



BEYOND THE PILOT: Electric Terminal Tractor Adoption, Four Years Later

ABSTRACT & AUTHORS

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The North American Council for Freight Efficiency (NACFE) undertook this research to assess how fleets are adopting electric terminal tractors and how their experience has evolved since NACFE's first look at the technology in 2022. The report examines fleet motivations for adoption, real-world operation, and financial performance compared to diesel, the barriers that still slow fleets from moving past a pilot, and how fleets themselves judge whether the technology has proven out.

This report's conclusions were generated through input from 62 survey respondents, 44 identifying as fleet operators and 18 as industry partners (OEMs, utilities, and consultants), together with in-depth interviews conducted with seven fleets: Bourassa Transport, Coke Canada Bottling, Lazer Logistics, PITT Ohio, Wegmans, YMX Logistics, and one large carrier that requested anonymity.

NACFE designed and fielded the survey, conducted the interviews, analyzed the data, and wrote the report. Orange EV helped fund the research, connected NACFE with some interview and survey participants, and provided a manufacturer's perspective.

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ABOUT US



ABOUT NACFE



The North American Council for Freight Efficiency (NACFE) works to drive the development and adoption of efficiency enhancing, environmentally beneficial, and cost-effective technologies, services, and operational practices in the movement of goods across North America. NACFE provides independent, unbiased research, including Confidence Reports on available technologies and Guidance Reports on emerging ones, which highlight the benefits and consequences of each, and deliver decision-making tools for fleets, manufacturers, and others. NACFE partners with RMI on a variety of projects including the Run on Less demonstration series, electric trucks, emissions reductions, and low-carbon supply chains.



ABOUT RUN ON LESS BY NACFE

Run on Less is a biennial demonstration showcasing advancements in freight efficiency. The event takes place over the course of three weeks and features fleets across North America moving real freight in their normal operations to show how it is possible to operate efficiently with today's technologies. Each truck in the Run is outfitted with a telematics device allowing NACFE to track key metrics.

GET INVOLVED

NACFE could use the assistance of fleets, manufacturers and other trucking industry stakeholders in improving freight efficiency. Become a part of this exciting opportunity.

Learn more at www.nacfe.org or contact Mike Roeth at mike.roeth@nacfe.org

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Beyond the Pilot: **ELECTRIC TERMINAL TRACTOR ADOPTION, FOUR YEARS LATER**

Four years ago, electric terminal tractors were a pilot bet. Today they are a proven option for a growing number of fleets and buyers. This and other findings were the result of research undertaken by the North American Council for Freight Efficiency (NACFE) to gather insights about fleet procurement behavior and preferences related to electric terminal tractors. NACFE published its [first electric terminal tractor report](#) in 2022, and in 2026 decided to revisit the topic to assess the change in fleet experiences and market development since then.

Since 2022, the economics of electric terminal tractors have further solidified. Direct economic benefit is the top-ranked reason fleets give for adopting electric terminal tractors, chosen by 60% of fleet operators surveyed, narrowly ahead of corporate sustainability goals (57%). Fleets surveyed are also in broad alignment that electric terminal tractors offer real operating-cost

savings: 76% of fleet operators report at least moderate savings compared to diesel, with fleets like Lazer Logistics and Wegmans crediting reduced maintenance and energy costs as their largest realized gains.

ACKNOWLEDGMENTS

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FIGURE ES1

MORE THAN HALF THE FLEETS SURVEYED REPORTED MOVING PAST THE PILOT STAGE INTO PARTIAL OR FULL STANDARDIZATION.



These savings are one major reason fleets are moving from pilot to scale: among fleets surveyed, 54% report having moved past the pilot stage into partial deployment or full standardization. However, the confidence in the operating savings of electric terminal tractors does not yet extend to the full business case. Just over half of fleet operators (52%) say it is still too early to tell whether the full business case, including the higher upfront cost of the vehicle, has proven out, even as they report real monthly savings. That gap may be less a sign the technology isn't paying off than a sign that many fleets haven't yet run electric units long enough to close out a full depreciation cycle.

Terminal tractors are also emerging as a proving ground for fleet electrification more broadly. Among fleet operators surveyed, 58% either adopted electric terminal tractors before any other electric vehicle type or have electrified terminal tractors exclusively — meaning well

over half started their fleet electrification journey with the yard. See Figure ES1. Because terminal tractors typically never leave the fence line, they let fleets build operational and financial confidence in electrification without the range anxiety and charging-access questions that complicate on-road electric trucks.

Among manufacturers, Orange EV remains the market leader, accounting for 58.3% of zero-emission heavy-duty truck registrations in Q1 2026 — a category that includes day cabs and other applications. Recent order volumes illustrate the scale of that lead: Orange EV secured a 600-unit order in mid-2026 and a 96-unit order from APM Terminals Elizabeth that same year. Since 2022, the manufacturer landscape has expanded, with electric terminal tractors manufactured by Autocar, BYD, Kalmar Ottawa, Lonestar, Terberg, and TICO.

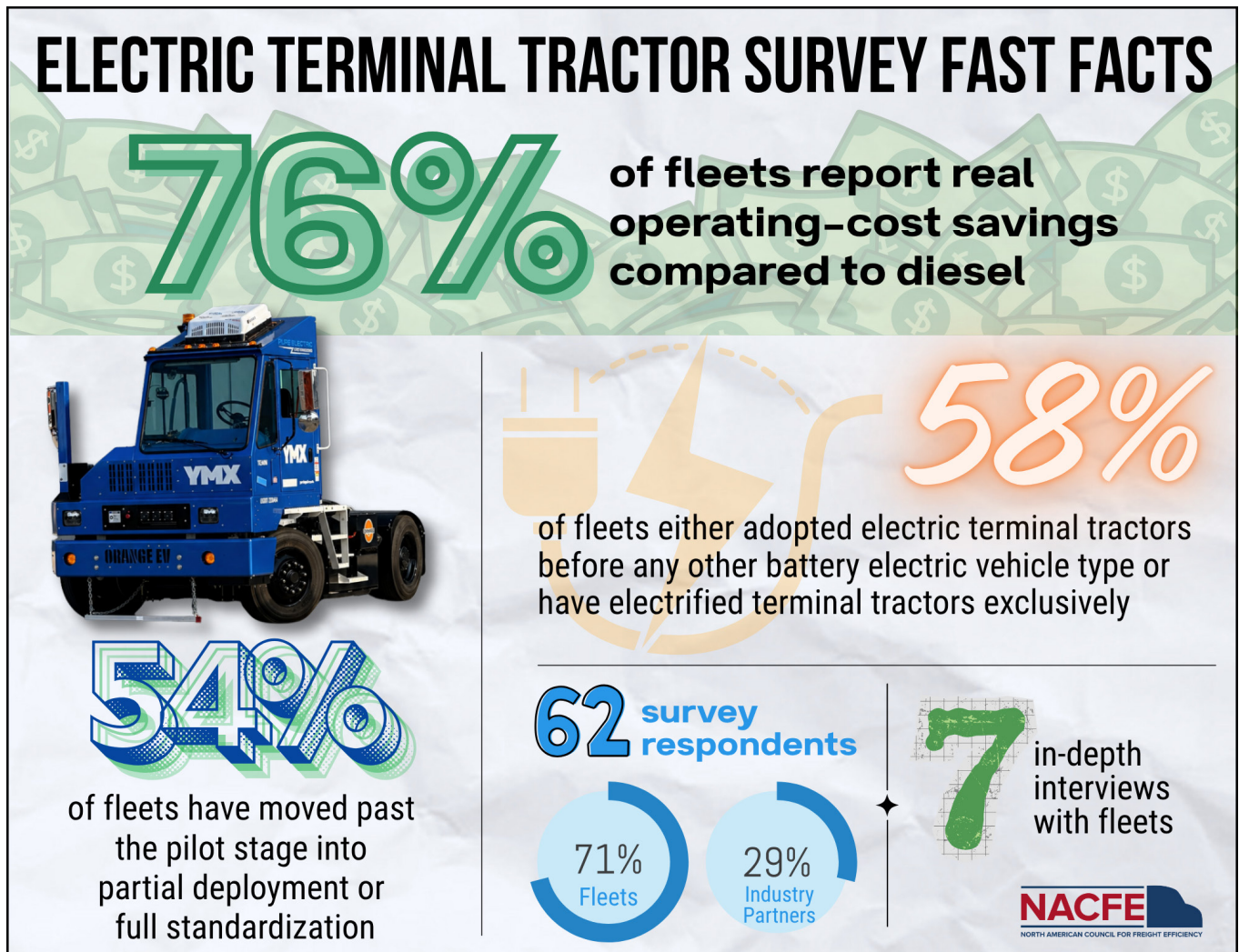


“Data from our 9+ years of experience with battery electric terminal tractors inform our belief that the yard is the best use case for battery electrification of heavy-duty transportation today.”

— Chris Bennett, VP of EV, Energy, and Sustainability, Lazer Logistics

FIGURE ES2

HIGHLIGHTS OF FINDINGS FROM RESEARCH CONDUCTED FOR THIS REPORT



This report does not find that electric terminal tractors are a perfect fit for every fleet, everywhere. Capital budgeting remains the top-ranked barrier to moving from pilot to scale, cited by 63% of fleet operators and 77% of industry partners, driven by a persistent gap between a new diesel unit at roughly \$150,000 and a new electric one at roughly \$300,000. Utility and infrastructure delays follow as the next most-cited barrier.

Cold-weather performance and tire wear are among the few areas where a meaningful share of fleets report electric units underperforming diesel. And at least one large carrier interviewed for this report has evaluated electric terminal tractors and chosen not to adopt them, citing cost and a lack of internal appetite for change rather than any technical failure of the equipment itself.

The seven fleets interviewed for this report illustrate just

how wide that range of outcomes is today, from Wegmans' full, three-site standardization and Lazer Logistics' fleet-wide scale, to Bourassa Transport's single-truck pilot and PITT Ohio's infrastructure-constrained rollout, to one large carrier that evaluated the technology and chose not to adopt it.

The report draws on interviews with seven fleets, a survey of NACFE's fleet and industry-partner network, and independent market data from CALSTART and the International Council on Clean Transportation (ICCT). See ES2 for a highlights of top statistics from this report.

For fleets weighing a first pilot, this report closes with a [Terminal Tractor Electrification Readiness Tool](#) developed from this project, intended to give an honest, directional read on whether now is the right time to deploy electric terminal tractors.

1 INTRODUCTION

In 2022, NACFE published its first look at electric terminal tractors. At that time, pricing was unclear, the long-term financial case rested on early estimates rather than real operating data, and manufacturers were still proving out basic reliability [1]. Four years later, this report asks a more direct question: for fleets that have piloted or adopted electric terminal tractors, is the technology proven enough to standardize and scale?

2 SCOPE

This report covers battery electric terminal tractors (also called yard trucks, yard tractors, yard horses, yard goats, hostlers, or spotters) used to move trailers within a yard or terminal. It does not cover Class 8 road tractors, forklifts, or other yard equipment, except where a fleet's experience with those vehicle types provides useful context for its terminal tractor decision.

The electric terminal tractors described in this report operate off-road, within a fenced yard or terminal, rather than being licensed for public roads — reflecting the vast majority of terminal tractors in use today. (The DOT requires anti-lock brakes and electronic stability control on-highway, but not for the sub-33-mph on-road duty cycles some terminal tractors run; as of this research, no electric terminal tractor manufacturer offers electronic stability control as a certified option regardless.) This report's findings on adoption, satisfaction, and operational performance should be read as describing off-road use specifically.

The report draws on seven fleet interviews, a survey of NACFE's fleet and industry-partner network, and publicly available market research. Distribution lists and the underlying survey respondent pool reflect fleets and industry partners who are more familiar with and experienced with electric terminal tractors, and as a result does not necessarily reflect the broader market as a whole. Because respondents skew toward fleets already engaged enough with electric terminal tractors to answer a detailed survey about them, the adoption-driver and satisfaction findings in this report may read more favorably than the market at large would report; readers should weigh the survey findings with that in mind, particularly fleets that have not yet evaluated the technology. One fleet interviewed for this report requested anonymity and is described without identifying detail.

This report was produced in collaboration with Orange EV, a manufacturer of electric terminal tractors, which helped fund the research, connect NACFE with some interview and survey participants, and provide a manufacturer's perspective. Orange EV did not write any part of the report nor provide any of the data within it.

This report does not attempt to independently validate the total terminal tractor market size, but rather uses independently sourced deployment and registration data from CALSTART and the International Council on Clean Transportation (ICCT) to demonstrate market scale since 2022. Section 5 discusses this question in more detail.

3 NACFE'S MISSION

NACFE's overriding principle in reporting on technologies is to provide an unbiased perspective. NACFE recognizes that it also has vested interests and an agenda. NACFE's mission is to improve the efficiency of North American goods movement. NACFE pursues this goal in two ways: by improving the quality of the information flow and by highlighting successful adoption of technologies. NACFE's [Confidence Reports](#) assist in information

flow, while the [Run on Less](#) demonstrations and [Fleet Fuel Studies](#) highlight adoption success and provide benchmarks for fleets.

NACFE also recognizes that emerging and future technologies need an unbiased review to help fleets consider them and for manufacturers to learn and adapt their products and solutions to better meet fleets' needs. To that end, NACFE started publishing [Guidance Reports](#) on emerging and future technologies. As of mid-2025, NACFE has published 11 Guidance Reports on electric and hydrogen fuel cell trucks.

NACFE shares its research free of charge to the industry, conducting and participating in information-sharing events including workshops, panel discussions, and conferences.

4 REPORT METHODOLOGY

This report draws on a survey of NACFE's fleet and industry-partner network (62 respondents: 44 fleet operators and 18 industry partners; response counts vary by question due to survey skip logic and partial completion). Appendix B contains a full list of survey questions. The report is also based on seven in-depth interviews conducted between June and August 2026: Bourassa Transport, Wegmans, PITT Ohio, Lazer Logistics, YMX Logistics, Coke Canada Bottling, and one large carrier that requested anonymity. Lastly, it drew from independent market research from CALSTART, ICCT, TRC Companies/WSP, and the trade press, and NACFE's own [2022 electric terminal tractor report](#).

NACFE designed and fielded the Electric Terminal Tractor Market Trends survey to gather current data on fleet behavior, adoption drivers, and operational experience directly from the market, rather than relying solely on interviews and secondary research. The survey targeted two respondent groups: Fleets (fleet operators and 3PLs describing their own terminal tractor operations), and Industry Partners (OEMs, utilities, and consultants, describing the fleets they support) as shown in Figure 1. The two groups answered largely parallel question tracks, adjusted for perspective; an industry partner, for example, was asked what barriers the fleets it works with encounter, rather than what barriers its own fleet encountered.

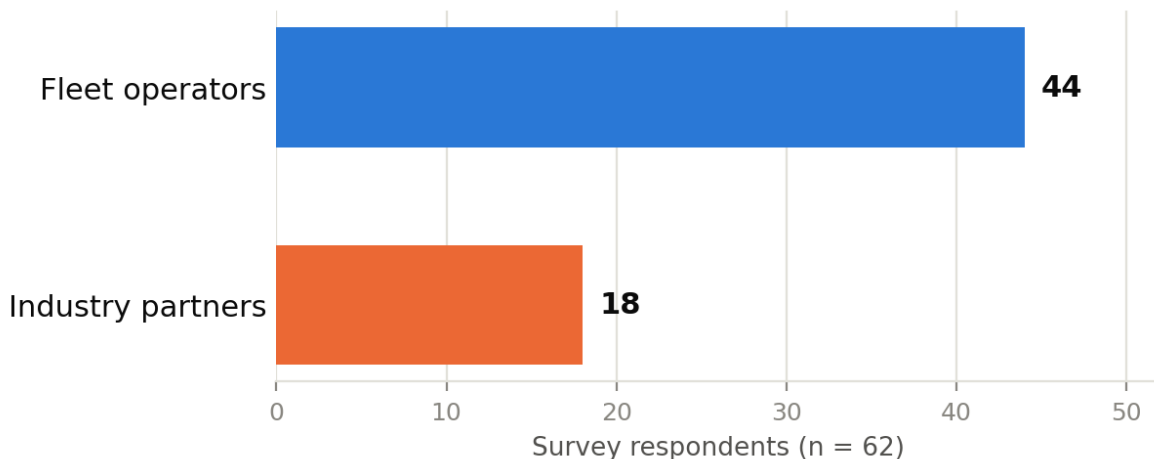


Figure 1: Survey respondents by type

Survey logic branched respondents down different paths depending on how they self-identified: a fleet that had not yet considered electrification saw different follow-up questions than one that had already implemented it at one or more locations. That skip logic is why response counts vary by individual question throughout this report,

and why some questions carry a smaller sample size than the full 62 respondents. The complete survey instrument, including every question-and-answer choice, appears in Appendix B.

5 THE MARKET, THEN & NOW

NACFE's 2022 report described a market still proving out basic assumptions. Four years later, several of those assumptions have held, some have been proven wrong, and at least one core question (how big is this market) remains an estimate. Figure 2 summarizes the comparison.

The Electric Terminal Tractor Market		
Topic	2022 Report	2026 Status
Market Size	Fewer than 500 electric terminal tractors estimated to be sold in the US and Canada in 2021	More than 500 electric terminal tractors estimated sold in the US in 2025; Canada data unavailable. Actual adoption is likely higher, as CALSTART's data undercounts off-road deployments.
OEM Landscape	Electric terminal tractor market described as supported by four manufacturers (BYD, Kalmar, Lonestar SV, Orange EV)	Orange EV remains the market leader; Autocar, BYD, Kalmar Ottawa, Lonestar, Terberg, and TICO are deploying electric terminal tractors.
Electric Unit Price	\$275,000 – \$350,000	Consistent: \$250,000 – \$350,000 reported directly by OEMs and fleets.
Diesel Unit Price	\$100,000 – \$125,000	Consistent: \$55,000 (used) – \$150,000 (new) average reported active listings on TruckPaper.
Charging Strategy	Assumes a block of several hours to charge is the norm; sees opportunity charging as an emerging possibility used by early adopters	Fast opportunity charging during shift breaks is now common. A blend of opportunity and overnight charging is the favored approach by most fleets surveyed.
Diesel Aftertreatment (DPF/SCR)	"Likely" required	Maintains high-pressure seal between head and block

Figure 2: Terminal tractor market, 2022 report vs. 2026 research

5.1 Electric Terminal Tractor Market Size

CALSTART's most recent report (June 2026) found zero-emission terminal tractors reached 3.21% of the total US terminal tractor population as of December 2025, the highest share of any zero-emission truck segment that CALSTART tracks [3].

An estimated 519 new zero-emission terminal tractors were deployed in 2025 (combining the 219 CALSTART reported for the second half of the year with the 300 it reported for the first half) [3] [5]. CALSTART's own reporting notes a methodological limitation: its figures rely heavily on on-road vehicle registrations and assume on-road units make up only 35% of the total terminal tractor population, meaning off-road-only deployments are likely undercounted. The true adoption rate may be higher than these figures show.

To put those electric-specific volumes in context, the total US terminal tractor market, all powertrain types combined, is estimated at roughly 62,000 units in the installed base, per market research firm Market.us [6]. Cumulative electric terminal tractor deployments to date, across all OEMs, are unknown; however, according to public reporting, Orange EV has deployed at least 2,000 units as of June 2026 [11]. Electric units therefore remain a small fraction of the total fleet.

However, the market for electric terminal tractors is accelerating. Recent order volumes give a sense of market growth: Orange EV secured a 600-unit order in mid-2026 and a 96-unit order from APM Terminals Elizabeth that same year [8] [9]. Taken together, these orders show real growth compared to the 500 total electric terminal tractors deployed across US and Canada as of 2021.

Comparable market-sizing data for Canada's electric terminal tractor market does not currently exist: the independent sources used above (CALSTART, ICCT) track only the US market, and general terminal tractor market research reports North America as a single aggregated region without a Canada-specific breakout.

Taken together, the market this research finds in 2026 is unmistakably more active than the one described in 2022, and it carries fewer open questions. On OEM choice, charging strategy, and cost drivers, fleets in 2026 are making decisions with real operating data behind them, not the assumptions the 2022 report worked from.

5.2 OEM Landscape

The manufacturer landscape has diversified since 2022. NACFE's report then described four manufacturers serving the market: BYD, Kalmar, Lonestar SV, and Orange EV. Today, that market has expanded to include more OEMs – including Autocar, Terberg, and TICO – and more production of electric terminal tractors.

Orange EV remains the leading manufacturer of zero-emission terminal tractors, based on independent registration and deployment data from ICCT and CALSTART. ICCT's vehicle registration data puts Orange EV at 58.3% of zero-emission heavy-duty truck registrations in the first quarter of 2026 [4]. That figure reflects Orange EV's share of *all* zero-emission heavy-duty truck registrations, not a terminal-tractor-specific market share (ICCT does not track yard or terminal tractors as their own registration category). It is also likely an undercount of the true terminal tractor market, since a meaningful share of terminal tractors are never registered for on-road use and so would not appear in registration data at all.

Since NACFE's 2022 report, Kalmar Ottawa has launched its third-generation OT2 electric unit in March 2025, Terberg units are in multi-year service at Coke Canada, and NACFE's survey found Lonestar and TICO in use at Schneider, one of the country's largest carriers.

5.3 Electric & Diesel Unit Price

The price gap between electric and diesel terminal tractors has narrowed, though not to parity. NACFE's 2022 report cited electric units at \$275,000 to \$350,000 against \$100,000 to \$125,000 for diesel. Prices reported directly by fleets in 2026 fall in a similar range. Wegmans paid roughly \$250,000 for its first electric units in 2020,

rising to about \$330,000 by 2026. PITT Ohio paid about 2x the cost of a new diesel tractor for its most recent electric unit. YMX Logistics, which operates across five manufacturers and has tracked pricing since before the 2022 report, describes the trend they have seen: a price premium that has fallen from roughly 3x the cost of diesel five to six years ago to under 2x today. To explain this trend, YMX points to the strategy of right-sizing the battery and using fast opportunity charging, rather than paying for more battery capacity than is needed to meet operational requirements.

Figure 3 lists the estimated price and potential utilization of electric terminal tractors by battery size, based on original research conducted by NACFE in conversations with two electric terminal tractor OEMs; these are the OEMs' own estimates, not figures independently verified against a third-party source. Note the "Hours of Use per Charge" column shows potential runtime on a single charge; fleets running multiple shifts can extend this by adding opportunity charging between shifts.

Estimated Electric Terminal Tractor Prices by Battery Pack Size

Battery Pack Size	Typical Application	Estimated Unit Cost	Energy Usage (per hour)	Hours of Use per Charge
100 kWh	Less-than-truckload (LTL); cross dock; light to medium duty applications	\$250,000	6 to 8 kWh	15 hours
180 to 200 kWh	Medium to heavy duty; railyards	\$300,000	10 to 14 kWh	13.5 hours
250 kWh	Ports	\$350,000	16 to 22 kWh	12.5 hours

Figure 3: Estimated electric terminal tractor prices by battery pack size (NACFE research)

Note: Hours of Use per Charge reflect the typical duty cycle associated with each battery size's stated application (e.g., railyard vs. port operations). Actual runtime depends on duty-cycle intensity rather than battery size alone — a lighter-duty application on the same battery pack can yield meaningfully more hours per charge, while a heavier-duty application on a larger pack can yield fewer.

5.4 Charging Strategy

The survey respondents also show new trends in charging strategy: 52% of fleet operators name a blended opportunity-and-overnight approach as their most effective charging strategy, more than three times the share favoring opportunity-only charging (14%), and industry partners report the same pattern even more strongly, with 82% pointing to a blended strategy. Fleets often benefit from keeping some overnight or depot charging in the mix, but the majority are using some opportunity charging as well. Fleets cite the value of strategically locating charging near the places where the driver takes breaks.

5.5 Diesel Aftertreatment

Diesel maintenance costs, which the 2022 report treated as a “likely” driver toward electrification, are now a confirmed one. Every fleet interviewed for this report that discussed diesel maintenance confirmed that emissions aftertreatment systems are now standard required equipment on new diesel units and a significant source of repair cost and downtime. This shift has shortened realistic diesel depreciation schedules well below the 12-year assumption in the 2022 report, depending on utilization.

6 TOP FINDINGS

NACFE’s survey and interviews targeted fleets and industry partners that had direct experience with electric terminal tractors. Through this research, NACFE found that the fleets who are adopting electric terminal tractors are indeed moving from pilot to standardization, but that for some fleets, the financial picture is still coming into focus as they gather enough data to confirm the long-term financial advantage. Figure 4 summarizes the top findings from the survey and compares responses from fleet operators and industry partners.

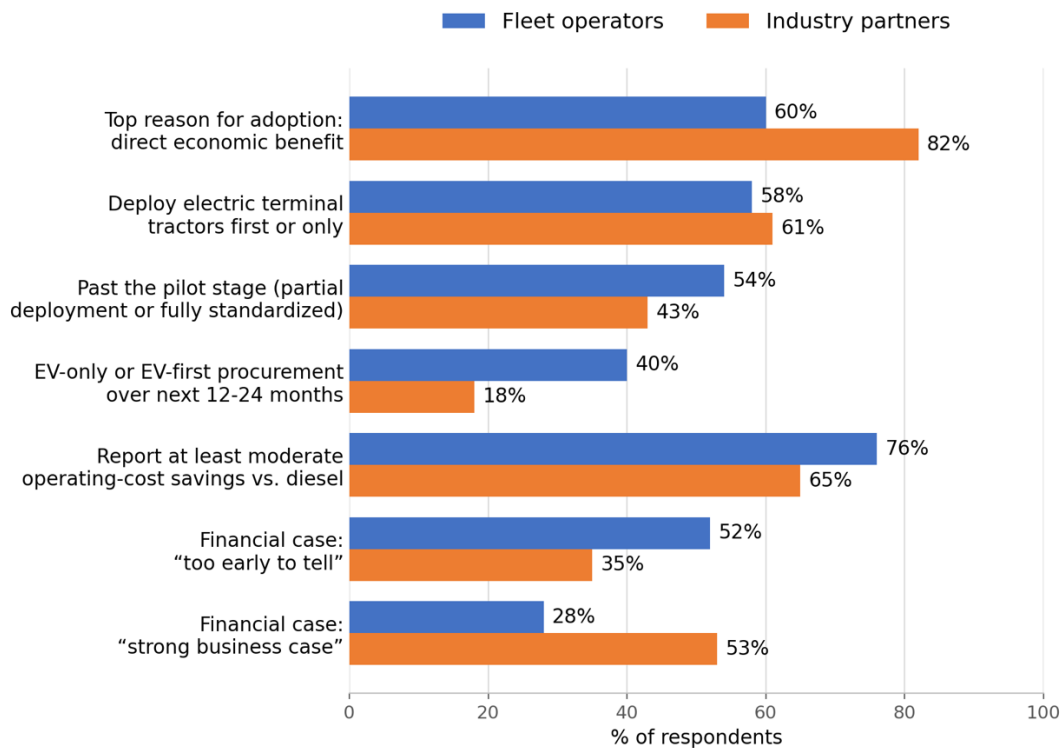


Figure 4: Adoption drivers and confidence (NACFE survey)

6.1 Adoption & Drivers

One of the clearest findings from the survey highlighted the move fleets are making from pilot stage to standardization. Roughly half of fleet operators surveyed (54%) report having moved past the pilot stage into partial deployment or full standardization. Industry-partner respondents, who observe many fleets’ operations rather than just their own, report seeing no fully standardized fleets, but 43% do see partial deployment fleets. This gap may reflect replacement-cycle timing rather than hesitancy: because terminal tractors typically remain

in service for 7 to 10 years, a fleet can commit to electric as its standard for all new purchases and still operate a mixed fleet for years while older diesel units cycle out. Taken together, this shows fleets are moving from pilot to standardization rather than stalling out or reverting to diesel — a sign the technology is holding up well in practice, and fleets who adopt plan to keep scaling.

What reasons do fleets point to for adopting electric terminal tractors? In the survey, fleets cite direct economic benefit (fuel and maintenance savings) as the top reason for adopting electric terminal tractors, chosen by 60% of respondents, narrowly ahead of corporate sustainability goals (57%) and well ahead of regulatory compliance (37%). Fleets that have reached full standardization or report a confirmed strong business case cite direct economic benefit as their primary motivation far more often (100% and 88%, respectively, though these are small subgroups) than fleets still awaiting confirmed savings, who lean more heavily on corporate sustainability goals.

In interviews, fleets describe a more layered set of motivations: sustainability commitments tend to be what starts the conversation, and economics (fuel savings, uptime, incentive-assisted returns) is what justifies scaling it once the pilot is running. Wegmans fleet manager Sean Dubman frames its transition to an electrified fleet as “really just in line with company values.” Lazer Logistics’ Chris Bennett, VP of EV, Energy, and Sustainability, points to accumulated operating evidence rather than a single motivation: “Data from our 9+ years of experience with battery electric terminal tractors inform our belief that the yard is the best use case for battery electrification of heavy-duty transportation today.” YMX Logistics ties its adoption to measured operational performance: 95% to 98% uptime on its electric units against what can be sub-90% on diesel, in a company that runs trucks from five different manufacturers. Cost, values, duty-cycle fit, and measured performance all add up as real reasons fleets adopt, not necessarily in that order, and rarely in isolation.

Regulatory pressure is not currently a strong adoption driver for electric terminal tractors in the US: off-road diesel engines have been subject to the EPA’s Tier 4 Final standards since around 2015, with no additional federal requirement adopted since. Regulation plays a larger role in certain states, however. For example, under South Coast AQMD’s Rule 2305 (the WAIRE program), large Southern California warehouses must earn annual emissions-reduction compliance points or pay a mitigation fee. Operating zero-emission terminal tractors is the single largest source of WAIRE points earned to date, accounting for roughly 43% of all points earned across the program’s history, more than any other compliance option, including on-road electric trucks, solar installations, or EV charging infrastructure [10].

The regulatory picture also depends on certification status: terminal tractors certified for on-road use fall under the same 2027 on-highway NOx rule facing Class 8 trucks generally, while off-road-only units fall under the more static Tier 4 framework. Fleets with a largely on-road-certified terminal tractor fleet, like Lazer Logistics, may see cost and availability pressure on new diesel units as 2027 approaches, though the timing and magnitude of any price impact is not yet clear.

6.2 Terminal Tractors as a Proving Ground

Survey and interview data both point to a pattern: fleets tend to electrify terminal tractors before they electrify other types of vehicles. “Electric Terminal Tractors First” was the most common response among fleet operators for deployment sequencing specifically (36%), and industry partners report the same pattern even more strongly among the fleets they support (50%). When NACFE combined this figure with fleets that have electrified terminal tractors exclusively (23%), it found that 58% of fleet operators surveyed either adopted electric terminal tractors before any other EV type or have made terminal tractors their only EV investment — meaning well over half started their fleet electrification journey with the yard.

Why are electric terminal tractors adopted first? One reason may be that because terminal tractors often don't leave the fence line, they sidestep the range and charging uncertainty that complicate on-road electric trucks. As Bourassa Transport put it, having one is "like having a gas station next to the truck at all times." Wegmans offers a concrete illustration of the same logic; its terminal tractors were fully electric years before its first electric Class 8 truck entered service, a sequencing the fleet attributes to how much simpler yard charging is than routing a long-haul electric truck reliably between chargers. For fleets still cautious about electrification broadly, a terminal tractor pilot can function as a comparatively low-risk way to build the operational and financial confidence a larger electrification program requires.

This bears out one of the central findings of NACFE's 2022 report, and this research confirms it still holds: for a fleet with no EVs that is considering electrification in any form, the terminal tractor is the natural place to start. It gives a fleet a relatively captive vehicle, one that stays close to home and runs a predictable route, and lets every part of the organization, from drivers to maintenance to finance, get familiar with both the advantages and the challenges of the technology before it shows up on a road route. Telematics and tracking can be layered on to see how the vehicle actually performs against the duty cycle for which it was bought. None of that changes the two conditions this report returns to throughout: the vehicle still has to fit the duty cycle, and the charging capability still has to be sized and sited correctly.

6.3 Operating Cost Savings

On operating costs specifically, most fleets that have adopted electric terminal tractors are seeing real savings: 76% of fleet operators report at least moderate operating-cost savings compared to diesel. The interviews put concrete numbers behind that figure. Lazer Logistics, drawing on close to 10 years of data, reports a roughly 50% reduction in maintenance and repair cost per operating hour on electric units compared to diesel, rising to as much as 75% in a unit's early years, alongside a 75% to 95% reduction in net energy cost per operating hour; figures independently corroborated by a third-party trade report crediting Lazer with more than \$5 million in combined fuel and maintenance savings [7]. Wegmans' Dubman credits reduced maintenance, driven by fewer components and no emissions aftertreatment system to fail, along with offset diesel fuel costs and reduced driver pre-trip inspection time, as its largest realized savings.

Some fleets highlighted the uncertainty around maintenance cost estimates specifically, which can take several years to solidify. Taki Darakos, PITT Ohio's VP of Vehicle Maintenance & Fleet Services, estimates roughly \$10,000 a year in fuel savings per electric unit, though he calls maintenance savings there "still to be determined." Coke Canada's fleet director similarly said maintenance savings are still "to be determined," since its model doesn't yet account for unknown future battery costs or diesel maintenance costs (like DPF/SCR aftertreatment repairs).

Results vary by fleet and duty cycle, but the pattern across these interviews is largely consistent: fleets like Lazer Logistics and Wegmans that have run electric terminal tractors long enough to compare a full maintenance cycle against diesel are seeing real operating-cost savings.

6.4 Full Business Case

While fleets were largely in agreement on the operating cost savings of electric terminal tractors, the full business case produced a more mixed response. Industry partners report high confidence here, with 53% calling it a strong business case already, but confidence isn't universal on the fleet-operator side: 52% say it is still too early to tell whether the full case has proven out.

The gap between 76% of fleet operators reporting real operating-cost savings and 52% calling the full financial case “too early to tell” looks contradictory at first read. The evidence in this research points to three explanations. First, the two questions measure different things: “operating-cost savings” asks about certain line items (fuel and maintenance) while “the full financial case” implies total payback against the upfront capital, a calculation that takes years to determine regardless of how favorable the monthly numbers look. Second, tenure matters: 54% of fleet operators surveyed have moved past the pilot stage, meaning roughly half the sample has not yet run an electric unit long enough to observe a full depreciation cycle, let alone a battery-replacement cycle. Wegmans, one of the few fleets in this research at full standardization, took five to six years to reach it, and even Wegmans still frames its return in a three-to-five-year window rather than a completed one.

Third, the financial case is more conditional: Coke Canada’s comparable return depends on incentives that are not guaranteed, and colder climates and lighter-duty cycles narrow the advantage electric units show in warmer or more continuous operations (see Section 8). A fleet operator watching real fuel and maintenance savings accrue every month can, quite reasonably, still consider the full multi-year business case unproven; the caution reads less as a signal that the technology isn’t paying off and more as a signal that most fleets are still in the middle of finding out by how much.

6.5 Operational Performance Ratings

The pattern in Figure 5 is consistent with what fleets described in interviews: driver experience and air quality are close to unanimous wins. Fleets cite the quieter, cleaner, more comfortable experience as a definitive benefit for their drivers. Uptime, brake lifespan, and telematics skew positive toward electric but with exceptions, and yard throughput mostly reads as equal. Electric terminal tractors are not, according to respondents, making yards faster, but they are definitively making them cleaner and more comfortable to run, with cost and maintenance advantages layered on top.

Tire wear and cold-weather performance are the two categories where a meaningful share of respondents report a real downgrade, not just a wash, and both are corroborated independently by interview evidence: Bourassa’s unresolved tire-wear cost and Wegmans’ 10% to 20% cold-weather range reduction – though fleets generally report that reduced range still comfortably covers their duty cycle.

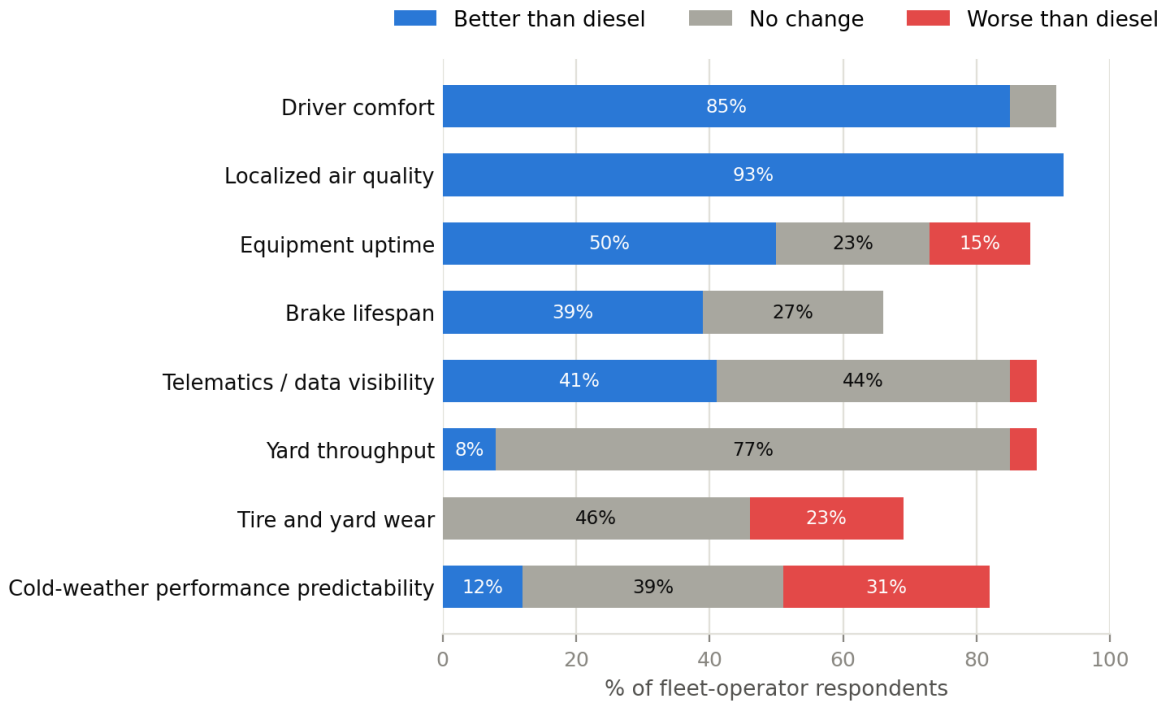


Figure 5: Fleet-operator ratings of terminal tractor operational performance vs. diesel

Regarding operational challenges with the vehicles themselves, nearly half of fleet respondents (44%) report no major operational challenges at all. Among those who do, thermal management issues are the most common (22%), followed by charging-interface failures and vehicle performance issues (11% each).

6.6 Ownership, Timeline & Service-Life Expectations

Beyond adoption drivers and confidence, the survey surfaces three additional patterns relevant to the way fleets plan and budget for electric terminal tractors. Capital purchase dominates how fleets acquire the vehicles: 63% of fleet operators and 47% of industry partners selected capital purchase among their acquisition models, well ahead of any leasing structure. That matters directly for the capital budgeting barrier already identified as the top obstacle to scaling (see Section 8), although leasing options that could ease the size of the up-front capital ask are beginning to emerge.

Fleet operators and industry partners also diverge sharply on expected service life. Fleet operators mostly commit to a concrete range, with 37% expecting 7 to 9 years and 30% expecting 10 or more; industry partners, by contrast, overwhelmingly say service-life data is not available or varies too much to generalize (71%), a gap that most likely reflects the difference between owning a specific fleet's maintenance history and observing a wide range of deployments with less uniform data.

A similar gap shows up when NACFE asked fleets to estimate the total time it took from their first internal discussion about electric terminal tractors to the first tractor deployed and operating. Fleet operators most often report reaching operational status within 6 to 12 months (37%), and 13% describe a fast track under 6 months. Industry partners report longer timelines more often, with 47% citing 13 to 24 months as typical for the fleets they support. Industry partners may be encountering fleets that specifically seek their help due to utility and infrastructure delays, while fleet operators may be largely reporting on their own, already-successful path.

6.7 Diverse Fleet Experiences

The survey also reveals a diversity of strategies, needs, and constraints fleets face around electric terminal tractor adoption. Schneider, one of the country's largest carriers, reports a multi-site electric terminal tractor deployment running on Lonestar and TICO units alongside 92 electric Class 8 tractors and a diesel fleet of roughly 12,000. This suggests a well-resourced operator treating electric terminal tractors as one part of a broader electrification program rather than a first experiment.

A large national retailer reports 50 electric terminal tractors across Autocar, BYD, Orange EV, and TICO equipment against 1,400 diesel units, describing its progress as “moving toward fully standardized for some supply site types, including greenfield sites.” This shows a strategy of partial, site-specific standardization rather than a fleet-wide switch. Another large carrier, by contrast, reports a single electric terminal tractor with a second on order against roughly 200 diesel units; an early pilot at an operator many times Schneider's scale in other respects, a reminder that adoption timing varies even among large, well-capitalized fleets. (The retailer and the second carrier requested that their responses be reported without identifying them by name.)

Open-text responses add texture the multiple-choice questions can't. One large parcel-delivery fleet running Autocar, Capacity, Kalmar Ottawa, Lonestar, and Orange EV equipment, which also requested anonymity, wrote that “EV yard tractors are expensive and that's without charging installation,” and separately noted that no on-road-capable, DOT-legal electric terminal tractor rated for highway-adjacent speeds is yet available from any manufacturer; a real product gap, not a cost complaint alone.

One respondent flagged a purely physical constraint: “We looked at yard tractors, but the wheelbase was too long for a tight yard application. We currently still run I/C [internal combustion] Ottawas;” a reminder that site geometry, not just cost or infrastructure, rules out some fleets. And one terminal tractor OEM, requesting to remain anonymous in the survey, corroborated the survey's own finding on standardization maturity: “As an OEM, we have customers in most phases. Very few are in the fully standardized [phase].”

Figure 6 sums up some of the top-level results from the survey.

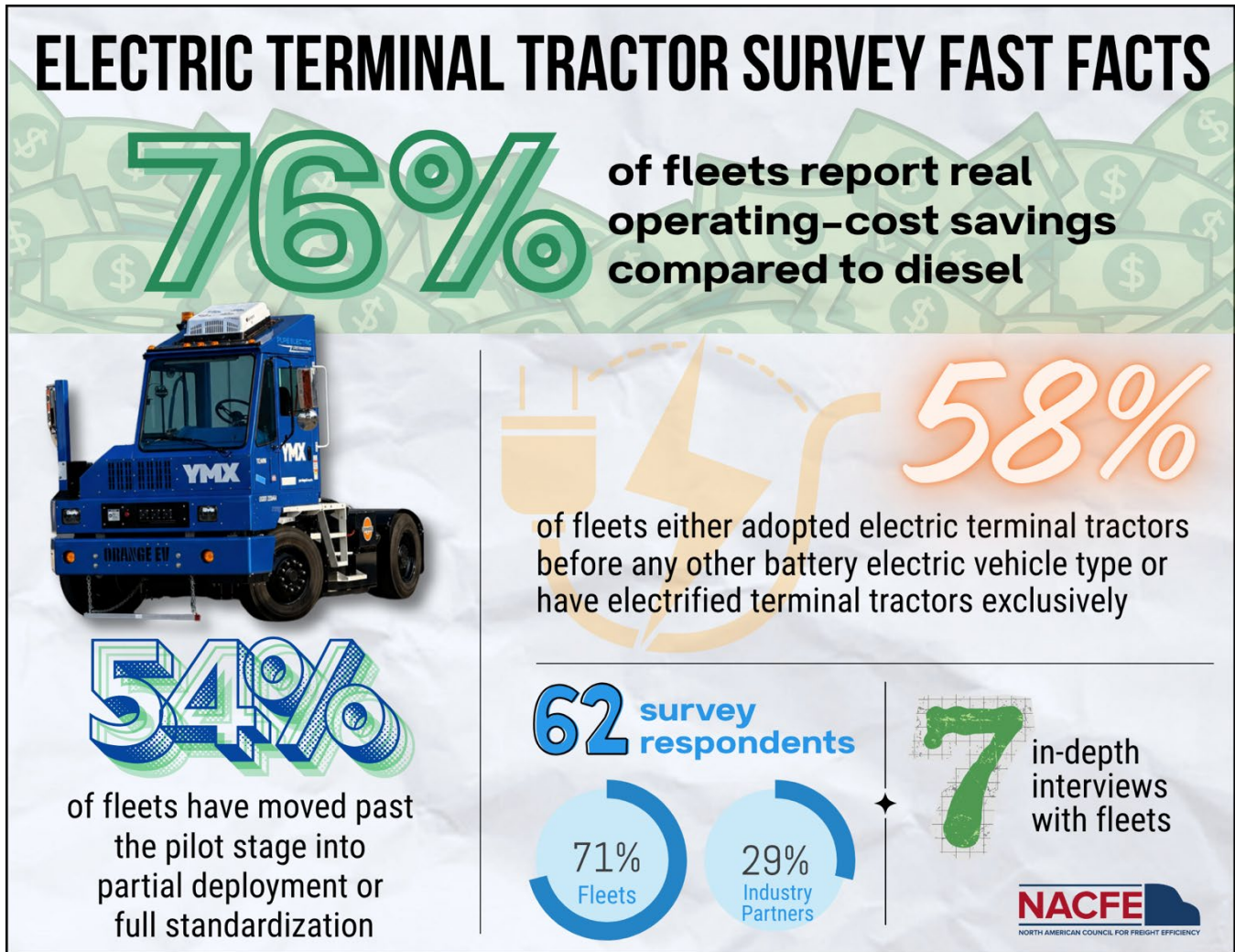


Figure 6: Summary of NACFE survey results

7 CASE STUDIES

The seven fleets below represent the full range of outcomes found in this research, from complete standardization to the decision not to adopt. Three threads from the survey data in Section 6 run through nearly all of them: a) direct economic benefit from fuel and maintenance savings shows up as a real driver; b) electric terminal tractors perform well operationally for the fleets that have adopted them, consistent with the largely positive ratings in Figure 5; and c) where adoption has gone furthest, it tends to trace back to a specific champion or mandate inside the organization that drives action, not just favorable unit economics. Wegmans is the clearest example of that third thread: Dubman describes the transition as driven by alignment with company sustainability values rather than a contract-winning business case, and that internal mandate (not a superior payback calculation) is what carried the fleet to full, three-site standardization while other fleets in this research remain at earlier stages, ranging from their first truck to a partial rollout.

7.1 Wegmans: Full Standardization

Wegmans Food Markets runs 18 terminal tractors across three distribution centers in New York, Pennsylvania, and Virginia; 100% electric, zero diesel. The transition traces to a company-wide sustainability initiative dating to 2013; formal electrification discussions began in 2019, the first pilot truck arrived in 2021 with New York state grant support, and the fleet will reach full standardization with its 19th truck at the end of 2026, a roughly five-to-six-year path from first pilot to complete conversion.

Wegmans targets a three-to-five-year return on investment and expects 7 to 10 years of battery life. Dubman credits reduced maintenance (fewer components, no emissions aftertreatment system to fail) and reduced driver pre-trip inspection time as the largest realized savings, alongside offset diesel fuel costs. Wegmans has also shifted its charging infrastructure from 22kW chargers to the CCS-1 standard, prioritizing compatibility with other EVs as it adds electric Class 8 trucks at the same sites.

Not every early decision held up without revision: Wegmans' first-generation units drew driver complaints about inadequate heating and air conditioning, prompting a move to an updated model with improved cab climate control.

7.2 YMX Logistics: Multi-Vendor Fleet

YMX Logistics is a yard-management provider, not a shipper; it operates terminal tractors on behalf of manufacturing and distribution clients, taking over spotting operations clients previously ran themselves. They also create efficiency in yard operations by combining several clients under one spotting service provider, thus reducing the number of spotters needed for each location. YMX runs roughly 200 terminal tractors nationally, with electric units growing to an expected 50 by the end of 2026, and it deliberately spreads the fleet across five manufacturers, configuring each location based on site duty cycle and terrain rather than a single relationship. "We're not tied to a single OEM," said YMX Chief Operating Officer Michael Lucas. "Our strategy is understanding where they're a right fit in our network and for our customer...aligning with just one OEM could be limiting."

YMX's own measured data shows electric units at 95% to 98% uptime against what can be sub-90% for diesel and describes the price premium over diesel falling from roughly 3x the cost five to six years ago to under 2x today. In one case, taking over a 24/7, multi-operator yard as the sole yard-management provider let YMX cut the equipment count by 36% while improving both efficiency and safety.

YMX is not without real operational friction: high-voltage components still require OEM-trained technicians while diesel parts remain broadly available anywhere. Some electric-specific parts currently cost more than their diesel equivalents despite the vehicle having fewer parts overall. YMX has looked at alternative solutions to charging EV yard tractors, including battery swapping as a strategy, but has not seen a clear path to commercialization or a competitive advantage due to hazmat complexity and inconsistent battery form factors across manufacturers.

YMX maintains strategic relationships with OEMs but remains agnostic to a specific brand of terminal tractor, and looks first at whether diesel or electric, and then which brand of electric unit, best fits the duty cycle at a given location. If barriers to EV adoption are driven by a lack of supporting electrical grid, diesel may be the best initial option. Ultimately, YMX sees sustainability and efficiency going hand in hand. To YMX, operational efficiency is the catalyst for their EV adoption — it brings customers immediate value while still supporting long-term environmental goals.

7.3 Coke Canada Bottling: Mixed-Fleet Comparison

Coke Canada Bottling operates eight terminal tractors across 42 locations. Its first electric unit, a Terberg YT-203EV piloted in 2020, has run without a single vehicle-level issue for five to six years; the only reliability problem traced to a charger commissioning error, not the truck itself. Coke Canada has since added two Orange EV units, with a fourth electric unit planned for 2027. Drivers have responded well to the switch: Director – Fleet COE Viren Rodrigues said drivers “love” the electric units, citing the quieter cab and the absence of diesel fumes.

Coke Canada’s return on these units is real but more modest than some other fleets in this report describe, a difference its fleet director attributes to conditions rather than to the technology itself. “In full transparency, it’s about the same [return] as if we replaced it with a diesel...I think we’re around 25% [return] on both.”

Coke Canada operates in a colder climate than several other fleets in this research and has not yet built maintenance savings into its return calculation, calling that “to be determined” without knowing future battery and diesel emissions-system costs. Their business case also depends heavily on incentives that are not guaranteed: Canada’s federal medium- and heavy-duty vehicle incentive (the iMHZEV program) ended in March 2026 as scheduled, leaving only provincial support in the two provinces where Coke Canada has electrified. Coke Canada noted that it deliberately excluded its Alberta site from electrification, citing that province’s natural-gas-heavy grid, which reduces the carbon-emissions-reduction benefit of running electric trucks compared with other hydro- and renewable-powered provinces.

7.4 Lazer Logistics: Electrification at Scale

Lazer Logistics, marking its 30th year of operation in 2026, is North America’s largest outsourced yard-management provider, running more than 800 locations across 43 states and Canada. Site size varies widely and is heavily skewed toward a few very large sites: a single truck on one shift at Lazer’s smallest locations, 20+ trucks running 24/7 at its largest sites, and two to four trucks around the clock as the typical footprint even at its larger Fortune 500 clients. Of Lazer’s roughly 2,100 terminal tractors, about 150 are electric, roughly 7% of the fleet. Lazer owns and operates Autocar, BYD, and Orange EV electric units. Bennett says the company has evaluated and demoed Kalmar Ottawa, Terberg Taylor, and TICO platforms but does not currently operate either at scale.

Lazer’s first three electric units, purchased in 2017, were Orange EV conversions built on donated diesel chassis; diesel to EV conversions now make up less than 1% of its electric fleet, with nearly all subsequent purchases purpose-built as electric from the start. Based on close to 10 years of data, Bennett reports a roughly 50% reduction in maintenance and repair cost per operating hour on electric units compared to diesel of the same model year, rising to as much as 75% in a unit’s early years; a figure that includes tires and holds consistently across every OEM in the fleet. Preventive maintenance also runs faster: Lazer can typically complete three to four PM visits at a site in a day on electric units, against two to three on diesel, partly because many customers restrict on-property diesel maintenance over fluid-spill concerns that electric units mostly avoid.

On energy costs, Bennett reports a 75% to 95% reduction in net cost per operating hour (diesel fuel minus the cost of electricity), based on 9+ years of data across roughly 4 million miles, 8+ million trailer moves, and 1.7 million key-on hours. The exact figure depends on climate, duty cycle, and diesel price volatility, and excludes the capital cost of charging infrastructure installation.

Every electric replacement at Lazer has been 1:1, with no additional units purchased to cover any charging-related downtime. Lazer credits a strategy of more deliberate specification (the largest available battery packs, paired with DC fast chargers behind the fence line) for making that possible. It also has pushed charging ratios

well past original OEM guidance: manufacturers initially recommended one Level 3 charger per two trucks in a 24/7 environment, but Lazer has run a confirmed four-trucks-per-charger ratio for several years and is now testing five- and six-truck ratios on its highest-output chargers. Labor efficiency continues to improve because charging happens during paid driver breaks and shift changes rather than pulling a truck off task as diesel units require.

Separately, Lazer has cut idle time across its diesel terminal tractor fleet from 52% in 2017 (the same year its electric program began) to 16% today, through a multi-year operational-discipline program unrelated to electrification. A follow-on idle reduction technology project targets under 5% idle time, with results expected in early 2027.

On the maintenance side, Bennett flags one recurring shortcoming: low-voltage wiring harnesses are a more frequent and harder-to-diagnose repair on electric units than anything comparable on diesel, even as high-voltage components have proven reliable. He also points to an industry-wide shortage of technicians trained on electric terminal tractors, a constraint Lazer manages by outsourcing 100% of its maintenance and repair — electric and diesel alike — to OEM field-service networks and dealers. An independently published trade report corroborates part of Lazer’s account: Lazer has logged more than 2.5 million zero-emission miles and reports more than \$5 million in combined fuel and maintenance savings [7].

7.5 Bourassa Transport: Single-Truck Pilot

Bourassa Transport, a Québec-based less-than-truckload carrier, operates a single Orange EV terminal tractor alongside five diesel units at one terminal. The truck entered service in April 2026, funded in part by a roughly \$150,000 federal grant that fleet manager Marilyn Bourassa says covered nearly half the purchase price; though she says she would have bought it regardless. Bourassa relies entirely on opportunity charging during driver breaks, with a contingency plan to charge overnight if winter range becomes a limiting factor.

Bourassa credits Orange EV’s pre-purchase site visit as a meaningful factor in choosing a unit that actually fit her operation. “It comes back to when Orange EV came here and looked at our facility and what is going on. It’s easy to talk to someone, but if you don’t know how their operation works and everything, it might not fit with yours.” Bourassa also offers a rare glimpse of how fit, not just brand, drives these decisions more broadly. Her drivers tried a competing electric unit for approximately four hours and found it wasn’t the right match for their operation, citing accelerator response and battery drain as the main concerns. Bourassa also flagged a real, unresolved cost. No terminal-tractor-specific tire exists yet for electric units, and the added torque and weight of electric drivetrains appear to accelerate tire wear, a concern independently corroborated in NACFE’s survey, where most fleet operators rated tire wear equal to or worse than diesel.

7.6 PITT Ohio: Infrastructure-Constrained Adoption

PITT Ohio, a regional less-than-truckload carrier with about \$970 million in annual revenue, operates 35 terminal tractors, two of them electric, across 25 terminals. Infrastructure availability has been PITT Ohio’s main constraint to scaling further: only some of its terminals currently have enough electrical service to support terminal tractor charging alongside its other electric yard equipment. (PITT Ohio has already electrified roughly half its forklift fleet.) Darakos estimates fuel savings of roughly \$10,000 a year per electric unit and a payback period under 10 years, while maintenance savings remain, in his words, “still to be determined.” PITT Ohio’s experience shows that for many fleets, the binding constraint on further electrification is not the vehicle, but the power availability.

PITT Ohio's experience confirms the cost delta between diesel and electric units. PITT Ohio's standard practice is to buy lightly-used diesel units, rather than new ones. Darakos recently bought a four-year-old diesel terminal tractor with less than 350 hours of use at a price that reflects its almost-new state. It was priced at roughly a third of the cost of a new electric unit.

PITT Ohio's terminal tractors run 10 to 14 hours a day, with electric units reaching roughly 40% to 50% state of charge by the end of a shift, and PITT Ohio typically replaces four to five units a year fleet-wide. Its electric units carry a seven-year battery warranty, and Darakos reports no reliability surprises so far. The fleet's rollout sequencing at new sites follows the same infrastructure logic driving its terminal tractor pace: electric forklifts and terminal tractors are electrified first, ahead of box trucks, at whichever terminals get adequate electrical service.

7.7 A Carrier That Chose Not to Adopt

One large carrier interviewed for this report, which requested anonymity, operates roughly 400 terminal tractors and has no electric units and no active plans to pilot one. Its terminal tractors run modest but steady duty cycles (six to eight hours a day, roughly 250 days a year), with idle time tracked above 50% on some units, exactly the kind of inefficiency electric terminal tractors are built to address.

But the carrier's leadership raised the idea internally and set it aside. One executive described the response to a proposal to address idle time as "just stop the idle time, next subject," addressing the underlying inefficiency through operational discipline rather than new equipment. A senior leader at the company said adoption of electric terminal tractors would likely require a board-driven initiative, not an operational one, to change course; and said the company would have zero interest in a pilot unless a manufacturer provided the truck and charging system free of charge, which no OEM interviewed for this report currently offers.

The carrier separately piloted 10 electric Class 8 delivery trucks from a manufacturer for short regional routes and parked all of them, citing poor performance and inadequate manufacturer support; an experience that, while not about terminal tractors specifically, appears to have reinforced institutional skepticism toward electrification in general. Its terminal tractors are diesel units acquired through a low-bid procurement process, run until they fail rather than replaced on a schedule, at roughly \$150,000 for a new unit.

This carrier's experience is a useful counterweight to the rest of this report: not every fleet that has not adopted electric terminal tractors is waiting on better technology or cheaper batteries. Some have evaluated the option and made a considered decision that it does not fit their operating model or culture, at least for now.

Read together, these seven fleets echo the survey findings in Section 6. Every fleet that adopted electric terminal tractors, regardless of scale, points to real fuel and maintenance savings once units are running; the economic case shows up in practice, even for fleets like Wegmans that describe values, not payback, as the primary motivation. Operational performance is consistently positive once a fleet commits, with cold weather and tire wear the recurring exceptions, matching Figure 5's pattern almost point for point. And the fleets that moved furthest (Wegmans to full standardization, YMX to a deliberately multi-brand program, Lazer to fleet-wide scale) each had an identifiable internal champion or mandate driving the decision, while the one large carrier that chose not to adopt lacked exactly that: leadership set the idea aside rather than assigning it to anyone to own. Organizational buy-in, more than any single unit economics threshold, appears to be one critical factor that separates a fleet that pilots one truck from a fleet that standardizes.

8 WHERE ADOPTION STILL STRUGGLES

When moving from pilot to scale, capital budgeting is the clearest barrier in NACFE's data: 63% of fleet operators and 77% of industry-partner respondents rank it among the top obstacles, with utility and grid delays cited next (40% and 53%, respectively). Figure 7 shows the full ranking of barriers reported by both respondent groups.

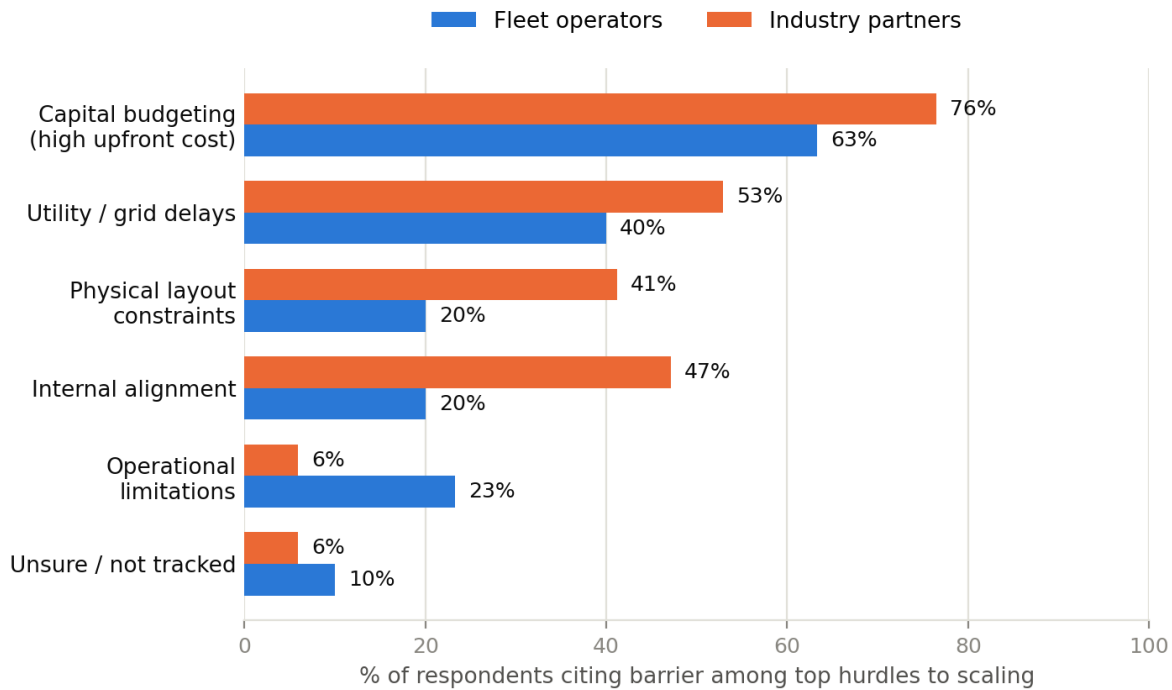


Figure 7: Barriers to moving from pilot to scale (NACFE survey)

8.1 Capital Budgeting

Capital budgeting is less about whether the economics eventually work and more about clearing a much larger upfront number. PITT Ohio's Darakos frames the gap directly: a new electric terminal tractor costs roughly double a new diesel unit, a difference that has to be justified against cost savings of about \$10,000 a year, well before the underlying total-cost-of-ownership case is proven out (see Section 6). That mismatch between a large, immediate capital ask and a savings case that accrues slowly is what pushes capital budgeting ahead of every other barrier fleets report, including infrastructure. Unlike a grid upgrade, which a fleet can sequence and phase over time, a fleet either has budget approved for a \$300,000 unit in a given cycle or it does not.

Leasing, rental, and other flexible commercial models can help fleets avoid clearing the full purchase price in a single budget cycle. For fleets that cannot secure capital approval for an outright purchase, these structures are one way to work around this specific barrier while still moving forward with electrification.

Incentive dependency is a real risk for the fleets relying on it, not a hypothetical one; both Coke Canada and Bourassa Transport's business cases lean on incentives that are smaller, less certain, or already gone (see Section 7). Fleets building a business case around electric terminal tractors should model the return without incentives, not just with them.

8.2 Utility & Grid Delays

The utility and grid barrier is more about site-by-site buildout than about the vehicle's power demands. Terminal tractor charging draws far less power than on-road electric truck charging. Bourassa Transport runs a 120kW charger with a 150kW backup, Coke Canada's single-site installations run 50kW to 60kW, and Lazer Logistics reports its chargers averaging around 70kW; well under the multi-hundred-kilowatt-to-megawatt scale that Class 8 truck charging depots require. That makes the yard a comparatively low-infrastructure-risk entry point into fleet electrification.

But a modest per-unit draw doesn't eliminate the buildout problem at scale. Coke Canada's Vancouver expansion needed 280kW of capacity for six trucks and required treating the project as materially bigger than its earlier single-charger installations. PITT Ohio's experience shows the same dynamic; only some of its terminals currently have enough electrical service, so its pace of electrification is set by how quickly it can extend service to more sites.

8.3 Physical Layout Constraints

After capital and utility obstacles, physical layout was cited by one-fifth of fleets and 41% of industry partners as a barrier to scaling. As mentioned previously, one survey respondent highlighted how this manifested in their yard: "We looked at [electric] yard tractors but the wheelbase was too long for a tight yard application." Wheelbase and turning radius vary meaningfully across OEMs, making a site-specific fit assessment — not just a cost or infrastructure check — part of a realistic electrification evaluation.

The constraint isn't only about the vehicle itself. Adding chargers competes for the same limited yard footprint as trailer staging, traffic flow, and maneuvering room, and retrofitting an existing yard to accommodate charging infrastructure is a fundamentally different problem than designing one from scratch. For fleets operating in older or space-constrained facilities, this can rule out electrification even when the unit economics otherwise work.

8.4 Internal Alignment

Internal alignment ranked lower but was still cited by one-fifth of fleet operators and 47% of industry partners. In practice, this shows up less as a technical or financial obstacle and more as friction getting a project through corporate approval. The clearest example among the fleets interviewed for this report is the large carrier that evaluated electrification and chose not to proceed (see Section 7). A senior leader said any real initiative would need to be board-driven rather than operational to gain traction. That carrier lacked exactly what distinguished the fleets in this research that scaled furthest — an identifiable internal champion or mandate. Every fleet that reached full or near-full standardization, from Wegmans to Lazer Logistics, points to one; without it, even a fleet with a workable business case underneath it can spend years unable to move a pilot past the proposal stage.

8.5 Operational Limitations

While operational limitations of electric terminal tractors was only cited by 6% of industry partners, nearly a quarter of fleets noted this barrier to scaling — perhaps reflecting their more direct experience with the trucks. Cold-weather performance is one operational category in NACFE's survey where a meaningful share of respondents (31% of fleet operators, 35% of industry partners) rate electric units worse than diesel rather than better or the same. Wegmans reports a 10% to 20% range reduction in cold weather; Bourassa built an

overnight-charging contingency plan specifically to manage winter range risk. This is not a minor edge case: several of the fleets in this research operate in the northeastern United States and Canada, where cold-weather performance is a year-round planning consideration.

Duty-cycle fit varies by application, and the fleets that have done best in this research tend to be continuous, DC- or plant-attached operations. YMX Logistics reports 95% to 98% uptime on its electric units against what can be sub-90% on diesel, and Lazer Logistics reports maintenance and repair costs roughly 50% lower on electric units, with much of that work completed on-site. The picture looks different at the highest end of duty-cycle intensity. A port-focused industry partner surveyed by NACFE flagged a specific concern: “the largest hurdle is the lack of uptime in a 20-hour duty cycle compared to that of a diesel port tractor.” This suggests port and marine terminal applications, which run longer and harder than the distribution-center and plant environments that dominate the case studies in this report, may still lag behind on readiness.

It is worth being direct about a related point: at least today, electric terminal tractors are not for every fleet or every site. There are locations where terminal tractor utilization is low enough that the economics simply do not work, electric or diesel. And in some businesses, the capital expense, or the operating expense if the units are leased, will not clear the financial or profitability bar fleet leadership sets, regardless of the operational case. YMX Logistics puts this plainly in its own sourcing decisions (see Section 7): where the duty cycle or the site’s power situation does not support it, diesel remains the better choice, not a fallback.

8.6 Safety

This research did not set out to evaluate safety specifically, and the survey and interviews did not systematically capture it, but it is important to mention. A quieter yard changes the sensory environment for the people working in it: drivers, dockworkers, and pedestrians who have relied on the sound of a diesel engine to know a tractor is approaching can lose that cue with an electric unit. It is a widely recognized consideration for electric vehicles operating around pedestrians generally, and it applies just as directly inside a working yard. None of the fleets in this research reported an incident tied to it, and several noted the quieter cab as a driver benefit rather than a hazard, but the absence of a reported problem is not the same as evidence the risk isn’t there.

Fleets piloting electric terminal tractors should treat driver and yard-worker awareness training, and where appropriate exterior alert sound systems, as part of the rollout rather than an afterthought, and this is an area future NACFE research could usefully examine more in depth.

Not every fleet that has considered electrification has chosen it, and not every fleet that rejected it chose to stay with diesel. One industry respondent to NACFE’s survey reported evaluating and rejecting electric terminal tractors in favor of compressed natural gas units, a reminder that electrification competes with other decarbonization paths, not just with the status quo.

9 TERMINAL TRACTOR ELECTRIFICATION READINESS TOOL

The fleets in this report that succeeded with electric terminal tractors share a set of conditions: among other things, they include a duty cycle that the vehicle and its charging strategy can actually support; adequate site power or a credible plan to get it; and a clear internal case for capital, whether from direct savings, incentives, or both. The fleets that have struggled or chosen not to adopt tend to be missing more than one of those conditions at once.

To help fleets assess their own readiness before committing to a pilot, this report includes the [Terminal Tractor Electrification Readiness Tool](#) (Figure 8 and Figure 9), developed for this project. It scores an organization across seven factors — daily duty cycle, capital access, external motivators such as regulation or internal decarbonization targets, incentive availability, power and charging infrastructure, prior EV experience, and site control — and maps the resulting score to one of four readiness tiers, from “strong candidate” to “not yet a fit.” It is not a financial model or a guarantee of outcomes. It is meant to give fleets, and the people advocating for a pilot inside their own organizations, a starting point for that conversation.

How to use this tool:

This scoring tool is designed to give fleets a directional understanding on how ready they are to pilot electric terminal tractors.

To use it:

- Answer each of the seven factors below based on your organization's current situation — not where you hope to be in a year, but where you are today
- Record the point value for your answer to each factor
- Add up your total score
- Find your total in the scoring key to see which readiness tier you fall into, along with suggested next steps

Factor	Answer	Points
1. Daily duty cycle	Continuous multi-shift operation	3
	High-idle operations	2
	Standard intermittent operation with regular breaks	2
	Low utilization (e.g., less than half a shift)	0
2. Capital access	Budget available (for a terminal tractor purchase or lease – electric or diesel)	4
	Budget likely	2
	No clear budget / competing priorities	0
3. External motivator	Active mandate or regulatory requirement	5
	Internal emissions or decarbonization target	3
	No active external motivator	0
4. Incentives available	Incentives exist and are accessible	4
	Incentives are available, but eligibility or timing is unclear	2
	None	0

5. Power/charging infrastructure	Sufficient grid power or charging already exists on-site	3
	Considering temporary charging to get started while a permanent solution is developed	2
	Power upgrade path identified (e.g., utility engaged, interconnection underway)	1
	No known path identified yet (not yet evaluated with a utility, or evaluated and found infeasible)	0
6. Organizational EV experience	Extensive (multiple different types of electric equipment already deployed at scale, such as electric forklifts or other electric vehicles)	3
	Some (piloted or operate a small number of EVs, electric forklifts, or other electric material handling equipment)	2
	None (no EV experience, may have evaluated only)	0
7. Site control	Facility owned	2
	Long-term lease (≥ 3 years)	1
	Short-term lease (< 3 years)	0

Figure 8: Terminal Tractor Electrification Readiness Tool: Scoring Factors (total possible: 24 points)

Terminal Tractor Electrification Readiness Tool: Scoring Key		
Score	Tier	Guidance
21-24	Strong Candidate	The ideal position to initiate a pilot.
16-20	Good Candidate	Most of the pieces are already in place. Addressing the remaining gap or two should be enough to move forward with a pilot.
11-15	Candidate	Several key factors are already favorable. A pilot is recommended, and closing one or two specific gaps – capital, incentives, or infrastructure – will meaningfully improve the odds of a smooth rollout.
6-10	Marginal	Not yet ready to pilot, but the gap is likely closeable. Identify your lowest-scoring factors and target those directly - capital, incentives, or utility engagement can often be addressed within a few months and would move you into Candidate range.
0-5	Not Yet a Fit	Multiple foundational factors are missing at once, so no single fix is likely to change the picture soon. Rather than actively pursuing a pilot, monitor for a shift - a new mandate, incentive program, or budget cycle - and revisit when one occurs.

Figure 9: Terminal Tractor Electrification Readiness Tool: Scoring Key

This report closes where it opened: electric terminal tractors have earned a real, standardized place in a growing set of fleets, without yet being the right fit for all of them. The readiness tool shown in Figure 8 and Figure 9 is meant to help each organization tell the difference for itself.

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APPENDIX A – SURVEY METHODOLOGY

NACFE fielded the Electric Terminal Tractor Market Trends survey to its fleet and industry-partner network in 2026. The survey used two parallel question tracks: one for fleet operators and 3PLs describing their own terminal tractor operations (n=44), and one for industry partners (OEMs, utilities, and consultants) describing the fleets and operations they observe (n=18). Response counts vary by individual question due to survey skip logic and partial completion; question-level sample sizes are noted throughout this report where relevant.

A small number of survey respondents are named directly in this report where their responses were self-identified, directly relevant to a specific finding, and the respondent did not request anonymity (for example, Schneider). Other respondents whose experiences are described in this report asked to remain unnamed and are referred to by descriptor only. All other survey data is reported in aggregate.

APPENDIX B – SURVEY QUESTIONS

The full text of the NACFE Electric Terminal Tractor Market Trends survey follows, in the order fielded. Fleet operators and industry partners answered largely parallel question tracks; where wording differed by respondent type, both versions are given. Not every respondent saw every question: survey logic skipped questions based on earlier answers, which is why response counts vary by question throughout this report.

Section 1: Demographics

- 1) What is your job title? (text box) _____
- 2) What is your organization's relationship to the terminal tractor market?
 - a) ☐ Direct Fleet Operator/3PL Supplier: We own, lease, manage, or provide dedicated yard equipment and operations.
 - b) ☐ Industry Partner (OEM, Utility, Consultant): We supply, support, or consult for fleets operating yard equipment.
- 3) *Fleet*: What yard types does your organization primarily operate? (Select all that apply) / *Partner*: What yard types do your fleet clients primarily operate? (Select all that apply)
 - a) ☐ Retail / E-commerce Distribution Center
 - b) ☐ Grocery / Cold Storage Facility
 - c) ☐ Less-Than-Truckload (LTL) Cross-Docking Hub
 - d) ☐ Manufacturing Facility
 - e) ☐ Marine / Intermodal Terminal
 - f) ☐ Other (Please specify): _____
- 4) *Fleet*: What does typical daily utilization look like for a terminal tractor in your busiest yard? (Select all that apply) / *Partner*: What does typical daily tractor utilization look like in your clients' busiest yards? (Select all that apply)
 - a) ☐ Low utilization: Less than 10 operating hours per day.
 - b) ☐ Standard intermittent operation (10 to 12 hours per day across 1 or 2 shifts).
 - c) ☐ Continuous multi-shift operation (20 to 24 hours per day).
 - d) ☐ High-weight / Severe duty: Moving loaded port hostling, overweight trailers, or intermodal containers
 - e) ☐ High-idle operations: Vehicles spend 40%+ of their active shift stopped, waiting, or idling
 - f) ☐ Data not available/Unknown
- 5) *Fleet*: How are the majority of your terminal tractors registered and legally operated? (Select one) / *Partner*: How are the majority of your clients' terminal tractors typically registered? (Select one)
 - a) ☐ Off-Road Only: Operates strictly within enclosed facility fence lines
 - b) ☐ On-Road Registered: Licensed to move trailers on public roads between close facilities
 - c) ☐ Mixed Fleet: Roughly even combination of on-road and off-road units
- 6) *Fleet*: What is the total estimated tractor count across your fleet? / *Partner*: What is the estimated fleet size for a typical client you support?
 - a) Approximate Diesel Units: _____
 - b) Approximate Electric (EV) Units: _____
 - c) ☐ Precise breakout unavailable / Not tracked

Section 2: Adoption Journey

- 7) *Fleet*: Which of the following best describes your organization's current phase of terminal tractor electrification? (Select one) / *Partner*: Which of the following best describes the current phase of terminal tractor electrification for the majority of the fleets you work with?
- a) ☐ Pre-Evaluation: Have not yet evaluated electric terminal tractors
 - b) ☐ Planning: Are actively evaluating or planning the first deployment but do not have units on-site yet
 - c) ☐ Pilot Underway: Are actively testing 1–5 units
 - d) ☐ Partial Deployment: Have moved past the pilot stage and scaled units across multiple sites
 - e) ☐ Fully Standardized: Electric terminal tractors are the default corporate procurement standard
 - f) ☐ Other (Please specify): _____
- 8) *Fleet*: Compared to other commercial vehicle classes, which statement best describes the deployment sequence for electric terminal tractors in your organization? (Select one based on your current operations or upcoming plans) / *Partner*: Compared to other commercial vehicle classes, which statement best describes the deployment sequence for electric terminal tractors? (Select one based on your client observations)
- a) ☐ Terminal Tractors First: They were or will be adopted *before* other EV truck types
 - b) ☐ Other EVs First: Other EV types (vans, box trucks, etc.) were or will be adopted before terminal tractors
 - c) ☐ Simultaneous Deployment: Terminal tractors and other EV types of trucks have been or will be deployed at the same time
 - d) ☐ Terminal Tractors Only: Terminal tractors are the only commercial EV truck being deployed or considered
 - e) ☐ Unknown / Undetermined
- 9) *Fleet*: Which equipment manufacturers (OEMs) are represented in your current or planned electric terminal tractor fleet? (Select all that apply) / *Partner*: Which equipment manufacturers (OEMs) are most frequently represented in the current or planned electric terminal tractor fleets you support?
- a) ☐ Orange EV
 - b) ☐ Kalmar Ottawa (e.g., T2 models)
 - c) ☐ Lonestar Specialty Vehicles / Kalmar TX (Legacy models)
 - d) ☐ Autocar
 - e) ☐ TICO
 - f) ☐ Capacity (including Hyster-Yale models)
 - g) ☐ Other (Please specify): _____
 - h) ☐ Unknown
- 10) *Fleet*: What is the primary catalyst that is driving your organization to adopt or consider electric terminal tractors? (Rank your top 2) / *Partner*: What do you observe as the primary catalyst driving fleets to adopt electric terminal tractors?
- a) ☐ Direct Economic Benefits: Projected fuel and maintenance cost savings
 - b) ☐ Regulatory Compliance: Regional air mandates or zero-emission vehicle rules
 - c) ☐ Operational Enhancements: Driver comfort, reduced noise, or indoor capabilities
 - d) ☐ Corporate Sustainability Goals: Carbon reduction targets or ESG mandates
 - e) ☐ No Active Catalyst / Not Applicable: We are not currently being driven or incentivized to consider electrification
 - f) ☐ Other (Please specify): _____
 - g) ☐ Unknown

- 11) *Fleet*: What is the primary reason your organization has not yet evaluated or adopted electric terminal tractors? (Select one) / *Partner*: What do you observe as the primary barrier preventing fleets from beginning their EV evaluation? (Select one)
- a) ☐ High Upfront Cost: The vehicle purchase price is too expensive
 - b) ☐ Infrastructure Constraints: e.g., lack of facility power or high charging setup costs
 - c) ☐ Operational Concerns: e.g., concerns about battery life, runtime, or matching diesel uptime
 - d) ☐ Utility Grid Delays: Long lead times for utility power upgrades or grid connections
 - e) ☐ Vehicle Availability Delays: Long manufacturer lead times or lack of immediate vehicle availability
 - f) ☐ Not a Priority: Current diesel units meet our needs and no mandates require a change
 - g) ☐ Other (Please *specify*): _____
- 12) *Fleets Only*: If electrification is not a near-term focus, what other strategies is your organization taking to improve yard efficiency? (Select all that apply)
- a) ☐ Yard Software: Upgrading or adding a Yard Management System (YMS) to reduce wasted driver moves
 - b) ☐ Gate Automation: Using cameras, RFID, or automated check-ins to speed up gate times
 - c) ☐ Yard Layout: Reconfiguring trailer parking or dock spaces to smooth out traffic flow
 - d) ☐ Diesel Optimization: Enforcing strict idle-reduction rules or updating older diesel units
 - e) ☐ None: We aren't focused on major yard improvements at this time
 - f) ☐ Other (Please *specify*): _____

Section 3: Procurement Behavior

- 13) *Fleet*: For your organization's upcoming terminal tractor procurement cycle (next 12–24 months), what is your primary strategy? (Select one) / *Partner*: For upcoming terminal tractor procurement cycles over the next 12–24 months, what is the primary strategy of the fleets you interact with?
- a) ☐ Diesel Only: We will only purchase/lease diesel terminal tractors
 - b) ☐ Mixed Footprint: We expect to purchase a blend of diesel and alternative/electric terminal tractors
 - c) ☐ EV First: We default to electric unless site-specific constraints (infrastructure, grid capacity) force a diesel purchase
 - d) ☐ EV Only: We will exclusively purchase/lease electric terminal tractors going forward
 - e) ☐ No Established Strategy / Under Evaluation
- 14) *Fleet*: What is the primary business model your organization utilizes to acquire electric terminal tractors? (Select all that apply) / *Partner*: What is the primary business model utilized by the fleets you support to acquire electric terminal tractors? (Select all that apply)
- a) ☐ Capital purchase
 - b) ☐ Operating Lease
 - c) ☐ Full-service lease (includes contract maintenance)
 - d) ☐ Yard management service provider (3PL managed)
 - e) ☐ Other (Please *specify*): _____
 - f) ☐ Not Yet Determined

- 15) *Fleet*: What is the expected primary service life of an electric terminal tractor in your fleet before it is replaced, rotated to backup duty, or retired? (Select one) / *Partner*: What is the typical primary service life of an electric terminal tractor among the fleets you support before it is rotated to backup duty or retired? (Select one)
- a) ☐ Less than 4 Years
 - b) ☐ 4 to 6 Years
 - c) ☐ 7 to 9 Years
 - d) ☐ 10+ Years
 - e) ☐ Data Not Available / Varies significantly

Section 4: Scaling Strategy

- 16) *Fleet*: When moving from a pilot to broader fleet scaling, which of the following hurdles has caused the most significant project delay? (Rank top 3, where 1 is the largest barrier): / *Partner*: Based on your client observations, rank the top 3 most severe hurdles fleets face when scaling from a pilot to broader fleet deployment (Rank top 3, where 1 is the largest barrier):
- a) ☐ Utility Delays: Lack of existing localized power at your facilities; long lead times for grid connections.
 - b) ☐ Physical Layout Constraints: Difficulty finding space for chargers or configuring efficient opportunity charging.
 - c) ☐ Capital Budgeting: High upfront cost of vehicles, charging hardware, engineering, and installation, etc.
 - d) ☐ Internal Alignment: Friction getting corporate approval, matching facility lease terms with infrastructure investments, or alignment on replacement schedules, etc.
 - e) ☐ Operational Limitations: Real-world vehicle performance constraints that slow down network scaling
 - f) ☐ Other (Please specify): _____
 - g) ☐ Unsure / Not Tracked
- 17) *Fleet*: Looking back at your first deployment, what was the estimated total time from your initial internal discussions to having electric terminal tractors operational in the yard? (Select one) / *Partner*: On average, how long does it take your clients to go from initial internal discussions to fully operational electric terminal tractors? (Select one)
- a) ☐ Less than 6 months (Fast Track)
 - b) ☐ 6 to 12 months (Standard Execution)
 - c) ☐ 13 to 24 months (Extended Deployment due to utility/infrastructure lag)
 - d) ☐ More than 24 months (Complex Lifecycle)
 - e) ☐ Data Not Available
- 18) *Fleet*: What charging strategy have you found to be the most effective for maintaining continuous operation? (Select one) / *Partner*: What charging strategy have you found to be the most effective for maintaining continuous operation among the fleets you support? (Select one)
- a) ☐ Opportunity Charging (Frequent short plug-ins during driver breaks/shifts)
 - b) ☐ Overnight / Extended Depot Charging
 - c) ☐ Both (Dynamic blend of opportunity and off-shift sessions)
 - d) ☐ None (We have not yet optimized our charging routine)
 - e) ☐ Other (Please specify): _____

Section 5: Benefits & Challenges

- 19) *Fleet*: Which statement best describes the financial performance of your electric terminal tractors? (Select one) / *Partner*: Based on your client observations or market data, which statement best describes the financial performance of electric terminal tractors?
- a) ☐ Strong Business Case: Achieves a full payback well within standard asset lifecycles
 - b) ☐ Breakeven Case: Payback is achieved at the absolute end of the vehicle's useful life, yielding no savings
 - c) ☐ No Business Case: Payback is never achieved during the vehicle's useful life
 - d) ☐ Too Early to Tell: Insufficient data to calculate payback
- 20) *Fleet*: Excluding the upfront vehicle cost, roughly how much cheaper is it to power and maintain an electric terminal tractor compared to a traditional diesel unit? (Select the choice that closest matches your experience) / *Partner*: Excluding the upfront vehicle cost, roughly how much cheaper is it to power and maintain an electric terminal tractor compared to a traditional diesel unit based on your clients' real-world data?
- a) ☐ Significant Savings: Operating costs are roughly cut in half compared to diesel
 - b) ☐ Moderate Savings: Noticeable cost reductions, but partially offset by utility or maintenance expenses
 - c) ☐ No Savings: Costs are roughly equal to, or higher than, diesel
 - d) ☐ Data Not Tracked: Operational cost metrics are not known or measured
- 21) *Fleet*: Based on your experience, rate the operational impacts of electric terminal tractors compared to diesel units. (Select one per row): / *Partner*: Based on your client observations, rate the operational impacts of electric terminal tractors compared to diesel units (Select one per row):

Category	EVs Are Better	No Change	EVs Are Worse	N/A
Driver Comfort (e.g., reduced noise, cabin vibration, diesel fumes)	☐	☐	☐	☐
Localized Air Quality (e.g., eliminating exhaust at or near loading docks)	☐	☐	☐	☐
Yard Throughput (e.g., total trailer moves per shift)	☐	☐	☐	☐
Performance Predictability (e.g., cold weather behavior)	☐	☐	☐	☐
Equipment Uptime (e.g., reduced days out of service)	☐	☐	☐	☐
Brake Lifespan (e.g., extended brake life due to regenerative braking)	☐	☐	☐	☐
Tire & Yard Wear (e.g., tire scrub or lot rutting from EV torque)	☐	☐	☐	☐
Telematics (e.g., tracking vehicle utilization, charging metrics)	☐	☐	☐	☐

- 22) *Fleet*: Which of the following electric terminal tractor challenges has your team most frequently encountered? (Select all that apply) / *Partner*: Which of the following electric terminal tractor challenges have your clients most frequently encountered? (Select all that apply)
- a) ☐ Software/Data Deficits: Inability to accurately track real-time energy usage or battery state-of-charge
 - b) ☐ Thermal Management Issues: Battery degradation or charging slowdowns during weather extremes
 - c) ☐ Physical Packaging Hurdles: Battery sizes or cab dimensions causing clearance constraints
 - d) ☐ Charging Interface Failures: Communication lag or connector friction between different charger brands and the truck
 - e) ☐ Vehicle Performance Issues: Inability of the vehicle to match diesel performance
 - f) ☐ None: No major technical or battery challenges encountered.
 - g) ☐ Other (Please specify): _____
 - h) ☐ Unknown
- 23) *Fleets & Partners*: Would you prefer to keep your organization anonymous?
- a) ☐ Yes
 - b) ☐ No. My organization's name is _____.