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# SHORT LINE SAFETY INSTITUTE: SAFETY CULTURE GROWTH ACROSS TWO RAILROADS

## SUMMARY

Research shows that a strong safety culture can influence a railroad's safety outcomes, resulting in less frequent, less severe accidents. The U.S. Department of Transportation's (DOT) Safety Council defines safety culture as "the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands" (Morrow, S., & Coplen, M., 2017).

The Federal Railroad Administration (FRA) recognizes the importance and function of a strong safety culture to railroad safety. Since 2014, FRA's Office of Research, Development and Technology (RD&T) has supported the American Short Line and Regional Railroad Association (ASLRRA) in its efforts to establish a Short Line Safety Institute (SLSI) focused on improving safety culture on short line and regional railroads. SLSI conducts voluntary, non-punitive, confidential Safety Culture Assessments (SCAs) for short line and regional railroads across the United States. SCAs provide a diagnostic appraisal of a railroad's safety culture at a given point in time, with documented opportunities for improvement across the DOT Safety Council's Ten Core Elements of a Strong Safety Culture, adapted for a railroad setting (Morrow, S., & Coplen, M., 2017).

This research summarizes findings from a case study analysis of initial and follow-up SCA reports completed for two railroads.

## BACKGROUND

SLSI began industry-wide implementation of its SCA model in 2016. It was originally envisioned that the SCA model would include post-

Assessment processes, to measure changes made by railroads following initial Assessments. In 2019, SLSI developed its post-Assessment processes. To date, SLSI has completed post-Assessments for two railroads referred to as Railroad 1 and Railroad 2 in this report, both of which completed their first Assessments in 2017.

SLSI's SCA model utilizes teams of two Assessors and a multi-method, data-focused, site-customized, in-depth process that involves survey, observation, interview, and document inventory. SLSI uses the Ten Core Elements of a Strong Safety Culture as a theoretical framework to operationalize its definition of safety culture.

Each on-site Assessment lasts approximately a week. At the end of each Assessment, the participating railroad receives a final report that presents the Assessment Findings, in relation to the Ten Core Elements of a Strong Safety Culture. In addition to presenting positive and negative findings about the railroad's safety culture, the report also details Opportunities for Improvement (opportunities), where the Assessors suggest organizational changes that, if implemented, may strengthen the railroad's safety culture.

## CASE STUDY ANALYSIS

To increase understanding of the safety culture growth realized by participating railroads over time, the Volpe National Transportation Systems Center (Volpe) completed a case study analysis of the initial and follow-up SCA reports for Railroad 1 and Railroad 2.



## METHODS

To gauge safety culture growth across the two participating railroads, the Volpe team systematically compared each railroad’s initial SCA report with its follow-up SCA report. The analysis, framed around the Ten Core Elements of a Strong Safety Culture, focused on two aspects:

1. Differences between first-time and second-time findings and;
2. Whether the railroad took action on noted opportunities for improvement.

Volpe analysts identified positive and negative safety culture indicators under each of the Ten Core Elements of a Strong Safety Culture. Using these indicators, the Volpe team estimated whether the safety culture under a particular Core Element strengthened, stayed about the same, or weakened. The Volpe team then determined whether the railroad’s overall safety culture, across all Ten Core Elements, showed evidence of strengthening.

To support interpretation of the SCA summary reports, the Volpe team reviewed areas of uncertainty with the SLSI Assessors.

## RESULTS

Both railroads demonstrated evidence of safety culture growth. Figure 1 shows the changes that took place from 2017 to 2019, by Core Element. A plus sign indicates strengthening, a negative sign indicates weakening, and an equal sign indicates no change.

The analysis identified six Core Elements that strengthened from 2017 to 2019 for both railroads. Two Core Elements showed no change for both railroads, and one Core Element weakened for both railroads. For the final two Core Elements, the results differed by railroad. Railroad 1’s safety culture weakened under Core Element 9, while Railroad 2’s safety culture strengthened. Conversely, Railroad 1’s safety culture strengthened under

Core Element 10, while Railroad 2’s safety culture showed no substantial change.

In both the initial and follow-up SCA reports, SLSI issued multiple opportunities for the two railroads to act on. After the initial Assessment, Railroad 1 fully implemented 10 opportunities and partially implemented three opportunities out of 19 that SLSI made. Railroad 2 fully implemented 8 of the 15 opportunities that SLSI made in 2017

|              |   | Change in SCA from 2017-2019 |            |
|--------------|---|------------------------------|------------|
| Core Element |   | Railroad 1                   | Railroad 2 |
| 1            | Leadership Is Clearly Committed to Safety                               | +                            | +          |
| 2            | The Railroad Practices Continuous Learning                              | +                            | +          |
| 4            | Reporting Systems and Accountability Are Clearly Defined                | +                            | +          |
| 6            | Employees Feel Personally Responsible for Safety                        | +                            | +          |
| 7            | There Is Open and Effective Communication across the Railroad           | +                            | +          |
| 3            | Decisions Demonstrate That Safety Is Prioritized Over Competing Demands | =                            | =          |
| 5            | There Is a Safety Conscious Work Environment                            | =                            | =          |
| 8            | Mutual Trust is Fostered between Employees and the Railroad             | -                            | -          |
| 9            | The Railroad Is Fair and Consistent in Responding to Safety Concerns    | -                            | +          |
| 10           | Training and Resources Are Available to Support Safety                  | +                            | =          |

Legend:  
 + Positive change   - Negative change   = No change

Figure 1. Change in Safety Culture Elements, 2017–2019

## CONCLUSIONS

Both railroads implemented the majority of the opportunities identified by SLSI in 2017, which supported a stronger safety culture in 2019. This case study raises the possibility that it may be easier for railroads to strengthen their safety culture under some Core Elements and more difficult under others. This was supported by the fact that both railroads showed improvements across the same six Core Elements and the same decline under one Core Element.

For both railroads, the Assessors reported that there was room for safety culture improvement. The Assessors repeated or expanded upon seven opportunities for Railroad 1 and eight opportunities for Railroad 2 in their second Assessments.

## FUTURE ACTION

The results of this study suggest that the SCA process and follow-up support hold promise for strengthening railroad safety culture. Note that the results of this study should be interpreted



with caution, given the very small number of railroads included in the analysis. Additional data is needed to determine if these results generalize beyond the two railroads studied.

A larger study examining additional railroads would increase understanding of the relationship between the Assessment process and changes observed at the railroads.

Future research could also examine barriers to improving safety culture and identify ways that organizations like SLSI can equip railroads with the tools they need to implement best practices.

## REFERENCES

Morrow, S., & Copen, M. (2017). *Safety Culture: A Significant Influence on Safety in Transportation*. Washington, DC: Federal Railroad Administration.

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## CONTACT

### Starr Kidda, PhD

Chief, Human Factors Division  
Federal Railroad Administration  
Office of Research, Development and  
Technology  
1200 New Jersey Avenue, SE  
Washington, DC 20590  
(202) 493-1300  
[Starr.Kidda@dot.gov](mailto:Starr.Kidda@dot.gov)

### Heidi D. Howarth, PhD

Engineering Psychologist  
U.S. DOT Volpe Center  
Transportation Human Factors Division  
55 Broadway  
Cambridge, MA 02142  
(617) 494-2522  
[Heidi.Howarth@dot.gov](mailto:Heidi.Howarth@dot.gov)

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Safety culture, safety culture model, safety culture assessment, safety culture measurement, evaluation, short line railroads, regional railroads, human factors

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