IMPROVING ROA
A Practical Framework to

By Kolby Burkhardt and Manuel Trejo Jr.

EVERY YEAR, American workers in professions such as road maintenance and construction face a grim reality: the risk of losing their lives while working dangerously close to traffic. In the U.S., hundreds of workers lose their lives each year in street and highway maintenance and construction operations. Other industries with similar occupational exposure include utilities, government and transportation. The Texas Municipal League Intergovernmental Risk Pool (TMLIRP, n.d.) provides workers' compensation coverage to more than 200,000 public servants, including nearly 50,000 first responders. Sadly, the organization averages at least one roadway-related fatality claim each year. In recent months, however, TMLIRP has seen 11 Texas public servants struck and killed on or near a roadway. The loss of these Texas municipal workers is tragic, and the group will—under the workers' compensation law—provide lifetime financial support to their family members in most cases. Organization staff will keep the families in their hearts, but the group is also taking action to stop the trend.

The Recognize, Observe, Assess, Determine (R.O.A.D.) Ready initiative (**https://info.tmlirp.org/road-ready-2-0**) is simple but important because even organizations with committed management and employees face challenges controlling roadway fatality risks. The excessive fatality rate is due partly to task execution within proximity to live traffic (Al-Bayati et al., 2022). These statistics reveal a significant risk, and therefore emphasize the need to continuously review and improve occupational safety programs for roadway workers. Lyon and Popov (2017) reviewed the application of the U.S. Coast Guard's risk-based decision-making process and its effectiveness for occupational environmental, health and safety (EHS) professionals. Lyon and Popov (2017) suggest that, for organizations to effectively manage risks while conducting operations and achieving objectives, management must include risk communication into their risk assessment process. The problem is that management and frontline personnel who do not have formal safety training may not have a fundamental understanding of what "safe" truly means (Lyon & Popov, 2017). Therefore, the challenge some industries face is adopting a risk assessment tool that is relevant, easily understood, and effective at communicating risks to frontline workers and management while engaging the worker in the safety process. After all, the more engaged the worker is in the safety effort, the more engaged they will be in the effort to perform in a safe manner (ASSP, 2022). By combining an effective risk assessment with relevant engagement tools, workers may begin to understand what safe means, especially those performing tasks near live traffic. Prior to assigning tasks to frontline workers on or near the roadway, organizations should ensure that these workers have been trained in hazard identification, control and how to perform roadway-related tasks. ASSP GM-Z10.100-2024 emphasizes the need for adequate competency for high-risk jobs; this competency should extend to performing high-risk job risk assessments, such as those working on or near the roadway.

Literature Review

Research conducted by Al-Bayati et al. (2023) found that recommendations from the NIOSH Fatality Assessment and

KEY TAKEAWAYS

- **The article highlights the risks faced by roadway workers, emphasizing the need for improved safety measures in industries such as road maintenance and construction.**
- **It also introduces R.O.A.D. Ready, a practical risk-based decision-making tool designed for frontline workers and safety professionals, and outlines its systematic approach to identifying and managing roadway risks.**
- **The article emphasizes the need for effective risk communication and the integration of industry standards to enhance the effectiveness of safety programs for roadway workers.**

FIGURE 1
RISK-BASED DECISION-MAKING

DWAY SAFETY
Protect Frontline Workers

Control Evaluation reports provide some indication that the construction industry, specifically roadway construction and work zone management, typically rely on engineering and administrative controls. Furthermore, as it relates to vehicle intrusion incidents, the main recommendations from more than 133 of these reports included following the required and recommended actions of the Manual of Uniform Traffic Control Devices (MUTCD). Elimination, avoidance and substitution were not listed as recommendations in these NIOSH reports. According to Al-Bayati et al. (2023), the gaps in literature significantly limit researchers' ability to propose effective national highway worker safety strategies and solutions. These findings suggest the need to reevaluate the risk at the task level utilizing a risk-based decision-making approach. In Part 6: Temporary Traffic Control of the 11th edition of the MUTCD, key elements of worker safety and temporary traffic control management included training, temporary barriers, speed management, activity area planning, and worker safety planning through jobsite hazard assessments (FHWA, 2023). In addition, the manual recommends road closure, shadow vehicles, law enforcement utilization in highly vulnerable areas, and lighting for nighttime work. If following the manual is the primary recommendation for controlling hazards and preventing fatalities, as Al Bayati et al. (2023) suggest, then frontline workers and roadway industry safety professionals should have a method for determining the safest course of action.

To address these shortfalls, the authors have modified the hierarchy of risk treatment to include roadway-specific treatments with an associated risk treatment multiplier. For EHS professionals, the hierarchy of controls provides a systematic way of choosing the most effective means of eliminating or reducing hazards and their associated risks (Lyon & Popov, 2017). Elimination, avoidance and substitution, while being the most effective in reducing risks, might not be practical for all industries considering the risk of being struck by a vehicle is often unpredictable. Going further, the authors support organizations revising their current control methods to align with framework and processes found in ANSI/ASSP/ISO 31000 Risk Management and ANSI/ASSP/ISO/IEC 31010 Risk Management—Risk Assessment Techniques, which would allow industry professionals to assess risk and determine effectiveness and reliability.

R.O.A.D. Ready Risk Assessment Methodology

ANSI/ASSP/ISO/IEC 31010, Risk Management—Risk Assessment Techniques, provides several risk assessment methods. These methods, which are commonly used by safety and risk management professionals, have been modified by organizations throughout the years to adequately address industry needs. Considering road working conditions are typically high-severity exposures, a significant need exists for a tool that not only allows workers to calculate frequency and severity of risk but also incorporates other risk factors into the equation. In the authors' view, a risk-based decision-making tool should increase the number of roadway risk assessments and engagement between workers and management, as well as reduce the overall risk of working on or near the roadway. By implementing R.O.A.D. Ready, organizations can create a culture of safety that aims to save lives, prevent injuries and protect property (TMLIRP, n.d.). Figure 1 shows the authors' interpretation and modification of the risk-based decision-making and their practical applications for operations working on or near the roadway.

R.O.A.D. Ready is designed to create a discussion (risk communication) about the hazards associated with working on or near a roadway with special consideration for people, the public and associated equipment. An acronym was developed for relevance to roadway workers and for memory recall. Mnemonic acronyms can aid in learning,

APPLICABLE WORK ACTIVITIES

The R.O.A.D. Ready risk assessment process can be utilized by organizations that are engaged in activities on or near the roadway. Some examples of job tasks that may benefit from implementing R.O.A.D. Ready are:

- confined space entry into sanitary sewer
- pavement marking and striping
- roadway maintenance and repair
- bridge inspection and repair
- traffic signal maintenance and installation
- emergency response and incident management
- snow removal and ice control operations
- roadside vegetation management
- roadside litter and debris pickup
- construction work near a roadway, such as excavation or utility installation
- traffic control or flagging operations
- delivery drivers and transportation workers who operate vehicles on roadways
- parking lot or garage attendants who work near vehicle traffic
- roadside rest area or toll booth workers who interact with drivers on roadways
- roadside assistance technicians who provide vehicle maintenance and repair services on roadways

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FIGURE 2

R.O.A.D. READY PREPLANNING QUESTIONNAIRE

This questionnaire can be used as a starting point for organizations to identify the risks associated with roadway activities and implement the R.O.A.D. Ready strategy to help prevent injuries and fatalities.

The following questionnaire can be utilized by organizations to identify at-risk jobs related to the roadway:

1) What types of activities involve working on or near roadways?
2) Who is involved in roadway activities and what are their roles and responsibilities?
3) Are employees trained to identify hazards associated with working on or near roadways?
4) What are the hazards associated with working on or near roadways?
5) How are the hazards associated with working on or near roadways identified?
6) Are there any tools or equipment used in roadway activities that may pose a hazard to workers?
7) Are there any environmental factors that may pose a hazard to workers in roadway activities?
8) What are the traffic conditions in the area where roadway activities are performed?
9) Are there any controls in place to reduce or eliminate the hazards associated with working on or near roadways?
10) Are the controls in place effective in reducing or eliminating the hazards associated with working on or near roadways?
11) Are there any specific procedures or guidelines in place for roadway activities?
12) Are employees trained on the specific procedures or guidelines for roadway activities?
13) What are the consequences of failing to follow the specific procedures or guidelines for roadway activities?
14) Is there a system in place to monitor compliance with the specific procedures or guidelines for roadway activities?
15) How often are roadway activities reviewed to ensure that hazards are identified and controlled?

TABLE 1

EXPOSURE SEVERITY

Category	Description	Risk value
Low	In the event of exposure, the potential harm or consequences are minimal. Injuries or damage are unlikely to be severe.	1
Low to moderate	Exposure may lead to minor injuries or limited damage. The severity is manageable with prompt intervention.	2
Moderate	Exposure could result in injuries requiring medical attention or moderate damage. Significant intervention is needed.	3
Moderate to high	Exposure poses a significant risk, leading to severe injuries or extensive damage. Emergency response is crucial.	4
High	Exposure has the potential for catastrophic consequences, causing severe injuries, fatalities or extensive, irreparable damage.	5
This risk factor helps quantify the severity of exposure to hazards associated with the specific tasks.		

teaching and executing procedural tasks (Radović, 2019). Like a job hazard analysis or job safety analysis, R.O.A.D. Ready aims to raise situational awareness, summarize critical steps of the task, and discuss potential errors and review past experiences. The "Applicable Work Activities" sidebar (p. 27) represents work tasks that may benefit from including R.O.A.D. Ready in existing safety programs. This methodology not only assesses various risk levels, but it can also be used as a prejob briefing or review, which is designed to cognitively prime a worker or team for the safe execution of a task (Yorio & Wachter, 2014). When implementing R.O.A.D. Ready, organizations should consider the following five steps to successfully identify and communicate roadway risks:

- **Step 1: Recognize the hazards.** Recognize the hazards associated with working on or near the roadway. This step involves identifying all potential hazards that could cause harm to workers, property or the public. Recognizing the hazards is a critical first step in preventing incidents and injuries. By identifying hazards, organizations can take proactive steps to eliminate or control them before work begins. It is important to involve workers in this step as they are often the ones with the most knowledge of hazards in their work environments. Figure 2 represents potential pretask questions to establish a context of hazard recognition.
- **Step 2: Observe people, processes and equipment.** Next, observe the people—both workers and pedestrians—processes or associated tasks of the people, and equipment being used on or near the road. This critical step involves observing how work is being done compared to how it was planned. This process identifies potential gaps in training and communication or the need to rewrite procedures. By observing people, processes and equipment, organizations can gain a better understanding of the risks associated with specific tasks and take steps to mitigate them. This step should create an open dialogue between the worker and management but also provide management with an opportunity to discuss roles and responsibilities, site conditions, and equipment needs (Yorio & Wachter, 2014).
- **Step 3: Assess the risk level.** Assess the risk level associated with the roadway activity or task. This step typically involves determining the likelihood and severity of potential harm and evaluating the effectiveness of current controls. However, severity outcomes for working on or near the roadway are typically high and happen frequently; rather than rely

solely on the subjective assessment of likelihood and severity, the authors combined other risk factors that more accurately depict roadway risks. Empowering employees to competently assess risks, and encouraging them to adopt a mindset in which identifying and analyzing hazards and their risks becomes integral to how they approach and think about work, would be a major step forward in injury and fatality prevention (Manuele, 2014). This empowerment at the task level may encourage effective worker safety guidelines for organizations to adopt. Tables 1 through 5 provide roadway industry professionals with the ability to combine indicators such as task duration, task location, and estimated traffic volumes into the risk assessment process. Note that the information obtained from the Federal Highway Administration (FHWA), the MUTCD, or other relevant industry metrics are used as an example of the risk factors that should be considered when performing risk assessments for roadway workers. Proper modification and customization of these methods should be tailored to fit the needs of the organization. To determine the risk score, EHS and roadway industry professionals use the following formula (see Table 6, p. 30):

risk score = (exposure severity x exposure frequency) + (task duration + task location + traffic volume)

•**Step 4: Determine the safest course of action.** This step involves selecting controls that help mitigate the initial risk score. For this article, risk treatment options provided in Table 6 (p. 30) provides a modified version of the hierarchy of risk treatment and incorporate the MUTCD 11th edition. Once the initial risk score has been determined, workers should identify which treatment options allow the operation to continue at an acceptable risk level. Table 7 (p. 31) provides guidance on the level of risk associated with the task, encouraging frontline workers to select appropriate controls to achieve appropriate risk action levels. The selection of controls should be based on risk assessment and involve input from workers who may have suggestions to improve safety. Given the potential severity, frequency and other risk factors of these hazards, multiple treatment options could be selected. By nature, working on or near the roadway is dangerous, and doing so exposes roadway workers to various risks. However, zero risk is unlikely given the unpredictable nature of road users and the external environment. In the authors' opinion, organizations should attempt to manage risk during the design

TABLE 2
EXPOSURE LIKELIHOOD

Category	Description	Risk value
Low	The likelihood of workers being exposed to hazards during the task is minimal. There are effective controls in place, and the chance of exposure is rare.	1
Low to moderate	There is a low to moderate likelihood of exposure to hazards. Controls are present but may need occasional monitoring.	2
Moderate	There is a moderate likelihood of workers being exposed to hazards. Controls are in place, but occasional incidents may occur.	3
Moderate to high	There is a moderate to high likelihood of exposure. Controls are implemented, but incidents are more frequent.	4
High	The likelihood of workers being exposed to hazards is very high. Controls may not be fully effective, and incidents are frequent.	5
This risk factor helps quantify the likelihood of exposure to hazards associated with the specific tasks.		

TABLE 3
TASK DURATION

Category	Description	Risk value
Mobile	Work that moves intermittently or continuously	1
Short duration	Work that occupies a location up to 1 hour	2
Intermediate-term stationary	Work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour	3
Long-term stationary	Work that occupies a location more than 3 days	4
This risk factor considers the MUTCD's five categories of work duration and their time at a location, which is a major factor in determining the number and type of traffic control device used in a temporary traffic control zone.		

TABLE 4
TASK LOCATION

Category	Risk value
Outside the shoulder	1
On the shoulder with no encroachment	2
On the shoulder with minor encroachment	3
Within the median or within the traveled way	4
Within the traveled way	5
This risk factor considers the proximity of the task in relation to road users, one of the most significant risks with roadway activities. As a rule of thumb, the closer the work is to road users, the greater the number of temporary traffic control measures, thus the greater the risk (FHWA, 2023).	

TABLE 5
TRAFFIC VOLUME

Average daily volume	Risk value
Worker counts approximately 3 or fewer cars per minute	1
Worker counts between 3 and 7 cars per minute	2
Worker counts between 8 and 15 cars per minute	3
Worker counts between 16 and 35 vehicles per minute	4
Worker counts approximately 36 or more vehicles per minute	5

This risk factor considers the average annual daily traffic (AADT) which is the transportation industries metric for analyzing and forecasting traffic volume. Under the simple average method, AADT is estimated as the total traffic volume passing a point (or segment) of a road in both directions for a year divided by the number of days in the year (FHWA, 2023). For ease of use by frontline workers, AADT have been converted to approximate vehicles per minute.

or redesign phases but remain practical by following the principles of as low as reasonably practicable (ALARP). By determining the safest course of action, organizations can take steps to protect workers, property and the public from harm.

•**Step 5: Ready.** Lastly, implement the controls selected in step 4. This step involves ensuring that workers are aware of the controls and trained on how to use them. This final step incorporates the risk communication need referenced by Lyon and Popov (2017). By being ready, organizations can ensure that workers are protected, and work is performed safely and efficiently. If workers are not ready to proceed due to an elevated risk score, then the process begins again by revisiting steps 3 to 4. This ensures that organizations are continuously improving upon the risks identified while ensuring worker input.

The following examples demonstrate the practical application to certain activities or tasks. Remember, these examples provide a general framework for how to conduct a risk assessment using R.O.A.D. Ready and should be tailored to specific tasks and conditions for effective risk management.

Case Study

The example presented in Figure 3 shows the application of the R.O.A.D. Ready methodology to a specific work activity: roadway striping operations. This activity, particularly at intersections, presents myriad safety challenges due to the proximity of workers and moving vehicles, as well as the intricate traffic patterns involved. In the case example, to address these

TABLE 6
ROADWAY RISK SCORE FORMULA & MULTIPLIERS

RS = (ES x EF) + TD + TL + TV	MRS = RS x (1 – RT + RT + RT . . .)	
Risk treatment	**Treatment description**	**Risk treatment percent**
Road/highway closure	Avoidance/elimination	10
Automated flagger/pilot vehicle	Substitute	9
Speed reduction/funneling, lane reduction	Minimize	8
Internal traffic control plan/activity area planning	Simplify	7
Temporary traffic barriers/truck-mounted attenuators	Passive engineering	6
Work zone intrusion alarm/rumble strips	Active engineering	5
Law enforcement/temporary traffic control devices/advanced warning signage	Warnings administrative	4
MUTCD training/traffic control plan	Training/procedures administrative	3
Flagger	Other administrative	2
ANSI high-visibility vest	PPE	1

The hierarchy of risk treatment combines the hierarchy from ANSI/ASSP Z590.3 Prevention Through Design standard with concepts from inherently safer design control. Using the 11th edition of the MUTCD, a sample risk treatment schedule has been developed for EHS professionals.

Note. RS = risk score; ES = exposure severity; EF = exposure frequency; TD = task duration; TL = task location; TV = traffic volume; MRS = mitigating risk score; RT = risk treatment.

challenges, R.O.A.D. Ready is implemented to ensure the safety of workers engaged in these critical tasks. As workers embark on roadway striping, they are immediately confronted with potential hazards, including traffic congestion, vehicles encroaching on work zones, and the risk of collisions with both equipment and personnel. Through observation, workers monitor the number of passing vehicles, the positioning of coworkers and equipment, communication effectiveness, and adherence to the MUTCD.

Assessing the risk level entails an evaluation of various factors contributing to the overall risk. Assuming a moderate frequency of work zone intrusions (3) and a high severity of potential incidents (4), as well as a short task duration (2), a task location within the shoulder with minor encroachment (3) and higher traffic volume (4), the risk score is calculated [risk score = (exposure severity x exposure frequency) + task duration + task location + traffic volume].

This comprehensive evaluation yields a risk score of 22, signifying a risk action level of 2, whereby the risk associated with the task is moderate, requiring additional attention and specific controls. It may be necessary to implement supplementary safety measures.

The initial risk score serves as the guiding metric to determine the safest course of action. Workers can review recommended risk treatment options in Table 6. By selecting appropriate risk treatments such as the implementation of truck-mounted attenuators (a form of passive engineering) and a lane reduction (a form of minimizing traffic), the mitigating risk score is calculated using the following formula:

mitigating risk score = risk score x (1 - risk treatment)

This mitigating risk score is determined to be 17.6, which indicates a risk reduction of 20%. If the risk level is satisfactory, task preparation continues.

Preparedness is key to ensuring the effectiveness of risk mitigation measures. Workers are thoroughly briefed on safety procedures, including lane reduction protocols, truck-mounted attenuator placement, and the correct PPE usage. Continuous monitoring of the work environment enables prompt adjustments to control measures as necessary, fostering a culture of safety and reducing the likelihood of incidents and injuries.

Through the application of the R.O.A.D. Ready methodology, road maintenance and construction crews can proactively identify, assess and mitigate hazards associated with roadway striping operations at intersections. This systematic approach not only prioritizes the safety of workers but also promotes a culture of communication and accountability, ultimately improving worker engagement and their understanding of how risk treatments impact worker safety efforts.

TABLE 7
ROADWAY RISK ACTION

Action level	Description	Risk score range
1	The risk associated with the task is deemed low. Standard safety measures are sufficient, and the operation can proceed with minimal adjustments.	1 to 15
2	The risk associated with the task is moderate, requiring additional attention and specific controls. It may be necessary to implement supplementary safety measures.	16 to 25
3	The risk associated with the task is high, indicating a significant potential for harm. Immediate and comprehensive risk management actions are necessary to mitigate the identified risks.	26 to 40

FIGURE 3
CASE EXAMPLE: ROADWAY STRIPING AT INTERSECTION

This case example shows the application of the R.O.A.D. Ready methodology to a specific work activity: roadway striping operations.

Step 1: Recognize the hazards
- Potential hazard: Traffic congestion, vehicles encroaching on work zones, and the risk of collisions with both equipment and personnel

Step 2: Observe people, processes and equipment
- Observe workers' positioning during installation and their communication with each other.
- Observe number of passing vehicles.
- Compare the installation process to the planned procedures to identify gaps.
- Review communication methods between workers.

Step 3: Assess the risk level
- Likelihood: Moderate frequency of work zone intrusions (3)
- Severity: High severity of potential incidents (4)
- Task duration: Short task duration (2)
- Task location: Location within the shoulder with minor encroachment (3)
- Traffic volume: Worker counts between 16 and 35 vehicles per minute (4)

Step 4: Determine the safest course of action
- Minimize: Lane reduction
- Passive engineering: Truck-mounted attenuator

Step 5: Ready
- Workers are thoroughly briefed on safety procedures, including lane reduction protocols, truck-mounted attenuator placement and the correct PPE use.

Conclusion & Implications for Practice

R.O.A.D. Ready offers a systematic and effective approach for identifying and managing roadway risks in various job tasks and occupations. More than 220 participating entities in Texas have accepted the challenge of enhancing worker


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R.O.A.D. Ready promotes a culture of continuous improvement, where workers and management work together to identify and control hazards, making the workplace safer for everyone.

safety, encouraging collaboration between workers and management, and creating a proactive safety culture. With the alarming statistics of work-related fatalities and injuries related to roadway incidents, organizations must prioritize the safety of their workers who operate on or near roadways. By investing in risk assessment and risk communication, organizations demonstrate their commitment to protecting workers' lives, preventing injuries and safeguarding property. R.O.A.D. Ready promotes a culture of continuous improvement, where workers and management work together to identify and control hazards, making the workplace safer for everyone. By recognizing hazards, observing people, processes and equipment, assessing risk levels, determining the safest course of action, and being ready to implement controls, organizations can proactively mitigate risks and create a culture of safety. The R.O.A.D. Ready process not only enhances situational awareness but also encourages collaboration between workers and management, empowering employees to take ownership of their safety while measuring the risks associated with the operation.

Future research efforts should focus on expanding the application of the R.O.A.D. Ready framework to other high-risk industries where dynamic environmental factors similarly impact operational safety. This would not only validate the framework's versatility but also refine its efficacy across different settings. Additionally, integrating technological tools that automate data collection and risk score calculation could significantly streamline the risk assessment process. By leveraging technology, EHS professionals can ensure continuous, real-time updates to risk scores, enhancing the responsiveness of the framework to changing conditions in the field. Further development should also explore how coefficients associated with the task-specific modifiers (task duration, task location and estimated traffic volume) impact risk evaluation. Enhancing these coefficients allows for more precise adjustments of each factor's influence based on empirical data and expert analysis, acknowledging that not all factors contribute equally to the overall risk. This nuanced approach to risk modulation can better tailor safety measures to specific hazards encountered in various industrial contexts, ultimately leading to more effective risk management strategies. **PSJ**

References

Al-Bayati, A.J., Ali, M. & Nnaji, C. (2023). Managing work zone safety during road maintenance and construction activities: Challenges and opportunities. *Practice Periodical on Structural Design and Construction, 28*(1). https://doi.org/10.1061/PPSCFX.SCENG-1212

ASSP. (2022, March 21). *Episode 77: Using worker feedback to improve your safety and health management system* [Audio podcast episode]. In *The Case for Safety* podcast. https://assp.us/3ucrczD

ASSP. (2024). Guidance and implementation manual for ANSI/ASSP Z10.0-2019 occupational health and safety management systems (ASSP GM-Z10.100-2024). https://assp.us/4diCqbZ

Esposito, P. (2023, June 5-7). *Implementing and measuring risk assessment data: Successful business integration* [Conference presentation]. Safety 2023 Conference and Expo, San Antonio, TX.

Federal Highway Administration (FHWA). (2023). Manual on uniform traffic control devices for streets and highways (MUTCD): Part 6—Temporary traffic control (11th ed.). https://bit.ly/4daUsgc

Geronsin, R. (2001). Job hazard assessment: A comprehensive approach. *Professional Safety, 46*(12), 23-30.

Lyon, B.K. & Hollcroft, B. (2012, Dec.). Risk assessments: Top 10 pitfalls and tips for improvement. *Professional Safety, 57*(12), 28-34.

Lyon, B.K. & Popov, G. (2017). Communicating and managing risk: The key result of risk assessment. *Professional Safety, 62*(11), 35-44.

Manuele, F.A. (2014). *Advanced safety management: Focusing on Z10 and serious injury prevention* (2nd ed.). Wiley.

Radović, T. & Manzey, D. (2019). The impact of a mnemonic acronym on learning and performing a procedural task and its resilience toward interruptions. *Frontiers in Psychology, 10*(2522), PMID: 31781008. https://doi.org/10.3389/fpsyg.2019.02522

Texas Municipal League Intergovernmental Risk Pool (TMLIRP). (n.d.). R.O.A.D. Ready. https://bit.ly/44D1gkC

Yorio, P.L. & Wachter, J.K. (2014). Safety-and-health-specific high-performance work practices and occupational injury and illness prevention: The mediating role of task and team safety proficiency behaviors. *Journal of Safety, Health and Environmental Research, 10*(1), 123-134.

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