

An Analysis of the Operational Costs of Trucking: A 2012 Update

September 2012



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LIST OF ACRONYMS

ATA	American Trucking Associations
ATRI	American Transportation Research Institute
BLS	Bureau of Labor Statistics
CFO	Chief Financial Officer
CMV	Commercial Motor Vehicle
CNG	Compressed Natural Gas
CPH	Cost per Hour
CPM	Cost per Mile
CSA	Compliance, Safety, Accountability
EIA	Energy Information Administration
FHWA	Federal Highway Administration
FPM	Freight Performance Measures
LCV	Longer Combination Vehicle
LNG	Liquefied Natural Gas
LTL	Less-than-Truckload
MPH	Miles per Hour
NDA	Non-Disclosure Agreement
OW/OS	Overweight/Oversize
P&D	Pick-up and Delivery
RAC	Research Advisory Committee
R&M	Repair and Maintenance
TL	Truckload
VMT	Vehicle Miles Traveled

EXECUTIVE SUMMARY

In late 2008, the American Transportation Research Institute (ATRI) published an *Analysis of the Operational Costs of Trucking* in an effort to provide more accurate marginal cost data for motor carrier operations. Several previous studies generated cost calculations that industry stakeholders considered unreasonably high or low; in other instances, analyses utilized somewhat nebulous “value of time” calculations which also did not reflect direct carrier-borne costs. Consequently, ATRI undertook research to document and quantify motor carriers’ key operational costs, stratified by fleet size, sector and region of the country. The goal of the research was to identify current and accurate operational costs based on data provided directly from motor carriers. The resulting dataset could then be used by both motor carriers as a high-level benchmarking tool and by government agencies for transportation improvement analyses. Due to the popularity of the initial report, ATRI subsequently updated the study with 2009 and first quarter 2010 data in 2011. Since its original publication in 2008, ATRI has received over 1,800 requests for the “Operational Costs of Trucking” reports. ATRI now intends to update the research on an annual basis. This 2012 report includes full year 2010 and 2011 data.

In summary, tables ES1 and ES2 present the marginal cost per mile (CPM) and cost per hour (CPH) for 2010 and 2011 juxtaposed with 2008 and 2009 data for comparison purposes. The average marginal CPM for 2011 was \$1.71, the highest of the four years studied. After a sharp decline in fuel prices resulted in decreased industry costs between 2008 and 2009, industry costs have steadily risen through 2010 and 2011. The CPM figures were converted from per-mile calculations to hourly figures, using an empirical average industry operational speed of 39.98 miles per hour¹. The total average industry CPH was \$68.20 in 2011, the highest “Operational Costs” calculation to date.

Fuel and driver wages (excluding benefits) continued to be the largest cost centers for carriers, together constituting 62 percent of the average operating cost in 2011 (Table ES3). Lease or purchase payments were the third largest cost center, constituting 11 percent of costs in 2011, repair and maintenance at 9 percent, driver benefits at 9 percent, and insurance at 4 percent.

As noted, total average costs rose in 2010 and 2011 as compared to 2009, due mostly to a gradual increase in fuel prices. The driver shortage, increasing insurance costs and Compliance, Safety, Accountability (CSA) impacts also put upward pressure on industry costs, as carriers increased wages to recruit and retain qualified drivers. After falling between 2008 and 2009, driver wages increased in 2010 and 2011.

¹ ATRI derived this speed using several sets of data from the ATRI/Federal Highway Administration (FHWA) Freight Performance Measures (FPM) program. ATRI analyzed one full week of national FPM data in each of the four seasons in 2010 (February, May, August, October). This dataset consisted of over 110 million truck speed data points. The average speed figure was also validated by multiple motor carriers from various sectors of the industry. The 39.98 mph figure more accurately represents an average operational speed since it includes speeds in all types of operational conditions.

The outlook for 2012 points to a continued increase in industry costs. The two key cost centers, fuel and driver wages, are expected to increase in 2012. Fuel prices have risen nearly 10 percent in the first eight months of 2012, which will almost certainly increase multiple cost centers, including (petroleum-based) tire purchases. For driver wages, the truck driver shortage is expected to become increasingly worse over time, likely translating to higher wages and higher industry costs. According to ATRI's 2011 "Top Industry Issues" survey of industry stakeholders,² the driver shortage and fuel costs ranked third and fifth on the list, respectively. The driver shortage issue rose from number five in 2010 to number three in 2011, indicating that the economy was improving. Other factors are likely amplifying the shortage however, including an aging workforce, new government regulations and driver quality-of-life challenges.

Table ES1. Average Carrier Costs per Mile, 2008, 2009, 2010 and 2011

Motor Carrier Costs	2008	2009	2010	2011
<i>Vehicle-based</i>				
Fuel & Oil Costs	\$0.633	\$0.405	\$0.486	\$0.590
Truck/Trailer Lease or Purchase Payments	\$0.213	\$0.257	\$0.184	\$0.189
Repair & Maintenance	\$0.103	\$0.123	\$0.124	\$0.152
Truck Insurance Premiums	\$0.055	\$0.054	\$0.059	\$0.067
Permits and Licenses	\$0.016	\$0.029	\$0.040	\$0.038
Tires	\$0.030	\$0.029	\$0.035	\$0.042
Tolls	\$0.024	\$0.024	\$0.012	\$0.017
<i>Driver-based</i>				
Driver Wages	\$0.435	\$0.403	\$0.446	\$0.460
Driver Benefits	\$0.144	\$0.128	\$0.162	\$0.151
TOTAL*	\$1.653	\$1.451	\$1.548	\$1.706

Table ES2. Average Carrier Costs per Hour, 2008, 2009, 2010 and 2011

Motor Carrier Costs	2008	2009	2010	2011
<i>Vehicle-based</i>				
Fuel & Oil Costs	\$25.30	\$16.17	\$19.41	\$23.58
Truck/Trailer Lease or Purchase Payments	\$8.52	\$10.28	\$7.37	\$7.55
Repair & Maintenance	\$4.11	\$4.90	\$4.97	\$6.07
Truck Insurance Premiums	\$2.22	\$2.15	\$2.35	\$2.67
Permits and Licenses	\$0.62	\$1.15	\$1.60	\$1.53
Tires	\$1.20	\$1.14	\$1.42	\$1.67
Tolls	\$0.95	\$0.98	\$0.49	\$0.69
<i>Driver-based</i>				
Driver Wages	\$17.38	\$16.12	\$17.83	\$18.39
Driver Benefits	\$5.77	\$5.11	\$6.47	\$6.05
TOTAL*	\$66.07	\$58.00	\$61.91	\$68.21

² Critical Issues in the Trucking Industry – 2011. ATRI. Arlington, VA. 2011.

* Line items may not sum to total shown due to rounding.

Table ES3. Share of Total Average Cost, 2008, 2009, 2010 and 2011

Motor Carrier Costs	2008	2009	2010	2011
<i>Vehicle-based</i>				
Fuel & Oil Costs	38%	28%	31%	35%
Truck/Trailer Lease or Purchase Payments	13%	18%	12%	11%
Repair & Maintenance	6%	8%	8%	9%
Truck Insurance Premiums	3%	4%	4%	4%
Permits and Licenses	1%	2%	3%	2%
Tires	2%	2%	2%	2%
Tolls	1%	2%	1%	1%
<i>Driver-based</i>				
Driver Wages	26%	28%	29%	27%
Driver Benefits	9%	9%	10%	9%
TOTAL*	100%	100%	100%	100%

* Line items may not sum to total shown due to rounding.

INTRODUCTION

As an update to reports released in 2008 and 2011, the American Transportation Research Institute (ATRI) is once again publishing *An Analysis of the Operational Costs of Trucking*. This research was initially identified as a priority by ATRI's Research Advisory Committee (RAC)³ in 2008 due to the increasing interest from policy makers in creative transportation funding strategies. Due to fiscal constraints in recent years, transportation policy makers have turned to creative financing strategies in an attempt to find new infrastructure funding sources. As part of the cost-benefit analyses for various funding proposals, different trucking industry operational cost assumptions have been promulgated. Depending on the agency or political objective, at times it has been advantageous for agencies to minimize the cost associated with truck operations and travel delays. At other times, unreasonably high cost figures or nebulous "value of time" calculations have been used to justify tolls and other creative financing fees. The trucking industry, which is heavily reliant on the 4 million miles of roadway in the U.S., has a vested interest in equitable funding and maintenance of the transportation system. In order for new funding proposals to be properly vetted, it is important that the underlying inputs to a particular policy analysis are accurate.

To remedy the lack of accurate trucking industry operational cost data, ATRI conducted research in 2008 and 2011 that generated more precise cost assumptions. Although several studies utilized highly subjective value of time metrics, very few had attempted to quantify real, direct costs of motor carrier operations, in particular, the marginal cost of operating a truck for one mile or one hour. Therefore, ATRI developed a methodology that would quantify the key operational cost centers for motor carriers, stratified by fleet size, major industry sectors and region of the country. The goal of the research was to collect and aggregate current operational costs provided directly from motor carriers. The resulting dataset and analyses are used by both motor carriers as a high-level benchmarking tool and by government agencies for transportation improvement analyses.

In late 2008, ATRI first published *An Analysis of the Operational Costs of Trucking*⁴ and an update report was released in 2011⁵. Since the publication of the first two reports, ATRI has received over 1,800 requests for the *Operational Costs of Trucking* report. Based on high interest in the original studies and the subsequent requests for continual updates, ATRI commenced a process for obtaining ongoing fleet data collection. This activity resulted in complete annual data for four full years (2008 – 2011) of operational cost information. ATRI expects to continue to update these results on an annual basis.

³ The American Transportation Research Institute (ATRI) Research Advisory Committee (RAC) is comprised of industry stakeholders representing motor carriers, trucking industry suppliers, labor and driver groups, law enforcement, federal government and academia. The RAC is charged with annually recommending a research agenda for the Institute.

⁴ ATRI. *An Analysis of the Operational Costs of Trucking*. Arlington, VA. (2008)

⁵ ATRI. *An Analysis of the Operational Costs of Trucking: A 2011 Update*. Arlington, VA. (2011)

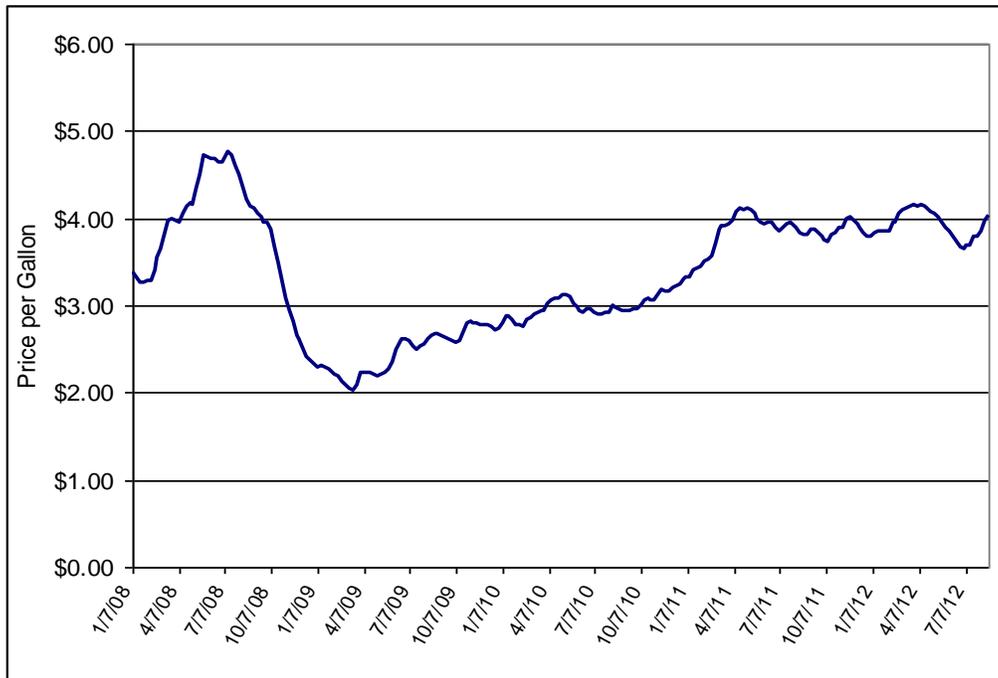
Changing Economic Conditions

Much has changed in the trucking industry over the past five years. After serious downsizing during the Great Recession in 2008 and 2009, the industry began to see increases in freight demand in 2010 and 2011. In the last two years, fuel prices, one of the largest components of industry operating costs, have been both volatile and increasing – reaching historic highs in 2008 then decreasing dramatically in 2009 before rising once again in 2010 and 2011. By August 2012, average diesel fuel prices were over \$4.00 per gallon.⁶ Furthermore, a series of internal and external factors are creating what some industry experts say will be the industry’s worst shortage ever of qualified drivers, leading to serious concerns for capacity constraints.

Fuel Cost Impacts

Petroleum prices rose to an unprecedented level in July 2008, reaching over \$145 per barrel before decreasing dramatically in late 2008. This translated to average U.S. diesel prices of well over \$4.50 per gallon during the summer of 2008 (Figure 1). However, by March 2009 diesel prices had fallen to \$2.02 per gallon. Since then, diesel prices have steadily risen, with on-highway prices averaging \$2.47 per gallon in 2009, \$2.99 in 2010 and \$3.84 in 2011.⁷

Figure 1. Average U.S. On-Highway Diesel Prices, 2008 - 2012⁸



⁶ Gasoline and Diesel Fuel Update. U.S. Energy Information Administration. Available Online: <http://www.eia.gov/petroleum/gasdiesel/>

⁷ Ibid.

⁸ Ibid.

Based on the Energy Information Administration's (EIA) diesel price information and market conditions, the American Trucking Associations' (ATA) Economic and Statistics Group estimated that the trucking industry spent nearly \$115.4 billion on diesel fuel in 2011.⁹ This would be significantly higher than the \$101.5 billion spent on diesel in 2010.¹⁰ The EIA is predicting that diesel prices will moderate over the next two years, however, and projects an average retail diesel price of \$3.62 per gallon for July through December 2012 and an average of \$3.58 per gallon for 2013, even though diesel prices are currently higher than these estimates.

The Driver Shortage

A severe and growing shortage of qualified drivers is also impacting the industry. It is currently estimated that the industry will be facing a shortage of 100,000 – 200,000 drivers in the next two years.¹¹ Driver downsizing during the recession, an aging workforce, new government regulations and high training costs for new drivers have dramatically reduced the number of truck drivers in the U.S. From January 2007 to March 2010, the trucking industry lost over 219,000 jobs (a 15% decrease).¹² By May 2012, the industry had recovered approximately 112,000 of those positions. However, despite fewer workers, for-hire truck tonnage activity has returned to pre-recession levels.¹³ The current shortage of drivers is already limiting capacity, pushing freight rates up and even delaying some deliveries.¹⁴ However, it is unclear how large of an impact the driver shortage will have, as the industry continues to expand its workforce. The U.S. Bureau of Labor Statistics (BLS) projects that employment for "heavy and tractor-trailer truck drivers" will increase by 21 percent through 2020, resulting in over 330,000 new jobs.¹⁵ This presumes that a qualified driver pool exists to fill this estimated demand.

⁹ ATA. American Trucking Trends 2011. Arlington, VA. (2011)

¹⁰ ATA. Weekly Economic Update, March 11, 2011. Arlington, VA. (2011)

¹¹ Driver shortage estimated lowered. Truck Gauge. March 19, 2012. Available online: <http://www.truckgauge.com/2012/03/19/driver-shortage-estimate-lowered-no-critical-shortage-until-hos-in-2013/>

¹² Bureau of Labor Statistics. Employment, Hours, and Earnings from the Current Employment Statistics Survey, Seasonally Adjusted Total Employment, Truck Transportation. Available online: <http://www.bls.gov/data/>

¹³ ATA. Weekly Economic Update, July 27, 2012. Arlington, VA. (2012)

¹⁴ Davidson, Paul. Trucker jobs go unfilled, leading to delayed deliveries. USA Today. June 25, 2012. Available online: <http://www.usatoday.com/money/economy/employment/story/2012-06-22/truck-driver-shortage/55797686/1>

¹⁵ Bureau of Labor Statistics. Occupational Outlook Handbook, Heavy and Tractor-trailer Truck Drivers. Available online: http://www.bls.gov/ooh/transportation-and-material-moving/heavy-and-tractor-trailer-truck-drivers.htm#TB_inline?height=325&width=325&inlineId=qf-emp-change

METHODOLOGY

This ATRI research utilized a data collection methodology that was similar to the research tools used in 2008 and 2011. Three new questions were added to the survey to obtain information on average age of trucks, speed limiter use and alternatively fueled vehicles. Where appropriate, the data request forms were streamlined to improve response efficiency. The data collection forms used common industry operational and financial metrics, and were beta-tested with several motor carriers. Specifically, the research team regularly solicited technical guidance and review from industry financial officers or those with working knowledge of motor carrier cost structures. Prior to full distribution, the data collection forms were modified several times based on the reviewers' recommendations.

Due to the highly competitive nature of the trucking industry and the sensitivity of a fleet's expenditures, operational cost information was collected confidentially from motor carriers and the data was used in aggregate form only. ATRI also provided survey respondents with non-disclosure agreements (NDA) when requested.

Ultimately, the survey was distributed in late April 2012 to a representative group of for-hire carriers, representing truckload (TL), less-than-truckload (LTL) and specialized carriers. Several industry mechanisms were used for outreach, including targeted emails, news alerts and coverage in major industry news outlets. Responses were collected through July 2012. Data collection forms were distributed electronically and via certified mail, with instructions to return the completed survey via email or fax. An online survey was also developed and made available for participants to enter their data. All responses were carefully reviewed by the research team for clarity and the research team contacted respondents to clarify ambiguous responses as needed. The majority of survey respondents held finance-related positions, with Chief Financial Officer (CFO) and financial controller being the most common titles held by the respondents.

The survey primarily solicited components and sub-components of carrier costs per mile (CPM) in order to accurately capture different industry business models. In order to convert line-item CPM figures into a total cost per hour (CPH) figure, an empirical, industry-vetted average operational speed of 39.98 miles per hour (MPH) was used in these calculations. It should be noted that this speed includes all roadway speeds rather than just highway speeds.¹⁶

ATRI then weighted, as needed, survey responses to reflect the average percentages of the major for-hire sectors. TL carriers were slightly over-represented in the survey

¹⁶ ATRI derived this speed using several sets of data from the ATRI/Federal Highway Administration (FHWA) Freight Performance Measures (FPM) program. ATRI analyzed one full week of national FPM data in each of the four seasons in 2010 (February, May, August, October). This dataset consisted of over 110 million truck speed data points. The average speed figure was also validated by multiple motor carriers from various sectors of the industry. The 39.98 mph figure more accurately represents an average operational speed since it includes speeds in all types of operational conditions.

sample while LTL carriers were under-represented (Table 1). Weighting the responses to the industry averages yielded more balanced results.

Table 1. Industry Sector Breakout

Industry Sector	ATRI Survey Respondents	U.S. Trucking Industry ¹⁷
Truckload	64%	52%
Less-than-Truckload	16%	24%
Specialized/Other	20%	24%

Where applicable, cost data were cross-tabulated by factors such as fleet size, operating sector and operating region. The data collected are presented in aggregate form in order to protect proprietary carrier information.

ANALYSIS

Fleet Demographics

Survey respondents represent more than 42,400 trucks and accrue more than 4.2 billion miles annually in the U.S. As previously noted, the for-hire fleets were grouped into three industry sectors; TL, LTL and specialized (see Glossary for sector descriptions). While the respondents were generally representative of the for-hire segment, the aggregated data was weighted to the industry averages of 52 percent for TL, 24 percent for LTL and 24 percent for specialized.¹⁸

While the majority (97%) of motor carriers in the U.S. operate fewer than 20 trucks,¹⁹ medium to large carriers are responsible for the majority of freight operations in terms of truck registrations, driver employment and freight tonnage moved. The majority of survey respondents represented medium to large fleets and are therefore consistent with the national statistics.

Survey respondents were also asked to indicate their fleet size by annual revenue. The respondent distribution by annual revenue is as follows:

- Small (less than \$10 million annual revenue) – 23 percent
- Medium (\$10 to \$100 million annual revenue) – 50 percent
- Large (greater than \$100 million annual revenue) – 27 percent

Among ATRI survey respondents, the 5-axle configuration was also the most common vehicle type at 56 percent (Table 2). Participants were also asked to provide the

¹⁷ ATA. American Trucking Trends: 2005-2006. Arlington, VA. (2007)

¹⁸ Ibid.

¹⁹ ATA. American Trucking Trends: 2011. Arlington, VA. (2012)

average truck age for each configuration. While responses ranged from 1 to 11 years old, on average, straight trucks were found to be the youngest at 2.3 years while longer combination vehicles (LCVs) were the oldest at 5.4 years.

Table 2. Survey Respondent Truck Configurations, Average Annual VMT per Truck and Average Truck Age

Truck Type	Percent of Total Trucks	Average Miles Driven per Year per Truck	Average Truck Age (years)
Straight Truck	15.0%	122,769	2.3
5-axle Tractor/trailer	56.0%	85,889	4.1
6-axle Tractor/trailer	4.4%	105,221	5.1
LCVs (Doubles/Triples)	24.6%	113,317	5.4

Participants were also asked to provide the number of vehicles that ran on an alternative fuel (i.e. a fuel other than diesel or a bio-diesel blend). Only two of the respondents reported using alternative fueled vehicles, equating to 21 trucks that ran on either compressed natural gas (CNG) or liquefied natural gas (LNG). This represents less than 0.05 percent of the vehicles in the sample fleet.

Since fuel costs are one of the largest cost centers for motor carriers, survey participants were asked if their fleet utilized speed limiters. Nearly all respondents (93%) had at least half of their trucks speed governed. While the settings ranged from 60 to 75 MPH, the most common speed limit was 65 MPH.

Survey respondents were asked to estimate the percentage of miles traveled in the U.S. by region. Table 3 compares respondents' percent of vehicle miles traveled (VMT) by region to commercial truck registrations in the U.S. As can be seen, the Southeast and Western regions were slightly under-represented while the Midwest and Northeast were slightly over-represented. The finding may relate to the lower costs associated with base-stating fleets in certain states, independent of where the truck operates.

Table 3. Survey Respondent Truck VMT and National Truck Registrations by Region

Region	Survey Respondent Percent of Miles Traveled	National Percent of Truck Registrations ²⁰
Midwest	31%	25%
Northeast	16%	8%
Southeast	28%	37%
Southwest	13%	11%
West	12%	19%

²⁰ FHWA. Highway Statistics 2010. Available online: <http://www.fhwa.dot.gov/policyinformation/statistics/2010/>

2010 and 2011 Motor Carrier Costs

In order to remain consistent with the previous operational cost analyses, marginal costs were once again divided into two groups: vehicle- and driver-based. Costs associated with each group include:

- Vehicle-based
 - Fuel
 - Truck/trailer lease or purchase payments
 - Repair and maintenance
 - Truck insurance premiums
 - Tires
 - Permits and special licenses
 - Tolls

- Driver-based
 - Wages
 - Benefits

Table 4 displays the average cost per mile for all sectors based on the survey data. The analysis across the four years found that the average CPM was \$1.653 in 2008, \$1.451 in 2009, \$1.548 in 2010 and \$1.706 in 2011. Table 5 presents the average cost per hour for all sectors. The average CPH was \$66.07 in 2008, \$58.00 in 2009, \$61.91 in 2010 and \$68.21 in 2011.

While driver pay had typically been the highest expense in the trucking industry, fuel prices increased so dramatically in 2008 that fuel costs topped the list (Table 6). Although fuel prices moderated in 2009, they once again outranked driver wages in 2010 and 2011. Equipment lease or purchase payments, driver benefits, repair and maintenance, and insurance premiums were the next largest cost centers. Tires, tolls, and permitting consistently represented 3 percent or less of total marginal costs each.

Table 4. Average Carrier Costs per Mile, 2008, 2009, 2010 and 2011

Motor Carrier Costs	2008	2009	2010	2011
<i>Vehicle-based</i>				
Fuel & Oil Costs	\$0.633	\$0.405	\$0.486	\$0.590
Truck/Trailer Lease or Purchase Payments	\$0.213	\$0.257	\$0.184	\$0.189
Repair & Maintenance	\$0.103	\$0.123	\$0.124	\$0.152
Truck Insurance Premiums	\$0.055	\$0.054	\$0.059	\$0.067
Permits and Licenses	\$0.016	\$0.029	\$0.040	\$0.038
Tires	\$0.030	\$0.029	\$0.035	\$0.042
Tolls	\$0.024	\$0.024	\$0.012	\$0.017
<i>Driver-based</i>				
Driver Wages	\$0.435	\$0.403	\$0.446	\$0.460
Driver Benefits	\$0.144	\$0.128	\$0.162	\$0.151
TOTAL*	\$1.653	\$1.451	\$1.548	\$1.706

* Line items may not sum to total shown due to rounding.

Table 5. Average Carrier Costs per Hour, 2008, 2009, 2010 and 2011

Motor Carrier Costs	2008	2009	2010	2011
<i>Vehicle-based</i>				
Fuel & Oil Costs	\$25.30	\$16.17	\$19.41	\$23.58
Truck/Trailer Lease or Purchase Payments	\$8.52	\$10.28	\$7.37	\$7.55
Repair & Maintenance	\$4.11	\$4.90	\$4.97	\$6.07
Truck Insurance Premiums	\$2.22	\$2.15	\$2.35	\$2.67
Permits and Licenses	\$0.62	\$1.15	\$1.60	\$1.53
Tires	\$1.20	\$1.14	\$1.42	\$1.67
Tolls	\$0.95	\$0.98	\$0.49	\$0.69
<i>Driver-based</i>				
Driver Wages	\$17.38	\$16.12	\$17.83	\$18.39
Driver Benefits	\$5.77	\$5.11	\$6.47	\$6.05
TOTAL*	\$66.07	\$58.00	\$61.91	\$68.21

Table 6. Share of Total Average Cost, 2008, 2009, 2010 and 2011

Motor Carrier Costs	2008	2009	2010	2011
<i>Vehicle-based</i>				
Fuel & Oil Costs	38%	28%	31%	35%
Truck/Trailer Lease or Purchase Payments	13%	18%	12%	11%
Repair & Maintenance	6%	8%	8%	9%
Truck Insurance Premiums	3%	4%	4%	4%
Permits and Licenses	1%	2%	3%	2%
Tires	2%	2%	2%	2%
Tolls	1%	2%	1%	1%
<i>Driver-based</i>				
Driver Wages	26%	28%	29%	27%
Driver Benefits	9%	9%	10%	9%
TOTAL*	100%	100%	100%	100%

As previously noted, the analysis stratified motor carrier responses by their primary sector of operation where applicable. Given the different operational conditions for each sector, the costs varied. In a change from the 2008 and 2009 results, LTL carriers reported the highest operating costs in 2010 and 2011 (\$1.76 and \$1.93, respectively) followed by specialized (\$1.61 and \$1.79) and TL (\$1.43 and \$1.57) (Table 7). LTL carriers can have higher operating costs for a variety of reasons, including:

- increased marginal costs associated with frequent pick-up and delivery (P&D) operations in congested urban areas;

* Line items may not sum to total shown due to rounding.

- increased overhead costs of handling many smaller shipments several times and associated dock personnel labor costs;
- need for multiple terminals located near urban areas and the associated need for more equipment; and
- increased labor costs that are associated with LTL-oriented collective bargaining contracts.

Table 7. Average Total Cost per Mile by Sector

Sector	2008	2009	2010	2011
Specialized	\$1.87	\$1.67	\$1.61	\$1.79
LTL	\$1.81	\$1.43	\$1.76	\$1.93
TL	\$1.48	\$1.36	\$1.43	\$1.57

The following sections analyze specific line-item cost centers that comprise major marginal operating costs for motor carriers.

Fuel and Engine Oil

As previously discussed, petroleum prices rose to an unprecedented level in July 2008, reaching over \$145 per barrel before decreasing dramatically in late 2008. During the summer of 2008 on-highway diesel prices averaged more than \$4.50 per gallon nationally but by March 2009, prices had dropped to \$2.02 per gallon.²¹ Fuel prices have steadily increased since then, averaging \$2.47 per gallon in 2009, \$2.99 in 2010 and \$3.84 in 2011.²²

Figure 2 shows the historic average fuel CPM from 2003 through 2011.

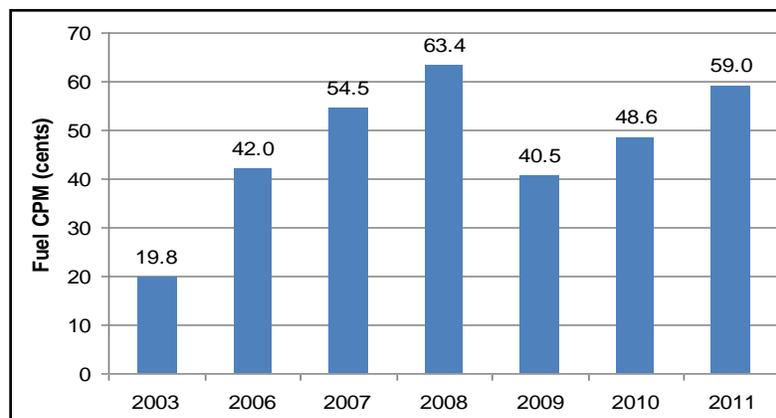


Figure 2. Historic Fuel CPM²³

²¹ Gasoline and Diesel Fuel Update. U.S. Energy Information Administration. Available Online: <http://www.eia.gov/petroleum/gasdiesel>

²² Ibid.

²³ Fuel and engine oil cost data for 2003 are from ATA's *American Trucking Trends: 2003*, data for 2006 are from ATA's *Motor Carrier Annual Report Summary Tables, 2006 Data, Aggregated Survey Results (2008)* and data for 2007 through 2011 are from ATRI's *An Analysis of the Operational Costs of Trucking* survey results.

Consistent with the EIA data, survey respondents indicated that after fuel costs fell significantly from a record high of 63.3 cents in 2008 to 40.5 cents in 2009, they were once again on the rise in 2010 and 2011, with the industry average CPM reported at 48.6 and 59.0 cents, respectively.

Truck and Trailer Payments

Truck and trailer payments were classified as a quasi-operational cost since many motor carriers purchase additional trucks and trailers in response to capacity constraints in high demand times. Survey respondents indicated that truck/trailer lease or purchase payments averaged 18.4 cents per mile in 2010 and increased slightly in 2011 to 18.9 cents. This is a sizable decrease from 2008 and 2009 when carriers reported an average cost of 21.3 cents in 2008 and 25.7 cents in 2009. This may be a sign that carriers have either eliminated more expensive units and are operating smaller fleets or have kept their trucks longer than normal and have therefore avoided new lease or purchase payments.

Repair and Maintenance

Several factors impact a carrier's repair and maintenance (R&M) costs, such as the age of the trucks and trailers, the vehicle configuration used and the technologies that are installed. Average R&M costs for survey respondents were 12.4 cents per mile in 2010 and 15.2 cents in 2011. This represents a slight increase from 2008 and 2009 where carriers indicated that R&M costs averaged 10.3 cents per mile in 2008 and 12.3 cents in 2009. The higher R&M costs were expected due to an increasingly older fleet; carriers had reported delaying the purchase of new equipment, thus increasing the average age of the vehicles in operation. It is well documented that the costs for maintaining trucks goes up dramatically with age and use.²⁴ Since new truck purchases have increased substantially in the last two years, R&M costs are projected to decrease in the future.

While specialized carriers had reported the highest R&M costs in the past (2008 and 2009), the LTL sector now has the highest costs in 2010 and 2011 (21% and 18% higher than the overall industry average). Conversely, truckload carriers reported lower than average R&M costs for both years (11% lower than the industry average in 2010 and 8% lower in 2011). The higher costs experienced by LTL carriers may be due to the extra wear on their vehicles associated with P&D operations in congested urban areas.

²⁴ Antich, Mike. Maintenance Costs Up Due to Frequency of Repair Increases. *Automotive Fleet*. March 2010. Available online: http://www.automotive-fleet.com/fc_resources/AF0310-16-maintenance.pdf

Truck Insurance Premiums

Another quasi-operational cost, truck insurance premiums can vary widely between carriers – particularly based on miles-traveled exposure. Many larger fleets self-insure or utilize umbrella policies which do not easily equate to per-truck unit costs. Additionally, property and liability insurance costs still apply while a truck is unoccupied and stationary. This cost center was ultimately included, however, since most insurance coverage is mileage- and vehicle-specific. Carriers often pay liability and cargo premiums by the mile (except for excess coverage). Since physical damage coverage is calculated by tractor/trailer value, the premium can be divided by the total miles traveled to obtain the cost per mile.

According to the motor carriers surveyed, commercial truck insurance premiums have risen during the past two years. Truck insurance premium CPM averaged 5.9 cents in 2010 and 6.7 cents in 2011. While the individual sectors reported very similar insurance costs for 2010, the 2011 costs varied significantly. Specialized carriers reported an insurance cost of 5.8 CPM in 2010 but averaged 7.6 CPM in 2011. Truck insurance premiums rose from 5.8 CPM in 2010 for TL carriers to 6.2 CPM in 2011. LTL carriers averaged 6.0 CPM in 2010 and 6.7 CPM in 2011.

Permits and Special Licenses

The average permitting and licensing CPM for carrier respondents was 4.0 cents in 2010 and 3.8 cents in 2011, which was significantly higher than the 1.6 and 2.9 cents found in 2008 and 2009. Not surprisingly, specialized carriers reported the highest permitting costs of all three sectors. In 2010, specialized carriers paid an average of 15 percent more on permitting compared to the overall industry average and 34 percent more in 2011.

Tires

Since tires are a petroleum-based product, tire costs increased in response to the higher oil prices of 2008. After remaining relatively stable in 2008 and 2009 (3.0 and 2.9 cents, respectively), survey respondents reported that tire CPM was again increasing. Carriers indicated that tire CPM rose considerably to 3.5 cents in 2010 and to 4.2 cents in 2011. LTL carriers reported the lowest tire costs (11% lower than the industry average in 2010 and 21% lower in 2011) while specialized carriers reported the highest tire costs (26% higher than the industry average in 2010 and 33% higher in 2011).

Tolls

Tolls can be a significant cost for motor carriers and are highly dependent on the carrier's region of operation. Many carriers try to avoid tolls whenever possible since shippers rarely reimburse a carrier for toll-related expenses. Motor carriers that operate predominantly in the Northeast, Southeast and Midwest tended to have the highest average toll costs, while carriers that operate primarily in the West and Southwest had the lowest toll costs. The average toll CPM for all regions was 1.2 cents in 2010 and 1.7 cents in 2011. These figures showed a decrease from the 2008 and 2009 costs which were 2.4 cents for both years.

Driver Wages and Benefits

Most over-the-road or long-haul truck drivers are primarily paid on a per-mile basis while LTL P&D drivers are generally paid by the hour. The U.S. BLS reported that the national average hourly pay for heavy duty truck drivers (excluding self-employed drivers) rose to \$18.16 in 2010.²⁵

Survey respondents indicated that average truck driver pay per mile was 44.6 cents in 2010 and 46.0 cents in 2011, which was expectedly higher than the 2008 rate of 43.5 cents and 2009 rate of 40.3 cents. In terms of hourly wages, these figures translated to \$17.38 in 2008, \$16.12 in 2009, \$17.83 in 2010 and \$18.39 in 2011. Across the three major industry sectors, driver wages mimicked sector trends in total costs for 2010 and 2011; LTL carriers reported the highest driver wages, followed by specialized carriers and TL carriers had the lowest.

Similar to the 2011 analysis, approximately one-third (29%) of survey respondents utilized team drivers, who alternate driving the same truck during a trip. Of those respondents, the average wage per mile for a company team driver was 43.2 cents per mile in 2010 and 44.0 cents per mile in 2011.

While the "driver benefits" CPM decreased from 2010 to 2011 (from 16.2 to 15.1 cents), both of these figures were higher than those reported in 2008 and 2009 (14.4 and 12.8 cents, respectively).

Operating Cost Trends

After declining by 12 percent from 2008 to 2009, total average costs are rising once again as shown in Table 8. Overall, survey respondents reported a 7 percent increase in operating costs from 2009 to 2010 and a 10 percent increase from 2010 to 2011.

²⁵ Department of Labor, Bureau of Labor Statistics. Occupational Outlook Handbook, Heavy and Tractor-trailer Truck Drivers. May 2010. Available online: <http://www.bls.gov/ooh/transportation-and-material-moving/heavy-and-tractor-trailer-truck-drivers.htm>

Rising fuel and tire costs as well as increasing insurance premiums and driver wages appear to be driving this trend.

As was the case with 2008-09, fuel and oil costs again had the largest impact on the overall average cost change. The 20 percent rise in fuel costs from 2009-2010 resulted in an 8.1 cent increase in CPM, and the 21 percent rise from 2010-2011 resulted in a 10.4 cent increase. Driver wages also experienced a slight increase, both from 2009-2010 (11% resulting in a 4.3 cent rise) and 2010-2011 (3% resulting in a 1.4 cent rise).

R&M and tire costs have also increased substantially. From 2008-2009, R&M costs rose 19 percent, increased by only 1 percent from 2009-2010, then jumped by 22 percent from 2010-2011. While tire costs decreased slightly from 2008-2009 (5%), both the 2009-2010 and 2010-2011 periods experienced double digit increases (24% and 18%, respectively).

Fuel prices and capacity constraints that limit the increase in new vehicles, and are heightened by the driver shortage, will likely continue to place upward pressure on operating costs. As previously noted, the EIA projects that fuel prices will remain steady or even decrease slightly through 2013, although any new upturn in manufacturing and/or consumer spending will likely make the EIA's predictions obsolete. The driver shortage issue may therefore play a much larger role in increasing operating costs moving forward. Industry experts predict a shortage of more than 200,000 drivers by 2013.²⁶ In response, carriers continue to increase driver wages and benefits. A number of fleets are also adding non-traditional benefits such as tuition reimbursement for new drivers and offering in-cab devices such as satellite radio, DVD players and satellite dishes.²⁷

Table 8. Motor Carrier Cost Center Trends

Motor Carrier Cost Centers	2008-2009 Change	2009-2010 Change	2010-2011 Change
<i>Vehicle-based</i>			
Fuel & Oil Costs	-36%	20%	21%
Truck/Trailer Lease or Purchase Payments	21%	-28%	2%
Repair & Maintenance	19%	1%	22%
Truck Insurance Premiums	-3%	9%	14%
Permits and Licenses	84%	39%	-4%
Tires	-5%	24%	18%
Tolls	3%	-49%	39%
<i>Driver-based</i>			
Driver Wages	-7%	11%	3%
Driver Benefits	-11%	26%	-6%
TOTAL*	-12%	7%	10%

²⁶ Driver shortage estimated lowered. Truck Gauge. March 19, 2012. Available online:

<http://www.truckgauge.com/2012/03/19/driver-shortage-estimate-lowered-no-critical-shortage-until-hos-in-2013/>

²⁷ Adler, Lynn. Con-Way, Ryder System And Swift Trucking Companies Pile On Perks To Keep Drivers. Reuters. August 10, 2012. Available online: http://www.huffingtonpost.com/2012/08/10/con-way-ryder-swift-trucking-companies_n_1763522.html

* Line items may not sum to total shown due to rounding.

Top Industry Issues

ATRI conducts an annual survey²⁸ of industry stakeholders to identify and monitor the issues that are most likely to affect the trucking industry in the coming years. Since its inception in 2005, the survey has tracked the most pressing issues and compares the results of previous years’ survey findings as an indicator of changing priorities in the trucking industry.

Table 9 shows the relative rankings of the top five issues from 2008 to 2011. In 2011, the driver shortage and fuel costs ranked third and fifth on the list, respectively. The driver shortage issue rose from number five in 2010 to number three in 2011, indicating that the economy was improving. Other factors are likely amplifying the shortage however, including an aging workforce and new government regulations.

The “fuel costs” topic dropped from the number one concern in 2008 (when diesel prices peaked well over \$4.50 per gallon) to number five in 2011. Since fuel costs continue to be one of the largest cost centers for fleets, diesel prices are projected to remain one the top issues in the coming years.

Table 9. Top Industry Issues Survey Results, 2008 – 2011²⁹

Top Industry Issues Survey Results			
2011	2010	2009	2008
1. Economy	1. Economy	1. Economy	1. Fuel Costs
2. Hours-of-Service	2. CSA 2010	2. Government Regulation	2. Economy
3. Driver Shortage	3. Government Regulation	3. Fuel Issues	3. Driver Shortage/ Retention
4. CSA	4. Hours-of-Service	4. Congestion/ Highway Infrastructure	4. Government Regulation
5. Fuel Issues	5. Driver Shortage	5. Hours-of-Service	5. Hours-of-Service

CONCLUSION

Due to the success of the 2008 and 2011 *Operational Costs of Trucking* analyses and the industry’s continued interest in benchmarking data, ATRI has updated the previous research with 2010 and 2011 data. This initiative documented, analyzed and tabulated operational cost data collected directly from for-hire motor carriers as a means of disseminating accurate, real-world operational cost information to key decision makers. In addition to serving as a high-level motor carrier benchmarking tool, the objective of

²⁸ Critical Issues in the Trucking Industry – 2011. ATRI. Arlington, VA. 2011.

²⁹ Ibid.

this research was to ensure that the appropriate data inputs were available for transportation planning and investment models in order to estimate realistic costs and benefits that accrue to commercial operators of the national highway system.

Motor carriers operate in an extremely competitive market, with very thin profit margins and must therefore be particularly attentive to all expenses, including marginal costs. Based on data provided by survey respondents, the average CPM was \$1.55 in 2010 and \$1.71 in 2011 for the for-hire segment of the trucking industry. These figures were higher than the average CPM of \$1.65 found in 2008 and \$1.45 in 2009.

The rise in average operating cost that was experienced between 2009 and 2011 is expected to continue given the current economic conditions and industry trends. Fuel costs and driver wages continue to constitute the majority of costs for motor carriers (60% in 2010 and 62% in 2011). Given the rise in fuel prices that was experienced in 2010 and again in 2012, motor carrier fuel costs are almost certain to continue to be the first or second largest cost center for fleets. Furthermore, increasing freight demand, new government regulations and an aging workforce have combined to intensify the shortage of qualified drivers. This will likely require carriers to further increase wages and benefits in order to recruit and retain drivers. All of these factors will continue to place upward pressure on motor carrier operating costs in the near future.

GLOSSARY

For-hire carrier – a motor carrier that offers freight transportation services to the general public.

Intermodal transportation – freight transportation that involves more than one mode (e.g. rail and truck or truck and air).

Less-than-truckload carrier – hauls a quantity of freight less than that required for the application of a truckload rate, usually less than 10,000 pounds. Typically maintains a “hub and spoke” model whereby carriers pick up smaller shipments, often on a set route, and return to a base terminal where the packages are unloaded, sorted and consolidated with other shipments going to similar locations. Line haul drivers move the shipments between terminals while pick-up and delivery (P&D) drivers deliver shipments to their final destination.

Longer Combination Vehicle – a combination vehicle consisting of a power unit (tractor) pulling more than one trailer. Common trailer configurations include doubles (two 28 foot trailers), Rocky Mountain doubles (one 40 to 53 foot trailer and one 28 foot trailer) and turnpike doubles (two 33 to 53 foot trailers).

Operating ratio – a measure of profitability based on operating expenses as a percentage of gross revenue.

Private carrier – companies whose primary business is not hauling freight for-hire but that own or lease a fleet of trucks in support of their primary business.

Shipper – a company that hires a transportation company to move its freight.

Specialized carrier – include flatbed trailers, tank trucks and agricultural-based carriers as well as carriers dedicated to hauling government munitions, radioactive waste and carriers utilizing specially permitted oversize/overweight loads.

Straight truck – a vehicle with the cargo body and tractor mounted on the same chassis.

Tractor semitrailer – a combination vehicle consisting of a power unit (tractor) and a semitrailer.

Truckload carrier – hauls a quantity of freight that fills a semitrailer, usually more than 10,000 pounds. Generally haul a dedicated load of freight for one customer (shipper) to one destination (consignee). Many TL carriers will specialize in moving a specific type of freight (e.g. refrigerated or hazardous materials).

APPENDIX A

OPERATIONAL COSTS OF TRUCKING SURVEY



OPERATIONAL COSTS OF TRUCKING SURVEY

The American Transportation Research Institute (ATRI) is conducting a strategic survey of **for-hire** motor carriers to update its previous reports on truck operational costs. This survey seeks those marginal costs associated with operating a truck in 2010 and 2011. The findings of this survey will be used in several research initiatives that address fuel costs, traffic congestion, and driver compensation and as input to various cost-benefit analyses of highway infrastructure improvements.

All responses to this survey will be kept completely confidential. Due to the sensitivity of this research, under NO circumstances will we release any of your personal or organizational information.

Demographics

1) What is your company's annual trucking-related revenue? (Exclude brokerage/logistics revenue.)

Less than \$10 million/year	<input type="checkbox"/>
\$10-\$100 million/year	<input type="checkbox"/>
Greater than \$100 million/year	<input type="checkbox"/>

2) What is your primary for-hire business type? (Please select one.)

Truckload	<input type="checkbox"/>
Less-Than-Truckload	<input type="checkbox"/>
Specialized, Flatbed	<input type="checkbox"/>
Specialized, Tanker	<input type="checkbox"/>
Express / Parcel	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>

3) What is your fleet size, average number of miles (including owner operators) traveled in a year and average truck age for each configuration?

Vehicle Type	Number of Trucks	Average Miles Per Year Per Truck	Average Truck Age (in years)
Straight Trucks			
5-Axle Tractor/ Semitrailer			
6-Axle Tractor/ Semitrailer			
Standard Double			
Rocky Mountain Double			
Turnpike Double			
Triple Trailer			
Other (please specify):			

4) Are any of the trucks in your fleet powered by an alternative fuel (i.e. do not run exclusively on diesel or any blended diesel)?

Yes No Don't Know

If yes, please indicate the number of trucks in your fleet that use each of the alternative fuels listed below.

Alternative Fuel	Number of Trucks
Compressed Natural Gas (CNG)	
Liquefied Natural Gas (LNG)	
Electricity	
Hybrid engine	
Other (please specify):	

5) Are any of the trucks in your fleet speed limited or governed?

Yes No Don't Know

If yes, please provide the maximum speed setting and the percent of your fleet governed at that speed.

Maximum Speed (mph)	Percent of Trucks

6) What percentages of your drivers' trips are for the following purposes? (Total must sum to 100%.)

Local pickups and deliveries (less than 100 miles)	
Regional pickups and deliveries (more than 100 miles, less than 500 miles)	
Inter-regional pickups and deliveries (more than 500 miles, less than 1,000 miles)	
National (greater than 1,000 miles)	
Total:	100%

7) Please estimate the percentage of miles traveled by your fleet (include owner operator miles) in the following regions. (Total must sum to 100%.)

Region	% of Total Miles
Midwest	
Northeast	
Southeast	
Southwest	
West	
Total	100%



2010 and 2011 Operational Costs

8) Please list the pay per mile (\$/mile) or pay per hour (\$/hour) rates for the following types of **SINGLE** drivers in 2010 and 2011. (If multiple pay rates for the same type of driver please use average pay rate.)

Type of Pay	Company Driver/ Company Truck		Leased Driver/ Company Truck		Leased Driver/ Leased Truck		Owner Operators	
	2010	2011	2010	2011	2010	2011	2010	2011
Pay per Mile	\$	\$	\$	\$	\$	\$	\$	\$
Pay per Hour	\$	\$	\$	\$	\$	\$	\$	\$
Benefits (Please specify \$/mile or \$/hour)	\$	\$	\$	\$	\$	\$	\$	\$

9) Do you employ team drivers?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

If yes, please list the pay per mile or pay per hour rates for the following types of **TEAM** drivers in 2010 and 2011. (Please use the pay rate for each individual driver. If multiple pay rates for the same type of driver, please use average pay rate.)

Type of Pay	Company Driver/ Company Truck		Leased Driver/ Company Truck		Leased Driver/ Leased Truck		Owner Operators	
	2010	2011	2010	2011	2010	2011	2010	2011
Pay per Mile	\$	\$	\$	\$	\$	\$	\$	\$
Pay per Hour	\$	\$	\$	\$	\$	\$	\$	\$
Benefits (please specify \$/mile or \$/hour)	\$	\$	\$	\$	\$	\$	\$	\$

10) If you indicated a driver benefit pay per mile or hour for single and/or team drivers (Question 7 and 8), please list what benefits are included in this pay (i.e. medical benefits, paid vacation, sick time, etc.)?

--

11) Please list your 2010 and 2011 costs (not rate) per mile for the following key cost centers: *(If the amount equals zero, please enter 0. If the line item does not apply to your operations, please enter N/A.)*

Expense Type	2010 Cost per Mile	2011 Cost per Mile
Repair & Maintenance (Include R&M costs for all trucks and trailers.)	\$	\$
Tires (Include all purchase, maintenance, re-treading and replacement costs.)	\$	\$
Fuel Costs (Include all transportation fuel; do not include fuel surcharge revenue.)	\$	\$
Truck Insurance Premiums (Include all liability, cargo and umbrella policy premiums.)	\$	\$
Truck and Trailer Lease or Purchase Payments	\$	\$
Tolls	\$	\$
Permits & Special Licenses (Include oversize/overweight permits, Hazmat, etc.)	\$	\$
Other (specify): _____	\$	\$
Total	\$	\$

Thank You! We greatly appreciate your participation.

For an advance copy of the updated report, please provide your contact information below (optional). Your information will remain strictly confidential.

Company/Organization Name	Contact Name
Address	Title
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