

**Safety Audit Cost Estimation**

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# Safety Audit Cost Estimation

## Purpose

The purpose of this report is to provide cost estimates of conducting an average New Entrant Safety Audit. These estimates are used by the Federal Motor Carrier Safety Administration (FMCSA) and State commercial motor vehicle enforcement agencies to help budget and allocate monetary resources. These estimates are also used for policy formulation. Costs are developed for both enforcing agencies and for motor carriers.

This cost estimate does not include Federal-level costs that are expected to result from proposed modifications to the safety audit process as described in *New Entrant Safety Assurance Process; Proposed Rule* published in the Federal Register on December 21, 2006. The proposed rule is expected to increase program administrative effort at the Federal level, but it will have a negligible effect on the time spent conducting a safety audit. Once the rule becomes final, we anticipate revising the safety audit cost estimate.

## Background\*

The FMCSA New Entrant Program was implemented on January 1, 2003. Any motor carrier receiving a new DOT Number enters the program and is subject to a mandatory safety audit. A safety audit is also required for any intrastate carrier that becomes an interstate carrier on or after January 1, 2003. In the event of a merger or acquisition, the status of the primary DOT Number will determine whether the resulting motor carrier enters the New Entrant Program. A safety audit must be conducted between 3 and 18 months after the DOT Number is issued. Being subject to a compliance review will fulfill the safety audit requirement of the New Entrant Program. Almost all new entrants are small carriers, usually with one to five drivers.

During a safety audit, the auditor reviews the motor carrier's safety programs and records system. These programs and systems must be in compliance with the Federal Motor Carrier Safety Regulations (FMCSRs) and, where applicable, the Hazardous Materials Regulations (HMRs). The auditor looks for deficiencies and gives educational guidance to the motor carrier personnel. A safety audit is not meant to lead to an enforcement action. But, if one or more critical violations are discovered, the auditor may choose to conduct a full compliance review in lieu of the safety audit.

The New Entrant Program is administered at the State level. Each State manages audits and auditors with support from Federal employees. Approximately 60 percent of safety auditors are State employees. Of the remaining 40 percent, most are Federal employees, and a small percentage are contractors. Approximately 40 percent of the auditors are full-time (including contractors); the others who work part-time are State Troopers.

## \*Acknowledgements

We would like to thank Margie McQueen at the National Training Center and Erica de la Torre at the Southern Service Center for their assistance in developing this cost estimate.

They were especially helpful by providing background information on safety audit procedures and clarifying certain operational costs.

## Safety Audit Cost Summary

The costs listed in this section assume a typical safety audit—with all aspects conducted by the auditor alone and no complications. The auditor is a full-time Federal employee, and differences between State and Federal costs are addressed below. The costs of additional procedures are addressed at the end of this section. Note that if the division administrator or auditor determines that a compliance review is required, these estimated costs are not applicable.

### *Agency Costs*

The primary cost incurred by the agency conducting the safety audit is the labor cost of the auditor. Federal auditors are GS-11 employees, with a base pay rate of \$25.08/hour (Step 5)<sup>1</sup>. Following Office of Management and Budget (OMB) guidance<sup>2</sup> we add 32.85% of base pay as fringe benefits and add 12% of base pay plus fringe as overhead for a total labor cost incurred of \$37.32/hour. An audit takes approximately 6 hours—2 hours on background research, 3 hours conducting the audit onsite, and 1 hour to complete the Part C. The total cost of the auditor's labor is \$223.90 per safety audit. In addition, a supervisor (GS-12 employee) must approve the Part C. The supervisor earns a base wage of \$30.06/hour (Step 5). Benefits and overhead are calculated following OMB guidance, resulting in a total labor cost incurred of \$44.73/hour. The supervisor spends approximately 45 minutes reviewing and approving the Part C, for a total labor cost to the agency of \$33.55. The total labor cost of a safety audit incurred by the agency is \$257.45.

The other marginal cost incurred by the agency is transportation. Because the onsite portion of a safety audit takes between 3 and 4 hours, most safety audits do not require an overnight stay. The transportation cost is best captured by a per diem of \$39.00 for the day (no overnight) for each safety audit.<sup>3</sup>

Each auditor needs the appropriate equipment and training—fixed expenses that are amortized.<sup>4</sup> Each auditor is provided with a vehicle, laptop computer, scanner, and printer. In addition, auditors usually carry the equipment necessary to conduct a Level I Vehicle Inspection. Equipment for all full-time auditors is associated with the New Entrant Program, while the vehicles and inspection equipment used by part-time State employees would normally be purchased in conjunction with the Roadside Inspection Program and/or other duties. The laptop computer, scanner, and printer are fixed expenses and amortized over a 3-year functional life. The laptop computer (including software) costs \$2,950.63; the scanner and printer costs are approximately \$200.00 and

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<sup>1</sup> Office of Personnel Management 2006 General Schedule (Base) Pay Table.

<sup>2</sup> OMB Circular No. A-76 – Revised Supplemental Handbook and Memorandum M-07-02

<sup>3</sup> This is the GSA fiscal year 2006 standard rate of \$39.00 for travel.

<sup>4</sup> Equipment and training costs were developed using FY2006 State Commercial Vehicle Safety Plans (CVSPs) and New Entrant Program Grant applications.

\$450.00, respectively.<sup>5</sup> The typical auditor's vehicle costs about \$21,950, a fixed expense amortized over 5 years. The average amount spent on equipment needed for the Level I Vehicle Inspections per auditor is \$121.89 annually.<sup>6</sup>

The annual costs of equipment are divided by the average number of safety audits conducted by the auditor each year. MCMIS data from fiscal year 2006 show that 38,680 safety audits were conducted by 874 unique auditors.<sup>7, 8</sup> Approximately 350 are full-time auditors. The average number of safety audits conducted by a full-time auditor in FY2006 was 85. Thus the equipment cost per safety audit is \$67.20 (\$14.12 for the laptop and accessories, \$51.65 for the vehicle, and \$1.43 for the vehicle inspection equipment). Costs for part-time auditors who are State troopers are found in Appendix B (Cost Matrices).

All Federal auditors must complete the Federal SA Academy, an eight-week course with an average total cost per auditor of \$6849.41<sup>9</sup>. Auditors that have completed the two-week Compliance Review training (i.e., safety investigators) can fulfill the New Entrant training requirement with a two-day course. In order to retain their certification, all auditors, Federal and non-Federal, are required to attend a New Entrant in-service annually at a cost of \$400.00 per auditor.

Because the New Entrant Program is less than 5 years old, it is difficult to estimate the average career length for a safety auditor. We assume 10 years based on estimates applied to safety investigators. The cost of training is amortized over 10 years. To compute the cost per safety audit, the amortized annual cost of training is added to the cost of the annual in-service for a total annual training cost of \$1,084.94. The average number of safety audits conducted by a full-time auditor in FY2006 was 85. Thus the training cost per safety audit is \$12.76. Costs for part-time State troopers are found in Appendix B.

### *Federal Costs*

Auditors use a number of FMCSA computer systems, such as MCMIS, which are primarily used by other FMCSA Safety Programs such as Compliance Reviews and Roadside Inspections. The New Entrant Program does not require additional computer systems resources, and thus incurs no additional cost. Federal administration and overhead costs attributed to the New Entrant Program should not be amortized over individual safety audits, and this paper follows such a strategy. The anticipated costs

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<sup>5</sup> The printer and scanner were included in less than three FY2006 CVSPs, so the costs reported here are approximate retail prices that are within the range given in the CVSPs.

<sup>6</sup> This cost is based on equipment costs per Safety Inspector in the Roadside Inspection Program and includes creepers, gloves, flashlight, and other equipment and supplies.

<sup>7</sup> This is the MCMIS snapshot of FY2006 data retrieved on November 13, 2006.

<sup>8</sup> This does not include: motor carriers not in the New Entrant Program, those revoked from the Program due to no contact, or those that exited the Program due to inactivation or change.

<sup>9</sup> Non-Federal auditors, including part-time auditors who are State troopers must complete one-week training courses on North American Standards Part A, North American Standards Part B, and General Hazardous Materials, and a two-week course on the New Entrant Program. The average total cost per auditor of the 5 weeks of training is \$4,280.88.

associated with *New Entrant Safety Assurance Process; Proposed Rule* (Federal Register, December 21, 2006) are not included in the current cost estimate.

The one Federal cost that we include is the cost of the contractor used to manage the new entrants and develop the list of motor carriers eligible for safety audits. The contract was worth \$7,034,694 per year in 2006. Amortized over 38,680 safety audits in 2006, the cost per safety audit is \$181.87. Although we amortize this cost over the number of safety audits conducted, the efficiency of the contract is best measured in terms of the total number of new entrant motor carriers reviewed per year.

#### *Motor Carrier Costs*

The only cost incurred by the motor carrier in this estimate is the time of its employees expended toward safety audit activities. All safety systems and procedures examined during the safety audit are required by the FMCSRs and must be developed and implemented in order to operate legally. This estimate does not consider enforcement costs. Any costs incurred by the motor carrier as a response to the findings of the safety audit are not included in this estimate as explained above.

A safety audit requires the presence of only one motor carrier employee, typically the highest-ranking officer or the safety officer. The base wage for motor carrier management is \$33.74/hour<sup>10</sup>. We include benefits (34.6% of total compensation<sup>11</sup>) and overhead (an additional cost calculated by multiplying total compensation by 5%<sup>12</sup>), resulting in a total labor cost incurred of \$54.17/hour. The motor carrier manager is involved in the audit for 4 hours—1 hour during the pre-visit telephone interview and 3 hours during the onsite portion of the audit. The cost to the motor carrier is \$216.68 per audit. Usually one or two additional motor carrier employees are present during the safety audit. Costs including multiple motor carrier employees can be found in Appendix B.

#### *Base Costs Summary*

Table 1 provides a breakdown of base costs. The average marginal cost to the enforcing agency is \$296.45 per safety audit, and the fixed cost is \$261.83 per safety audit. The average total cost to the enforcing agency is \$558.28. The motor carrier costs are limited to labor costs, so their average marginal cost of \$216.68 per safety audit is the same as their average total cost per safety audit. The average overall cost is \$774.96 per safety audit.

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<sup>10</sup> NAICS 484000, 11-1021 mean wage of General and Operations Managers in the Truck Transportation Industry (BLS, May 2005).

<sup>11</sup> Employer Costs for Employee Compensation – Dec. 2006, Table 10, Transportation and warehousing (BLS, Mar 2007).

<sup>12</sup> 5% overhead load taken from previous FMCSA cost estimates.

**Table 1. Base Costs Summary**

	Base Cost	Cost per Safety Audit
<b>Enforcing Agency</b>		
Total Labor Cost		\$224.93
Safety Auditor Labor	\$25.08 per hour	\$150.48
Benefits and Overhead	\$12.24 per hour	\$73.44
Supervisor Labor	\$30.06 per hour	\$22.55
Benefits and Overhead	\$14.67 per hour	\$11.00
Travel	\$39.00 per day	\$39.00
<b>Agency Marginal Cost</b>		<b>\$296.45</b>
Training		\$12.76
Total Equipment		\$67.20
Laptop and Accessories	\$3,600.63	\$14.12
Vehicle	\$21,950.00	\$51.65
Other Equipment	\$121.89 per year	\$1.43
Program Administration Costs		\$181.87
<b>Agency Fixed Cost</b>		<b>\$261.83</b>
<b>Agency Total Cost</b>		<b>\$558.28</b>
<b>Motor Carrier Cost</b>	<b>\$54.17 per hour</b>	<b>\$216.68</b>
<b>Total Cost</b>		<b>\$774.96</b>

In FY2006, FMCSA and enforcing agencies conducted 38,680 safety audits. Based on the estimates described above, the aggregate cost to the enforcing agencies is \$21.6 million.

#### *Additional Costs*

In general, additional costs are incurred in three cases. The first case is when a new entrant is a HM carrier. HM carriers are subject to a lengthier onsite questionnaire, adding approximately 45 minutes to the safety audit. The costs are limited to increased time expenditure, translated into additional labor costs of \$27.99 for the auditor and \$40.63 for the motor carrier staff.

The second case occurs when an auditor performs a Level I Vehicle Inspection. For the purpose of this cost estimate, we will disregard all costs associated with the Roadside Inspection Program except for equipment and labor costs. Equipment costs are included in the base cost. Based on calendar year 2005 MCMIS data<sup>13</sup>, a Level I Vehicle Inspection takes approximately 36 minutes, plus 5 minutes for the auditor to record and upload the results. The additional labor costs incurred when a safety audit includes a Level I Vehicle Inspection are \$25.50 for the auditor and \$37.02 for the motor carrier staff.

Finally, additional costs are incurred by the enforcing agency when an overnight stay is required due to distance traveled by the auditor. This cost is best estimated by adding an

<sup>13</sup> MCMIS snapshot of CY2005 data retrieved on August 14, 2006.

overnight per diem<sup>14</sup> of \$60.00 for lodging and \$60.00 for traveler expenses. A summary of these additional costs are provided in Table 2.

**Table 2. Additional Costs per Safety Audit**

Category	Cost
HM	\$68.62
Vehicle Inspection	\$62.52
Overnight Stay	\$120.00

### Alternative Methods

The above cost estimates are based on a typical scenario involving the auditor traveling to the motor carrier, administering the safety audit, and returning to the State office in order to complete the Part C. In the course of our research, we learned of three alternative methods for conducting safety audits.

The first alternative is for the State to hire contractors to conduct safety audits. The fee charged is a flat rate of \$1,200 to \$1,400 per safety audit. The contractor is responsible for equipment, training, travel, lodging, per diems, and all other expenses. The contractor provides coverage for the entire state.

The second alternative is a group audit session. The State will rent a hotel and invite new entrants to attend. Each auditor conducts a small group session covering an applicable section of the FMCSRs, with the motor carrier personnel rotating through to each section. The State cost for a group audit session depends on location and hotel rates. The State lowers its overall cost through centrality and economies of scale, while motor carriers incur a greater cost burden due to travel expenses. A typical group audit session will involve 20 to 30 motor carriers.

The third alternative is a two-week deployment. This has evolved out of the changing work conditions of an auditor. With current equipment and a telephone/Internet access card for the laptop, an auditor is capable of working out of his/her car or home. This has already reduced overhead costs, travel expenditure, and per diems. The two-week deployment involves sending a fully-equipped auditor to a series of motor carriers, one after the other, without returning to the home office between safety audits. The cost to the State is approximately \$1,600 in per diems, including travel and lodging, plus the cost of each safety audit (not including travel). During the deployment, the auditor usually completes 17 to 20 safety audits.

### Summary

The FMCSA New Entrant Program requires almost all motor carriers receiving a new DOT number to undergo a safety audit within 18 months. The safety audit almost always consists of an onsite review of the carrier's safety processes, systems, and procedures. Its

<sup>14</sup> Based on GSA fiscal year 2006 standard rates.



purpose is educational, and only in the case of critical violations will the motor carrier fail the safety audit or be subject to a compliance review in lieu of the audit. A typical safety audit conducted by a full-time Federal safety auditor and one motor carrier employee has a total cost to the enforcing agency of \$558.28 and total cost to the motor carrier of \$216.68. The total cost is \$774.96, and the marginal cost is \$513.13 (\$296.45 to the enforcing agency and \$216.68 to the motor carrier). Costs will vary based on specific situations, and costs of the most common permutations are included in Appendix B.

## Appendix A – Safety Audit Procedures

### Safety Audit Procedures

More than 50,000 motor carriers applying for DOT numbers are entered each year into the New Entrant Program. Approximately 20,000 of these carriers do not belong in the Program. FMCSA has hired a contractor to examine the list of motor carriers entered into the New Entrant Program. The contractor removes carriers that do not belong in the program, such as those that only operate intrastate or those that are not new companies. The remaining motor carriers are admitted to the New Entrant Program, and at the appropriate time, each one is assigned to a safety auditor.

When the safety auditor receives the assignment, the first step is background research and preparation. The auditor gathers the motor carrier's history and background information from FMCSA computer systems (such as MCMIS). Then the auditor telephones the motor carrier to schedule the safety audit and to obtain answers to a questionnaire. The questionnaire is used to (1) confirm that the motor carrier is an interstate carrier and a new entrant; (2) confirm and update carrier information in MCMIS; and (3) prepare the carrier for the safety audit. Once the safety audit is scheduled, the auditor checks FMCSA computer systems for any critical or acute violations associated with the carrier. If such a violation exists, then the carrier must be subject to a compliance review that will fulfill the safety audit requirement. The auditor may conduct a compliance review if an acute or critical violation is discovered during the safety audit. The background research takes approximately 2 hours, one each for the FMCSA systems research and for the telephone questionnaire. Most auditors conduct this research, although some offices have a New Entrant Coordinator who assists.

The onsite portion of the safety audit takes between 3 and 4 hours. The audit begins with a meeting with the highest-ranking motor carrier officer. During this meeting, the auditor builds a rapport with the motor carrier official and explains the purpose of the safety audit. At the end of the meeting, the motor carrier officer gives the auditor a tour of the operation and introduces drivers and other employees.

After the tour, the auditor conducts a review of the motor carrier's safety programs, procedures, and records systems. Usually two or three motor carrier employees (owner/manager, administrative assistant, and a driver) participate in the audit, although only one is required. The auditor updates MCMIS and other FMCSA information onsite, and then asks the motor carrier employee(s) approximately 50 questions covering the FMCSRs. The auditor is looking for deficiencies in the safety systems and is attempting to educate the motor carrier employee(s).

The onsite portion of the safety audit ends with a close-out meeting with the highest-ranking motor carrier officer. At this time, the auditor presents the results of the safety audit and explains any deficiencies found. The auditor may make additional observations and recommendations.

In order to finish the safety audit, the auditor must prepare and upload a Part C form on the motor carrier. Once uploaded, the Part C is approved by a supervisor and the safety audit is official and complete. It takes approximately 1 hour to fill out the Part C and about 45 minutes for the supervisor to review and approve it.

### **Additional Safety Audit Procedures**

During a safety audit, the auditor may conduct a Level I Vehicle Inspection. This is required if there is a deficiency in the number of roadside inspections conducted on the carrier before the safety audit. A vehicle inspection will add approximately 41 minutes to the length of the safety audit.

HM carriers are subject to the Hazardous Materials Regulations, and the safety audit will include a review of HM safety systems. This is covered through additional questions asked onsite and adds approximately 45 minutes to the length of the safety audit.

## Appendix B – Cost Matrices

### Motor Carrier Employee Wages

While the safety audit requires only one motor carrier employee, most small carriers have one or two additional employees participate in the onsite portion of the audit. In addition to the highest-ranking officer, an administrative assistant will assist with the audit. Auditors usually meet one or more drivers while touring the facilities, and occasionally a driver will join the other motor carrier employees during the entire onsite portion of the audit. Costs associated with these functions are provided in Table B.1.

**Table B.1. Motor Carrier Employee Wages**

	Base Wage (hourly)	Total Labor Cost (hourly)
Employee 1 - Manager/Owner	\$33.74	\$54.17
Employee 2 - Admin Asst	\$10.96	\$17.60
Employee 3 - Driver	\$17.41	\$27.95
NAICS 484000 (Truck Transportation); median wages (BLS May 2005)		
11-1021 General and Operations Managers		
43-9061 General Office Clerk		
53-3032 Truck Driver, Heavy and Tractor-Trailer		

### Part-Time Auditors

Part-time auditors are almost always State Troopers who conduct safety audits as part of their law enforcement duties, often assessed as overtime (conducted in the evenings and on weekends). The primary differences in costs are found in the fixed costs. Part-time auditors conduct an average of 17 safety audits per year, so per-audit costs will be higher than for full-time auditors. Offsetting the increased per audit costs are equipment costs that can be reasonably attributed to other programs. We assume that vehicles used by part-time auditors are assigned and paid for by other safety programs, and that the vehicle inspection equipment costs are covered by the Roadside Inspections Program. A comparison of costs associated with full-time and part-time auditors is provided in Table B.2.

**Table B.2. Base Audit Cost to Enforcing Agency**

	Full-Time Auditor	Part-Time Auditor
<i>Marginal Costs</i>		
Auditor Labor Cost	\$223.90	\$223.90
Supervisor Cost	\$33.55	\$33.55
Travel	\$39.00	\$39.00
<b>Total Marginal Cost</b>	<b>\$296.45</b>	<b>\$296.45</b>
<i>Fixed Costs</i>		
Training	\$12.76	\$48.71
Laptop and Accessories	\$14.12	\$70.60
Vehicle	\$51.65	\$0.00
Other Equipment	\$1.43	\$0.00
<i>Total Equipment</i>	<i>\$67.20</i>	<i>\$70.60</i>
Program Costs	\$181.87	\$181.87
<b>Total Fixed Cost</b>	<b>\$261.83</b>	<b>\$301.18</b>
<b>Total Cost</b>	<b>\$558.28</b>	<b>\$597.63</b>

**Cost Matrices**

Tables B.3 through B.5 summarize total and marginal costs for the base safety audit conducted by either a full-time or part-time auditor and involving up to three motor carrier employees. Table B.5 summarizes the additional costs based on optional aspects of the safety audit.

**Table B.3. Base Audit Total Cost**

	Full-Time Auditor	Part-Time Auditor
MC Manager	\$774.96	\$814.31
MC Manager and Admin. Asst.	\$827.75	\$867.10
MC Manager, Admin. Asst., and Driver	\$911.60	\$950.95

**Table B.4. Base Audit Marginal Cost**

	Full-Time Auditor	Part-Time Auditor
MC Manager	\$513.13	\$513.13
MC Manager and Admin. Asst.	\$565.92	\$565.92
MC Manager, Admin. Asst., and Driver	\$649.77	\$649.77

**Table B.5. Additional Costs**

	Enforcing Agency	Motor Carrier		
		1 Emp.	2 Emp.	3 Emp.
HM	\$27.99	\$40.63	\$53.82	\$74.79
Vehicle Inspection	\$25.50	\$37.02	\$49.04	\$68.14
Overnight Stay	\$120.00	\$0.00	\$0.00	\$0.00