

Technical Paper:
**Root cause analysis report of driver fatigue among
professional truck drivers in Ontario**

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Table of contents

Executive Summary3

1. Risk Assessment Project: The Subject of Inquiry5

2. Background: General Trucking Risk Assessment Workshop Results5

3. Root-Cause Analysis: Risk Statement.....6

4. Root-Cause Analysis Workshop: A Tripartite and Collective Process7

5. Workshop Participants: Industry, Public Health, System Partners.....7

6. “Fishbone” Diagram: Primary Causal Factors8

7. Top 10 Primary Causal Factors 10

8. Critical controls to address primary causal factors of driver fatigue among professional truck drivers. 11

9. Next Steps: What we should focus on immediately..... 24

10. References and Resources..... 25

11. Appendix i: “Fishbone Diagram” for Secondary, Tertiary and Quaternary Causal Factors..... 26

13. Appendix B: Workshop Contacts..... 30

14. Appendix C: Infographic: Top 10 health and safety risks in Ontario’s trucking sector 31

15. Appendix D: Infographic: Top 10 causes of drive fatigue among professional truck drivers in Ontario31

Executive Summary

Risk assessment and root cause analysis workshops are used by MLTSD to help industry sectors identify high-risk events and hazards in their workplaces. This enables the ministry, health and safety partners, and industry sectors to work together to reduce those risks and prevent workplace injury, illness and deaths.

In March 2019, a volunteer group of 18 industry subject matter experts (SMEs) from the general trucking sector—including management, labour, government, and health and safety associations—met for a workplace risk assessment for the General Trucking – General Freight sector. The workshop was hosted by the Infrastructure Health and Safety Association (IHSA) and led by Dr. Sujoy Dey, Ph.D., of the Ministry of Labour, Training and Skills Development (MLTSD).

In November 2019, a follow up workshop – with the support of the Ministry of Labour, Training and Skills Development (MLTSD) in partnership with IHSA – gathered drivers, supervisors, and employers again to examine the causes of driver fatigue. The experts’ root cause analysis workshop identified 68 contributing causal factors and then voted on them to determine the top 10 causal factors for driver fatigue among professional truck drivers in Ontario.

1	Traffic conditions road closures, delays, construction zones, road design
2	Health conditions & unhealthy lifestyle limited or poor food choices; lack of rest and irregular sleep; not enough exercise
3	i. Work-life balance long hours on the road; time away from friends and family ii. Stress pressure from management, dispatch, and customers; wait times at customer’s locations; meeting deadlines iii. Mental health anxiety, depression, substance use
4	i. Hypnotic effects during periods of drowsiness snow or rain coming at the windshield; driving long hours on open highways ii. Not enough truck/rest stops long distances between safe rest areas; not enough quality amenities iii. Lack of education & training to recognize driver fatigue myths about fatigue; use of inappropriate (instead of safe) ways to deal with fatigue
5	Licensing doesn’t align with skill requirements some vehicles are more difficult to operate (i.e. automatic vs. manual transmission, different forms of vehicles); lack of experience and training provided through licensing
6	i. Rushing to get job done pressures to be in compliance with Hours of Service regulations ii. Lack of political will loop holes in the law can mean that best practices aren’t always followed; limited engagement from government to change
7	i. Inexperienced drivers lack of skill to operate more complex vehicles (i.e. double trailers); general public needs more education on sharing the road with trucks ii. Company culture

	can promote rushing and stress; prioritize productivity over safety
8	<p>i. Classification of skill some vehicles require more skill and experience; no recognized professional status of drivers</p> <p>ii. Societal attitudes pressure to meet the demands of “just-in-time” delivery; poor public attitude toward trucking professionals</p>
9	<p>i. Poor vehicle maintenance unexpected break downs on the road lead to longer shifts; not enough vehicle inspection training for new drivers</p> <p>ii. Seats uncomfortable seats, lack of ergonomic features</p> <p>iii. Rest in truck irregular sleep schedule; uncomfortable sleeping quarters do not provide enough quality rest</p>
10	<p>i. Electronic logging devices (ELDs) can create false sense of compliance and safety with shift lengths and rest</p> <p>ii. Substance use negatively affects ability to get enough quality rest</p>

The group also identified as specific controls for each causal factor. The next steps include an immediate focus on the five most common systemic weaknesses that were identified contributing to driver fatigue and workplace health and safety:

1. Classify truck driving as a skilled trade (Red Seal)
 - ✓ Needs to be implemented at the federal level

2. Review and address critical training gaps in mandatory entry-level training (M.E.L.T.)
 - ✓ E.g. Fatigue, training hours, standards, school audit, insurance, etc.

3. Mandatory graduated licensing for all truck drivers
 - ✓ Including testing for English/French competency

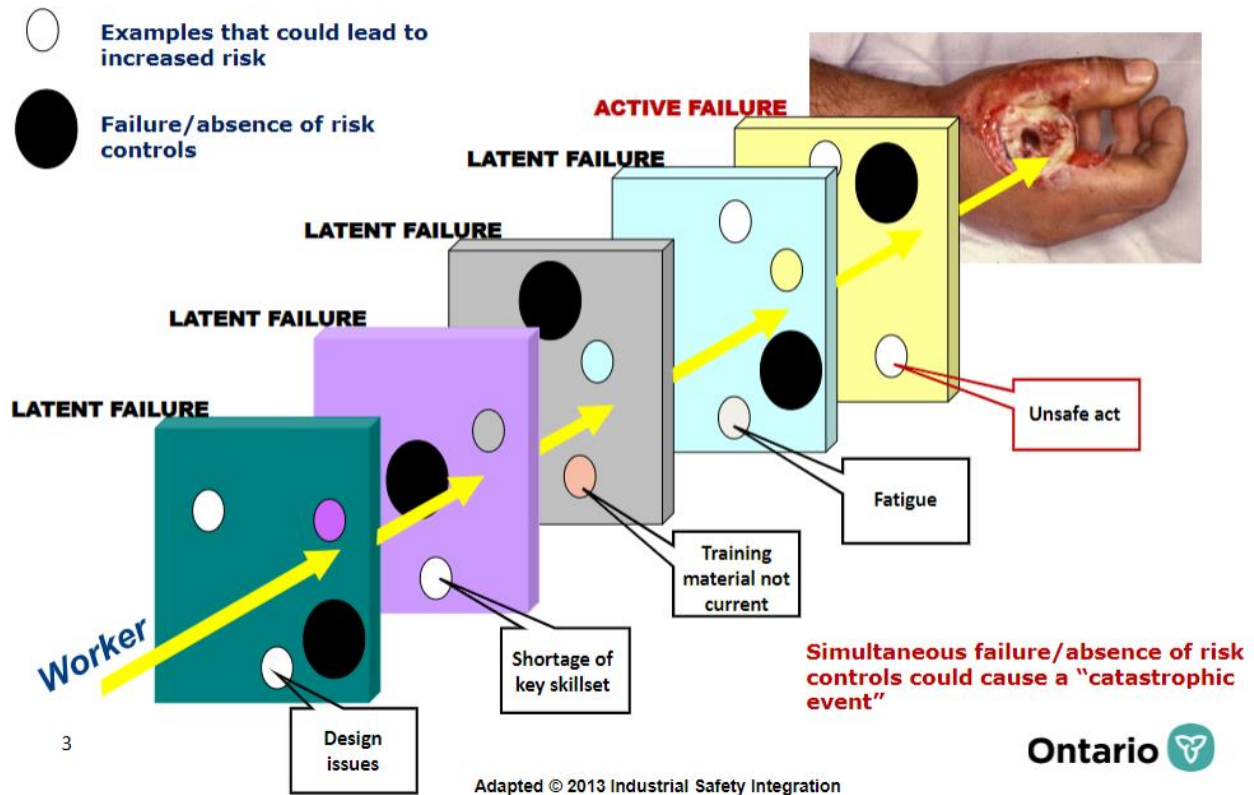
4. Greater enforcement of non-compliant carriers
 - ✓ Driver Inc.

5. Promote mental health and wellness
 - ✓ Provide support tailored to the driver

IHSA has developed a number of online educational resources to address driver fatigue and workplace road safety plans. These resources assist in communicating the hazards of driver fatigue and other hazards on the road. These resources support the work of the driver fatigue root cause analysis results.

1. Risk Assessment Project: The Subject of Inquiry

Risk Assessment: The Swiss Cheese Model of Accident Causation



Pictured above: The “Swiss cheese” model of simultaneous failure or absence of risk controls that could cause a “catastrophic event.” In this model, when there are latent failures in design, gaps in regulation, outdated training material, shortage of skillsets, and an unsafe act, all the “holes” in the system line-up to potentially cause a critical injury or fatality.

2. Background: General Trucking Risk Assessment Workshop Results

In March 2019, a volunteer group of 18 industry SMEs from the general trucking sector —including management, labour, government, and health and safety associations — met for a workplace risk assessment. The workshop was hosted by the Infrastructure Health and Safety Association (IHSA) and led by Dr. Sujoy Dey, Ph.D., Corporate Risk Officer at the Ministry of Labour, Training and Skills Development (MLTSD).

In advance of the workshop, each industry expert submitted their top transportation health and safety concerns. This resulted in 105 identified risks for review. During the workshop, the participants discussed each of the risks at length. In order to fairly and accurately assess the importance and urgency of the identified risks in the General Trucking – General Freight sector, only those working in the trucking sector – five workers and five managers from the industry – were allowed to vote. They did so anonymously with hand-held electronic devices.

“As they identified specific conditions and situations that could result in injury or illness, we asked the group, ‘what keeps you up at night?’” says Dr. Dey. It turned out that what worries industry experts the most is distracted driving, driver fatigue, and the carelessness of other road users.

[Top 10 Health and Safety Risks in General Trucking – General Freight](#)

1. Distracted driving
2. Driver fatigue
3. Careless drivers on the road (other truck drivers, other motorists)
4. Driving conditions
5. Lack of truck awareness for average everyday car drivers sharing the roads with the trucking industry
6. Slips, trips, and falls
7. Stress
8. Inadequate or insufficient training, skills, or qualifications
9. Illness resulting from the lifestyle of a long-distance driver
10. Working at heights (tarping loads)

The report produced as a result of the workshop was reviewed IHSA’s Transportation Advisory Council (TAC), a group of volunteer industry experts for the transportation sectors. Recognizing that IHSA was already in the process of developing resources, tools and, an education awareness campaign regarding Distracted Driving, the TAC decided that focussing on Driver Fatigue would have the most impact as a new initiative. Workplace Safety North (WSN) had also just finished a root cause analysis on distracted driving, and IHSA felt there could be topical crossover, so opted to choose another topic for root cause analysis.

The TAC decided that the next steps would be to make a detailed analysis of the root causes of driver fatigue and to create a plan for developing controls and activities for addressing those causes.

The Transportation Advisory Council, together with IHSA, would support these steps and would help carry them out.

“Using the risk assessment method and analyzing its root causes within the workplace is an extremely effective method for understanding and identifying the leading indicators that allow industry to work more proactively in addressing key concerns,” says Dr. Dey.

3. Root-Cause Analysis: Risk Statement

Based on the results of the General Trucking – General Freight risk assessment, the following risk statement was selected by the IHSA Transportation Advisory Council for Root-Cause Analysis using the “Fishbone” approach: “Driver fatigue can have serious unintended adverse effects on the safety and well being of the driver, carrier, fellow workers, and the community.”

4. Root-Cause Analysis Workshop: A Tripartite and Collective Process

- Workshop participants were peer-recognized industry and system experts.
- Workshop process was open, transparent, and collaborative.
- All participants met face-to-face; there was no teleconferencing.
- Ranking and prioritization of causal factors for driver fatigue was voted on by industry management and labour only; Ministry of Labour, Training and Skills Development (MLTSD), Ministry of Transportation (MTO), Employment and Social Development Canada (ESDC), and Infrastructure Health & Safety Association (IHSA) did not vote.

The results of the root cause analysis were presented and discussed among general trucking industry constituents, at conferences and health and safety meetings, as well as at IHSA advisory board meetings, industry conferences, and Fleet Safety Council meetings for the Ontario general trucking sector.

5. Workshop Participants: Industry, Public Health, System Partners

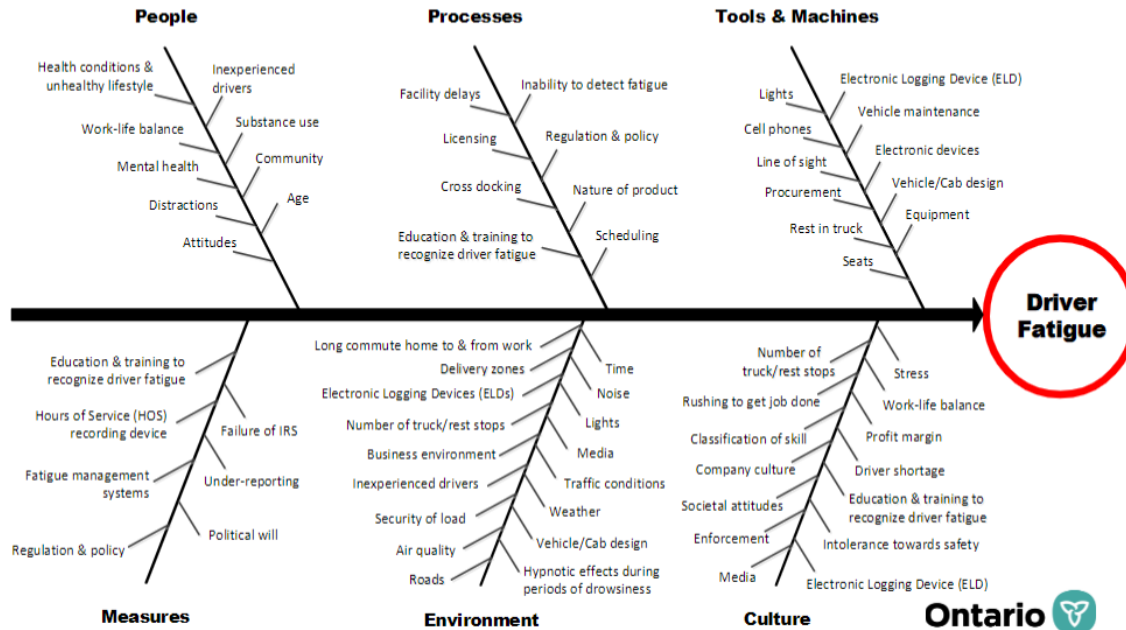
Participants from the following organizations attended:

- AMJ Campbell
- APPS Transport
- ConTrans
- ERB Transportation
- ESDC Labour Program
- Infrastructure Health and Safety Association
- JBT Transport
- Midland Transport
- Ministry of Labour, Training & Skills Development: Operations Division
- Ministry of Labour, Training & Skills Development: Prevention Division
- Ministry of Transportation: Enforcement and Carrier Branch
- Northbridge Insurance
- Teamsters (Cooney Bulk Sales)
- Teamsters (Loblaws)
- Unifor (Penske Logistics)
- University Health Network

6. “Fishbone” Diagram: Primary Causal Factors

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Prevention

“Fishbone” Diagram: Primary Causal Factors



Primary causal factors of driver fatigue in the workplace: tools and methods, culture, processes, environment, people, measures

A total of 68 primary causal factors were identified and ranked by the expert group.

Priority Rank	Category	Primary Causal Factor
1	Environment	Traffic
2	People	Health conditions
3	People	Family obligations
4	Environment	Number of truck stops
5	Culture	Stress
6	Environment	Hypnotic effects during periods of drowsiness
7	Culture	Work-life balance
8	Culture	No advocating for rest stops
9	People	Unhealthy lifestyle
10	Culture	Rushing to get job done
11	Processes	Training
12	Tools & Machines	Seats
13	Measures	Lack of education and training to recognize driver fatigue
14	Culture	Training
15	People	Mental health
16	Culture	Classification of skill

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17	Tools & Machines	Electronic logging device (ELD)
18	Tools & Machines	Rest in the truck
19	Culture	Company Culture
20	Environment	Inexperienced drivers
21	Processes	Licensing
22	Tools & Machines	Electronic devices
23	Culture	Societal attitudes
24	People	Driver experience
25	Measures	Inability to measure fatigue
26	Measures	Lack of political will
27	Tools & Machines	Line of sight
28	Tools & Machines	Vehicle maintenance
29	Environment	Time
30	Measures	Lack of fatigue management systems
31	Tools & Machines	Vehicle design
32	Tools & Machines	Cell phones
33	Culture	Electronic logging device (ELD)
34	Environment	Cab design
35	People	Substance use
36	Measures	Lack of regulations and policies
37	Processes	Facility delays
38	Environment	Weather
39	Environment	Long commute home to and from work
40	Processes	Regulation and policy
41	People	Distractions
42	People	Community
43	Tools & Machines	Lights
44	Processes	Cross docking
45	Processes	Inability to detect fatigue
46	Measures	Failure of IRS
47	People	Young age
48	Culture	Profit margin
49	Culture	Enforcement
50	Processes	Nature of product
51	Environment	Noise
52	People	Older age
53	Environment	Electronic logging device (ELD)
54	Environment	Business environment
55	People	Attitudes
56	Processes	Scheduling
57	Environment	Security of load
58	Culture	Intolerance of safety
59	Environment	Lights
60	Measures	Under reporting
61	Tools & Machines	Procurement
62	Tools & Machines	Equipment

63	Culture	Driver shortage
64	Tools & Machines	Lack of equipment
65	Measures	Hours of service (HOS) recording device
66	Environment	Media
67	Environment	Air quality
68	Culture	Media

7. Top 10 Primary Causal Factors

Below is the ranked list of the top 10 causes of driver fatigue, as identified by workers, supervisors, and employers in the Ontario trucking industry. Some of the ranked numbers have multiple causes listed, as they resulted in a tie during the formal voting process. (Note: The ranked items in the list below are hyperlinked to the corresponding controls and solutions listed later on in this document.)

1	Traffic conditions road closures, delays, construction zones, road design
2	Health conditions & unhealthy lifestyle limited or poor food choices; lack of rest and irregular sleep; not enough exercise
3	i. Work-life balance long hours on the road; time away from friends and family ii. Stress pressure from management, dispatch, and customers; wait times at customer’s locations; meeting deadlines iii. Mental health anxiety, depression, substance use
4	i. Hypnotic effects during periods of drowsiness snow or rain coming at the windshield; driving long hours on open highways ii. Not enough truck/rest stops long distances between safe rest areas; not enough quality amenities iii. Lack of education & training to recognize driver fatigue myths about fatigue; use of inappropriate (instead of safe) ways to deal with fatigue
5	Licensing doesn’t align with skill requirements some vehicles are more difficult to operate (i.e. automatic vs. manual transmission, different forms of vehicles); lack of experience and training provided through licensing
6	i. Rushing to get job done pressures to be in compliance with Hours of Service regulations ii. Lack of political will loop holes in the law can mean that best practices aren’t always followed; limited engagement from government to change
7	i. Inexperienced drivers lack of skill to operate more complex vehicles (i.e. double trailers); general public needs more education on sharing the road with trucks ii. Company culture can promote rushing and stress; prioritize productivity over safety
8	i. Classification of skill some vehicles require more skill and experience; no recognized professional status of drivers

	<p><u>ii. Societal attitudes</u> pressure to meet the demands of “just-in-time” delivery; poor public attitude toward trucking professionals</p>
9	<p><u>i. Poor vehicle maintenance</u> unexpected break downs on the road lead to longer shifts; not enough vehicle inspection training for new drivers</p> <p><u>ii. Seats</u> uncomfortable seats, lack of ergonomic features</p> <p><u>iii. Rest in truck</u> irregular sleep schedule; uncomfortable sleeping quarters do not provide enough quality rest</p>
10	<p><u>i. Electronic logging devices (ELDs)</u> can create false sense of compliance and safety with shift lengths and rest</p> <p><u>ii. Substance use</u> negatively affects ability to get enough quality rest</p>

8. Critical controls to address primary causal factors of driver fatigue among professional truck drivers

1. Traffic conditions

- a. Graduated licensing for the general public (new drivers) for G licenses: include section in the driving education for requirement to safely operate around trucks
- b. Graduated licensing for all truck drivers
- c. Mandatory training for all employees on how to deal with traffic conditions
- d. Schedule the routes to avoid congestion (peak, off-peak, day, night)
- e. Scheduling consistency: knowing your drivers, local/long-haul
- f. Artificial intelligence solutions to scheduling
- g. Proper dispatch and road trip planning
- h. More communication between dispatcher and driver with respect to route and customer location
- i. Public education/blitz: focus on cell phone and alcohol use
- j. Revisit aspects of deregulation that may compromise driver safety
- k. Enforcement (targeted blitz) by the Ontario Provincial Police (OPP)
- l. Employers having an onboarding (safe driving course) system for drivers
- m. Employer policies on traffic, defensive driving is communicated to the drivers. This should not be just a paper exercise
- n. Onus on government to keep the roads safe, proper licensing
- o. Media support on distracted driving focusing on public awareness/driving
- p. Speed limiter regulation needs to be revisited
- q. Road closures: more notice from the government (call 511)
- r. Reasonable compensation for delays (employer relationship)
- s. Preferred lane strategy like High Occupancy Lanes (HOV) lanes: programmable lanes
- t. Consider allowing trucks to use 407Etr for free (productivity and safety)
- u. Tax break to companies for 407Etr use if not free
- v. Road design (e.g. 407ETR): design to keep drivers more alert

- w. Better alert notification (signage, electronic) for construction zones
- x. Temporary speed notification signs
- y. More rumble strips layout to alert for construction zones
- z. More "zig-zag" lanes when entering the construction area
- aa. Modifying Book 7 (to include construction zone solutions)
- bb. Research on traffic patterns, speed changes on the fly
- cc. Rest stops
- dd. Rumble strips mandatory in high risk areas (e.g. high collisions, land departure, etc.)
- ee. Regulators to consider more investment into infrastructure, explore variable speed limits, more incentives for car pooling and incentives for companies to develop work from home, ride sharing programs, or off hours scheduling
- ff. Company/management to work with shippers (accountability) to adjust delivery/pick-up times to avoid peak periods, schedule work loads in a manner that allows enough time for drivers to take more breaks in heavier traffic and hourly pay for city drivers so to relieve the pressure of traffic leading to fatigue
- gg. Drivers leave extra space and be patient so that you are not forcing your way through traffic, thereby increasing stress leading to fatigue

2. Health conditions & unhealthy lifestyle

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Connect with research centres (e.g. Toronto Rehabilitation Institute) and other experts
- d. Encourage company to open to suggestions from experts
- e. Having a true understanding of health concerns and being able to address them
- f. Budget time to share health concerns with driver
- g. Employee Assistance Program (EAP); hotline for the driver to reach anybody
- h. Encourage/motivate driver to learn/gain knowledge and understanding of health and diet; practical strategies for the driver to help maintain their health (engage local programs from places like diabetes associations and other health organizations, walk or do isometric exercises during rest breaks, pack healthy lunches rather than eating out)
- i. Incorporate health conversation as part of driver performance
- j. Opening up communication lines with driver (actual conversations), not telling them to "read a book"
- k. Allow time for driver to attend to medical need and get proper breaks and meals on the road
- l. Financial support/benefit plan for driver for medical conditions
- m. Providing drivers with technology to monitor health in real-time (e.g. FitBit, etc.) to help them get interested in good health
- n. Incentivize: pay hourly to exercise. No exercise, no pay
- o. Educate companies on prevention/safety return-on-investment (e.g. research)
- p. Incentivize keeping good health for all kinds of drivers (independent owner-operator, company)
- q. Onboarding screening for sleep apnea
- r. Address stigma of sleep apnea as a system
- s. Connect impacts of fatigue with other major health conditions

- t. Develop fact sheets or information sheets for drivers to take to physician about habits and signs, symptoms and risks associated with fatigue and driver occupation to assist with screening or early detection
- u. Consider mandatory medical tests for certain classes of licenses and prescribed intervals
- v. Regulators should consider healthy options and proper medical clinics at truck stops

3. i. Work-life balance

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Promote and support mental health and wellness programs
- d. Greater enforcement to prevent the "Driver Inc." model
- e. Compassionate family support (e.g. during any emergency) policy (best practice)
- f. Artificial intelligence (new technology) solutions to scheduling
- g. Scheduling consistency: knowing your drivers (roster), long-haul
- h. Personal paid flex-days
- i. Shift management
- j. Pay drivers an hourly rate and not by mileage
- k. Determine reporting/disclosing criteria for second job and or volunteer activities that could impact rest
- l. Education for family members on impact of rest/break and off duty hours/activities on drivers
- m. Education for drivers on quality of rest
- n. Provide vehicles that have access to WiFi and technology such as FaceTime to connect with family while away from home. Auto-disable when vehicle is on or moving
- o. Create awareness and workplace culture that supports work-life balance, time off, rest, etc.
- p. Do not over schedule/over book loads so that you have options to allow drivers time off
- q. Consider having some local drivers to do pickups and deliveries for highway drivers allowing highway drivers more home time
- r. Develop plans that allow drivers to be able to take time for personal appointments or commitments and not have to miss several days of work
- s. Be honest with drivers about delivery times or expected issues so that they can plan accordingly
- t. Develop financial planning training sessions and connect workers with financial planners so that they can learn to live within their means and plan for the future. These steps help drivers have the funds to take time off or slow down when they need to
- u. Workers should notify the company early when you know you need time off to allow them time to plan for it
- v. Workers should understand that driving for a living is a lifestyle choice and work to plan things/adjust as necessary

ii. Stress

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Greater enforcement to prevent the "Driver Inc." model
- d. Promote and support mental health and wellness programs
- e. Revisit aspects of deregulation that may compromise driver safety
- f. Education and awareness on stress (e.g. identify the stressors)
- g. Allow driver the time to deal with the stress
- h. Improve the pay structure
- i. Promotion and education of EAP services in workplaces
- j. Develop a stress release travel kit or package (healthy trucker)
- k. Plan routes in a manner that does not put undue stress on drivers
- l. Figure out how to build the relationships between dispatch and drivers to alleviate the "Us vs. Them" mentality
- m. Communicate with drivers and have contingency plans for drivers to be able to take time when necessary. Have a way for drivers to be able to privately notify the company of personal stressors so work can be accommodated where necessary
- n. Develop financial planning training sessions and connect workers with financial planners so that they can learn to live within their means and plan for the future. These steps help drivers have the funds to take time off or slow down when they need to
- o. Workers should not make promises to home that their work may interfere with. For example, if you are working that day do not make commitments close to the time you expect to get back since that's when there will be delays breakdowns or other issues putting stress on you to try and get back for personal commitments
- p. Workers should make a financial plan and don't live beyond your means so that you can afford time off when you need it
- q. Workers focus on exercise: having a regular exercise routine helps alleviate stress and provides an outlet when you experience stress

iii. Mental health

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Greater enforcement to prevent the "Driver Inc." model
- d. Have EAP plans available for workers and educate workers on what they are for. Hotline for the driver to reach anybody
- e. Training to recognize fatigue signs should be included in the Mandatory Entry-Level Training (M.E.L.T.)
- f. Companies provide benefits which cover mental health issues
- g. Run awareness campaigns in the company to help erase stigma so people aren't afraid to deal with issues
- h. Provide counselling for drivers/staff involved in traumatic incidents

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- i. Workers seek help early and have someone to talk to. Spending the amount of alone time that drivers do affects moods and they need to have a person (outlet) to speak to
- j. Have check-in procedures with drivers and have codes, safe words or messages to trigger conversations
- k. Identify an ambassador or advocate for driver mental health
- l. Work on scheduling through artificial intelligence solutions to reduce stress, increase predictability in work hours
- m. Fleets have active promotion and support of healthy habits and choices by drivers, including food and physical exercise
- n. Promote sense of belonging/reduce isolation; drivers should feel sense of proprietorship or power to influence, within company and with clients
- o. Organize truly beneficial external relationships (e.g. obtaining better rates at credit unions, Costco memberships, etc.) to reduce stress arising from financial issues
- p. Recognize when your "head isn't in the game." Know when to say no
- q. Be assertive. You are the "captain of the ship" and in complete control of your safety decisions
- r. Don't succumb to a pushy dispatcher /manager who is not in your shoes
- s. Seek help. Don't let a bad feeling fester
- t. Always put your health first and don't be bullied by anyone
- u. Connect with research centres (e.g. Toronto Rehabilitation Institute) and other experts
- v. Encourage company open up for suggestions from the experts
- w. Encourage/motivate driver to learn/gain knowledge and understanding of mental health; practical strategies for the driver to help maintain their mental health
- x. Incorporate health conversation as part of driver performance
- y. Opening up communication lines with driver (actual conversations), not telling them to "read a book"
- z. Time for driver to attend to medical need
- aa. Providing drivers with technology to monitor health in real-time (e.g. FitBit) to help them get interested in good health

4. i. Hypnotic effects during periods of drowsiness

- a. Train the drivers and staff on the signs/effects of fatigue and situational hypnosis so that they can recognize when to take breaks
- b. Rest stops especially when travelling in conditions/areas that may be hypnotic
- c. Employer to encourage micro breaks and not penalize when breaks are taken
- d. Self-awareness: recognizing fatigue symptoms. Screening for factors that contribute to fatigue (e.g. sleep apnea, medication and alcohol)
- e. Promote and support mental health and wellness programs
- f. Identify routes that are most likely to have this effect
- g. Complete a study of highway lighting
- h. Design roads that have some turns and attributes that help encourage alertness without distracting the driver
- i. Infrastructure design: rumble strips, management of glare
- j. Funding research to support drowsiness or fatigue surveillance (sensor technology, identification, tracking, measurement)

k. Incentivize industry to fund research (e.g. tax breaks)

ii. Number of truck/rest stops

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Need lots of proper washrooms (porta-potties are not proper washrooms). Not just an Ontario issue but a Canada issue (USA is so much better with this. Everybody benefits, not just the truck driver)
- c. "Duty to accommodate is a basic human right" (United Nations general assembly, 2015)
- d. Stop "second-class citizen treatment" at the customers'/suppliers' locations (e.g. "No drivers" signage on washroom door)
- e. This is a political/government issue where jurisdiction infrastructure plans should have a truck parking facility with proper washrooms
- f. Bare minimum: a government run rest stop for at least every 200 km, 24hr/day, 365 days access
- g. Media attention to this need
- h. Need a "Trucker's app" (USA) for Canada
- i. National Truck & Trailer Service (NTTS) website: can look for parking locations, repair facilities
- j. Adequate and proper parking at all rest stops
- k. Use of ON511 to identify where rest stops are for proper route planning
<https://511on.ca/list/restareas?start=0&length=25&order%5Bi%5D=0&order%5Bdir%5D=asc>
- l. Explore partnership with corporate retailers to determine if designated parking spots and services can be accessed at their facilities
- m. Provide more public washroom and shower facilities like the secured European style ones (wash rinse out)
- n. Incentives for municipalities to house rest stops and commercial truck stops
- o. Financial/tax incentives for people to open truck stop
- p. Company can research routes and notify drivers of possible rest stops when assigning routes. Plan longer routes around rest stop locations
- q. Regulator or industry should invite workers to participate in any studies into rest stops

iii. Education and training to recognize driver fatigue

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Greater enforcement to prevent the "Driver Inc." model
- d. Training and instructor standards
- e. Revisit aspects of deregulation that may compromise driver safety
- f. Add fatigue training to the M.E.L.T. curriculum
- g. Training and awareness of mental health and wellness
- h. Quality of training materials, formats and delivery options
- i. Content delivered, vetted by Subject Matter Experts
- j. Budget for training

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- k. Refresher training
- l. On-the-road training (mentor): learning on the job where a new driver is not allowed to drive alone without a trainer
- m. Apprenticeship model (graduated model for learning)
- n. Standardized training program through the MLTSD
- o. Speed limiter regulation needs to be revisited
- p. Training includes information on trucking as a lifestyle choice and not just a career choice
- q. Training for dispatch and supervisor to understand driver fatigue
- r. Transferrable skills standards, providers, transferrable skills card: professional highway driver
- s. Training in different languages, but CANNOT be lost in translation
- t. Company uses translation services to communicate with driver
- u. Use veteran company drivers who want to and can be a coach
- v. Customer location orientation
- w. Leverage and promote the North American Fatigue Management Program (NAFMP) resources from education sessions
- x. Create a fatigue policy and educate all workers
- y. Company completes studies/surveys of workers to determine the fatigue levels within own fleet
- z. Work to become self-aware to recognize when fatigue is setting in

5. Licensing

- a. Regulators should review the licensing process - it should include stricter mandatory entry level training
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Greater enforcement to prevent the "Driver Inc." model
- d. Develop licensing/industry standards (standardized program through MLTSD)
- e. Renewals should require education refresher: credit hour requirement to maintain License that includes the requirement to take a defensive driving, pre-trip inspection, load securement, and fatigue management courses every License cycle
- f. Graduated licensing for both commercial and personal drivers
- g. Eliminate other license testing languages, except the two official languages that are used on road signs in Canada. This is a safety requirement and not a discriminatory factor. Applies to all classes of Licenses
- h. Testing for English and/or French competency
- i. Consistency in licensing tests: road tests vs. signage
- j. Graduated licensing for G licensing: petition MTO for section in the driving education for requirement to safely operate around trucks
- k. Instructor /school accreditation
- l. Random audit of driving schools
- m. Oversight on trainings standards
- n. Evaluation and testing for certification
- o. For new immigrants, training and licensing should match road conditions

- p. On-the-road training (mentor): learning on the job where a new driver is not allowed to drive alone without a trainer
- q. Apprenticeship model: graduated model for learning
- r. Insurance premium credits for investment in fatigue management programs
- s. Allow insurance industry to verify driver driving experience
- t. Fleets provide additional training and safety/performance programs for all drivers: awards/rewards

6. i. Rushing to get job done

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Promote and support mental health and wellness programs
- d. Revisit aspects of deregulation that may compromise driver safety
- e. Greater enforcement to prevent the "Driver Inc." model
- f. M.E.L.T. training should include in-depth road and safety training
- g. Company encourages financial planning training, with regular refreshers
- h. Message from senior management: it starts at the top
- i. Industry needs to adjust "just-in-time" approach. There is too much pressure to cut corners. Add time into "just-in-time" deliveries so that drivers don't feel they have to rush. Make sure the true expectations and timing are communicated to and known to the driver
- j. Evaluate routes to ensure that they can be completed safely
- k. Consider having some local drivers do pickups and deliveries for highway drivers reducing the hours used by highway drivers providing them more time in their weekly cycle to get home safely before they are out of hours. Make sure to not over-schedule the local drivers leading to them rushing
- l. Have contingency plans in place for drivers that run out of hours within a certain radius of the home terminal. Include having people that can go out and pick up the driver and truck if they run out of hours close to home. This way a driver does not feel they have to rush to get back before the hours run out: if you find you are using this plan too often re-evaluate your route plans
- m. Have protocols on how many available hours a driver must have to be assigned different lengths of runs
- n. Encourage to take breaks and not penalize when they are taken
- o. Do not penalize drivers for being late if reasons for being late is out of their control (e.g. stuck in traffic)
- p. Drivers communicate early to dispatch and provide realistic arrival time

ii. Political will

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Greater enforcement to prevent the "Driver Inc." model
- d. Safety must come first, safety has a price, but liability has an even bigger price

- e. Revisit aspects of deregulation that may compromise driver safety
- f. Putting safety first would see training and regular retraining requirements increase. In the United Kingdom, drivers have to go through retraining every 5 years
- g. Promote and support mental health and wellness programs
- h. Pay scales may need to increase to recognize years of experience and specialized training.
- i. Industry, drivers and general public use social media to lobby for safer conditions for commercial drivers
- j. Increased education and awareness of driver fatigue and the serious impacts of fatigue on job performance
- k. Being aware of/examining/studying the complexities due to barriers in personal and work fatigue
- l. Company to provide support to drivers and employees to attend to their well being like mental health, physical health, financial help & EAP
- m. Increased focus on work-life balance: educating employees on work- life balance, scheduling of trips to ensure that drivers have time to get from point A to point B and have adequate time off between shifts
- n. Developing policies and procedures for fatigue management, defensive driving, scheduling of trips, driver rosters and fit for duty
- o. Educational blitz to companies and general public on awareness and advertising for the trucking industry to support anti-fatigue strategies and emphasize positive impacts to businesses
- p. Public education/blitz focusing on cell phones and substance use

7. i. Inexperienced drivers

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry).
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Greater enforcement to prevent the "Driver Inc." model
- d. Graduated licensing for all classes like limitations on vehicle size, equipment and cargo (e.g. no hazmat for first year, then add flatbed with added cargo securement training. Adding specialized training requirements increases value of driver and decreases liability)
- e. Implement retraining or knowledge testing for license renewals (e.g. retesting every 5 years, written test)
- f. Revisit aspects of deregulation that may compromise driver safety
- g. Eliminate other license testing languages, except the two official languages that are used on road signs in Canada. This is a safety requirement, not a discriminatory factor. Applies to all classes of licenses
- h. No translators allowed during testing as they are not in the vehicle with the driver
- i. Mandatory education for certain high-risk behaviour violations (aggressive, distracted and impaired)
- j. Use veteran company drivers who want to and can be a coach
- k. Schedule the routes to avoid congestion (peak, off-peak, day, night)
- l. Avoid putting them in "just-in-time" deliveries, to help avoid the stress
- m. Graduated onboarding strategies for new drivers, limited selection of runs and predictable trips
- n. Graduated licensing for the general public (new drivers) for G licenses: include section in the driving education for requirement to safely operate around trucks

- o. Training to be provided in a way it is easily understood: multiple formats to ensure understanding for all new drivers and employees
- p. Refresher training on a regular basis
- q. On-the-road training (mentor): learning on the job where a new driver is not allowed to drive alone without a trainer
- r. Training and instructor standards
- s. Ensure company has a budget for training
- t. Customer location orientation for all new employees/and new routes
- u. Company to ensure proper supports are in place for inexperienced drivers so they can ask questions and have a mentor or obtain assistance when required
- v. Create quick video series of vehicle limitations: blind spots, space, speed, physics of truck limitations for multi-format approach
- w. For new truck drivers, use graphic reports and pictures of what happens when following too closely at highway speed, distracted driving, insufficient load securement and the need to follow regulations and best practices and not cut corners
- x. Use highway electronic signs for truck safety messages for all drivers (e.g. construction zones)
- y. Support research on truck safety measures (e.g. autonomous features)
- z. Promote and support mental health and wellness programs

ii. Company culture

- a. Have discussions and training regarding fatigue at work: don't just sweep it under the rug
- b. Protect drivers against unrealistic and unsafe demands of customers
- c. Support drivers and help them deal with regulators
- d. Developing policies and procedures to address scheduling of trips, driver fitness to work, roster of drivers and education on fatigue management
- e. Make safety a priority and ensure that the company is adhering to the safety standards and regulatory requirements
- f. Promote and support mental health and wellness programs
- g. Both highway and personal safety needs to be a top priority and not negotiable
- h. Operations and safety departments should be in sync on safety
- i. Industry needs to adjust to 'Just-in-time" not effective with too much pressure to cut corners. Add time into "just-in-time" deliveries so that drivers don't feel they have to rush. Make sure that true expectations and timing are communicated to and understood by the driver
- j. Scheduling to allow for downtime, power naps, rest, and to account for road closures/accidents
- k. Artificial intelligence solutions to scheduling
- l. Incorporate health conversation as part of driver performance
- m. Open communication lines with driver (actual conversations)
- n. Budget for training/refresher training
- o. On-the-road training (mentor): learning on the job
- p. Increased communication between company and customer (warehousing) to ensure that the driver is not rushing or waiting for hours for their load to be ready when it is late
- q. Develop procedures and standards for the customer to adhere to
- r. Address stigma of sleep apnea

- s. Promote sense of belonging/reduce isolation so drivers can feel like a part of a team
- t. Driver should be able to say "no" to unsafe work and be allowed to justify their decision
- u. Effective recruitment and hiring practices

8. i. Classification of skill

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry).
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Graduated licensing for all truck drivers
- d. Greater enforcement to prevent the "Driver Inc." model
- e. Implementation of high skills major designation
- f. Offer industry incentive for companies/fleets/carriers that are offering apprenticeship style graduation
- g. Instructor /school accreditation
- h. Oversight on training standards
- i. Evaluation and testing for certification
- j. Sector specific for the industry
- k. Long Combination Vehicle (LCV) designation
- l. Re-testing (continuous training) to maintain designation
- m. Training credit hours to maintain designation
- n. Different pay grades for different levels of experience/risk
- o. Accreditation printed on driver license (designation)
- p. Transferrable designation (e.g. moving away from high risk/heavy haul if you need)

ii. Societal attitudes

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Move away from the term "truck driver"
- d. Company open to suggestions from the experts, employees and unions
- e. Societal awareness promotional activities: educating the general public on the importance of commercial drivers, the importance of the jobs they do and debunking other myths and inaccurate information about commercial drivers
- f. Public awareness on the space commercial drivers require on public roads, road safety and safe driving tips
- g. Government should assist with campaigns to support and promote commercial drivers
- h. Education campaigns on fatigue: making driving tired socially unacceptable (like impaired driving)
- i. Promote and support mental health and wellness programs
- j. Develop company culture that driving tired is not acceptable
- k. Different pay grades for different levels of experience/risk

9. i. Vehicle maintenance

- a. Develop preventative maintenance schedule where all vehicles are on a schedule to be inspected and maintained by a qualified person
- b. Keep adequate records of maintenance performed on all vehicles
- c. Proper training and education in the M.E.L.T. curriculum
- d. Purchase equipment that is up-to-date
- e. If owner-operators are hired, make sure their equipment is up-to-date and safe
- f. Create company policy and standard on the maintenance of equipment and type of equipment to be used
- g. Budget for maintenance: mechanical parts will break at some time
- h. Timely repairs: fix it now, not later when it gets worse and causes driver aggravation
- i. More on-road services
- j. Cutting corners on maintenance is cutting corners on safety
- k. Worker quickly reporting defects on vehicles they drive
- l. Industry hiring professionals increases the likelihood of timely and quality maintenance and repairs

ii. Seats

- a. Good quality seats need to be fully adjustable and have features to reduce stressors on the body such as heat, massage, adjustable support for low, middle and upper back
- b. Do not go for the "lowest common denominator" on seats (e.g. heated seats are not a luxury in a truck, but a necessity)
- c. Mandatory air ride and both arm rests
- d. Educate drivers on seat positioning (pressure points for blood circulation)
- e. Preference for leather seats which are easier to clean than fabric, which is a hygiene issue with truck slip seating
- f. Invest in ergonomics assessment for the design and posture of the seats
- g. Develop minimum standards for seat design/ergonomics
- h. Increased regulation on the industry standard for seating
- i. Implement a preventative maintenance policy/add the seats to the current preventative maintenance policy to ensure seats are regularly inspected and maintained by a qualified person
- j. Employers should provide a work environment that meets the standards for seating and sleeping accommodation
- k. Promote and support mental health and wellness programs
- l. Company open to suggestions from the experts, drivers and unions
- m. Mandatory training for driver ergonomics

iii. Rest in truck

- a. Worker should be comfortable sleeping in the truck, like he/she is at home. This includes mattress quality, proper bedding, pillows, blackout curtains and proper climate control
- b. Avoid noise: white noise a worker creates, use of ear plugs and parking spot choice

- c. Plan for a better quality sleep the next night if you had poor quality sleep one night
- d. Put phone on silent and make a conscious decision that your own sleep and health need to be the highest priority
- e. Quality sleep is not justified by the number of hours of sleep you had that was dictated by a dispatcher or driver manager. For example, showing ten hours off at a receiver does not mean you are rested if they woke you up to get your paperwork. You "slept" with all your clothes on because you did not know when they would come wake you up again. This is not exactly a comfortable and restful sleep, even though the ELD says the truck did not move
- f. Engage manufacturers to ensure latest technologies (noise, light and motion cancelling) are used to make the best possible sleep environment
- g. Industry-wide standards for long-haul sleeper berths
- h. Awareness on worker sleep/rest habits
- i. Worker plans/controls their rest and sleep breaks
- j. Incentive programs for fitness and best practices
- k. Design and investment incentives through rebates and insurance premiums for equipped luxury style sleeper berths
- l. Research routes and notify drivers of possible rest stops that are appropriate for sleeping at
- m. Promote and support mental health and wellness programs

10. i. Electronic Logging Device (ELD)

- a. ELD is a compliance tool, not a safety tool. Treat it accordingly and make judgement calls based on overall safety, not ultimate compliance
- b. Set the ELD to silent mode, minimizing distractions it can cause
- c. Electronic devices of any kind will fail, so be prepared and have a backup
- d. Know available "hours of service (HOS)" without having to look at ELD while driving. Don't rely on it
- e. Training for drivers on ELD operation especially ones that are less technically inclined
- f. Customers are made aware of the time restraints on the ELD so that a driver can be loaded or unloaded in a timely fashion
- g. Standardization and mandatory usage to avoid or eliminate paper log fraud
- h. Awareness of the benefits and investment of ELDs: <http://www.eldfacts.com/elds-for-truckers/>
- i. Reconsider the exemptions: <http://www.eldfacts.com/exempt-from-the-canadian-eld-mandate-heres-5-reasons-to-comply-anyways/>
- j. Clarification on the certification requirements
- k. Build awareness of the benefits for drivers on use of ELD vs myths and concerns relating to "big brother" oversight
- l. Open communication between management, dispatch and employees regarding the ELD system
- m. Developing policies/procedures to address scheduling of trips, driver rosters and fitness to work in order to combat and reduce stress
- n. Monitor the inputs of ELDs to ensure they are accurate. Ensure record keeping is accurate
- o. Request feedback from drivers and be open to their suggestions/concerns

ii. Substance use

- a. Political will to stand up for the well-being of the industry (e.g. skill classification, support for the driver to attend to their well-being, work-life balance, awareness/advertising for the trucking industry)
- b. Recognize commercial driving as a skilled trade (e.g. Red Seal)
- c. Promote and support mental health and wellness programs
- d. Put a pay structure in place and the driver will stay home when too ill to drive or if side effects of a medicine makes them unfit for the road
- e. This is a safety sensitive occupation and any misuse should not be tolerated
- f. If a prescription medicine is known to impair, do not work while on this medication
- g. Consult with physician about job requirements when things are being prescribed
- h. The United States drug and alcohol testing rules should apply to Canadian drivers also, including random testing
- i. Employee Assistance Program (EAP) hotline for the driver to reach anybody
- j. Encourage/motivate driver to learn and gain knowledge and understanding of health; practical strategies for the driver to help maintain their health
- k. Incorporate health conversation as part of driver performance
- l. Open communication lines with driver
- m. Developing a fit-to-work policy and using tools to measure fit-to-work
- n. Time for driver to attend to medical need
- o. Financial support/benefit plan for driver for medical condition
- p. Allow employees time off to attend substance use programs if required
- q. Don't penalize employees if they come to the employer and notify that they have a substance use issue and need help; rather encourage open communication and provide driver with the resources to get help if they are willing to get help
- r. Improve recognition training for managers and supervisors.

9. Next Steps: What we should focus on immediately

Based on a scan of controls identified for the top 10 primary causal factors, it is beneficial, as a start, to focus right away on the following five common mitigation actions (current systemic weaknesses):

1. Classify truck driving as a skilled trade (Red Seal)
 - ✓ Needs to be implemented at the federal level
2. Review and address critical training gaps in mandatory entry-level training (M.E.L.T.)
 - ✓ E.g. Fatigue, training hours, standards, school audit, insurance, etc.
3. Mandatory graduated licensing for all truck drivers
 - ✓ Including testing for English/French competency
4. Greater enforcement of non-compliant carriers

- ✓ Driver Inc.

5. Promote mental health and wellness

- ✓ Provide support tailored to the driver

These five recommendations provide a systemic foundation for the reduction in driver fatigue. If ignored, the solutions listed for the top ranked primary causal factors will just serve as “band aid” solutions. Based on the Swiss cheese model of accident causation, risk assessment and root-cause analysis theories, we must focus on the systemic causal factors and not just the symptoms.

10. References and Resources

Addressing Human Factors in the Motor Carrier Industry in Canada. Ottawa: Canadian Council of Motor Transport Administrators:

<https://ccmta.ca/en/reports-publications/item/addressing-human-factors-in-the-motor-carrier-industry-in-canada>

Evaluating a Fatigue Management Program, Alberta Government:

<https://www.alberta.ca/assets/documents/tr-evaluating-fatigue-management-program.pdf>

Fatigue Management Program and Training, Alberta Government:

<https://www.alberta.ca/fatigue-management-program-and-training.aspx>

Fox Business News: <https://www.foxbusiness.com/money/truck-driver-deadliest-professions>

Get the Facts: The Canadian ELD Mandate: <https://www.eldfacts.com/get-the-facts-the-canadian-eld-mandate/>

Motor Carrier Safety Research, Transport Canada:

<https://www.tc.gc.ca/eng/motorvehiclesafety/roadsafety-motor-carrier-safety-research-1329.htm>

North American Fatigue Management Program <https://www.nafmp.com/>

North American Fatigue Management Program Implementation Guide:

https://files.nafmp.org/download/implementation_manual_en.pdf

Thiffault, P., & Bergeron, J. (2003). Monotony of road environment and driver fatigue: a simulator study. *Accident Analysis & Prevention*, 35(3), 381-391

Workplace Fatigue - Current Landscape and Future Considerations, CSA Report:

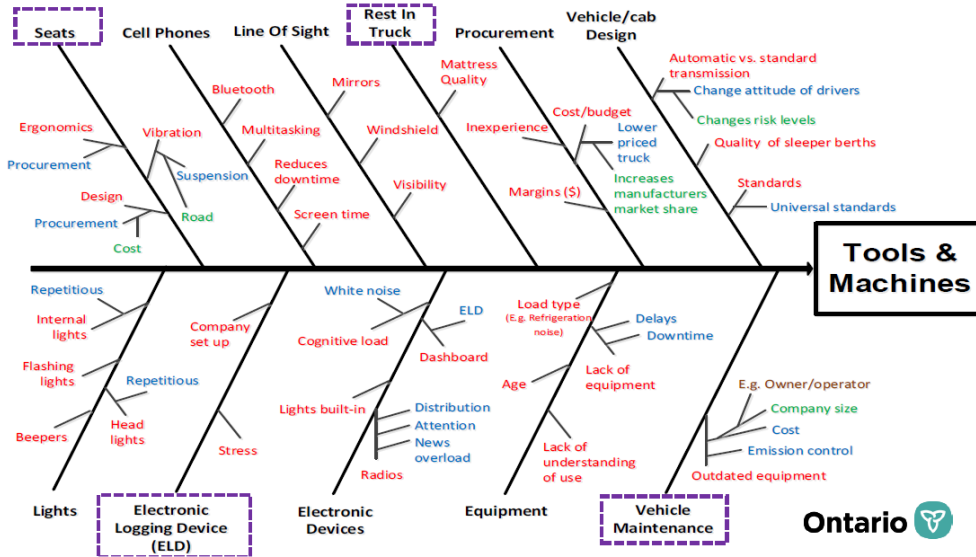
<https://www.csagroup.org/article/workplace-fatigue-current-landscape-and-future-considerations/>

Wylie C, Shultz T, Miller J, Mitler M, Mackie R. (1996). Commercial Motor Vehicle Driver Fatigue and Alertness Study: Project Report. Washington, DC: U.S. Department of Transportation, Federal Highway Administration.

11. Appendix i: "Fishbone Diagram" for Secondary, Tertiary and Quaternary Causal Factors

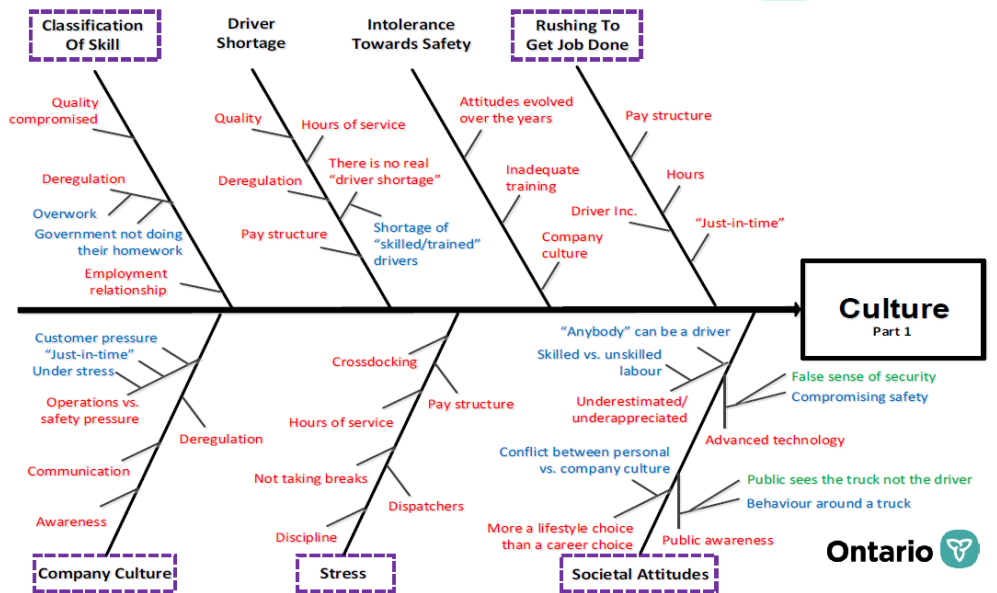
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"Fishbone" Diagram: Tools & Machines



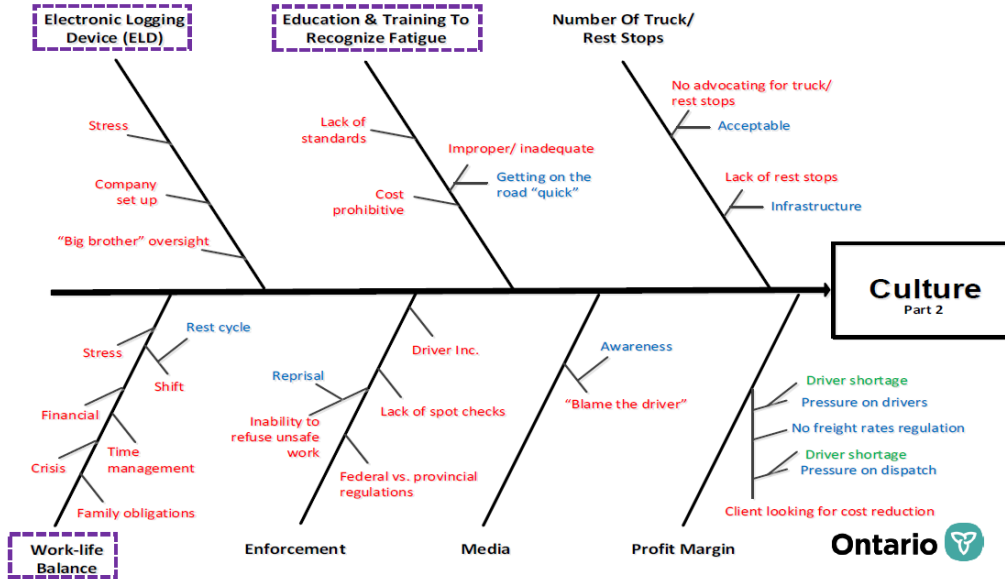
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"Fishbone" Diagram: Culture (Part 1)



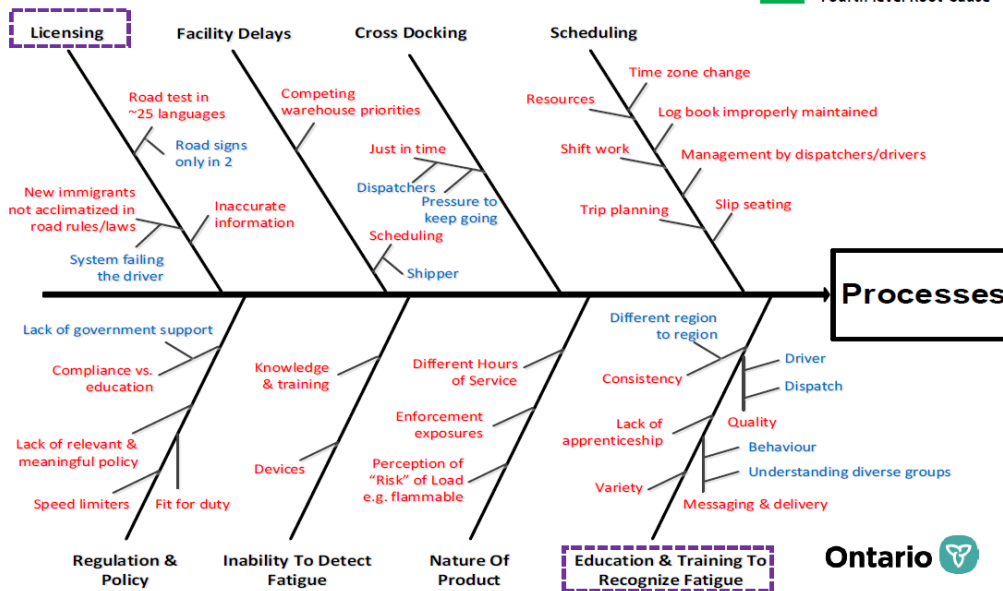
"Fishbone" Diagram: Culture (Part 2)

- Top Primary Root-Cause
- Primary Root-Cause
- Second level Root-Cause
- Third level Root-Cause
- Fourth level Root-Cause

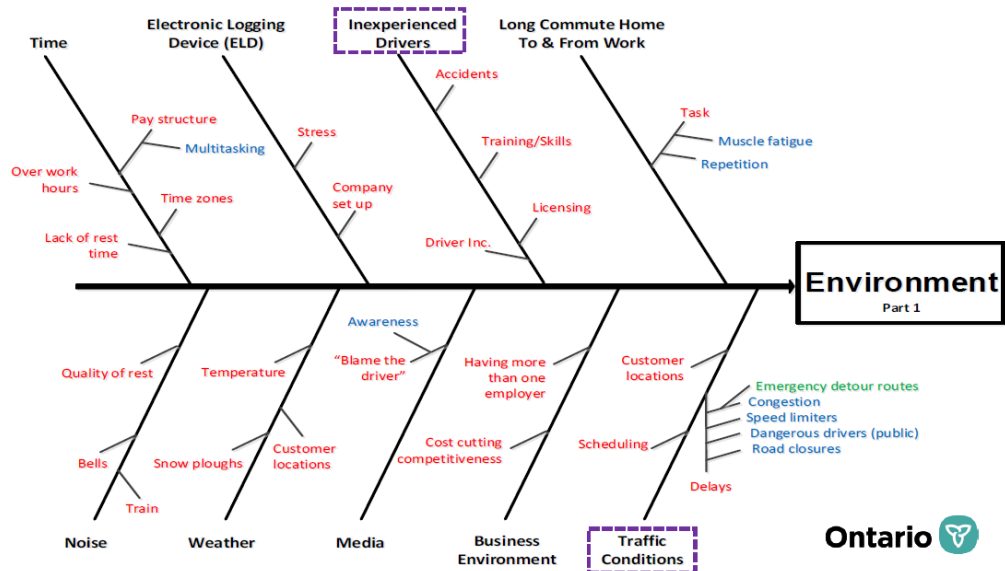


"Fishbone" Diagram: Processes

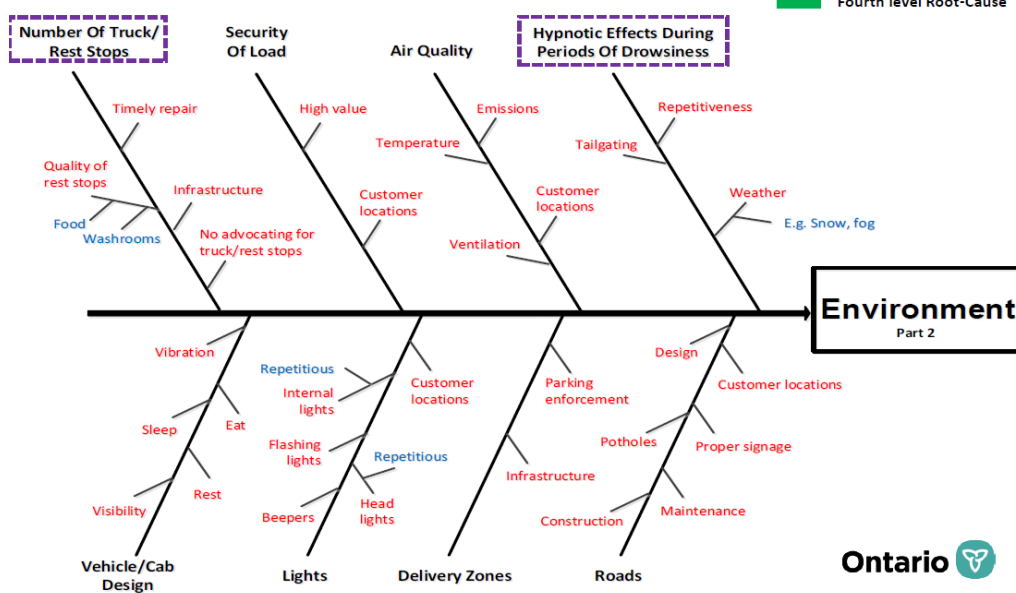
- Top Primary Root-Cause
- Primary Root-Cause
- Second level Root-Cause
- Third level Root-Cause
- Fourth level Root-Cause



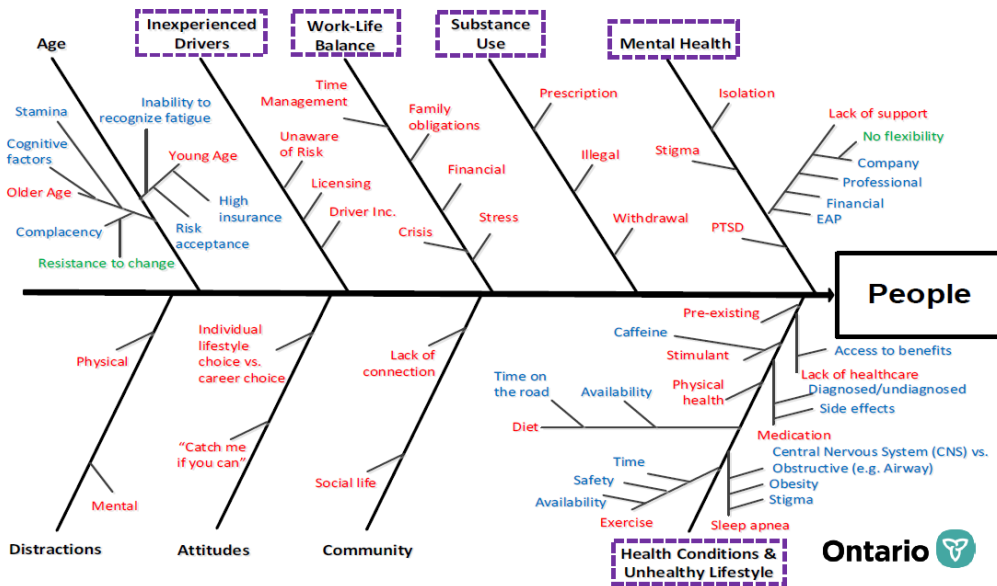
“Fishbone” Diagram: Environment (Part 1)



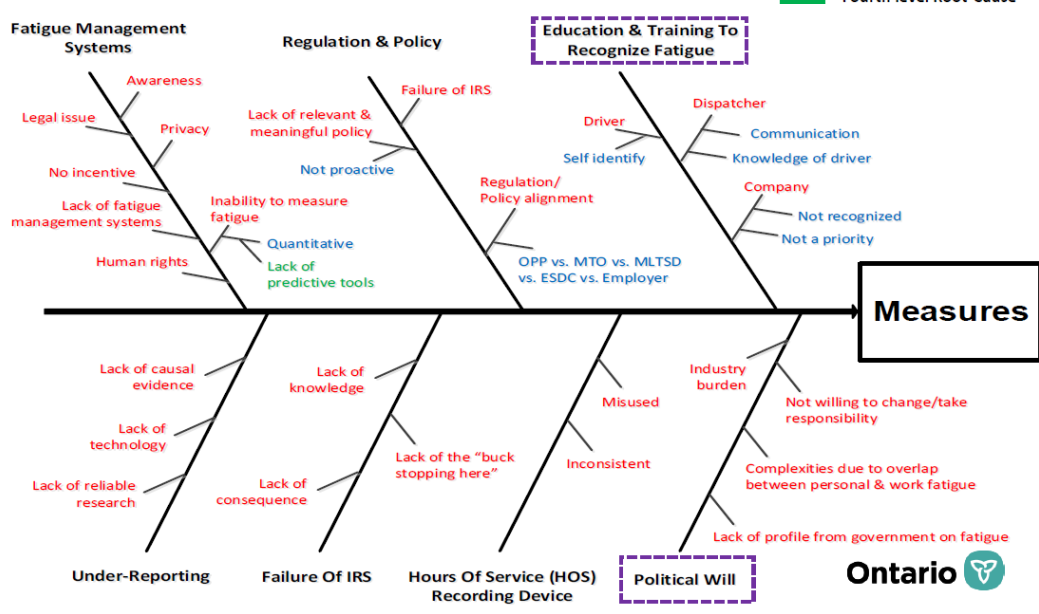
“Fishbone” Diagram: Environment (Part 2)



"Fishbone" Diagram: People



"Fishbone" Diagram: Measures



12. Appendix A: Risk Assessment Methods/Standards

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Appendix A: Risk Assessment Methods/Standards*

1. Bayesian Analysis
2. Bow-tie analysis
3. Brainstorming (e.g. what-if)
4. Business impact analysis
5. Cause and effect analysis
6. Checklists
7. Computer Hazard and Operability Studies (CHAZOP)
8. Consequence Analysis (or Cause-Consequence Analysis)
9. Likelihood/Consequence matrix
10. Construction Hazard Assessment and Implication Review (CHAIR)
11. Decision tree
12. Delphi technique
13. Energy Barrier Analysis (or Energy Trace Barrier Analysis)
14. Environmental risk assessment
15. Event tree analysis
16. Failure Mode and Effect Analysis (FMEA)
17. Failure mode, effect and criticality analysis
18. Fault Tree Analysis
19. Fishbone (Ishikawa) Analysis
20. Hazard analysis and critical control points
21. Hazard and Operability studies (HAZOP)
22. Human Error Analysis (HEA)
23. Human reliability analysis
24. Job Safety Analysis (JSA)
25. Level of Protection Analysis (LOPA)
26. Markov analysis
27. Monte Carlo Analysis
28. Preliminary Hazard Analysis (PHA)
29. Reliability centered maintenance
30. Scenario analysis
31. Sneak circuit analysis
32. Structured/semi-structured interviews
33. SWIFT (i.e. structured what-if)
34. Systemic Cause Analysis Technique (SCAT)
35. Workplace Risk Assessment and Control (WRAC)

Risk Management Standards:

1. Risk Management Principles and Guidelines (ISO 31000:2018)
2. Risk Assessment Techniques (ISO/IEC 31010:2009)
3. OH&S Hazard Identification and Elimination and Risk Assessment and Control (CSA Z1002)
4. Process Safety Management (CSA Z767-17)
5. Enterprise Risk Management (COSO 2004)
6. Global Minerals Industry Risk Management (GMIRM)
7. International Council on Mining & Metals (ICMM)

* Not an exhaustive list



13. Appendix B: Workshop Contacts

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14. Appendix C: Infographic: Top 10 health and safety risks in Ontario’s trucking sector



15. Appendix D: Infographic: Top 10 causes of drive fatigue among professional truck drivers in Ontario

The infographic is in development and will be added to this document soon.