

Guidance for Evaluating Traffic Safety Culture Strategies

by

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A proposal prepared for the

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November 26th, 2018

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PROBLEM STATEMENT

In an effort to reduce the number of traffic crashes and resulting injuries and fatalities, traffic safety agencies are developing and implementing new intervention strategies aimed at changing road user culture. However, systematic evaluations of the implementation and impacts of these new programs are not advancing as rapidly as the programs themselves. At this point, there are neither well-developed summative/outcome evaluations nor formative/process evaluations of most existing programs. Compounding this lack of systematic evaluation is an underlying lack of consensus about or development of the sorts of evaluation designs capable of yielding results that researchers and program managers can be confident in to support future programming and resource allocation decisions.

BACKGROUND SUMMARY

In recent years, traffic safety agencies have developed and implemented new initiatives aimed at changing both agency and road user culture as a way to reduce the number of injuries and fatalities on public roads and highways. A preliminary review of Transportation Research Board's Transportation Research International Documentation Research in Progress databases, as well as other research databases, found several broad lines of research on culture. One line focuses on social and safety culture of communities as it relates to the behaviors of community members who operate cars, ATVs, watercraft, snowmobiles, and other vehicles (Mulder and de Rooy 2018; Hanchrow 2017; Li et al. 2014). A second body of research studies the organizational culture of transportation agencies and examines culture both as it affects either safety orientated activities or organizations' cultural capacity for innovation and change (Bedford et al. 2017; Brunetto et al. 2014). A final area of cultural research explores these questions in maritime, air, and other non-road transportation domains (Fu and Chan 2013; Mearns et al. 2013; Lopez de Castro et al. 2013).

As the use of culture-based safety initiatives has expanded, systematic evaluations of the operations and impacts of these new programs have not advanced as rapidly as the programs themselves. Several authors have noted that road safety campaigns (one type of strategy used to change traffic safety culture) are rarely subjected to a formal and complete evaluation (Robertson and Pashley 2015; Hoekstra and Wegman 2011). This lack of accessible evaluation data severely restricts the advancement and adoption of effective campaigns because there is (1) no guidance on how to improve campaigns, (2) no evidence to discontinue ineffective campaigns, and (3) no impetus to advance safety campaign techniques. Both peer-reviewed and professional literature suggests that there is a consistent set of barriers to both conducting evaluations and using the results in the instances when evaluations are conducted. Commonly cited barriers include factors such as a lack of time and resources, insufficient knowledge to conduct or use evaluations, and skeptical attitudes among program staff about the process and results of evaluations (Bresciani 2011; Holosko 2008). The General Accountability Office (GAO) reports that less than 40% of the agencies they examined had conducted formal evaluations of their programs. However, 80% of the agencies that conducted evaluations reported multiple benefits from having done so. Thus, rather than provide a hypothetical example of a complete evaluation, we instead reference the European Campaigns and Awareness-Raising Strategies in Traffic Safety (CAST) project which developed standard tools for evaluating roadway safety campaigns (Vaa et al. 2009) and reporting their effectiveness (Boulanger 2009). Both these tools are supported by a comprehensive guidance manual for designing, implementing, and evaluating roadway safety campaigns (Delhomme et al. 2009). Transportation agencies are advised to review this tool and manual as part of the design, implementation, and evaluation steps of the strategic approach.

As the conceptual development of culture-based safety strategies becomes more refined and more agencies move to implement those strategies, there is a need to systematically assess which program models are effective and why and what program models function well within organizations and communities. It is also important to consider evaluations focused on culture change and development in settings other than traffic and transportation agencies. Organization and social culture have been extensively studied in other social settings, and an examination of what is known of culture-focused evaluation in those areas can contribute to related efforts in transportation safety.

Summative or outcome evaluations are those that assess the effectiveness of programs with respect to their capacity to affect desired outputs and/or outcomes and, where possible, to separate the impacts of the program from other factors that may simultaneously affect the outcomes of the program in question. Summative evaluations are also critical in calculating the size of the program's impact, particularly in public sector programming where scarce resources need to be allocated to programs with the most substantial impacts. An initial review of the existing literature revealed a small number of self-identified summative evaluations, as well as a number of case and single-group studies that assessed the impact of single or stand-alone programs. However, these efforts vary substantially in design, and the review did not uncover any meta-analyses of these empirical assessments that would enable any conclusions about the relative effectiveness of different program models.

In contrast to summative evaluations, formative or process evaluations examine the implementation or operation of a program in order to determine if how a program is organized or implemented impacts its effectiveness. The focus of these assessments is on design and functional performance of programs, regardless of the causal or logic model used. The review of existing formative research revealed even fewer process evaluations of existing programs than summative evaluations. Similarly, the review found no evidence of existing meta-analyses that would enable more global claims about the operational approaches that have proven effective or not.

While the shift towards cultural approaches to safety programming is relatively new to transportation and traffic domains, culture change and cultural interventions have been used in other organization types for nearly three decades. As the features and functions of culture are not confined to traffic or transportation domains, there is also a need to assess what is known about change strategies and their effectiveness in other areas such as public health, social services, nursing, community development, and beyond. Assessment of what is known about the effectiveness of culture-based strategies in these areas will enable researchers and program staff to begin to determine what can be drawn from these settings and applied or adapted to traffic safety. A systematic assessment of this broader literature poses a different challenge than the review of traffic safety culture research and evaluations in that it is so extensive that narrowing the analysis to those studies that are most applicable to traffic safety will require refining the search and collection strategies and then the synthesis of those results into a meta-analysis useful to traffic safety researchers and program staff.

BENEFITS

The short-term benefits of this project include:

- The research will result in a summary analysis of formative and summative evaluation designs as well as any outcomes identified by the existing studies.
- That comparative assessment will be utilized to develop evaluation process guidance of traffic safety culture strategies for current practitioners based on available best-practices.
- The assessment will also provide recommendations to develop better evaluations and ultimately more effective programs.

In the long-term:

- These findings will also benefit researchers conducting future evaluations and their ability to craft successful summative and formative designs as well as program managers who either conduct or assess contracted evaluations.
- These findings will lead to more effective strategies as better evaluations allow program managers to make more informed decisions about selecting strategies and program developers to create more effective strategies.

OBJECTIVES

To address the lack of generally accepted formative and summative evaluation designs and the resulting lack of available outcome and process data, this research will:

1. Conduct a comprehensive systematic review of available evaluations of traffic safety culture initiatives in order to catalog and assess both their designs and findings. This will result in a better understanding of the state of the field with respect to what is known about the effectiveness of existing culture-focused interventions and countermeasures and will identify, catalog, and assess the evaluation designs including their associated impact indicators and measures.
2. Conduct a parallel examination of what is known about formative and summative designs used to evaluate culture change initiatives in other fields including organization development, community development, and community health. An examination of these related fields will yield additional information about both the effectiveness and rigor of the evaluation designs as well as any knowledge generated about the effectiveness and operation of culture change programs in those fields.
3. Provide guidance for practitioners on best practices to evaluate traffic culture strategies.

To support this objective, this project will create:

1. **Summary Guidance on Best Practices to Evaluate Traffic Safety Culture Strategies** – A brief document will be created that can be readily used by traffic safety professionals and stakeholders.
2. **Journal Article** – An academic journal article will be written and submitted for publication to a peer reviewed journal in the traffic safety field. This article will help move the field of study forward and provide researchers with guidance on how to evaluate culturally-based strategies in the future.
3. **Webinar** – A webinar will be created to summarize guidance for the traffic safety community. The webinar will highlight how program managers can use this guidance to select intervention strategies.
4. **A Poster** – A high-resolution graphic will be created that is suitable for printing on a large poster for use in a conference poster session for traffic safety professionals to use to disseminate a summary of guidance on the evaluation of traffic safety culture strategies. A handout with talking points will also be created.

RESEARCH PLAN

The Center for Health and Safety Culture is proposing to conduct a systematic review of available evaluations of traffic safety culture initiatives as well as evaluations of culture change initiatives in an effort to develop guidance for practitioners to increase program effectiveness and decision making.

1. Method

The method proposed for this project is divided into four tasks:

- Task 0. Project Management
- Task 1. Literature Review
- Task 2. Journal Article
- Task 3. Final Report, Summary Guidance for Practitioners, Webinar, and Poster

Task 0. Project Management

Nic Ward, Ph.D., and Eric Austin, Ph.D., will be the principal investigators for this project. Ward is the Director of the Center for Health and Safety Culture (CHSC) and has experience leading a number of other research projects. Austin is an associate professor in the Department of Political Science and the Master's of Public Administration's coordinator. His research focuses on the role of public organizations in supporting democratic processes, collaborative processes of organizational and policy decision-making, theories of technology and digital governance, and psychoanalytic theory and phenomenology in public administration. They will participate in the kick-off meeting to review the details of the project and to make sure all policies and procedures are followed to align with MDT's expectations. Ward will engage in monthly calls with MDT to review progress and will provide quarterly reports of progress addressing time and budget. He will assure quality for all aspects of the project. They will be supported by Deb Strachan and Kelly Green who will provide financial data. As part of project management, communications will leverage existing communication plans from the support contract including the monthly phone call with MDT and the quarterly meetings with the pooled fund panel. To ensure quality of deliverables, the pooled fund panel will be invited to review draft deliverables. Necessary revisions will then be made for the final products submitted to MDT.

Task 1. Literature Review

A comprehensive literature review of published research on available evaluations of traffic safety culture initiatives will be completed. Austin, with the support of a graduate student, will review the research and draft the literature review. Ward, Otto, and Green will provide feedback and submit the task report to MDT.

A task report will be written capturing the findings of the literature review. The publication of this task report online will be delayed until the journal article has been published. CHSC staff will conduct a second scan of published literature at the time of the final report and augment the literature review with recently published information in the final report.

Task 2. Journal Article

An article will be written and submitted to a peer-reviewed journal in the traffic safety field. The intent of this journal article will be to help address the lack of evaluations of the operations and

impacts of traffic safety culture strategies. The article will catalog the current traffic safety culture evaluation designs and findings as well as their impact indicators and measures. It will recommend evaluation designs capable of yielding results that practitioners and researchers can use to advance practice. Austin, Ward, Otto, and Green will be responsible for getting the article published. The anticipated timeline is to submit the article after the board's review in December 2019 with publication to follow in four to six months.

The task report will be the journal article. This task report will not be published online; instead, a link to the published article can be posted online.

Task 3. Guidance for Practitioners, Final Report, Webinar, and Poster

The final draft of each component created for this project will be documented in a Task 3 Final Report following MDT's reporting guidelines. A key component of the final report will be summary guidance for conducting an evaluation process. This will be written for practitioners in a way that is accessible to a general, practitioner (i.e., non-academic) audience. This guidance will be a standalone product that can be distributed to traffic safety professionals. It will be written as a sequence of guiding principles or steps that need to be undertaken as part of a process to evaluate a traffic safety culture based on best-practices identified in the reviewed literature. This report will be written by Ward, Otto, and Green. A webinar will be presented to the pooled fund members upon acceptance of the final report. The webinar will be recorded and made available for future distribution and viewing. A poster will be developed by CHSC staff along with talking points, and a draft will be shared with the final report.

The final report will include previous task reports, summary guidance for the practitioner, and a link to the downloadable poster.

TSC POOLED FUND INVOLVEMENT

We anticipate the assistance of the TSC Pooled Fund board in contributing to the review and approval of the project deliverables.

PRODUCTS

1. Task 0 Quarterly Progress Reports
 - Progress reports based on MDT template for each quarter of project.
2. Task 1 Report: Literature Review
 - A summary of findings of the literature review will be provided.
3. Task 2 Report: Journal Article
 - A draft of the final journal article will be provided.
4. Task 3 Final Report Including Summary Guidance on Best Practices for Practitioners
 - The final report will include previous task reports as well as the Summary Guidance for Practitioners.
5. Task 3 Video Webinar of Results (recorded)
 - A webinar will be created to summarize guidance to the traffic safety community. The webinar will highlight how program managers can use this guidance to inform process and outcome evaluations.
6. Task 3 Poster and Talking Points
 - A high-resolution graphic will be created that is suitable for printing on a large poster for use in a conference poster session for traffic safety professionals to use to disseminate a summary of guidance on the evaluation of traffic safety culture strategies. A handout with talking points will also be created.
7. Task 3 Project Summary Report
 - Provide text and graphics for project summary report. To be completed within a month of final revisions of the final report.

IMPLEMENTATION

The final report, summary guidance, webinar, and poster will provide accessible guidance for traffic safety professionals at the national, state, and local levels on how to enhance the quality of evaluation (both process and outcome) for traffic safety culture interventions. Increasing the quality of process and outcome evaluations has the potential, over time, to significantly enhance the impact of culture-based strategies and thereby improve traffic safety.

SCHEDULE

The timeline for the main tasks and deliverables is summarized below for this 18-month project (Months 16-18 are for board review of final report, revisions, and comment):

	Month (Est. Starting Month- December 2018)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Task 0. Project Management Bimonthly Progress Report	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Task 1. Literature Review Report	X	X	X	X X	X													
Task 2. Journal Article Report						X	X	X	X	X	X X	X	X					
Task 3. Guidance, Final Report Guidance, Report Webinar/Poster/ Project Summary											X	X	X	X	X X	X X	X X	X X

BUDGET

The project costs are summarized below. Table 1 summarizes the costs by budget item; Table 2 summarizes the pay rate and benefit rate for project staff; Table 3 summarizes the costs by task; and Table 4 summarizes the project costs by fiscal year. Note that a variety of staff are included in the budget because of (1) the need for skills and knowledge across a range of disciplines, and (2) the need to reduce the budget by using staff from lower salary ranges.

Table 1. Project Budget by Item

Item	Total
Salaries	\$32,338
Benefits	\$9,903
Contracted Services	\$0
Supplies	\$100
Communications	\$0
Total Direct Costs	\$42,341
Indirect Costs (25%)	\$10,585
Total Project Cost	\$52,926

Table 2. Pay Rate and Benefits

Individual	Hourly Rate	Benefit Rate
Eric Austin	\$47.98	34.0%
Nic Ward	\$87.78	26.9%
Jay Otto	\$53.86	34.1%
Kelly Green	\$27.49	42.1%
Jamie Arpin	\$24.52	44.8%
Graduate Student	\$23.01	1.0%
Deb Strachan	\$31.45	39.3%

Table 3. Project Budget by Task

Item	Total
Task 0 – Project Management	\$1,768
Task 1 – Literature Review	\$21,598
Task 2 – Initial Drafts	\$18,907
Task 3 – Final Drafts	\$10,653
Total Project Cost	\$52,926

Table 4. Project Budget by State and Federal Fiscal Years

Item	State Fiscal Year		Federal Fiscal Year	
	2019	2020	2019	2020
Salaries	23,989	8,349	18,586	13,751
Benefits	7,072	2,831	5,366	4,538
Contracted Services	0	0	0	0
Supplies	75	25	67	33
Total Direct Costs	31,136	11,205	24,019	18,322
Indirect Costs (25%)	7,784	2,801	6,005	4,580
Total Project Cost	\$38,920	\$14,006	\$30,024	\$22,902

STAFFING

Staffing for this project involves members of the Center for Health and Safety Culture. Each staff member contributes to the project in a unique way based on their specific expertise and background. Table 5 summarizes staff time by task for the 18-month duration of this project. Overall, this effort can be interpreted as the equivalent of one person working on this 25% of the time for 18 months (see FTE in Table 5). We believe this FTE equivalent effort is reasonable to satisfy the goals of this project in a cost-effective manner.

Eric Austin, Ph.D., will serve as the co-Principal Investigator (PI) for this research project. Austin will lead Task 1 and Task 2. He will also manage a graduate research assistant who will help with both tasks as well. Dr. Eric Austin joined MSU's Political Science department in 2005 after three years with the School of Public Affairs and Administration at Western Michigan University. Since coming to MSU, he has served as the Coordinator of the Master of Public Administration program and in 2013 was appointed as the Executive Director of the Burton K. Wheeler Center for Public Policy. Austin's research focuses on the factors that affect organizational culture that influences policy making and decision making, especially in contentious environments. He teaches courses including organization theory, public management, public policy, and administrative ethics. In the fall of 2014, he and his co-author Sandra Parkes-Pershing, published their book *Organization Theory and Governance for the 21st Century* with CQ Press. Austin's professional career prior to completing his Ph.D. at Virginia Tech included working as a project director in both public and non-profit organizations. In addition to working on various environmental, educational and social services programs, Austin served and continues to work as a trainer and consultant providing technical support and capacity building programs for organizations ranging from large, federal agencies to small, volunteer-based non-profits.

Nic Ward, Ph.D., will serve as the co- Principal Investigator (PI) for this research project. Ward will manage the project and monitor all progress for quality as well as contribute to developing each multimedia primer component. Ward will communicate on a monthly basis with MDT and the pooled fund on the progress of the project. Ward will contribute to the project bringing nearly 20 years of international research in human factors applied to traffic safety. Professor Nicholas Ward (F. Erg. S) is currently a Professor of Mechanical and Industrial Engineering at Montana State University and Director for the Center for Health and Safety Culture at WTI. Professor Ward has led several successful interdisciplinary and international consortia for traffic safety research including intelligent transportation systems, driver behavior (impairment), and traffic safety culture.

Jay Otto, M.S., will assist with all steps of the project and co-author the journal article with Austin, Ward, and Green. Otto is the principle research scientist at the Center for Health and Safety Culture. He oversees all the Center's projects and fosters integration and dissemination of research findings across projects. He is a contributing author on several publications about traffic safety culture and is presently leading multiple traffic safety projects.

Kelly Green, M.P.A., will contribute to the journal article and will compile the final report and the project summary report. Green is a Research Associate II with training in public administration, qualitative evaluation, and publication processes.

Jamie Arpin, B.S., will provide editing for all task reports, journal article, final report, project summary report, and presentations. Arpin is a Research Associate who provides editing and writing guidance on all Center projects.

Deb Strachan will be involved in the financial and contract management of this project.

Table 5. Schedule of Staffing

Name	Role	FTE*	Hours by Task				
			0	1	2	3	Total
Eric Austin	P.I./Principal Researcher	8.14%	0	100	100	55	255
Nic Ward	P.I./Project Manager	1.76%	0	10	25	20	55
Jay Otto	Research Staff	3.13%	0	48	30	20	98
Kelly Green	Research Staff	5.11%	0	80	60	20	160
Jamie Arpin	Research Staff	1.12%	0	10	10	15	35
Graduate Student	Research Student	5.27%	0	120	45	0	165
Deb Strachan	Financial Management	0.96%	30	0	0	0	30
Total		25.48%	30	368	270	130	798

*based on 18 months

FACILITIES

The Western Transportation Institute (WTI) is the nation's largest transportation institute focusing on rural transportation issues and is designated as a National University Transportation Center sponsored by the U.S. Department of Transportation. The Institute was established in 1994 by the Montana and California Departments of Transportation in cooperation with Montana State University (MSU). WTI has a 50+ person multidisciplinary staff of professionals, students, and associated faculty from engineering (mechanical/industrial/civil/electrical), computer science, fish and wildlife, ecology, business, and economics.

WTI has an annual budget of approximately \$8 million, which is obtained from a diverse sponsor base including 26 state departments of transportation, the U.S. Department of Transportation (USDOT), and other federal agencies such as the National Science Foundation, Department of Homeland Security, Transportation Research Board, and the National Park Service. WTI also receives funding from private foundations, Parks Canada, and several companies.

WTI draws from eight integrated research areas to create solutions to rural transportation issues and manages seven laboratories. The 30,000 square feet of space provides dedicated onsite space and laboratories for project staff as well as facilities for archiving and transmitting data. As a department within the College of Engineering at MSU, WTI is also supported by the College and by the umbrella of MSU administrative, academic, and research resources.

Center for Health and Safety Culture

In 2009, WTI established the Center for Health and Safety Culture (CHSC) – a research center composed of inter-disciplinary researchers and practitioners from across North America dedicated to using science to address social issues. The mission of the CHSC is to develop methods to grow positive norms that support health and safety. The Center works with a variety of clients and sponsors including local, state, federal governmental agencies (e.g., state departments of transportation), private businesses, corporations, community coalitions, and private foundations.

Information Services

The Western Transportation Institute is housed in the Transportation and Systems Engineering Building on the Montana State University (MSU) campus, which provides ready access to MSU's library, computing, and other facilities. The MSU Library system has licenses with the largest databases of published literature as well as open access to published articles in numerous peer reviewed journals. These resources will be critical in researching past studies and identifying evidence-based strategies. Literature and information gathering is performed through the Carnegie Research Level 1 Library (Renne Library). In addition to an extensive collection of printed material, the library subscribes to dozens of databases and hundreds of refereed journals in print and electronic format. Specific items not accessible through these sources can be located and retrieved by the Interlibrary Loan service, which is affiliated with other research libraries across the United States. Typical sources used to aid literature searches include: TRIS Online (Transportation Research Information Services), E-Science Server, Transportation Research Board Research Records and Annual Meeting CD-ROMs, Google Scholar, Google, and Montana Local Technical Assistance Program library.

Graphic and Communication Services

Communications staff provides technical editing, layout, graphic design, and web page support. Information Technology staff maintains network servers and individual computers, software, and hardware. Relevant university communication facilities include video and conference room facilities. WTI routinely conducts internet-based meetings with clients and staff located across the United States and Canada. Webinars are hosted to facilitate training and information dissemination and recorded for later access by stakeholders and clients.

Administrative Services

The researchers at WTI are assisted by a highly-qualified group of experienced support staff. Administrative staff members assist with budgeting, procurement, contracts, and accounting. The university provides Extended University services for online educational course development and publications and an Institutional Review Board (IRB) to oversee all research engaging humans.

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