



**SCAN TEAM REPORT**  
NCHRP Project 20 68A, Scan 14-03

# Successful Approaches For The Development Of An Organization-Wide Safety Culture In Transportation Agencies

*Supported by the*  
National Cooperative Highway Research Program

The information contained in this report was prepared as part of NCHRP Project 20-68A U.S. Domestic Scan, National Cooperative Highway Research Program.

SPECIAL NOTE: This report **IS NOT** an official publication of the National Cooperative Highway Research Program, Transportation Research Board, or the National Academies of Sciences, Engineering, and Medicine.



**Safety**  
doesn't happen by  
**Accident**



---

# Acknowledgments

The work described in this document was conducted as part of NCHRP Project 20-68A, the U.S. Domestic Scan program. This program was requested by the American Association of State Highway and Transportation Officials (AASHTO), with funding provided through the National Cooperative Highway Research Program (NCHRP). The NCHRP is supported by annual voluntary contributions from the state Departments of Transportation. Additional support for selected scans is provided by the U.S. Federal Highway Administration and other agencies.

The purpose of each scan, and of Project 20-68A as a whole, is to accelerate beneficial innovation by facilitating information sharing and technology exchange among the states and other transportation agencies, and identifying actionable items of common interest. Experience has shown that personal contact with new ideas and their application is a particularly valuable means for such sharing and exchange. A scan entails peer-to-peer discussions between practitioners who have implemented new practices and others who are able to disseminate knowledge of these new practices and their possible benefits to a broad audience of other users. Each scan addresses a single technical topic selected by AASHTO and the NCHRP 20-68A Project Panel. Further information on the NCHRP 20-68A U.S. Domestic Scan program is available at <http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1570>.

This report was prepared by the scan team for Domestic Scan 14-03, *Successful Approaches for the Development of an Organization-Wide Safety Culture in Transportation Agencies*, whose members are listed below. Scan planning and logistics are managed by Arora and Associates, P.C.; Harry Capers is the Principal Investigator. NCHRP Project 20-68A is guided by a technical project panel and managed by Andrew C. Lemer, PhD, NCHRP Senior Program Officer.

The scan team members include the following individuals:

**Rudy Malfabon**, PE, Nevada DOT, AASHTO Chair

**Timothy E. Barnett**, PE, PTOE, Alabama DOT

**Steven A. Buckley**, PE, Kansas DOT

**Katie Fleming**, Minnesota DOT

**John C. Milton**, PhD, PE, Washington State DOT

**Chimai Ngo**, FHWA

**Mark Shelton**, PE, Missouri DOT

**Mike Tooley**, Montana DOT

**Nicholas J. Ward**, PhD, Montana State University, Subject Matter Expert

---

# Disclaimer

The information in this document was taken directly from the submission of the authors. The opinions and conclusions expressed or implied are those of the scan team and are not necessarily those of the Transportation Research Board or its sponsoring agencies. This report has not been reviewed by and is not a report of the Transportation Research Board or the National Academies of Sciences, Engineering, and Medicine.

# Scan 14-03

## Successful Approaches for the Development of an Organization-Wide Safety Culture in Transportation Agencies

REQUESTED BY THE

American Association of State Highway and Transportation Officials

PREPARED BY

**Rudy Malfabon, PE,**  
*Nevada DOT, AASHTO Chair*

**Timothy E. Barnett, PE, PTOE,**  
*Alabama DOT*

**Steven A. Buckley, PE,**  
*Kansas DOT*

**Katie Fleming,**  
*Minnesota DOT*

**John C. Milton, PhD, PE,**  
*Washington State DOT*

**Chimai Ngo, FHWA**

**Mark Shelton, PE,**  
*Missouri DOT*

**Mike Tooley,**  
*Montana DOT*

**Nicholas J. Ward, PhD,**  
*Montana State University,*  
*Subject Matter Expert*

SCAN MANAGEMENT

**Arora and Associates, P.C.**  
Lawrenceville, NJ

August 2015

The information contained in this report was prepared as part of NCHRP Project 20-68A U.S. Domestic Scan, National Cooperative Highway Research Program.

SPECIAL NOTE: This report IS NOT an official publication of the National Cooperative Highway Research Program, Transportation Research Board, or the National Academies of Sciences, Engineering, and Medicine.

## TABLE OF CONTENTS

---

---

# Table of Contents

Abbreviations and Acronyms .....	VI
Executive Summary.....	ES-1
1.0 Introduction.....	1.1
2.0 Cultural Transformation .....	2.1
3.0 Organizational Factors.....	3.1
4.0 Implementation Factors.....	4.1
5.0 Recommended Next Steps .....	5.1
6.0 Dissemination Strategies .....	6.1

# List of Appendices

**Appendix A: Scan Team Biographical Sketches ..... A-1**

**Appendix B: Scan Team Contact Information..... B-1**

**Appendix C: Amplifying Questions ..... C-1**

**Appendix D: Host Agency Contacts ..... D-1**

# List of Figures

Figure 1.1. Schematic illustration of facets of organizational culture ..... 1-2

Figure 1.2 Eight-step model for successful program implementation<sup>5</sup> ..... 1-5

Figure 2.1 Examples of imagery used to change employee behavior based on their cultural value about protecting family ..... 2-2

Figure 2.2 Example of imagery used to change road user behavior based on their cultural value about protecting family ..... 2-2

Figure 4.1 Impetus for MnSafe based on a period of no improvement in injury rates..... 4-1

Figure 4.2 Example of roadway messaging of Iowa DOT’s Message Monday program ..... 4-3

Figure 4.3 Integration of vehicle safety across global business functions in Monsanto ..... 4-4

Figure 4.4 Monsanto’s Young Driver Program in Brazil..... 4-5

Figure 4.5 Family BBQ at Granite Construction..... 4-6

Figure 4.6 An example of an effective Granite strategy that became a best practice..... 4-7

# List of Tables

Table 1.1 Summary of participating organizations ..... 1-3

Table 3.1 Reported status of organizational factors to establish successful program..... 3-2

Table 4.1 Safety program implementation factors cross-referenced with Kotter’s5 eight-stage model for organization culture transformation..... 4-9



---

# Abbreviations and Acronyms

<b>AASHTO</b>	American Association of State Highway and Transportation Officials
<b>DOT</b>	Department of Transportation
<b>EDC</b>	Every Day Counts (FHWA)
<b>FHWA</b>	Federal Highway Administration
<b>Granite</b>	Granite Construction
<b>Iowa DOT</b>	Iowa Department of Transportation
<b>MnDOT</b>	Minnesota Department of Transportation
<b>MnSAFE</b>	Minnesota statewide workplace safety initiative for state employees
<b>NCHRP</b>	National Cooperative Highway Research Program
<b>SHSP</b>	Strategic Highway Safety Plan
<b>TZD</b>	Toward Zero Deaths (FHWA)
<b>USDOT</b>	U.S. Department of Transportation
<b>WTSC</b>	Washington Traffic Safety Commission

---

# Executive Summary

Organizations need to establish safety programs that reinforce behavioral compliance with existing safety policies, procedures, and regulatory requirements (i.e., compliance safety programs) and motivate spontaneous and innovative behaviors that proactively support the safety of others within the organization (i.e., proactive safety programs). However, the success of implementing such programs is dependent on the organization's safety culture. Therefore, it is necessary to understand the factors that support strong safety cultures within organizations.

For this scan, we have adopted a simplified version of the definition of organization safety culture proposed by the US Department of Transportation <sup>1</sup>:

***Safety culture within an organization is exemplified by  
“the shared values and behaviors that demonstrate  
a commitment to safety over competing goals.”***

Based on this definition, safety programs can strengthen (i.e. transform) the culture of an organization by several means, including increasing the valuation of safety and expanding behavioral strategies to achieve safety goals. In addition, we suggest that a strong safety culture is also evident from the use of strategies that recognize the role that local culture plays in the engagement of protective or risky behaviors.

Specifically, the focus of this scan was on the organization conditions in which successful programs emerged and the process by which successful programs were implemented.

This scan used a case study methodology whereby the scan team obtained detailed data about safety programs<sup>2</sup> from a select group of safety-related organizations. Specifically, the team selected these organizations because of their reputation for demonstrating strong safety cultures. The presumption was that factors common to these organizations should be related to their shared ability to establish successful safety programs.

The data collection method involved two phases. In the first phase, representatives of each organization completed a comprehensive questionnaire. In the second phase of data collection, a representative from each organization made a presentation to the NCHRP scan team about their implemented safety programs.

---

1 Safety Council (2011), Safety Culture: A significant driver affecting safety in transportation, research paper prepared for the USDOT Safety Council, U.S. Department of Transportation, Washington, DC, p 2

2 Safety program refers to a systematic set of actions an organization takes with the intent to improve safety (e.g., reduce reportable injuries related to work activities).

---

Consistent with prior research<sup>3,4</sup>, the data the participating organizations provided revealed several existing contextual factors that appeared to establish the conditions for successfully developing the safety program:

- Employees shared a common bond with organization values and mission.
- The organization's management and leadership are publically committed to safety.
- Safety goals are formalized in organization planning and in strategic documents.
- There is open communication within the organization about safety programs and goals.
- The organization provides safety training for all employees.
- The organization has policies and equipment that promote and support safety in workplace.
- There is low turnover in the organization workforce, including its leadership.
- The organization has a democratic style of management and leadership (i.e., based on worker input).
- The organization emphasizes safety as part of its internal and public image.
- The organization has a vision for the goal (i.e., success) of the safety culture program.
- Many organizational levels are involved in the program's design and implementation.
- Failure of safety can be catastrophic and will affect the organization's public reputation.

It was also apparent that these successful safety programs shared several aspects of program implementation that can be represented by Kotter's<sup>5</sup> eight-step model for implementing programs to transform organization culture.

---

3 Austin EK (2010), The possibility of effective participatory governance: The role of place and the social bond, *Public Administration and Management*, 15(1), 221–258

4 Sorensen JN (2002), Safety culture: A survey of the state-of-the-art Reliability Engineering and System Safety, 76, 189–204

5 Kotter JP (2002), Leading change: Why transformation efforts fail, *Harvard Business Review*, January, 1–9



# Introduction

According to Fugas, Silva, and Melia<sup>6</sup>, organizations need to establish safety programs that reinforce behavioral compliance with existing safety policies, procedures, and regulatory requirements (i.e., compliance safety programs) and motivate spontaneous and innovative behaviors that proactively support the safety of others within the organization (i.e., proactive safety programs). The intent of such programs is to reduce reportable injuries related to work activities. However, the impetus and success of implementing such programs is dependent on the organization's safety culture<sup>7</sup>. Therefore, it is necessary to understand the factors that support strong safety cultures within organizations.

To support this understanding, it is necessary to recognize three facets that represent the culture of an organization as shown in **Figure 1.1**<sup>8,9,10</sup>:

- **Paradigm** – values that the organization seeks to satisfy as part of its stated mission. For example, this may be embodied in statements made by organization leaders, such as “improving the safety of the nation’s transportation system is the highest priority of the U.S. Department of Transportation.”<sup>11</sup> (USDOT)
- **Strategies** – behavioral efforts based on beliefs about hazards that threaten the organization’s stated values (paradigm) and its ability to respond with strategic interventions (e.g., the belief that “road users are responsible for following the rules for using the road transport system set by the system designers”<sup>12</sup>). Such beliefs may then support the assumption that increased enforcement is an effective strategy to achieve safety goals.
- **Artifacts** – organizational products that codify the organization’s values and belief systems (e.g., documentation, operating policies, and leadership structures). For example, the Strategic Highway Safety Plan<sup>13</sup> (SHSP) developed by each state’s Department of Transportation (DOT) “is a data-driven, multi-year comprehensive plan that establishes statewide goals, objectives, and key emphasis areas and integrates the four E’s of highway safety: engineering, education, enforcement, and emergency medical services.”<sup>14</sup>

6 Fugas CS, SA Silva, and JL Melia (2012), Profiling safety behaviors: Exploration of the sociocognitive variables that best discriminate between different behavioral patterns, *Risk Analysis*, 33, 838–850 Choudhry RM, D Fang, and S Mohamed (2007), The nature of safety culture: A survey of the state-of-the-art, *Safety Science*, 45, 993–1012

7 Choudhry RM, D Fang, and S Mohamed (2007), The nature of safety culture: A survey of the state-of-the-art, *Safety Science*, 45, 993–1012

8 Guldenmund FW (2000), The nature of safety culture: a review of theory and research, *Safety Science*, 34, 215–257

9 Johnson G (1992), Managing strategic change: strategy, culture and action, *Long Range Planning*, 25, 28–36 Schein EH (1992), *Organizational Culture and Leadership*, Jossey-Bass, San Francisco

10 Schein EH (1992), *Organizational Culture and Leadership*, Jossey-Bass, San Francisco USDOT (2013a), US Department of Transportation home page accessed online September 6, 2013,

11 USDOT (2013a), US Department of Transportation home page accessed online September 6, 2013, <http://www.dot.gov/mission/about-us>

12 Whitelegg J and G Haq (2006), Vision Zero: Adopting a target of zero for road traffic fatalities and serious injuries, Stockholm Environment Institute

13 Strategic Highway Safety Plan (SHSP), Safety, Federal Highway Administration, U.S. Department of Transportation, <http://safety.fhwa.dot.gov/hsip/shsp/>

14 Strategic Highway Safety Plan (SHSP), Safety, Federal Highway Administration, U.S. Department of Transportation, <http://safety.fhwa.dot.gov/hsip/shsp/>



**Figure 1.1. Schematic illustration of facets of organizational culture<sup>15</sup>**

Within this framework, safety culture is represented by a paradigm that includes the valuation of safety, a belief system that supports effective strategies to improve safety, and artifacts that formalize the safety mission and supporting strategies. Specifically, we have adopted a simplified version of the USDOT's proposed definition of organizational safety culture<sup>1</sup>.

***Safety culture within an organization is exemplified by  
“the shared values and behaviors that demonstrate  
a commitment to safety over competing goals.”***

Based on this definition, safety programs can strengthen (i.e. transform) an organization's culture by several means, including increasing the valuation of safety and expanding behavioral strategies to achieve safety goals. In addition, the scan team suggests that a strong safety culture is also evident from the use of strategies that recognize the role that local culture plays in the engagement of protective or risky behaviors.<sup>16</sup>

<sup>15</sup> Strategic Highway Safety Plan (SHSP), Safety, Federal Highway Administration, U.S. Department of Transportation, <http://safety.fhwa.dot.gov/hsip/shsp/>

<sup>16</sup> This means implementing behavioral strategies that use cultural factors as a mechanism for influencing safe behavior (e.g., see Ward NJ, J Otto, and J Linkenbach [2014], A primer for safety culture, ITE Journal, May 2014, 42–47).

## Goal

The goal of this scan was to identify key factors that support the successful implementation of programs to transform the safety culture within transportation organizations. Specifically, this scan's focus was on the organization conditions in which successful programs emerged and the process by which successful programs were implemented.

Thus, this scan had two fundamental objectives:

- Identify which factors within an organization are important to establish successful cultural transformation programs (see **Section 3**).
- Identify which factors within the process of implementing cultural transformation programs are important to ensure success (see **Section 4**).

## Method

This scan used a case study methodology. With this methodology, the scan team<sup>17</sup> selected and reviewed detailed data<sup>18</sup> about safety programs from a select group of safety-related organizations.<sup>19</sup> The scan team selected these organizations because of their reputation for demonstrating strong safety cultures. The presumption was that factors common to these organizations should be related to their shared ability to establish successful safety programs. However, organizations that were heavily regulated (e.g., a nuclear power company) or had robust command and control structures (e.g., a branch of the U.S. military) were excluded because these contexts are substantially different from state transportation agencies, to which this scan's results are expected to be applied.

**Table 1.1** presents a summary of the organizations that provided data for this scan.

Name (Abbreviation)	Sector	Description
Federal Highway Administration <sup>20</sup> (FHWA)	USDOT	FHWA provides stewardship over the construction, maintenance, and preservation of the nation's highways, bridges, and tunnels. It also conducts research and provides technical assistance to state and local agencies to improve safety, mobility, and livability, and to encourage innovation.
Iowa Department of Transportation <sup>21</sup> (Iowa DOT)	State Agency	Iowa DOT manages more than 9,400 miles of state-owned highways and ramps and 4,200 bridges, which includes all interstate, U.S., and state roadways within Iowa. It licenses 2.5 million people, enforces all laws and regulations related to commercial motor vehicles, and assists in the preservation and development of safe and reliable transportation through air, transit, freight, river navigation, and trails. The department currently employs about 2,600 employees and is headquartered in Ames.

**Table 1.1 Summary of participating organizations (continued on next page)**

17 See Appendix A for biographical sketches and Appendix B for contact information.

18 This data was obtained from agency responses to amplifying questions the scan team provided. See Appendix C for these questions.

19 See Appendix D for host agency contact information.

20 Safety, Federal Highway Administration, U.S. Department of Transportation, <http://safety.fhwa.dot.gov/1>.

21 Iowa Department of Transportation, <http://www.Iowa DOT.gov/index.html#/services>

Name (Abbreviation)	Sector	Description
MnSafe: Safety Accountability From Everyone <sup>22</sup> (MnSafe)	Joint State Agency Safety Program (led by Minnesota Department of Administration)	MnSafe is the statewide workplace safety initiative for Minnesota state employees. It recognizes that safety within state agencies can only be successful if everyone embraces safety culture in all of their workplaces. The Minnesota Department of Administration manages this safety program, which provides key professional administrative services to state agencies. A primary state agency partner in this program is the Minnesota DOT, which engages in the administration, regulation, licensing, planning, inspection, maintenance, and construction related to all modes of transportation services and facilities for the state.
Washington Traffic Safety Commission <sup>23</sup>	State Commission	The WTSC is the state’s designated highway safety office. It leads statewide efforts and builds partnerships to save lives and prevent injuries on its roadways for the health, safety, and benefit of its communities.
Granite Construction <sup>24</sup> (Granite)	Construction	Granite is a full-service general contractor, construction management firm, and construction materials producer in North America. Consistently recognized as one of the top 25 largest construction companies in the U.S., Granite specializes in heavy civil, complex infrastructure projects serving the transportation, industrial, and federal markets.
Monsanto <sup>25</sup>	Agriculture	Monsanto delivers agricultural products that support farmers all around the world, including seeds that are used by farmers, consumers, and lawn-and-garden professionals.

*(continued) Table 1.1 Summary of participating organizations*

It is important to note that for practical and political reasons this selection criteria excluded organizations with weak safety cultures.<sup>26</sup> Consequently, it is not possible to verify that the identified factors in the selected strong-culture organizations are absent from excluded weak culture organizations. Therefore, the causal effect of these factors on the development of strong safety cultures cannot be logically asserted.

Instead, it was necessary to interpret and analyze factors identified from this scan within the framework of previous research that has identified and compared factors between successful and unsuccessful organizations. For this purpose, we used research by Austin<sup>3</sup> and Sorensen<sup>4</sup> that have identified organizational factors that define the conditions in which successful transformation programs have emerged. In addition, we also used Kotter’s<sup>5</sup> model that specifies the necessary steps for successful program implementation. Thus, by cross-referencing the factors observed in this scan with those specified in these “validated” models, we can infer which factors in our participating organizations supported their programs’ success. We can then have some degree of confidence in

<sup>22</sup> Eliminating Workplace Injuries, MnSAFE: Safety Accountability From Everyone, <http://mn.gov/mnsafe/>

<sup>23</sup> Washington Traffic Safety Commission, [wtsc.wa.gov](http://wtsc.wa.gov)

<sup>24</sup> Granite Construction, Watsonville, CA, [www.graniteconstruction.com/](http://www.graniteconstruction.com/)

<sup>25</sup> Monsanto, St. Louis, MO, <http://www.monsanto.com/pages/default.aspx>

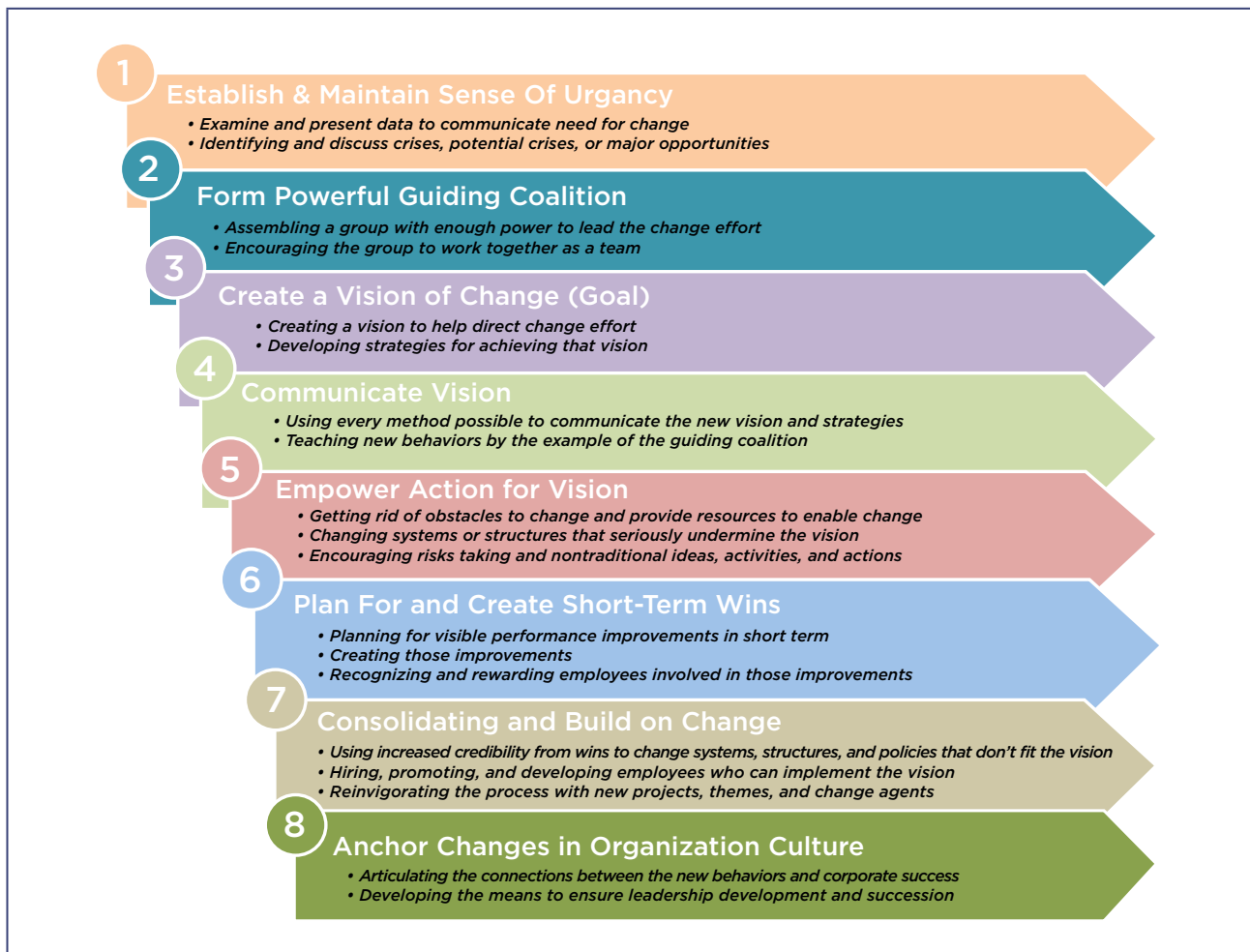
<sup>26</sup> This exclusion was necessitated by the need to focus limited project resources only on successful cases and the expected resistance of organizations to be identified as unsuccessful cases.



recommending these same factors to other organizations seeking to develop in their own efforts to transform their safety cultures.

For example, suppose that the scan observed that all the participating organizations used rewards for obtaining short-term goals in their safety programs. Logically, the use of rewards can only be asserted to have a causal effect on program success if it is absent from those organizations that had failed programs. However, because we do not have a comparison group of unsuccessful organizations, we cannot make this assertion.

Instead, we can cross-reference this factor with the steps for successful program implementation that were developed by Kotter<sup>5</sup> based on previous analyses of successful and unsuccessful organizations. As shown in **Figure 1.2**, capitalizing on short-term goals is indeed part of this validated model (Step 6). Therefore, we can infer that the use of rewards within our sample of participating organizations was also a key factor for their success. We would then recommend this factor for other organizations seeking to transform their own safety culture.



**Figure 1.2** Eight-step model for successful program implementation<sup>5</sup>

The data collection method involved two phases. In the first phase, representatives of each organization completed a comprehensive questionnaire (see **Appendix C**). This questionnaire was designed to collect information about the:

- History and nature of the safety programs that involved cultural transformation
- Status (presence or absence) and relevance of **organizational factors** that prior research has shown can enable successful safety programs<sup>3,4</sup>
- Specific efforts made within each of Kotter's<sup>5</sup> recommended steps for successful program implementation (i.e., **implementation factors**) as shown in **Figure 1.2**.

In the second phase of data collection, a representative from each organization made a presentation to the scan team about their organization's implemented safety programs. At that time, the team asked additional questions to clarify responses made to the questionnaire and to obtain supplemental information relevant to the scan's goals. The discussion focused on identifying factors involved in the implementation process that seemed to support the successful transformation of the organization's safety culture.



# Cultural Transformation

This section provides examples of specific safety programs that the participating organizations presented. These programs could be classified under three possible ways to strengthen (i.e. transform) organization safety culture:

- **Increase the shared valuation of safety**

These programs seek to increase the valuation of safety among organization members.

*Example:* The Toward Zero Deaths<sup>27</sup> (TZD) National Strategy on Highway Safety is a communication effort to inspire states, organizations, and companies to prioritize safety as a primary value, with a goal of zero traffic fatalities. Numerous transportation organizations, including Iowa DOT, Minnesota DOT (MnDOT) and the Washington Traffic Safety Commission (WTSC) have publically adopted this vision and have integrated it as a guiding principle in their respective SHSPs.

- **Change behaviors to achieve safety goals**

These programs seek to change behaviors that have been identified to affect safety performance.

*Example:* Iowa DOT introduced the Arch Angel system<sup>28</sup> as a safety program within the Motor Vehicle Enforcement fleet. This system helps prevent drivers from engaging in distraction-related behaviors that may increase crash risk by disabling the onboard laptop while the vehicle is in motion.

- **Employing safety strategies that are themselves based on a cultural paradigm**

These programs specifically address the social and cultural factors that influence behaviors that affect safety performance<sup>29</sup>.

*Example:* Granite has developed a safety program including a series of new-hire training videos. As shown in **Figure 2.1**, these training videos use imagery that encourages compliance with safety

---

27 Toward Zero Deaths, Safety, Federal Highway Administration, U.S. Department of Transportation, <http://safety.fhwa.dot.gov/tzd/>

28 Iowa DOT Deploying Laptop-Disabling Equipment in Motor Vehicle Enforcement Vehicles, Press Release, Iowa Department of Transportation, October 9, 2013, <http://www.news.IowaDOT.gov/newsandinfo/2013/10/iowa-dot-deploying-laptop-disabling-equipment-in-motor-vehicle-enforcement-vehicles.html>

29 For example, see Section 4 (Safety Culture), Toward Zero Deaths: A National Strategy on Highway Safety, [http://www.towardzerodeaths.org/wp-content/uploads/TZD\\_Strategy\\_12\\_1\\_2014.pdf](http://www.towardzerodeaths.org/wp-content/uploads/TZD_Strategy_12_1_2014.pdf)

procedures by reminding employees that their own safety also affects their family. Given that protecting family is a common value in our culture, this safety program is leveraging this cultural value to encourage safe behavior so that employees remain safe for the sake of their families.



*Figure 2.1 Examples of imagery used to change employee behavior based on their cultural value about protecting family*

Granite uses similar messaging to motivate safe behaviors in the public who drive in proximity to employees working on roadways. The messaging reminds drivers that these workers are part of a family that depends on their safety (see **Figure 2.2**).



*Figure 2.2 Example of imagery used to change road user behavior based on their cultural value about protecting family*



# Organizational Factors

This section summarizes the presence and role of organizational factors that establish the conditions in which successful programs emerged within the participating organizations.

Table 3.1 summarizes the participating organizations' responses to the:

- Prevalence (or absence) of organization factors at the time the reported safety program emerged
- Perceived relevance of those factors to the eventual success of that program

Several conclusions can be inferred from these responses. First, the participating organizations reported several common factors. Given that these organizations were selected for having a reputed successful safety culture, one can surmise that these factors are indeed relevant to establishing a successful program to increase safety culture:

- Employees shared a common bond with organization values and mission.
- The organization's management and leadership are publicly committed to safety.
- Safety goals are formalized in organization planning and strategic documents.
- There is open communication within the organization about safety programs and goals.
- The organization provides safety training for all employees.
- The organization has policies and equipment that promote and support safety in the workplace.
- There is low turnover in the organization workforce, including its leadership.
- The organization has a democratic style of management and leadership (based on worker input).
- The organization emphasizes safety as part of its internal and public image.
- The organization has a vision for the goal (i.e., success) of the safety culture program.
- Many organizational levels are involved in the design and implementation of the program.
- Failure of safety can be catastrophic and will affect the organization's public reputation.

Second, several factors that were reported to be absent were also reported to impede the successful development of safety programs. Logically then, one can infer that the presence of these factors might be important to establishing a successful safety program.

- Employees share a common culture that supports change to benefit the organization.
- The organization incorporates safety metrics in its performance evaluations.
- Internal and external stakeholders collaborate in the design and implementation of the program.

Organizational Factors	Statements				
	Was this factor absent or present when you started your program?		What impact did the absence or presence of this factor have on your program's success?		
	Absent	Present	Impeded Success	No Effect	Supported Success
Employees share a common bond with organizational values and mission.	WTSC Iowa DOT	FHWA Granite MnDOT Monsanto	WTSC	Monsanto	FHWA Granite MnDOT
Employees share a common culture that supports change to benefit the organization.	MnDOT WTSC Iowa DOT	FHWA Granite	MnDOT WTSC		FHWA Granite
The organization's management and leadership are publicly committed to safety.		FHWA Granite Iowa DOT MnDOT Monsanto WTSC			FHWA Granite Iowa DOT MnDOT Monsanto WTSC
Safety goals are formalized in organization planning and strategic documents.		FHWA Granite Iowa DOT MnDOT Monsanto WTSC			FHWA Granite Iowa DOT MnDOT Monsanto WTSC
There is open communication within the organization about safety programs and goals.	MnDOT	FHWA Granite Iowa DOT Monsanto WTSC	MnDOT		FHWA Granite Iowa DOT Monsanto WTSC
The organization provides safety training for all employees.	MnDOT WTSC	FHWA Granite Iowa DOT Monsanto	WTSC	MnDOT	FHWA Granite Iowa DOT Monsanto
The organization has policies and equipment that promote and support safety in workplace.		FHWA Granite Iowa DOT MnDOT Monsanto WTSC		WTSC	FHWA Granite Iowa DOT MnDOT Monsanto
There is low turnover in the organization's workforce, including its leadership.	Monsanto WTSC	FHWA Iowa DOT MnDOT	WTSC	Monsanto	FHWA Iowa DOT MnDOT

Table 3.1 Reported status of organizational factors to establish successful program (continued on next page)



Organizational Factors	Statements				
	Was this factor absent or present when you started your program?		What impact did the absence or presence of this factor have on your program's success?		
	Absent	Present	Impeded Success	No Effect	Supported Success
The organization incorporates safety metrics in its performance evaluations.	FHWA MnDOT Iowa DOT	Granite Monsanto	FHWA MnDOT		Granite Monsanto
The organization has a democratic style of management and leadership (i.e., based on worker input).	Monsanto	FHWA Granite MnDOT		Monsanto	FHWA Granite MnDOT
The organization emphasizes safety as part of its internal and public image.	MnDOT	FHWA Granite Iowa DOT Monsanto WTSC		MnDOT	FHWA Granite Iowa DOT Monsanto WTSC
Failure of safety can be catastrophic and will affect the organization's public reputation.		FHWA Granite Iowa DOT MnDOT Monsanto WTSC		MnDOT	FHWA Granite Iowa DOT Monsanto WTSC
The organization has a vision for the goal (i.e., success) of the safety culture program.	MnDOT	FHWA Granite Iowa DOT Monsanto WTSC	MnDOT		FHWA Granite Iowa DOT Monsanto WTSC
Many organizational levels are involved in the program's design and implementation.	WTSC Iowa DOT	FHWA Granite MnDOT Monsanto	WTSC		FHWA Granite MnDOT Monsanto
Internal and external stakeholders collaborate in the program's design and implementation.	MnDOT Monsanto WTSC Iowa DOT	FHWA Granite	Monsanto WTSC	MnDOT	FHWA Granite

*(Continued) Table 3.1 Reported status of organizational factors to establish successful program*



# Implementation Factors

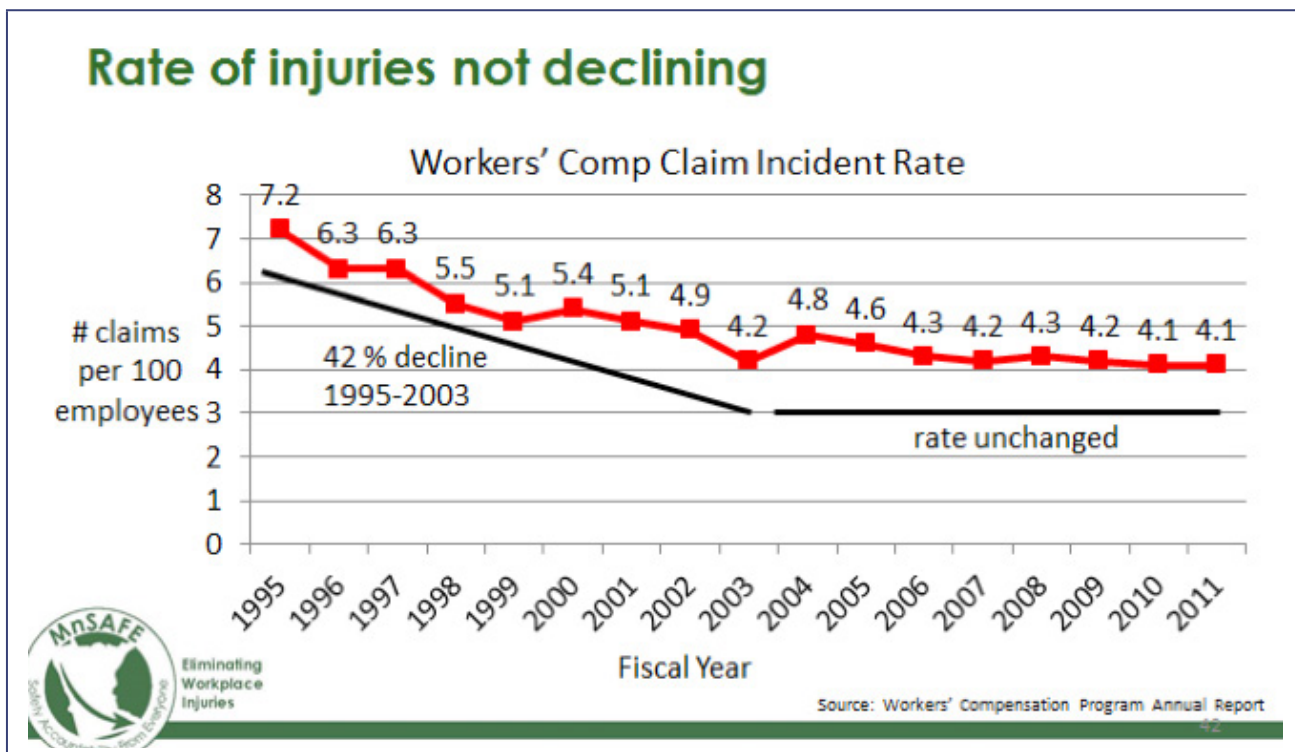
This section provides examples of specific actions reported by the participating organizations that supported the successful implementation of their safety programs. These examples are made in reference to the steps recommended by Kotter<sup>5</sup> for successfully implementing programs that transform organization culture (see **Figure 2.1**):

- Establish a sense of urgency

Expose safety issue (e.g., with dramatic visualization of relevant data) to engage frank conversations with safety stakeholders, thereby motivating commitment to action.

*Example:* In 2008, USDOT conducted a safety review in three surface transportation modes to identify weaknesses and vulnerabilities in three broad areas: risk management strategies and approaches, agency safety culture, and internal control systems. As a result of this initiative, safety culture became one of the founding principles of the USDOT Safety Council when it was established in October 2009.

*Example:* The impetus for the MnSAFE program was a workplace injury rate that had not declined in eight years. This was especially noteworthy given that there was an average decline in injury rate of 42% in the preceding eight-year period (see **Table 4.1**).



**Figure 4.1** Impetus for MnSafe based on a period of no improvement in injury rates

### ■ Form a powerful guiding coalition

Create a coalition of influential leaders and stakeholders that can collaborate as a team (both within and outside the formal organization boundaries) to guide and generate an emotional commitment to the safety program.

*Example:* WTSC is a coalition of traffic safety stakeholders that leads statewide efforts and builds partnerships to save lives and prevent injuries on roadways in Washington State. This coalition includes traffic safety stakeholders from multiple state departments, the governor’s office, county engineers, enforcement agencies, community associations, and tribal organizations.

*Example:* USDOT created the Safety Council to address transportation safety as a critical national health issue. The council is a coalition of 10 USDOT agencies (including FHWA) that serves as the cross-modal safety advocate within USDOT and provides a venue for communication and information exchange between USDOT agencies.<sup>30</sup> A primary focus of the council is safety culture across all transportation modes, with the goal that all USDOT employees will “strive to ensure safety of every user of our transportation system, as well as all who are affected by those systems <sup>31</sup>.”

### ■ Create vision for change

Create a tangible and compelling vision of the safety program goal (and specific strategies) that resonates with the values held by those participants involved in the change process.

*Example:* Washington was the first state to adopt a clear and verifiable goal of “zero traffic deaths and serious injuries on roadways by 2030<sup>32</sup> .”

*Example:* FHWA is itself committed to the TZD vision as “a way of clearly and succinctly describing how an organization or an individual is going to approach safety—even one death on our transportation system is unacceptable<sup>27</sup>.”

*Example:* MnSAFE was created as a multiagency safety program in response to Minnesota Governor Dayton’s vision to reduce workplace injuries across all state agencies by 25% over three years.<sup>33</sup> The charge for this safety program is to ensure that:<sup>34</sup>

State government will actively promote the safety and health of all while conducting its work.

30 An executive team leads the safety council and comprises the Secretary of Transportation and the administrator for each modal division, including the FHWA administrator. The council formed a technical team of chief safety officers from each mode to carry out the policies of the executive team. The action teams were formed to address the specific issues, including safety culture. The FHWA Associate Administrator for Safety is a member of the technical team. Members of the FHWA Office of Safety staff participate in selected action teams.

31 FHWA Strategic Planning Efforts, Safe Roads for a Safer Future—A Joint Safety Strategic Plan, Safety, Federal Highway Administration, U.S. Department of Transportation, <http://safety.fhwa.dot.gov/ssp/jssp.cfm#n8>

32 Toward Zero Deaths—TZD, Press Release, Washington Traffic Safety Commission, March 26, 2015, <http://wtsc.wa.gov/News/toward-zero-deaths-tzd2/>

33 “Our Shared Commitment to Workplace Safety and Injury Prevention,” letter to Cabinet Commissioners from Commissioners of the Minnesota Department of Administration and Department of Labor and Industry, February 17, 2015, [http://mn.gov/mnsafe/documents/2015\\_mnsafe\\_letter\\_to\\_commissioners.pdf](http://mn.gov/mnsafe/documents/2015_mnsafe_letter_to_commissioners.pdf)

34 Eliminating Workplace Injuries, MnSAFE: Safety Accountability From Everyone, <http://mn.gov/mnsafe/goal.html>

All employees will be personally responsible and accountable for workplace safety.

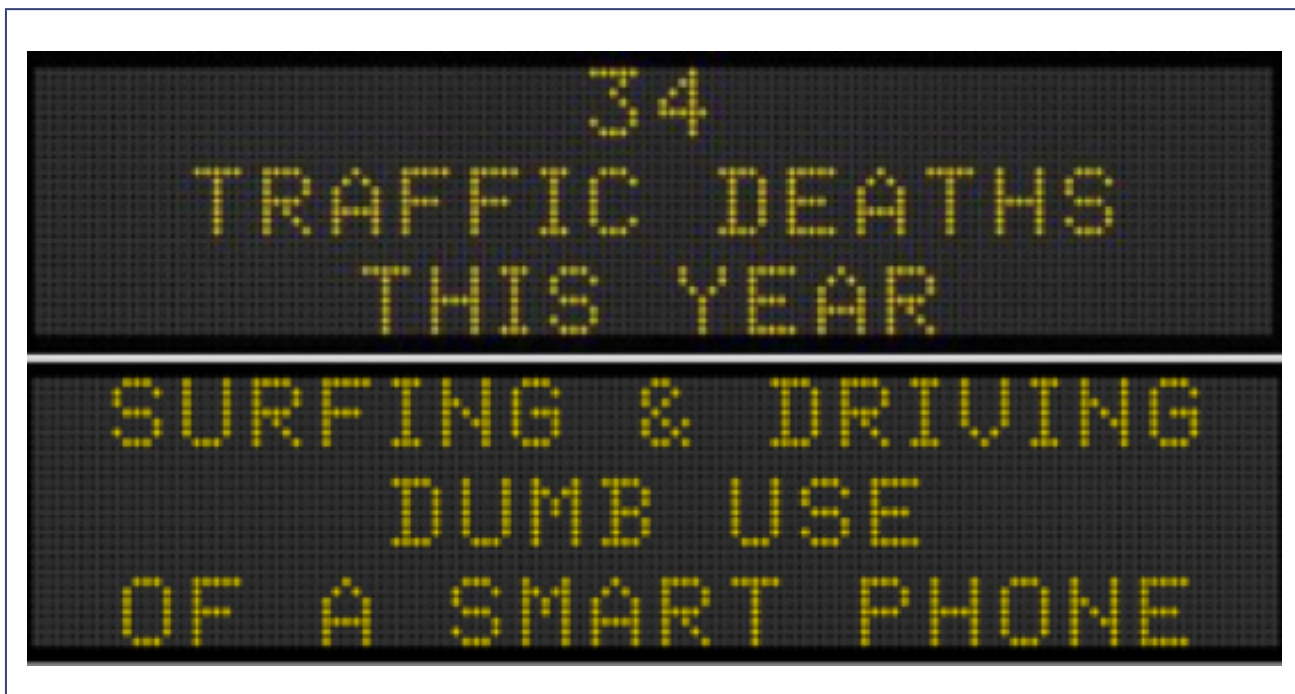
All employees will ensure a safe workplace and reduce losses associated with accidents and injuries.

■ **Communicate the vision**

Communicate frequently, consistently, and powerfully through multiple innovative channels to impart and clarify the vision. This includes embedding the vision in all organization activities (e.g., demonstrable leadership behavior that is consistent with the espoused vision).

*Example:* Monsanto’s CEO conducts a quarterly virtual town meeting across the entire company to communicate values and successes. In these meetings, safety is given prominence as a core value and attention is given to new safety programs and examples of success in safety improvement.

Example: Iowa DOT uses several communications channels to promote its safety mission including social media (e.g., Facebook<sup>35</sup>), internal weekly newsletters featuring the DOT director, and safety messages—often created by the general public—that are presented every Monday on dynamic message signs on Iowa roadways.<sup>36</sup> As shown in **Figure 4.2**, these Monday messages typically are designed to remind road users of safety as an issue by reporting the current number of traffic fatalities and conveying a message that prompts attention to safe behaviors.



**Figure 4.2** Example of roadway messaging of Iowa DOT’s Message Monday program

<sup>35</sup> Iowa Department of Transportation, <https://www.facebook.com/IowaDOT>

<sup>36</sup> Message Monday, Transportation Matters for Iowa, Iowa Department of Transportation, <http://www.transportationmatters.IowaDOT.gov/2015/03/message-monday-march-2-2015.html>

■ Empower action for vision

Remove existing organization structures and policies that are obstacles to the execution of the program’s strategies. Conversely, provide resources and develop supporting structures and policies that enable the execution of the program’s strategies. In some instances, the obstacles may be with certain personnel who lack necessary leadership skills or are resistant to change. Thus, this step includes empowering employees to participate in the program (e.g., through training and education) and engendering an environment that fosters innovation.

*Example:* Providing employees with safety training provides them with the skills to perform their duties safely. Thus, training empowers employees to meet the goals of the organization’s safety culture. As part of Monsanto’s Global Vehicle Safety function (see **Figure 4.3**), Monsanto conducts regular training programs for safe driving training and reviews driver performance (e.g., random seatbelt checks of drivers operating company vehicles on Monsanto work sites).<sup>37, 38</sup> In addition, Monsanto also offers training for young drivers in several of the communities in which it operates, as shown in **Figure 4.4**. This reflects Monsanto’s corporate belief that traffic safety should extend beyond company roles to include family and the local communities.

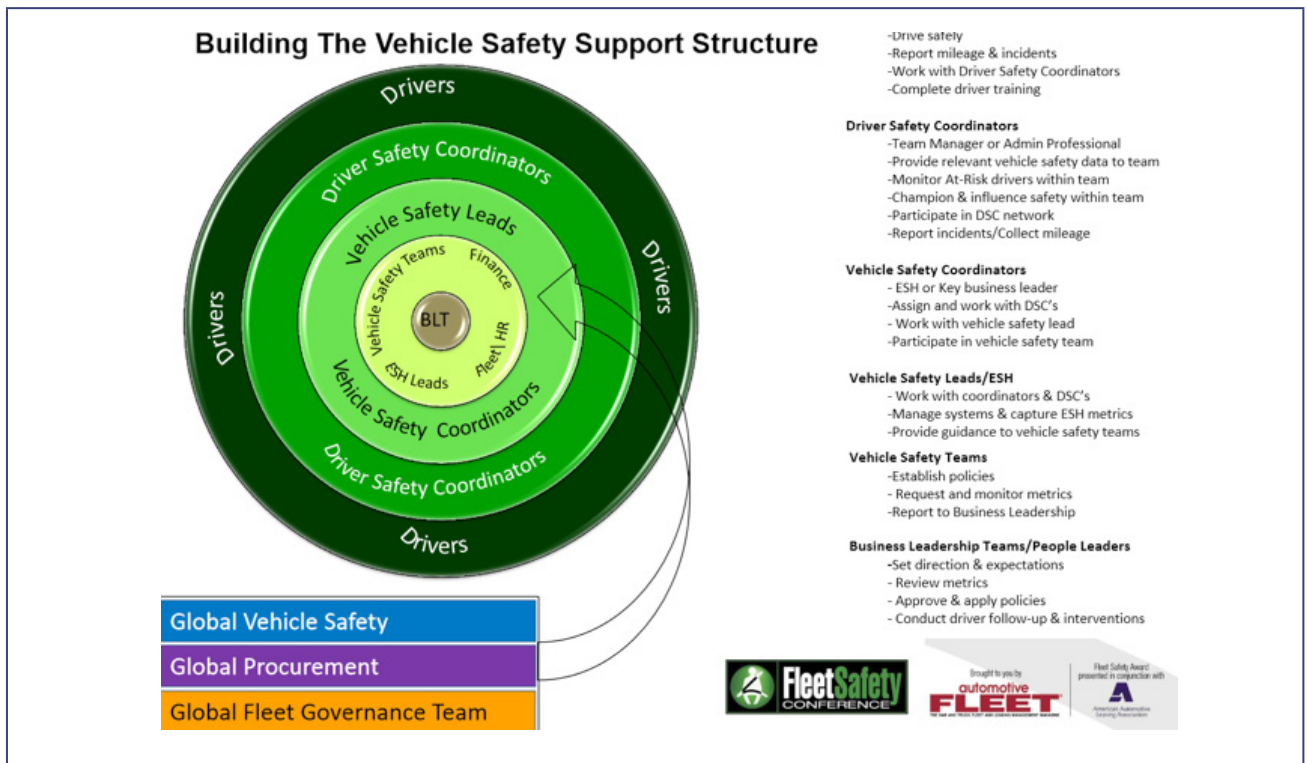


Figure 4.3 Integration of vehicle safety across business functions in Monsanto

37 Monsanto and Global Vehicle Safety, Beyond the Rows, February 12, 2013, Monsanto,

<http://monsantoblog.com/2013/02/12/monsanto-and-global-vehicle-safety/>

38 Grown for the Future, Monsanto Company 2008–2009 Corporate Responsibility and Sustainability Report, Monsanto,

<http://www.monsanto.com/sitecollectiondocuments/2008-2009-csr-report.pdf>



**Figure 4.4 Monsanto’s Young Driver Program in Brazil**

*Example:* Granite has adopted a safety program from Caterpillar Safety Services called “Speak Up!/Listen Up!”<sup>39</sup> that empowers employees to identify and voice concerns about unsafe behaviors with their fellow employees.<sup>40</sup> This program includes training in communication skills necessary to both deliver and receive feedback from peers about unsafe behaviors.

*Example:* Iowa DOT has established dedicated funding to provide resources to support safety programs on the city, county, and state agency levels.<sup>41</sup> These funds are available through a competitive application process to support different types of programs to improve safety on any public road in Iowa. These include site-specific construction or operation improvements, installation of traffic control devices, and research projects and public education initiatives.<sup>42</sup>

■ **Create short-term wins**

Maintain momentum by setting, measuring, and celebrating (i.e., rewarding) short-term

39 Safety Services, Support, Caterpillar, <https://safety.cat.com/cda/layout?x=7&m=692454>

40 Safety Program Preview, Speak Up!/Listen Up! for Construction, YouTube, September 20, 2013, <https://www.youtube.com/watch?v=WhKG0yTY-7U>

41 The TSIP funds are one-half of 1% of all state highway funds (before the funds are distributed to counties, cities, and the DOT). These funds are generated primarily from the Iowa state gas tax, annual registration fees on vehicles, and sales tax on new and used vehicle purchases.

42 Traffic Safety Improvement Program (TSIP), Systems Operations Bureau – Office of Traffic and Safety, Iowa Department of Transportation, <http://www.IowaDOT.gov/tsip.htm>

safety goals that clearly demonstrate the program’s progress and success. These efforts not only build confidence to achieve program goals, they also maintain the attention and motivation necessary to sustain the program.

*Example:* To facilitate short-term wins, MnSafe has segmented its three-year goal to reduce its injury rate by 25% into incremental annual targets for each state agency: 5% reduction for the first year, 10% for the second year, and 25% for the third year. Performance with respect to these goals is monitored and success celebrated through agency-wide notifications (e.g., newsletters <sup>43</sup>).

*Example:* Granite organizes period celebrations of the success of its safety programs by hosting social events with its employees (e.g., BBQ dinners). Notably, area offices organize these events locally to reflect the broader culture of that area, such as the existing value of BBQs as a social celebration. In this context, the BBQs also include employee families to represent the importance of safety beyond the company (see **Figure 4.5**). In addition, senior management often does the cooking at these events to create a more approachable relationship with staff.



**Figure 4.5 Family BBQ at Granite Construction**

43 “We achieved a 23 percent reduction in the workers’ compensation claim incidence rate over the past 3 years. Thanks to all who contributed to this great success! We need to keep up the momentum and reduce the incidence rate by another 10 percent over the next year. We can do it if we continue to focus on preventing injuries to state employees.” (Alert Newsletter, A Publication of the MN Department of Administration, Risk Management Division, Summer 2014, 18:2, p 1, <http://mn.gov/admin/images/AlertSummer2014.pdf>)



## ■ Build on change

Use the momentum achieved from short-term wins to garner additional support and resources to tackle larger problems that are inconsistent with the program’s vision and that remain within the organization’s systems and structures. Continually evaluate program effectiveness to examine opportunities for iterative improvements and incorporation of innovative ideas. This requires dedication and recognition that the change process is a long-term effort that must be sustained over time.

*Example:* Based on the success of MnSafe to reduce state employ injuries, Minnesota Governor Mark Dayton renewed the commitment to the MnSafe program and established a new goal to reduce the incidence of workplace injuries across all state agencies by 5% annually for fiscal years 2015-2018.<sup>44</sup>

*Example:* Every Day Counts<sup>45</sup> (EDC) is a FHWA initiative that promotes the adoption of proven innovations and enhanced business processes (e.g., Safety Edge<sup>SM</sup><sup>46</sup>, a product that prevents pavement edge drop-off on highways, and data-driven safety analysis methods<sup>47</sup>). Through the EDC model, FHWA works with partnering transportation agencies and industry stakeholders to identify, promote, and deploy successful strategies to improve transportation safety.

*Example:* As shown in **Figure 4.6**, Granite identifies successful safety strategies and communicates them as best practices throughout the organization where similar safety hazards might exist.

BEST PRACTICE
GRANITE

---

Location: Salt Lake City    Tracking #: SL-002    Date: January 8, 2010

**DESCRIPTION:**

Storing of metal materials in the shop.

**RISK FACTOR AND/OR EFFICIENCY ISSUES:**

Material is being stored on the floor which facilitates employees having to bend to pick up material increasing probability of developing low back pain.

This is a productivity issue as it takes time to bend to pick up the materials.



It creates a trip and fall hazard being stored on the floor.

**SOLUTION:**

Racks were built to move the material off the floor eliminating the bending and trip and fall hazard as well as increasing production by not bending and reducing the walking distance.

**MEASURES:**

How many times on an annual basis did employee bend to pick up material? How many times did an employee walk over the material without falling? How many times did an employee walk around the material increasing his walking distance, time, and fatigue? Remember to always annualize your cost!

BEST PRACTICE – SALT LAKE CITY (SL – 002)
JANUARY 8, 2010

**Figure 4.6** An example of an effective Granite strategy that became a best practice

<sup>44</sup> A Commitment to Workplace Safety, Minnesota Governor Mark Dayton, February 5, 2015, [http://mn.gov/mnsafe/documents/2015\\_Safety\\_Commitment\\_Statement.pdf](http://mn.gov/mnsafe/documents/2015_Safety_Commitment_Statement.pdf)

<sup>45</sup> Every Day Counts: Better, Faster, Smarter, Center for Accelerating Innovation, Federal Highway Administration, U.S. Department of Transportation, [www.fhwa.dot.gov/everydaycounts/](http://www.fhwa.dot.gov/everydaycounts/)

<sup>46</sup> Safety Edge<sup>SM</sup>, Center for Accelerating Innovation, Federal Highway Administration, U.S. Department of Transportation, <http://www.fhwa.dot.gov/everydaycounts/technology/safetyedge/intro.cfm>

<sup>47</sup> Data-Driven Safety Analysis, Center for Accelerating Innovation, Federal Highway Administration, U.S. Department of Transportation, <http://www.fhwa.dot.gov/everydaycounts/edc-3/analysis.cfm>

- Anchor changes in organization culture

Integrate the changes made by the program into the organization's core culture. This requires making the connection that the engaged strategies are responsible for the demonstrated safety improvements. It also requires ensuring that the next generation of leadership in the organization also personifies the program's vision. This may require codifying the program's vision and supporting strategies into the culture's artifacts (e.g., hiring and training policies that include the values and ideals of change, creation of leadership succession plans, and requirements for promotion based on participation in safety programs and achieving safety performance goals).

*Example:* Monsanto has institutionalized safety by creating the Global Vehicle Safety business function, which is dedicated to safety (see **Figure 4.3**) and is integrated across the company's other business functions. For example, global procurement ensures that Monsanto companies identify and purchase safer vehicles in all countries to support the overall goal of improved traffic safety among the workforce.

*Example:* Granite has begun adopting a new strategy to support its safety goals. This strategy, named relationship-based safety, is founded on the principle of fostering supportive relationships within the workforce so that personal safety in the workplace is a primary value (i.e., rather than relying on just impersonal efforts to create rules and procedures to govern compliance with safety regulations). In this framework, safety is achieved on a basis of caring for each other rather than just following rules and regulations.

Next, the team examined these and other examples to observe common factors that supported the successful implementation of the safety programs discussed with the participating organizations. **Table 4.1** describes these general factors for a subset of these examples. The factors are cross-referenced to Kotter's<sup>5</sup> eight-step model to provide a framework to organize and interpret the function of these factors in the transformation process.

Factor	Description	Step 1. Establish sense of urgency	Step 2. Form powerful guiding coalition	Step 3. Create a vision for change	Step 4. Communicate the vision	Step 5. Empower action on vision	Step 6. Create short-term wins	Step 7. Build on change	Step 8. Anchor change in organization culture
Measurement	Quantify safety performance using a valid and intuitive metric.	X							X
Justification	Create sense of urgency for the safety program (e.g., showing objective data to show the significance of the existing problem).	X	X						
Leadership Champion	Leadership champions and exposes need for change.	X	X						
Relationships	Employee roles and relationships provided the program's foundation and sense of citizenship in achieving program goals.		X						
Collaboration	Internal and external stakeholder partnerships supported the program based on a shared sense of responsibility and vision for the program's goals.		X	X					
Leadership Commitment	Explicit commitment and support for program by leadership and significant stakeholders (e.g., signing a charter supporting program).		X						
Responsibility	There was both personal and corporate responsibility for the program's success across all departments and employee roles.		X						
Targeting	Use the safety performance metric to set incremental performance targets.			X				X	X
Integration	Adopt a systems-based approach to integrate multiple types of strategy from different disciplines to support program goals.			X	X				
Vision	Leadership articulated a clear and compelling vision for the program's goal.				X				
Communication	Provide frequent, consistent, and impactful communication to create awareness across all organizational levels about the program's vision, goals, and strategies.				X			X	
Leadership Involvement	Leadership personifies the program vision in its own behavior and integrates the program into all organizational activities.				X				

Table 4.1 Safety program implementation factors cross-referenced with Kotter's<sup>5</sup> eight-stage model for organization culture transformation (continued on next page)

Factor	Description	Step 1. Establish sense of urgency	Step 2. Form powerful guiding coalition	Step 3. Create a vision for change	Step 4. Communicate the vision	Step 5. Empower action on vision	Step 6. Create short-term wins	Step 7. Build on change	Step 8. Anchor change in organization culture
Passion	Employees are passionate about their role in the program's success, thereby creating persistence in efforts to support the program.					X			
Empowerment	Empower employees so that they are able to participate successfully in the program (e.g., training and education).					X			
Innovation	Create an environment that supports and shares innovative ideas to develop and sustain the program.					X			
Resources	Provide the resources necessary to develop and sustain the program.					X			
Monitoring	Monitor and provide feedback about safety performance relative to set targets.						X		X
Reward	Recognize and reward participants responsible for achieving safety performance targets.						X	X	X
Investigate	Evaluate program effectiveness to identify a clear relationship between program strategies and changes in safety performance.							X	X
Values	The value of safety was integrated as a permanent feature of the organizational culture, rather than as a temporary priority.								X
Stability	Dedicated organizational structures and policies and consistent leadership maintain and perpetuate the program's vision.								X
Ecology	The value of safety was extended to support families of employees and members of the community in which the organization exists.								X

(continued) Table 4.1 Safety program implementation factors cross-referenced with Kotter's<sup>5</sup> eight-stage model for organization culture transformation



# Recommended Next Steps

**F**rom the review of information provided by the organizations that participated in this scan, it was apparent that most safety programs focused on changing behavior related to reportable injuries and fatalities either in the workplace or on public roads. These program tended to focus on compliance or the communication of harm associated with behavior.

Whereas some of the programs were intended also to increase the value of safety, few programs attempted to use culture as a vehicle for promoting and sustaining behavior change. This suggests that using culture-based programs may be a new opportunity for many organizations. The programs that did use culture as the basis for behavior change recognized the role social factors play in behavioral decisions, such as the common values of family and community.

The analysis of the answers to the amplifying questions provided by the scan's participants revealed several existing contextual factors that appeared to establish the conditions for the successful development of a safety program:

s tended to focus on compliance or the communication of harm associated with behavior.

- Employees shared a common bond with organization values and mission.
- The organization's management and leadership are publically committed to safety.
- Safety goals are formalized in organizational planning and strategic documents.
- There is open communication within the organization about safety programs and goals.
- The organization provides safety training for all employees.
- The organization has policies and equipment that promote and support safety in the workplace.
- There is low turnover in the organization workforce, including its leadership.
- The organization has a democratic style of management and leadership (i.e., based on worker input).
- The organization emphasizes safety as part of its internal and public image.
- The organization has a vision for the goal (i.e., success) of the safety culture program.
- Many organizational levels are involved in the program's design and implementation.
- Failure of safety can be catastrophic and will affect the organization's public reputation.

It was also apparent that these successful safety programs shared several aspects of program implementation that can be represented by Kotter's<sup>5</sup> eight-step model for successful implementing programs to transform safety culture (see **Figure 1.2**).

Based on these results, it can be suggested that state DOTs and other traffic safety agencies that intended to implement safety programs to transform safety culture should:

- Assess and prepare conditions of readiness within the agency such that development of the process will be successful (see **Table 3.1**).
- Explore innovative strategies based on the role of culture itself as a vehicle for behavioral change relevant to safety goals.
- Follow a systematic process to successful implement the safety program as summarized in **Figure 1.2**.





# Dissemination Strategies

The following actions are planned for promoting and disseminating the results of this domestic scan project in the transportation industry.

## Presentations

Scan team members will present the key findings from the scan during various meetings and conferences. Scan team members and their assistants are planning to give presentations at meetings held by the following entities.

- American Association of State Highway and Transportation Officials<sup>48</sup> (AASHTO) and its subcommittees
- Western Association of State Highway and Transportation Officials<sup>49</sup> (WASHTO)
- Mid America Association of State Transportation Officials<sup>50</sup> (MASSTO)
- Southern Association of State Highway and Transportation Officials<sup>51</sup> (SASHTO)
- Federal Highway Administration (FHWA)
- Transportation Research Board<sup>52</sup> (TRB) and its subcommittees
- Project panel meeting for NCHRP 17-69, A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries<sup>53</sup>
- Asset Management Peer Exchange
- Alabama Rural Road Safety Workshop
- 2nd National Summit on Roadway Safety Culture: Moving Toward Zero Deaths Through Organizational Transformation<sup>54</sup>
- Governors Highway Safety Conference

48 American Association of State Highway and Transportation Officials, <http://www.transportation.org/Pages/Default.aspx>

49 Western Association of State Highway and Transportation Officials, <http://www.washto.org/default.asp>

50 Mid America Association of State Transportation Officials, <http://www.maasto.net/>

51 Southern Association of State Highway and Transportation Officials, <http://sashto.org/>

52 Transportation Research Board, <http://www.trb.org/Main/Home.aspx>

53 NCHRP 17-69, A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries, <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3662>

54 2nd National Summit on Roadway Safety Culture: Moving Toward Zero Deaths Through Organizational Transformation, <http://www.cvent.com/events/2nd-national-summit-on-roadway-safety-culture-moving-toward-zero-deaths-through-organizational-trans/event-summary-0a132e1b22484605963f84c7adfd2514.aspx>

- Leadership forums
- Safety administrators conferences
- Local Technical Assistance Program/Tribal Technical Assistance Program<sup>55</sup> (LTAP/TTAP)
- National Highway Traffic Safety Administration<sup>56</sup> (NHTSA)
- Internal meetings of team members' and workshop participants' agencies

## Webinar

A webinar could possibly be made to promote the scan findings through TRB, National Highway Institute<sup>57</sup> or other entities' activities. A webinar would allow the scan's findings to be conveyed to a broader range of audiences that cannot attend the meetings or conferences included in this dissemination plan.

---

<sup>55</sup> Local Technical Assistance Program/Tribal Technical Assistance Program, <http://www.ltap.org/index.php>

<sup>56</sup> National Highway Traffic Safety Administration, <http://www.nhtsa.gov>

<sup>57</sup> National Highway Institute, <https://www.nhi.fhwa.dot.gov/home.aspx>



---

# Appendix A: Scan Team Biographical Sketches

**RUDY MALFABON** (AASHTO CHAIR) is the Director of the Nevada DOT. As director, Malfabon leads an organization of nearly 1,800 employees focused on providing a safe, reliable transportation system for Nevada's residents and visitors. Malfabon currently serves as the chairman of the AASHTO Standing Committee on Highway Traffic Safety. He also chairs the SHRP 2 Safety Task Force, a cross-functional advisory committee demonstrating the use of safety data gathered through the SHRP 2 Naturalistic Driver Study. The safety research relying on this study will result in various countermeasures to reduce crashes and fatalities on our nation's streets and highways. Malfabon has a bachelor's degree in civil engineering from the University of Nevada, Reno, and is a licensed professional engineer in Nevada and Washington State.

**TIM BARNETT** is the State Safety Operations Engineer for the Alabama DOT (ALDOT), in Montgomery. Barnett directs and administers the Office of Safety Operations, which implements statewide safety programs in order to reduce the occurrence and severity of crashes along the public roadway system. These programs include the implementation of the infrastructure elements of the Strategic Highway Safety Plan and the dispensation of the Highway Safety Improvement Program. Additionally, Barnett manages the road safety assessment program that involves the rapid review, response, and resolution of urgent safety issues identified on the state's public roads. This program involves field investigations, along with statistical examinations of crash, roadway, and traffic data, to identify and develop methods to resolve safety issues, including the development of both immediate and long-term remedial safety countermeasures. Barnett additionally develops programs and practices to accomplish ALDOT's overall highway safety goal of zero deaths. Barnett has worked for ALDOT for 12 years, as a right-of-way engineer, design engineer, and as a safety engineer. Prior to his career with the agency, Barnett served as a traffic engineer with the City of Huntsville, AL, for 20 years. He is a member of several TRB committees and research panels. Barnett holds both bachelor's and master's degrees in civil engineering from the University of Alabama in Huntsville and is a licensed professional engineer in Alabama, Florida, Georgia, Louisiana, and Mississippi.

**STEVEN BUCKLEY** is the State Highway Safety Engineer for the Kansas DOT (KDOT). In this position, he manages the Traffic Safety Section, with responsibilities that include development and implementation of the Kansas Strategic Highway Safety Plan, management of the federally funded Highway Safety Improvement Program, and oversight of both the Kansas Governor's Highway Safety Office and Crash Data Unit. The issue of safety culture is relevant in a rural state like Kansas; as such, many projects and programs in the state work to address related deficiencies. Buckley has been with KDOT since 1990 after graduating from the University of Kansas in 1989 with a degree in civil engineering. He has worked in the field of traffic engineering nearly his entire career, serving on numerous national research committees, including pooled-fund studies and NCHRP panels. He currently chairs the Research Task Group for AASHTO's Subcommittee on Safety Management and is a member of the SHRP2 Safety Task Force.

---

**KATIE FLEMING** is a Senior Research Analyst for the Minnesota DOT (MnDOT), Office of Traffic, Safety, and Technology. During her tenure with MnDOT, Fleming served as a project manager for the state's first Measurement of Traffic Safety Culture project and served as a panel member for NCHRP 17-69, A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries. Fleming's office is responsible for developing and updating the statewide Strategic Highway Safety Plan, establishing guidelines and procedures for uniform traffic engineering, and building working relationships between state, county, and city engineering staff. Fleming holds a master's degree in sociology from California State University and specializes in evaluation research and applied research. She has worked for MnDOT since 2009.

**JOHN MILTON** currently serves as the Director of Quality Assurance and Transportation System Safety Division for the Washington State DOT (WSDOT). In this role he works closely with the Secretary of Transportation. This position defines appropriate implementation of quality assurance, enterprise risk management and transportation system safety in the planning, programming, development, and delivery of projects and programs agency-wide, including working with multimodal transportation (e.g., bicycle, pedestrian, public transit, rail, marine, and freight) and ensures consistent application of quality assurance for WSDOT. Milton is an affiliate assistant professor at the University of Washington and a licensed engineer with over 28 years of experience in safety, design, and traffic engineering. He holds a bachelor's degree in civil engineering and a master's degree in engineering management from St. Martin's College; he also holds master's and doctoral degrees in civil engineering from the University of Washington. Milton's research is safety-focused, and he has published a number of articles on crash frequency and severity prediction. He has served on a number of National Academy of Engineering research panels, with an emphasis on highway safety and data analysis. He chairs the Transportation Research Board's Highway Safety Performance Committee (ANB25), where he is leading the development of the second edition of the American Association of State Highway Transportation Officials Highway Safety Manual. Milton is also active with AASHTO and serves on the organization's Safety Management Subcommittee; he also chairs the Performance and Data Task Group. Milton is a member of PIARC (World Road Association) and is a working group leader on the Development of the World Road Association's Road Safety Manual.

**CHIMAI NGO** is a Transportation Specialist at the Federal Highway Administration's Office of Safety in Washington, DC. She manages the Transportation Safety Planning Program, which promotes the integration of safety in the transportation planning process. Ngo also leads efforts to promote safety culture and the Toward Zero Deaths concept. During her 21 years with the FHWA, she has worked on issues related to traffic safety and transportation planning and reached out to a number of transportation partners at tribal, federal, state, and regional levels. Ngo holds a bachelor's degree in architecture from the Catholic University of America and a master's degree in planning from the University of Virginia.

**MARK SHELTON** is the District Engineer for Missouri DOT's (MoDOT's) Southeast District, which covers 25 counties in southeast Missouri. He is responsible for all operations in the district, including maintenance, construction, and traffic engineering. He is also the team leader for MoDOT's statewide Safety Focus Team, a multidisciplinary team charged with moving MoDOT forward with "keeping ourselves and our customers safe." Shelton has 30 years of experience with MoDOT in a variety of locations within the state. He has a bachelor's degree in civil engineering from the University of Missouri-Rolla and is a registered professional engineer in Missouri.

**MICHAEL TOOLEY** was named Director of the Montana DOT in December 2012. Prior to that, he spent more than 28 years in the uniform of the Montana Highway Patrol. He started his career there as a dispatcher and retired as chief of the organization. As a member of law enforcement, Tooley was heavily involved in safety through the investigation of traffic crashes. Those experiences highlighted the importance of a strong safety culture and prevention, as well as the consequences of failure in that regard. Tooley holds a bachelor's degree in public safety administration from Grand Canyon University. He completed Harvard University's Senior Executives in State and Local Government Course and is a 2008 graduate of the Federal Bureau of Investigation's National Academy. Currently, Tooley is a member of the American Association of State Highway Transportation Officials board of directors and has a seat on that organization's Standing Committee on Highway Safety. Tooley is a past regional chair for the International Association of Chiefs of Police's (IACP's) Mountain Pacific Region for State and Provincial Police, and a past regional president for the American Association of Motor Vehicle Administrators. Tooley was also a member of the IACP's Highway Safety Committee.

**NICHOLAS WARD (SUBJECT MATTER EXPERT)** is Professor of mechanical and industrial engineering at Montana State University and Director of the Center for Health and Safety Culture at the Western Transportation Institute in Montana. This center focuses on transforming culture related to health and safety, including safe driving. This is achieved through community engagement (across the social ecology) in the measurement, analysis, and transformation of cultural cognitions, including values, beliefs, attitudes, and norms. These methodologies have been applied to high-risk driving behaviors, such as speeding, drunken driving, seat-belt compliance, bystander intervention, and workplace safety. In addition, Ward has developed methodologies to quantify the safety culture of organizations responsible for traffic safety. As a founding member of the National Summit for Rural Traffic Safety Culture and the Transportation Research Board's Subcommittee on Roadway Safety Culture, Ward is a national leader in United States for the definition and advancement of traffic safety culture. He recently authored the traffic safety culture chapter for the national Toward Zero Deaths strategy and published a primer on traffic safety culture for traffic safety practitioners. Ward earned his doctoral degree in human **factors psychology from Queen's University, Ontario, Canada.**

## APPENDIX B: SCAN TEAM CONTACT INFORMATION

---



---

# Appendix B: Scan Team Contact Information

**Rudy Malfabon, PE** – AASHTO Chair/Director

Nevada Department of Transportation  
1263 South Stewart Street  
Carson City, Nevada 89712  
Phone: (775) 888-7440  
E-mail: [rmalfabon@dot.state.nv.us](mailto:rmalfabon@dot.state.nv.us)

**Timothy E. Barnett, PE, PTOE**

State Safety Operations Engineer  
Office of Safety Operations  
Alabama Department of Transportation  
1110 John Overton Drive  
Montgomery, AL 36110  
Phone: (334) 353-6464  
Fax: (334) 353-6470  
E-mail: [barnettt@dot.state.al.us](mailto:barnettt@dot.state.al.us)

**Steven A. Buckley, P.E.**

State Highway Safety Engineer  
Bureau of Transportation Safety & Technology  
Kansas Department of Transportation  
700 SW Harrison Street, 6th Floor  
Topeka, KS 66603-3745  
Phone: (785) 296-1148  
E-mail: [buckley@ksdot.org](mailto:buckley@ksdot.org)

**Katie Fleming**

Research Analyst  
Traffic Safety & Technology  
Minnesota Department of Transportation Mail Stop 725  
1500 West County Road B-2  
Roseville, MN 55113  
Phone: (651) 234-7013  
Fax: (651) 234-7006  
E-mail: [katie.fleming@state.mn.us](mailto:katie.fleming@state.mn.us)

---

**John C. Milton, Ph.D., P.E.**

Director of Quality Assurance and Transportation System Safety

Office of the Secretary

Washington State Department of Transportation (WSDOT)

310 Maple Park Ave SE 3C-17

P.O. Box 47418

Olympia, WA 98504-7418

Office: 360-704-6363

Fax: (206) 381-6442

E-mail: [miltonj@wsdot.wa.gov](mailto:miltonj@wsdot.wa.gov)

**Chimai Ngo**

Transportation Specialist

Office of Safety (HAS-20 / E71-105)

Federal Highway Administration (FHWA)

12 New Jersey Avenue, SE

Washington, DC 20590-9898

Phone: (202) 366-1231

E-mail: [chimai.ngo@dot.gov](mailto:chimai.ngo@dot.gov)

**Mark Shelton, PE**

District Engineer, Southeast District

Missouri Department of Transportation

PO Box 160

Sikeston, MO 63801

Phone: (573) 472-5341

Fax: (573) 472-5381

E-mail: [mark.shelton@modot.mo.gov](mailto:mark.shelton@modot.mo.gov)

**Mike Tooley**

Director

Montana Department of Transportation

2701 Prospect Avenue

PO Box 201001

Helena, MT 59620

Phone: (406) 444-6201

E-mail: [mitooley@mt.gov](mailto:mitooley@mt.gov)

**Nicholas J. Ward**, PhD –Subject Matter Expert  
Mechanical and Industrial Engineering  
College of Engineering  
Montana State University  
Phone: (406) 994-5942, (406) 581-1633  
E-mail: [nward@ie.montana.edu](mailto:nward@ie.montana.edu)



---

# Appendix C: Amplifying Questions

## Amplifying Questions

The objective of this scan is to examine organizations that have successfully designed and implemented strategic safety-culture transformation programs. The scan team will examine research and experience with strategic safety-culture transformation programs that could be applied to enhance highway safety. For these purposes, we are using the U.S. DOT definition of safety culture as “the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands.”<sup>58</sup> This safety culture can be evident from the (a) organization environment (climate); (b) processes, procedures, and policies (documents); and (c) implemented programs and expenditures (projects).

In addition to government agencies responsible for public traffic safety, we are also contacting organizations outside of the transportation sector to gain a complete understanding of important factors for a broad set of successful safety culture programs.

Your organization has been contacted because of its reputation in successfully implementing and managing programs to increase safety culture. The scan is intended to look at organizations that have successfully transformed their culture. **We are defining “program” as a systematic set of actions taken by an organization to improve their internal safety culture. This may have been triggered by the realization that safety could be improved in your organization.**

Please take the time to answer the following questions in order that the important factors related to your success can be identified. This information will be compiled to develop a set of best practices for developing a successful safety culture and shared with other organizations.

The following questions are designed to inform the scan team about activities within your organization intended to improve safety culture and your perception about the success of those activities.

***To ensure that your responses are complete and accurate, we encourage you to contact other key members of your organization to provide the information requested in these questions.***

---

<sup>58</sup> Safety Council (2011), Safety Culture: A significant driver affecting safety in transportation, Research Paper Prepared for the USDOT Safety Council, U.S. Department of Transportation, Washington, DC, p 2

---

## Section 1 - Contact Information

1.1 Please provide the contact information for the person completing this survey who may be contacted to facilitate the collection of additional information in the future.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Organization (include website): \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

1.2 Please describe the specific program your organization implemented to improve the safety culture.

If available, please provide a web link (or attached document) that provides an overview of your safety culture program.

1.3. What events or conditions within your organization precipitated the need to develop this program?

1.4 What specific aspects of your existing organization culture (e.g., structures, processes, strategies, policies, behaviors) was this program intended to change?

1.5 What was the intended overall goal (outcome) of your safety culture program?

1.6 What aspects of the existing safety culture in your organization did this program address?

1.7 Who was responsible for developing, implementing, and managing this program located in your organization?

1.8 Can you estimate the total number of staff hours involved in developing, implementing, and managing this program?

1.9 What new structures and resources were required to implement this program?

1.10 If you used your existing “safety committee” (e.g., an appointed committee responsible for workplace safety) or developed a new committee to develop and manage this program, what was the committee function, constitution, and membership?

1.11 What source of funding was used to resource the development, implementation, and sustainment of this program?

1.12 Was your program predicated on collaboration with other safety stakeholders outside of your own organizations (e.g., other organizations)? Yes or No



If yes, how was the need for collaboration identified, created, and subsequently managed?

And, what were the direct benefits to your program from this collaboration?

1.13 Did your program utilize any form of incentives tied to the safety performance of individuals or the organization as a whole? Yes or No

If yes, who was incentivized and what forms of incentive were utilized?

1.14a Did you formally evaluate the success of your program. If yes, please summarize the evaluation process and conclusions.

1.14b If you did evaluate your program, what were the key performance indicators (metrics) you used to measure the effect of your program?

1.14c If you did evaluate your program, what were the major conclusions about the program reaching your intended goals?

1.14d If you did evaluate your program, how were the results used to revise and improve the program?

1.15 Do you have a process in place for continuous review and modification of the program to ensure it is sustainable in the long term? Yes or No

If yes, please summarize the components of this process and the factors you have implemented to ensure the sustainability of the program.

1.16a What major risks did you identify that threatened the success of implementing your program (e.g., lack of resources, lack of support from leadership, etc)?

1.16b What strategies did you engage to mitigate these risks to the successful implementation of your program?

1.16c What major risks did you identify that threatened the sustainability of the long-term success achieved with your program (e.g., changes in leadership, indoctrinating new staff, etc.)?

1.16d What strategies did you engage to mitigate these risks to the sustainability of the success achieved with your program?

1.17 Describe the important aspects of your organization's culture that existing prior to the implementation of your safety culture program that supported the success of that program.

1.18 Describe the important aspects of your organization's culture that existing prior to the implementation of your safety culture program that were impediments to the success of that program.

1.19 What is the consensus across your organization about the success of your program?

1.20 What ongoing policies and practices keep safety issues prominent in your organization (e.g., among leadership)?

## Section 2 – Program Factors

The following is a list of factors that have been identified as necessary pre-conditions for the successful implementation of programs to change organization safety culture.<sup>59, 60</sup> Please indicate with a mark (x) which statement best represents your answer to question A and B about the presence or absence of each factor within your organization **BEFORE** you implemented your program:

	Statements				
	(A) Was this factor absent or present when you started your program?		(B) What impact did the absence or presence of this factor have on the success of our program?		
	Absent	Present	Impeded Success	No Effect	Supported Success
Employees shared a common bond with organization values and mission.					
Employees share a common culture that supports change to benefit the organization.					
Management and leadership within the organization are publicly committed to safety.					
Safety goals are formalized in organization planning and strategic documents.					
There is open communication within the organization about safety programs and goals.					
The organization provides safety training for all employees.					
The organization has policies and equipment that promote and support safety in workplace.					
There is low turnover in the organization workforce, including leadership.					
The organization incorporates safety metrics in its performance evaluations.					
The organization has a democratic style of management and leadership (i.e., based on worker input).					
The organization emphasizes safety as part of its internal and public image.					
Failure of safety can be catastrophic and impact the public reputation of the organization.					
The organization has a vision for the goal (i.e., success) of the safety culture program.					
Many organizational levels are involved in the design and implementation of the program.					
Internal and external stakeholders collaborate in the design and implementation of the program.					

59 Austin EK (2010), The possibility of effective participatory governance: The role of place and the social bond, *Public Administration and Management*, 15(1), 221–258

60 Sorensen JN (2002), Safety culture: A survey of the state-of-the-art Reliability Engineering and System Safety, 76, 189–204

### Section 3 – Program Process

The following is a list of steps that have been identified as part of the process to implement a program to change culture in organizations.<sup>61</sup> Please indicate the extent to which each step was present in the implementation of your program and its perceived impact on the outcome of your program.

Stage 1 Create a sense of urgency within the organization for the need to change the safety culture. This motivates organization members by convincing them of the need for change.

3.1 Did you complete this step in your program? (Y/N)

If Yes, describe the process you used to fulfill this step as part of your program to change safety culture within your organization:

---

If Yes, explain how fulfilling this step supported the goals of the safety culture program within your organization:

---

If No, how do you think not including this step impacted the success of the safety culture program within your organization?

---

Looking back, what would you do differently with this step to ensure greater success for future programs to change safety culture in your organization?

---

<Repeat for remaining steps>

Stage 2 Form a powerful coalition within the organization to support the program. This involves securing strong leadership and support from influential sources to implement the program.

Stage 3 Create a vision for change to direct the program. This provides focus and understanding about the goal of the program to direct actions and defines success.

Stage 4 Communicate the vision of the program to all participants and stakeholders. This communicates and incorporates the program goal into the conversation and culture of the organization.

Stage 5 Remove obstacles that can impede the program. This stage considers the processes, structures, knowledge, and skills that can help or hinder progress with the program.

Stage 6 Create short-term wins to demonstrate feasibility and success of program. This provides the motivation and confidence to pursue the program of change.

---

61 For example, see “Kotter’s 8-Step Change Model: Implementing Change Powerfully and Successfully,” Mind Tools Ltd., [http://www.mindtools.com/pages/article/newPPM\\_82.htm](http://www.mindtools.com/pages/article/newPPM_82.htm)

---

Stage 7 Create momentum by building on successes. This provides momentum for the program of change and supports the evaluation of progress to revise the program.

Stage 8 Make sure changes are incorporated in the culture. This solidifies and sustains the changes achieved in the overall organizational culture.

Stage 9 Implement process of ongoing program review and evaluation to support continuous improvement and program sustainability.

## Section 4 - Final Thoughts

Finally, we would like you to reflect on the overall success of the program and think about lessons learned by your organization in the development and implementation of your program.

4.1 In your opinion, what was the most important element in the design of your program (e.g., introduction of additional safety training or incentives) that contributed to the program's success in changing the safety culture program within your organization?

---

4.2 In your opinion, what was the most important process used in the implementation of your program (e.g., early participation by employees, strong support from leadership) that contributed to the program's success in changing the safety culture program within your organization?

---

4.3 In your opinion, what was the most important strategy used by your organization (e.g., reducing turnover, training new leadership) to sustain the ongoing success of the program to improve the safety culture program within your organization?

---

4.4 In your opinion, were there any elements, processes, or strategies that your organization omitted that could have increased the success of your program had they been included?

---

4.2 In your opinion, what was the biggest "mistake" made by your organization that jeopardized the success of the safety culture program?

---

4.3 Is there anything else you would like to share with us about your program that you feel would help us with this scan?

---

**Thank you for your time and input.**

**APPENDIX D: HOST AGENCY CONTACTS**

---

---

# Appendix D: Host Agency Contacts

## **FHWA**

Tony Furst  
Associate Administrator for Safety Federal Highway Administration (FHWA)  
1200 New Jersey Avenue, SE  
Washington, DC 20590  
Phone: (202) 366.2288  
E-mail: [tony.furst@dot.gov](mailto:tony.furst@dot.gov)

## **Iowa**

Steve J. Gent  
Director, Traffic and Safety  
Iowa Department of Transportation  
800 Lincoln Way  
Ames, IA 50010  
Phone: (515) 239-1129  
E-mail: [steve.gent@dot.iowa.gov](mailto:steve.gent@dot.iowa.gov)

## **Minnesota**

Todd Haglin  
Emergency Management and Safety Manager  
Minnesota Department of Transportation  
395 John Ireland Boulevard  
St. Paul, MN 55155  
Phone: (651) 366-3079  
E-mail: [todd.haglin@state.mn.us](mailto:todd.haglin@state.mn.us)

---

Todd A. Christenson  
Program Manager  
Property & Casualty, Safety & Loss Control Risk Management Division  
Minnesota Department of Administration  
310 Centennial Office Building  
658 Cedar Street  
St. Paul, MN 55155  
Phone: (651) 201-3005  
E-mail: [todd.christenson@state.mn.us](mailto:todd.christenson@state.mn.us)

## Washington

Darrin Grondel  
Director  
Washington State Traffic Safety Commission  
621 8th Avenue SE – Suite 409  
Olympia, WA 98501  
Phone: (360) 725-9899  
E-mail: [dgrondel@wtsc.wa.gov](mailto:dgrondel@wtsc.wa.gov)

## Granite Construction

Bob Johnson  
Vice President  
Director of Safety  
Granite Construction Incorporated  
Phone: (661) 399-3361  
E-mail: [bob.johnson@gcinc.com](mailto:bob.johnson@gcinc.com)

## Monsanto Company

Jeff Castillo  
Monsanto Company  
Global Vehicle Safety Lead  
800 N Lindbergh Boulevard  
St. Louis, MO 63167  
Phone: (314) 694-6524  
E-mail: [jeff.e.castillo@monsanto.com](mailto:jeff.e.castillo@monsanto.com)





**Safety**  
doesn't happen by  
**Accident**

