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Towards establishing effective commercial driver training standards: analysis of industry opinions from Alberta.

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16 **Abstract**

17 The aim of commercial driver licensing program training is to ensure that drivers have the
18 appropriate skills to perform their duties in a manner that provides the safest, most efficient travel
19 environment. In order to establish an appropriate training standard with high compliance, it is
20 important to understand the opinions of professionals from the trucking industry on such a
21 program. These include opinions regarding deficiencies in existing training programs, the types of
22 training a new mandatory program should include, when training should be undertaken, and
23 financial responsibilities for training. To gain an understanding of such matters, this study presents
24 the results of a survey of employees at Alberta Motor Transportation Association (AMTA)
25 member companies. Over 200 valid responses were obtained from drivers, company managers,
26 training staff and other industry affiliates. The survey included questions about respondents'
27 commercial driving and training experiences, and attitudes on standardized training programs. The
28 survey also gathered respondents' opinions about specific training courses when considering them
29 from different perspectives (importance, standard acceptance, value and interest). Ordinal logistic
30 regression models were developed to understand the effects of different factors on course rating
31 and training acceptance. In general, the results show high desire and acceptance for a mandatory
32 standard training program, with factors such as a participant's role in the industry (i.e. driver,
33 manager, trainer) having significant impacts on the ratings for specific training courses. In
34 addition, the results support establishment of a program that increases basic pre-licensing training,
35 requirements that specific training classes to be taken at several points throughout a commercial
36 driver's career, and specify which parties should be financially responsible. The findings of this
37 paper provide a foundation to begin forming unified policies on standard driver training in Alberta,

38 and ultimately Canada, by supplementing Canada's National Safety Code Standards with driver
39 training standards.

40 **Keywords:** Commercial driving industry safety standards, commercial driver training, industry
41 opinions survey, Alberta Motor Transport Association.

42 **1. Introduction**

43 This paper investigates the attitudes and opinions held by commercial transport professionals
44 regarding commercial driver training standards, and how this information can be used to update
45 existing policies for the improvement of road safety. An online survey of industry professionals
46 employed at member companies of the Alberta Motor Transport Association (AMTA) was
47 conducted to investigate various factors influencing respondents' opinions on how road safety may
48 be improved through driver safety training, perceived deficiencies in their received training, and
49 their attitudes towards the establishment of mandatory training standards. The survey also polled
50 respondents about their opinions on the content of training courses, who should be responsible for
51 related fees, and other practical details.

52 A significant portion of freight is moved by trucks through the province of Alberta, heavily driven
53 by the oil and gas industry. In 2015, Alberta had 605,335 registered commercial vehicles (Alberta
54 Transportation 2015a) and 694,222 registered commercial drivers (Alberta Transportation 2015b).
55 It is noted here that Alberta Motor Transport Association's member companies mainly operate big
56 tractor-trailer units (Cotter 2014). Moreover, Alberta's highway design guide lists the following
57 vehicles as design trucks: Semi-Trailer (WB-20), Double Trailer Combination (WB-23), Triple
58 Trailer Combination (WB-33), Rocky Mountain Double (WB-28), Turnpike Double (WB-36) and
59 Alberta's log haul trucks (Alberta Infrastructure 1999).

60 Due to their constant presence on roads and their potentially deadly impacts in collisions, trucks
61 pose a major threat to the safety of all road users (FHWA 2010, NHTSA 2013). In 2012 in the
62 United States, 333,000 large trucks (gross vehicle weight >10,000lbs) were involved in traffic
63 crashes alone, an increase of 4% from 2011 (NHTSA 2012). These collisions led to 3,921 fatalities
64 and 104,000 injuries. A Transport Canada report from 2010 revealed that heavy vehicles were

65 responsible for 20% of fatalities on Canadian roads in 2001-2005 (Road Safety Canada Consulting
66 2011). In Alberta, there were 57 tractor-trailer fatalities and 633 truck-trailer injuries in 2014
67 (Alberta Transportation 2014).

68 Previous research has been able to establish a link between commercial driver training and safety.
69 In one study, “level of driver training” and “driving too fast for conditions” were the most
70 frequently cited factors associated with heavy vehicle collisions (Beilock et al. 1989). Moreover,
71 the positive impacts of driver training in reducing incidents caused by technical driving errors have
72 been highlighted in previous research (Hanowski et al. 2007). Similarly, previous research has also
73 highlighted that voluntary training attendance had positive impacts on driver fatigue perception
74 (i.e. drivers who participated in training were less likely to have the perception that they were
75 suffering from fatigue, possibly due to their knowledge on how to manage it) (Crum and Morrow
76 2002).

77 These studies suggest that formalized driver training standards could help improve overall road
78 safety. However, in order for new standards to be effective in doing so, changes must precisely
79 target current training deficiencies and be readily adopted by the majority of industry participants.
80 To this end, inputs from the industry should be taken into consideration when establishing new
81 training standards. This paper presents insights and results from such a survey administered
82 through the AMTA. Overall, the results indicate a need for, and wide acceptance of, new
83 mandatory training program standards, while also providing insight about the potential structure
84 of such a program.

85 **2. Existing Regulations**

86 The importance of commercial driver training is widely accepted, however, regulations specifying
87 the amount of training required and its contents differ from one jurisdiction to another. They also

88 vary with respect to the areas of training they cover. For instance, Kuncyć et al. (2003) reported
89 that in Canada and the US, training drivers for dangerous goods transport was the employer's
90 responsibility. In such a case, the employer alone determines training duration and content, and
91 assesses the fitness of each driver to perform their duties.

92 While the basic Commercial Driver's License (CDL) exam in the US is federally regulated, each
93 state has different training standards and a driver must obtain a CDL through their home state.
94 Depending on the type of vehicle to be operated, the driver might be required to complete special
95 endorsements under the licensing program (Federal Motor Carrier Safety Administration 2015).
96 Although training is not mandatory (DMV 2015), there are a variety of schools offering training,
97 moreover, some companies will offer training to their employees in return for future service.
98 Training can range from three to seven weeks (Trucking Job 2013), with practical training
99 conducted through a combination of simulator and on-road experience.

100 In an attempt to address the lack of a national training standard, the Federal Motor Carrier Safety
101 Administration (FMCSA) recently introduced a mandatory "Final Rule" requiring entry-level
102 commercial truck operators seeking a commercial driver's license (CDL) or certain endorsements
103 to obtain specific levels of training (Green 2016). The proposed rule was assessed by several
104 entities including academic institutions, the agriculture industry, motor carriers, CMV driver
105 trainers, school bus operators, and trade associations. Support for the new rule was driven by its
106 anticipated improvements to industry safety and efficiency. Opposing opinions, on the other hand,
107 argued that such a rule would aggravate existing shortages in commercial drivers.

108 Under the new law, applicants would be required to show proficient skill in both practical and
109 theoretical knowledge related to commercial vehicle operations. Moreover, the program requires
110 that training is obtained from an instructional program that meets FMCSA standards, which require

111 a certain level of experience for instructors and online delivery of training content (FMCSA 2016).
112 However, the program does not specify a minimum number of training hours required, although
113 the rule does require training providers to ensure that applicants demonstrate proficiency in all
114 required elements of the training to successfully complete the program.

115 In 2003, the European Union issued a “Driver Certificate of Professional Competence,” which
116 requires commercial drivers to take 35 hours of training every five years. However, due to the low
117 take-up rate of the program across member countries, the effects of the program are unclear
118 (Gordon 2014).

119 In Canada, the operation of commercial buses and trucks is governed by provincial and territorial
120 regulations (Transport Canada 2014). Although Transport Canada does administer the Motor
121 Vehicle Transport Act (MVTA), which has some federal regulations that govern hours of service
122 for commercial drivers (Transport Canada 2014), no regulations exist regarding the training
123 required in the provincial licencing programs. The federal government also works with provincial
124 and territorial governments on setting the National Safety Code (NSC), which includes 15
125 commercial driver-specific safety standards. One aspect of the NSC aims at standardizing
126 knowledge and performance tests for commercial drivers from different provinces (CCMTA
127 2016). However, the NSC standards lack guidelines on the amount of driver training required, and
128 the specific contents of a potential training program.

129 In Alberta, there are no mandatory commercial driver training requirements at the provincial level.
130 The current Alberta commercial driver licensing regulations require that applicants hold a non-
131 Graduate Driver’s License (non-GDL) and have graduated from the GDL program by passing a
132 physical exam (including vision test), and driving knowledge and in-vehicle tests. However, the
133 licensing program has no minimum practice requirements, or regulations about training and

134 education, prior to taking the exam. Although exam contents vary for the different license classes,
135 commercial driver license testing generally covers pre-trip inspection, vehicle handling skills, and
136 basic knowledge of traffic controls.

137 Overall, this review indicates that there does not seem to be a basic consensus on the type of
138 training that should be provided, the amount of training that should be mandatory as part of a
139 training standard, when training should take place during a driver's career, and the means of
140 providing such training. Horn and Tardif (1999) argued that, although training is essential, it
141 cannot be effective in reducing heavy vehicle collisions unless the content covered in training
142 programs is bounded by certain standards and delivered through an industry-based strategy. This
143 point is further emphasized by Staplin (Staplin et al. 2004), who stated that "*without regard to the*
144 *quality of training, formal schooling prior to beginning trucking appears to have little effect on*
145 *crash probabilities.*"

146 In one of the few studies based on surveys of industry professionals regarding driver training,
147 Dueker (1995) concluded that the private sector was not effective in providing adequate training
148 for drivers of heavy trucks, motor coaches, or school buses. Dueker compared the amount of
149 training received by survey respondents to a pre-determined minimum threshold, consisting of
150 lower limits of training hours and number of topics covered in a training program.

151 In another study, (Staplin et al. 2004), surveyed industry participants about their opinions on
152 alternative methods of delivering training materials. The study found that conventional teaching
153 methods received the highest average ratings, and thus recommended that multimedia instructional
154 materials be replaced with traditional classroom presentations relying on printed material. It is
155 noted here that with the recent surge in technological tools over the past decade, the preference of
156 trainees in terms of the tools used to deliver training material may have changed. Unfortunately,

157 to the best of our knowledge, this is the most recent study to have explored the opinions of drivers
158 on such tools.

159 In summary, it is clear that although jurisdictions around the world acknowledge the importance
160 of training in creating a safer and more efficient trucking industry, not much has been done to
161 establish standard training programs. Moreover, previous research also shows that if training
162 programs are not properly designed to meet the needs of the industry, safety benefits are limited.
163 This paper aims to address the aforementioned issues by assessing the opinions of industry
164 professionals on their training experiences and the perceived quality of these experiences. The
165 results can help jurisdictions such as the Province of Alberta and other Canadian provinces
166 understand where current training practices may be lacking and therefore, how to address these
167 deficiencies through legislation. The study also gauges industry support for potential new
168 legislation, which is critical for policy-makers. Based on driver self-assessment, the survey
169 identifies areas where drivers acknowledge a lack of appropriate skill and where they believe they
170 need more training. Moreover, the paper also identifies the training courses employers are willing
171 to sponsor, and those which drivers are prepared to pay for, to understand what kinds of training
172 drivers must acquire before and after obtaining their commercial driver's license.

173 **3. Survey Design and Response Collection**

174 Survey data was collected in collaboration with the Alberta Motor Transport Association (AMTA),
175 a not-for-profit group that represents the highway transportation industry in Alberta. AMTA's
176 main mission is to work with industry member companies on managing regulatory, safety and
177 environmental issues. The survey was administered using the SurveyMonkey platform, and
178 participation by employees of AMTA member companies was requested through advertisement
179 on the AMTA website and on an industry radio channel. The survey was open to employees of

180 AMTA member companies from October 30 to November 20, 2013; a total of 305 responses were
181 received. Respondents' roles in the industry ranged from commercial vehicle drivers to company
182 managers, supervisors, training staff or other industry affiliates. Many of the respondents that were
183 currently not in driving roles had prior Commercial Driving Experience (CDE).

184 The survey was divided into three parts. Part 1 sought respondents' basic demographic
185 information; Part 2 gathered opinions on current training procedures, their importance, and how
186 they are thought to address road safety; Part 3 gathered opinions regarding new mandatory training
187 standards, training courses' contents, and responsibilities for training fees. The survey was divided
188 into parts for two reasons: (i) to separate the different categories of information collected, and (ii)
189 to stream respondents into appropriate versions of the survey depending on their role in the
190 industry.

191 Most questions in the survey seeking respondents' opinions adopted a 5-point Likert response,
192 where responses could range from *Strongly Disagree* to *Strongly Agree* or *Not Important At All* to
193 *Extremely Important*. The Likert response scale was also used to gauge respondents' opinions on
194 potential training courses proposed by AMTA. Ten courses were included in the assessment; these
195 courses, along with a brief description of the contents of each, are listed in Table 1.

196 **4. Dataset Statistics**

197 This section describes the respondents' demographic information (Part 1) and their responses to
198 the survey questions of Parts 2 and 3.

199 **4.1 Survey Part 1: Respondents' Information**

200 After excluding invalid and/or incomplete responses, 247 responses remained, consisting of those
201 from 37 commercial drivers (all with Commercial Driving Experience, CDE), 145 company

202 managers or supervisors (101 with CDE), 46 training personnel (39 with CDE) and 29 industry
203 affiliates (19 with CDE).

204 The largest category of survey respondents consisted of company managers or supervisors with
205 CDE (40.9%), and the majority of respondents within each group (except training staff with CDE)
206 were between 40-55 years old. The groups with more educational attainment were mixed;
207 company managers and industry affiliates without CDE largely had (junior) college degrees while
208 industry affiliates with CDE largely did not respond to this question, for reasons unknown.

209 **4.2 Survey Part 2: Opinions on Current Training Standards**

210 *4.2.1 Current Training Practices and Their Role in Improving Safety*

211 This section gathered drivers' opinions, as well as those of managers and trainers with CDE, on
212 current training programs (in-vehicle and otherwise) and their impacts on road safety. Respondents
213 are asked to assess the quality and sufficiency of the in-vehicle training they received by expressing
214 their level of agreement on 11 statements. Similarly, the respondents are also asked about the
215 quality and adequacy of current training practices in general, and their perceived impacts on safety,
216 by expressing their level of agreement with an additional six statements. The responses to
217 statements in the survey are shown in Figure 1.

218 Figure 1a shows responses regarding in-vehicle training, which is the most commonly-taken
219 approach to acquiring driving skills. The survey results indicate that basic in-vehicle training is
220 not considered sufficient for creating a safe driving environment; a large majority of respondents
221 believe their in-vehicle training to be of minimal value in creating safer roads, while other forms
222 of training may be more beneficial in this respect. Although 83% of (current) drivers acknowledge
223 the necessity of formal in-vehicle training and its role in increasing roadway safety, not many

224 respondents believe that the training included in current programs is sufficient to achieve such
225 gains. This is mainly due to drivers believing that other skills that are improved through training
226 (i.e. cargo securement) are equally important to safety in the industry.

227 In order to ensure that the sample size obtained in the survey was a good representative of the
228 population, the margin of error expected given the sample size was estimated. In Alberta, 245,000
229 licensed commercial drivers exist, although not all those drivers are employed, it was assumed that
230 the 245,000 drivers represented the population from which the 247 responses were sampled. The
231 margin of error (e) at a 95% confidence level was then estimated using the following equation.

$$n = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \frac{z^2 \times p(1-p)}{e^2 N}}$$

232
233 Where, n is the sample size, N is the population size, z is the z -score assuming normal
234 distribution (1.96 at 95% confidence level) and p is the response distribution 50% is often
235 used assuming responses are not skewed.

236 The margin of error was estimated to be 6.2% which indicates that the sample is an accurate enough
237 representation of the population. In other words, this indicates that we are 95% confident that the
238 margin of error in the responses gathered from the 247 survey is 6% from the responses we could
239 have obtained had we interviewed the entire population.

240 About 50% of drivers surveyed believe the in-vehicle training they received at a driving school
241 was sufficient for finding employment; however, 95% stated that this same training was inadequate
242 for safe commercial driving and driving environment. Likewise, 56% of managers and training
243 instructors with CDE believed the in-vehicle training they received equipped them with basic skills

244 necessary to get employed but again, a high proportion (89%) believed that the training did not
245 provide them with adequate safe driving skills (these results are not shown).

246 Only 38% of drivers agree that the formal training they received was adequate for creating a safe
247 and efficient commercial driving environment (see Figure 1b). This is consistent with the
248 previously discussed responses on in-vehicle training. When considering all types of training
249 received in their careers, 70% of drivers believed that the training was helpful. The survey did not
250 directly ask why the formal training was thought to be inadequate – whether it was due to poor
251 course quality, inability of drivers to select appropriate courses, etc. Only 27% of respondents who
252 had sought formal training indicated that they had faced no difficulty in selecting appropriate
253 courses at the beginning of their careers. This suggests that a standard training program policy
254 would be helpful to entry-level commercial drivers navigating their training needs, instead of
255 expecting them to choose their own training courses before they fully understand their needs.

256 Over 76% of respondents agreed that a standard training program would provide a safer and more
257 efficient driving environment. The majority (66%) of trainers and managers without CDE agreed
258 that employees with formal training have better performance in their careers (results not shown).
259 More than 60% of respondents believe that training, which could be in the form of short courses
260 held throughout an employee's appointment, would be extremely valuable. Overall, respondents
261 appear to strongly support standard training requirements for commercial drivers throughout their
262 careers.

263 The results of survey Part 2 lead to several conclusions. Firstly, although there are no mandatory
264 training requirements, drivers acknowledge the importance of training, and seek training at
265 different stages of their career either on their own or through their companies. The majority of
266 respondents believe that standardized training requirements will improve the overall safety and

267 efficiency of the commercial driving industry. Most drivers are satisfied with the quality of in-
268 vehicle training for securing jobs in the industry, but a much smaller proportion believe that it is
269 adequate in promoting the safest driving environment possible. They believe that all types of
270 training they received (formal and non-formal) were helpful in this respect, but still not fully
271 adequate.

272 4.2.2 Training Experience

273 The previous discussions indicate that respondents felt current training standards were limited,
274 were welcoming of improved standards, and had sought out different types of training in their
275 careers. This section presents the results of questions asked of respondents regarding the types of
276 training they pursued (and when they pursued it) in addressing their own perceived training
277 deficiencies.

278 The training courses included in the survey, along with a brief description of each, are shown in
279 Table 1. A driver may pursue training in three identified phases – *before obtaining the CDL, during*
280 *the process of obtaining the CDL, and after obtaining the CDL* (and presumably, employed as a
281 driver). The option “*no training*” was provided as well, to capture when a respondent did not enroll
282 in a given course at any time in his/her career. Of course, questions about past training experience
283 were only asked to respondents with CDE.

284 More than 60% of respondents sought in-vehicle training and pre-trip training, before or during
285 the process of obtaining the CDL, unsurprising given that licensing tests evaluate knowledge in
286 these areas. In contrast, most respondents participated in the other eight courses (except General
287 Oilfield Driver Improvement (GODI)) after obtaining their CDL, likely because the knowledge
288 provided in these courses is not required to pass the licensing exam. Thus, if a respondent sought
289 out this type of training in a later stage of their career, this indicates that they or their employer

290 identified a need for such training. Courses in Professional Driver Improvement and
291 Transportation of Dangerous Goods were found to be the most popular post-CDL.

292 Despite the importance (particularly from a safety perspective) of fatigue management, cargo
293 securement, and understanding legal weights and dimensions, only 50%, 71% and 60% of drivers
294 received any formal training, respectively. Given that survey respondents have also indicated a
295 general dissatisfaction towards current training classes provided at driving schools, low formal
296 training participation is most likely due to beliefs that currently available training classes are not
297 of satisfactory quality¹.

298 In general, the survey responses indicate that the lack of mandatory training requirements is a
299 significant disbenefit to the commercial driving industry. Training requirements would allow for
300 drivers and other industry participants to receive the training they need at each stage in their career,
301 based on their evolving job requirements, without having to “guess” their needs. This is
302 particularly true in the early stages of drivers’ careers, when they particularly lack the experience
303 required to tailor their training needs to the skills required of them for safe and efficient job
304 performance.

305 **4.3 Survey Part 3: Opinions on Future Training Standards**

306 In Part 3, respondents were also asked to rate the quality of, and need for, ten proposed training
307 courses (identified in Table 1), with the purpose of gauging participants’ support for changes to
308 training standards, to identify changes that would target current deficiencies. Respondents were
309 asked to rate each course from the different perspectives listed below:

¹ We felt this to be the most plausible explanation of several, others being that drivers are not fully aware of the importance of the skills taught through these classes, or that drivers believe they are already knowledgeable enough to perform their duties.

- 310 (i) **Importance.** This measured how important respondents think the course is to a safe and
311 efficient driving environment.
- 312 (ii) **Standard Acceptance.** This measured respondents' acceptance of a course within a required
313 CDL standard training program.
- 314 (iii) **Value.** This was measured by a respondents' stated willingness to pay for the course.
- 315 (iv) **Interest.** This was measured by a respondents' stated willingness to enroll in a course, should
316 the employer be responsible for course fees.
- 317 (v) **Sponsorship.** In addition to the previous four characteristics, company managers and training
318 staff (i.e. non-drivers) were asked to rate courses based on their willingness to sponsor
319 employees in that course.

320 One of the most important indications of a successful training program is when trainees themselves
321 acknowledge the importance of the materials covered. Hence, it was vital that respondents rate the
322 courses from an importance perspective. However, although trainees might find a course to be
323 important, they may also see no need to include it in a standard training program or a prerequisite
324 for obtaining a CDL (and possibly think the course more appropriate at another time in their
325 career). As a result, respondents were also asked to rate courses from a standard acceptance
326 perspective. It was also important to identify expected sources of financial support for training,
327 and therefore courses were rated from "Value" (drivers) and "Sponsorship" (companies)
328 perspectives. In general, all respondents' attitudes and levels of agreement towards accepting a
329 new standard were relatively high regardless of the respondent's role in the industry.

330 **5. Influence of respondents' characteristics on course rating impacts**

331 Ordinal logistic regression models were developed to statistically assess the effects of a number of
332 variables on the course ratings results of survey Part 3. All respondents, regardless of their role in

333 the trucking industry, rated courses highly on the five criteria identified. Similarly, courses were
334 highly rated regardless of the perspective from which they were considered. Without statistical
335 tools, it is difficult to say whether factors such as a respondent's role and perspective have reliable
336 effects on how an individual rates courses. Therefore, analysis performed in this section identifies
337 whether certain variables have statistically significant impacts on a respondent's rating of a course.
338 The factors (explanatory variables) considered in the models are:

- 339 1. Respondent's role in the industry (driver, training staff, etc.).
- 340 2. Respondent's CDE (binary variable: yes=1, no=0).
- 341 3. Rating perspective (importance, standard acceptance, value, interest, sponsorship).
- 342 4. Prior beliefs of respondents about the need for companies to provide regular training.
- 343 5. Prior beliefs about the effects of a standard training program.
- 344 6. Prior difficulty faced when choosing training courses at different career stages.

345 Recall that survey responses to 4, 5 and 6 were provided on a Likert Scale (1=Strongly Disagree
346 to 5=Strongly Agree), and that question 6 was only asked of respondents with CDE. Three different
347 models were developed, one considering the opinions of all participants, the second considering
348 the opinions of participants with driving experience only and a third considering the opinions of
349 respondents with no driving experience at all. The main aim of developing three different models
350 was to understand how opinions of different respondents varied based on their background. This
351 is extremely important particularly when trying to identify how different groups value different
352 types of training and what types of training each party is willing to fund.

353

354 **5.1 Ordinal Logistic Regression**

376 also demonstrated by the insignificance of the Pearson χ^2 and Scaled Deviance statistics
377 ($p > 0.1$).

378 **5.2 Model 1 (All Respondents)**

379 The results of this model, which includes all survey responses, are shown in Table 2. The
380 coefficient estimated for each variable level indicates how much a course rating would change, if
381 there was a movement from the reference category (within the same variable) to that variable level.
382 For instance, compared to those with CDE = 1 (i.e. respondents with commercial driving
383 experience, which is the reference category here), respondents with CDE = 0 (i.e. without any
384 experience) are less likely (-0.024) to rate a course highly. This particular observation, however,
385 is statistically insignificant (p -value = 0.821). Results with >95% significance are bolded.

386 In contrast to the statistically insignificant impacts of CDE above, statistically significant
387 differences in course rating are observed when considering a respondents role in the industry.
388 Compared to company managers, training staff are more likely to rate a course highly, a difference
389 which was significant at the 95% level. Drivers appeared to rate courses higher than company
390 managers, but this result was insignificant.

391 As expected, the less enthusiastic a respondent is about companies providing regular training, the
392 more likely they were to rate a course lower. Conversely, respondents who believe a standard
393 training program would be instrumental in providing safer and more efficient driving environments
394 were more likely to rate a course highly. This demonstrates that the survey responses are consistent
395 and valid.

396 When considering courses from a standard-acceptance perspective, respondents were more likely
397 to rate a course higher than when considering it from an importance perspective, a difference which

398 was statistically significant. This implies that, although respondents might not believe that some
399 courses are important, they are still willing to accept it as part of a standard training program. This
400 in turn could be interpreted as 1) an implicit acknowledgement by respondents that they might not
401 personally be able to say what is best for their industry, 2) that even if a course is not highly
402 important, the knowledge is still considered valuable to have, and/or 3) respondents would like to
403 regulate the members of their profession to some level of competence.

404 Overall the results show a high appreciation for training among all respondent groups; however,
405 there were also noteworthy differences in how the different respondent groups rated training
406 courses. This highlights the importance of accounting for the opinions of people in different roles
407 when designing a standard training program

408 **5.3 Model 2 (Respondents with CDE)**

409 Only the opinions of respondents with CDE were considered in this model, in order to assess the
410 effects of factors not applicable to respondents without CDE. The variable groups of highest
411 interest here are “difficulty experienced in choosing a course”, and “rating perspectives”. The
412 results are shown in Table 3. Again, all results with >95% significance are bolded.

413 Respondents who stated to have had less difficulty in choosing appropriate training at the
414 beginning of their careers were slightly more likely to rate a course lower than those who did face
415 some difficulty; however, this result is not statistically significant.

416 In general, being financially sponsored for a course increased the likelihood of a respondent rating
417 a course higher. This effect was considerable – to the extent that respondents were six times more
418 likely to rate a course highly if course expenses were covered by their employer. In fact, even
419 when compared to ratings from an importance perspective, the ratings from an interest perspective

420 were significantly higher. This indicates that even if drivers did not consider a course important,
421 they were still willing to attend as long as they were not responsible for the fees. In contrast, the
422 most significant drop in the log odds of rating a course highly was observed when a driver was
423 responsible for the course fees compared to getting sponsored for it (-2.29 value). The financial
424 burden of training is something drivers would, unsurprisingly, prefer to avoid, possibly to the
425 detriment of their training quality.

426 Overall, the results demonstrate survey respondents with CDE acknowledge the importance of a
427 mandatory training standard, and are prepared to comply with it if it did exist.

428 **5.4 Model 3 (Current Non-Drivers)**

429 This model was estimated using the responses of those not driving professionally at the time of the
430 survey. The aim was to assess the opinions of managers, training staff and industry affiliates on
431 their willingness to provide sponsored training to their employees, and how their perspective
432 ratings compared against the (baseline) sponsorship perspective. Although we have not shown the
433 model results in the interest of space, we will present some key findings below.

434 When asked to rate courses under the assumption they would sponsor employees to take them,
435 non-drivers were less likely to rate a course highly, compared to when rating the courses based on
436 their beliefs about importance and inclusion in a mandatory training standard. These differences
437 were statistically significant. Within the three roles, managers were most likely to drop their
438 ratings, based on the positive parameter values for “roles”. Although these results are not
439 surprising given that managers must consider budget issues, responses to the standard acceptance
440 perspective were uniformly high. Moreover, the fact that the average ratings of courses from all
441 perspectives were relatively high also shows that companies are, in general, willing to sponsor
442 training programs they believe are needed.

443 Overall, the results indicate that there may be a gap to bridge when setting new driver training
444 policies – a gap between the perceived need for training, and willingness to shoulder the financial
445 responsibilities. More discussion on this issue is provided in the following section where course
446 level analysis is performed.

447 To sum up, the following can be inferred from the model results:

- 448 1. All respondents demonstrated a clear interest in training.
- 449 2. Respondents believe a training standard is extremely important and would accept one.
- 450 3. There were large differences between how each respondent group rated training courses,
451 highlighting the importance of considering the opinions of all industry participants when
452 designing a standard training program. It is critical to understand which courses drivers rate
453 highly versus those managers prefer, and use this to inform training program design.
- 454 4. Sponsorship and Value are the key factors behind drivers' ratings. Understanding which groups
455 may be more willing to shoulder the financial burdens for certain types of training is important
456 to ensuring successful training program participation.

457 **6. Course-Level Analysis**

458 The analysis presented in the previous section revealed statistically significant differences between
459 course ratings from respondents in different industry roles, and from the five perspectives in
460 Section 4.3. This section aims to further investigate and explore these differences by identifying
461 which courses drivers rate highest and which courses non-drivers prefer.

462 Likert scale responses were coded into a numeric scale where “Strongly Agree” corresponds to a
463 rating of 5 and “Strongly Disagree” to 1. Then, the weighted average of each course rating was
464 computed. For instance, if two respondents chose “Strongly Agree” and one chose “Strongly

465 Disagree” then the average rating would be $[(2 \times 5) + (1 \times 1)]/3 = 3.67$. This was done for all
466 questions for drivers and non-drivers (Table 4), and repeated for each of the “Drivers”, “Non-
467 Drivers with CDE” and “Non-Drivers without CDE” respondent groups. The latter results were
468 then used to rank the courses (Table 5). Then, we discuss how respondents ranked courses
469 differently depending on the perspective in question, and their role in the industry.

470 **6.1 Drivers**

471 Drivers ranked In-vehicle Basic Training and Pre-trip Truck Inspection highest among those that
472 could be included in a standard training program. These are followed by Cargo Securement, Hours
473 of Service (how to correctly complete logbooks) and Weights & Dimensions (knowing legal
474 weights and dimensions of freight). This indicates that the high proportion of drivers who received
475 no training in Cargo Securement and Weight and Dimensions, (discussed in Section 5) are not
476 necessarily due to drivers feeling these topics are of little importance, but more likely, due to the
477 lack of availability of suitable training. Similar conclusions can be inferred when observing course
478 rankings by other groups, compared against importance ratings.

479 When considering inclusion of a Fatigue Management course as part of a standard training
480 program we notice that, although it received a high average rating, only 75% of respondents agree
481 that such a course must be included in a standard training program before obtaining the CDL. It is
482 worth noting here that 61.8% of surveyed drivers work on shifts longer than 10 hours, and therefore
483 are likely to have higher exposure to fatigue; however, drivers ranked the fatigue course 7 (out of
484 10) on the importance scale. This suggests that respondents consider fatigue management to be a
485 secondary issue – possibly, a skill that can adequately be developed and managed personally –
486 compared to other potential areas of training. In fact, even if sponsored by their employer, drivers
487 do not indicate interest in attending a training course about fatigue (see Table 5). Additional

488 reasons for lack of interest and uptake may be that drivers are skeptical about what they might
489 learn in such a class, possibly unaware of the importance of fatigue as a risk factor in heavy vehicle
490 collisions, or do not understand how such a course would provide helpful skills. It is recommended,
491 that, in future surveys, questions be specifically designed to uncover the reasoning behind these
492 responses.

493 Correlation analysis of the relationship between the number of hours per shift for drivers and their
494 rating of the fatigue management course were performed; however, the correlations were not
495 statistically significant and therefore are not reported here.

496 When drivers were asked about training courses they were willing to pay for (i.e. value
497 perspective), the average rating for all courses dropped (Table 4). Almost 60% of respondents
498 expressed willingness to pay for training which would help them obtain those skills, while the
499 course also obtained the highest rating. Along with in-vehicle training and pre-trip training,
500 Professional Driver Improvement (PDIC) was also highly rated on the list of courses drivers were
501 willing to pay for. It is clear that drivers value in-vehicle training and pre-trip training courses,
502 because they know these course will provides skills tested for in a CDL exam.

503 Overall, the results indicate that drivers are willing to pay for courses which equip them with the
504 basic skills necessary to obtain a CDL and get hired, while they believe additional training to be
505 the responsibility of their employer. In fact, the responses show that drivers would be highly
506 interested in attending courses about Transportation of Dangerous Goods (TDG) and Workplace
507 Hazardous Materials Information System (WHMIS) if their employer were to provide financial
508 sponsorship. In contrast, even if an employer is offering sponsorship for in-vehicle training or pre-
509 trip training (interest perspective), surveyed drivers are unlikely to accept it.

510 **6.2 Non-Drivers**

511 Non-drivers (company managers, trainers and industry affiliates) rate cargo securement courses
512 even higher than in-vehicle training from an importance perspective, compared to drivers.
513 Although there is only a small difference in the average rating (see Table 4), industry managers
514 appear to value such training. Other courses that non-drivers ranked highly in importance were
515 pre-trip training and fatigue management.

516 When asked about courses which should be included in mandatory standard training before
517 obtaining a CDL, non-drivers, again, ranked pre-trip training and cargo securement highly. One
518 curious outcome was that non-drivers without CDE ranked in-vehicle training 5th on the list of
519 courses to be included in standard training. This could be due their lack of commercial driving
520 experience, leading them to underestimate and undervalue the importance of in-vehicle training.

521 When assessing the willingness of company managers and trainers to sponsor drivers or potential
522 employees for certain training courses, cargo securement, hours of service and fatigue
523 management were ranked highest. This was true of all individuals with and without CDE.

524 In contrast, both those with and without CDE ranked in-vehicle training lowest, which may be due
525 to the fact that drivers themselves are typically willing to pay for their own in-vehicle training to
526 quality for CDL. This may also be interpreted as a sign that employers are relatively satisfied with
527 the in-vehicle skills of their employees, an observation which cannot be made for pre-trip skills.

528 Despite drivers being uninterested in a course about pre-trip training (even if financially sponsored
529 by their employer), the results indicate that employers view such a course as highly important.

530 Moreover, non-drivers with CDE ranked pre-trip training as 2nd on the list of course they were
531 willing to take under the sponsorship of their employer.

532 The sponsorship opinions of non-drivers with CDE and those without CDE differed for the course
533 related to pre-trip inspection. As evidenced in the ratings, individuals without a CDE saw such
534 training as important and were willing to sponsor it, while those with a CDE were less enthusiastic.
535 This could be due to respondents with CDE seeing their pre-trip experience, at the time they were
536 driving, as sufficient.

537 A key observation from the results in Table 4 and Table 5 is that courses given a high value rating
538 by drivers seem to consistently match to those non-drivers were willing to sponsor. For instance,
539 drivers ranked In-vehicle training and Professional Driver Improvement Training (PDIC) 2nd and
540 3rd, respectively, on the willingness to pay scale. However, they were not as willing to pay for
541 Fatigue Management or Hours of Service training. In contrast, non-drivers were more interested
542 in supporting their employees for training in Fatigue Management and Hours of Service compared
543 to In-vehicle training and PDIC.

544 Overall, the results show that drivers appear to more greatly value training that would enhance the
545 skills required en route and to pass the CDL exam, while non-drivers are more concerned about
546 the skills required in the trip planning phase to execute a trip as efficiently and safely as possible.
547 These results suggest that the courses that drivers are more willing to pay for do not overlap with
548 those that non-drivers (i.e. managers) are willing to sponsor. Therefore, standards on financial
549 responsibilities for training could be implemented without conflicts regarding party responsibility,
550 and therefore, achieve greater acceptance. To go back to the results highlighted above: non-drivers
551 would be willing to sponsor a Fatigue Management course that drivers rate as important but are
552 less willing to pay for themselves.

553 **7. Implications of Results for Training Policies and Regulations**

554 The results and discussions presented in this paper lead to several key recommendations for the
555 design of an effective and acceptable mandatory industry-wide training program, and setting
556 policies governing training program administration.

557 Firstly, surveyed industry respondents expressed that the training received by those who have
558 taken the Commercial Driving Licensing (CDL) exam does not fully meet industry needs (Section
559 4.2 – Survey Part 2). Also, respondents expressed some dissatisfaction with current levels of
560 training throughout the industry and even the contents of the CDL examination itself, and in turn,
561 overall roadway safety and industry efficiency. Therefore, they would be highly receptive of, and
562 compliant to, a well-designed standard training program that mandates training for CDL applicants
563 and commercial drivers throughout their careers.

564 Secondly, respondents have indicated a need for content and delivery improvements to the basic
565 training that CDL applicants take, and possibly even changes to the CDL exam itself (Sections 4.2,
566 4.3, and 6). Currently, CDL trainees will typically train for in-vehicle skills and pre-trip inspection,
567 as the CDL exam currently only evaluates knowledge and skill in these areas. Therefore, as
568 reflected by the ratings in Table 5, managers are seeing knowledge deficiencies in areas they feel
569 are highly important (fatigue management, cargo securement, and legal weights and dimensions),
570 and it would be important for a new mandatory training program to specify greater training
571 requirements for drivers before the CDL exam. It is recommended that this new program be
572 accompanied by changes to the CDL exam as well, to reflect the additional training required.

573 Thirdly, the new mandated training program should clearly outline a sequence of training classes
574 required to be taken at specific points in a participant's career (Section 6.1). This program can be
575 used to regulate the process of maintaining a CDL; for instance, drivers may be expected to receive
576 a certain number of hours of training (or re-training) in certain areas at various stages of their

577 careers. Also, the course ratings results shown previously can be used to structure the program.
578 The previous recommendation indicated that new CDL trainees were not currently receiving as
579 much training as they should; respondents expressed a clear demand for additional training at later
580 stages as well, to improve industry safety and efficiency. More specifically, the survey indicated
581 that the benefits of training classes taken were limited because training opportunities that would
582 be appropriate, relevant, and purposeful at a particular time in a career were missed. The results in
583 section 5.2.2 suggested that drivers do not have a clear idea regarding the types of training they
584 must be targeting, and when they should target them, leading to some seemingly random training
585 choices. Although drivers are receiving training, and both companies and drivers are willing to
586 pay for it, the lack of a standard specifying the appropriate training required at different stages of
587 a career means some drivers waste resources on inappropriate training. The unsystematic nature
588 of current training practices reduces the potential benefits of such programs. Hence, mandating a
589 program would take the decision process out of the hands of those that may not have the necessary
590 tools to choose appropriate classes.

591 The fourth major implication for policy involves identifying which parties should be responsible
592 for which training fees and other expenses involved with training (Sections 6.1 and 6.2). The
593 results from the Sponsorship and Value ratings of Table 5 have indicated that drivers have been,
594 and are, willing to self-sponsor classes necessary to pass the CDL, while managers are more
595 willing to sponsor others later in a driver's career. This points to the possibility of demarcating the
596 proposed mandated training program by financial responsibility: Phase 1 (pre-CDL) in which
597 drivers are responsible for the training fees, and Phase 2 (post-CDL) in which employers are
598 responsible for sponsoring drivers in advanced training. However, some flexibility should be built
599 into these regulations, to account for hardships during economic downturns.

600 Table 6 shows the training that ought to be provided before obtaining a CDL, and that which should
601 be provided after. There are some forms of training that may be provided more than once; results
602 indicate that companies are still interested in sponsoring their drivers through training that they
603 have previously already taken, indicating that further training is beneficial.

604 The results documented in this paper inform the setting of well-designed standards; standards that
605 are not supported with empirical evidence (or poorly so) would burden the industry with
606 requirements, without providing the benefits they aim to achieve. Therefore, we also recommend
607 that further surveys and data be gathered when possible and similar analysis conducted; this should
608 continue after a standard training program has been placed, in order to measure program efficacy
609 and direct program improvements.

610 **8. Concluding Remarks**

611 This paper analyses a survey of employees of Alberta Motor Transport Association (AMTA)
612 member companies, regarding the contents of and acceptance for a potential standard driver
613 training program. The results lead to four major conclusions regarding a potential standard training
614 program. Firstly, surveyed respondents are general dissatisfied with current levels of training in
615 the industry, and would be highly supportive of a well-designed training program (Section 4.2 –
616 Survey Part 2). Secondly, respondents indicated a need for content and delivery improvements to
617 the basic training that CDL applicants take (Sections 4.2, 4.3, and 6). Thirdly, a new training
618 program should clearly outline an entire sequence of training required over a driver’s career, to
619 maintain a CDL (Section 6.1). Finally, different parties would more easily accept the financial
620 responsibility for different training courses, and responsibility should be placed as such (Sections
621 6.1 and 6.2).

622 While this study has provided vital information about the importance of setting a mandatory
623 standard commercial driver training program, and how this program may be designed, the study
624 suffers from some limitations. The primary limitation of this study is that some respondents might
625 be reluctant to provide truthful answers due to the pressure of providing a more socially acceptable
626 (or aspirational) answer. However, with that being said, the effects of such a phenomenon on the
627 analysis performed in this paper are minimal since the analysis was concerned with comparing and
628 contrasting the opinions of participant from different groups. Another limitation related to the
629 survey design was the platform used to access participants, in this paper the only way for
630 participants to fill the survey was online, although a reasonable sample was obtained, opening up
631 more streams to participants might have made it possible to gather information from participants
632 reluctant to fill the survey online. Additionally, before developing a training standard, it would be
633 beneficial to also gather the opinions of traffic safety experts on training courses, their duration,
634 and their content. Although the main aim of this study was to understand opinions of individuals
635 in the commercial driving industry, considering the opinions of safety experts is vital to the
636 development of an effective standard and something that must be considered in future research.

637 Finally, future surveys should be designed to minimize the possibility of outcomes that at the outset
638 appear contradictory, due to gaps in information asked of survey respondents. For example,
639 respondents rated the importance of Fatigue Management training highly but the number that
640 wanted to see it included in basic training courses was lower.

641 **9. Acknowledgements**

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643 Sciences and Engineering Research Council (NSERC) of Canada's Collaborative Research and
644 Development Grants program.

645 **10. References**

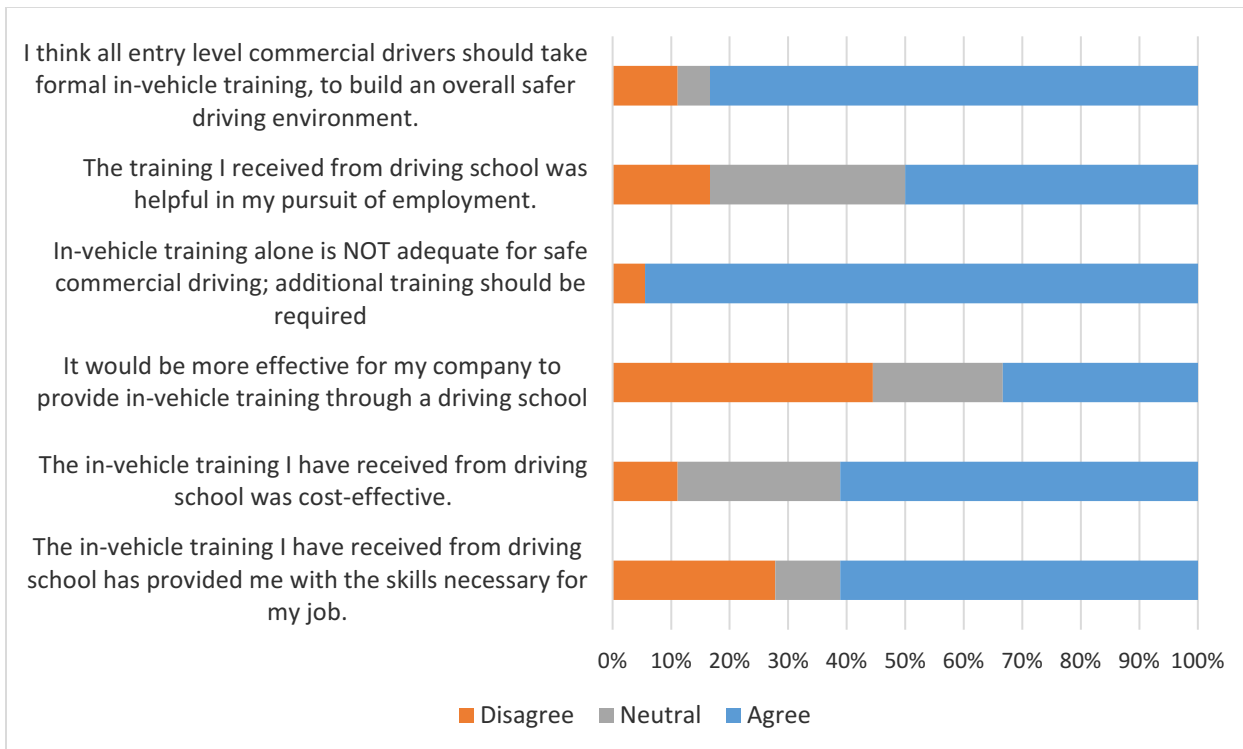
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697 **Table 1: Training courses (as identified by AMTA) included in the survey**

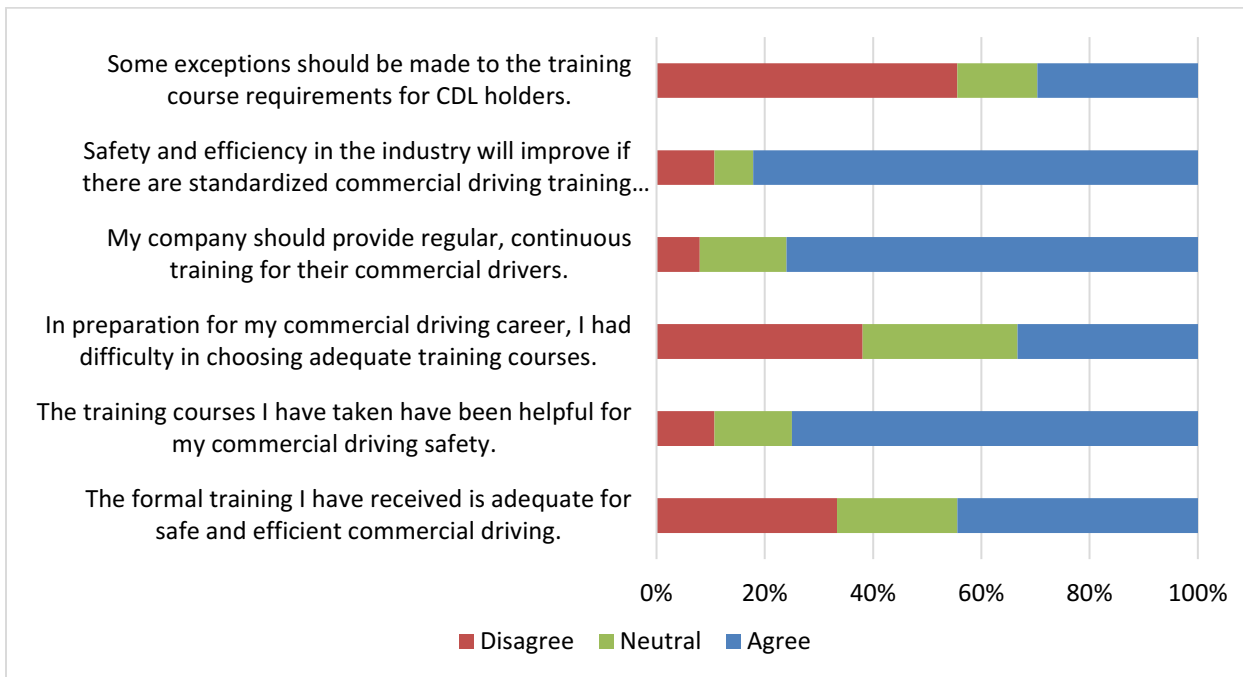
Course Name	Purpose/Content
In-Vehicle Training	Train drivers to obtain basic commercial driving skills
Pre-Trip	Introduce drivers to the vehicle checks required before a truck can be used
Hours of Service	Provide drivers with the knowledge and skill required for correct completion of log books
Fatigue Management	Help drivers recognize fatigue, and provides skills necessary to manage it
Cargo Securement	Provide education on the methods and tools required for proper loading/securement of cargo
WHMIS (Workplace Hazardous Materials Information System)	Canada's national hazard communication standard. Provide training about how to read and interpret standardized labels on hazardous materials used in the workplace.
TDG (Transportation of Dangerous Goods)	Educate drivers on regulations and best practices to follow when transporting dangerous goods (i.e. chemicals and toxic materials).
PDIC (Professional Driver Improvement Course)	Sharpen drivers' professionalism and skill through a structured look at experiences and problem areas shared by drivers such as bad weather, winter roads, pressures of time and distance, etc.
GODI (General Oilfield Driver Improvement)	Designed for professional drivers working in oilfield environments.
Weights & Dimensions	Provide education on the legal limits for weight and dimensions of transported material.

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(a) Opinions on current in-vehicle training practices.



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(b) Opinions on current training procedures and their impacts on safety.

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Figure 1: Commercial drivers' opinions

Table 2: Logistic Regression Model 1 – All Respondents

Factor	Levels	Estimate	Std. Error	Wald	Sig.	95% CI (Lower/Upper)	
Rating (Dependent Variable)		-2.872	.165	303.00	.000	-3.195	-2.548
CDE	0	-.024	.106	.051	.821	-.231	.183
	1	0 ^a					
Need for Regular Training	1	.822	.380	4.673	.031	.077	1.568
	2	-.702	.228	9.534	.002	-1.148	-.257
	3	-.857	.158	29.537	.000	-1.165	-.548
	4	-.489	.125	15.448	.000	-.733	-.245
	5	0 ^a					
Positive Effects of Standard Training	1	-3.167	.283	125.20	.000	-3.722	-2.612
	2	-1.270	.223	32.428	.000	-1.707	-.833
	3	-.845	.169	25.023	.000	-1.177	-.514
	4	-.491	.120	16.828	.000	-.725	-.256
	5	0 ^a					
Rating Perspective	Importance	-1.124	.089	160.924	.000	-1.297	-.950
	Standard	0 ^a					
Course	In-vehicle Training	.594	.202	8.639	.003	.198	.990
	Pre-Trip	1.062	.223	22.569	.000	.624	1.499
	Hours of Service	.370	.194	3.634	.057	-.010	.751
	Fatigue Management	.210	.189	1.234	.267	-.161	.582
	Cargo Securement	1.022	.222	21.232	.000	.587	1.457
	WHMIS	-1.089	.169	41.626	.000	-1.420	-.758
	TDG	-.319	.179	3.196	.074	-.669	.031
	PDIC	-.542	.175	9.641	.002	-.884	-.200
	GODI	-1.377	.178	60.150	.000	-1.725	-1.029
	Weights & Dimensions	0 ^a					
Role	Driver	.186	.134	1.918	.166	-.077	.449
	Training staff	.302	.123	5.986	.014	.060	.544
	Industry Affiliate	-.192	.136	1.991	.158	-.460	.075
	Company manage/supervisor	0 ^a					

a. This parameter is set to zero because it is the reference category for each of the six variables.

Table 3: Logistic Regression Model 2 – Respondents with CDE

Factor	Levels	Estimate	Std. Error	Wald	Sig.	95% CI (Lower/Upper)	
Rating (Dependent Variable)		-2.894	.160	325.219	.000	-3.209	-2.579
Role	Driver	.147	.105	1.967	.161	-.058	.352
	Training staff	.286	.101	8.002	.005	.088	.483
	Industry Affiliate	.519	.152	11.747	.001	.222	.816
	Company manager/supervisor	0 ^a					
Need for Regular Training	1 (Strongly Disagree)	.211	.278	.577	.448	-.333	.755
	2	-.569	.189	9.117	.003	-.939	-.200
	3	-.355	.150	5.603	.018	-.649	-.061
	4	-.180	.102	3.119	.077	-.379	.020
	5 (Strongly Agree)	0 ^a					
Positive Effects of Standard Training	1 (Strongly Disagree)	-2.710	.199	185.545	.000	-3.100	-2.320
	2	-1.258	.222	31.966	.000	-1.694	-.822
	3	-.997	.158	39.978	.000	-1.306	-.688
	4	-.279	.101	7.678	.006	-.476	-.082
	5 (Strongly Agree)	0 ^a					
Perspective	Importance	-1.103	.112	97.701	.000	-1.322	-.885
	Standard	-.058	.124	.220	.639	-.301	.185
	Value	-2.290	.109	439.108	.000	-2.504	-2.076
	Interest	0 ^a					
Course	In-vehicle Training	.149	.160	.867	.352	-.165	.464
	Pre-Trip	.546	.169	10.505	.001	.216	.877
	Hours of Service	.200	.161	1.543	.214	-.116	.516
	Fatigue Management	-.116	.156	.551	.458	-.422	.190
	Cargo Securement	.423	.166	6.462	.011	.097	.749
	WHMIS	-.941	.149	39.874	.000	-1.233	-.649
	TDG	-.242	.155	2.426	.119	-.546	.062
	PDIC	-.121	.157	.593	.441	-.428	.186
	GODI	-1.127	.158	50.637	.000	-1.438	-.817
Weights & Dimensions	0 ^a						
Difficulty in Choosing Courses	1 (No)	-.091	.092	.972	.324	-.271	.090
	2 (Neutral)	-.573	.090	40.110	.000	-.750	-.396
	3 (Yes)	0 ^a					

a. This parameter is set to zero because it is redundant.

Table 4: Average Ratings (Drivers versus non-drivers)

	Course	Value	Interest	Importance	Standard Acceptance	Sponsorship
Drivers	Cargo Securement	3.28	4.36	4.52	4.38	
	Fatigue Management	2.82	4.25	3.90	4.10	
	GODI	2.73	4.38	3.48	3.63	
	Hours of Service	3.04	4.36	4.21	4.24	
	In-vehicle Training	3.17	4.24	4.55	4.55	
	PDIC	3.15	4.46	3.72	3.93	
	Pre-Trip Truck inspections	3.10	4.32	4.38	4.43	
	TDG	3.07	4.46	3.93	4.17	
	Weights & Dimensions	3.07	4.36	4.07	4.24	
	WHMIS	2.90	4.43	3.45	3.83	
Non-Drivers	Cargo Securement	3.41	4.33	4.55	4.52	3.89
	Fatigue Management	3.34	4.27	4.43	4.44	3.85
	GODI	3.12	4.10	3.66	3.86	3.39
	Hours of Service	3.43	4.36	4.42	4.49	3.88
	In-vehicle Training	3.16	4.18	4.36	4.47	3.28
	PDIC	3.47	4.28	3.98	4.15	3.73
	Pre-Trip Truck inspections	3.44	4.35	4.59	4.60	3.81
	TDG	3.27	4.24	4.17	4.14	3.69
	Weights & Dimensions	3.35	4.32	4.19	4.32	3.73
	WHMIS	2.98	4.12	3.66	3.91	3.55

Table 5: Course Rankings from Different Perspectives

Standard Acceptance		Pre-Trip	In-Veh Training	Cargo Sec	Hours of Service	Fatigue Management	Wts & Dimensions	TDG	PDIC	WHMIS	GODI
	Drivers	2	1	3	4	7	4	6	8	9	10
	Non-Drivers with CDE	1	2	3	4	5	6	8	7	9	10
	Non-Drivers without CDE	1	5	3	2	3	6	7	8	9	10
	Average Rank	1.3	2.7	3	3.3	5	5.3	7	7.7	9	10
Importance		Pre-Trip	Cargo Sec	In-Veh Training	Hours of Service	Fatigue Management	Wts & Dimensions	TDG	PDIC	GODI	WHMIS
	Drivers	3	2	1	4	7	5	6	8	9	10
	Non-Drivers with CDE	1	2	3	5	4	6	7	8	10	9
	Non-Drivers without CDE	1	2	5	3	3	7	6	8	9	10
	Average Rank	1.7	2	3	4	4.7	6	6.3	8	9.3	9.7
Value		PDIC	Cargo Sec	Pre-Trip	In-Veh Training	Hours of Service	Wts & Dimensions	TDG	Fatigue Management	WHMIS	GODI
	Drivers	3	1	4	2	7	5	5	9	8	10
	Non-Drivers with CDE	1	4	2	8	3	5	7	6	10	9
	Average Rank	2	2.5	3	5	5	5	6	7.5	9	9.5
Interest		Hours of Service	PDIC	TDG	Cargo Sec	Wts & Dimensions	Pre-Trip	WHMIS	GODI	Fatigue Management	In-Veh Training
	Drivers	5	2	1	5	5	8	3	4	9	10
	Non-Drivers with CDE	1	5	7	3	4	2	9	10	6	8
	Average Rank	3	3.5	4	4	4.5	5	6	7	7.5	9
Sponsorship		Cargo Sec	Hours of Service	Pre-Trip	Fatigue Management	PDIC	Wts & Dimensions	TDG	WHMIS	GODI	In-Veh Training
	Non-Drivers with CDE	1	1	2	3	5	4	6	8	9	10
	Non-Drivers without CDE	1	2	2	2	5	6	7	8	9	10
	Average Rank	1	1.5	2	2.5	5	5	6.5	8	9	10

Table 6: Recommended Course Structure and Funding Party

	Party Interested in Funding			
	<i>Companies</i>	<i>Drivers</i>	<i>Both</i>	<i>Neither</i>
Before CDL		In-Vehicle Training	Pre-Trip (R*)	
			Cargo Securing (R)	
			Hours of Service (R)	
After CDL	Fatigue Management	PDIC	Weights & Dimensions	WHMIS
			TDG	GODI

*(R) = Regular Training (i.e. may be repeated after obtaining CDL)