RESEARCH

Report No. UT-23.21

FATALITY REDUCTIONS ABROAD: A SURVEY OF SUCCESS FROM FOREIGN JURISDICTIONS

Prepared For:

Utah Department of Transportation
Research & Innovation Division

Final Report
November 2023

<u>DISCLAIMER</u>

The authors alone are responsible for the preparation and accuracy of the information, data, analysis, discussions, recommendations, and conclusions presented herein. The contents do not necessarily reflect the views, opinions, endorsements, or policies of the Utah Department of Transportation or the U.S. Department of Transportation. The Utah Department of Transportation makes no representation or warranty of any kind, and assumes no liability therefore.

<u>ACKNOWLEDGMENTS</u>

TECHNICAL REPORT ABSTRACT

1. Report No. UT- 23.21	2. Government Accession No. N/A	3. Recipient's Catalog No. N/A	
4. Title and Subtitle FATALITY REDUCTIONS ABROAD: A SURVEY OF SUCCESS FROM FOREIGN JURISDICTIONS		5. Report Date November 2023	
		6. Performing Organization Code	
7. Author(s) Shaunna K. Burbidge, PhD, Camille Anderson, PE, Mitsu Saito, PhD		8. Performing Organization Report No.	
9. Performing Organization Name and Address Avenue Consultants 6605 South Redwood Road Suite 200 Taylorsville, Utah, 841423		10. Work Unit No. 5H08636H	
		11. Contract or Grant No. 228194	
12. Sponsoring Agency Name and Address Utah Department of Transportation 4501 South 2700 West P.O. Box 148410 Salt Lake City, UT 84114-8410		13. Type of Report & Period Covered Final Sept 2021 to Nov 2023	
		14. Sponsoring Agency Code PIC No. 21.307	
15. Supplementary Notes Prepared in cooperation with the Utah Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration			

16. Abstract

Despite intensive efforts on the part of the Utah Department of Transportation (UDOT) and Vision Zero, fatalities in the state of Utah have seen only a modest decrease, with the most recent years exhibiting an uptick in fatalities. Achieving a goal of zero road fatalities is of great importance to UDOT. Using an extensive network of contacts abroad (such as in Greece, Italy, Israel, and Denmark), Avenue Consultants was able to provide UDOT with a number of policies and strategies designed to reduce traffic fatalities that have been implemented in foreign countries, with the goal of presenting examples of strategies that UDOT could implement with the goal of reducing road fatalities. Extensive background research was performed on multiple countries to identify their current safety initiatives and to identify which countries had seen significant decreases in roadway fatalities over the last decade. Contacts were then identified for each of the countries that had seen significant decreases in roadway fatalities through internet search or through contacts known to Avenue Consultants. A survey was developed, and a survey link sent to each country; the survey inquired about traffic safety initiatives in each country, details on how traffic fatality prevention was approached, successes that were seen in reducing fatalities and injuries, and other factors. Results from the survey were compiled and then studied. Responses from the survey revealed several strategies aimed at mitigating roadway safety concerns seen abroad and in Utah.

17. Key Words Roadway fatalities, safety programs, roadway safety, traffic and safety		18. Distribution Statement Not restricted. Available through: UDOT Research Division 4501 South 2700 West P.O. Box 148410 Salt Lake City, UT 84114-8410 www.udot.utah.gov/go/research	23. Registrant's Seal N/A
19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. No. of Pages 83	22. Price N/A

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

CDC	Centers for Disease Control and Prevention
CEDR	Conference of European Directors of Roads
CNSR	The French National Road Safety Council
DUI	Driving Under the Influence
FHWA	Federal Highway Administration
GRSP	Global Road Safety Partnership
ISA	Intelligent Speed Adaptation
NHTSA	National Highway Traffic Safety Administration
ONISR	The French Road Safety Observatory
PIARC	Permanent International Association of Road Congresses
UDOT	Utah Department of Transportation
WHO	World Health Organization

EXECUTIVE SUMMARY

Despite intensive efforts on the part of the Utah Department of Transportation (UDOT) and Vision Zero, fatalities in the state of Utah have seen only a modest decrease, with the most recent years exhibiting an uptick in fatalities. Vision Zero is a vitally important goal for UDOT, and despite seeing lackluster results in terms of fatality reduction there are still vast opportunities for assessing other systems or policies to adopt. On the topic of reducing fatalities, much may be learned from innovators outside the borders of the state and even outside the country. Several foreign nations have seen significant decreases in fatalities over the past several years. The primary objective of this research is to develop a list of proven strategies to decrease fatalities that can realistically be applied in the state of Utah. This list will be developed from the investigation results of successful systems and policies of foreign nations.

In order to identify effective strategies to reduce traffic fatalities, the project team aimed to send surveys to countries with downward trends in fatalities. Data from the World Health Organization (WHO)'s "Global Status Report on Road Safety" was used to identify countries with marked decreases in traffic fatalities and historical traffic data to compare countries. A survey was created for contacts in foreign countries to provide feedback on their programs and policies. Contact information was found through previously established resources and internet searches. The survey was then distributed through email to previously identified contacts. The open-ended survey questions were designed to obtain as much information as possible from the survey respondents about the efforts of their country to reduce roadway fatalities and serious injuries. The survey was distributed via email and was sent separately to multiple contacts per country to increase the chances that the survey was taken from each country at least once.

The survey received nine complete responses and three partial responses. Full or partial responses were received from Iran, Italy, Lithuania, the Netherlands, Norway, Austria, Qatar, South Korea, Australia, Sweden, Greece, and Hungary. Survey respondents were asked to list safety strategies their agency has used and then name the types of crashes these strategies intended to reduce. Once a target is established and a strategy chosen, the strategy must be honed to render it effective in its intended use case. In addition to the implementation strategies, a survey question asked respondents for more information on the techniques they use to communicate the strategy

to the public. Strategies were identified pertaining to the following topics: prioritization techniques, targeted crashes, implementation and communication techniques, challenges and solutions, additional strategies, interagency collaboration, and additional lessons learned.

In general, the countries that responded to the survey seem to have similar roadway safety concerns as UDOT, though some differences in political structure and transportation culture were also evident. The survey responses showed a healthy variety of strategies for concerns common to UDOT and provided a fresh list of new ideas. Their strategies are rooted in several different initiatives, including use of technologies (such as automatic speed management), roadway re-design, educational programs, initiatives aimed at changing driver behavior, and others.

1.0 INTRODUCTION

1.1 Problem Statement

Despite intensive efforts on the part of the Utah Department of Transportation (UDOT) and Vision Zero, fatalities in the state of Utah have seen only a modest decrease, with the most recent years exhibiting an uptick in fatalities. Vision Zero is a vitally important goal for UDOT, and despite seeing lackluster results in terms of fatality reduction there are still vast opportunities for assessing other systems or policies to adopt. On the topic of reducing fatalities, much may be learned from innovators outside the borders of the state and even outside the country. Several foreign nations have seen decreases in fatalities over the past several years. This research investigates existing programs and surveys transportation officials in a variety of foreign countries to identify practices that have led to these decreases in fatalities. By investigating the methods that led to substantial results in other places, UDOT can accelerate the timeline of obtaining updated policy and design guidelines, potentially preventing numerous fatalities and saving lives.

1.2 Objectives

The primary objective of this research is to develop a list of proven strategies to decrease fatalities that can realistically be applied in the state of Utah. This list is developed from the investigation results of successful systems and policies of foreign nations.

1.3 Scope

The scope of this project includes using available online resources to learn about successful strategies, as well as creating and disseminating a survey to selected foreign transportation officials to receive specific feedback on the topic of fatality reduction strategies. The results of the data collection were then used to create a list of strategies tailored to Utah.

1.4 Outline of Report

The report is organized into four additional chapters, as follows:

- Chapter 2 provides a literature review examining current practices and background research on specific countries, including the characteristics of their traffic fatality reduction programs and traffic safety initiatives.

- Chapter 3 presents the countries selected for further study and the survey that was created for means of data collection.

- Chapter 4 presents a comprehensive evaluation of the survey results.

- Chapter 5 provides conclusions and recommendations based on the research findings.

2.0 LITERATURE REVIEW

2.1 Overview

A thorough literature review examined foreign programs and the methodologies used for reducing road fatalities. This section provides background information on the countries of Sweden, the Netherlands, New Zealand, Australia, Denmark, and France, as well as existing road fatality initiatives in the United States.

2.2 Introduction

According to the Centers for Disease Control and Prevention (CDC) (2020), over 1.35 million people are killed on roadways around the world each year. That equates to approximately 3,700 people per day. More than half of these fatalities are vulnerable road users, including pedestrians, motorcyclists, and cyclists. Data shows that globally, crash injuries are the 8th leading cause of death, and the leading cause of death for those ages 5-29 (WHO, 2018).

As fatality reduction strategies have been implemented around the world, many countries have seen a significant reduction in traffic deaths. From 2010, the state of Utah similarly saw a downward trend in fatalities. However, in the past two years, roadway fatalities have begun to increase. Considering this increase, the Utah Department of Transportation is undertaking an effort to examine the strategies employed not only in other states, but in other countries where significant improvements have been made. This technical memo outlines a preliminary survey of foreign fatality reduction programs that have proven to be effective. It concludes by highlighting two US jurisdictions that have successfully implemented safe system strategies.

2.3 Foreign Safe Systems Programs

The Safe System approach is not a new concept. It has existed for more than 30 years in countries across the globe. Each of the early adopters of the Safe System approach, shown in Table 2-1, saw marked decreases in traffic fatalities across their roadway systems from 1994-2015, with each country achieving a 50% reduction in fatalities, at least. During the same period, fatalities in

the US only decreased by 11%. The Safe System approach is how these countries moved off the "plateau" of safety to start achieving significant reductions. Analysis in 53 countries found that those that have taken a "Safe System" based approach have achieved both the lowest rates of fatalities per 100,000 inhabitants and the greatest reduction in fatality levels over the past 20 years (World Resources Institute, 2018). These examples show promise that by implementing a Safe System approach, agencies and municipalities in the United States may be able to achieve meaningful reductions in traffic deaths.

Table 2-1 Foreign Fatality Reductions and Programs

Nation	Program Name	Reduction in fatalities from 1994-2015
Sweden	Vision Zero	60-70%
Netherlands	Sustainable Safety	50-60%
Australia	Safe System	50-60%
New Zealand	Safer Journeys	50-60%

2.3.1 Sweden

The motivation to make sure no one is killed or permanently injured on road networks led Sweden to adopt its Vision Zero program in 1995 (TrafikVerket, 2020). Sweden's Vision Zero emphasizes the fact that all the different components of the road transport system belong together and influence each other. If an accident leads to serious personal injuries, it is because the various components of the road transport system do not work together.

The three guiding principles of Vision Zero in Sweden are:

- Road traffic accidents should not lead to serious health loss

- A safe system assumes shared responsibility

- Consideration must be paid to human capabilities and limitations (Szruba, 2020)

The five key strategies Sweden has implemented are:

- Technology for impaired driving – this includes devices that do not allow a car to start unless the driver's breath is non-alcoholic

- Median barriers – used to separate opposing traffic flows

- Roundabouts – used for traffic calming and as a safer alternative to standard intersections

- Speed management – the three specific approaches to this strategy are:

  - Setting the speed limit based on the ability of the environment to avoid or mitigate a crash (e.g., based on the existing separation between conflicting road users or the ability to traverse the roadside area)

  - Speed cameras

  - A vehicle feature called Intelligent Speed Adaptation (ISA) that beeps or makes the accelerator stiffer when significant speeding is detected

- Seat belt reminders – a vehicle feature

Median barriers and cameras are other innovations that have increased the level of safety on Swedish roads. Older solutions such as roundabouts and alcolocks have been developed and have acquired greater importance since Vision Zero was established.

From 2000 to 2020, road fatalities in Sweden decreased by approximately 65%. As shown in Figure 2-1, the last 10 years (2010-2020) have continued to show a decrease, but at a slower rate (2020 fatalities are approximately 15% lower than 2010). Responding to this trend, the Swedish Transport Administration has voiced their determination to find increasingly innovative solutions to reach the ultimate goal of zero fatalities and serious injuries (Sveriges Oficiella Statiskik, 2020).
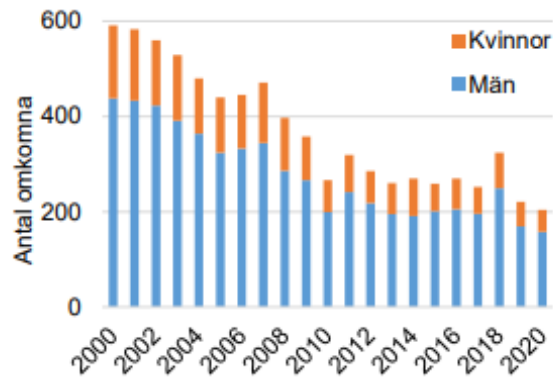
Figure 2-1 Annual Swedish Road Fatalities (Female = Orange, Male = Blue) (Credit: Sveriges Oficiella Statistik, 2020)

2.3.2 Netherlands

The nationwide program in the Netherlands was adopted in 1996 with a focus on human factors (SWOV, 2018). The five principles highlighted are:

- Functionality of roads – every road should have only one functional purpose

- (Bio)mechanics – physical protections for road users should be built into the road network

- Psychologics – roadways should be crafted in ways that match driver expectations and capabilities

- Responsibility – travelers, manufacturers, and government all have responsibility to keep road users safe

- Learning and Innovation – traffic professionals are to continually improve the system through planning, action, evaluation, and revision.

Overall, fatalities on roads in the Netherlands were reduced by approximately 48% from 2000 to 2020. Shown in Figure 2-2 and similar to Sweden, this rate slowed from 2010 to 2020, which saw a decrease of only 5% in the number of fatalities (Theseus, 2020).
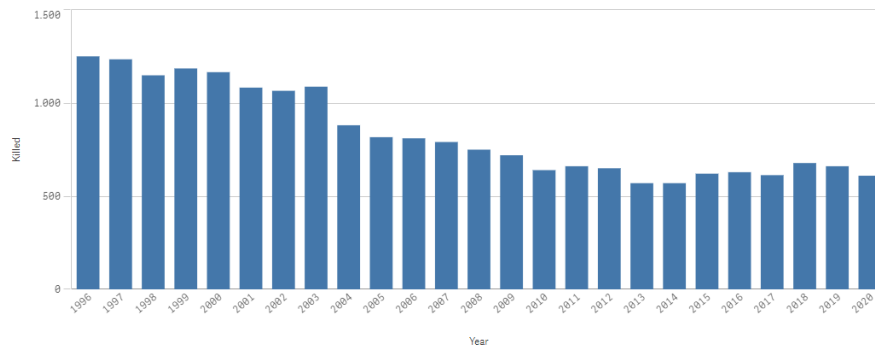
Figure 2-2 Annual Road Fatalities in the Netherlands (Credit: SWOV)

2.3.3 New Zealand

The current New Zealand program for reducing road fatalities, Road to Zero, has been adopted for the years 2020-2030. The previous initiative (for years 2010-2020) was named Safer Journeys (Waka Kotahi, 2021). Road to Zero aims for a 40% reduction in fatalities and serious injuries between 2020 and 2030 with a focus on these five areas:

- Infrastructure and speed

- Vehicle safety

- Work-related road safety

- Road user choices (including training, enforcement, and penalties)

- System management

As shown in Figure 2-3, the number of fatalities (deaths) and serious injuries (combined as DSIs) have trended downward from years 2018 to 2020, but current 2020 numbers are approximately equivalent to those in 2010 (New Zealand Government, 2020).
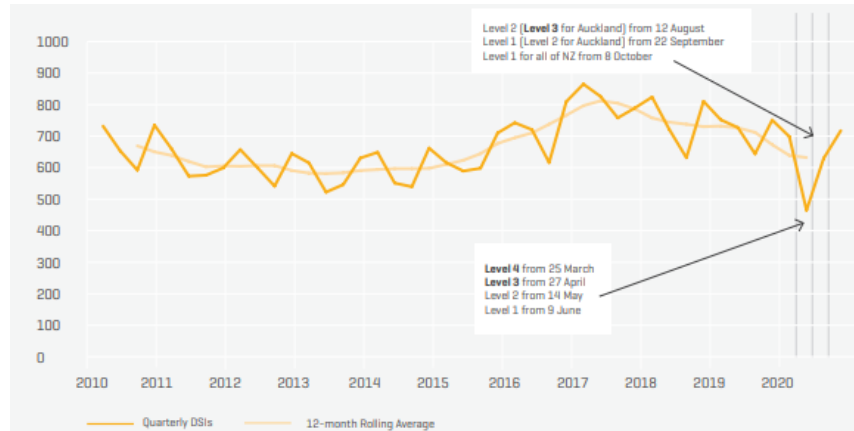
Figure 2-3 New Zealand Deaths and Serious Injuries by Quarter (Credit: Government of New Zealand; Road to Zero, 2020).

<u>2.3.4 Australia</u>

Like the United States, Australia has adopted the Safe Systems approach for their road safety efforts (National Road Safety, 2021). The guiding principles and the seven key inputs noted by Australia are:

- Guiding Principles

    o People make mistakes

    o Human physical frailty

    o A "forgiving" road transport system

- Key Inputs

    o Data, research, and evaluation

    o Road rules and enforcement

    o Licensing and registration

    o Education and information

    o Innovation

    o Standards

o Coordination

Despite an up-and-down trend shown in Figure 2-4, fatalities in Australia have trended downward overall from 2011 to 2020, and the country has seen a 15% reduction in road fatalities (Australian Government, 2021).

Calendar year total
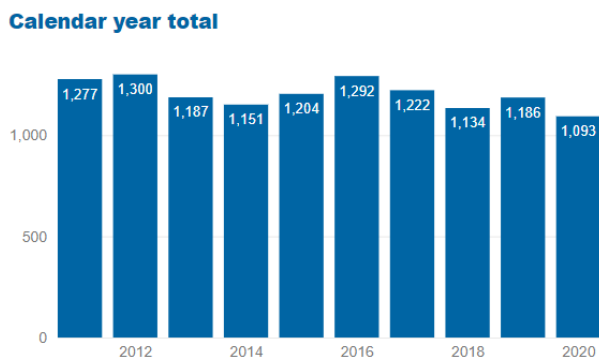
Figure 2-4 Annual Australian Road Fatalities (Credit: Australian Road Deaths Database)

2.3.5 Denmark

Denmark has a published strategy for road safety and the road network in general, but it does not have a specific name. The two-part vision includes "better roads for your money" and "arriving easily and safely (Danish Road Directorate, 2021)." The Danish strategy lists three mission statements and seven focus areas:

- Mission

  o "Danish Road Directorate is responsible for the national roads"

  o "We promote a coherent road and transport system"

  o "Based on the goal of sustainable development, we work for people and goods to arrive easily and safely

- Focus Areas

  o Professionalism and Reliability

  o Sustainability

- o   Efficiency and Cost Management

- o   Mobility

- o   Passability, Safety, and Predictability

- o   Capacity and Coherence

- o   Digitization

As shown in Figure 2-5, the number of fatalities on Danish roads saw a 36% decrease from 2010 to 2020. The number of serious injuries also trended downward. Crash statistics by mode of transportation show that the greatest decrease in fatalities and injuries were found in the modes of car, moped, and pedestrian transportation which had decreases of 20%, 14%, and 11%, respectively, since 2010. The Danish Road Directorate reports that the year 2020 had the fewest road fatalities since the 1930s (Danish Road Directorate, 2021).
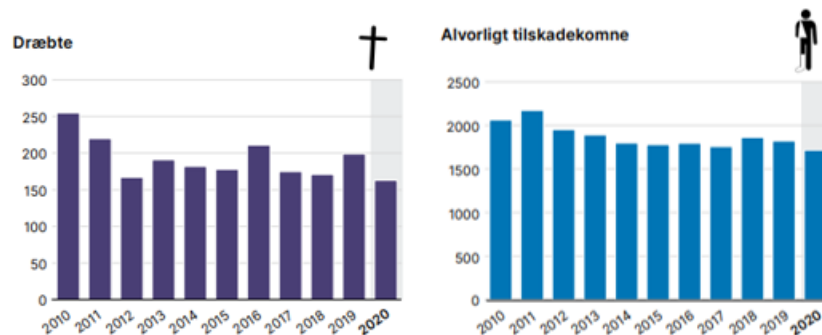
Figure 2-5 Danish Deaths (Left) and Serious Injuries (Right) from 2010-2020 (Credit: Danish Road Directorate)

2.3.6 France

A variety of French publications and government web pages reveal the approaches that have been recommended to reduce road fatalities as well as the steps that have been taken in recent years.

The French Road Safety Observatory (ONISR) states the objective of their road safety policy is to "reduce the number of road traffic injury accidents, in order to reduce the number of

people killed and injured each year." They describe three challenges resulting from fatal or serious injuries on roadways which this policy addresses: emotional tolls, societal tolls, and economic tolls (French Road Safety Observatory, 2021a). A key part of their strategy is interdisciplinary collaboration and efforts, and the ONISR website credits this as a significant part of the success achieved in reducing deaths during 2018 and 2019 (French Road Safety Observatory, 2021b).

The French National Road Safety Council (CNSR) is reported to have three commissions, one for each of the following topics: sharing road protections and risks, societal and health issues that arise from shifting demographics and new mobility behaviors, and innovative technologies in vehicles and related infrastructure (French Road Safety Observatory, 2021c).

In 2019, CNSR presented eight recommendations to the French government to aid in reducing fatalities and serious injuries on the road (CNSR, 2019). These recommendations are:

1. Protect against wrong-way driving

2. Create an Observatory for active transportation to understand its uses and users more effectively

3. Involve manufacturers in training on the proper use of driving aids (e.g., lane departure warning)

4. Preserve the mobility of seniors within good safety practices

5. Raise awareness of work-related road traffic risks among new hires at companies

6. Define an evaluation framework for experiments with autonomous vehicles on public roads

7. Improve the protection of cyclists

8. Train road users in first aid

France has kept a quick-reference guide to the road safety-related measures implemented in recent years. Their website lists a total of 18 measures that were implemented in 2019 and 2020 (French Road Safety Observatory, 2021d). Highlights include:

- "Driving license suspension for drivers holding a phone in their hand and committing at the same time another traffic offence in terms of driving rules: speeding, passing, overtaking, intersection, right of way. Detention then suspension for up to 6 months."

- "Simplification of access to supervised driving. In case of failure of the practical test, only the agreement of the insurer is necessary to resume supervised driving."

- "Enhanced training required to obtain an AM license (for the operation of a moped or light motor quadricycle)"

ONISR has also published the topics of their calls for research projects. The list reveals the issues on which they hope to make large improvements in coming years (French Road Safety Observatory, 2021e). The seven listed topics are:

- "Vulnerable road users (pedestrians, cyclists and powered two wheelers)"

- "Most at-risk age groups: young adults and senior people"

- "Reducing the number of seriously injured people"

- "Behavioural factors (speed, alcohol, drugs, non-compliance with traffic rules, lack of attention and loss of alertness)"

- "Favoring compliance with road traffic regulations and driving safely"

- "The intelligent vehicle"

- "Evaluation of public action in favour of road safety and synergies with other public policies"

As shown in Figure 2-6, the number of fatalities on French roads decreased by approximately 15% between 2010 and 2019 (Ministere de la Transition Ecologique, 2021).
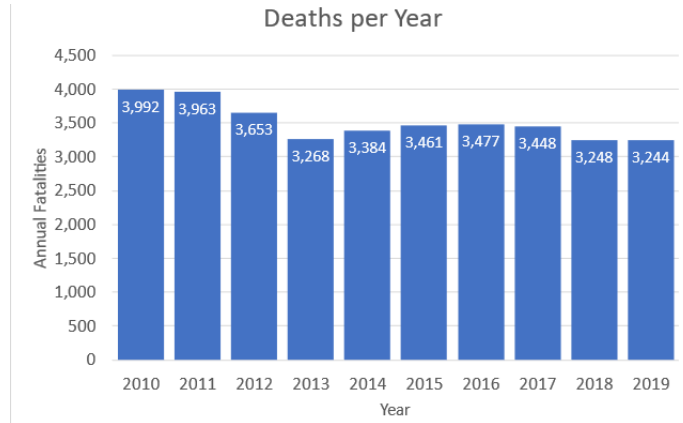
Figure 2-6 Annual French Road Fatalities from 2010-2019 (French Road Safety Observatory)

2.4 U.S. Safe Systems Approach

2.4.1 Safe Systems

The Safe System approach aims to eliminate fatal and serious injuries for all road users by accommodating human mistakes and keeping impacts on the human body low. This is the fundamental objective of the Safe System approach. The Federal Highway Administration (FHWA) has adopted the Safe System program to achieve an end goal of zero fatalities and zero serious injury crashes (FHWA, 2015). The program focuses on six main principles and five layers of protection:

- Principles:
    - Death/serious injury is unacceptable
    - Humans make mistakes
    - Humans are vulnerable
    - Responsibility is shared
    - Safety is proactive
    - Redundancy is crucial

- The Layers of Protection

  o Safe road users

  o Safe vehicles

  o Safe speeds

  o Safe roads

  o Post-crash care

Figure 2-7 below shows the major differences between a traditional crash reduction approach and the Safe Systems approach. As a whole, the Safe Systems program focuses on accepting and accommodating human behavior to limit severity rather than attempting to change behavior or place blame.
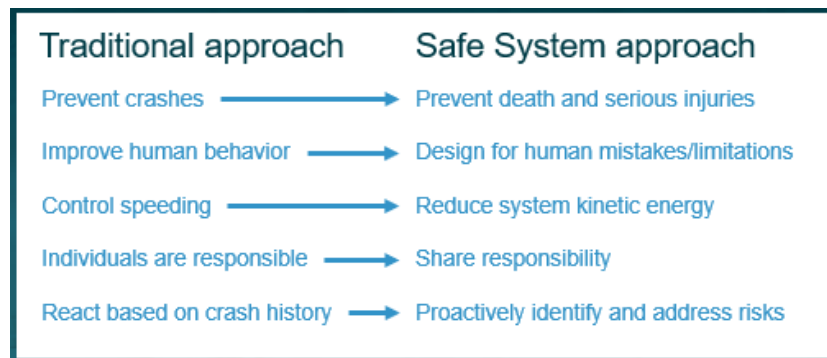
Figure 2-7 Safe Systems Approach (Credit: FHWA Safe Systems Approach)

Studies support the finding that even a small change in vehicle operating speed can have large safety impacts. According to NHTSA Countermeasures that Work, "a reduction of 3 mph in average operating speed on a road with a baseline average operating speed of 30 mph is expected to produce a reduction of 27% in injury crashes and 49% in fatal crashes." Speed limits also help to reduce speeds, but only when they are set with a context in mind. As an example, some Vision Zero cities set speed limits at 20 mph for urban areas with high pedestrian and bike activity.

2.4.2 Carmel, Indiana

According to FHWA (2021), "since 1997, Carmel, IN, has taken a Safe System approach to intersection design by installing roundabouts at intersections wherever possible. The city of Carmel took a systemic approach by converting over 125 intersections to roundabouts to improve safety citywide, regardless of crash history. Roundabouts move people through intersections more efficiently and safely than stop signs or signalized intersections. With roundabouts now at so many of the city's intersections, Carmel has seen serious injury crashes reduced by about 80 percent, and the number of crashes overall has reduced by about 40 percent. The Mayor of Carmel instituted the comprehensive roundabout program to prioritize safety after learning from Europe that roundabouts eliminate right angle and head-on crashes and reduce pedestrian conflict crashes. In addition, roundabouts slow the speed of vehicles maneuvering through an intersection, thus reducing the kinetic forces and crash severity if a crash occurs" (City of Carmel, 2021).

2.4.3 New York, New York

New York City completed a systemic, data-driven crash analysis to understand which areas had high numbers of crashes (FHWA, 2021). They used this information to develop a network map of streets where crashes were disproportionately occurring. New York City then set out to develop infrastructure countermeasures, such as those on Queens Boulevard (Figure 2), which included pedestrian improvements, bike lanes, and physical barriers to separate users in the space. After adding dedicated space for pedestrians and cyclists, traffic injuries dropped by approximately 35 percent on the 2.5-mile corridor. Pedestrian injuries decreased by 63 percent (New York City DOT, 2018).

2.5 Summary

Numerous fatality reduction programs are utilized in foreign countries. A number of countries have successfully reduced the amount of traffic fatalities seen annually through implementation of specific programs with forward-thinking methods and innovation. These

programs could serve as an example to US agencies on how to approach traffic fatality reduction strategies, and similar strategies implemented within the US could help reduce the number of roadway fatalities that occur.

3.0 DATA COLLECTION

3.1 Overview

In order to identify effective strategies to reduce traffic fatalities, the project team aimed to send surveys to countries with downward trends in fatalities. Data from the World Health Organization (WHO) was used to identify countries with marked decreases in traffic fatalities and historical traffic data to compare countries. A survey was created for contacts in foreign countries to provide feedback on their programs and policies. Contact information was found through previously established resources and internet searches. The survey was then distributed through email to previously identified contacts.

3.2 Who to Survey

The project team wanted to survey as many countries as possible that have had a noticeable downward trend in fatalities, including those with known traffic safety programs as mentioned in the literature review. To find a list of such countries, the project team referred to a 2018 WHO report titled "Global Status Report on Road Safety." This report provides one-page summaries for each country in the world, including line charts of historical traffic deaths based on available data (typically years 2007-2016). These line charts were reviewed, and countries with a noticeable decrease in roadway fatalities over time were selected for further study. The two countries neighboring the United States (Canada and Mexico) were also selected due to the potential relevance to the project, considering their proximity. The combined list of countries (those studied in the literature review, those selected from the WHO report, and the neighboring countries) is shown in Table 3-1. It should be noted that more countries than on this list showed a decrease in fatalities in the WHO report, but only those with the most marked reduction were selected.

Table 3-1 Selected Countries

Australia	Hungary	Oman
Austria	Iran	Portugal
Belarus	Italy	Qatar
Belgium	Kazakhstan	Russia
Canada	Lithuania	Singapore
Czech Republic	Mexico	South Korea
Denmark	Moldova	Spain
France	Netherlands	Sweden
Germany	New Zealand	Switzerland
Greece	Norway	Syria
		Trinidad and Tobago

Further information on these countries was found to aid the creation and distribution of the survey, including contact information, historical crash data, and examples of safety strategies. The following sections will discuss these topics.

3.2.1 Collecting Contact Information

Dr. Saito and Dr. Burbidge of the project team had several foreign contacts from their time and efforts in international engineering associations. Their contacts for the selected countries were gathered and saved for the distribution of the survey. Contacts were also gathered from the traffic safety (or related) websites of the countries. Email addresses of traffic safety government leaders were preferred, but in some cases generic contact emails were the only emails found. Wherever possible, multiple contacts for each country were collected and saved.

3.2.2 Collecting and Comparing Historical Crash Data

Historical crash data found online were used to create comparisons between the selected countries. Crash data coming directly from a government website of each country was preferred, but for some countries the only crash data obtained was on a third-party website. Annual unrounded fatalities from 2010 to 2019 (or as many years in that range as possible) were collected. The full list of websites from which this data was obtained is found in Appendix A.

The data were then compiled into one spreadsheet and several calculations were made. First, the growth from one year to the next year was calculated for each year of available data using Equation 3-1. Second, the average growth was calculated for each country using Equation 3-2. Third, the percent average annual decrease in fatalities was calculated using Equation 3-3; the results for each country are shown in Table 3-2.

$$Growth_{Year\ N\ to\ N+1} = \frac{Fatalities_{Year\ N+1}}{Fatalities_{Year\ N}} \qquad \textbf{(3-1)}$$

$$Avg.\ Growth = \left(\sum_{N=Year_{min}}^{Year_{max}-1} Growth\right)/(Year_{max} - Year_{min} - 1) \qquad \textbf{(3-2)}$$

Where:

$Year_{max}$ = most recent year of available data before 2020

$Year_{min}$ = earliest year of available data after 2010

$$Percent\ Avg.\ Annual\ Decrease\ in\ Fatalities = (1 - Avg.\ Growth) * 100 \qquad \textbf{(3-3)}$$

Table 3-2 Percent Average Annual Decrease in Fatalities by Country

Australia	1%	Hungary	2%	Oman	4%
Austria	3%	Iran	3%	Portugal	4%
Belarus	9%	Italy	3%	Qatar	3%
Belgium	3%	Kazakhstan	3%	Russia	5%
Canada	2%	Lithuania	5%	Singapore	5%
Czech Republic	2%	Mexico	4%	South Korea	5%
Denmark	2%	Moldova	5%	Spain	4%
France	2%	Netherlands	-1%	Sweden	1%
Germany	2%	New Zealand	0%	Switzerland	5%
Greece	6%	Norway	6%	Syria	6%
				Trinidad and Tobago	6%

3.2.3 Collecting Examples of Safety Strategies

The third set of information that was collected from online searches was an example of a safety strategy from each country. These examples were collected to be used in the customization of the survey to respondents from each country. There was a wide variety in the example strategies found, ranging from collaborating with non-governmental groups to modifying procedures for obtaining a driver's license.

3.3 Survey Content

A survey was created in SurveyMonkey to be sent out to each country. The survey consisted of 11 pages, shown in Appendix B. The following sections will discuss the five building blocks to the survey, namely the introduction, request for contact information, customized background and example, questions, and conclusions.

3.3.1 Introduction

The introduction to the survey includes a brief description of the project team, the motivation behind the research, and details about the survey including the estimated time for completion.

3.3.2 Request for Contact Information

Following the introduction, a request for the contact information of the survey respondent is listed. The nationality, name, title, and email address of the respondent are all required before continuing on in the survey. This information serves several purposes for the project team, such as knowing who the survey was ultimately taken by (potentially different than who it was sent to), providing a way to send survey deadline reminders and follow-up questions, keeping track of which countries take the survey, and displaying customized content.

3.3.3 Customized Background and Example

The customized content was placed in the page following the contact information so that the survey generator could use the nationality of the respondents to populate the correct customized

content. The intention of introducing this content to the survey was two-fold: first, to create a more personal feel that indicates the project team has not blindly chosen which countries are surveyed, and second, to increase the understanding of the survey respondent on what is meant by "safety strategies." The two portions of customized content used within the survey are the annual average percent decrease in fatalities and the example of a safety strategy (which were discussed previously in Sections 3.2.2 and 3.2.3, respectively). The text of the survey provides context to the customized content as well as links in hyperlink and footnote form that direct to the websites from which the customized content was taken.

3.3.4 Questions

The survey was designed to obtain as much information as possible from the survey respondents about the efforts of their country to reduce roadway fatalities and serious injuries. Thus, all questions were written as open ended, and they covered a wide range of topics on the subject matter. The following is a list of the questions posed in the survey:

1. How does your agency prioritize (decide which are the most important) safety strategies for reducing fatalities, especially when there is a limited budget?

2. What strategies has your agency selected? Please list at least one (1) strategy. [Five response boxes were provided, labeled Strategy #1, Strategy #2, etc.]

3. Please answer the following questions as best you can about this strategy: [the text written for "Strategy #1" on page 4 was pasted here]. [This question series was repeated for a total of five times, once for each possible response to Question #2]

    a. What steps led to choosing this strategy? Please include what data was referenced/reviewed.

    b. What types of crashes did this strategy intend to reduce?

    c. What steps were used to implement this strategy?

    d. What challenges did your agency face when implementing this strategy? How did your agency overcome these challenges?

e. How was this strategy <u>communicated</u> to the public? Was this communication effective?

f. Please explain the <u>results/impact</u> of the strategy. Did the strategy work?

4. What other strategies has your agency discussed for reducing fatalities?

5. What other agencies or departments does your agency collaborate with to identify safety needs? Why?

6. What have you learned from the successes or failures related to reducing fatalities?

<u>3.3.5 Survey Conclusion</u>

The final page of the survey is a short thank you note to the survey respondent, along with the contact information for the project team. All responses to the survey were saved and accessible to the research team regardless of whether the survey respondent made it to the final page.

3.4 Distributing the Survey

The survey was distributed via email. It was sent separately to multiple contacts per country to increase the chances that the survey was taken from each country at least once. In each email was a greeting, an explanation of how the contact information of the recipient was obtained, a brief background on the context of the research project, and a request to fill out the survey. In addition, the estimated time of completion was provided along with the request to forward the email and survey to a more suitable party if the recipient was unable or unqualified to respond to the survey themselves. A deadline for responding to the survey, approximately two weeks after the survey was sent, was also given. Like the survey itself, the email used customized content to show the true interest of the project team. The name of the country and the name of the organization to which the recipient belongs were used throughout the email body.

An example email is shown in Figure 3-1. In this example, the name and contact information of the recipient were provided by project contributor Dr. Mitsu Saito, and his name is displayed rather than the URL address to an agency website.

Dr. Thomas G. Jin,

Our team of transportation engineers at Avenue Consultants, located in Utah, USA is working on traffic safety research with the Utah Department of Transportation (UDOT). Your name was recommended by Dr. Mitsu Saito who is working with us in this research effort.

Despite the best efforts of UDOT and their partners, traffic fatalities in Utah have continued to increase in recent years. We, together with UDOT, would like to learn from your experiences and determine what we can learn from South Korea's strategies for reducing traffic fatalities and severe injuries.

To achieve that goal, we have developed this survey to learn from the experiences and best practices in your country. The survey should not take more than 45 minutes to complete. If you are unavailable to complete the survey due to time constraints, we respectfully ask that you request another person to respond to this survey. You may also save your progress and come back another time to complete the survey.

Survey link: https://www.surveymonkey.com/r/UDOTsafety

If there is someone in the Korea Transport Institute or the Korea transportation government more suited to respond to this survey, we ask that you please forward this email onto him/her and request that he/she respond to this survey. We are seeking to obtain responses by May 20, 2022.

We understand that your time is precious. At the same time, we hope that you would be willing to share your experiences with us about the strategies South Korea has implemented to reduce the number of fatalities and severe injuries.

Sincerely,

Robert Miles, P.E.

Shaunna Burbidge, PhD

Mitsu Saito, PhD, P.E.

Camille Anderson

Figure 3-1 Example email sent to distribute the survey.

4.0 DATA EVALUATION

4.1 Survey Results

The survey received nine complete responses and three partial responses. Two of the complete responses were from the same country, but in that case, the respondents were different persons from different government agencies The following countries gave full or partial responses to the survey:

- Australia
- Greece
- Hungary
- Iran
- Italy
- Lithuania

- Netherlands
- Norway
- Qatar
- South Korea
- Sweden

This chapter will delve into the survey responses – particularly those pertaining to the following topics: prioritization techniques, targeted crashes, implementation and communication techniques, challenges and solutions, additional strategies, interagency collaboration, and additional lessons learned.

Each topic will be discussed in individual sections in this chapter. Note that some survey responses were similar between nations; duplicate or similar ideas have been combined into one for the purpose of discussion. Full, unedited survey responses are provided in Appendix C.

4.1.1 Prioritization Techniques

A common challenge shared among agencies is a limited budget. For many agencies, there are consistently more projects to be done than there is budget to be had. With a limited budget, agencies must be wise in choosing the strategies that will best serve the needs of their jurisdictions. With this issue in mind, the following question was posed to the survey respondents: *How does your agency prioritize safety strategies for reducing fatalities, especially when there is a limited budget?* The following paraphrased answers were given in response to that question:

- Putting emphasis on addressing the causes of fatal crashes

- Focusing on identified safety issues

- Focusing on vulnerable road users

- Aligning priorities with those previously established by a respected commission and/or the agency's published plan

- Selecting countermeasures with the best benefit-to-cost ratio

- Selecting countermeasures that have been proven to work by the agency

- Focusing on hot spots

- Using statistical analyses

- Selecting low-cost measures

- Selecting countermeasures that also align with the current political winds

4.1.2 Targeted Crashes

There are many types of crashes and agencies must choose which ones to pursue reducing first. Survey respondents were asked to list safety strategies their agency has used and then name the types of crashes these strategies intended to reduce. This section gives a list of the crash types named as targets in the survey responses. This is not an exhaustive list of the crashes targeted by the agencies, and it does not necessarily represent a list of the most important crashes the agencies focus on reducing (though it is likely there is much overlap with that theoretical list). What this list does show is a sample of the crash types other agencies felt compelling enough to attack with a safety strategy.

- Crashes involving pedestrians

- Crashes involving cyclists

- Crashes involving motorbikes, motorcycles, mopeds, and powered-two wheelers

- Crashes resulting in fatalities

- Crashes resulting in fatalities and/or serious/disabling injuries

- Bus- or truck-related injury crashes

- Crashes involving unsafe/non-compliant vehicles

- Single vehicle crashes

- Head-on collisions

- Run-off-the-road to-the-left crashes

- High-speed crashes

- Alcohol- and drug-related crashes (impaired driving)

- Crashes involving mobile phone use

- Crashes involving young drivers without seat belts

- Crashes involving fatigue or drowsy driving

- Crashes related to unsafe planning and construction

4.1.3 Implementation and Communication Methods

Once a target is established and a strategy chosen, the strategy must be honed to render it effective in its intended use case. The following were paraphrased topics brought up in answer to this question: *What steps were used to implement this strategy?*

- Hiring a public relations agency; other communication tools

- In-person inspections of hot-spot areas to better understand the issues

- Inviting all municipalities to sign a memorandum agreeing to act on a safety strategy

- Follow priorities

- Meeting with interested stakeholders including non-profit organizations and police forces

- Create a safety campaign and establish a communication campaign for it

- Perform speed-limit suitability checks

- Seeking political support

- Statistical analyses

- Seeking understanding of the user perception of the issue

- Identification and ranking of hot spots

- Develop ways to enforce/monitor a desired road user behavior change

In addition to the implementation strategies above, one survey question asked the respondents for more information specifically on the techniques they use to communicate the strategy to the public. The following techniques were given in response to this question: *How was this strategy communicated to the public?*

- Sending recommendations to the target groups (e.g., pedestrians in rural areas, school kids)

- Writing articles and doing interviews on what roads users can do to be safe

- Inviting a prominent journalist to attend/host memorandum signing events; the journalist then published a positive article

- Holding memorandum signing meetings at schools

- Publish a list of priorities and inform municipalities about it

- Media communication, including use of/collaboration with TV, radio, journals, newspapers, public media platforms

- Long-standing safety campaigns

- Annual themed campaigns

- "Special communication actions"

- "Information campaigns in touristic areas"

- Directly convincing political leaders and getting them to adopt the strategy

- Using variable message signs

- Using roadside signs

- Promoting safety campaigns with dedicated events in-field

- Publishing numbers (including the benefits and targets) to back up decisions

- "Close co-operation with consumer organizations"

- Videos

- Brochures

- Discussions in media about new rules/enforcements

- Raising public awareness of the anticipated benefits of a strategy

4.1.4 Challenges

Effective implementation of a strategy does not always go smoothly; there are often challenges along the way. The following question was posed to the survey respondents: *What*

challenges did your agency face when implementing this strategy? How did your agency overcome these challenges? The paraphrased responses received are listed below; challenges are listed first with solutions developed to overcome those challenges indented beneath. Not all challenges presented in the responses were accompanied by solutions.

- Budget constraints, including prioritization and the risk of cost increases

- Public communication

  - Media campaigns

- Providing necessary equipment

- Stubborn views of decision-makers and road owners, including lobby influences

  - Make small changes to the already-established strategies

  - Use numbers and targets

  - Persistence and persuasion

- Stubborn/uneducated views of drivers/road users

  - Long-standing campaigns (with updates as needed)

  - Increasing drivers' awareness of consequences to specific unsafe behaviors

  - Increasing penalties for specific unsafe behaviors

  - In-vehicle warning systems

  - Developing training for specific road user types

  - Safety-related laws (such as helmets)

  - "Managing pedestrians' access to road network"

- Cost of inspections/audits/maintenance management

  - Improve the inspection/audit systems for both new and existing roads

- "The need for developing … systems to monitor drivers' behaviors"

- "Automated data administration which is necessary for imposing penalties"

- "Not all road users are willing to cooperate in providing information on accidents"

- High costs associated with infrastructure improvements, especially relating to active transportation

  o Improving traffic calming techniques in key areas

- "Willingness of commercial drivers to work more than authorized working hours in order to increase their revenue" [an issue related to drowsy driving]

  o Better enforcement of commercial/transit drivers' allowable hours

  o Improving rest areas

In the responses to the question on overcoming challenges, some additional strategies that have been used by the countries of the survey responses were mentioned:

- "Improving proper methods for reducing vehicle run-off"

- "Improving low-cost safety measures approach"

- "Improving [hotspot] treatment"

- "Revealing untreated segments by installing traffic signs"

- "Improving safety in residential zones and city entrances"

- "Improving traffic safety in working zones"

- "Developing supervisory systems and methods to control pedestrians' traffic behaviors"

- "Improving road geometric design and safety, considering pedestrians and cyclists needs"

- "Developing infrastructures and equipment for transportation of roadside residents"

4.1.5 Results of Strategies

Tables 1, 2, 3, and 4 present paraphrased strategies and the responses received in answer to this prompt: *Please explain the results/impact of [a] strategy. Did the strategy work?* The tables are divided into successful, disappointing, not yet determined, and unknown results.

Table 4-1. Strategies with Successful Results

Strategy	Result
"Priority lists"	Decrease in fatalities in 2021
"Vision Zero"	Reached 2020 targets
TUTOR speed management system	Decrease in fatalities
Speed reduction for high-speed roads / motorways	Decreases in serious injury crashes
"Reduction of safety Risks"	Decrease in fatalities
Education on why safer vehicles are better	Decrease in targeted crashes
"Vulnerable Road Users' Safety Improvement"	Decrease in fatalities
Separate slow mopeds from cyclists	Decrease in targeted crashes

Table 4-2. Strategies with Disappointing Results

Strategy	Result
Hot spot analyses	Not as impactful as was hoped due to the limited budget
Ban using a mobile device while driving	Some reduction in phone use, but not as much as anticipated
Ban driving under the influence (DUI) (alcohol and drugs)	Decrease in DUIs at first, but recent uptick

Table 4-3. Strategies with Results Not Yet Determined (Data Not Yet Collected)

Strategy	Result
Educational activities to develop in society a conscious and safe traffic culture	TBD
Speed management	TBD
Median barriers on high-speed roads	TBD
Video detection of cellphone use with fines as enforcement	TBD, but lots of fines have been issued
Average speed control system on arterials	TBD, but initial results show decrease in fatalities
Long-term systematic approach with specific goals/targets for a future year	TBD

Strategy	Result
Requiring vehicle inspections and vehicle condition standards	TBD
Requiring seat belts to be worn on school buses	TBD

Table 4-4. Strategies That Did Not Report Results in the Survey Responses

Strategy	Result
Speed enforcement by both police and automatic systems	[no response received]
Lower speed limits on urban and neighborhood roads (to 30 mph and 20 mph)	[no response received]
"Make recommendations for improving road safety"	Impossible to tell because "several institutions are working … to improve traffic safety"
Signage and striping	[no response received]
"Agenda 2030 and the sustainable development goals (SDG) are guiding our work on an overarching level"	[no response received]
Lower speed limits	[no response received]
"'The Global Plan for the Decade of Action for Road Safety 2021-2030'… is used as a guiding document."	[no response received]
Flashing lights and beacons	[no response received]

4.1.6 Additional Strategies

The following were paraphrased topics brought up in answer to this question: *What other strategies has your agency discussed for reducing fatalities?*

- Better drivers' education/training

- Pedestrian and cyclist reflectors

- Creating a central organization that oversees all road safety actions

- Increase enforcement/coordination with police force

- Systematic monitoring of strategy implementation

- Systematic monitoring of road safety level and related factors

- Effective management system

- "Radical redesign" of transportation within cities

- Policy to promote safe driving

- "Road safety campaigns"

- Regulating heavy vehicles

- ITS systems

- "Improving the emergency value-chain, involving all stakeholders"

- Targeting both driver behavior and infrastructure

- Work-zone safety

- Improving emergency response efforts

- Improving vehicle safety

- Improving transit as an alternative to driving personal cars

- Practice resource management

- Research in "sustainable road safety"

4.1.7 Interagency Collaboration

The following were paraphrased topics brought up in answer to this question: *What other agencies or departments does your agency collaborate with to identify safety needs?*

- Ministry of Transport and Communications

- Police

- Agency for Transport Competences

- Ministry of Infrastructure and Transport

- Ministry of Education

- Ministry of Citizen Protection

- Ministry of Health

- Public Authorities of Regions and Municipalities

- Universities

- Research Institutes

- Non-Government Organizations

- Council for Road Safety/Road Safety Commission

- Association for Victims

- Automotive Stakeholders

- GRSP (Global Road Safety Partnership)

- PIARC (Permanent International Association of Road Congresses, World Road Association)

- CEDR (Conference of European Directors of Roads)

- Ministry of Interior

- Ministry of Health and Medical Education (emergency services teaching?)

- Ministry of Industry, Mining, and Trade (vehicle manufacturing)

- Ministry of Information and Communication Technology (for data collection)

- Institute of Standard and Industrial Research (standards)

- Legal Medicine Organization (autopsies)

- Red Crescent/Red Cross Society (rural road medical services)

- Central Insurance (crash costs and post-crash support)

<u>4.1.8 Lessons Learned</u>

The following were paraphrased topics brought up in answer to this question: *What have you learned from the successes and failures related to reducing fatalities?* They are listed below as either challenges or key helps.

- Challenges:

  o Cooperation between agencies

  o Convincing the public that reducing speeds is important, even when science and facts back it up

  o Aligning the public's will with safe practices; if the public is not committed, compliance rates will be consistent with enforcement (less enforcement, less compliance)

- Key Helps:

  o Use a systematic approach as well as integration with planning and mobility policies

  o Get everyone necessary involved and actually doing their part

  o Have a vision of Vision Zero

  o Truly understand the effects of countermeasures

  o Use a broad approach, cooperating closely with other agencies

  o Have a vision that all road fatalities are preventable, and that safety can be guaranteed

  o Aim toward creating roads and vehicles that are "adapted to match the capabilities of the people that use them"

  o Have the perspective that all transportation accidents are a concern of the Department of Transportation, even if not involving a vehicle

- Share responsibilities with other agencies/authorities; understand that one agency can't do it alone

- Understand that change needs time and perseverance

- If a countermeasure ends up not working, choose another more effective one and implement it

- Choose strategies that impose the least burden/direct cost possible on the public; understand that imposed burdens and costs typically reduce the public's willingness to comply

5.0 CONCLUSIONS

5.1 Summary

In general, the countries that responded to the survey seem to have similar roadway safety concerns as UDOT, though some differences in political structure and transportation culture were also evident. The survey responses showed a healthy variety of strategies for concerns common to UDOT and provided a fresh list of new ideas. Their strategies are rooted in a number of different initiatives, including use of advanced technologies (such as automatic speed management), roadway re-design, educational programs, initiatives aimed at changing driver behavior, and others. As found in the survey results, some agencies focus on getting buy-in from local municipalities – following a bottom-up instead of top-down pattern of buy-in and using a grassroots sort of initiative, promoting safety on the micro level. Other agencies pursue more national-level strategies, tied into current issues within the country and prevailing political opinion. Additionally, several agencies focus on monitoring their current strategies and continually improving the systems already in place to make them more effective.

5.2 Limitations and Challenges

While every effort was made to ensure the internal validity (accuracy of the data) and external validity (ability to generalize to our location) of this data collection process, there are a few limitations that should be discussed. First, there are clear cultural and structural differences between the United States, specifically the state of Utah, and the countries surveyed in this research. Because of these differences, it is possible that policies and programs that have shown success in other countries may not have the same outcomes or even be applicable here. Because of this, care was taken to not just identify strategies, but to distill the reasoning behind the strategies and the programs. For example, while many countries in Europe use automation for enforcement (e.g., red light cameras), those modalities are against the law in Utah. However, we can glean important insights from their approach to enforcement even if our methods of enforcement may require different tactics.

The second limitation of this research is the limited sample size caused by the data collection response burden. As noted previously, only nine countries responded to the survey. This meant that our analysis was limited to the countries that provided data. For respondents, the burden was rather high as the survey required a significant amount of time to complete if done thoroughly, which likely led to the smaller number of complete responses. While a larger sample would have allowed for a more comprehensive evaluation, the data we did receive provided a great deal of depth and information. Likewise, because the analysis used in the process was qualitative, the sample size was not as prohibitive as it otherwise could have been, should quantitative methods have been employed. Overall, this sample provided a robust picture of safety programming across several regions and gave the research team a good starting point toward exploring how programs are run outside the United States. Future research could be profitable in finding a way to shorten the survey or reduce response burden and follow up with countries who chose not to participate in this first round.

6.0 RECOMMENDATIONS AND IMPLEMENTATION

The findings of this research were presented to members of the Technical Advisory Committee (TAC) in August 2022. Based on a thorough discussion, the following topics were identified for further discussion: Prioritizing Techniques, Targeted Crashes, Implementation, Communication Methods, Challenges, Overcoming Challenges, Results of Strategies, and Collaboration. Results of those discussions are highlighted in the recommendations section below.

6.1 Recommendations

6.1.1 Prioritization

The first option identified for prioritizing countermeasures was to implement a cost-benefit ratio. Additional research may be required to develop an appropriate cost-benefit structure; however, it would provide a data-driven approach to the prioritization process. This would allow UDOT to plan and implement interventions or policies based on a measurable return on investment.

A second method for prioritizing policies and procedures would include prioritizing crash types by occurrence rate or severity (e.g., most frequent fatal crash types), and then choosing implementation strategies accordingly.

6.1.2 Targeted Crashes

The study found that the following crashes were targeted throughout the agencies surveyed:

- Crashes involving pedestrians

- Crashes involving cyclists

- Crashes involving motorbikes, motorcycles, mopeds, and powered-two wheelers

- Crashes resulting in fatalities

- Crashes resulting in fatalities and/or serious/disabling injuries

- Bus- or truck-related injury crashes

- Crashes involving unsafe/non-compliant vehicles

- Single vehicle crashes

- Head-on collisions

- Run-off-the-road to-the-left crashes

- High-speed crashes

- Alcohol- and drug-related crashes (impaired driving)

- Crashes involving mobile phone use

- Crashes involving young drivers without seat belts

- Crashes involving fatigue or drowsy driving

- Crashes related to unsafe planning and construction

UDOT already focuses on most of the targeted crashes prioritized in the study sample, however the priority ranking given to each crash type varies by region. In terms of targeting policies toward crash types, the study found that hot-spot analysis, banning using a mobile device while driving, and banning DUI were not as effective as anticipated in the foreign jurisdictions.

6.1.3 Strategy Implementation

The key to implanting the strategies provided in this research is first seeking to understand the user perception of issues. It has been suggested that working with Social and Behavioral Science experts to study changes in aggressive driving or distracted driving could be beneficial at effecting a change in behavior, as there needs to be a better understanding of the "why" behind these behaviors. Users must see a benefit, either utilitarian or individual, to changing their behavior. A campaign should be considered to reach users at a personal level, addressing individual behavior mechanisms.

One of the major takeaways from the data collection effort was the need for local buy-in and support for any top-down policies or programs. Therefore, the second major recommendation to promote successful implementation is to create a master safety plan for the state. The plan would include overarching goals for improving safety but would allow and encourage local agencies to

identify strategies for their own jurisdictions. This would promote buy-in at the local level and provide a sense of ownership and customization. These local strategies should be measurable so that outcomes can be seen, and each local area can show success toward the larger state goals. This local focus also provides an opportunity for interdisciplinary/interagency cooperation and coordination (fire, law enforcement, etc.).

6.1.4 Communication Methods

Based on input from the study, the TAC suggested several options for communicating safety concepts to the public. The first strategy included the development of a Utah Safety Lottery. The lottery would use a percentage of funds from traffic/safety violations to provide awards/prizes for driving safely. For example, in Stockholm, Sweden a collaborative program was created between the Swedish Road Safety Organization NTF and Volkswagen. A portion of the fines collected from speeding drivers is put into a lottery. Drivers who do not have any offenses are automatically entered into the lottery and have the chance to win cash for driving safely. Motorists have received checks of up to $3,000, and the scheme has improved road safety (Sorrel, 2010). Another option for implementation would include having law enforcement identify travelers (drivers, pedestrians, or cyclists) doing something "good" and awarding them with gift cards or other prizes.

A second strategy the TAC identified based on the survey results included using existing programs in a more effective way. Specifically, they determined the importance of reaching out to youths and encouraging safe behavior from a young age. Existing programs focused on youth include Child Passenger Safety Week, Green Ribbon Month, Safe Routes to School, Road Respect, etc. Retooling these existing programs to focus on a more comprehensive set of goals (e.g., the master state safety plan described previously) would synchronize existing efforts to be more effective.

6.1.5 Overcoming Challenges

A major challenge in promoting safety is changing user behavior. Most safety enforcement includes potentially negative interactions with law enforcement and punitive responses (paying a fine, etc.). The TAC considered that many users will pay any incurred fee and move on with their

lives without changing their behavior patterns, and they determined it may be more beneficial for specific infractions to require specific training, or at least the option of a training vs. a fee. Currently, trainings are available that can be court-ordered through the Safety Council. These include drive alive (teens) or seatbelt training (court ordered). Local jurisdictions provide traffic school, and often a second speeding ticket can require a class to be taken. Examples of new training options for specific infractions could include distracted driving, impaired driving, speeding, pedestrian-specific infractions, etc.

Additionally, the TAC determined that many existing policies and strategies could be tweaked or adjusted to improve safety outcomes, for example providing protected-only lefts at a light with a signal. The survey data determined that many jurisdictions implemented their safety plans incrementally. They took 'baby steps' while implementing the program which made it easier for lawmakers and roadway users to buy in and understand the changes as they were introduced.

6.2 Implementation Plan

At the conclusion of this project, the UDOT Traffic and Safety Division reviewed the recommendations outlined above. Traffic and Safety is conducting ongoing discussions with DOT leadership regarding appropriate steps for implementation of the recommendations listed above.

7.0 REFERENCES

Australian Government. (2021). Road Deaths: 12-month total. Australian Government Department of Infrastructure, Transport, Regional Development and Communications. Available at: https://app.powerbi.com/view?r=eyJrIjoiZDEyNDAyZmMtMjQ5OC00M2YyLWFiZmYtMWI4NzMwZjUzYmRiIiwidCI6ImFhMjFiNjQwLWJhYzItNDU2ZC04NTA1LWYyY2MwN2Y1MTc4NCJ9

City of Carmel. (2021) Roundabouts. City of Carmel, Indiana. 2021. Available at: https://www.carmel.in.gov/department-services/engineering/roundabouts

CDC. (2020). Roadway Traffic Injuries and Deaths – A Global Problem. CDC Injury Prevention and Control. Available at: https://www.cdc.gov/injury/features/global-road-safety/index.html

CNSR (2019). Le Conseil national de la sécurité routière (CNSR) adopte huit nouvelles recommandations à l'attention du Gouvernement. Available at: http://www.lot.gouv.fr/conseil-national-de-la-securite-routiere-a12514.html

Danish Road Directorate. (2021). Vejdirektoratet. Available at: https://www.vejdirektoratet.dk/english/sektion/information-english#1

Federal Highway Administration (FHWA). (2015). The Safe System Approach. Brochure available at: https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf

Federal Highway Administration (FHWA). (2021). The Safe System Approach. PowerPoint Presentation available at: https://safety.fhwa.dot.gov/zerodeaths/docs/safety_systems_pres_rv062821.pptx

French Road Safety Observatory. (2021a). Road Safety Policy. Available at: https://www.onisr.securite-routiere.gouv.fr/en/road-safety-policy

French Road Safety Observatory. (2021b). Road Safety History. Available at: https://www.onisr.securite-routiere.gouv.fr/en/road-safety-policy/road-safety-history

French Road Safety Observatory. (2021c). Road Safety Management in France. Available at: https://www.onisr.securite-routiere.gouv.fr/en/road-safety-policy/road-safety-management-in-france

French Road Safety Observatory. (2021d). Road Safety Measures. Available at: https://www.onisr.securite-routiere.gouv.fr/en/road-safety-policy/road-safety-measures

French Road Safety Observatory. (2021e). French Research Strategy. Available at:
    https://www.onisr.securite-routiere.gouv.fr/en/road-safety-policy/french-research-strategy

Ministere de la Transition Ecologique. (2021). Données et études statistiques. Available at:
    https://www.statistiques.developpement-durable.gouv.fr/memento-de-statistiques-des-
    transports-2019?rubrique=56&dossier=1337

National Road Safety. (2021). Safe System Principles. Australian Government. Available at:
    https://www.roadsafety.gov.au/nrss/safe-system

New York City DOT. (2018). Queens BLVD. Multi-phase, comprehensive redesign of Queens
    Blvd. New York City Department of Transportation: Projects & Initiatives. 2018.
    Available at: https://nycdotprojects.info/queens-blvd

New Zealand Government. (2020). Road to Zero: Te Ara Ki Te Ora. Available at:
    https://www.transport.govt.nz//assets/Uploads/MOT-3833-Road-to-Zero_Annual-
    Monitoring-Report-2020_FA4_WEB.pdf

Sorrell, C. (2010). *Swedish Speed-Camera Pays Drivers to Slow Down*. Wired, Dec. 6, 2010.
    Available online at: https://www.wired.com/2010/12/swedish-speed-camera-pays-
    drivers-to-slow-down/

Sveriges Oficiella Statistik. (2020). Trafik Analys. Available at:
    https://www.trafa.se/globalassets/statistik/vagtrafik/vagtrafikskador/2020/vagtrafikskador
    -2020.pdf?

SWOV. (2018). Sustainable Safety 3rd edition – The advanced vision for 2018-2030. Available
    at: https://www.swov.nl/publicatie/sustainable-safety-3rd-edition-advanced-vision-2018-
    2030

Szruba, M. (2020). Bezpieczeństwo w ruchu drogowym przede wszystkim (Trafikverket Quick
    Guide). Nowoczesne Budownictwo Inżynieryjne. 2:46-51. Available at:
    https://www.trafikverket.se/contentassets/63f0b8caf88045a2a32dffb37ff26ccb/infoblad_
    nollvisionen_eng_korr2.pdf

Theseus (2020). CBS Real Number of Fatalities Trend. Available at:
    https://theseus.swov.nl/single/?appid=5dbac35a-5fbd-401f-b711-
    682176941688&sheet=fe486196-1895-443d-96e0-
    930374fa0e7b&opt=currsel%2Cctxmenu

Trafikverket. (2018). Key Interventions Based on Vision Zero. Available at:
    https://www.trafikverket.se/en/startpage/operations/Operations-road/vision-zero-
    academy/Key-interventions-based-on-Vision-Zero/

Trafikverket. (2020). Vision Zero: Together we save lives. Swedish Transport Administration. Available at: https://www.trafikverket.se/en/startpage/operations/Operations-road/vision-zero-academy/This-is-Vision-Zero/

Waka Kotahi. (2021). Safer Journeys 2010-20. New Zealand Transport Agency. Available at: https://www.nzta.govt.nz/safety/what-waka-kotahi-is-doing/our-advertising/safer-journeys/

World Health Organization. (2018). Global Status Report on Road Safety 2018. Available at: https://www.who.int/violence_injury_prevention/road_safety_status/2018/en/externalicon

World Resources Institute. (2018). Sustainable and Safe: A vision and guidance for zero road deaths. Available at: https://www.wri.org/research/sustainable-and-safe-vision-and-guidance-zero-road-deaths

APPENDIX A: INTERNATIONAL ROADWAY FATALITY DATA SOURCES

The following table lists the data sources for the annual roadway fatality information obtained during the initial screening of what countries to send the survey.

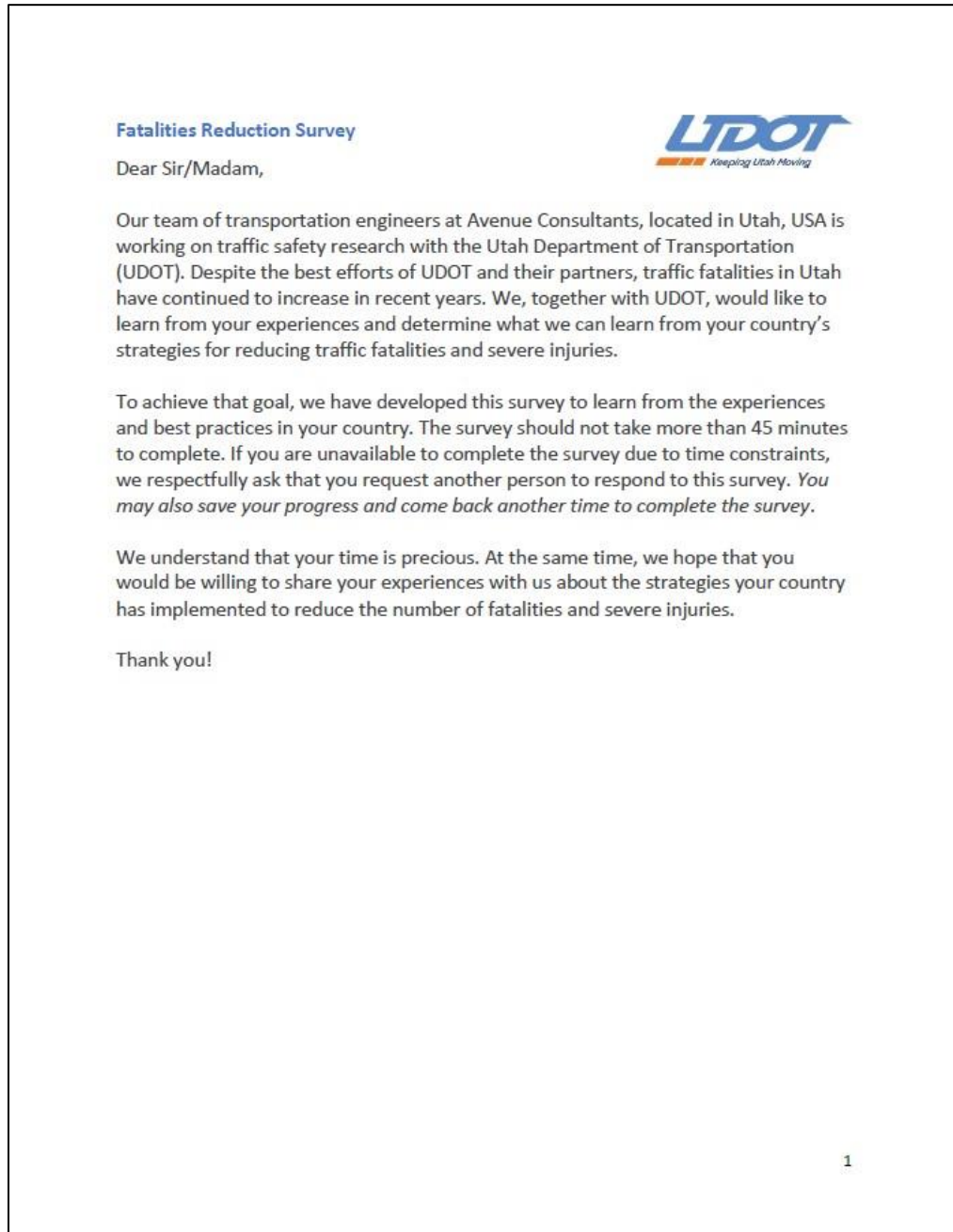## Table A-1. International Crash Data Sources

COUNTRY	YEAR RANGE OF DATA	CRASH DATA SOURCE
FRANCE	2010 to 2019	https://www.statistiques.developpement-durable.gouv.fr/memento-de-statistiques-des-transports-2019?rubrique=56&dossier=1337
AUSTRALIA	2011 to 2019	https://www.bitre.gov.au/statistics/safety
AUSTRIA	2011 to 2019	http://www.statistik.at/web_en/statistics/EnergyEnvironmentInnovationMobility/transport/road/road_traffic_accidents/index.html
BELARUS	2010 to 2019	http://sdgplatform.belstat.gov.by/en/sites/belstatfront/index-info.html?indicator=3.6.1
BELGIUM	2010 to 2019	https://bestat.statbel.fgov.be/bestat/crosstable.xhtml?view=5f1235c3-fa23-4878-a26c-c1a753bdd2cd and https://apps.who.int/gho/data/view.main.51310?lang=en
THE CZECH REPUBLIC	2010 to 2019	https://www.sydos.cz/en/yearbooks.htm
GERMANY	2010 to 2019	https://www.destatis.de/EN/Themes/Society-Environment/Traffic-Accidents/Tables/persons-killed-age.html and https://apps.who.int/gho/data/view.main.51310?lang=en
GREECE	2010 to 2019	https://www.statistics.gr/en/statistics/-/publication/SDT03/-
HUNGARY	2010 to 2019	https://www.ksh.hu/stadat_files/sza/en/sza0033.html

IRAN	2010 to 2019	https://apps.who.int/gho/data/view.main.51310?lang=en
ITALY	2010 to 2019	Multiple Istat articles Accessed on 12/08/21 from https://www.istat.it/en/archivio/deaths?page=7
KAZAKHSTAN	2010 to 2018	https://stat.gov.kz/official/industry/18/statistic/7
LITHUANIA	2010 to 2019	https://osp.stat.gov.lt/statistiniu-rodikliu-analize?indicator=S5R034#/
THE NETHERLANDS	2010 to 2020	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/71936ned/table?ts=1539365088669
NORWAY	2010 to 2019	ssb.no/en/statbank/table/09000 custom layout created 12/08/21
OMAN	2010 to 2019	https://apps.who.int/gho/data/view.main.51310?lang=en
PORTUGAL	2010 to 2018	http://www.ansr.pt/Estatisticas/RelatoriosDeSinistralidade/Pages/default.aspx
QATAR	2010 to 2018	https://portal.moi.gov.qa/wps/portal/MOIInternet/departmentcommittees/gatraffic/!ut/p/a1/hc_BboJAEAbgZ_H AlfkXrFl622Ijgi010gJ7MdjQlQRYA7S8flfipYnaOc1MvpnJkKSMZFv8VKoYKt0W9bmWi_2rB8G8GFGcCJM- rz7e_Tl34DkG5AasBZ8HDCziATjELgmTp9h3APbffEpyImGwXMPdIVptFq7ZsHnxHX8L8IcLuHdiArgRAhSSVLU- TP_koj24XJHsyq-yKzv7uzPt4zCc- kcLFsZxtJXWqi7tT91YuDZy1P1A2V9JpyZD9dakvBezX8xP4LY!/?1dmy&urile=wcm%3apath%3a%2Fwcmlib-internet- en%2Fsa-departmentcommittee%2Fgeneraladministrationoftraffic%2Faccident%2Bstatistics
SOUTH KOREA	2010 to 2019	tmacs.kotsa.or.kr and https://www.police.go.kr/eng/statistics/statisticsSm/statistics05.jsp
MOLDOVA	2010 to 2016	http://saferoads.md/index.php?view=statistics
RUSSIA	2010 to 2019	https://www.statista.com/statistics/437986/number-of-road-deaths-in-russia/
SINGAPORE	2010 to 2019	https://www.police.gov.sg/-/media/170D31BB17EF441881138E1A556F210C.ashx

SPAIN	2010 to 2019	https://www.statista.com/statistics/438008/number-of-road-deaths-in-spain/ and https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwinxqTZ2_X0AhWWK80KHb8FC1sQFnoECAkQAw&url=https%3A%2F%2Fwww.itf-oecd.org%2Fsites%2Fdefault%2Ffiles%2Fspain-road-safety.pdf&usg=AOvVaw2fr4xqJycI4OwOpuwRWHJf
SWEDEN	2010 to 2019	https://www.trafa.se/en/road-traffic/road-traffic-injuries/
SWITZERLAND	2010 to 2019	https://www.bfs.admin.ch/bfs/en/home/statistics/mobility-transport/accidents-environmental-impact.assetdetail.18064666.html
SYRIA	2010 to 2019	https://apps.who.int/gho/data/view.main.51310?lang=en
TRINIDAD AND TOBAGO	2010 to 2016	https://cso.gov.tt/subjects/population-and-vital-statistics/traffic-statistics/
DENMARK	2010 to 2019	https://api.vejdirektoratet.dk/sites/default/files/2021-06/Trafikulykker_2020.pdf
CANADA	2010 to 2019	https://tc.canada.ca/en/road-transportation/statistics-data/canadian-motor-vehicle-traffic-collision-statistics-2020
MEXICO	2017 to 2019	https://www.itf-oecd.org/sites/default/files/mexico-road-safety.pdf
NEW ZEALAND	2010 to 2019	https://www.transport.govt.nz/statistics-and-insights/safety-road-deaths/death-on-nz-roads-since-1921/

APPENDIX B: SURVEY SCREENSHOTS

The following attachment shows what the survey looks like in PDF form. As can be seen on page 3 of the survey, this example survey was tailored to Iran. For a survey given to another country, page 3 follows a similar structure but provides crash data and strategy descriptions specific to that country.

Fatalities Reduction Survey

Dear Sir/Madam,

Our team of transportation engineers at Avenue Consultants, located in Utah, USA is working on traffic safety research with the Utah Department of Transportation (UDOT). Despite the best efforts of UDOT and their partners, traffic fatalities in Utah have continued to increase in recent years. We, together with UDOT, would like to learn from your experiences and determine what we can learn from your country's strategies for reducing traffic fatalities and severe injuries.

To achieve that goal, we have developed this survey to learn from the experiences and best practices in your country. The survey should not take more than 45 minutes to complete. If you are unavailable to complete the survey due to time constraints, we respectfully ask that you request another person to respond to this survey. *You may also save your progress and come back another time to complete the survey.*

We understand that your time is precious. At the same time, we hope that you would be willing to share your experiences with us about the strategies your country has implemented to reduce the number of fatalities and severe injuries.

Thank you!

1

Fatalities Reduction Survey

Contact Information

* **Which country are you representing?**

Iran _____

Other (please specify)

_____

* **Please provide your contact information.**

Name *   _____

Title   _____

Agency *   _____

Email Address * _____

Fatalities Reduction Survey

Iran Introduction

We read online that Iran has achieved an average decrease in traffic fatalities of 3% per year from 2010 to 2019 (here[1]). This is a great success, and we look forward to learning from your country's efforts to reach this level of improvement.

The next few pages will ask questions about safety strategies that your agency has implemented. An example of a safety strategy that has been used in Iran is: improve trauma, medical, and retrieval services (here[2]).

How does your agency prioritize (decide which are the most important) safety strategies for reducing fatalities, especially when there is a limited budget?

_____

[1] https://apps.who.int/gho/data/view.main.51310?lang=en
[2] https://www.unescap.org/sites/default/files/18.%20%20Road%20Safety%20Action%20Plan%20-%20A%20step%20forward%20to%20improve%20road%20safety%20in%20Iran.pdf

Fatalities Reduction Survey

Agency Safety Strategies

What strategies has your agency selected? Please list at least one (1) strategy.

Strategy #1

_____

Strategy #2 (optional)

_____

Strategy #3 (optional)

_____

Strategy #4 (optional)

_____

Strategy #5 (optional)

_____

4

Fatalities Reduction Survey

Agency Safety Strategy #1

Please answer the following questions a best you can about this strategy:
<the text written for "Strategy #1" on page 4 will be pasted here>

What steps led to choosing this strategy? Please include what data was referenced/reviewed.

_____

What types of crashes did this strategy intend to reduce?

_____

What steps were used to implement this strategy?

_____

What challenges did your agency face when implementing this strategy? How did your agency overcome these challenges?

_____

How was this strategy communicated to the public? Was this communication effective?

_____

Please explain the results/impact of the strategy. Did the strategy work?

_____

5

55

Please answer the following questions a best you can about this strategy:
<the text written for "Strategy #2" on page 4 will be pasted here>

What steps led to choosing this strategy? Please include what data was referenced/reviewed.

_____

What types of crashes did this strategy intend to reduce?

_____

What steps were used to implement this strategy?

_____

What challenges did your agency face when implementing this strategy? How did your agency overcome these challenges?

_____

How was this strategy communicated to the public? Was this communication effective?

_____

Please explain the results/impact of the strategy. Did the strategy work?

_____

6

Please answer the following questions a best you can about this strategy:
<the text written for "Strategy #3" on page 4 will be pasted here>

What steps led to choosing this strategy? Please include what data was referenced/reviewed.

_____

What types of crashes did this strategy intend to reduce?

_____

What steps were used to implement this strategy?

_____

What challenges did your agency face when implementing this strategy? How did your agency overcome these challenges?

_____

How was this strategy communicated to the public? Was this communication effective?

_____

Please explain the results/impact of the strategy. Did the strategy work?

_____

7

Please answer the following questions a best you can about this strategy:
<the text written for "Strategy #4" on page 4 will be pasted here>

What steps led to <u>choosing</u> this strategy? Please include what data was referenced/reviewed.

_____

What <u>types of crashes</u> did this strategy intend to reduce?

_____

What steps were used to <u>implement</u> this strategy?

_____

What <u>challenges</u> did your agency face when implementing this strategy? How did your agency overcome these challenges?

_____

How was this strategy <u>communicated</u> to the public? Was this communication effective?

_____

Please explain the <u>results/impact</u> of the strategy. Did the strategy work?

_____

Please answer the following questions a best you can about this strategy:
<the text written for "Strategy #5" on page 4 will be pasted here>

What steps led to choosing this strategy? Please include what data was referenced/reviewed.

_____

What types of crashes did this strategy intend to reduce?

_____

What steps were used to implement this strategy?

_____

What challenges did your agency face when implementing this strategy? How did your agency overcome these challenges?

_____

How was this strategy communicated to the public? Was this communication effective?

_____

Please explain the results/impact of the strategy. Did the strategy work?

_____

9

Fatalities Reduction Survey

What other strategies has your agency discussed for reducing fatalities?

_____

What other agencies or departments does your agency collaborate with to identify safety needs? Why?

_____

What have you learned from the successes or failures related to reducing fatalities?

_____

Fatalities Reduction Survey

Thank you for taking the time to complete the survey. The information you provided will be very valuable for the Utah Department of Transportation (UDOT) as we work to develop strategies for reducing traffic fatalities and severe injuries.

If you have any questions or would like to speak to the UDOT project team, please contact Camille Anderson at camille@avenueconsultants.com.

APPENDIX C: SURVEY RESPONSES

These tables show all received survey responses (basic spelling errors were edited). Personal information (name, email, title, and agency of the respondent) was removed for privacy.

Table C-1. Strategy Prioritization

Country	How does your agency prioritize (decide which are the most important) safety strategies for reducing fatalities, especially when there is a limited budget?
Lithuania	The Government of the Republic of Lithuania has approved the "Vision 0" program, according to which individual institutions, such as the Lithuanian Police, the Lithuanian Road Administration, Lithuanian Transport Safety Administrations and other institutions, have their main activities and traffic safety indicators to be achieved. The Lithuanian Transport Safety Administration investigates fatal traffic accidents and determines the causes of these traffic accidents, therefore, knowing the causes, we can predict specific directions to which it is necessary to pay the most attention.
South Korea	Among 4 strategies such as 1) the compulsory wearing of front seat belts ; 2) drink driving enforcement 3) installation of median barriers on national roads; 4) speed enforcement by the police, including automatic speed camera enforcement since 2008; and, 5) lower speed limits on urban roads in residential areas , the fourth is the most important strategy
Lithuania	There are approved methodologies for priority lists of deployment road safety measures.
Trinidad and Tobago	
Greece	Based on international experience and good practices and taking into account the particular key road safety problems in Greece (e.g. PTWs)
Qatar	Through awareness, better IT infrastructure and Enforcement
South Korea	
Norway	The Government´s transport goals, strategies and priorities in a long term perspective are set out in the National Transport Plan (NTP). This also includes goals, strategies and priorities for traffic safety. The plan is submitted to the Parliament as a white paper, and is produced every four years. Much of the professional basis for the priorities within traffic safety is prepared by the Norwegian Public Roads Administration (NPRA). Based on the guidelines in the NTP, the NPRA prepares an implementation plan for its own activities, with more detailed priorities within given financial limits. The implementation plan is an important basis for priorities in the annual budgets. The priorities within traffic safety are largely based on knowledge of what gives the best effect on road safety related to the financial efforts. However, our knowledge about road safety effects is generally better as a basis for prioritization between road construction projects then when it comes to measures aimed at road users and vehicles.
Sweden	This is a complex question! Also in Sweden the budget is strictly limited and prioritizations have to be made. To start with, all road safety work and implemented measures are based on the Vision Zero. Measures are evidence based, and measures known and verified to show good effects are prioritized. There are no strict rankings in the measures being implemented, but it can be described as a combination of effects and possibilities. The Swedish Transport Administration tries in the best way possible to prioritize evidence based measures, based on the available budget, cost-benefit analysis, and following the political will and leadership.
Italy	The institution that fix and identify strategies and priorities is the Ministry of Sustainable Mobility: the safety strategies are set, considering European Commission targets, and the most vulnerable users risk classes. As an example, they considered: - total number of injuries and deaths; Historical trend of injuries and deaths; Comparison with EU countries' figures. This analysis identified several categories: Pedestrian; Cyclist; Motorbikers
Denmark	
Netherlands	as we have a Strategic Road Safety Plan (SPV2030 as it's called) in operation cost benefit ratio's are - as always - important instruments for decision making.
Australia	Statistical analyses and network screening
Sweden	
Hungary	black spot analyses
Iran	The Prioritization of safety strategies is based on Accident Data (Identification of Black spots, High risk and High Accident Corridors, Safety Audit and Investigation) and according to the required budget. Therefore, the strategies with low-cost measures are in higher ranks.

Table C-2. Safety Strategies

Country	Strategy #1	Strategy #2 (optional)	Strategy #3 (optional)	Strategy #4 (optional)	Strategy #5 (optional)
Lithuania	Carry out educational activities to develop a conscious and safe traffic culture recognizing society	Make recommendations for improving road safety	Ensuring the technical condition of vehicles	Ensuring that all students fasten seat belts on school buses	
South Korea	speed enforcement by the police, including automatic speed camera enforcement since 2008	lower speed limits on urban roads in residential areas (50km/h and 30km/h)			
Lithuania	Priority lists: https://lakd.lt/prioritetines-eiles-sarasai-pagal-keliu-ir-ju-elementu-planavimo-metodikas	The most efficient seems Average speed control system network on the State Significant Roads			
Trinidad and Tobago	----------				
Greece	speed management				
Qatar	----------				
South Korea	----------				
Norway	Reducing head-on collisions - By 1 January 2028, 60 percent of the motor vehicle traffic on national roads with speed limits of 70 km/h or higher shall take place on roads with median barriers.				
Sweden	Vision Zero	Management by objectives	Agenda 2030 and the sustainable development goals (SDG) are guiding our work on an overarching level (and road safety is a part of this, from various aspects).	The Global Plan for the Decade of Action for Road Safety 2021-2030, developed by the WHO and the United Nations Regional Commissions. The Swedish Transport Administration actively contributed to the development of the plan and it is used as a guiding document also to the national road safety work.	
Italy	"Harmonization" of maximum speed on highways	Raise the awareness among users related to the adoption of safer vehicles			
Denmark	----------				
Netherlands	Speed reduction on high- and motorways	Ban the use of mobile devices whilst driving	Ban drunk driving [includes (medicinal)drug also]	Separate slow-mopeds from cyclists in some (bigger) cities	
Australia	Video detection of cellphone use and enforcement (fines)	Signage and striping	Lowering speed limits	Flashing lights and beacons	
Sweden	----------				
Hungary	black spot analyses				
Iran	Reduction of Safety Risks	Vulnerable Road Users' Safety Improvement			

Table C-3. Strategy Selection

	What steps led to choosing this strategy? Please include what data was referenced/reviewed.				
Country	Strategy #1	Strategy #2	Strategy #3	Strategy #4	Strategy #5
Lithuania	Vision 0 is a traffic safety strategy initiated by the Ministry of Transport and Communications. LTSA is also implementing this strategy in some areas: safety of electric scooter drivers, car driver culture, safety of students on school buses. The Sociological Research Agency conducted sociological research on the safety of electric scooter drivers and regarding car driver`s culture. LTSA will be working on these topics in the coming years: 1. To increase the safety of electric scooter drivers. The aim is to increase the proportion of respondents (e-scooter drivers) who believe that other e-scooters scooter drivers behave culturally and safely. 2. Increase the culture of drivers on the roads, thus reducing the number of accidents. The aim is to increase proportion of surveyed car drivers who believe that the traffic culture on the country's roads is improving and getting better.	This strategy was chosen by the Ministry of Transport and Communications, but its main goal is to eliminate the causes of fatal accidents.	This strategy was chosen by the Ministry of Transport and Communications, but this choice was determined by the causes of accidents involving technically untidy vehicles	LTSA inspectors checked passengers on buses and counted how many people were fastened seat belts. A secret client was also used. The data collected showed that a large proportion of passengers in buses do not fasten seat belts. Also, a large part of the passenger seat belts are fastened when LTSA inspectors board the bus.	
South Korea					
Lithuania	Wide state significant road network (21 000 km), big number of road accidents and limited budget. See methodologies.	See relevant methodology: https://lakd.lt/wp-content/uploads/2021/12/VGM_PES_metodika.pdf			
Trinidad and Tobago					
Greece	- identification of the most critical factors that contribute to the cause of road accidents and especially serious accidents in Greece - identification of he main generative causes of the high number of road accidents in Greece - identification of the main institutional problems of road safety in Greece				
Qatar					
South Korea					
Norway	About 45 percent of all fatalities and severe injuries on national roads are in head-on collisions. The risk of being killed or seriously injured per km driven is much lower on roads with median barriers compared to roads without physical separation. Head-on collisions are close to eliminated. 1 January 2021 53.3 percent of motor vehicle traffic on national roads with speed limits of 70 km/h or higher took place on roads with median barriers.				

Sweden	In the 1980's Sweden saw a stagnation in the road safety development and what was being done at the time, was no longer giving the right effects. A number of road safety experts within the Swedish Road Administration (nowadays Swedish Transport Administration) realized that we needed to do more than just information and education campaigns - a new strategy was needed. When the concept of Vision Zero was introduced in 1995, it turned the traditional view of road safety work upside down. The basic starting point for Vision Zero is the ethical standpoint that no-one should be killed or suffer lifelong injury in road traffic. This means that the view of safety in the road transport system concurs with those values that apply for safety in society as a whole. According to Vision Zero, the main problem is not that accidents occur, it is instead whether the accidents lead to death or lifelong injury. Vision Zero stresses the fact that the road transport system is an entity, in which different components such as roads, vehicles and road users must be made to interact with each other so that safety can be guaranteed. In the development of the strategy also other areas of society, such as energy security, nuclear safety, human factors (human beings moving in a complex system) etc., were providing important insights to the work. Implementing new road safety measures require fundamental information about the problems that need to be solved. There are two sources of statistics and knowledge about road deaths in Sweden: STRADA (the Swedish Traffic Accident Data Acquisition) and the Swedish Transport Administration's in-depth studies of fatal crashes, these two sources of statistics and knowledge are important tools in the work.	Road safety work in Sweden has up until now been carried out in a systematic way using a management by objectives model. This model involves measuring and following up a series of current conditions in the road traffic system which have a verified relationship with the trend for the numbers of fatalities and severely injured on the roads. These conditions are measured using what are known as road safety performance indicators (SPI). Interim targets have been set for the numbers of fatalities and severely injured, as well as for the SPIÂ´s. The actual numbers of fatalities and severely injured, and the indicators, are followed up and analyzed every year. The analysis is then presented at annual results conferences attended by various stakeholders.	Agenda 2030 is a guiding document, which is taken to account in everything we do, but Vision Zero is our main and leading strategy. Road safety now is a part of the sustainable development goals. One important aspect, we cannot reach the SDGs without a substantial contribution from the private sector. Companies, private and public enterprises etc. need to take responsibility to generate sustainable transports, which also includes road safety. The development of the car/vehicle industry, and the industry working beyond regulations is also important. Initiatives such as Euro NCAP etc. pushes the development to levels well above legal requirements (and in line with the Vision Zero).		
Italy	- Analysis of accidents related to: - Identification the risk classes and causes - Accident analyses and comparison with national and EU data	- Analysis of accidents related to: - Alcohol & drugs - mobile phone use - Speed - Seat Belt use - Identification the risk classes and causes - Accident analyses and comparison with national and EU data			
Denmark					

Netherlands	Figures on K/SI accidents by speed limit	Figures showed a huge number of drivers in accidents were using the mobile device. Observations proved an overall used of nomadic devices whilst driving cars, van, hgc, but also on bikes/moped etc.	Too large a number of drivers in crashes were driving under the influence of alcohol/ill drugs of medication	Figures on crashes between cyclists and slow-mopeds plus the perceived hinderance by road users showed a "problem" Too many slow-mopeds (rather wide compared to an ordinary bicycle) in an already heavy traffic situation
Australia	Human factors including distractions Data analyses and field observations			
Sweden				
Hungary	national, international best practices			
Iran	The necessity for reduction of the fatalities due to the accidents caused by speeding, impaired driving and driver's fatigue led us to choose this strategy. Following Data were used for choosing the Strategy: number of accidents and fatalities based on the type of the accident, driver's age, type of the vehicle and road environment.	Various road users are not disposed to equal safety levels and in order to expand social justice, the characteristics of each group should be notified and considered, such as Pedestrians, cyclists, handicapped, people with disabilities, and etc. The huge number of road accidents in which vulnerable road users have been involved and their fatalities led us to choose this strategy. In order to choose this strategy different data were used such as Pedestrian accidents and fatalities (based on age, sex, disability, type of the accident, the vehicle(s) involved in the accident, …), cyclists and motorcyclists' accidents and fatalities (based on age, type of the accident, type of the accident, the vehicle(s) involved in the accident, …).		

Table C-4. Strategy Intention

Country	What types of crashes did this strategy intend to reduce?				
	Strategy #1	Strategy #2	Strategy #3	Strategy #4	Strategy #5
Lithuania	Aim to reduce all types of accidents, no specific accidents have been identified.	1. Traffic accidents in which people are killed 2. Traffic accidents in which people are injured but involving buses and / or trucks	Accidents involving technically unsafe vehicles	This measure is more about reducing the painful consequences of accidents	
South Korea					
Lithuania	Fatal accidents and serious injuries.	Fatal accidents and serious injuries.			
Trinidad and Tobago					
Greece	single vehicle accidents				
Qatar					
South Korea					
Norway	Head-on collisions and Run-off-the-road accidents to the left				
Sweden	Crashes resulting in disabling injuries and fatalities.	Crashes resulting in disabling injuries and fatalities.			
Italy	High speed leads to an increased severity of the accident: on that respect, this factor was the main target to be addressed by the strategy	All accidents related to: - Alcohol & drugs - mobile phone use - Speed - Seat Belt use Especially for young drivers			
Denmark					
Netherlands	All types both fatal ones in particular	All types but K/SI in focus	All	All	
Australia	All types				
Sweden					
Hungary	accidents with personal injuries				

Country				
Iran	Accidents due to Speeding, Fatigue or Impaired driving and unsafe Planning and construction	Accidents in which pedestrians, cyclists or motorcyclists in a way are involved.		

Table C-5. Strategy Implementation

	What steps were used to implement this strategy?				
Country	Strategy #1	Strategy #2	Strategy #3	Strategy #4	Strategy #5
Lithuania	PR agency will be selected, and they will use communication tools to solve problems and achieve safety goals.	Accidents are investigated using the "5 why?" method and recommendations are provided once the causes have been identified	1. Roadside inspections 2. Joint inspections with the Police 3. Inspections at technical inspection stations	The LTSA has drafted a memorandum agreeing to ensure that students wear seat belts on buses. We invited all Lithuanian municipalities to sign this memorandum.	
South Korea					
Lithuania	Following the priority lists.	1. Methodology for selection of sectors for average speed enforcement was approved. 2. List of priorities approved and published on the Road Administration web page (4,003 homogeneous road sections). 3. 131 average speed enforcement sectors installed on state roads. Sectors cover 857 km of state roads.			
Trinidad and Tobago					
Greece	Speed limits revision - Speed limit suitability check - 30 km/h zones in urban areas - Reduction of speed limit to 80km/h in the rural network - Introduction of variable speed limits on motorways Speed management - Infrastructure adaptation - Section control - Dynamic speed signs				
Qatar					

South Korea					
Norway	The strategy is implemented in the National Transport plan 2022-2033. It is followed up in the NPRAÂ´s Implementation plan.				
Sweden	A theoretical framework and political acceptance. Vision Zero is a Swedish policy innovation. It received strong political support at a rather early stage of its development and became widely established as a result of cooperation between the various players in the road safety sector. When the vision was first presented publicly in 1995, many people were skeptical. However, the more people began to consider and adopt the ideas behind Vision Zero, the more support it attracted. A growing number of people began to accept that zero deaths in traffic is the only conceivable vision. The Vision Zero was adopted by parliament in 1997, with a large majority, and has been the leading star for all road safety work ever since.				
Italy	- Identify a technological solution to address the above mentioned issue - design and install the TUTOR system on specific section of Italian highways - Full deployment on Italian highway network	1. Meeting with interested Stakeholders (e.g. road accident victims association); 2. Meeting with Road Police 3. Establish a safety campaign and communication campaign to promote best practices and safer vehicles			
Denmark					
Netherlands	Figures on crashes by various variables used for selecting road sections and lowering the limits	Figures used to define policy and campaigns		Figures on crashes at first, observations proved and supported the crash data. Policy was developed and implemented with the Belgian BOB-campaign as example.	Using the crash data and observations Plus reports from perception of the issue by cyclists lead to policy-development to have full separation of bicycles and slow-mopeds on bicycle-paths (in some larger cities and only on some cycle-paths)
Australia	Statistical analyses, discussions, and deployment				
Sweden					

Hungary	1. Identification and ranking of potential accident black spots 2. On-site inspections at accident black spots, preparation of a final list 3. Definition, ranking and implementation of interventions (project variants)				
Iran	- Increase driver's awareness of consequences of misbehaviors (speeding, driving while fatigued or impaired). - Increase the penalties for unauthorized behaviors. - Development of supervision and monitoring systems to prevent such misbehaviors. - Improve and develop supervisory systems and methods to control authorized working hours of public transport drivers. - Improving low-cost safety measures approach. - improving roadside safety. - Improving Black spot treatment system.	- Increasing the public awareness of pedestrian's threatening risks, through campaigns and media. - Developing special traffic training for roadside residents. - Developing infrastructures and equipment for transportation of roadside residents and traffic calming in residential regions and city entrances. - Improving road geometric design and safety, considering pedestrians and cyclists needs. - Developing methods to persuade pedestrians to behave in accordance with the traffic regulation. - Improving motorcyclists training system. - Encouraging the use of helmet and other safety equipment. - Intensification of penalties for dangerous offenses committed by motorcyclists.			

70

Table C-6. Strategy Challenges

Country	Strategy #1	Strategy #2	Strategy #3	Strategy #4	Strategy #5
Lithuania	We cannot say at the moment, because the action has not yet begun.	1. Not all road users are willing to cooperate in providing information on accidents 2. Some undertakers refuse to implement the recommendations for improving road safety	It has become our daily job so I would not single out the difficulties	There are 60 municipalities in Lithuania. After the first call to sign the memorandum, only half of the municipalities signed it. Therefore, the remaining municipalities had to be persuaded to join the measure. The memorandum has now been signed by 57 municipalities	
South Korea					
Lithuania	Lack of budget.	Automated data administration which is necessary for imposing penalties			
Trinidad and Tobago					
Greece	This strategy is currently proposed to be implemented. The main expected challenges are: - communicating to the public the need for lower speed limits and speed enforcement - providing the necessary technological equipment to the Traffic Police				
Qatar					
South Korea					
Norway	The biggest challenge is related to costs - that there is a risk that construction of new roads will be more expensive than planned.				

The top spanning header reads: What challenges did your agency face when implementing this strategy? How did your agency overcome these challenges?

Sweden	It was a (difficult) paradigm shift. It was not an easy task to have researches and other road safety actors to completely change their views. As mentioned above, when the concept was first introduced, it turned the traditional view of road safety work upside down and many people were skeptical. In general, it is easier to make small changes and take steps in strategies one is already working on, than completely changing strategies.			
Italy	It was quite easy to implement the system	- We do not have access to this information		
Denmark				
Netherlands	There was(and remains) always a "lobby" for higher speeds. Numbers and targets used for communication.	Campaign was launched based - in principle - on the successful BOB (designated driver) campaigns so challenges were already known...how to address the driver's sense of responsibility...	Biggest challenge was to address all drivers and their sense of responsibility. The campaign (having some "updates" over the years) runs since 2004	The issue was "how to address" the slow-moped-drivers to adhere to the separation rule. Campaigns (media) were launched.
Australia	Cost Prioritization			
Sweden				
Hungary	limited budget			
Iran	Challenges: - The lack of public awareness of the severe consequences of over-speeding and driving while impaired or fatigued. - The low rate of traffic fines. - The need for developing controlling systems to monitor drivers' behaviors. - Willingness of commercial drivers to work more than authorized working hours in order to increase their revenue. - The huge cost of applying road safety inspection and road safety audit systems. The Agency's actions: -Increasing drivers' awareness of consequences of over-speeding and driving while impaired or fatigued. - Increasing the penalties for unauthorized speeds and intensifying law enforcement against impaired driving. - Improving supervisory systems and methods to control authorized working hours of public transport drivers and preventing impaired or fatigue driving. - Development of in-vehicle systems affecting drowsiness warning. - Improving proper methods for reducing vehicle	Challenges: - The lack of public awareness of the severe consequences of the accidents. - Ignoring the traffic regulations by pedestrians and cyclists. - The low rate of traffic fines. - The need for training pedestrians, cyclists and motorcyclists in order to change unsafe behaviors. - The huge cost of modifying road geometric design and safety, considering the needs of vulnerable road users. The Agency's actions: -Developing special training for pedestrians, cyclists and motorcyclists. - Increasing the penalties and traffic fines for unsafe behaviors and offenses (specially for motorcyclists). - Developing supervisory systems and methods to control pedestrians' traffic behavior. - Improving road geometric design		

72

	run-off. - Developing and equipping rest areas. Improving low-cost safety measures approach. - Improving road safety inspection system in existing road network. - Improving road safety audit system in new roads, under study and under construction road projects. - Improving Black spot treatment system in existing road network and revealing untreated segments by installing traffic signs. - Improving safety in residential zones and city entrances. - Improving traffic safety in working zones.	and safety, considering pedestrians and cyclists needs. - Developing infrastructures and equipment for transportation of roadside residents. - Improving traffic calming and other safety measures in residential regions and city entrances. - Managing pedestrians' access to road network. - Mandating the use of Helmet for Motorcyclists.			

Table C-7. Strategy Communication

	How was this strategy communicated to the public? Was this communication effective?				
Country	**Strategy #1**	**Strategy #2**	**Strategy #3**	**Strategy #4**	**Strategy #5**
Lithuania	We cannot say at the moment, because the action has not yet begun.	Some recommendations are addressed to the target groups of the public (pedestrians in the countryside, children in schools), but most of the recommendations are addressed to the road infrastructure manager.	We prepare articles on the need to take care of the proper condition of the vehicle, most of which cause accidents that affect traffic accidents, we give advice. Articles on these topics are prepared, which are placed on the LTSA website, and sometimes published on other Lithuanian portals. We participate in interviews on these topics.	To sign the memorandum, we held a meeting with the municipalities in the schools. We invited a prominent journalist to host the event, who later wrote an article about the event in the media. Feedback on the article was positive.	
South Korea					
Lithuania	All relevant methodologies and priority lists published, all municipalities and other interested parties informed about that.	All steps were communicated to public via media.			
Trinidad and Tobago					

Greece	it is suggested that a National Road Safety Communication Policy is developed comprising the following: - Central ten-year road safety campaign - Annual thematic road safety campaigns - Special Communication Actions - Information campaigns in touristic areas - Collaboration with Mass Media			
Qatar				
South Korea				
Norway				
Sweden	One thing which was very important in this paradigm shift, was to influence the political leaders as a first step, and not the general public. The biggest fight was to get the new strategy adopted by the parliament. The political leadership and to show that the system is responsible for injuries in road transports, was a second step, showing the general public that the only conceivable vision is zero deaths in traffic.			
Italy	A cooperation agreement was signed with Italian Road Police A communication campaign on VMS (variable Message Signs) was implemented, together with Vertical Signs on highways	The Ministry promoted a safety campaign on the main Italian media (journal, newspaper, TV, Radio) and with specific dedicated event on field. The communication was effective, based on the data reduction accidents in the following years after the campaign		
Denmark				
Netherlands	Decision was made public using the numbers, the benefits and the targets	Radio/TV-campaigns, advertisements in printed press, signs alongside some roads and close co-operation with consumer organizations	Radio/TV, printed press and media campaign, signs along some roads, close co-operation with consumer organizations	Campaigns (media) were launched.
Australia	Media release			

Sweden					
Hungary	public media platform				
Iran	Like every strategy or decision, it has pros and cons in the society. For instance, Commercial drivers believed that the fatigue monitoring systems could decrease their revenue. The public believed the increase of traffic fines is not fair and the required budget for developing supervisory systems could be spent on more necessary areas. Although part of society believed that these costs are necessary to prevent more financial burden on the society due to road accidents fatalities. To aware the society about the consequences of ignoring the speed limits and impaired- fatigued driving, campaigns were held including video-clips, Brochures, and etc. The new rules and penalties were discussed in the media. Those actions were so helpful in informing and convincing the public to accept the strategy.	Initially, there was a lot of opposition in the community to measures related to this strategy, especially those that imposed a financial burden on road users (drivers and motorcyclists). However, gradually and with the expansion of public awareness about the positive effects of this strategy and a significant reduction in the severity of accidents and the number of casualties, the acceptance of this strategy by the community was done.			

Table C-8. Strategy Results

	Please explain the results/impact of the strategy. Did the strategy work?				
Country	Strategy #1	Strategy #2 (optional)	Strategy #3 (optional)	Strategy #4 (optional)	Strategy #5 (optional)
Lithuania	We cannot say at the moment, because the action has not yet begun.	It is very difficult to measure the benefits of the recommendations provided, as several institutions are working in Lithuania to improve traffic safety. And the recommendations form only a part of all the measures implemented	We plan to set an indicator to calculate the number of vehicles inspected and vehicles found to be defective. Then we will be able to evaluate the efficiency	We do not have a result yet, because this year we have just started working with municipalities, cooperating with them and looking for the best solutions.	
South Korea					
Lithuania	Road Budget Allocations goes for to the most appropriate road stretches or objects. In 2016-2020: the same number of fatalities (from 62 to 68 fatalities per 1 million inhabitants). In 2021: 17 percent decrees in road deaths (from 63 to 52 fatalities per 1 million inhabitants).	Results at very early stage of exploitation (based on 56 sectors installed): total length of ASCS sectors 389,285 km: before installation in 5 years period 407 > in 2021 26; Fatalities on ASCS sectors: before installation in 5 years period 36 > in 2021 2.			
Trinidad and Tobago					
Greece	The results of the strategy are expected after a significant period of implementation so they are not yet available.				
Qatar					
South Korea					
Norway	Is to be seen				
Sweden	Before the Vision Zero strategy was developed and adopted, we saw a stagnation in the road safety development. After 25 years of working with Vision Zero we reach our targets (such as the interim target for 2020). Implemented interventions and measures, based on Vision Zero,	The purpose of the management by objectives model is to apply a long term, systematic approach to road safety work. Follow-up of SPI is central to management by objectives. Each of the indicators has a target value to attain by 2020. Together, these target values are taken to correspond to the overall goal for road safety development. The			

	have shown good results. Some examples of interventions are: median barriers; roundabouts instead of intersections; road safety cameras (ATK); securing safe speed in areas where vulnerable road users are mixed with vehicles; safe road environment and road sides etc.	fundamental idea is for the goals to be achieved as a result of systematic road safety work regardless of the effect of external factors (such as traffic increases) and any random variation on the outcome.		
Italy	The TUTOR system objective is the reduction of the maximum speed, and the homogenization of the average maximum speed. The TUTOR systems calculates the average speed among two specific sections, generally 10 to 25 km long. If the average speed is above the legal threshold, the data are sent to the Road police for the fines. The TUTOR system reduced the number of deaths by 70%, if compared with the previous year before the introduction of the system.	- We do not have this specific information: the number of accidents that were the targets of this campaign were reduced.		
Denmark				
Netherlands	We saw indeed a decline in serious accidents on the affected road sections	We have seen a reduction in numbers of drivers using their mobile devices but - up until now - not to the extent foreseen.	Over the decade we have seen a decline in crashes and people fined for DUI, but recently (2019/2020) an unexpected increase was observed. This will lead to intensified campaign messages	We have seen a decline in crashes between the two vehicle-types on the designated stretches/cycle-paths
Australia	It is relatively new. Hence, data is been collected. However, lots of fines have been issued.			
Sweden				
Hungary	elimination of black spots limited budgetary reasons do not lead to the expected effects			

Iran	This Strategy resulted in a considerable decrease in the number of accident fatalities. After 10 years implementation of this strategy, the number of accidents (Total of fatal, injury and damage accidents) and consequently the number of fatalities decreased by 62% and 27%, respectively. It must be noted that these percentages are related to implementation of both strategies, but certainly other factors have played a role in this reduction (such as improving the quality and standards of vehicle manufacturing, mandate the use of safety equipment in vehicles, enforcing some standards and safety requirements and etc.).	This Strategy resulted in a considerable decrease in the number of accident fatalities. After 10 years implementation of this strategy, the number of accidents (Total of fatal, injury and damage accidents) and consequently the number of fatalities decreased by %62 and %27, respectively. It must be noted that these percentages are related to implementation of both strategies, but certainly other factors have played a role in this reduction (such as improving the quality and standards of vehicle manufacturing, mandate the use of safety equipment in vehicles, enforcing some standards and safety requirements and etc.).			

Table C-9. Additional Questions

Country	What other strategies has your agency discussed for reducing fatalities?	What other agencies or departments does your agency collaborate with to identify safety needs? Why?	What have you learned from the successes or failures related to reducing fatalities?
Lithuania	Appropriate training for future drivers Reflectors for pedestrians and cyclists	Ministry of Transport and Communications Lithuanian police Agency for Transport Competences Lithuanian Road Administration	The biggest challenge to date is interinstitutional cooperation.
South Korea			
Lithuania	See the list of methodologies.	https://tka.lt/oro-transportas/?lang=en TKA conducts Road Safety Surveys: https://tka.lt/oro-transportas/katalogas/eismo-sauga/	https://transport.ec.europa.eu/news/preliminary-2021-eu-road-safety-statistics-2022-03-28_en#:~:text=Today%20the%20European%20Commission%20published%20preliminary%20figures%20on,fatalities%20compared%20to%20the%20pre-pandemic%20period%20in%202019.
Trinidad and Tobago			
Greece	- creation and operation of a Central Public Authority with overall responsibility for all road safety actions in Greece and - intensification of road safety enforcement - systematic monitoring of the implementation of actions, the level of road safety and all factors affecting it - development and implementation of an effective road infrastructure safety management system - radical redesign of road infrastructure and traffic in cities - design and implementation of a comprehensive policy to promote safe driving behavior	Ministries (i.e. of Infrastructure and Transport, of Education, of Citizen Protection, of Health) Public authorities (Regions, Municipalities) Private sector Universities / Research Institutes NGOs	In order for all priority actions to bring short-term and long-term results of road safety improvement in Greece, it is necessary to implement them systematically and to be definitely integrated within the framework of the wider spatial planning and mobility policies inside and outside the cities. At the same time, however, all the competent Governmental and non-governmental bodies must intensify their efforts for the implementation of both the above actions and all the actions of their competence.
Qatar			
South Korea			
Norway	The priorities within traffic safety are based on strategic assessments in many different areas. This includes driver training, road safety campaigns, controlling of heavy goods vehicles etc.	In road safety issues NPRA collaborate closely with the police, the Norwegian Directorate of Health, the county administrations and the Norwegian Council for Road Safety. We also collaborate with the municipalities and a range of non-governmental organizations.	(1) Broad acceptance that all traffic safety work is to be based on vision zero is crucial - a vision of no one being killed or seriously injured within the transport system. (2) Road safety work must be based on the best available knowledge of the effects of measures. (3) Road safety work must be based on a broad approach and close cooperation between different agencies.

Sweden	Vision Zero is the basis for all road safety work in Sweden.	The Swedish Parliament decided in 1997 that Vision Zero should form the basis for all road safety work in Sweden, and in 2016 the Government made a renewed commitment to Vision Zero following a stagnation in the road safety development. At the same time, in 2016, the Swedish Transport Administration (STA) was commissioned by the Swedish Government to lead the national collaboration on road safety and the Vision Zero, and thus coordinating and leading the road safety work. In this framework, a national action plan (joint actions for road safety) was created for the period 2019-2022 and now a new version has just been launched for the period 2022-2025. This action plan brings together 30 participating actors (authorities, municipalities, regions, private sector, NGOs, etc.) and proposes 250 actions for improved road safety. The strength of the action plan is the work-process and dialogue between actors, and that the various stakeholders themselves decide how they can contribute in the coming years. We have also seen that it has led to involved stakeholders finding new collaborations with other involved stakeholders. Many of the commitments and ambitions in the plan would probably have been implemented irrespective of the action plan (sooner or later), but the plan puts the spotlight on the work and it is also a good way of spreading the information about how different stakeholders will and can contribute â€“ and it encourages the stakeholders to go from ideas and visions to action.	The insight that all fatalities on roads are considered preventable must be considered a major success. There is no longer a general thinking that people have themselves to blame for crashes. Vision Zero stresses the fact that the road transport system is an entity, in which different components such as roads, vehicles and road users must be made to interact with each other so that safety can be guaranteed. In order to prevent serious results from crashes, it is essential for the roads, and the vehicles they carry, to be adapted to match the capabilities of the people that use them. Failures: the general approach to speed. We still have a long way to go to gain full acceptance for the importance of (reducing) speed, despite the scientific evidence. In this particular case, many actors and people are not receptive to the facts (speed, kinetic energy, how much crash violence a human body can tolerate etc.) Another step forward is that we have managed to get different types of fatalities and injuries happening in the road transport system included in the systematic thinking. The Swedish Transport Administration is responsible for the infrastructure and therefore we should also take responsibility for falling accidents, suicide, single accidents with bikes etc., even if vehicles are not involved.
Italy	- Introducing ITS systems - Improving the emergency value-chain, involving all stakeholders - Increased cooperation with road Police and patrolling on Italian highway network	All relevant stakeholders are involved: - road police - Association of victims - Automotive players - Universities it is important, in order to maximize the impact, to have all relevant actors on-board	- We do not have a proper answer on this
Denmark			
Netherlands	As mentioned, we have the Strategic Road Safety Pan 2030 (with adjacent short term action plans) targeting various topics. We address not only driver behavior, but also the infrastructure itself as well as vehicles and their co-operation.	The SRSP2030 was developed and signed by public and private organizations, road authorities, enforcement, and researchers etc. The collaborative impulse is key shared responsibilities	No one body or institute can work it all out alone, close co-operation is key and - one needs time and perseverance
Australia			
Sweden			
Hungary	communication campaigns increase the safety of road works	GRSP Hungary PIARC CEDR	if there is no result, we choose other, more effective means

| Iran | - Trauma, Medical and Retrieval Services Improvement
- Vehicle Safety Improvement
- Improving Alternative Public Transportation Systems to Passenger Cars
- Resource Management for Safety Improvement
- Purposeful Development of Research to Achieve Sustainable Road Safety | - Iran's Road Safety Commission (as the coordinator of the involved organizations)
- Traffic Police (responsible of traffic monitoring and enforcement)
- Ministry of Interior (responsible of the transportation in urban areas)
- Ministry of Education (responsible of teaching traffic regulation in the schools)
- Ministry of Health and Medical Education (responsible of post-crash services)
- Ministry of Industry, Mine and Trade (responsible of the industries related to the Vehicle manufacturing)
- Ministry of Information and Communication Technology (responsible of providing the infrastructures for data collection)
- Institute of Standard and Industrial Research of Iran (responsible of defining and monitoring Standards)
- Iranian Legal Medicine Organization (responsible of determining the exact cause(s) of death or Injury)
- Iranian Red Crescent Society (responsible of providing medical services in interurban roads)
- Central Insurance of Iran (responsible of determining the cost of accidents and post-crash supports) | The first and most important factor of success is the association of society with the desired decisions and actions. If people are not willing to comply with the rules, even if it is in their best interest, it will not have a positive effect on improving the situation. This issue was clearly seen in the mandatory use of helmets and safety equipment for motorcyclists. Whenever the level of control and supervision decreased, the rate of compliance by motorcyclists decreased, under various pretexts such as hot weather, expensive equipment, etc.
The strategies and actions are better to seem that they do not burden an additional cost on people (road users), which can reduce people's willingness to comply with the regulation. |