Technical Paper: Ontario's Logging Sector Root Cause Analysis Workshop Results and Next Steps

A focused approach to improving workplace health and safety

Workplace Safety North

ONTARIO MINE RESCUE

Technical Paper: Root Cause Analysis report- Driving- Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance).

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Executive Summary

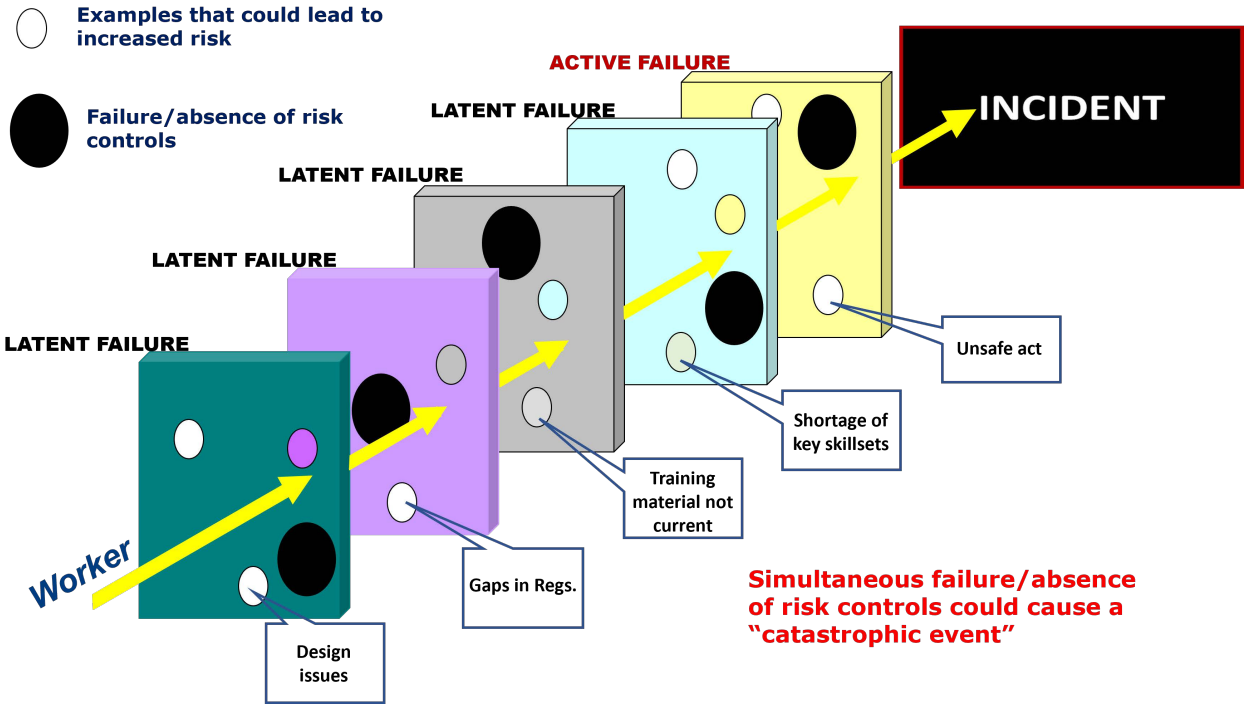
A volunteer group of labour and management subject matter experts, supported by the Forestry Tripartite Committee, met face-to-face to conduct a risk assessment of the hazards in Ontario's logging industry, and later, a root cause analysis of its top health and safety risk.

The group of representatives from management, labour, Ministry, and Workplace Safety North, was facilitated by Konor Poulin, Health & Safety Specialist, and Adrienne Allam, CRSP, Health & Safety Specialist at Workplace Safety North (WSN). In advance of the workshop, each industry expert submitted their top health and safety concerns, and during risk assessment workshop, more than 35 identified risks were reviewed and discussed by the group. Both management and labour agreed the top risk was Driving Hazards– Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance).

The experts' root cause analysis workshop determined the top 10 causal factors for Driving Hazards – Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance), as well as specific controls for each. Next steps include an immediate focus on the five most common systemic weaknesses regarding collisions or contact between mobile equipment, pedestrians, light vehicles, and/or fixed facilities causing harm to workers and workplace health and safety:

- *Deficient vehicles or older equipment with inadequate maintenance*
- *Inadequate/limited support of safety programs (Internal Responsibility System)*
- *Inconsistent competency-based on-the-job driver training*
- *Lack of fit for duty program awareness and implementation*
- *Limited or insufficient standards and co-ordination of company/Ministry of Transportation highway maintenance*

1. Risk Assessment Project: The Subject of Inquiry



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: Revisiting the 2022 Risk Assessment Workshop Results

In December 2022, a volunteer group of subject matter experts met face-to-face for a logging sector workplace risk assessment at Workplace Safety North (WSN) headquarters in North Bay, Ontario. The workshop with representatives from management, labour, Ministry and Workplace Safety North was facilitated by Konor Poulin, Health & Safety Specialist, and Adrienne Allam, CRSP, Health & Safety Specialist at Workplace Safety North (WSN).

In advance of the workshop, each industry expert submitted their top health and safety concerns, and during the one-day workshop, all 39 identified risks were reviewed and discussed by the group.

When it came time for the final vote on the top risks, only actual workers and managers from the forestry industry were allowed to vote. In order to ensure an open and fair voting process, handheld electronic devices recorded votes anonymously. Both labour and management agreed: the top risk in Ontario Logging operations is Driving Hazards- Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance).

"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 Konor & Adrienne, "And both workers and managers agreed: the number one risk in Ontario Logging Operation is Driving Hazards- Highway Travel.

Top 10 health and safety risks in Ontario Logging Operations

1. Highway Travel – dangerous conditions, fatigue, weather, road and vehicle maintenance
2. Conventional harvesting – struck by overhead tree or branch
3. Off-road driving during work activities – including haul drivers
4. Distracted while driving to and from work site – not including hauling
5. Inadequate or improper lockout while working on energized equipment
6. Fatigue-induced incidents
7. Substance use: Under the influence of alcohol, prescription or other drugs
8. Lack of experience, training, and risk perception
9. Caught In or struck by equipment
10. Lack of enforcement – including contractors

"The risk assessment workshop provided direct feedback from industry experts about their perception of the workplace. By using leading rather than lagging indicators, WSN can be more proactive in assisting industry in addressing these workplace risks," says Tom Welton, Director, Health and Safety Services and Education Programs

Health and safety in the workplace

When the group of industry experts reviewed the risk assessment results, they found that three of the top 4 risks were related to driving hazards specific to highway travel (dangerous conditions, fatigue weather, road and vehicle maintenance), conventional harvesting (struck by overhead tree or branch), off-road driving during work activities (including haul drivers) and distracted while driving to and from work sites (not including hauling).

A related resource supporting workplaces gaining a better understanding about the importance of taking a holistic approach to health and safety and having a supportive workplace culture encourages both self-care and concern for co-workers, research also supports an increased focus on overall well-being.

The results of the workshop were reviewed by the WSN Forestry, Paper, Printing and Converting Advisory committee which includes experts from the Forest sector. The committee, in conjunction with WSN, confirmed their support of the next step: a detailed analysis of the root causes of highway travel (dangerous conditions, fatigue, weather and vehicle maintenance) and the creation of an effective prevention plan.

"Using the risk assessment method and analyzing its root causes within the workplace is an extremely effective method to identify leading indicators to allow industry to work more proactively in addressing key concerns," says Dr. Sujoy Dey, Ph.D., Corporate Risk Officer at the Ministry of Labour, Immigration, Training and Skills Development (MLITSD)

Following review and discussion, both industry labour and management committee members voted and confirmed that the top risk to the logging sector was Driving Hazards - Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance). A few months later, in late 2023, the group of industry experts met for two days to determine the root cause of Driving Hazards- Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance) in the workplace, and develop critical controls that can be put in place to address the risks.

3. Root-Cause Analysis: Risk Statement

Based on the results of the logging sector risk assessment, the following risk statement was selected by the Workshop Committee Members for Root-Cause Analysis focus using the "Fishbone" approach:

"Commutes on highway and forestry roads can result in injury to workplace parties and/or the public based on unsafe acts/ conditions during travel"

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

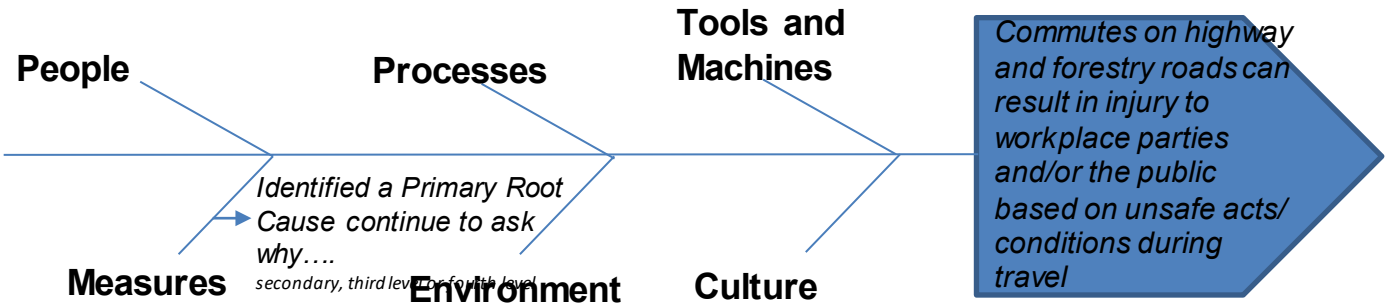
- Workshop participants were peer-recognized industry and system experts.
- Workshop process was open, transparent, and collaborative.
- All participants met face-to-face; there was no teleconferencing.
- Ranking and prioritization of causal factors for substance use was voted on by industry management and labour only; MLITSD and WSN did not vote.

Validation of the results, in addition to workshop subject matter expert participants, included having the results presented and discussed: among forestry industry constituents including a webinar hosted by the Ontario Forest Industries Association, at conferences and health and safety meetings, as well as at Workplace Safety North advisory board meetings for the Ontario forest sector.

5. Workshop Participants: Industry, System Partners Participants from the following organizations attended:

- United Steel Workers Union
- Interfor
- Remar Transport
- Workplace Safety North
- Ministry of Labour

6. "Fishbone" Diagram



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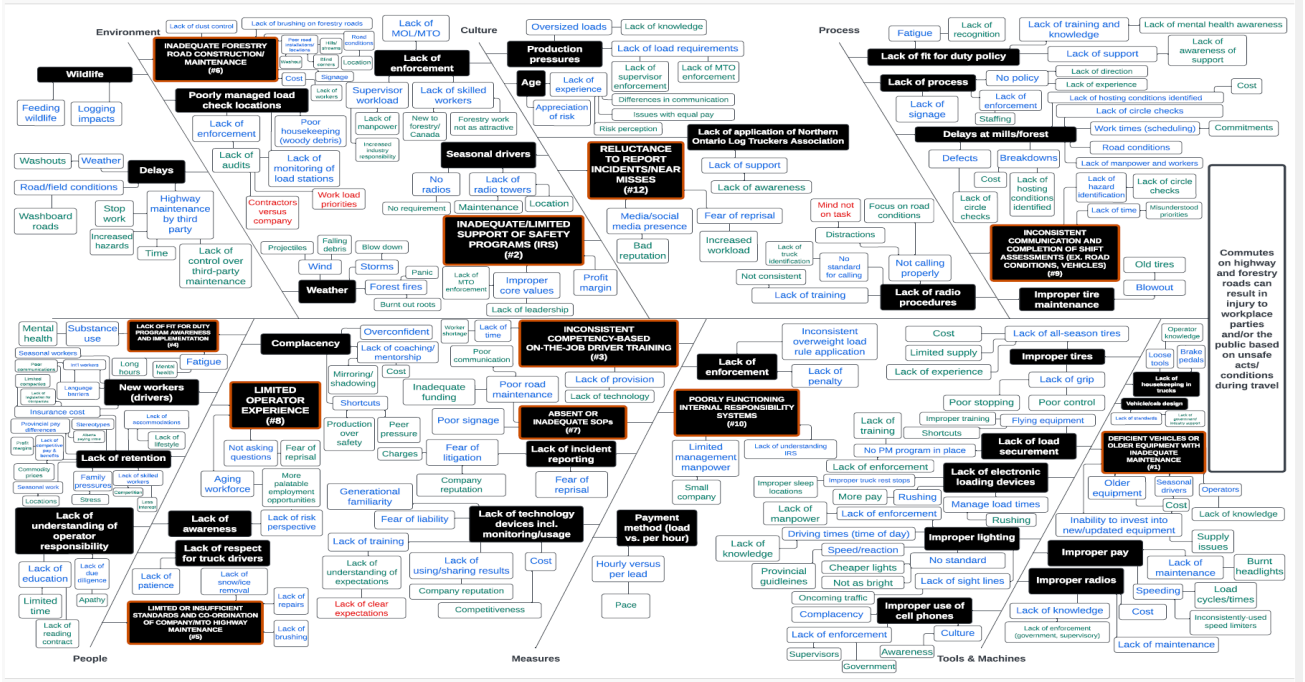


CLOSE-UP of fishbone diagram: Primary causal factors of Driving- Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance) focused on six key workplace factors including: Tools and equipment, culture, process, environment, people, measures

44 Primary Causal Factors Identified by Hazard Category

Priority Rank **Category** **Primary Causal Factors**

#	Category	Primary Root-Cause
1	Tools and machines	Unsafe equipment
2	Culture	Lack of safety culture
3	Measures	Lack of driver training
4	People	Fit for duty
5	People	Lack of company/MTO highway maintenance involvement
6	Environment	Improper road maintenance
7	Measures	Lack of procedures
8	People	Lack of experience
9	Process	No pre-assessment
10	Measures	Lack of internal responsibility system
11	Culture	Lack of reporting
12	Tools and machines	Lack of load securement
13	People	Lack of awareness
14	People	New workers (drivers)
15	Environment	Weather
16	Process	Lack of fit for duty policy
17	Tools and machines	Improper use of cell phones
18	Measures	Payment method (load versus per hour)
19	Measures	Lack of incident reporting
20	Measures	Lack of enforcement
21	People	Lack of understanding of operator responsibility
22	People	Lack of retention
23	Culture	Production pressures
24	People	Complacency
25	Culture	Lack of enforcement
26	Process	Lack of process
27	Process	Improper tire maintenance
28	Process	Lack of radio procedures
29	Tools and machines	Improper radios
30	Tools and machines	Lack of electronic loading devices
31	Tools and machines	Improper tires
32	People	Lack of respect for truck drivers
33	Measures	Lack of technology devices including monitoring and usage
34	Environment	Delays
35	Tools and machines	Lack of housekeeping in trucks
36	Tools and machines	Improper lighting
37	Tools and machines	Improper pay
38	Culture	Seasonal drivers
39	Culture	Age
40	Culture	Lack of application of Northern Ontario Log Truckers Association
41	Process	Delays at mills/forest
42	Tools and machines	Vehicle/cab design
43	Environment	Poorly managed load check locations
44	Environment	Wildlife

7. Top 10 Primary Causal Factors: Development of a list of Controls

1. Deficient Vehicles Or Older Equipment With Inadequate Maintenance
2. Inadequate/Limited Support Of Safety Programs (IRS)
3. Inconsistent Competency-based On-the-job Driver Training
4. Lack Of Fit For Duty Program Awareness And Implementation
5. Limited Or Insufficient Standards And Co-ordination Of Company/MTO Highway Maintenance
6. Inadequate Forestry Road Construction/ Maintenance
7. ABSENT OR INADEQUATE Safe Operating Procedures
8. Limited Operator Experience
9. Consistent Communication And Completion Of Shift Assessments (Ex. Road Conditions, Vehicles)
10. Poorly Functioning Internal Responsibility Systems

Next, the industry group of subject matter experts got down to work to develop controls that could be put in place for the top 10 primary causal factors, and address the risk of driving hazards causing harm to workers in the workplace.

8. Critical controls to address primary causal factors of Driving Hazards - Highway Travel, (Dangerous conditions, fatigue, weather, and vehicle maintenance) *Note: Control lists are not in any order of priority*

1. Tools and machines: Deficient vehicles or older equipment with inadequate maintenance.

- Maintenance audits
- Spot checks
- Circle checks – documentation of circle checks
- Annual inspections, including ones completed by third party.
- Standards on years' service for vehicle replacements (25 yrs. replacement)
- Repair work done by qualified/licensed mechanics.
- Stronger enforcement for vehicles that do not meet requirements.
- Plated and Un-plated vehicles properly maintained (sanders, plow, rock truck)
- Seasonal preparedness for equipment/vehicles

2. Culture: Inadequate/limited support of safety programs (internal responsibility system)

- Auditing, both internal and third party
- Competent trained personnel to manage and enforce the program.
- Clearly define the roles and responsibilities within the safety programs.
- Measurables and accountability for licensee and contractor through a legislated modular training program.

3. Measures: Inconsistent competency-based on -the-job driver training

- Mentoring opportunity and programs
- Legislated modular training program standards
    - Required minimum number of hours for apprenticeship
    - Performance-based assessments of driver practices on-site
- On-the-job forestry driver experience requirements (hours)
- Communication of site-specific safety expectations
- Government support (incentives) for forestry driver training

4. **People: Lack of fit for duty program awareness and implementation**

- Consistent program auditing and implementation
- Improved supervisor and worker mental health training
    - Ensure supervisors training to recognize substance use/fit for duty
- Substance use (drug and alcohol) policies
    - Third-party testing
- Fit-for-duty worker self-assessment training
- Competent trained personnel to manage and enforce the program.

5. People: Limited or insufficient standards and co-ordination of company/MTO highway maintenance

- Annual planning meetings with government involvement to set and implement best practices with respect to the highway maintenance
- Government MTO explanation on what their standards are to contractors and drivers at contractor meetings.
- Public awareness and signage of potential haul areas (movable signs)
- Share the road reminders to contractors and drivers.

6. Environment: Inadequate forestry road construction/maintenance

- Development and implementation of provincial standards on building and maintaining forestry roads.
- Legislative review: Ontario Regulation 851 (Industrial Establishments), Section 117, with more rigid measurements (e.g.: five metre road width) for haul roads
- Implement the due diligence program of audits on forestry road audits (if in place)
- Communicate the audit results to improve planned maintenance of forestry roads.
- More government funding opportunities

7. Measures: Absent or inadequate standard operating procedures (ex. Radio, signage, road maintenance)

- Develop an Ontario forest road radio standard
    - Develop a consistent provincial standard for radio communication procedure.
    - Include mandatory signage with radio frequencies, kilometre call requirements.
- Develop a consistent provincial standard for forest road signage (visible, legible, reflective, placement with frequency, height,)
- Develop a must call standard on forestry roads (calling every 5 km or high-risk areas like steep hills, blind corners)
- Increased monitoring of communication procedures and recognized hazards

8. People: Limited operator experience

- Government assistance, development, and implementation of a Provincial modular training standard for log trucks
- Incentives for operator experience to support recruitment.
- Government assistance/incentives for insurance fees.
- Additional vehicle specific training for forest roads (pickup trucks, fuel truck, transportation vehicles) with requirements for documented skills-based sign-off
- Company or government incentives for truck driving mentoring

9. Process: Inconsistent communication and completion of shift assessments (ex. Road conditions, vehicles)

- Include a module for shift assessments in the proposed provincial modular training standard.
- Mandatory documentation of shift assessment/risk assessment.
    - Weather forecast
    - Road conditions
    - Circle checks (ex. ELD's and dash cam functioning)
    - 511
- Due diligence of assessment from supervisor (process training)

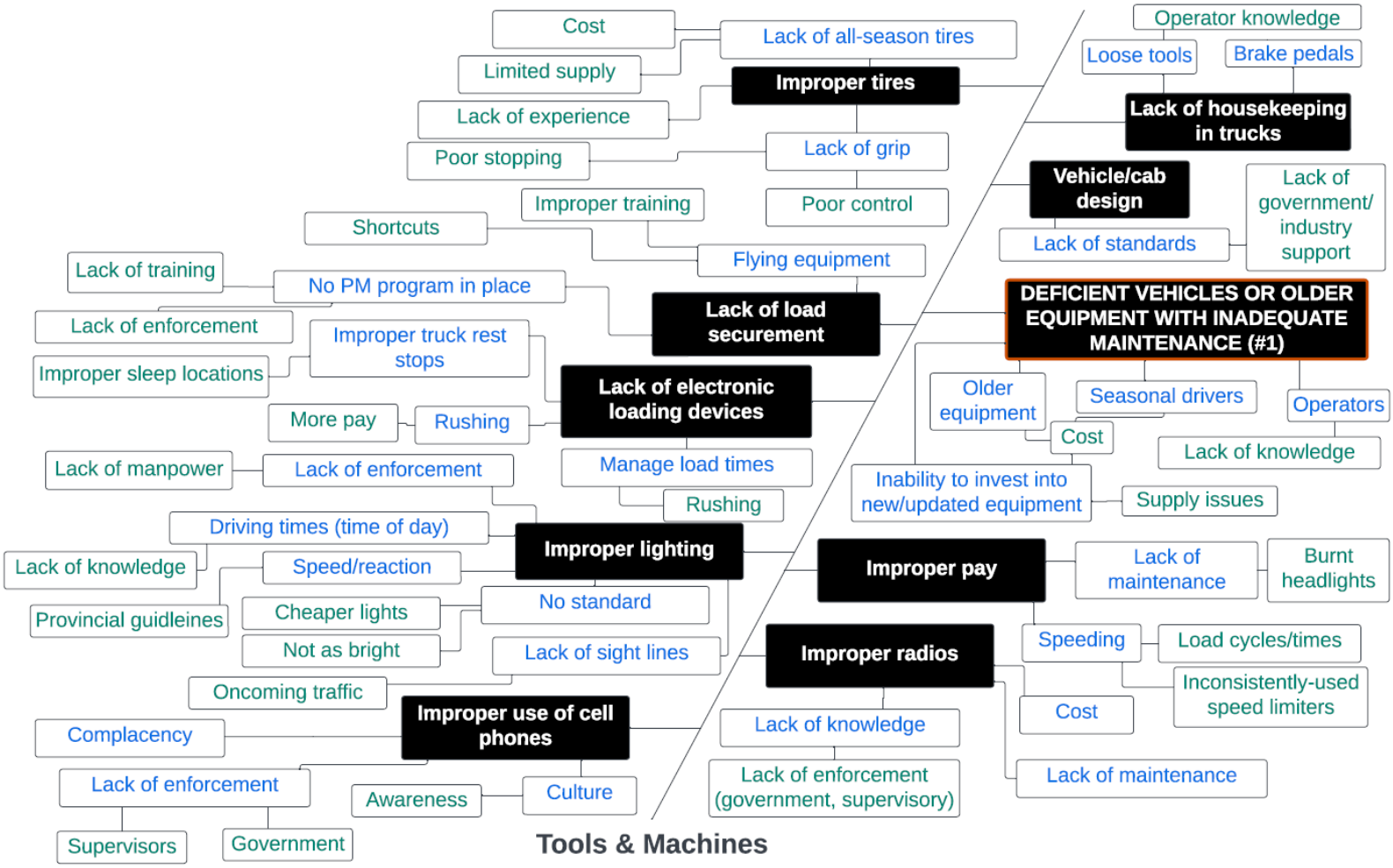
10. Measures: Poorly functioning internal responsibility systems (forest roads specific)

- Adequate and mandatory forest road - specific training focussing on the IRS
- Clear understanding in each workplace party's roles and responsibilities within the IRS
    - Training conducted by a competent person
- Set and monitor performance measurables of the IRS

10. References

1. **Top 10 Health and Safety Risk in Logging Operations 2023:** https://www.workplacesafetynorth.ca/resources/top-10-health-and-safety-risks-logging-operations-2023
2. **Logging Sector Risk Assessment Workshop Results 2023** https://www.workplacesafetynorth.ca/resources/logging-sector-risk-assessment-workshop-results-2023
3 **Root Cause Analysis Results:** https://www.workplacesafetynorth.ca/resources/top-10-causes-driving-hazards-logging-operations

11. Appendix I –VI: "Fishbone Diagram" for Primary, Secondary, Tertiary and Quaternary Causal Factors



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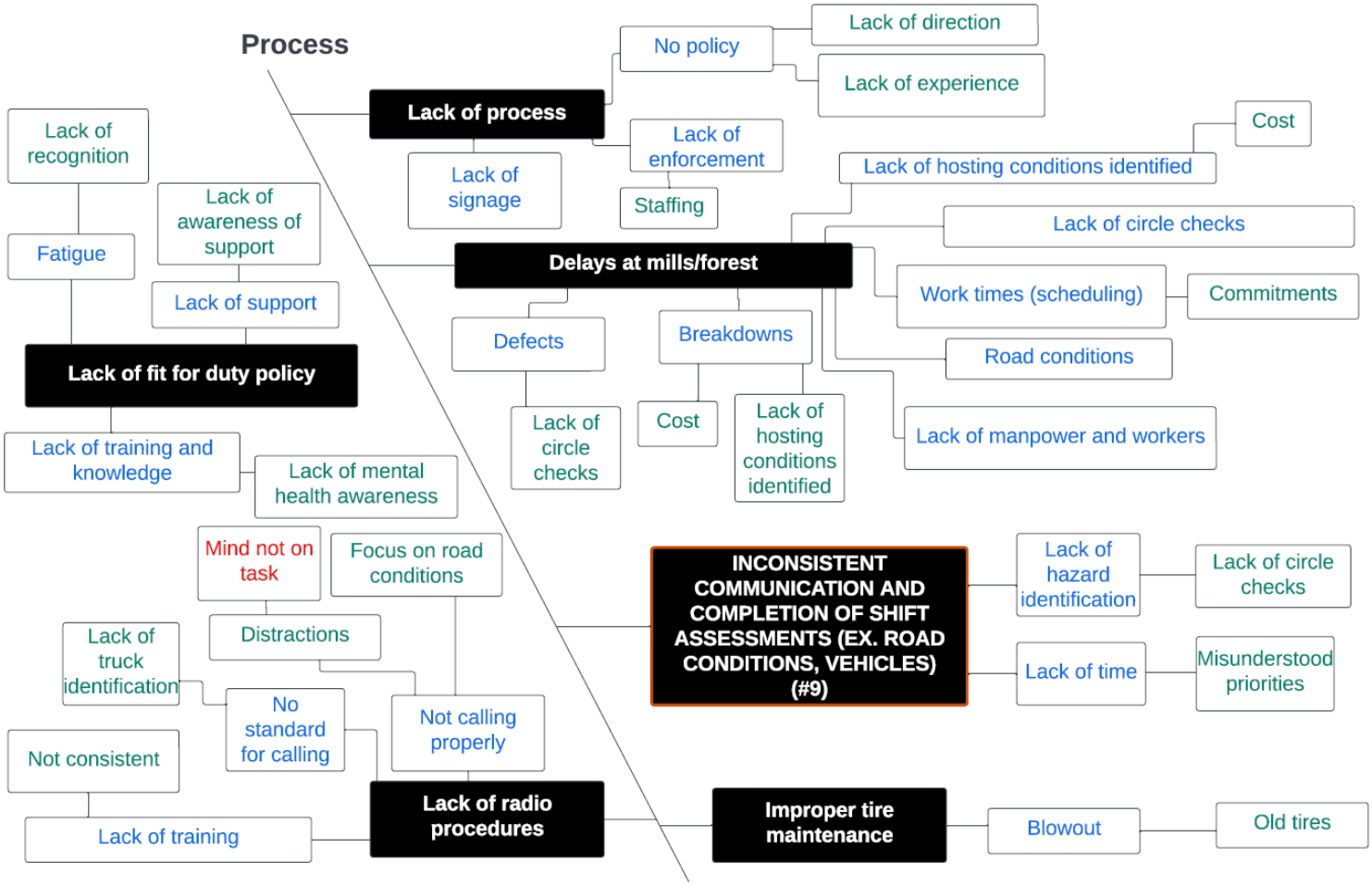

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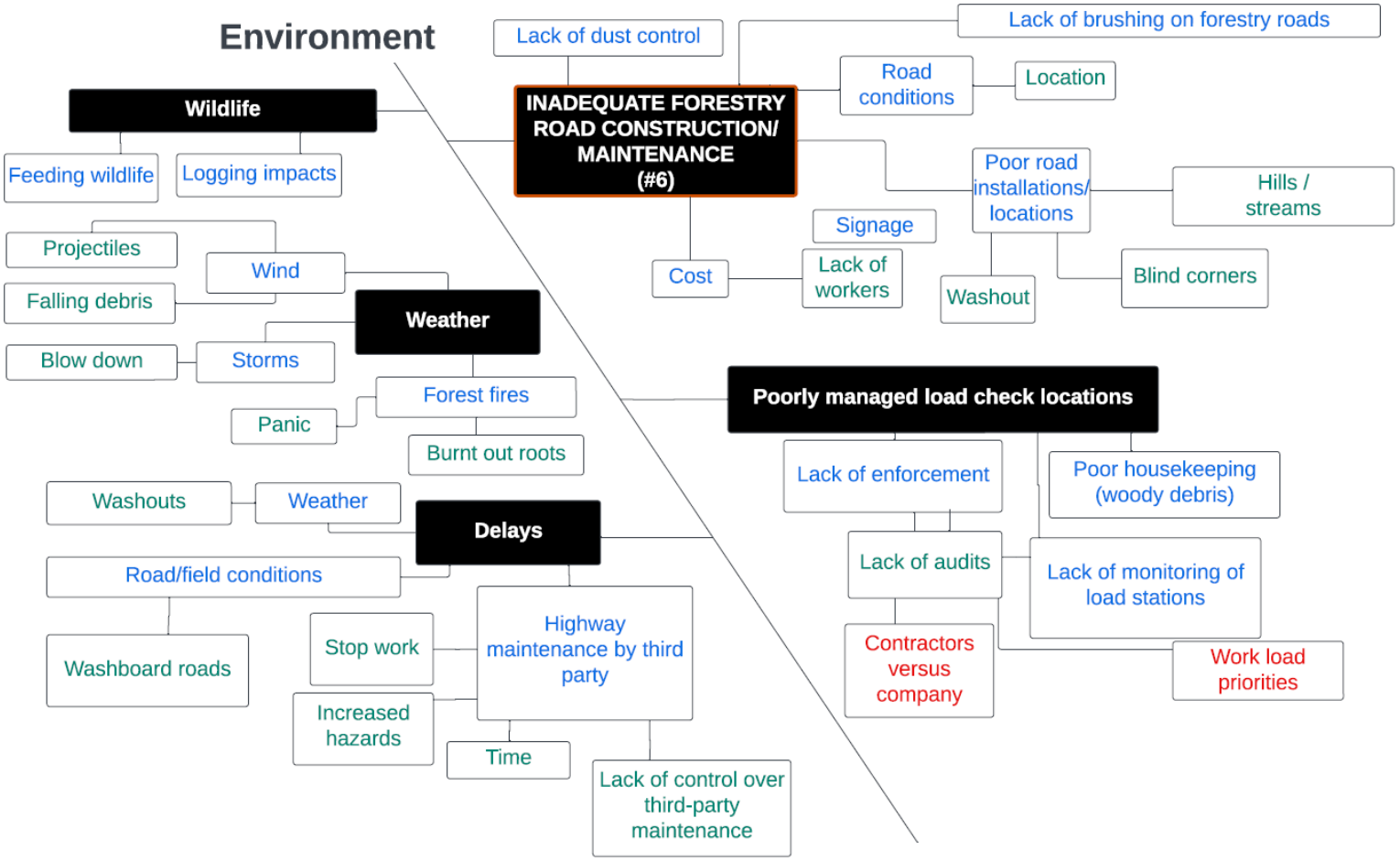

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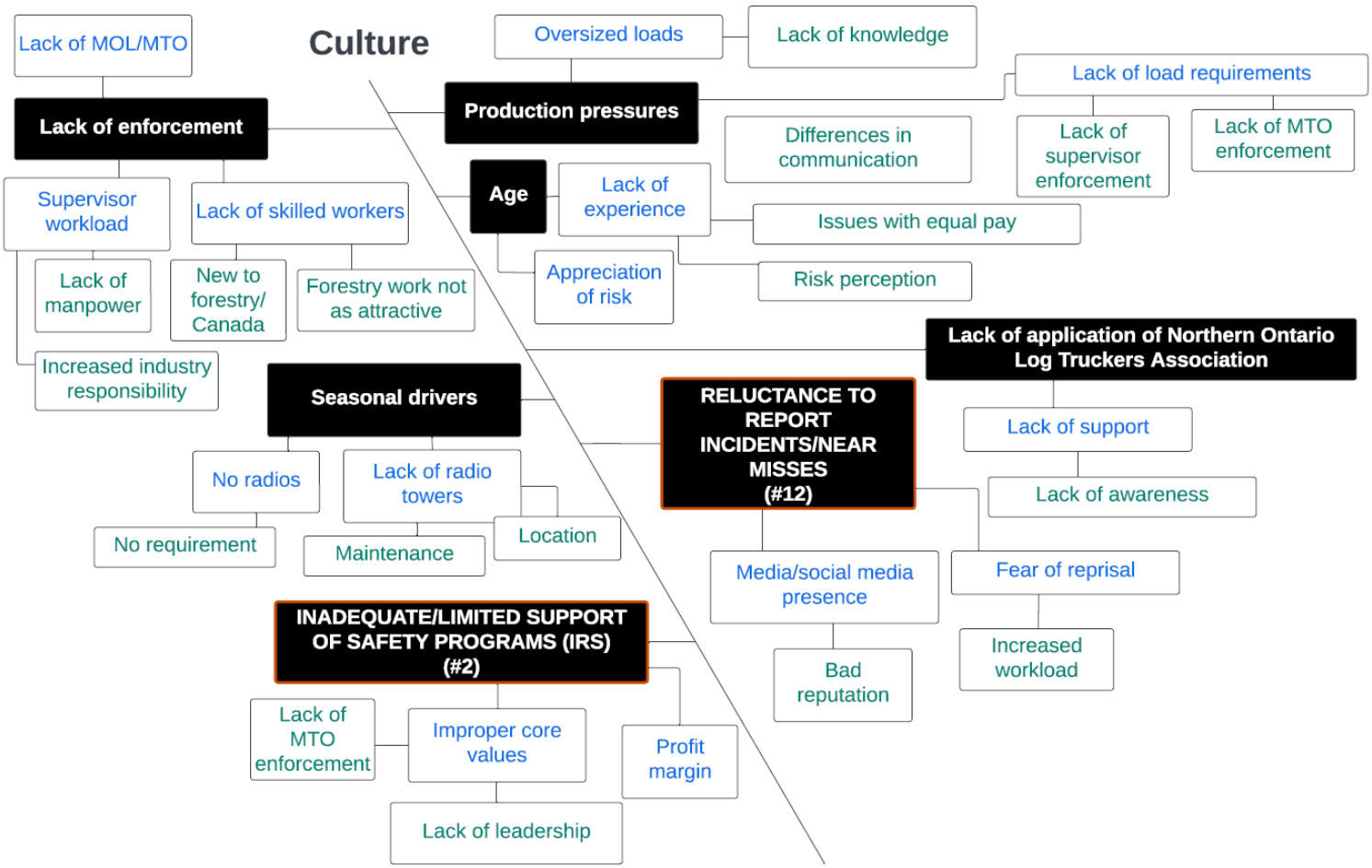

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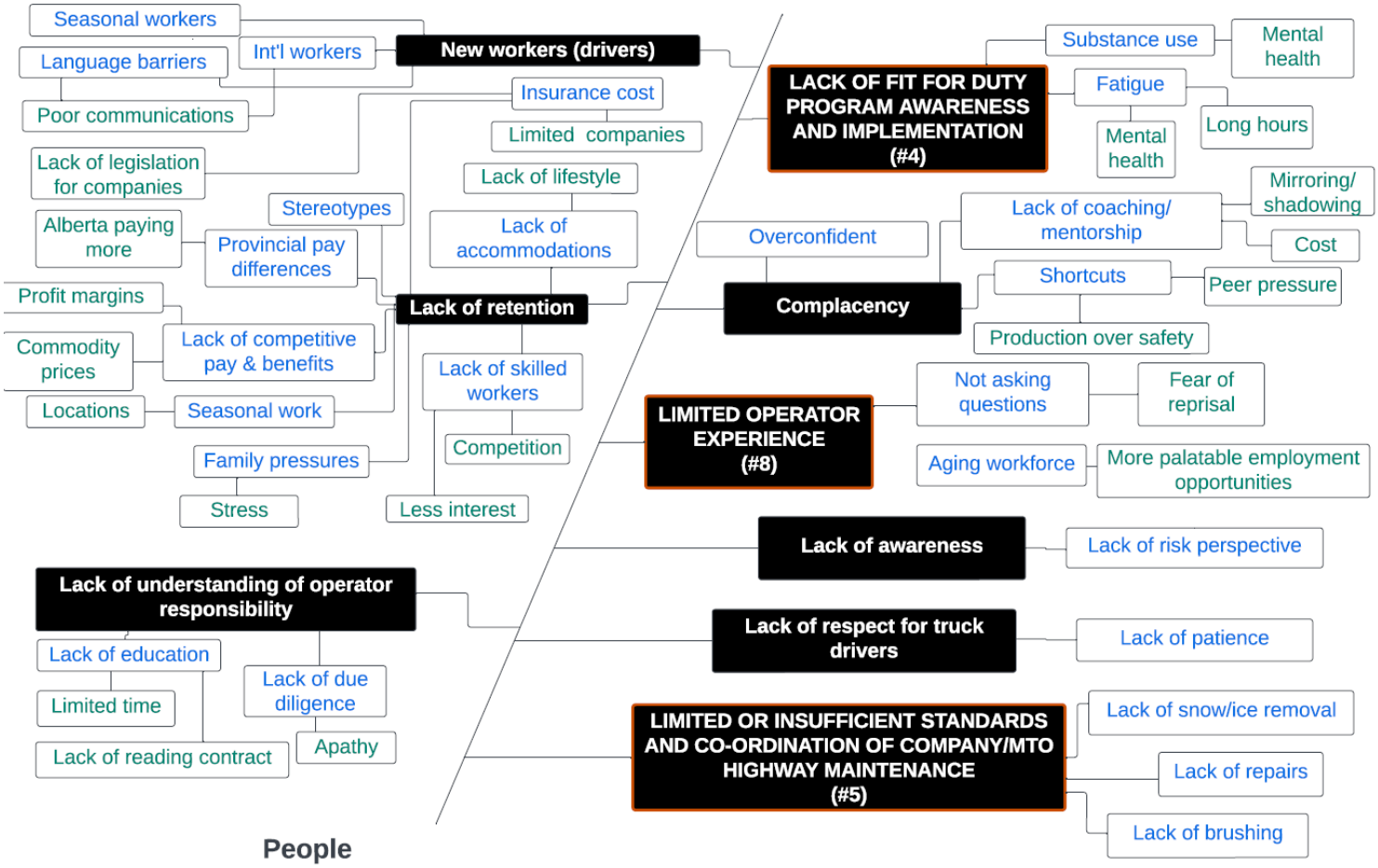

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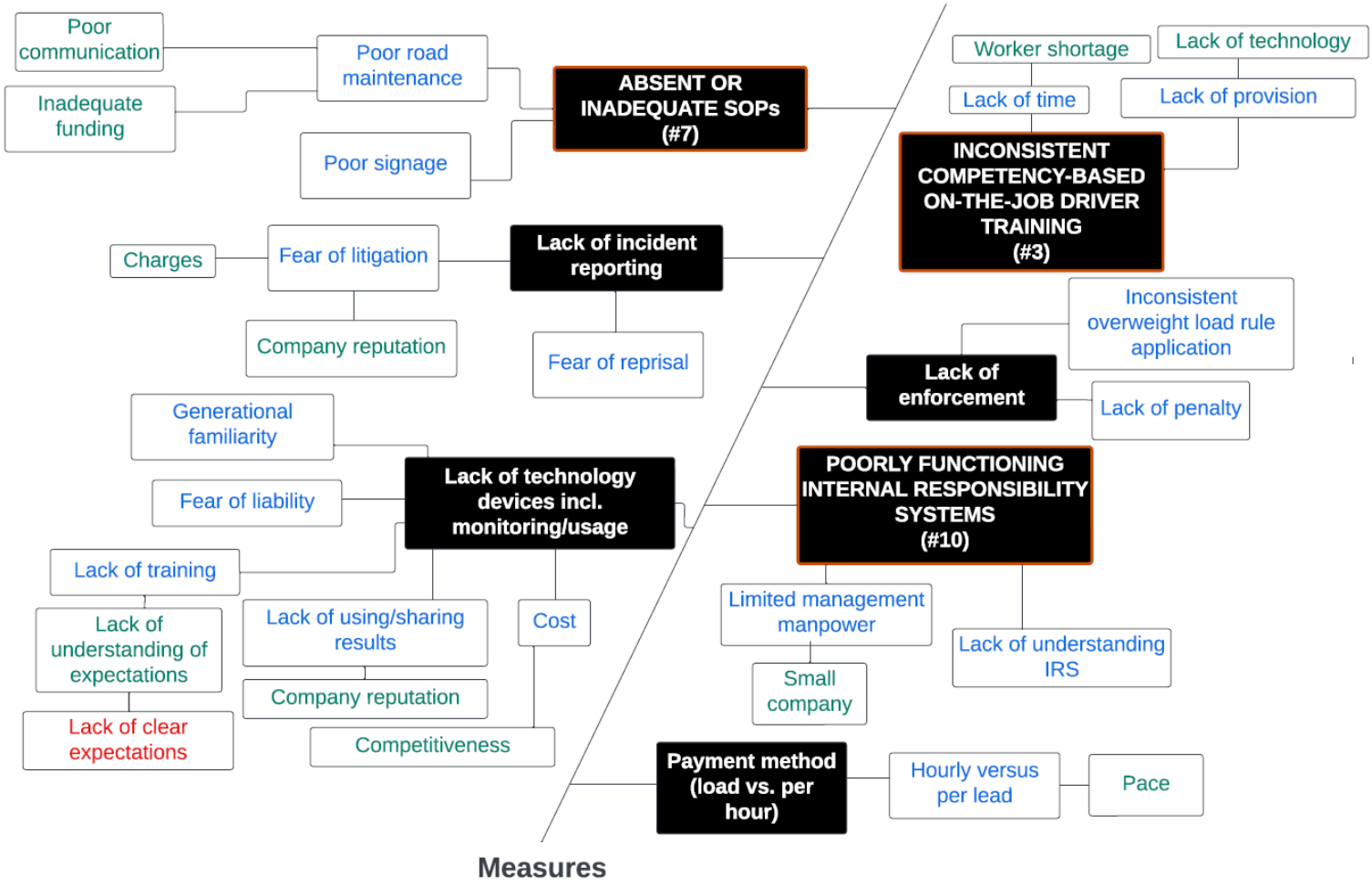

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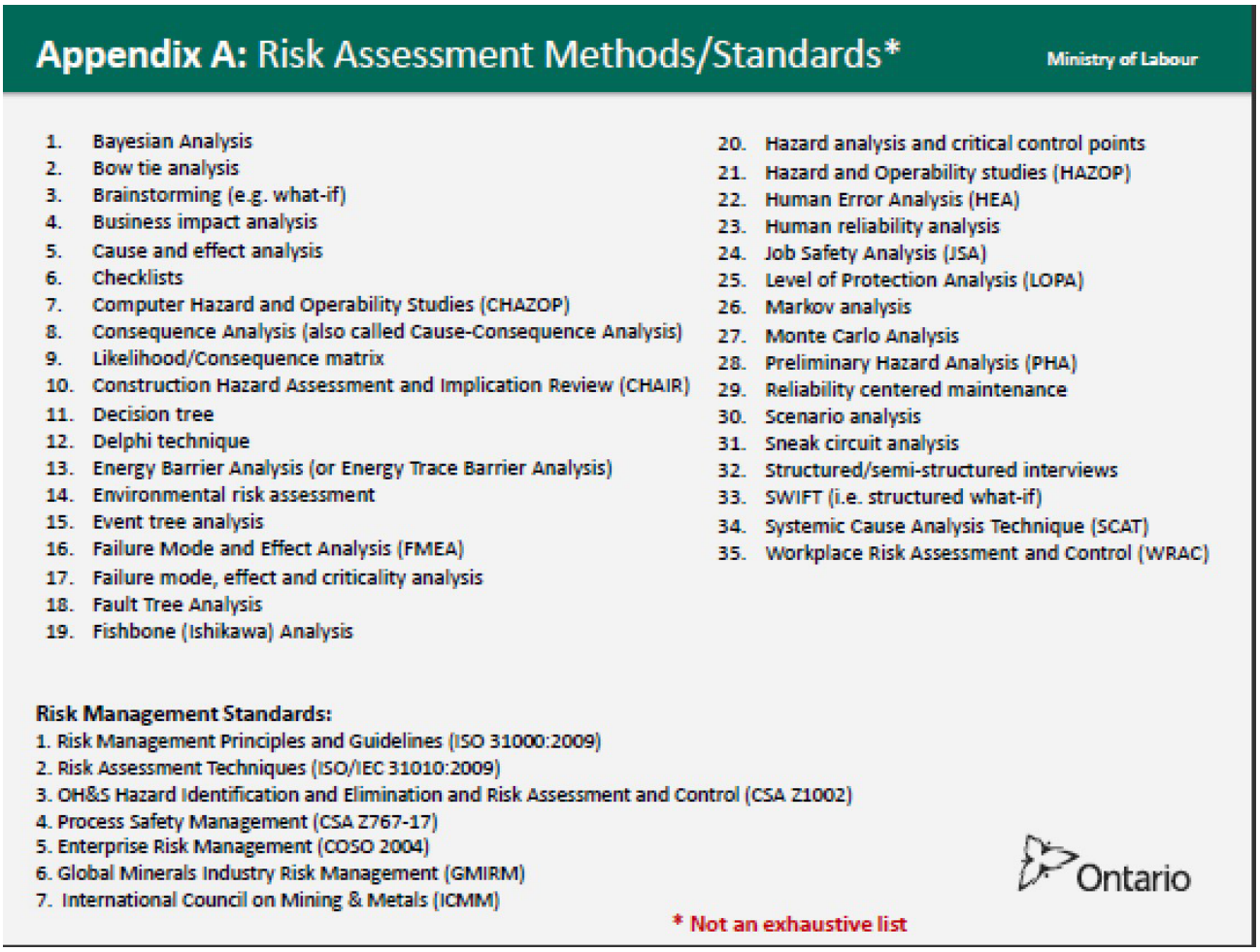
12. Appendix A: Risk Assessment Methods/Standards



13. Appendix B: Workshop Contacts

For additional information or questions, please contact:

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14. Appendix C: Poster: Top 10 health and safety risks in Ontario Logging Operations