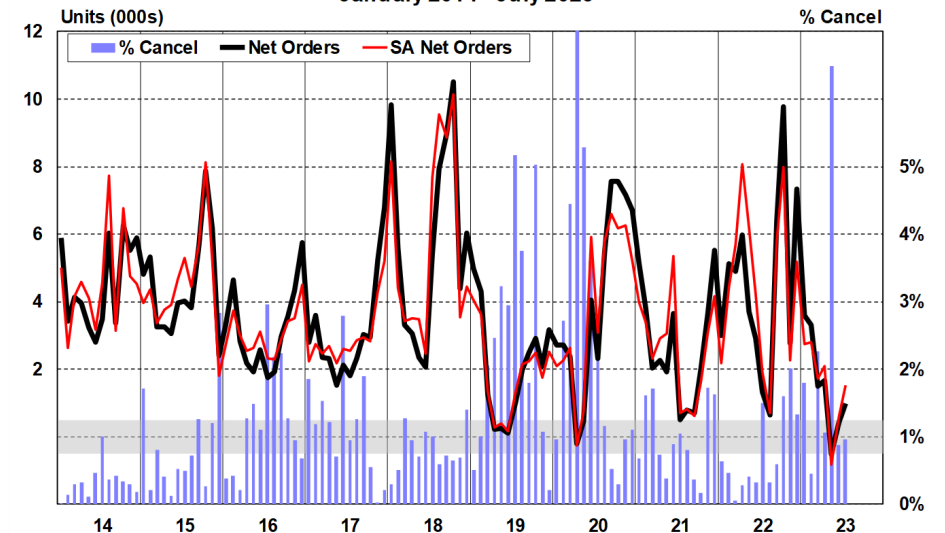
January 2014 - July 2023



Reefer Van Net Orders & Cancellation Rate

Expressed as a percentage of Backlog

January 2014 - July 2023

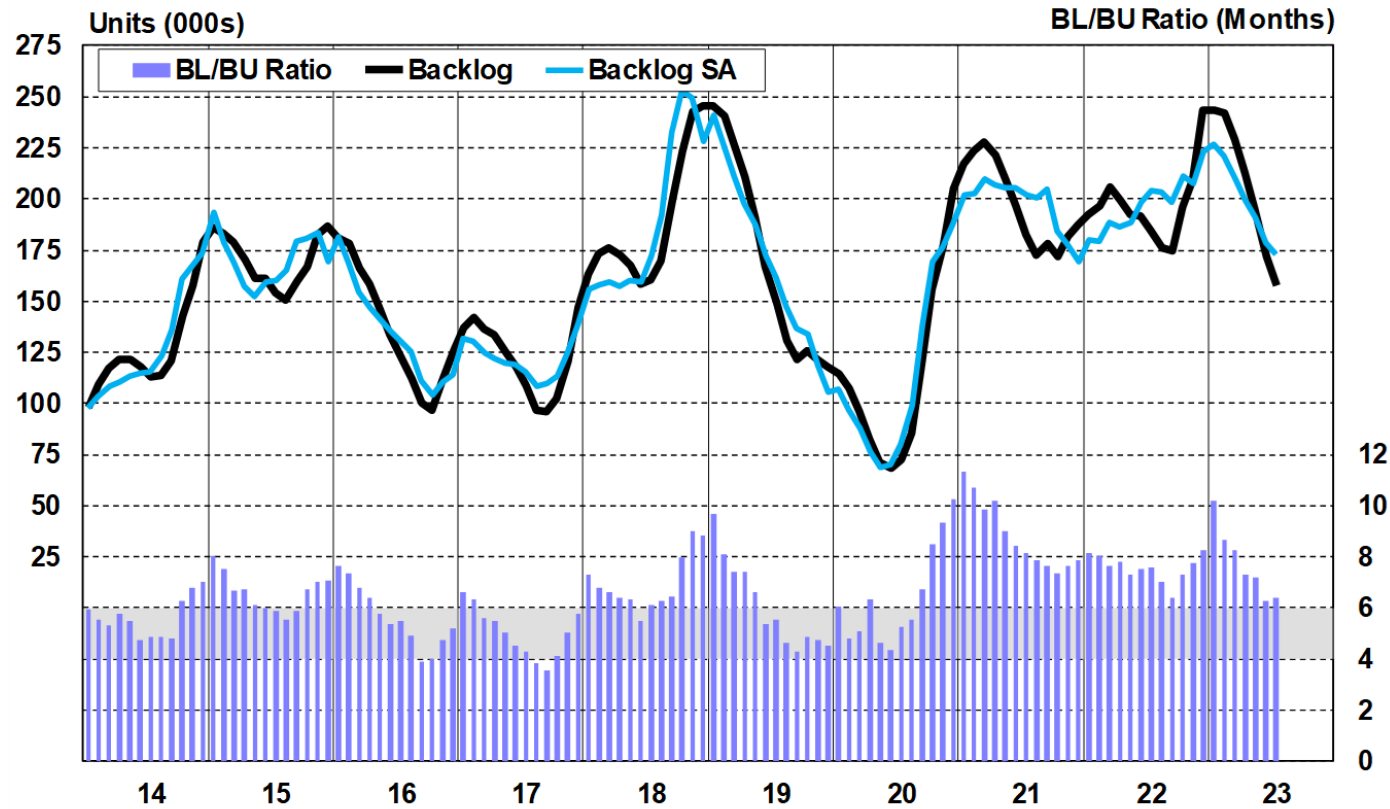


Source: ACT Research Co. © 2023

Trailer Backlogs

Total Trailers Backlog & Backlog/Build Ratio

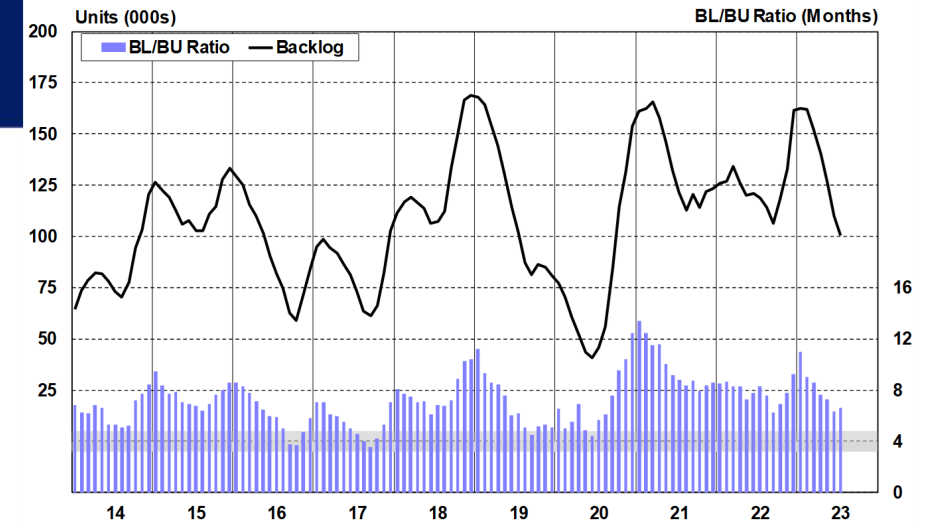
January 2014 - July 2023



Source: ACT Research Co. © 2023

Dry Van Backlog & Backlog/Build Ratio

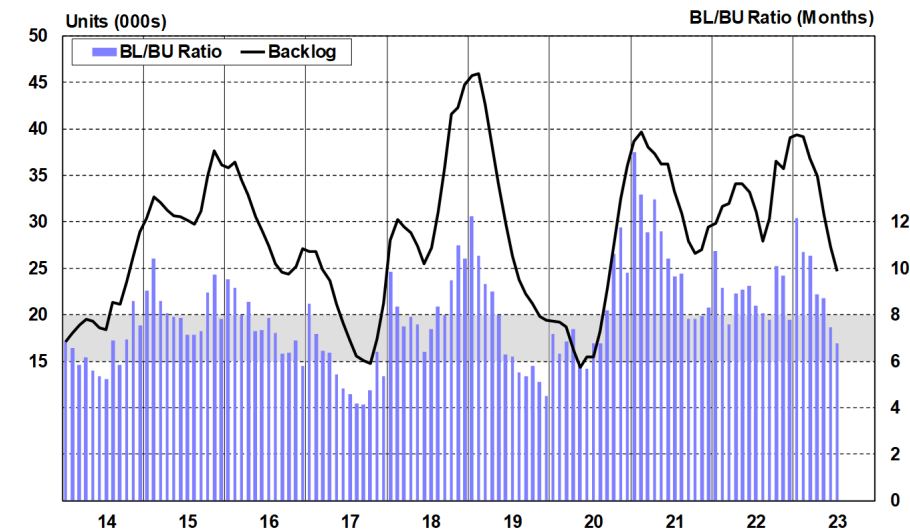
January 2014 - July 2023



Source: ACT Research Co. © 2023

Reefer Van Backlog & Backlog/Build Ratio

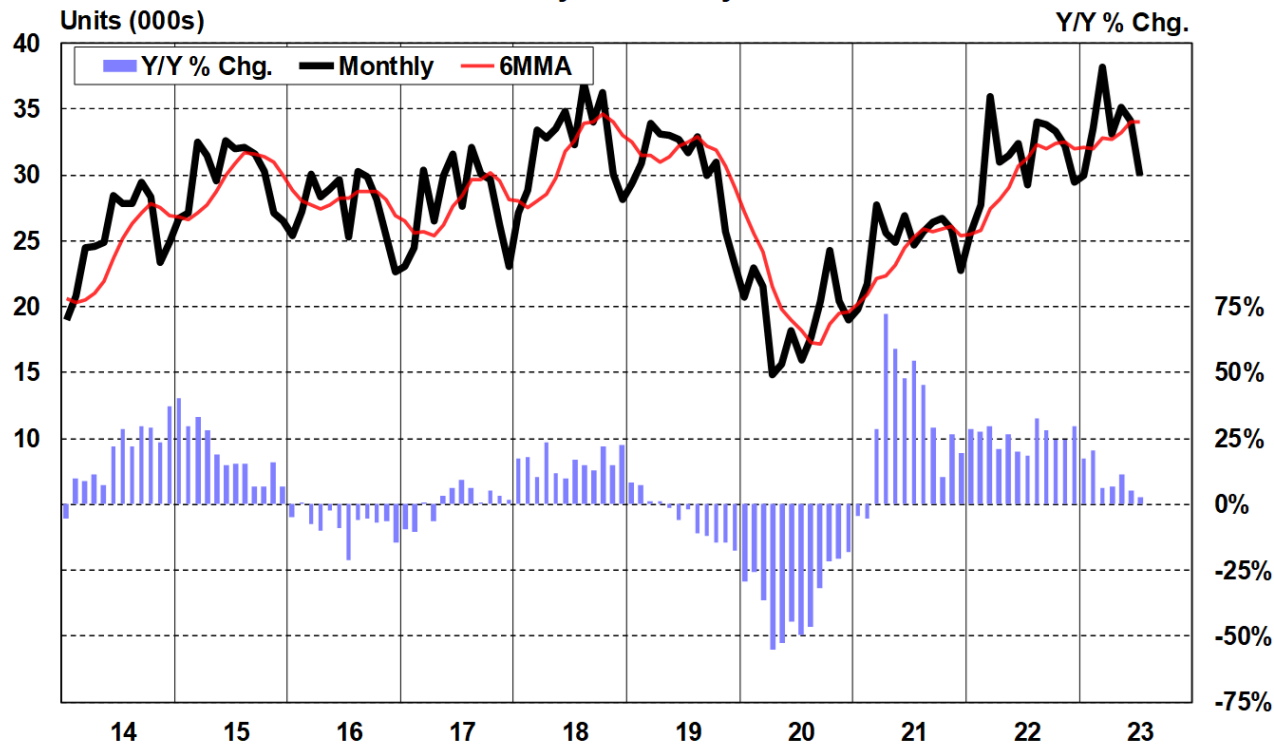
January 2014 - July 2023



Source: ACT Research Co. © 2023

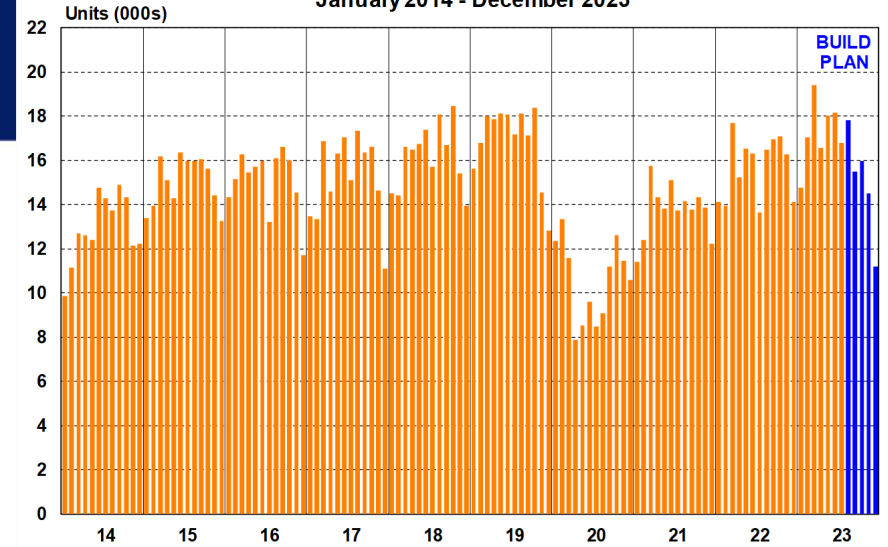
Trailer Build

Trailer Industry Build
Year Over Year Percent Change
January 2014 - July 2023



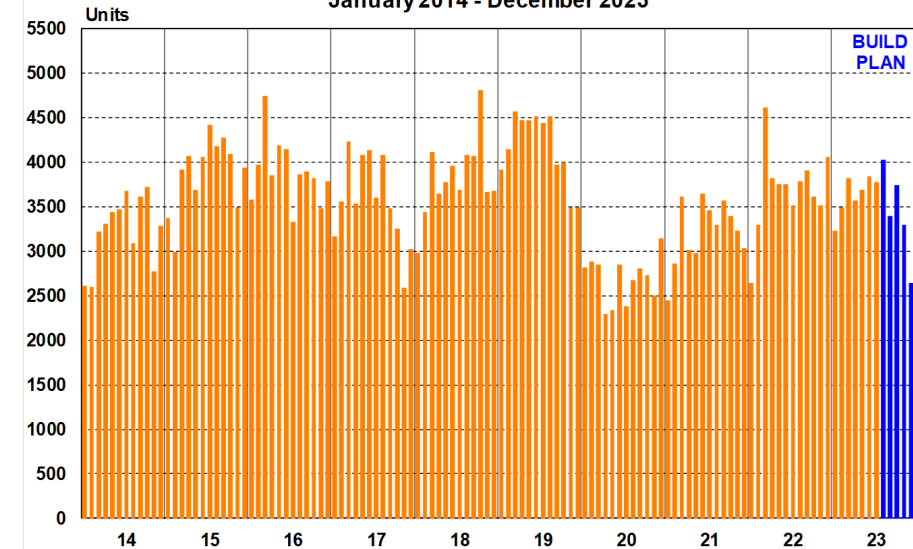
Source: ACT Research Co. © 2023

Dry Van Build
January 2014 - December 2023



Source: ACT Research Co. © 2023

Reefer Van Build
January 2014 - December 2023



Source: ACT Research Co. © 2023

Very Soft Landing

	2021	2022	2023f	2024f	2025f	2026f	2027f	2028f
Production (000s)								
US Trailer	268k	308	313	280	304	309	309	290
YY%Δ	30%	15%	1%	-10%	8%	2%	0%	-6%
Dry Van	165.1	188.4	197.0	173.6	190.0	192.5	190.0	170.0
YY%Δ	30%	14%	5%	-12%	9%	1%	-1%	-11%
Reefer Van	38.6	44.3	42.5	39.0	44.0	45.7	47.0	48.4
YY%Δ	20%	15%	-4%	-8%	13%	4%	3%	3%
Flats	23.6	29.4	26.5	24.5	25.0	26.0	26.0	25.0
YY%Δ	65%	24%	-10%	-8%	2%	4%	0%	5%
US Total Axled	298	376	375	319	351	355	352	336
YY%Δ	29%	26%	-0%	-15%	10%	1%	-1%	-5%



CURRENT STATE OF THE TRAILER INDUSTRY: SUMMARY

- **2024 Demand**
 - Order season dependent
 - Cancellations should moderate from here
 - Backlogs: Still elevated, but need filling
 - Builds: Build rates still improving
 - Inventories: Elevated
- **Supply Chain**
 - Materials and Commodities: Lumpy
 - Disruptions: Fewer
 - Labor: Better
 - Cost Pressures: Easing



CLASS 8



Heavy-Duty Overview

Market supports in 2023: carrier \$, pent-up demand, CARB pull

- Topside supply constraints persist
- Pent-up demand largely sated by YE2023
- Falling carrier profits through Q1'24
- Class 8: Potential prebuying ahead of CARB Clean Truck

Coming downturn: Unavoidable, healthy, shallow

- Relatively lean inventory dampens end-of-cycle headwinds
- Less-than-usual carrier overbuying, but overbuying
- Trough profitability for carriers higher
- OEMs already pushing EPA 2027 narrative to fleets

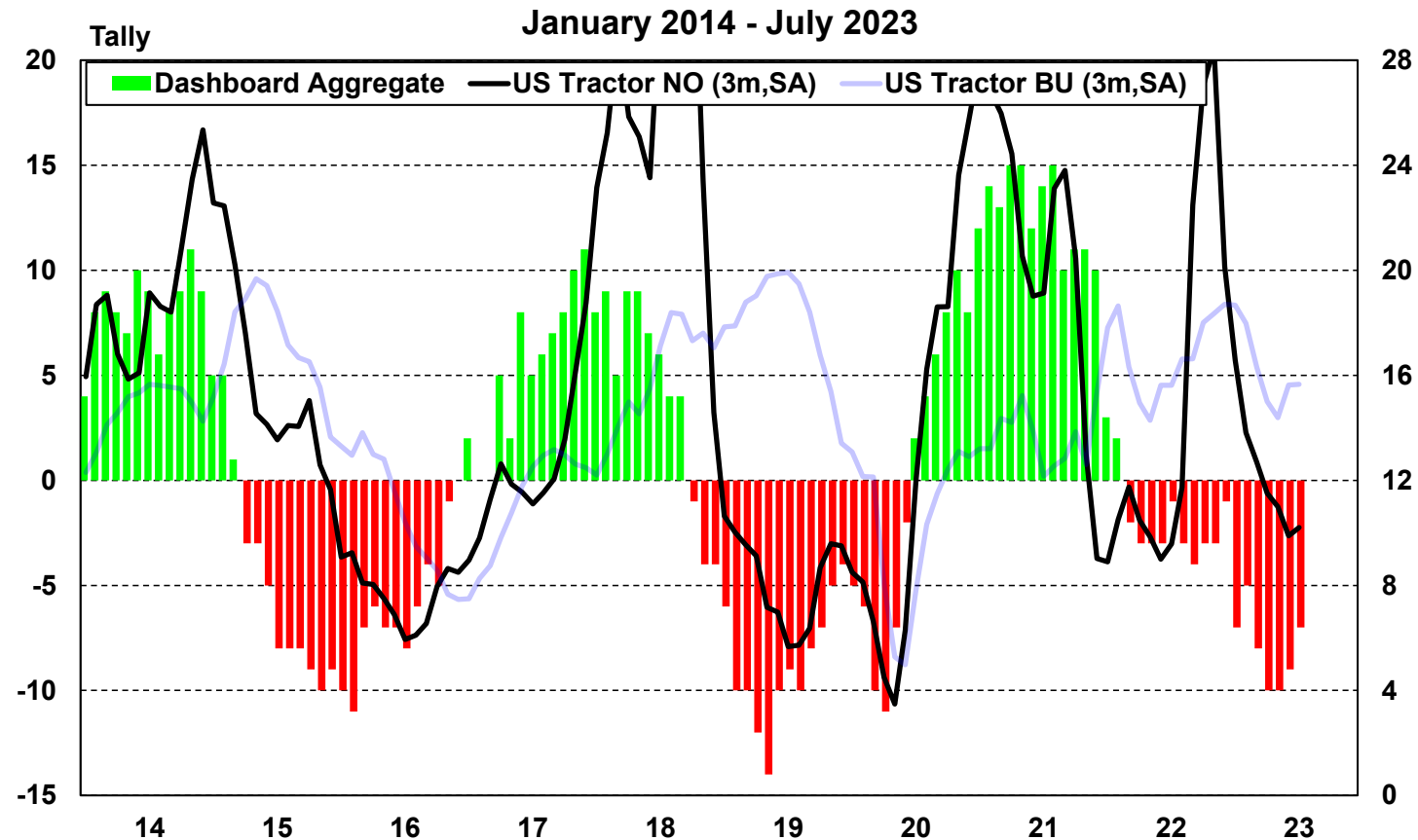
Regulations will shape current 5-year cycle

- CARB Clean Truck (Jan. '24)
- EPA'27: High \$ mandate, alignment of willingness and ability create the potential for a record market in '26
- Reefer: '14-'16 "FSMA" bubble drives replacements higher



Dashboard Analysis

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



Source: ACT Research Co. © 2023

Pandemic supply-chain issues have broken the linkage between the Dashboard and orders.

The relationship should re-exert itself as pent-up demand dissipates.

Full '23 BL and Unopened '24s = Weak Orders

Class 8 Tractor: N.A. Net Orders

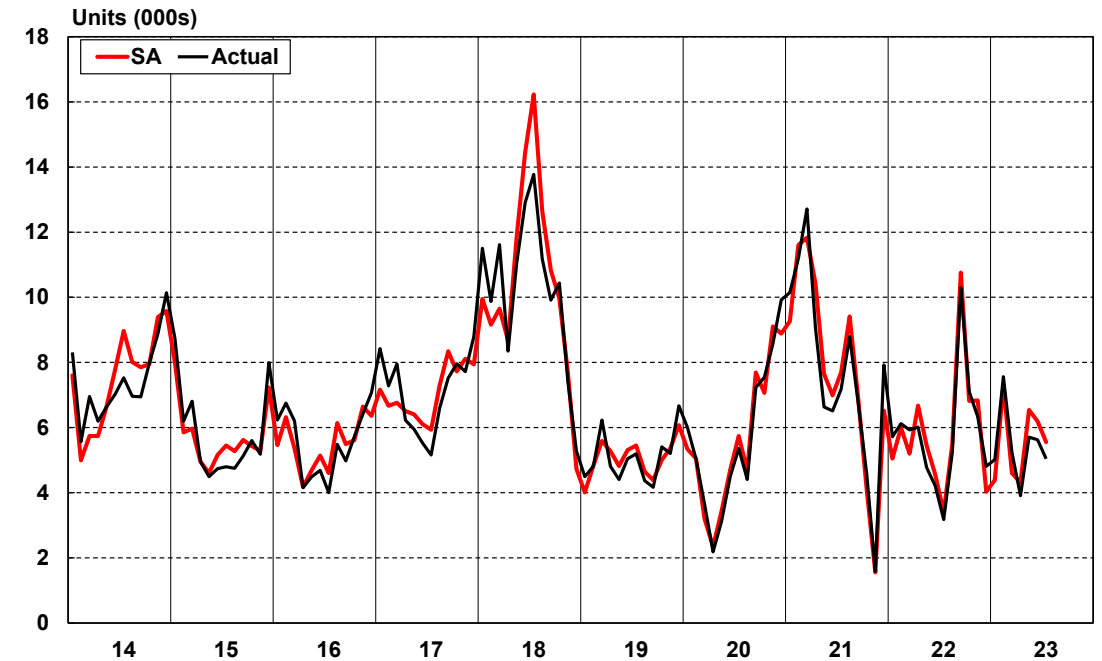
January 2014 - July 2023



Source: ACT Research Co. © 2023

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

January 2014 - July 2023

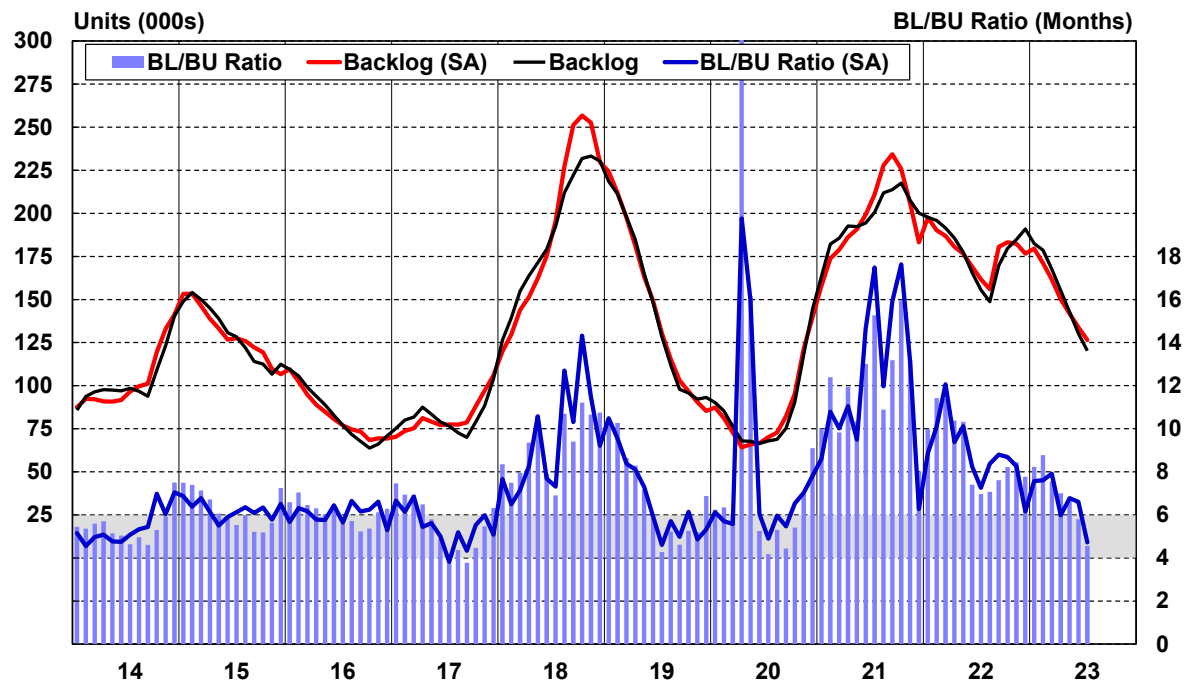


Source: ACT Research Co. © 2023

Waiting for 2024 Opening

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

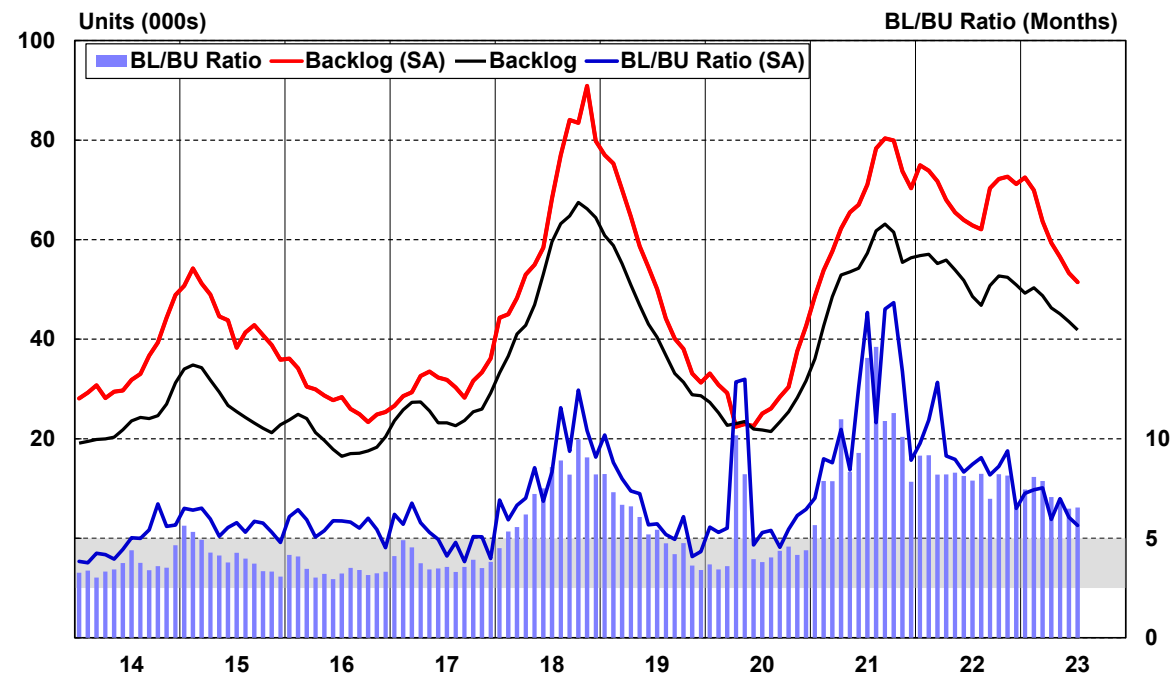
January 2014 - July 2023



Source: ACT Research Co. © 2023

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

January 2014 - July 2023

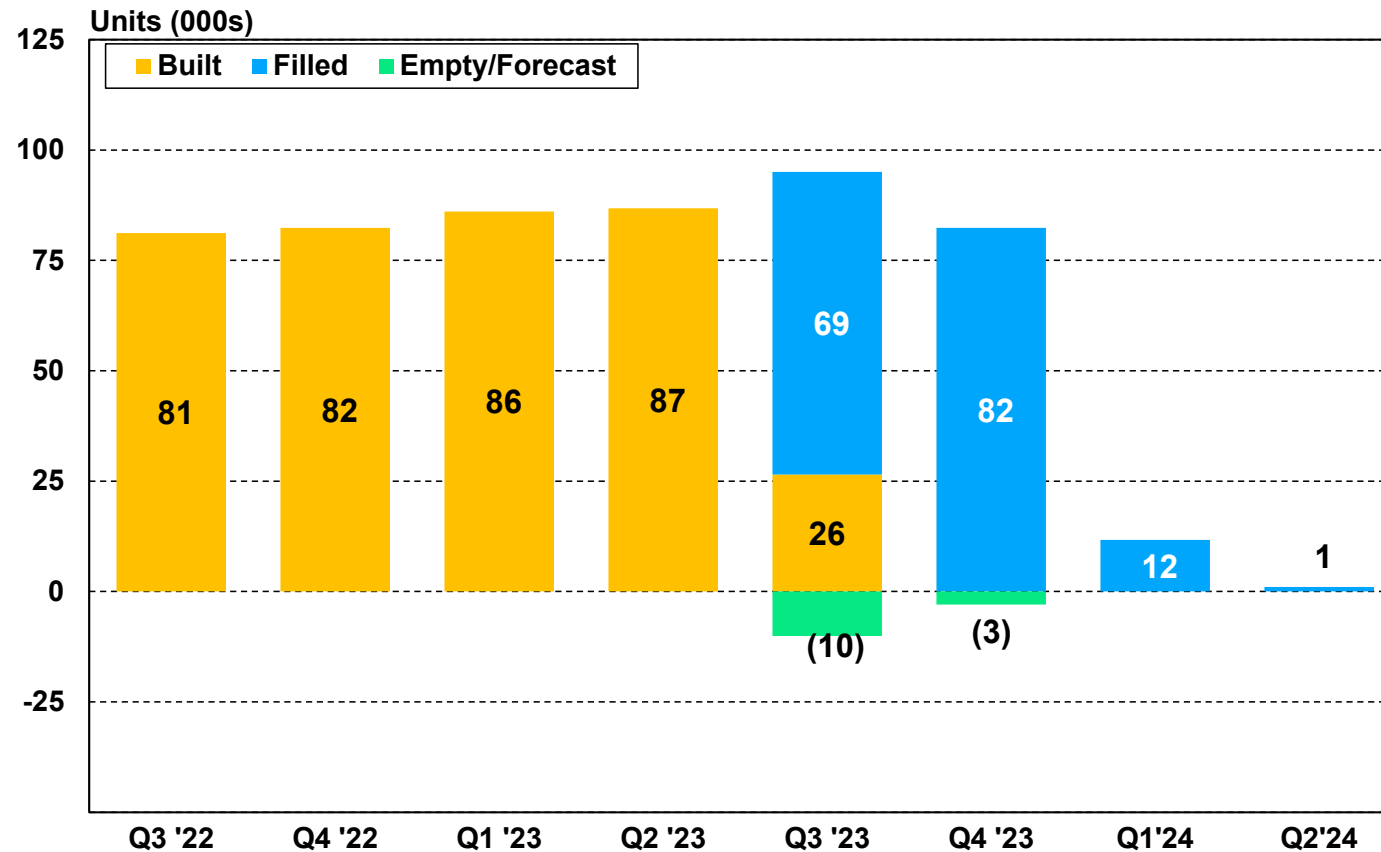


Source: ACT Research Co. © 2023

2024 Order Dependent

Class 8 Backlog Fill

July 2023 Ending



Source: ACT Research Co. © 2023

July'23 backlog: 164k

2023 schedule: 151k

2024 schedule: 13k

OEM's BU Plan

Q3'23 (bal): 59k

Q4'23: 79k

Uneven Distribution

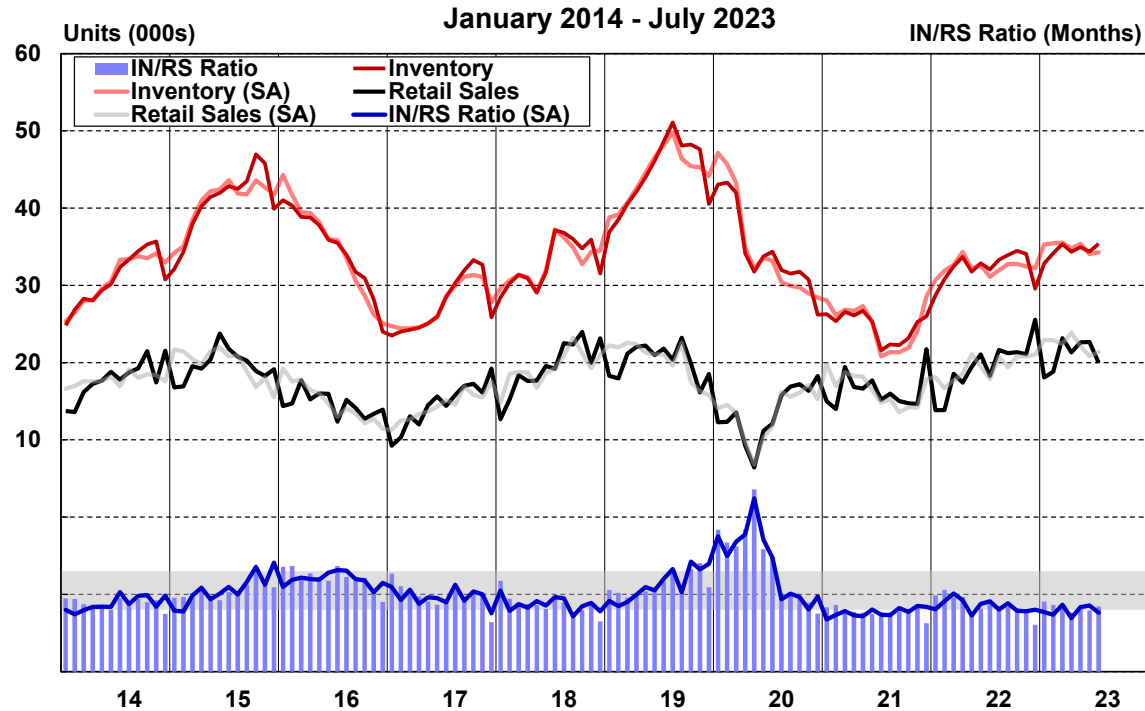
JULY ENDING		Next Qtr			BL/BU	Excess		
		<u>Backlog</u>	<u>BUPD Rate</u>	<u>BL Days</u>	<u>Low Bound Target</u> (days)	<u>Backlog</u> (days)	<u>Backlog</u> (months)	<u>Backlog @ Burn Rate</u> (months)
US	Tractor	103,000	870	118	95	23	1.1	2.1
	Truck	35,100	275	128	80	48	2.3	6.0
Canada	Tractor	11,000	95	116	90	26	1.2	2.1
	Truck	5,400	42	129	70	59	2.8	4.2
Mexico	Tractor	4,800	43	112	60	52	2.5	4.0
	Truck	1,000	15	67	55	12	0.6	2.3
Export	Tractor	1,600	24	67	60	7	0.3	1.1
	Truck	1,800	16	113	55	58	2.7	7.2
TOTAL Class 8		163,700	1,380	119	90.0	29	1.4	2.4

Market segments in need of a strong order season

**US & CA Tractor
65% of NA market**

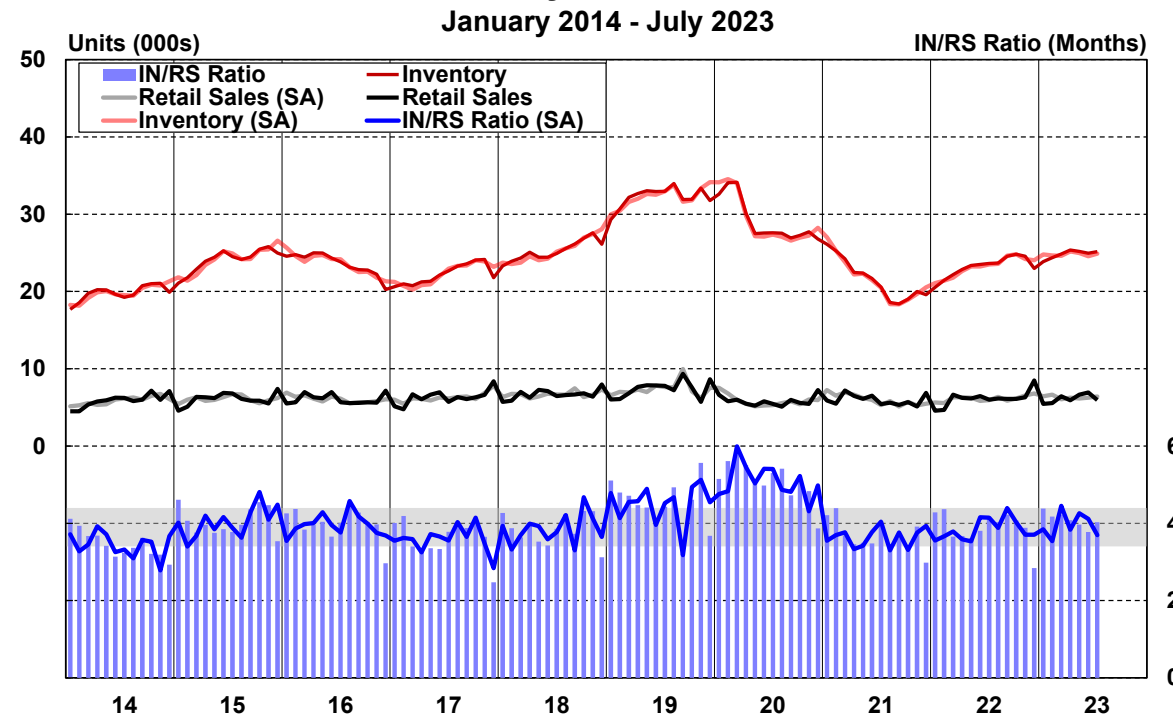
Strong Demand Support To Date

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



Source: ACT Research Co. © 2023

Class 8 Vocational Truck N.A. Inventory/Retail Sales Ratio

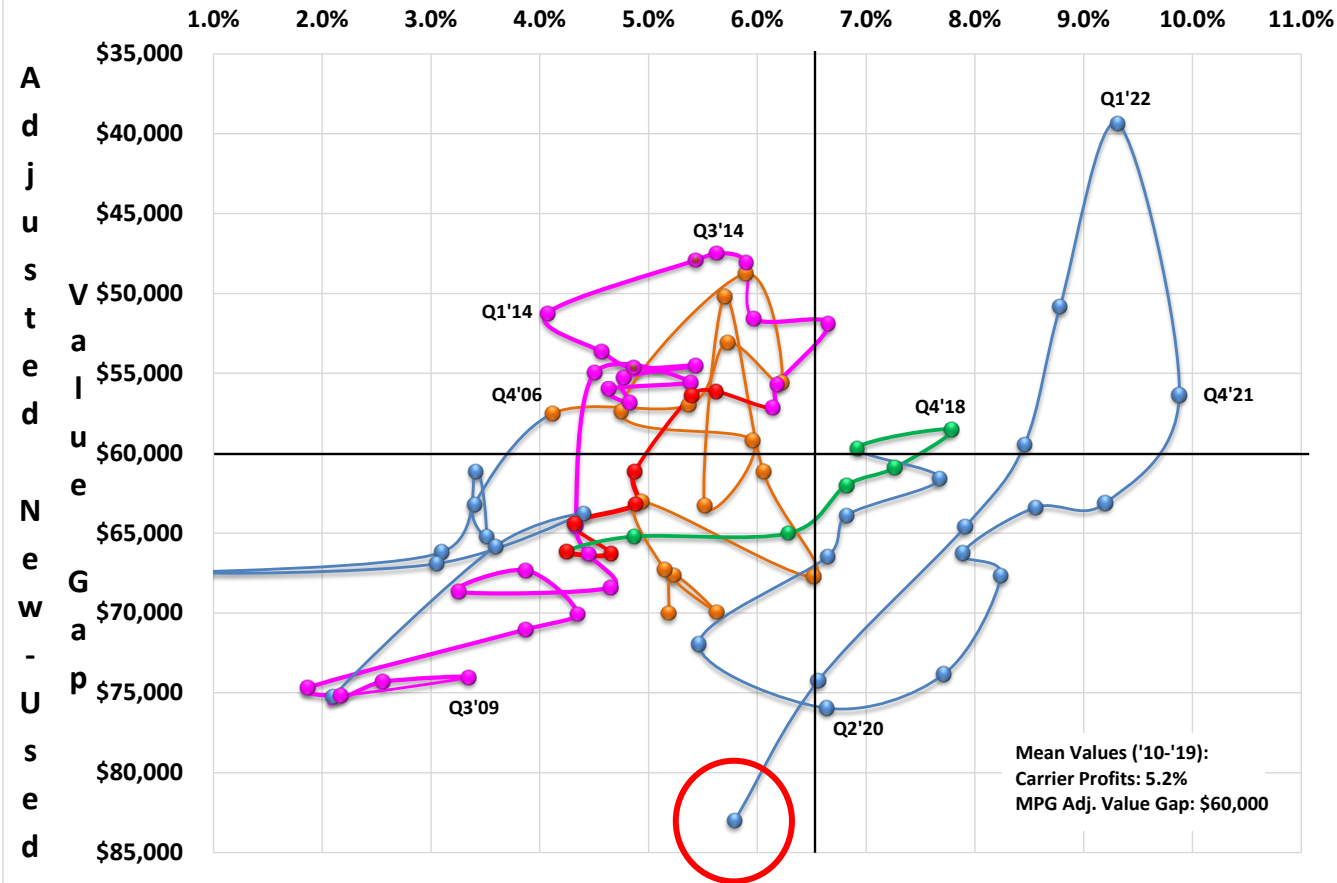


Source: ACT Research Co. © 2023

Used: From Head- to Tailwind

ACT: Carrier Ability & Willingness Analysis (Q2'23)

TL DB Core Carrier Profitability (SA) & MPG Adj. New Used Price Spread

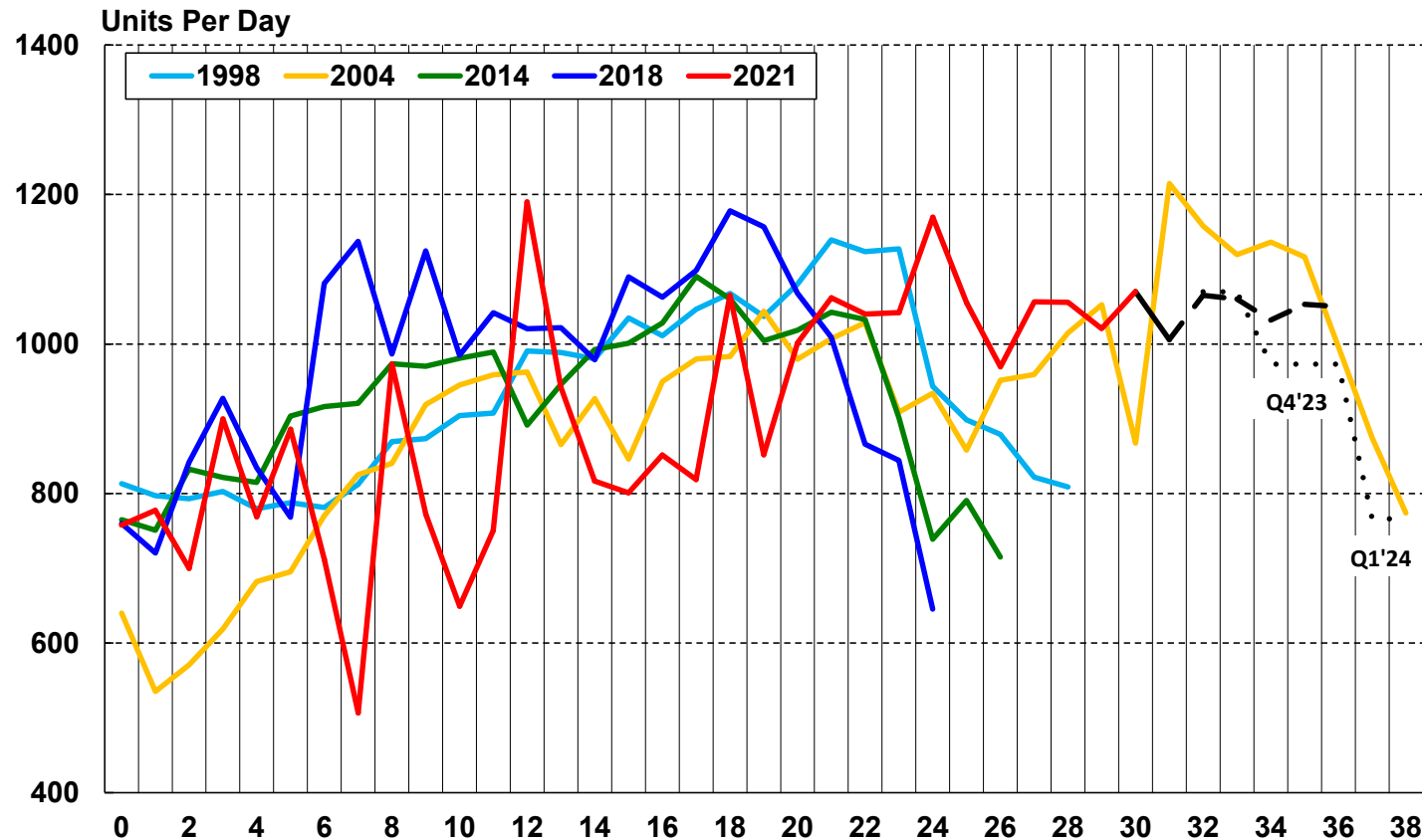


Source: ACT Research Co., LLC; Copyright 2018

Cycles Do Not End Gracefully

Class 8 Tractor: Arc & Duration of Peak Demand Cycle

Build rate progression following cycle-initiating order trend shift



ACT expectations and OEM build plan diverge in Q4

Source: ACT Research Co., LLC: Copyright 2023

Soft(ish) Landing

	2021	2022	2023f	2024f	2025f	2026f	2027f	2028f
Equipment Production (000s)								
NA Total Class 8	264k	315	337	285	320	389	216	276
YY%Δ	23%	19%	7%	-15%	12%	21%	-45%	28%
NA Tractor	196.1	235.2	256.1	208.7	238.1	284.1	156.2	200.5
YY%Δ	33%	20%	9%	-19%	14%	19%	-45%	28%
NA Truck	68.3	79.9	81.3	76.7	82.2	104.5	59.4	75.2
YY%Δ	3%	17%	2%	-6%	7%	27%	-43%	27%
Build by Destination								
US	222k	265	282	227	260	323	153	212
Canada	27k	29	32	27	30	41	21	29
Mexico	9k	13	14	24	24	19	31	26
Export	6k	8	10	8	6	5	10	9

REGULATORY RISKS COMING INTO FOCUS



Impactful Regulations Inbound

After a decade of win-win regulations, winning gets expensive with market altering potential

- EPA Clean Truck 2027
 - **NOx**
 - **Warranty and useful life extensions**
- EPA GHG Phase 3, CARB ZEV tie-in: 2027-2032
 - **EPA ZEV informed carbon targets**
- Recipe for Disaster
 - Failure to meet ZEV targets could technically limit sales of ICE vehicles
 - Reliance on outside entities to support ZEV adoption
 - Utilities
 - Infrastructure suppliers
 - Customers



2027 is going to be expensive

Useful life: minimum time an engine must be emissions compliant

Useful Life, Current

	Mileage	Years	Hours
Spark HDE	110k	10	--
Light HDE	110k	10	--
Medium HDE	185k	10	--
Heavy HDE	435k	10	22k

Useful Life, 2027

	Mileage	Years	Hours
Spark HDE	200k	15	10k
Light HDE	270k	15	13k
Medium HDE	350k	12	17k
Heavy HDE	650k	11	32k

Warranty, Current

	Mileage	Years	Hours
Spark HDE	50k	5	--
Light HDE	50k	5	--
Medium HDE	100k	5	--
Heavy HDE	100k	5	--

Warranty: The portion of UL that OEMs are on the hook to support

Warranty, 2027

	Mileage	Years	Hours
Spark HDE	160k	10	8k
Light HDE	210k	10	10k
Medium HDE	280k	10	14k
Heavy HDE	450k	10	22k

Source: EPA Clean Trucks Plan

Willingness + Ability = Prebuy

	MY2027 \$ Change Op. <u>Costs</u>	MY2027 % Change Op. <u>Costs</u>	Anticipated Prebuy: <u>2025</u>	Share of new <u>Market</u>	Anticipated Prebuy: <u>2026</u>	Share of new <u>Market</u>	Combined 2025-2026 Prebuy
US Class 8 Tractor	\$ 30,414	14%	15,343	8%	65,026	36%	80,369
US Class 8 Vocational	\$ 30,366	12%	4,916	8%	18,082	28%	22,998
US Total Class 8			20,259	8%	83,108	34%	103,367
US Classes 6-7	\$ 14,290	14%	5,167	6%	24,472	22%	29,639
US Total Classes 6-8			25,426	7%	107,580	25%	133,006

Costs

Technology + warranty (from Ricardo)
Taxes (FET, state)
Increased insurance, financing

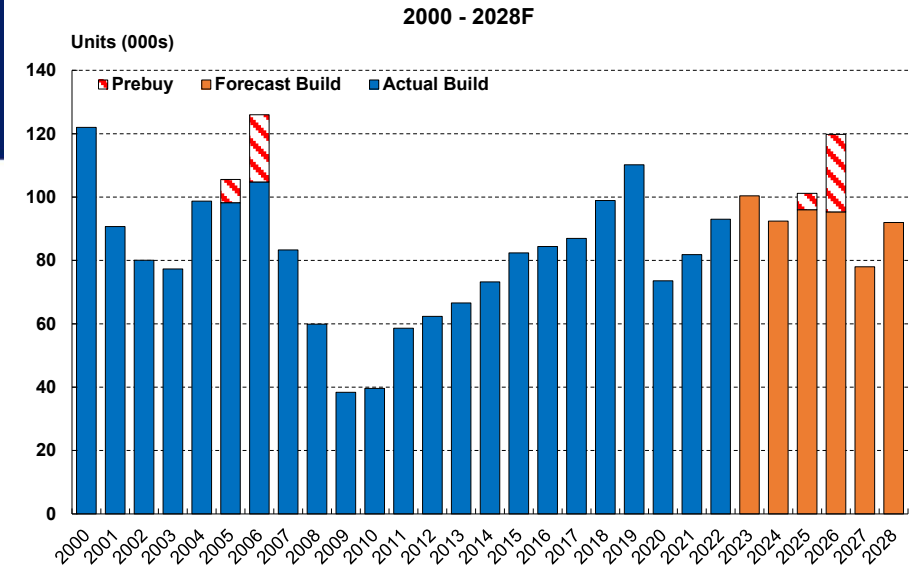
Fleets already buying extended warranties will not be subject to the full cost of the regulation

EPA'07 estimated at ~8% price increase

Willingness + Ability = Prebuy

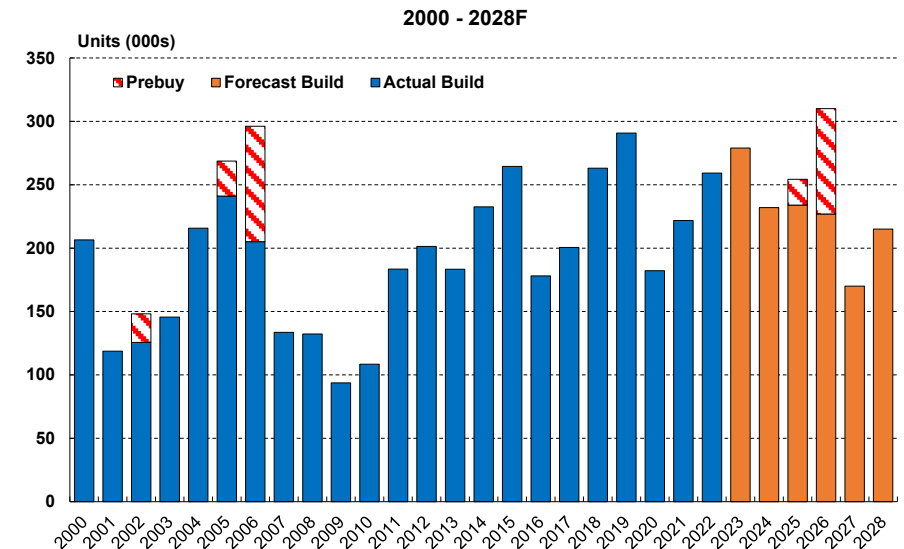
- 2025
 - Current projection: Heart of next freight cycle
 - **Freight rates, carrier profits accelerating**
 - High carrier awareness of mandate costs
- 2026
 - **Carrier profits near record levels**
 - OEMs/supply-chain flow, not demand, will be key 2026 demand determinant
- 2027
 - Newton's Third Law prebuy payback
 - Demand delays on higher prices
 - **Freight cycle risk**
 - *Alt-fuel TCOs get much more competitive*

U.S. Class 6-7 MHD Truck Build



Source: ACT Research Co., Copyright 2023

U.S. Class 8 HHD Truck / Tractor Build



Source: ACT Research Co., Copyright 2023

GHG+ZEV: Flirtin' With Disaster

	2027	2028	2029	2030	2031	2032
LHD Cl. 2b-5 vocational	22%	28%	34%	39%	45%	57%
MHD Cl. 6-7 vocational	19%	21%	24%	27%	30%	35%
HHD Cl. 8 vocational	16%	18%	19%	30%	33%	40%
Cl. 8 tractors, Day cabs	10%	12%	15%	20%	30%	34%
Cl. 8 tractors, Sleeper	0%	0%	0%	10%	20%	25%

Source: EPA

Summary

- Good support for trend-type economic growth (assuming risks don't bite)
 - Healthy US balance sheets, positive RDPI, housing, inventory set up macro cycle in '24 into '25
 - Reports of weak China economy should benefit on the goods inflation front
- Freight market balance looser 1H'23, bottoming in 2H'23, tightening by ~1H'24
 - Helping to solidify up-cycle demand into 2025
 - Too many trucks entering a shrinking/stagnant freight market offset by rapidly shrinking driver supply
- Truckload rate/profit downcycle sharper, shallower, shorter
 - **Elevated trough-level fleet profits, absence of major equipment overbuy are “different-this-time” factors supporting shallower market trough**
- 2024 is the transition year into a profitability and regulatorily driven 2026 “super-market”





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