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Optimizing Operating Costs in Small Logistics Businesses (U.S.)

Vitalii Kostrub

GBA TFreight Inc., Bellevue, WA, USA
Email: vitalii.kostrub@gbatf.com

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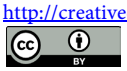

Abstract

This study examines the structure and evolution of operating costs among small U.S. logistics firms from 2019 to 2024. We analyze marginal cost per mile and its sensitivity to fluctuations in fuel prices, insurance premiums, and labor shortages. Drawing on data from ATRI, ATA, Overdrive, and other industry sources, we document a market-cycle reversal: a surge of new carriers in 2020-2021 gave way to fleet contraction in 2022-2023. Three categories of cost-reduction practices are identified—telematics for vehicle-movement monitoring, freight-flow consolidation schemes, and financial risk-sharing instruments. Empirical estimates show that collectively implementing these measures can lower per-trip unit costs while maintaining service standards. The author contributes a typology of effective strategies, assessing their scalability and financial resilience for small fleets. Findings are directed to owner-operators, digital-platform developers, and regulators shaping policies to bolster industry competitiveness.

Keywords

Operating Costs, Small Business, Insurance Premiums, Fuel Prices, U.S., Trucking

1. Introduction

Small logistics companies constitute the vast majority of the U.S. transportation and warehousing sector and play a pivotal role in the national economy. According to the American Trucking Associations, approximately 91 percent of U.S. carriers operate six or fewer trucks (American Trucking Associations, n.d.). Consequently, the industry is dominated by small firms and owner-operators who frequently face challenges in managing costs effectively. The imperative to optimize operating expenses in the small-business segment has intensified in recent years

for several reasons: rising fuel price volatility, increasing insurance premiums, and persistent labor shortages.

The objective of this research is to dissect the cost structure and dynamics of operating expenses among small U.S. logistics firms and to synthesize the optimization strategies they employ. Specifically, the study aims to:

1) Examine a prototypical cost breakdown for a small carrier—fuel, driver wages, maintenance, insurance, and other components—and their respective shares.

2) Assess external factors affecting these costs, including fuel-price swings, workforce scarcity, and inflationary pressures.

3) Investigate case studies and best practices for expense reduction—through technology adoption (route-planning software, telematics) and organizational measures (freight consolidation, outsourcing, procurement strategies).

4) Quantify the economic impact and constraints associated with each optimization approach.

2. Methods and Materials

The preparation of this article drew on industry reports, empirical studies, and analytical publications listed in the references. Each source offered a distinct avenue for analyzing cost structures and assessing optimization strategies, enabling a comprehensive view of the financial and organizational features of small logistics companies in the United States. M. A. Cole examined the cost dynamics of motor carriers in 2023 and showed that expenditures continued to rise even as fuel prices declined, highlighting the contradiction between market price movements and the actual cost of hauling (Cole, 2024). Fleet Owner provided statistics on the rise in total fleet costs, identifying fuel as the primary driver of higher expenses, which served as a basis for comparative analysis of changes in the expense structure by category (Fleet Owner, n.d.). The American Trucking Associations systematized industry-structure data and showed that more than 90% of carriers in the United States operate small fleets, confirming the specificity of the study's sample (American Trucking Associations, n.d.). Orenstein reviewed practical approaches to cost optimization for small delivery firms, emphasizing the importance of telematics solutions and digital platforms, thereby linking industry practice to technological instruments (Orenstein, 2023). The Organisation for Economic Co-Operation and Development identified the effects of macroeconomic conditions on the resilience of small and medium-sized enterprises, showing that under volatility, they are most sensitive to rising costs (Organisation for Economic Co-Operation and Development, 2023). Kodi's Transportation presented practical cases of cost reduction in logistics, detailing organizational techniques including shipment consolidation and shared use of infrastructure (Kodi's Transportation, n.d.). Data from the Trucking Association of Georgia revealed the specific drivers of rising insurance premiums and their disproportionate impact on small fleets, providing an empirical basis for analyzing insurance expenses (Trucking Association of Georgia, 2022). Stinson analyzed the behavior of small carriers in the spot market, identi-

fying entry and exit patterns that helped reflect the market cycle and its connection to costs (Stinson, 2020). Xu, Lai, and Huang developed decision-support models for the transport sector applicable to forecasting and maintenance planning, which enabled integration of a quantitative toolkit into the study of operating expenses (Xu, Lai, & Huang, 2021). Guan, Sun, Wu, and Sun examined the effectiveness of supply chain finance via fintech instruments and showed their impact on SME resilience, forming the foundation for incorporating financial analysis into the study's structure (Guan, Sun, Wu, & Sun, 2025). Y. Tang analyzed innovations in supply chain finance and emphasized their significance for overcoming small firms' capital-access constraints, providing a methodological bridge between logistics and finance (Tang, 2024).

The article employs comparative analysis of time-series statistics, content analysis of trade publications, and graphical trend visualizations to validate the findings. A prototype cost model was constructed from averaged industry data provided by ATRI, ATA, and other sources reflecting the expense structure of a small carrier, which made it possible to build a representative framework for analysis.

3. Results

Contemporary literature underscores that the resilience of small carriers depends largely on access to supply chain finance and cost-control capabilities. Studies show that SCF instruments help SMEs smooth liquidity gaps and improve financial efficiency, especially under market turbulence (Tang, 2024). It has also been confirmed that incorporating small firms into supply chain finance schemes increases their resilience to external shocks.

Cost reduction in the transport-logistics sector is examined through the lens of organizational solutions. Analyses of urban freight demonstrate that consolidating small consignments and sharing capacity allow smaller enterprises to substantially reduce unit costs (Guan et al., 2025).

Technological approaches occupy a distinct place in the research. In particular, implementing telematics and digital tools for movement monitoring reduces fuel consumption and optimizes labor utilization. Empirical data confirm that such measures improve operating efficiency and the competitiveness of small operators (Xu, Lai, & Huang, 2021).

Taken together, findings accumulated in the scholarly literature reveal a close connection among financial, organizational, and technological strategies for cost optimization, confirming the relevance of a study aimed at systematizing the practices of small U.S. logistics companies.

An analysis of the operating-cost structure for a small logistics carrier reveals that the primary expense categories are fuel, driver compensation, vehicle maintenance, equipment leasing or loan payments, insurance, and overhead administrative costs. According to the American Transportation Research Institute (ATRI), in fiscal year 2023, the average marginal (direct) cost to operate a truck in the U.S. reached a record high of approximately $2.27 per mile (Cole, 2024) (**Table 1**).

Table 1. Average marginal cost per mile, 2014-2023 (Cole, 2024).

Category	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Vehicle-Based										
Fuel Costs	0.583	0.403	0.336	0.368	0.433	0.384	0.308	0.417	0.641	0.553
Truck/Trailer Lease or Purchase Payments	0.215	0.230	0.255	0.264	0.265	0.256	0.271	0.279	0.331	0.360
Repair & Maintenance	0.158	0.156	0.166	0.167	0.171	0.149	0.148	0.175	0.196	0.202
Truck Insurance Premiums	0.071	0.074	0.075	0.075	0.084	0.071	0.087	0.086	0.088	0.099
Permits & Licenses	0.019	0.019	0.022	0.023	0.024	0.020	0.016	0.016	0.015	0.009
Tires	0.044	0.043	0.035	0.038	0.038	0.039	0.043	0.041	0.045	0.046
Tolls	0.023	0.020	0.024	0.027	0.030	0.035	0.037	0.032	0.028	0.034
Driver-Based										
Driver Wages	0.462	0.499	0.523	0.557	0.596	0.554	0.566	0.627	0.724	0.779
Driver Benefits	0.129	0.131	0.155	0.172	0.180	0.190	0.171	0.182	0.183	0.188
TOTAL	**1.703**	**1.575**	**1.592**	**1.691**	**1.821**	**1.699**	**1.646**	**1.855**	**2.251**	**2.270**

Over the period, fuel costs first declined and then became highly volatile. Lease and financing expenses rose steadily, reflecting heavier capital investment by carriers. Repair, insurance, and tire costs grew more modestly, suggesting aging fleets and heightened safety requirements. To combat driver shortages, carriers increased compensation packages. After a brief downturn, total marginal costs resumed an upward trajectory, intensifying pressure on trucking profitability (Table 2).

Table 2. Year-over-year change in average cost per mile, 2022-2023 (Cole, 2024).

Category	Percent Change
Fuel Costs	−13.7 %
Truck/Trailer Lease or Purchase Payments	8.8 %
Repair & Maintenance	3.1 %
Truck Insurance Premiums	12.5 %
Permits & Licenses	−40.0 %
Tires	2.2 %
Tolls	21.4 %
Driver Wages	7.6 %
Driver Benefits	2.7 %
TOTAL	**0.8 %**
Total Excluding Fuel	**6.6 %**

Small logistics firms typically face higher unit-costs than their larger counterparts. Devoid of economies of scale, they purchase fuel at retail rather than whole-

sale discounts, incur steeper insurance premiums, and pay higher lease or financing rates for equipment. Research indicates that insurance costs are especially disproportionate: fleets of fewer than twenty trucks pay roughly three times the per-mile premium of carriers operating hundreds of vehicles (Trucking Association of Georgia, 2022). Constrained cash reserves leave many small operators unable to raise deductibles or self-insure, forcing them to maintain full coverage at elevated rates. Consequently, about one-third of small trucking firms report cutting driver pay or bonuses, and 22 percent defer fleet upgrades due to rising insurance expenses (Trucking Association of Georgia, 2022).

Beyond insurance, other fixed overheads—taxes, licensing fees, facility rents or depreciation, and information-technology systems—are difficult for small firms to trim. Because these costs must be amortized over fewer miles than in large fleets, the per-trip cost advantage tilts toward larger operators.

Recent macroeconomic conditions have intensified cost pressures on small carriers. After the pandemic-induced downturn in 2020, the trucking sector rebounded strongly in 2021 and early 2022, marked by surging spot rates and a flood of new small entrants. From July to December 2020, over 30,000 new motor-carrier businesses registered in the U.S.—more than in the entire year of 2015—underscoring the market's pull during rate spikes (Stinson, 2020).

However, by mid-2022, the cycle reversed: declining freight demand and rates forced many small carriers out of business. In Q1 2023, active carrier counts fell so that for every four new registrations, roughly five ceased operations (**Figure 1**).

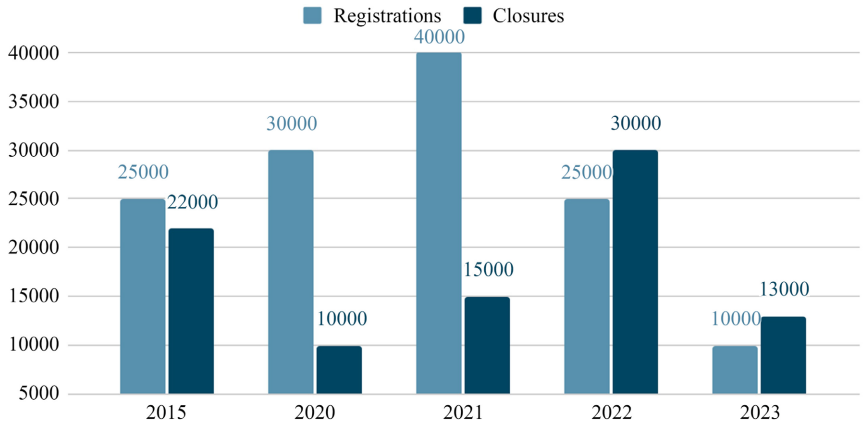

Figure 1. U.S. small trucking companies: market entry and exit (compiled by the author on the basis of Stinson (2020)).

This attrition affected both owner-operators and smaller fleets. Key drivers were eroding market rates and persistently high operating costs—especially fuel. Notably, falling diesel prices from mid-2022 into early 2023—according to FTR—averted an even greater wave of small-carrier bankruptcies. Nonetheless, those firms that had not implemented cost-optimization measures were the first to exit when the downturn hit (Fleet Owner, n.d.).

Amid these pressures, small logistics businesses have adopted a range of oper-

ational-cost-reduction strategies, which fall into three broad categories: technological, organizational, and financial.

Technological measures focus on digitalization and specialized software. Even modest fleets now deploy GPS tracking and telematics to monitor driving behavior and real-time fuel consumption. Driver training in eco-driving practices—avoiding harsh acceleration and braking, maintaining steady speeds, and minimizing idle time—can, by itself, cut fuel burn, as experts note (Orenstein, 2023). Route-planning software further helps small carriers trim mileage and reduce empty runs. Simple navigation apps that account for traffic and optimize delivery sequences can yield significant savings in both fuel and driver labor. Many telematics solutions are subscription-based, enabling rapid payback via lower variable costs within months.

Organizational approaches aim to maximize load factors. Avoiding empty backhauls is critical for small carriers. Freight consolidation—combining multiple small shipments into a single load, particularly in less-than-truckload (LTL) segments—spreads transport costs over greater freight volumes and lowers unit costs (Kodi's Transportation, n.d.). Many small operators partner with third-party logistics (3PL) providers or use online freight marketplaces to identify backhaul opportunities. Digital freight exchanges (e.g., Uber Freight, Convoy) have made it easier for smaller players to fill capacity on return legs, reducing average weekly empty time by several hours per truck—equivalent to increased revenue and fuel savings (Orenstein, 2023).

Financial strategies also play a pivotal role. Small firms increasingly review their insurance programs and lease terms. A common tactic is raising insurance deductibles to reduce premium expenses—viable only for carriers with sufficient cash reserves (Organisation for Economic Co-Operation and Development, 2023). Others form purchasing cooperatives for fuel and consumables, leveraging collective bargaining to secure lower unit costs. U.S. tax law permits partial refunds of excise taxes on diesel used off-road or on private sites, which some carriers exploit to reduce fuel expenses. Asset-management flexibility—shifting between used-truck purchases and leasing new units—also materially impacts depreciation charges. In 2021-2022, many small carriers sold high-value used trucks at strong resale prices and rented equipment on an as-needed basis, sidestepping large capital outlays (Stinson, 2020). This agility in asset deployment helps cushion financial stress during market downturns.

4. Discussion

The findings indicate that small logistics carriers in the United States face a complex array of cost pressures but also possess a toolbox of remedies. The operating-cost breakdown reaffirms the familiar rule: fuel and labor together constitute the lion's share of carriage expenses. Accordingly, early cost-reduction efforts have targeted these two categories. Our analysis shows that technological solutions—such as telematics and route-optimization software—are no longer luxuries but essential tools even for the smallest operators. Over the past five years, digitalization

has penetrated the small-business segment substantially, driven by the mandatory adoption of electronic logging devices (ELDs) in 2018 and the falling cost of cloud services. Barrier to entry for IT solutions has thus fallen, enabling many "traditional" owner-operators to acquire basic cost-control tools—from idle-time monitoring to per-trip fuel-use analytics.

Organizational strategies—including freight consolidation and partnerships with third-party logistics providers—have also proven effective. Small carriers are becoming more cooperative: instead of fierce competition, resource sharing is increasingly common. For example, several local delivery firms may jointly lease a warehouse to consolidate parcels, thereby reducing both transportation and storage costs. The COVID-19 pandemic, with its surge in e-commerce, further accelerated such alliances: in some U.S. cities, courier services divided delivery zones among themselves so that drivers traveled shorter routes, saving fuel and time. This illustrates how external shocks can spur small businesses to forge collective cost solutions.

A key conclusion of this study is the direct link between a small carrier's resilience and its flexibility in cost management. Firms that adapted promptly to market shifts—by, for example, securing long-term, fixed-price fuel contracts or renegotiating customer rates to reflect rising expenses—fared relatively well through the 2022-2023 downturn. In contrast, those with an inert approach to costs and no financial cushion were often forced out, as evidenced by the wave of bankruptcies during the spot-rate decline. Thus, cost optimization is not a one-off effort but an ongoing, integral component of corporate strategy. Small logistics operators that survived recent market volatility distinguished themselves by superior digital fluency, rapid fleet scaling (up or down in line with demand), and proactive management of variable expenses.

The identified cost-reduction strategies can be interpreted through established management theories. Technological measures, including telematics and routing, align with the resource-based view: digital solutions function as rare and hard-to-imitate resources that confer a sustainable advantage on small firms. Organizational strategies—consolidation of freight flows, collaboration with 3PLs, and engagement with digital platforms—corroborate the tenets of transaction cost economics, in which the primary aim is to minimize coordination and search costs. Financial instruments such as the revision of insurance programs, pooled procurement, and flexible asset management reflect institutional mechanisms of risk redistribution that help compensate for a lack of scale. Taken together, this demonstrates that optimization practices are not reducible to ad hoc measures; rather, they are embedded in the logic of strategic management, thereby strengthening small carriers' resilience to external shocks.

It is also important to recognize external constraints: some cost lines are beyond the control of small firms and require industry-wide or governmental interventions. For instance, the disproportionately high insurance costs borne by small carriers stem in part from juries awarding multi-million-dollar verdicts in truck-

accident cases. Insurers raised rates across the board, but large carriers were able to self-insure or establish captive insurance funds—options unavailable to smaller outfits. Legislative caps on tort awards or the creation of state-backed mutual insurance pools for SMEs could mitigate this burden. Similarly, fuel-price spikes are absorbed more slowly by small operators than by large fleets with long-term supply contracts; here, tax relief measures—such as temporary state-level fuel-excise reductions in 2022—played a beneficial role. Accordingly, expense optimization in small logistics businesses is not solely an internal challenge but also a field for sectoral policy and cooperative action.

From an academic standpoint, examining cost-management practices in small logistics firms enriches our understanding of business adaptability in volatile economic conditions. Microeconomic theory predicts that small operators have limited scope for spreading fixed costs through scale; hence, they must focus on lowering variable costs and enhancing operational flexibility. In today's data-accessible environment, small carriers can partly offset their scale disadvantages via rapid managerial decisions and niche specialization. For example, some have concentrated on narrow market segments where they compete on quality and speed rather than price, passing a portion of their cost base into service rates. This strategic maneuver aligns with competitive-advantage theory for SMEs.

5. Conclusion

Operational-cost optimization is a decisive factor in the resilience and competitiveness of small logistics businesses in the United States. This study has demonstrated that the cost structure of these carriers is dominated by variable expenses—namely fuel, driver labor, and vehicle maintenance—which are highly vulnerable to external shocks such as spikes in energy prices or driver shortages. In recent years, small carriers weathered unprecedented challenges: diesel costs soared to historic highs, overall expense inflation mounted, and freight rates later plunged. Under these conditions, many operators survived and even adapted largely through timely cost-reduction measures and improved operational efficiency.

The scientific value of these findings lies in systematizing cost-management approaches for small logistics firms. We have shown that a combination of modern technologies (fleet monitoring systems, route-optimization algorithms), organizational changes (freight consolidation, collaboration via digital platforms), and financial strategies (insurance optimization, agile fleet management) can reduce per-mile operating costs by tens of percent while preserving service quality. The practical significance is that these strategies can guide thousands of small carriers striving to boost profitability. Even relatively straightforward actions, such as curbing idle time or training drivers in fuel-efficient driving techniques, yield substantial annual savings and enhance a carrier's competitive edge in a market where every cent in the freight rate matters to shippers.

At the same time, the study highlights certain limitations: not all costs can be slashed by individual firms alone. Structural challenges—high insurance premi-

ums, expensive fuel and lubricants, chronic driver shortages—demand comprehensive industry-and government-level solutions. Public support for small businesses (subsidized fleet renewal programs, grants for driver training, tax incentives for adopting efficiency technologies) could elevate the sector's overall performance. Moreover, small operators should increasingly cooperate, share best practices, and even jointly negotiate procurement agreements to capture collective economies of scale.

In sum, operational-cost optimization must be a continuous, integral component of any small logistics company's growth strategy. Firms that cultivate a culture of ongoing efficiency improvements demonstrate superior survival and growth even under adverse conditions. This research contributes both in practice and theory by confirming that, through astute cost management, small logistics businesses can significantly enhance their resilience, yielding cumulative benefits of greater reliability and cost-efficiency across the wider logistics network serving the economy.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

American Trucking Associations (n.d.). *Economics and Industry Data*. https://www.trucking.org/economics-and-industry-data

Cole, M. (2024). Truckload Carriers' Costs Rose in 2023 Despite Lower Fuel Costs. *Overdrive*. https://www.overdriveonline.com/business/article/15678343/truckload-carriers-costs-rose-in-2023-despite-lower-fuel-costs

Fleet Owner (n.d.). Fleet Costs Rise 21.3% with Fuel the Leading Expense. ATRI Reports. *Fleet Owner*. https://www.fleetowner.com/operations/article/21268287/fleet-costs-rise-213-with-fuel-the-leading-expense-atri-reports

Guan, Y., Sun, N., Wu, S. J., & Sun, Y. (2025). Supply Chain Finance, Fintech Development, and Financing Efficiency of SMEs in China. *Administrative Sciences, 15,* Article 86. https://doi.org/10.3390/admsci15030086

Kodi's Transportation (n.d.). *Cost Reduction in Logistics*. https://kodistransportation.com/logistics/cost-reduction

Orenstein, O. (2023). Cost Optimization Strategies for Small Delivery Businesses. *Locate2u*. https://www.locate2u.com/delivery-management/cost-optimization-strategies-for-small-delivery-businesses/

Organisation for Economic Co-Operation and Development (2023). *OECD SME and Entrepreneurship Outlook 2023*. https://www.oecd.org/en/publications/2023/06/oecd-sme-and-entrepreneurship-outlook-2023_c5ac21d0.html

Stinson, J. (2020). Small Truckload (TL) Carriers Turn to Spot Market. *Trucking Dive*. https://www.truckingdive.com/news/small-truckload-TL-carriers-spot-market/591888/

Tang, Y. (2024). The Impact of Supply Chain Finance Innovation on the Financing Challenges of SMEs. *Academic Journal of Business & Management, 6,* 186-191. https://doi.org/10.25236/AJBM.2024.061127

Trucking Association of Georgia (2022). *New Research from ATRI Quantifies Impacts of Rising Insurance Costs*. https://truxonline.gmta.org/2022/12/07/new-research-from-atri-quantifies-impacts-of-rising-insurance-costs/

Xu, R. H., Lai, Y. C., & Huang, K. L. (2021). Decision Support Models for Annual Catenary Maintenance Task Identification and Assignment. *Transportation Research Part E: Logistics and Transportation Review, 152,* Article 102402. https://doi.org/10.1016/j.tre.2021.102402