



# Traffic Safety Practice in U.S. Cities: Survey and Focus Group Results

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Eric Dumbaugh, Ph.D  
Dibakar Saha, Ph.D.  
Louis Merlin, Ph.D.  
Jesse Saginor, Ph.D.  
**Florida Atlantic University**

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<b>16. Abstract</b> This study seeks to understand the state-of-the-practice for addressing safety in U.S. cities. It consists of a survey of the 150 largest cities in the U.S., by population size, as well as a focus group of individuals from cities recognized at being the forefront of addressing safety. This study finds that cities view themselves as placing a higher priority on safety, and particularly the safety vulnerable users such as pedestrians and bicyclists, than do state departments of transportation, which are viewed as being principally concerned with automobile mobility. More cities list safety as a policy goal over the mobility or congestion relief, though safety is often linked to broader quality-of-life concerns, such as supporting walking and cycling. This report identifies the policies and practices adopted by cities, as well gaps between municipal safety policy statements and adopted implementation strategies.			
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# Traffic Safety Practices in U.S. Cities: Survey and Focus Group Results

## Introduction

The Collaborative Sciences Center for Road Safety (CSCRS) is a National University Transportation Center supporting the FAST Act research priority of promoting safety. The mission of CSCRS is to create and exchange knowledge to advance transportation safety through a multidisciplinary, systems-based approach. The emerging concept of “safe systems” has been focused on a kinetic energy model of road safety, which seeks to reduce the amount of kinetic energy absorbed in a crash event to levels that are survivable for a street’s most vulnerable users. In practice, this has led to a four-pronged approach to addressing safety: providing safe roads, ensuring safe speeds, designing safe vehicles, and encouraging safe behavior.

*A Safe Systems Approach to Traffic Safety (OECD, 2016)*



The Collaborative Sciences Center for Road Safety is the recipient of a national university transportation center awards from the United States Department of Transportation. This study examines the safety needs and practices of cities in the United States. This was accomplished through a two-tiered approach. The first entailed a survey of respondents from the 150 largest cities in the United States, measured by population size, to understand their current safety practices in three areas:

- Transportation Planning and Programming

- Project Design and Development
- Education and Enforcement

This study further recognized that municipal decision making works in a political context comprised of multiple actors, including state departments of transportation, metropolitan planning organizations, mayors, city councils, and local residents. As such, we included an additional series of questions on administration and leadership to understand the political dynamics that may influence the implementation of safety-related programs.

In addition to gathering general safety trends from the survey, we further wanted to obtain a more nuanced understanding of the experiences of cities that have been at the forefront of advancing safety practice. To do so, the second tier of this analysis entailed a focus group with 10 representatives from cities that have sought to aggressively advance traffic safety. This focus group was held at the NACTO annual conference in Chicago in October of 2017. This report concludes by summarizing the aggregate findings of these two efforts.

## Survey of U.S. Cities

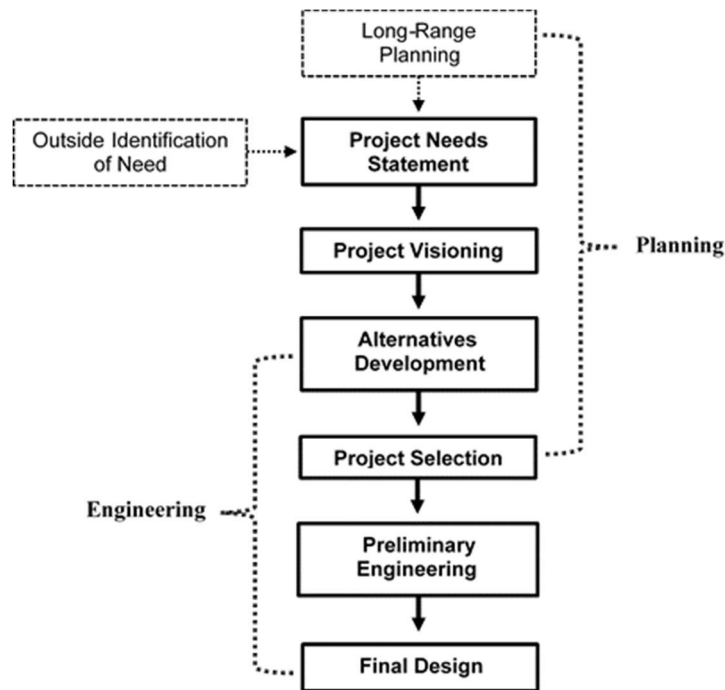
The first portion of this effort sought to understand the current state-of-the-practice of the 150 most populous cities in the United States. For each city, we identified the person most likely to oversee the city's safety activities, which entailed directors of transportation and Vision Zero program administrators, or other personnel, as identified by the cities. We used SurveyMonkey, an online survey platform, to design the survey and collect and analyze the survey data. The first invitation to participate in the survey was sent on June 26, 2018. Three follow-up emails were sent thereafter to those who did not respond to the survey. As a second tier of outreach, we further hired a professional call center, BPO American, to contact each of the respondents personally and encourage them to participate. Respondents were given the opportunity to complete the survey via telephone or using the online survey instrument. In all cases, respondents elected to complete the survey using the online web portal. Ultimately, 74 cities participated in the survey, providing a 49% response rate, which is substantially higher than the typical online survey response rate of 12-15%. Of these, three persons did not answer all the questions; however, as they responded to more than 50% of the questions, their responses are counted and included in the aggregate totals when their information was available.

## Survey Design

The survey consisted of 67 questions that sought to capture city safety experience related to both safety-related policies and administrative leadership across 8 dimensions: (i) transportation planning and programming, (ii) project design and development, (iii) education and enforcement, (iv) metropolitan planning organizations (MPOs) or council of governments, (v) state Departments of Transportation, (vi) city council, (vii) city executive, and (viii) residents.

Specifically sought was an understanding of the extent to which safety was established as a goal for various cities, the extent to which safety goals are integrated into the project development process (see Figure 1), which governs the design and implementation of specific transportation projects. As many projects relating to pedestrians and bicyclists relate to safety goals, we further sought to identify the presence of these programs as well.

*Figure 1: The Project Development Process*



## Survey Results

### Policies and Programs

The first area of focus sought to understand how safety considerations may have been integrated into the policies and practices adopted by cities. This may occur at three levels. The first are the adoption of specific goals and policies related to safety. The second is the manner in which safety considerations are integrated into the design, selection, and implementation of specific transportation project alternatives. Finally, the safety efforts may be complemented by education and enforcement programs.

### Transportation Planning and Programming

The majority of respondents (84%) indicated that safety is an explicit policy goal in their long-range transportation plan, compared to only 64% of cities identifying congesting relief as a specific policy goal. Of these, 45% of respondents identified that they have adopted a policy goal related to Vision Zero or Towards Zero Deaths (see Table 1). In terms of monitoring safety, the overwhelming majority (90.5%) indicated that they collect safety-related data, though only 62% indicated that they use this data for activities such as the identification of high-crash locations in their jurisdictions. More widespread are the development of policies and programs related to pedestrians and cyclists. 95% reported that their city has adopted a bicycle master plan, 88% reported that they have adopted a Complete Streets program. Further, 62% of respondents indicated that their city has implemented a Safe Routes to School program, and 58% reported adopting a pedestrian master plan.

### Project Design and Development

The second section of the survey sought to understand how safety may be integrated into the project development process that guides the development of specific project alternatives. As shown in Table 2, measures of traffic congestion, such as level-of-service, are used by 89% of the respondents when evaluating specific project alternatives. Comparatively fewer cities indicated that they had adopted policies regarding the inclusion of safety as part of the development of new projects or 3R/4R (resurfacing, restoration,

rehabilitation, and reconstruction) projects, which pertain to the modification of existing transportation infrastructure, with only 55% and 32% responding that they have adopted such policies, respectively. This suggests that, despite the widespread adoption of safety as a specific policy goal (see Table 1), these policies may not be guiding the types of transportation projects that are ultimately adopted by these cities.

Nonetheless, 80% of respondents indicated that their cities have conducted safety audits of existing infrastructure in the past, 52% have developed a traffic calming plan, and 97% have installed traffic calming devices in the past. Collectively, this suggests that while safety may not be a priority when developing or implementing specific project alternatives, most cities have at least some experience in the development of safety-related solutions, though many of these solutions may be developed in an ad-hoc basis.

### Education and Enforcement

The education and enforcement policies adopted by cities seem to pertain principally to conventional programs such as legal prohibitions against texting while driving (82%), DUI/DWI enforcement (85%), seat-belt enforcement (65%), and restrictions on cell phone use while driving (60%). Less than half of the cities have sought to modify speed or driving behavior through programs such as speed limit enforcement, crosswalk enforcement, or red light cameras. Nonetheless, 81% did report the adoption of at least one Safe Routes to School program during that last 3 years (See Table 3).



Table 1: Transportation Planning and Programming

	Question	Response		
		Yes	No	Don't Know / No Response
Q1	Does the long-range transportation plan for your city, or the transportation element of your city's comprehensive plan, identify traffic safety as an explicit policy goal?	62 83.8%	6 8.1%	6 8.1%
Q2	Does the long-range transportation plan in your city, or the transportation element of your city's comprehensive plan, identify reducing traffic congestion or vehicle delay as a policy goal?	47 64.4%	17 23.3%	9 12.3%
Q3	Does the long-range transportation plan for your city, or the transportation element of your city's comprehensive plan, identify transportation reliability as an explicit policy goal. Reliability is a measure of the variability of average travel times. A reliable corridor is one that while congested, has little daily variation in travel times.	38 52.1%	21 28.8%	14 19.2%
Q4	Does your city have a formal policy or explicit target pertaining to traffic safety, such as a "Vision Zero" or "Towards Zero Deaths"?	33 45.2%	35 47.9%	5 6.8%
Q5	Does your city use performance measures that evaluate traffic crashes, deaths, and injuries?	42 56.8%	24 32.4%	8 10.8%
Q6	Does your city collect or evaluate data on the number of traffic-related crashes, deaths and injuries that occur?	67 90.5%	4 5.4%	3 4.1%
Q7	Does your city have a formal program for identifying high-crash locations, sometimes referred to as "black-spot" locations?	46 62.2%	21 28.4%	7 9.5%
Q8	Does your city have a "complete streets" policy or program, which is a policy asserting that a city's streets should be designed to provide safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities?	65 87.8%	6 8.1%	3 4.1%
Q9	Have your city adopted "safe routes to schools" as a formal policy goal or objective?	46 62.2%	20 27.0%	8 10.8%
Q10	Does your city have a bicycle master plan, which details the city's current and/or future bicycle network?	70 94.6%	2 2.7%	2 2.7%
Q11	Does your city have a pedestrian master plan, which identifies current and/or future pedestrian infrastructure needs?	43 58.1%	22 29.7%	9 12.2%

Table 2: Project Design and Development

No.	Question	Response		
		Yes	No	Don't Know / No Response
Q12	Does your city analyze traffic congestion or level-of-service (LOS) when evaluating specific design alternatives for a proposed transportation project?	65 89.0%	5 6.8%	3 4.1%
Q13	Has your city installed traffic calming devices, such as traffic circles, neck downs, or bulb-outs, on your city's streets?	70 97.2%	1 1.4%	1 1.4%
Q14	Does your city have a plan, program, or policy to identify locations where future traffic-calming devices may be desirable or needed?	38 52.1%	27 37.0%	8 11.0%
Q15	Does your city have a formal process for reviewing the potential traffic safety impacts of NEW construction projects?	40 54.8%	22 30.1%	11 15.1%
Q16	Does your city conduct "safety audits," whereby safety professionals examine areas where safety problems may occur? These may include pedestrian safety audits, or audits affecting other modes.	58 79.5%	9 12.3%	6 8.2%
Q17	Does your city evaluate traffic safety as part of 3R/4R projects, which are projects that entail the resurfacing, repaving, rehabilitation, or reconstruction of an existing street? A formal evaluation entails quantifying its potential benefits.	23 31.5%	24 32.9%	26 35.6%
Q18	Does your city have guidelines for the inclusion of pedestrian infrastructure on city streets? This may include city-specific documents relating to the design of "livable" or "complete" streets," or the adoption of an existing manual on these issues, such as NACTO's Urban Streets Design Guide or the Manual for Living Streets.	60 82.2%	6 8.2%	7 9.6%

Table 3: Education and Enforcement

No.	Question	Response		
		Yes	No	Don't Know / No Response
Q19	Are there any State or local regulations that prohibit texting while driving?	60 82.2%	6 8.2%	7 9.6%
Q20	Are there any State or local regulations that prohibit distracted driving, such as driving while holding a cell phone?	44 60.3%	20 27.4%	9 12.3%
Q21	During the last three years, has your city used red-light cameras to issue citations to drivers that run red lights?	30 41.1%	39 53.4%	4 5.5%
Q22	During the last three years, has a speed-limit enforcement program such as "obey the sign" or "pay the fine" been conducted in your city?	35 47.9%	19 26.0%	19 26.0%
Q23	During the last three years, have speed enforcement cameras been used in your city to automatically issue citations to drivers exceeding the speed limit?	10 13.7%	57 78.1%	6 8.2%
Q24	During the last three years, has there been a crosswalk enforcement program that cites either drivers or pedestrians for violating laws regarding intersection crossings being conducted in your city?	35 48.6%	26 36.1%	11 15.3%
Q25	During the last three years has there been any DUI/DWI enforcement program conducted in your city by state, county, or local law enforcement personnel? DUI refers to driving under the influence of drugs or alcohol. DWI refers to driving while intoxicated.	62 84.9%	1 1.4%	10 13.7%
Q26	During the last three years, has there been a seat-belt enforcement campaign, such as "Click-it or ticket," conducted in your city?	47 64.4%	5 6.8%	21 28.8%
Q27	Safe Routes to Schools programs seem to provide safe pedestrian or cycling options to school-age students. During the last 3 years, has there been at least one "safe routes to school" program adopted or implemented in your city?	59 80.8%	5 6.8%	9 12.3%

## Administration and Leadership

The second area of focus sought to understand respondent's perception of the nature of safety administration and leadership in their city. As the development of effective transportation programs requires coordination across multiple agencies, including Metropolitan Planning Organizations (MPOs), State Departments of Transportation (DOTs), as well as mayors, city councils, and local residents, we asked respondents to discuss their experiences with these entities in advancing safety concerns.

### Metropolitan Planning Organizations

Metropolitan Planning Organizations or Councils of Government (MPO/COG) oversee the distribution of federal transportation funds to cities. In this section, opinions are sought from respondents regarding the role of the region's MPO or COG in shaping safety decisions that affect their respective cities.

Approximately 90% of survey respondents believed that their city has a positive working relationship with the MPO. Design elements such as traffic congestion/vehicle delay and mass transit were viewed as the top transportation priorities of the MPO, as reported by more than 80% of survey respondents. 73% of survey respondents either strongly or somewhat agree that the MPO takes an active leadership role in advancing traffic safety, and also is responsive to the traffic safety needs and concerns expressed by its constituent cities. Nonetheless, when asked whether the MPO advances safety considerations over issues of congestion and delay, only 55% agreed with the statements, with only 19% of respondents indicating that they strongly agreed with the statement.

### State Departments of Transportation

State Departments of Transportation (DOT's) are responsible for allocating federal transportation funds. In this section, opinions are sought from the survey respondents regarding the role of the state's DOT on safety decisions that affect the respective city. 76% of survey respondents indicated that they either strongly or somewhat agree that there is a positive working relationship between the city and the state DOT. More than 90% of survey respondents affirm that the state DOT views traffic congestion or vehicle delay as a top transportation priority; however, this is not the case with mass transit, with only 33% of respondents indicating that the State DOT supports transit as a means of urban mobility.

Two-thirds of the respondents agreed with the statement that their DOT views transportation safety as a priority. However, only half of survey respondents affirm that the state DOT is responsive to the traffic safety needs and concerns expressed by its constituent cities, and only one-quarter of the survey respondents reported that the State DOT prioritizes projects that enhance traffic safety if the projects may lead to additional vehicle delay.

The majority of respondents do not view the state DOT's role as supportive or encouraging toward projects that enhance pedestrian and bicycle safety. Approximately 40 percent of respondents either strongly or somewhat agree that their state DOT takes an encouraging role in supporting projects that enhance pedestrian and bicycle safety. That the state DOT plays a supportive role in the development of complete streets (i.e., streets designed to be safe for all road users, including motorists, pedestrians, and bicyclists of all ages and abilities) is agreed upon by only one-third of respondents, consisting of 9.7 percent that strongly agree and 23.6 percent that somewhat agree.

### Mayor or City Executives

Of the groups identified as have a role in leading city safety initiatives, the city executive, which may be either a mayor or a city manager, was identified as having the strongest influence. 76% of respondents indicated that transportation was a top priority for their city executive, and 81% of respondents either strongly or somewhat agreed that their city executive is concerned about overall traffic safety, with 52% indicating that they strongly agreed. This is noteworthy when considered against issues pertaining to congestion, about which only 62% of respondents indicated that congestion is a top concern, and only 24% indicating that they strongly agreed with the statement. Within specific safety domains, 80% indicated that pedestrian safety was a concern of their city executive, and 73% indicated that bicyclist safety was a concern.

## City Council

In general, respondents did not report that city council was as strong a proponent of transportation issues in general, or safety specifically, as was their city executive. 72% of respondents indicated that pedestrian safety was a concern in the consideration of development proposals, while 67% reported congestion as a concern for members of their city council. By comparison, 58% indicated that the provision of minimum parking was a concern, and 71% indicated that city council was supportive of investments in transit.

## City Residents

Elected officials are responsive to the needs and concerns of their city's residents, who have the ability to ensure that policies and programs continue on through any specific elected official's term of office. As such, public support is essential for ensuring the long-term success of safety-related programs. To gauge the perceived interests of the public, respondents were asked their view of the concerns expressed by residents. More than 80% of survey respondents agree that residents of their city are concerned about traffic congestion, traffic safety, and pedestrian safety and regularly voice their concerns about these issues at public meetings. In line with this, similar percentage of cities have residents who support projects that enhance pedestrian facilities, such as the construction or improvement of sidewalks and pedestrian crosswalks. In more than 65% of cities, residents encourage projects that enhance bicycle infrastructure and enhance the safety of bicyclists as well. Also, expanding or improving the city's transit system is supported by residents of 62% of cities. Nearly half of the survey respondents feel that their city residents consider traffic safety more important than traffic congestion in shaping the overall transportation system of the city.

Table 4: Respondent Opinions on Metropolitan Planning Organizations

No.	Statement	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	Don't Know/No Response
Q28	Considered as a whole, my city has a positive working relationship with the MPO.	45 62.5%	17 23.6%	5 6.9%	0 0.0%	1 1.4%	4 5.6%
Q29	My MPO views traffic congestion and vehicle delay as a top transportation priority.	23 31.9%	29 40.3%	8 11.1%	6 8.3%	1 1.4%	5 6.9%
Q30	My MPO supports transit as a top transportation priority.	33 45.8%	25 34.7%	5 6.9%	5 6.9%	1 1.4%	3 4.2%
Q31	My MPO takes an active leadership role in advancing traffic safety.	23 31.9%	30 41.7%	9 12.5%	4 5.6%	3 4.2%	3 4.2%
Q32	My MPO is responsive to the needs and concerns expressed by its constituent cities.	33 45.8%	19 26.4%	8 11.1%	4 5.6%	1 1.4%	7 9.7%
Q33	My MPO prioritizes projects that enhance traffic safety, even if they may lead to additional vehicle delay.	14 19.4%	26 36.1%	14 19.4%	6 8.3%	6 8.3%	6 8.3%
Q34	My MPO encourages projects that enhance pedestrian safety.	37 52.1%	19 26.8%	8 11.3%	2 2.8%	2 2.8%	3 4.2%
Q35	My MPO encourages projects that enhance bicycle safety.	37 52.1%	20 28.2%	5 7.0%	3 4.2%	2 2.8%	4 5.6%
Q36	My MPO supports the development of "complete streets," which are streets designed to be safe for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.	41 56.9%	19 26.4%	6 8.3%	2 2.8%	2 2.8%	2 2.8%

Table 5: Respondent Opinions on State Departments of Transportation

No.	Statement	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	Don't Know/No Response
Q37	Considered as a whole, my city has a positive working relationship with the State DOT.	21 29.2%	34 47.2%	6 8.3%	9 12.5%	1 1.4%	1 1.4%
Q38	My State DOT views traffic congestion and vehicle delay as a top transportation priority.	41 56.9%	26 36.1%	2 2.8%	0 0.0%	0 0.0%	3 4.2%
Q39	My State DOT supports mass transit as a means for providing urban mobility.	8 11.1%	16 22.2%	20 27.8%	13 18.1%	10 13.9%	5 6.9%
Q40	My State DOT takes an active leadership role in advancing traffic safety.	17 23.6%	30 41.7%	12 16.7%	8 11.1%	2 2.8%	3 4.2%
Q41	My State DOT is responsive to the traffic safety needs and concerns expressed by its constituent cities.	11 15.3%	25 34.7%	16 22.2%	13 18.1%	4 5.6%	3 4.2%
Q42	My State DOT prioritizes projects that enhance traffic safety, even if they may lead to additional vehicle delay.	6 8.5%	13 18.3%	18 25.4%	19 26.8%	9 12.7%	6 8.5%
Q43	My State DOT encourages projects that enhance pedestrian safety.	8 11.3%	22 31.0%	18 25.4%	13 18.3%	6 8.5%	4 5.6%
Q44	My State DOT encourages projects that enhance bicycle safety.	6 8.3%	22 30.6%	15 20.8%	16 22.2%	9 12.5%	4 5.6%
Q45	My State DOT supports the development of "complete streets," which are streets designed to be safe for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.	7 9.7%	17 23.6%	19 26.4%	18 25.0%	7 9.7%	4 5.6%

Table 6: Respondent Opinions on their Mayor or City Executive

No.	Statement	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	Don't Know/No Response
Q47	My city's executive is concerned about transportation issues.	35 48.6%	27 37.5%	3 4.2%	4 5.6%	0 0.0%	3 4.2%
Q48	Transportation is a top priority for my city's executive.	31 43.1%	24 33.3%	8 11.1%	5 6.9%	0 0.0%	4 5.6%
Q49	My city's executive has a clear vision for the future of the city's transportation system.	17 23.6%	30 41.7%	14 19.4%	4 5.6%	3 4.2%	4 5.6%
Q50	My city's executive is concerned about traffic congestion and vehicle delay.	17 23.6%	28 38.9%	17 23.6%	4 5.6%	1 1.4%	5 6.9%
Q51	My city's executive promotes transit as a means for addressing urban transportation.	27 38.0%	25 35.2%	10 14.1%	2 2.8%	3 4.2%	4 5.6%
Q52	My city's executive is concerned about traffic safety.	37 52.1%	20 28.2%	8 11.3%	2 2.8%	1 1.4%	3 4.2%
Q53	My city's executive is concerned about the safety of pedestrians.	37 51.4%	20 27.8%	8 11.1%	3 4.2%	1 1.4%	3 4.2%
Q54	My city's executive is concerned about the safety of bicyclists.	32 44.4%	21 29.2%	13 18.1%	2 2.8%	1 1.4%	3 4.2%



Table 7: Respondent Opinions of their City Council

No.	Statement	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	Don't Know/No Response
Q55	In general, my city council views reducing traffic congestion or vehicle delay as an important issue when evaluating new development projects.	17 23.6%	31 43.1%	17 23.6%	5 6.9%	0 0.0%	2 2.8%
Q56	In general, my city council views the provision of adequate minimum parking as an important issue when reviewing new development projects.	11 15.3%	31 43.1%	19 26.4%	5 6.9%	1 1.4%	5 6.9%
Q57	In general, my city council is supportive of investments in public or mass transit.	24 33.3%	27 37.5%	7 9.7%	6 8.3%	4 5.6%	4 5.6%
Q58	My city council views pedestrian safety as an important issue when reviewing development proposals, such as new residential or commercial projects.	23 31.9%	29 40.3%	11 15.3%	3 4.2%	2 2.8%	4 5.6%

Table 8: Respondent Opinions of their City Residents

No.	Statement	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	Don't Know/No Response
Q59	Residents of my city regularly voice concerns about traffic congestion at public meetings.	28 39.4%	30 42.35%	4 5.6%	7 9.9%	1 1.4%	1 1.4%
Q60	Residents of my city regularly voice concerns about traffic safety at public meetings.	32 45.1%	31 43.75%	5 7.0%	2 2.8%	0 0.0%	1 1.4%
Q61	In general, residents of my city support expanding or improving the city's transit system.	20 28.2%	24 33.8%	16 22.5%	4 5.6%	3 4.2%	4 5.6%
Q62	In general, residents of my city voice concerns about pedestrian safety.	36 51.4%	24 34.3%	8 11.4%	1 1.4%	0 0.0%	1 1.4%
Q63	In general, residents of my city encourage projects that enhance the safety of bicyclists.	14 19.7%	35 49.3%	13 18.3%	6 8.5%	2 2.8%	1 1.4%
Q64	In general, residents of my city support projects that enhance pedestrian facilities, such as the construction or improvement of sidewalks and pedestrian crosswalks.	37 52.1%	23 32.4%	7 9.9%	2 2.8%	1 1.4%	1 1.4%
Q65	In general, residents of my city support projects that enhance bicycle infrastructure.	12 16.9%	35 49.3%	15 21.1%	6 8.5%	2 2.8%	1 1.4%
Q66	Residents of my city believe that traffic safety is more important than traffic congestion in shaping my city's overall transportation policy.	8 11.3%	28 39.4%	20 28.2%	11 15.5%	3 4.2%	1 1.4%
Q67	Residents of my city are concerned about the safety of pedestrians.	31 43.7%	29 40.8%	5 7.0%	4 5.6%	1 1.4%	1 1.4%

# Focus Group

This effort sought to complement the survey results with an in-depth focus group of national leaders on transportation safety. To do so, we invited representatives from 10 cities throughout the United States to participate in a Safe Systems focus group held at the annual conference of the National Association for City Transportation Officials, held on October 30, 2017. All of the selected participants represented cities that had adopted Vision Zero programs. Participants were further selected to represent diverse geographies and cultural characteristics that may influence the nature of adopted safety programs, including representatives from the Northeast, South, Central, and Western United States.

## Focus Group Methodology

The objective of the focus group was to stimulate a participatory discussion among national leaders in road safety at the municipal level. Discussions were open-ended to encourage the emergence of unique ideas and perspectives, though the focus group was actively moderated around to ensure coverage of two specific areas: participants' perspectives on the most pressing safety issues confronting their cities, and the specific safety issues confronting different modal users, including motorists, pedestrians, cyclists, and transit users. When specific points of interest emerged during the focus group, the moderator probed the participants to elicit additional details.

The resulting discussion was fully transcribed, and is included in Appendix A. To ensure that the information contained in the transcript accurately reflected the views and perspectives of the participants, they were provided with a draft of the transcript and provided with the opportunity to review the transcript for accuracy and provide additional elaboration, if they so desired. Other than correcting a few typographical issues resulting from the transcription process, the content of the transcript was otherwise left unaltered. To maintain the confidentiality of the focus group participants, all identifying information has been removed from the transcript, with participant's names changed to read Participant 1,2,3, etc., city names changed to City 1,2,3,etc, as well as the removal of information that would permit the identification for specific projects that were discussed. A thematic analysis was conducted of the focus group transcript to identify the specific topics and issues around which the discussion centered, resulting in the following categories, each of which is summarized in the findings, below:

- Vehicle Speeds
- Street Network Configuration
- Urban Form
- Traffic Congestion
- Bicycle Safety
- Multiple-Vehicle Crashes
- Surface Rail
- Culture and Behavior
- Funding and Maintenance

## Focus Group Findings

### Vehicle Speeds

Participants largely viewed vehicle speeds as the key safety issue confronting their cities. Many of the safety problems are attributable to street design and local culture that encourages high vehicle operating speeds. Some cities have adopted speed management programs to reduce speeds through street design and intersection control applications. A related issue was deaths and injuries involving pedestrians and cyclists, which several participants noted had been increasing in their cities, despite the adoption of Vision Zero programs.

### Street Network Configuration

The configuration of city street networks was viewed as a specific issue of concern for addressing safety, pertinent to two related problems. The first is the configuration of suburban networks, which are designed to route nearly all traffic onto arterials. This creates a situation where all users, regardless of mode, are forced to use streets that are ill-equipped to safely accommodate them. *“As you start moving out into the suburbs, you start running into these cul-de-sac developments, basically, as I would put it. And so, all the pressure’s put on the limited network of streets.”* This safety problem is compounded by the high operating speeds found on arterials, particular those located in more suburban locations. As noted by another participant, *“where we see the most crashes, it’s the larger arterials, five-lane arterials in parts of town that have the least connectivity. So, you’ve got a lot of cars, high-volume roadways, wide crossings, [and] no infrastructure to cross. So, we see a lot of pedestrian crashes on those streets.”*

### Urban Form

A related issue is the evolving nature of urban form. While a street, such as a suburban arterial, may be safe when initially designed, the addition of new development along a corridor can dramatically changes the use and users of the route, introducing safety problems on an otherwise safe road. Participants discussed the need for the development of land use controls that would protect the operational integrity of streets over time. This will require greater education and outreach to non-traditional safety partners. As stated by one participant, *“[t]he challenge with the elected officials and the developers is getting them on-board, educating them... so they understand both the implication of land-development patterns and the cost to local governments of continuing with this same pattern.”*

### Traffic Congestion

As noted in the survey results, issues such as vehicle congestion and delay are often a primary focus of transportation agencies, but less so for cities and their elected officials. Focus group participants have largely accepted that congestion is a reality for their cities. *“What we’ve decided is that congestion is going to get here no matter what... it’s just going to be part of the landscape and [we should instead] focus on quality-of-life issues.”*

Nonetheless, another participant from another city that has historically focused more on quality-of-life factors than congestion noted that recent increases in congestion have had negative effects on safety. This individual stated that: *“Our roadways, particularly in the inner city, can’t handle [the increase in traffic congestion]... As a result, people are becoming more aggressive, particularly at the commute hours.”*

### Bicycle Safety

The issue of bicycle safety stimulated a good deal of recurrent discussion, as it is an issue with which all of the cities struggle. Several participants, including two who identified themselves as active cyclists, observed that much of the problem is educational; many bicyclists are not aware of the rules of safe conduct, nor of traffic laws pertaining to cyclists. Issues such as positioning in relation to motor vehicles and directional travel were identified as specific issues.

One participant from a city that has been aggressive in providing bicycle infrastructure stated that *“most of our [bicycle] crashes this year are enforcement-related versus design-related.”* Another noted that their city had a specific safety problem with cyclists traveling against the flow of traffic, which were identified as occurring on

routes with wide spacing between intersections, which thus failed to provide adequate opportunities for bicyclists to safely cross the street to travel in the appropriate direction.

An additional safety issue relates to conflicts between cyclists and large trucks, freight, and delivery vehicles, particularly when the drivers of large vehicles are attempting to negotiate right turns and cannot see oncoming cyclists from the outside lane. One participant noted that their city has sought to address this problem through educational programs provided to vehicle operators from UPS, FedEx, and the teamsters. Another city noted that they were in the process of requiring the installation of side-panels on delivery vehicles that would prevent bicyclists from going underneath trucks as they made a right-turn. While many cities struggle with balancing the needs of trucks and bicyclists, participants observed that protected bicycle lanes are a feature that both groups regard as beneficial.

## Multiple-Vehicle Crashes

Interestingly, the issue of multiple vehicle crashes was not one that emerged naturally from the conversation. After prodding from the moderator, one respondent dismissed the subject, stating that *“most of them are on the interstate because of tailgating. We don’t have much on our system. No big issues.”* Another noted that they are considering the adoption of access management policies to address these issues, though this person proceeded to discuss the city’s lane reduction projects, which were successful in reducing deaths and injuries on affected routes. Considered as a whole, multiple-vehicle crashes did not generate the same level of participant interest as did other safety issues.

## Surface Rail Systems

Next to motorcycles, light rail transit (LRT) is the most dangerous mode of surface transportation, producing 14.8 fatalities per billion passenger miles traveled. Light rail service in the US is very limited, and even in the cities with the most established systems, light rail comprises a comparatively small share of overall trips, and thus a small share of total injuries and fatalities. As such, light rail safety is not currently regarded as a safety priority. Nonetheless, with more cities looking towards surface transit solutions as a means for addressing urban mobility, we probed respondents on their safety experience with light rail.

Focus groups in general did not regard light rail or streetcar service as a pressing safety problem, though several noted that such crashes were frequent, and that there is little meaningful guidance on safe design. One respondent felt that that *“we’ve been running this natural experiment since almost the cable car started.”* Safety problems with surface rail systems are particularly problematic when the rail runs through the median, creating traffic conflicts between rail cars and turning vehicles. These problems include vehicles attempting to make left-turns across the median from intersecting streets and driveways, as well as persons entering the median to make left-turns along the thoroughfare along which the rail service travels.

One participant said the solution to this problem was accomplished by modifying signal timings along the route to clear turning vehicles in advance of the train. Other respondents noted that rail vehicles can create a problem when they are too silent, leading to collisions with pedestrians and cyclists. Another participant noted that their city sought to address safety issues with cyclists by having bicycle lanes go behind the transit station when transit vehicles travel along the outside lane.

## Public Support

Most of the participants believed that the major challenge to advancing safety was cultural. While the public supports the idea of safety in general, there is a good deal of resistance to undertaking specific safety projects that result in reduce vehicle speeds or increased vehicle delay. This problem is particularly pronounced for areas outside of the urban cores. Education was viewed as essential for advancing safety for changing the safety culture, among both governmental officials and the broader public.

## Culture and Behavior

Cultural issues relating to safety were raised by several participants. One participant noted that many of the city’s safety problems revolved around a culture that did not regard driving under the influence as a serious concern. Another noted that law enforcement personnel were not aware of traffic regulations relating to pedestrian and cyclist safety. Several others noted that the culture of bicyclists encourages a disregard of traffic laws. In general, the focus group participants felt confident that they understood how to design safe

streets, but the challenge was in addressing culture and behavior. As one participant remarked, *[we've] got the engineering part down. Supposedly, the cops got the enforcement part down. Where I think we don't do a good job and that we don't have good resources is on the education side. It's like I said, those cultural changes that we need to get, both from the police department and in the public.*"

Another participant felt that making these cultural changes needed to be accomplished by more "impactful" means than generalized education campaigns, such as "click-it or ticket" programs. Instead, the focus should be directed at the core belief systems of specific at-risk road users. The cultural transition made by Mothers Against Drunk Driving (MADD), which focuses specifically on preventing teens from driving under the influence of alcohol, was identified as a useful model for safety programming. Considered as a whole, these comments suggest that there is value in better understanding the specific at-risk sub-cultures that influence safety-related behavior and developing targeted interventions to modify them.

## Funding and Maintenance

Several participants noted the important role of funding in advancing safety programs. State Departments of Transportation are under significant financial pressure, with traditional resources, such as gas tax revenues, failing to adequately cover transportation needs. As stated by one participant, *"[t]he locals have more capital funds than [State DOTs] do. And so, we're at this point where we're actually pouring our own sales tax and bond money into rebuilding because we can't wait for them to get around. They're 12 years off their maintenance cycle. So, they might repave this street in 2027. People are dying now."* This issue is particularly acute with regards to the maintenance. Another stated that *"what we keep running up against is the funding to maintain. "Don't put trees. Those are too hard to maintain"... [a]nd don't put in more signals." I mean, they're not really saying, "Don't put in more signals," they're saying, "If you add signals every three blocks or hybrid signals to facilitate pedestrian crossings, how will we maintain that in the future? You're going to triple or quadruple our assets."*

## Conclusion

This project entailed a survey of the safety practices of the 150 largest cities in the United States, as well as a focus group of representatives from 10 cities at the forefront of traffic safety. Several major findings emerge from this effort. First and foremost, the safety programs adopted by cities have taken a distinctly urban flavor, with a particular emphasis placed on the needs of pedestrians and cyclists, rather than on crashes involving motorists. This is perhaps unsurprising; in the United States, 70% of all pedestrian and cyclist fatalities occur in urban environments, and 40% of all urban traffic fatalities involve pedestrians and cyclists (NHTSA, 2018). These fatalities often involve children, making them a particular focus of concern. In response, the types of safety programs adopted by cities include bicycle master plans (95%) complete street programs (88%), and Safe Routes to Schools programs (87%).

Cities appear to prioritize safety considerations over traditional transportation concerns such as vehicle congestion and delay. While 84% of cities have an explicit policy goal related to safety, only 65% have a goal related to traffic congestion or vehicle delay. As revealed from the findings of the focus group, the reason appears to be attributable to the perception that *"congestion is going to get here no matter what... it's just part of the landscape and [we should instead] focus on quality-of-life issues."*

But this also raises a larger concern about the efficacy of city-led safety policies. These safety goals appear to be bundled with broader concerns about livability and quality-of-life, rather than a direct outcome of its own. While 84% have adopted safety as a policy goal, only 55% of survey respondents indicated that safety was a formal consideration as part of new capital projects, and less than one-third indicated that they had policies to address safety as part of 4R (e.g., reconstruction and rehabilitation) projects. In other words, high-level policy goals related to safety often do not translate into specific policies and practices that inform the design and construction of transportation infrastructure. Instead, it appears that cities regard the provision of pedestrian and cyclist facilities as a sufficient commitment to traffic safety. This was further evidenced in the focus group, where the safety discussion overwhelmingly focused on the specific needs of pedestrians and cyclists, rather than multiple-vehicle crashes, which constitute the majority of traffic-related deaths and injuries.

In terms of safety leadership, mayors or city executives appear to be the motivating force behind city safety activities, with 76% of respondents indicating that safety was a top priority for their city executive. Similarly, 89% of respondents reported that city residents regularly voiced concerns about safety, with 85% of residents indicating concerns about pedestrian safety particularly. These concerns help explain the emphasis placed on pedestrian safety by U.S. cities.

Safety appears to be less of a priority for those agencies tasked with the planning of state and regional transportation systems. Metropolitan planning organizations were viewed as valuing safety, but only 45% of respondents felt that their MPO prioritized safety over congestion-related concerns. Only half of survey respondents felt that their state department of transportation was responsive to city safety needs, and only one-quarter believed that their DOT would prioritize safety projects if they were to lead to additional vehicle delay. Note that these findings also correspond to respondents' perceptions about how DOTs prioritize the safety projects of greatest interest to cities. Only about 40% indicated that their DOT prioritizes pedestrian safety, bicyclist safety, or complete streets programs, the types of safety-related programs that were most heavily emphasized by city officials.

It should be noted that the survey findings were further corroborated by the focus group results, with participants noting that they felt their state departments of transportation were not supportive of projects that promoted pedestrian and cyclist safety. Taken as a whole, there appears to be a significant difference in safety priorities of cities and states.

An important finding of the focus group was that cities view themselves as being largely responsible for the construction and finance of safety improvements as a result of declining sources of state and federal aid. Given the emphasis placed on safety by these groups, when compared to MPOs or state DOTs, this presents a unique opportunity for advancing safety practice. Yet the scope of interest for cities extends well-beyond transportation safety issues. As such, this suggests that the implementation of safety programs would be most effective if they are directly linked to the broader livability and quality-of-life concerns of cities. For cities, projects are evaluated based not simply on safety, but on broader factors such as resident support and demonstrable benefits to property values.

The relative lack of meaningful implementation strategies at the project level, combined with a broader focus on quality-of-life issues, presents a unique opportunity for encouraging innovations in safety. Cities value the safety of pedestrians and cyclists, and, as has been increasingly demonstrated, interventions that enhance the safety of these vulnerable user groups lead to safety benefits for all road users, including motorists (Dumbaugh and Rae, 2011; Ewing and Dumbaugh, 2009). As such, it would be useful to develop project-level safety practices that can be demonstrably shown to garner local neighborhood-based support. Indeed, with city officials finding themselves increasingly responsible for funding safety-related infrastructure improvements, the ability to tie these improvements to increases in property values and tax revenues would enable these projects to be financed through value capture mechanisms, such as tax-increment financing, special assessment districts, and impact fees (Lari et. al., 2009).

This effort thus concludes by encouraging safety professionals to link safety considerations to broader municipal concerns, and to translate these considerations into formal project evaluation criteria. Doing so would serve the dual purpose of advancing safety consideration in practice and activating new revenue sources to fund their construction. Future research should seek to develop our understanding of how safety relates to livability and property valuation, as well as how to translate these linkages into actionable policies and programs.

# References

Dumbaugh, E. and W. Li. (2011). "Designing for the Safety of Pedestrians, Cyclists, and Motorists in Urban Environments." *Journal of the American Planning Association*, 77(1): 69-88.

Ewing, R. and E. Dumbaugh (2009). "The Built Environment and Traffic Safety: A Review of Empirical Evidence." *Journal of Planning Literature*. 23(4): 347-367.

Lari, A., D. Levinson, Z. Zhao, M. Iacono, S. Aultman, K. Vardhan Das, J. Junge, K. Larson, and M. Scharenbroich (2009). *Value Capture for Transportation Finance: Final Report*. Minneapolis: Center for Transportation Studies.

National Highway Traffic Safety Administration (2018). *Rural/Urban Comparison of Traffic Fatalities Report # DOT HS 812 521*. Washington DC: United States Department of Transportation.



# Appendices

## Appendix A: Focus Group Transcript

- Eric Dumbaugh: All right. I think you all have done this, but we just need to introduce ourselves and where we're from.
- Participant 2: I'm Participant 2, and I'm the senior director of the Office of Bicycle and Pedestrian Programs at [INAUDIBLE 00:00:56].
- Participant 3: Participant 3, from City 1. I work in Public Works, and I'm a transportation-planning manager.
- Participant 4: Participant 4, Director of Transportation and Drainage Operations for City 2.
- Participant 5: Participant 5, City 3 and [INAUDIBLE 00:01:13] project manager.
- Participant 6: I'm Participant 6. I work at the Highway Safety Research Center at University 1 with Eric [INAUDIBLE 00:01:19].
- Participant 7: I am Participant 7. I'm a traffic-safety engineer for City 4.
- Participant 8: Participant 8. I'm the bicycle coordinator with City 4.
- Participant 9: Participant 9. I'm the transportation director for City 5 and just left the DOT, where I led the Complete Streets and bike/ped safety initiative for the last five years.
- Eric Dumbaugh: Okay. To start off, just a general question. The way we'll do this is really just to have you guys talk. I'll mostly just...going to listen and moderate because I'm interested in what y'all have to say about what you're doing and to each other. And the back and forth is really what we're looking for.
- So, just to start, in your view, what are the most pressing or important traffic issues confronting your city?
- Participant 3: Pedestrian crashes... That increase of pedestrian crashes is something we're having that we're trying to tackle and get on top of.
- Eric Dumbaugh: All right.
- Participant 9: Likewise, we're obviously in the Dangers by Design report, which is I ended up back at DOT for the last five years but the metropolitan area for City 5. And a big part of the challenge is not just the roadway system that contributes to our problems, I think like most, some don't. Cities... It's also land-development patterns contribute to the problem.
- Participant 4: Speeds. I sum it up in one word – speeds. People drive too fast.
- Participant 7: Yeah. I think it's the crashes, and it's also the near misses, which affect the way people travel and the decisions they make or whether or not they'll get back on their bike or if they feel safe. So, it's very important.
- Participant 2: I think one thing that has been City 6, we've been doing a lot of work around pedestrian and driver. Bicyclist behavior with a very specific recent focus on the intersections because that's where we're seeing the most challenging issues to solve. But one thing that we're seeing this year, if you believe, is motorcycles. We're having a very big problem with motorcycles, and I think it just goes back to speed. And so,

that's the thing we're not designing for, necessarily. It's not at the forefront of our mind, but I think you kind of play with it and just use your behavior and driver decision and all that [INAUDIBLE 00:03:54].

Participant 4: The challenge is, particularly in older...well, most cities, to a certain extent, have a grid system. And so, all the streets are straight, and they're flat. And then we built them too wide because, A, we wanted people to have room for parking and stuff. So, it just encourages people to go faster. And, I don't know about anywhere else, but in City 2, they only write speeding tickets on the freeway.

Participant 3: I think distraction's huge, too. The number of times, everyone at a traffic light, you just see their hand go up like this, or they're doing it all the time, but...

Participant 4: No question.

Participant 8: I'll expand a little bit on what Participant 7 said. In City 4, we've identified a high-crash network of roadways in the city, and I think City 4's got very different urban forms in different parts of town. And where we see the most crashes, it's the larger arterials, five-lane arterials in parts of town that have the least connectivity. So, you've got a lot of cars, high-volume roadways, wide crossings, no infrastructure to cross. So, we see a lot of pedestrian crashes on those streets. And then I agree, certainly speeds, of course, and distraction, I think...

Participant 4: On those... Particularly, on those type of streets.

Participant 8: ...we're seeing crashes increase.

Participant 7: We're seeing crashes increase, most drastically, with pedestrians but kind of with everybody. This last year, I think just kind of been bad behavior, bad driver behavior. The last... One of the last [INAUDIBLE 00:05:37] we had was on a three-lane roadway. It's mostly industrial, not high volume, and this person just was going... I don't know...65 miles an hour in the center turn lane, weaving in and out of traffic and then goes head on with a truck. And those are more and more the types of crashes we're seeing instead of sort of the... We see these, too, but the tragic, "Oh, everybody just kind of made a little mistake, and it turned out to be a real tragedy." We were just seeing some really bad behavior, more often than just sort of the, "Oh, I made a mistake, and it was fatal." So, that's sort of interesting. That's sort of a departure, right? I feel like we used to have ones where they were more honest mistakes or stuff like that, if that makes sense.

Eric Dumbaugh: [INAUDIBLE 00:06:21], I was in City 4 recently, and I was kind of surprised with how much more aggressive the drivers seemed. Why do you think that is?

Participant 7: More congestion, I'm guessing, some of it. Our freeways are deadlocked during the peak hour. And so, that's why.

Participant 8: Yeah. I think in the 15 years between 2000 and 2014, we saw about a 55,000 increase in the number of commuters...a 20-percent increase. And then, just in the last couple of years, we've seen that jump at 10,000. So, we've seen a huge influx. Our roadways, particularly in the inner city, can't handle that. And I think Participant 7's right. As a result, people are becoming more aggressive, particularly at the commute hours. It's anecdotal, but it's... Somebody who's biking on the streets every day, I'm noticing that.

Participant 4: Yeah. I think that the spillover from the freeways is part of it, but you just can't build the freeways big enough. And everybody's driving, and they're driving farther. And I've got an arterial that carries 75,000 vehicles a day. And the last place I worked,

that was a freeway [INAUDIBLE 00:07:26]. But... And, fortunately, on that one and the areas where 75,000 vehicles a day... They can't speed or at least not very far because all the traffic signals are over capacity. It's just... People ask how you can... I've got one intersection with almost 140,000 vehicles a day going through it. People say, "How do you do that?" It's easy. Peak hour starts are 5:00 a.m., and it ends at 9:00 p.m. And you can't really speed through there. But, as you get out in the fringes, where it starts drops into the 40,000 range, those speeds start going up again.

- Participant 9: Yeah. Speeding is a huge issue. And we've had about a 30-percent increase in fatalities in State 1 in the last two years, and the only thing that I can assign it to is distracted driving. Going back to the five... With the pedestrian issues, we... In State 1, we looked at our statistics on the different types of roadways, and we found that our undivided cross-sections had four times the fatalities of any of our other corner types. So, not having... Always having this battle between access to business and refuge for pedestrians is a big challenge for us. I would say, in State 1 and in the City 5 area and, similarly, when the speeding issue, you get this, as you mentioned, as you get out into the suburbs, the speeds go up dramatically, even [INAUDIBLE 00:08:56].
- Participant 3: Similar to what you both were just saying about the [INAUDIBLE 00:08:59] not working, we've recently conducted an in-depth study of our pedestrian crashes. So, we've got jurisdictional issues around... So, our commute roads were our most [INAUDIBLE 00:09:11] not where pedestrians are. So, you have competing jurisdictional interests who are... Their focus is something different than the city's... a little bit more nimble, or paying more attention, or ready to react a little bit more quickly, I think. [INAUDIBLE 00:09:26] solutions [INAUDIBLE 00:09:28] challenges.
- Participant 9: Those higher speeders just on the fringes, that. And then the other thing we've got is a phenomenon, and part of it's the way our freeways were built. As they're rebuilding them, it's becoming less possible for people to do it. But it's amazing the number of people who'll play Frogger with 70-mile-per-hour traffic. I'm like, "Really?" That run across five lanes of freeway traffic moving 70 miles an hour, jump the divider, and run across another five lanes. So, we have an issue with people getting hit on the freeway.
- Participant 2: So, parts of the city are getting developed [INAUDIBLE 00:10:08], so that's adding to our [INAUDIBLE 00:10:13] where people are looking for access that... Those people didn't live there before, so now there's more people in these spots. And we've actually seen a very similar uptake of pedestrians getting hit crossing these multi-lane highways.
- Participant 5: So, the other part is the lack of infrastructure, right? Most of our streets are designed for vehicle traffic, and no one's expecting to see a pedestrian [INAUDIBLE 00:10:36]. Pedestrian is on the side of the road, there's not enough light early in the mornings. So, the lack of [INAUDIBLE 00:10:44] along the [INAUDIBLE 00:10:46] urban streets.
- Participant 4: You mentioned the lack of infrastructure. We made it a standard when we rebuild the street, sidewalks have to go in, even in neighborhoods. It's amazing the number of people we get petitioning the city council to get us not to put sidewalks in their neighborhood.
- Participant 5: How do you design that infrastructure if you have large... If you have a five-lane or a six-lane roadway [INAUDIBLE 00:11:16] medians and such. So, how do you design that pedestrian and bike infrastructure?

Eric Dumbaugh: I wanted to follow up with something Participant 9 said, which was the role of land use. Can you elaborate a little more on that?

Participant 9: Well, we have areas that are still growing in the urban and the suburban areas [INAUDIBLE 00:11:36] new development, and we can... Even though the city has done a good job, I think, in the downtown of requiring the grid to be reconnected and expanded. As you start moving out into the suburbs, you start running into these cul-de-sac developments, basically, as I would put it. And so, all the pressure's put on the limited network of streets. And, because those streets are doing the heavy lifting, they tend to be multi-lane, higher speed. And, yet, people that live in those neighborhoods are [INAUDIBLE 00:12:09] walk and bike more. And so, it puts things in direct conflict. So, just getting the developers to change their lane-development patterns is very generally difficult at this point in time because very few of them understand. And, likewise, as a city, it has a direct impact on us and our ability to serve those neighborhoods because it's going to cost us more to support them over the long term. And the elected officials are just not there yet. Some of them.

Eric Dumbaugh: So, that is something else to be curious about, and I don't know if this is true for the rest of you, too. But is safety a factor in your cities when you're making development decisions on future growth or the form of that growth?

Participant 4: I'm from City 2, and we don't have zoning. No, it's... We don't have zoning, but we do have other types of controls and stuff. But the problem is that the design du jour that most of the land-use folks are putting together are these little pod subdivisions, 300 houses, one [INAUDIBLE 00:13:25] two of a collector street. And then that collector street ties into a couple of arterials. And so, the collector street, which has houses backed up to it...fortunately, not onto it, in most cases... But that's how they're designing them. They design them for that way. And part of the reason they're designing them that way is that's what people want to buy. We continue to talk about it, that we've had not had good luck. Within the city, we can force multiple exits out of the subdivision. We've got to be careful how we do that because so many of our subdivisions were designed so now that they've become cut-throughs to bypass the major intersection.

But there are ways you can do that. In the city, we try to push for that. But the problem is more on those outlying county areas that one day will be city and how you sit there and what land-use controls you have there. We're talking about traffic, but one of the big things we've been talking about is how much the development is impacting drainage, the impact on our biosystem, and such. You might have heard we had a little rainstorm back in late August, but the county keeps on blaming the city saying, "The city can put their [INAUDIBLE 00:14:52] in our [INAUDIBLE 00:14:52] territorial jurisdiction," which is a unique State 2 thing. We can sit here, and we can force some things in the county, except for the fact that the county is not really being fair when they say that because, every time we try and do that, they come unglued and start raising heck and everything else and throwing their weight around and everything else until, finally, it gets [INAUDIBLE 00:15:13] and goes the way that they want. So, I'm not sure what the solution there is, but those little high-cove [Phonetic] subdivisions, cul-de-sac subdivisions, whatever we want to call them, they're popping all over.

Now, the good news is I don't have to do traffic [INAUDIBLE 00:15:29] in them because they're, generally, designed so that drivers can't drive very fast in them. But, as soon as you leave the neighborhood, that... I've got one street where the speed limit's 30 miles per hour, and we've been trying to get the police department to do something with it. And they went out, and they were all thrilled. They wrote 500 tickets in a week. And it worked great until I showed them the 85th was actually 51

miles an hour and that there were roughly 5,000 vehicles a day that were doing 10 miles an hour or more over the speed limit.

Eric Dumbaugh: I'm sorry. I should introduce...

Participant 4: It's straight and flat.

Eric Dumbaugh: ...Participant 10 from City 7[INAUDIBLE 00:16:04]. He's coming from [INAUDIBLE 00:16:07].

Participant 9: To answer your question, I would say, generally, no. Before I became... Before I moved to the city, my predecessors were really focused on...just on moving cars quickly into and out of the city and in the suburbs. And, likewise, that the county... The county... County 1 is very much that way, but that... But the culture is starting to change, both at the city and the county, now that I've been there almost a year. So, we're working on a vision-zero plan. We're expanding our Complete Street policy. And what DOT has done with allowing us to reduce design speeds and travel-lane widths and things of that nature is actually going to help facilitate changes in development patterns. But the challenge with the elected officials and the developers is getting them onboard, educating them, and getting them on board to help them so they understand both the implication of land-development patterns and the cost to local governments of continuing with this same pattern.

Eric Dumbaugh: What about City 6? You guys are sort of at the forefront of safety. Is there anything in developing controls that [INAUDIBLE 00:17:18]?

Participant 2: So, a couple of things come to mind. We have a couple of areas that we are... We have brand-new developments in City 8, out in the Area 1, where we are pretty heavily involved in the designing of the streets. And we're sort of pushing back, in some cases, in what [INAUDIBLE 00:17:37] is the needed...the needs. Let's create streets like you don't have anywhere in the city, two-lane sort of suburban streets where, really, it could be one lane. And then, if you ever need a second lane, we can add it future. So, we're adding that down so those streets. We're designing them with a safe... We're getting involved early so that they're designed and built with safety in mind. And then we have a lot of areas that are currently free developing and that thing that comes to mind is our greater... We just rezoned Area 2, basically, which is a huge square land around Area 3...north of Area 3.

As a part of that process, we built into the zoning a fund, a development fund that's going to go to also retrofitting the streets as more density comes into this neighborhood. The street... The money's going to go towards the fund to actually build up and [INAUDIBLE 00:18:34] widen the sidewalks, add better transit infrastructure, sort of to retrofit the streets with all the tools that we're using now in-house kind of on a daily basis, make sure that [INAUDIBLE 00:18:46] has as the neighborhood grows.

So, something slipped through the cracks, certainly, and we have to go back and figure it out. But I think we're trying to get in at the frontend as much as possible.

Participant 4: One of the things that we're starting to look at is that, for years, the tendency has been to go wider and wider and wider, that every two-lane road's going to have to be four lanes. Every four-lane was going to have been six-lane. Every six-lane road's going to have to be eight lanes, so on and so forth. That I finally got everybody to understand that we're not going to build our way out of congestion. That only took me 10 years. So, we're going to be able to build enough freeways or anything else to continue the growth the way it has been and the traffic patterns the way we have been.

And what we've been trying to do is we've been trying to accommodate these increased growths with our land planning and such. And that what we've kind of decided is congestion is going to get here no matter what. And people are going to have to deal with it, that they deal it with it in other cities. It's just going to be part of the landscape and that maybe focus on quality of life on a lot of these roadways becomes more important. We're having conversations right now where we're looking at, in general, not widening road beyond four lanes, that, right now... Hell, I've got a ten-lane road. I've two ten-lane roads. Things like that. And the thing is that should we be doing that? And we're having the discussion about rather than rushing out and building a bunch of...widening everything to six lanes that's four lanes and everything else, just leave them as four lanes. In some cases, we're looking at the quality-of-life issues and such, saying, "Okay. Is it really worth taking all the buildings on this side of the street in order to accommodate this little bit wider?" And so, even though it's four lanes today, and they're nine-foot lanes, and we have horrible crash problems all up and down it, but they're usually low-speed minor crashes, but we'd like to eliminate some of those. But how do you do that?

We're actually saying, "Well, most of the day, because of the buses, it only operates as two lanes anyway. So, maybe we build it as a two, rebuild it as a two-lane with bus pullouts, and give a way around the buses and such." So, we're having a lot of those conversations, recognizing that, if we do this, that the congestion is going to, basically, continue to build. It's going to spill into neighborhoods and such, and we're trying to tell people that's going to happen anyway, that until we can change the attitudes about transit in City 2, the land of, "You can have my car keys when you pry them from my cold, dead fingers," that until we can get more people on transit, walking, biking, those types of things, that the condition's just going to build and that we're trying to force some of that transition because, if you've got a certain a traffic for all those hours... Number one, we're trying to get companies to change...flex their hours. Not everybody has to be working at eight o'clock in the morning, trying to get more of the telework stuff going and stuff. But, basically, we're kind of pushing the issue by saying, "This isn't going to get any wider. Yeah. We understand it's got 35,000 vehicles a day on it, and we're not going to widen it to six lanes. It's going to be four lanes, and it's going to carry 35,000 vehicles a day. And maybe, eventually, even 40,000, but that's just where it's going to go. We're not going to make it wider." So, that is actually slowing traffic down, believe it or not, because, again, if it's congested like that, people are... They're forced to drive slow. Our bad crash problems are not things that happen between six and nine in the morning and three and eight in the evening. It's the stuff that happens at ten o'clock at night when there isn't as much traffic and people can get that speed up, but...

Eric Dumbaugh: So, a follow-up question for you. One of the things that City 2's done before, they had the most successful [INAUDIBLE 00:23:23] light rail system when they opened up that first leg. Another thing that they do really well is, apparently, it does a very good job of running into cars.

Participant 4: Yes.

Eric Dumbaugh: I've been curious about... And maybe a few of you can talk about this. Certainly, it might apply to the City 4 experience, too. What's the... Light rail, mixed traffic, and safety? How do those things interplay?

Participant 4: Not very well.

Participant 9: We had the same issue with commuter rail, and we have a program with FTA or... Excuse me...the FRA, the Federal Rail Administration, where we've actually got cameras at a number of crossings. And people driving are just doing stupid things. I

had a guy in front of me yesterday who parked on the... He passed... I'm in the lane. I'm in the right lane. He's in the left lane. He cuts over in front of me and parks right on the rail. And some rails come through there every 20 minutes. It's a commuter rail.

Participant 4: You can go to YouTube and do a search for metro's greatest hits and just in metro's greatest hits. And they actually have videos from their trains. And I mean that, basically, part of the original rail line where they had such high ridership and everything, and they also managed to set a new record for crashes, is they took a roadway that's a two-way roadway that people used to be able to turn left on, they put the train down the middle and told people you can't turn left anymore. Yeah. That's a silly rule. What the heck? Now, basically, people continue and that's what their greatest hits shows is people continuing to turn in front of the train. It's not the train that's coming at them. It's the one that's coming up behind them that always gets them.

Participant 10: So, we have [INAUDIBLE 00:25:05] all over City 7. In many ways, we've been running this natural experiment since almost the cable car started. But the [INAUDIBLE 00:25:11] rail's been there much longer than cars have been, actually. And, in many of our neighborhoods that have developed around [INAUDIBLE 00:25:17] center of the street, sometimes we'll have a traffic prohibition. Sometimes, we'll let cars drive in the track lane. There's not... We have a pretty good [INAUDIBLE 00:25:25] record there, except for the left-turn issues. We built a [INAUDIBLE 00:25:30] rail line about 15 years ago and had to add a bunch of left turns in order to... It doesn't [INAUDIBLE 00:25:37] complete [INAUDIBLE 00:25:38]. So, even more so than downtown in City 2, a few of the left turns we've banned require drivers to go a pretty extraordinary way out of their way to make the turns they used to be able to. So, there's [INAUDIBLE 00:25:48].

Participant 4: You make three rights in City 2 to make a left.

Participant 10: But this is not. This is three rights that takes you a mile out of your way from the industrial area. So, yeah. The [INAUDIBLE 00:25:58] can be turning. And we're in this war of explanation with these giant red "No Left Turn" arrows, [INAUDIBLE 00:26:06] devices [INAUDIBLE 00:26:07] train, but we're just not [INAUDIBLE 00:26:08]

Participant 4: But I'll tell you that City 2's problem's gotten better, that, initially, when they started running it, they had issues and that, basically, the city said, "We said not to do this. We don't want anything to do with the system you guys have got." And they were actually running the traffic signals along it. Well, finally, they got desperate. They came to us, and they said, "What can we do?" We said, "Well, we're glad you asked. Here's what we'll do." And we started programming cue jumps and get the train to start directional-cue jumps and that kind of thing and get the train started [INAUDIBLE 00:26:44] and that type of thing. And it's really eliminated a lot of their crashes. Not perfect, but we still have drivers involved. But... And it's really tethered down.

The thing that's actually been interesting...in...is the streets that...or the new streets that they put it on where they didn't put it in the middle. They put it on the side, and it's actually mixed traffic. They're one-way streets, and they got one direction on two streets, being their theory is why jack up one street when you can jack up two? But, anyway. They got one-way out of two one-way streets. But the interesting thing is we haven't really had an issue with crashes in that segment where it's shared and that there's been the occasional one, but it really hasn't been too bad, that... And I can't explain it, other than the fact that people know that they're driving with the train.

That combined with the fact that we went ahead and put the cue jumps in automatically where we'd have dual tiny movements. Where somebody's going to be turning across the train, we automatically put those in before the system even started so that there's nobody moving with the train starts entering the intersection. But, considering the fact that we have cars and trains in the same landscape, it really hasn't been that bad.

Participant 2: One other aspect we have, where we do have trains running in mixed traffic, there are a few parts of our system that are still built in the sort of traditional streetcar, where the streetcars are in the center lane, which means that they are letting...they were discharging passengers into moving traffic, which is just insane. And so, that, we're probably the only jurisdiction [INAUDIBLE 00:28:31] that has that condition. So, it's been a real fight with our state [INAUDIBLE 00:28:35] commission, which sets our local [INAUDIBLE 00:28:38]. We've really struggled to even [INAUDIBLE 00:28:41] the traffic [INAUDIBLE 00:28:42] tools we need to prevent that particular thing from happening, but there's definitely a vulnerable today with any kind of street-running route where you've got... Inevitably, you've got people who dash in across the street or, literally, [INAUDIBLE 00:28:55] trains of traffic [INAUDIBLE 00:28:58] bus [INAUDIBLE 00:28:59] dedicated routes to fix that wherever we can.

Participant 4: And, lately, it's been bicycles and pedestrians we're having more a problem with because the trains are too quiet, that people just ride right out in front of it or step out in front of it. And the... You just can't explain it.

Participant 3: We have a... It's not light rail, but, with our buses, we have a protected bikeway on the street and then the bus pullover. We're developing a lot of BRT systems right now so the interplay between the bikes and the buses, that conflict [INAUDIBLE 00:29:38], something we've tried to pay more attention to and [INAUDIBLE 00:29:41] practices.

Eric Dumbaugh: So, how do you address that? That's another issue that is worth exploring. So, the interplay between bicycles and buses? They're both fighting for that curb.

Participant 3: Well, right. And then, if you keep the bikeway on the right side, then you've got people entering the next speed, and you've got accessibility issues and how to navigate that. So, it's a work in progress. We don't have...

Participant 2: If you want to completely separate the two, it takes more space that we don't have. That's a problem we're have, too. If you're going to take the [INAUDIBLE 00:30:17] and put to the one side of the bus, the pedestrian/bike conflict is one thing, but then we really just don't have the room to put them there. So, we've been designing [INAUDIBLE 00:30:29] and that's the best. And we have the bikes enter the zone. It is shared marking. Basically, the bikes and the buses are meant to be there. Everyone has signs that says watch for the other, and we do a lot of clearing of the parked cars on the approach to make sure the visibility is there. We're doing more and more of that and tweaking the design as it happens, but I don't think we're doing the... We haven't really done the standard [INAUDIBLE 00:31:01] street design guide, like bus separation, because of the pedestrian issue and the space issue.

But we've found it's actually worth... We haven't really seen a lot of conflicts. I think just raising the awareness of both users is helping. We'll see more over time, but we haven't... We're not having that conflict.

Participant 3: And we just got...

Participant 4: I don't think...

Participant 3: Oh...



- Participant 4: Sorry. Go ahead.
- Participant 3: I was just going to say one more point. I don't think we've seen a lot of conflict there, but we've seen a lot of flags raised from our...accessibility to certain groups saying, "We're really nervous about this if you do the bikeway to the right of the busway." And so, while I don't know that I can point to a lot of incidents where there's been crashes, it's been brought up as a big concern.
- Participant 8: Yeah. Just going back to transit and all... When the... Let me know if I'm telling the truth or not, but transit safety is not... Traffic safety is not a big consideration for us in City 4. We've had light rail, I think, since the early '80s. We continue to build new lines. We're building BRT, our first BRT line, or we're planning it right now. And I don't... There is the occasional crash, but I don't think it rises to the level that we're...we have significant concerns about light rail, auto/ped/bike interactions.
- Participant 7: Very, very small percentage.
- Participant 8: Very, very small percentage. Yeah.
- Participant 7: Like, less than 1 percent involves light rail and buses.
- Participant 8: Yeah. It's personal automobiles that are the biggest safety concern. That's where we focus our efforts. And then, just going back to the transit, we're designing a BRT system with stations and a limited-width corridor. And we're going to be separating bikes and peds, bringing bikes up onto a sidewalk environment, getting a little extra right-of-way. We have some existing conditions like that I'd be happy to talk to you about offline and just... We have some examples that have been operating well. I know City 7 has examples as well.
- Participant 7: But [INAUDIBLE 00:33:22] and both this BRT [INAUDIBLE 00:33:24], we've got some exceptional signal engineers in City 4 that... And they do a fabulous job of being able to separate movements in time with the signal phasing. We just lost one of them to the private industry. We're pretty bummed about that. Colleague 1.
- Participant 8: Oh, Colleague 1. Yep.
- Participant 7: Yeah. But he's still working in City 4, so that's been one way that we've managed that and just [INAUDIBLE 00:33:49] really good signal system with signal timing. And the same with BRT when they... Sometimes, like you mentioned, of bringing the bikes to the sidewalk level. But, where they can't in some of the bigger intersections, they're separating with separate bike phase, keeping the bikes to the right and [INAUDIBLE 00:34:08]. So...
- Participant 8: Yeah. The bikes are going behind the stations in every instance, either at street level, in some cases, or at side level when it's more constraint.
- Participant 10: One thing I just wanted to add about the signal-[INAUDIBLE 00:34:23] thing. So, in City 7, we both run the transit and control the traffic. So, in some ways, we're in a good position. One of the challenges we face is that we are pushing very hard on [INAUDIBLE 00:34:32] signal privatization to the point of where we are asking some of these complex signals to skip phases in [INAUDIBLE 00:34:39] both directions. That does create a risk, which we think is probably the causes of some of these left-turn crashes I talked about.
- Participant 4: The phase omission?

- Participant 10: Yeah. Unpredictable or, "Hey, I haven't seen my left-turn arrow. I'm just going to go," behavior by drivers. So, there's a little bit of tension between transit priority and the [INAUDIBLE 00:35:00] separation is kind of [INAUDIBLE 00:35:02] intersection [INAUDIBLE 00:35:04] for us.
- Participant 4: That's interesting.
- Eric Dumbaugh: So, another one that came up, too, that I wanted to explore a little more with y'all is bicycles. What are the problems with bicycles?
- Participant 4: None.
- Participant 9: I would say, at least in State 1, that I would say the biggest problem is the lack of understanding [INAUDIBLE 00:35:31] on both sides of the table. And I've... During my last... Probably during my last two years was when I started getting into the whole issue at DOT...was getting to the whole issue of education. And the fact is, I think, probably surveyed 800 or 900 people during that time in presentations. And over 90 percent of people never looked at the driver's handbook after they get their license, and the average time was 20 years. I lead a 40-mile-group ride on Saturdays. It's a Spandex ride, so to speak. And, even in my bike-rider group, some of these folks have been riding for years. They don't know the bike laws. People just don't know the laws, and laws change. The laws related to bicycling and driving have all been changing over the years, and nothing is really done to reach out and education people by Highway Safety and Motor Vehicle or for the DOT or...
- And, likewise, what was even more stunning was the number of law-enforcement officers in these surveys that have never looked at the handbook since they got their driver's license. So, if they're in the motor-enforcement side, they tend to know things, but they still aren't interpreting the laws properly. So, we created roll call videos through the State 1 Police Chief Association and the Sherriff's Association and distributed those to all the law-enforcement agencies in State 1, basically, to help the law-enforcement officers understand the laws when they did the bike and ped. So, there's a huge issue with education, and I suspect it's similar in other states because law enforcement can't enforce the move-over law, the three-foot move-over law, because they have no way to judge whether or not someone violated three feet. So, we're actually trying to change the legislation through our coalition, safety coalition, to get a full lane change for bicyclists. And I think outside of the low-speed streets, that's really going to be one of the most important things to help.
- We increased our bike lanes from four feet to seven feet in the state at the state DOT, and we also are increasing the use of side paths in the [INAUDIBLE 00:37:47] environments just because there's... People don't want to ride next to cars going 50 miles per hour. So, there are things that can be done, but there's a lot of challenges with education, even if you fix the engineering causes for problems.
- Participant 7: I was just going to say, in City 4, and Participant 8 probably knows more than I do about some of the bicycle issues and safety. But one of the things we noticed when we developed our high-crash [INAUDIBLE 00:38:14] plan about 10 years, and now it's morphed into our vision-zero plan, that is on our four- and five-lane arterials, where speeds are high, and crossings are far apart, we're seeing a lot of wrong-way bike-riding crashes. And so, that's something we're trying to deal with out there. We suspect... We don't know entirely, but we suspect it's because there's not enough opportunities to get across the street easily. So, they drive the wrong way until they find their own gap or get to a signal where they can cross. But that's something that was sort of new to me in the last five years. Like, "Oh, this is interesting." And you have a lot more to add [INAUDIBLE 00:38:53].

Participant 8: Yeah. I think it's... Yeah. With bikes, I think it's two things. There individual behavior, but there's also facility design. So, like Participant 7 says, in some instances where we have wrong-way riding, it's because you're just going a few blocks, and you don't want to cross the arterial twice, especially if it's not an improved crossing. So, I think you do see that.

In the recent years... Actually, for quite a while now, we've been focusing on intersections, creating exclusive phases. So, failing of the infrastructure is where you're kind of putting cyclists in difficult situations – dual turns, asking them to be to the right of a dual-right turn or left of a dual-left turn. And then I think over where there's no facilities, we had a fatality not that long ago where, on a state highway where the bike lane just dropped and, all of sudden, the cyclist was just in a shared lane with probably 85th-percentile speed of 50 miles per hour or greater, and they were hit. So, I think there's the failure of facilities, but then I think it's also some are failures of the behavior of the person biking. So, sometimes, no lights at night. I don't know how much that's a contributing factor to crashes, but I imagine it is. And then just cyclists' disregard for stop signs. Just kind of going right through the intersection.

And then something that's even more subtle, I think, is just cyclists positioning. And one of the first things you... It's just basically knowing how to operate your vehicle well, which is what we expect of every motor-vehicle operator on the road. We expect them to know how to operate their vehicle, and I think the same could be true for people for biking and just not positioning yourself in the wrong spot as you're approaching the intersection because people don't often signal their turns. So, contributing factor to right-hook and left-hook crashes are just...especially right-hook crashes, are just not knowing you're in a blind spot. So, I think there's better education for people biking, but I think probably better design as well.

Eric Dumbaugh: Yeah. Copenhagen, I saw, had studied that and that the bulk of their crashes were trucks turning right and encroaching on the cyclists. So, I guess they do a painting [Phonetic] on the side of the freight vehicle, goods vehicles, that show you where the bicyclist ought to be just [INAUDIBLE 00:41:15] on the side of it. So, "Don't come here because I can't see you."

What about City 6?

Participant 2: I think a lot of what has been said is true. We have a lot of [INAUDIBLE 00:41:28] now on our intersection and facility design at our intersection [INAUDIBLE 00:41:35] design out some crashes to [INAUDIBLE 00:41:37] the running the red [INAUDIBLE 00:41:40]. But there is a lot of bikes. Bicyclist behavior is one major issue and then the other is a lot of enforcement issues that we can't design away – large trucks that aren't allowed to be on the street that are on the street, people running lights, vehicles running lights that aren't supposed to be speeding. So, issues that are sort of out of our control that could be in better control of our police department aren't being addressed. I think most of our crashes this year were really enforcement related versus design related in one way or another.

Participant 3: [INAUDIBLE 00:42:22] change [INAUDIBLE 00:42:24] from recent years with all the investment you all have been doing in design facilities?

Participant 2: I would think so. I would say so. We have... We're putting in 80-plus miles a year of infrastructure. So, the streets are being covered in bike facilities [INAUDIBLE 00:42:44] protected in standard lanes. And we're making a major push for the infrastructure in neighborhoods in the next five years that we've seen high crashes

and high ridership up [INAUDIBLE 00:42:57] infrastructure. So, we know buildings facilities is one sort of...the easiest response to creating a safer riding environment. But then, if it's not tied in with the enforcement side of it, we're [INAUDIBLE 00:43:12]. And there's so many more cyclists out there, too. So, your overall risk might be down, but our fatalities and severe injuries are going up.

Participant 10: So, in addition to educating the cyclists and [INAUDIBLE 00:43:28] vehicles, we've also started educating the large-vehicle drivers in City 7. So, actually, both our taxis, but also every city contractor, [INAUDIBLE 00:43:37] mayor [INAUDIBLE 00:43:37] FedEx and UPS, the Teamsters [INAUDIBLE 00:43:39] annual dump of a training video from us. It's basically meant to sort of supplement their own by saying, "When you come to City 7, you're going to see things on the street you're not used to seeing elsewhere. You'll see cyclists riding in traffic. You'll see people [INAUDIBLE 00:43:55] street. You'll see street patterns of turn prohibitions and [INAUDIBLE 00:43:58]. So, it's basically sort of breaking down [INAUDIBLE 00:44:01] and getting people familiar with what to expect, how to do some basic [INAUDIBLE 00:44:05] spot checking [INAUDIBLE 00:44:07], and sort of have that [INAUDIBLE 00:44:09] so that when they cross the city lines, they're ready for driving. So, it's kind of supplement the education piece by educating the large-vehicle drivers as well.

Eric Dumbaugh: And to follow that up, I never really appreciated the extent of the freight/cyclist problem until I was out... I guess two years ago, Colleague 2 invited me out to deal with safety issues involving a bike path along the waterfront in City 9 where you've got containers.

Participant 2: Oh, you were out [INAUDIBLE 00:44:34]?

Eric Dumbaugh: Yeah. How do you address that? How do you address that intention in a fair way? I, certainly, had my role and that sort of thing, but I don't know what the right solution is or how you balance the tension between trucks and cyclists for facilities.

Participant 2: So, this was a facility that was crossing several large driveways and access points like Home Depot, our sanitation yard, a couple other things. So, our sort of head engineers, people in the division at the time, they didn't think we had a safe solution to get this cyclists across that huge driveway entrances and entryways for visibility of the two users, basically. So, I think in the end, the solutions were multi-layered. We've had signs and markings, new signals, changes to the driveways, driveways themselves where people entered and exited. If it was sanitation, we could work with them to educate their drivers about exiting and entering this space. So, it wasn't just one thing. It's definitely... And then we're... It took multiple layers of things to sort of make everyone feel comfortable in the space and make it safe. And then a lot of that now, we're applying to all of these cases on our greenways and our waterfronts where we have these older, sort of big [INAUDIBLE 00:46:01] entering onto the city streets. It definitely was several different things coming together to make it work.

Eric Dumbaugh: And what about for the rest? Is there work you guys are doing with freight, with delivery, with goods movement in urban areas to address the safety effects of those vehicles?

Participant 9: We don't have a big issue with the freight in the downtown. Most of our deliveries happen outside of the peak and outside of the community time. So, that's not been a big issue in Downtown City 5.

Participant 4: Yeah. It's more of an issue on the freeway system.

Participant 8: In City 4, it seems like the... We have a bike-advisor committee and a freight-advisor committee to the city, and they're kind of natural enemies.

Eric Dumbaugh: Yeah.

Participant 8: But the one thing that they both agree on is the provision of protected bikeways. They both like that quite a bit. And then, in terms of driveways, we're building a two-way protected bikeway across a freight facility that I think... I can't remember how many container trucks it's seeing a day, but quite a bit. And it hasn't opened yet. Visibility is good. The train speeds are low for large vehicles. We're marking it. We're signing it. We're having the cyclists stop and designing it so that the bike path has to stop as it approaches the driveway from both directions. We'll have prominent marking, so we'll see how that works.

In other cases, we also have a facility, an off-street pathway, that's crossing many active freight driveways. And we had probably more room to work with than City 6 has, and we set the pathway back quite a bit so that any freight driver will be squared up by the time they're crossing the path that people biking and walking are taking. So, just trying to increase visibility. We haven't had any problems out there on Street 1 all the way to [INAUDIBLE 00:48:09].

Participant 7: And then there's a movement to add side panels to our truck fleets. Just saw something right before I came here that that's going to start happening on some of ours so that, if a bike does hit the side of our truck, they don't go underneath.

Participant 2: So, like what they put on the front of the railroads?

Participant 8: Similar. Cow catcher.

Eric Dumbaugh: Cow catcher. Yeah.

Participant 8: Similar idea.

Participant 2: Between the tires [INAUDIBLE 00:48:32].

Participant 8: Yeah. On the side.

Participant 2: We have that on all of our city fleets and then I think we're trying to pass the law that any...or make a rule change that anyone doing business in the city also has to have them because it's a really significant [INAUDIBLE 00:48:47] benefit.

Participant 7: Yeah. I do want to point out that, in City 4 I think, truck crashes, like heavy-truck crashes, are less than 3 percent of our total crashes. So, it's not a huge number, but I think, when you look at those crashes, 19 percent result in fatal or serious injuries. So, even though the number's small, those crashes are serious.

Eric Dumbaugh: And I found out that, often doesn't come up in these discussions, but multiple-vehicle crashes. What is...

Participant 7: That's mostly what we have in City 4.

Eric Dumbaugh: Yeah. So, is there a specific sense of what those problems are? Obviously, intersections, but... And things you might be doing to address them that might be innovative or unique? The bike stuff and the ped stuff gets a lot of attention. But, if we're going to make a big difference, that's another area that warrants some consideration. So, it's curious...to what extent you guys might've been developing policies to mitigate these.

Participant 9: Most of them are on the interstate because of tailgating. We don't have much on our system. No big issues.

Participant 4: And we've got issues with red-light-running crashes just like everybody does. Actually, we have more of a problem with red-light running than we do the crashes.

You get the occasional one-offs here and there, but they're not at any particular intersection. We haven't got an intersection where we get a bunch of them happening and that they're just poor driver behavior, that the red-light-running crash we actually have is more of an efficiency issue than a safety issue because they're all right there at that change interval. Everybody sits here now, and they go, "Okay. How many cars are going to run the red light now that I've got the green?" And everybody waits. And we're not really...have crashes there, but it slows the intersection efficiency.

But now that they're just so distributed. And, to a certain extent, what ends up happening is that we know why some of them happen...is so many of them... So many of the multi-vehicle crashes we get are rear-end crashes and chain reactions and everything. And somebody decided to stop when somebody else didn't think they should have and not a whole lot you can do about that and that... We've all seen the stuff that says, "Well, gee. If you just add another second to the yellow, you'd eliminate all of these." Yeah. That's what the all red was going to do, right? Yeah. They'll adapt to it eventually. It's one of those things where it makes up a significant number of crashes, but not a whole lot you can do.

Probably the biggest issue with those, again, as far as severity, is, "Hey. I better speed." And when you get out on the freeway, that's where we have the most serious ones.

Participant 7:

Yeah. So, we're looking through vision-zero just at the fatal and injurious crashes, and what we're seeing is the turning and angle crashes are, obviously, the most serious ones. And we're... I think we're split about 50/50 between signalized intersections and other intersections or driveways. And we have a current project right now on one our five-lane arterials where we were experiencing a very high number of crashes out there, a high number of pedestrian crashes, and we started really looking like, "What's going on out there?" It's all turning and angle crashes. So, we're starting to delve into access management, which we really haven't done that much of in City 4. So, that's where we're going with that.

But also, interestingly, I took a look back at some of our lane-reduction projects where we went from five lanes to three lanes. And we weren't sure what we were going to see because the center-turn lane was already there, and what does that really mean? But what saw is that crashes didn't change much, the fatal and injury rate changed a lot because rear-end crash actually increased, but they weren't very severe. And the fatal and Injury 8 crashes decreased by, like, 35 percent. Part of that was speed related. Speeds went down on all three of the projects that we looked at. So, those are the types of things that we're starting to understand a little bit better. Before, we used to look at crashes only. And, by focusing on the fatal and injurious, we're really trying to...beginning to understand better what the issues are or, maybe, what the treatments are.

Participant 10:

When we look at vehicle crashes, there's an interesting trend where, in City 7, we've got 30 traffic fatalities in [INAUDIBLE 00:53:20]. 1990, we got 70. But almost the entire drop is either drivers or people [INAUDIBLE 00:53:27] vehicle. So, we are losing as many pedestrians now as we were when we had fewer residents in the city, but... And some of that's probably attributable to the cars being safer, but the tools that we had before, maybe this generation of vision-zero, Complete Streets, the traditional [INAUDIBLE 00:53:43] tools, like left-turn pockets, turn prohibitions, left-turn arrows, left turns and right turns off of two-way streets being the most common cause factor, we've been pretty systematic with getting those risks out of the system [INAUDIBLE 00:53:56] generation. And so, we were [INAUDIBLE 00:53:58]. I think that those tools are still very useful and an improvement. And so, we're at this point

where, now, pedestrians and cyclists both [INAUDIBLE 00:54:07] disproportional high number of our fatalities, mainly, because I think it's... And sometimes, I think the trapping and sharing tools, which were built for vehicle-vehicle crashes, work if you use them probably. I think the tools are there [INAUDIBLE 00:54:20].

Eric Dumbaugh: All right. And then to shift up just a little bit, one other thing I wanted to ask was, in your view, what are the biggest challenges you face in reducing traffic-related death and injury?

Participant 9: I think outside of the urban core, I think... At least in the urban core, we have the potential to do [INAUDIBLE 00:54:40] and two-way conversions from one-way streets to get the speeds down because I think the speed, as we've... Everybody has said the speed is a big issue. The big challenge is what do you once you get outside of an urban core where the land-development patterns are suburban, and everything's set back off from the roadway? And you may have a 35-mile-an-hour-posted speed limit on a four-lane divided road, people've got to drive 50 and 60.

The only thing we had any potential for doing, I think, at DOT was introducing more modern [INAUDIBLE 00:55:16] on the state system, which there's been a big push for. And then, in some locations, at least with the high-pedestrian crashes, we were even looking at putting in race crosswalks on multi-lane roadways, like Highway 1. I was working with the city there to look at doing that to get the speeds down on approaches so that people would slow down. It's in a very high-tourist area, and there's a lot of pedestrians wanting to get to the downtown across Highway 1. And there was no room for a pedestrian bridge, and the signal spacings were already very close. But there's where people are going to cross, so we were looking at putting in a race crosswalk at that location as a pilot. But it's still very general [INAUDIBLE 00:56:01], for the most part, in suburban environments.

Eric Dumbaugh: Yeah.

Participant 5: I'd say education and... So, City 3, we're a small city...urban, most built out. And, as we are introducing more design for pedestrian and for bicyclers, there is a lot of confusion on how to use the infrastructure.

For example, we just recently installed a mountable-truck apron at one of our intersections. You would think some of these designs are intuitive, and people understand how to use it, but it ended up creating a lot more confusion that it intended to solve. And there's a lot of pushback when we unfinished the project into its entirety. There was a lot of pushback from the community because no one understands how to use it. The intent was the larger trucks was use a mountable side, and the small trucks, smaller vehicles, but that was lost. So, we did put up some temporary signage saying, "This is how you use it." But I think we are lost on how far our education can go. Small projects, we have very small budgets. So, how do we reach the multitude of people we're supposed to reach? So, that's our biggest challenge. My biggest challenge right now is I don't want to pull any projects.

Eric Dumbaugh: So, I'll throw this up for discussion because I grew up right by City 3, and I know it intimately. So, one of the biggest problems that I see... I'll do this to sort of see what I can get a response from you on...is the city seems to have the right idea with the roads it has control over. But the roads that have the most problems, it has no control over.

Participant 5: True.

Participant 9: Are those County 2 or the state or both?

Participant 5: County 2.

Eric Dumbaugh: So...

Participant 5: Some of the times, more often than not, we work with our agency, the different agencies. We come to a point. Not all projects make it to construction. But, the ones that get to that point, for it to be used the way it was intended to be used, it's like you just through hoops and then you still don't get the desired effect.

Eric Dumbaugh: Are... And I'll just tossed this out for the rest of y'all... Are organizational issues like that...

Participant 9: Oh, yeah.

Eric Dumbaugh: ...part of the big problem?

Participant 9: Yeah. We have county roads within the city limits. And we've got a corner [Phonetic] that we'd like to [INAUDIBLE 00:58:42], and the county's been hell-bent against it. And we have a high crash. We have high crashes on that where there's been a change in the commissioner, and we have, hopefully, a new mayor coming on board in about less than a year. So, hopefully, we'll get past that, but it's been held up for... It's been talked about for over 10 years.

Participant 2: We want to do more [INAUDIBLE 00:59:05] because we know that's a proven treatment in the city, and we can't because it's, you were saying earlier, jurisdictional issues. The state controls our ability to add some [INAUDIBLE 00:59:16], and they will not give us the... They will not allow us to add the amount that we think is necessary to control the issue.

Participant 9: [INAUDIBLE 00:59:25].

Participant 4: And so, KR Citizens came up with a charter and [INAUDIBLE 00:59:27] and that it passed that the City 2 cannot do [INAUDIBLE 00:59:32] enforcement.

Participant 9: We're fighting legislature every year to keep our red-light camera program in State 1.

Participant 8: Yeah. That's an issue in City 4 as well. State DOT's roads are fastest and have a lot of crashes, but City 4 has plenty of roadways that are approximately 76 feet curb to curb, five lanes, unused parking, bike lanes, wide open, straight, flat. And as Participant 7 mentioned, we're beginning to delve into access management and put up some kind of a concrete median. I think the challenge is how do you take a road like that and, even though we have the authority to bring the speeds down to probably 35 on a road like that...

Participant 7: 30. [INAUDIBLE 01:00:25] at 30. [INAUDIBLE 01:00:26]

Participant 8: 30 even. How do you... What people respond to is what they see. And what it looks like is it looks like a landing runway, and so, people just go fast. So, coming up with the dollars that would allow us to put in the protected bike lanes on the side of the roadway that would narrow it on that side, put in access management in the middle, and plant trees on it to create that visual narrowing, so that the roadway looks like it's 30 miles per hour roadway as opposed to 60 miles per hour roadway. I think coming up with the resources to do that is very difficult. The political support to do that... Or not the political support, the community support to do that is very difficult. And we're also operating in an environment right now, even as a Vision Zero city, where enforcement is not really a big part of the conversation, because of concerns about equity issues.

Participant 7: That's changing for sure.



- Participant 8: Yeah, and that'll change over time.
- Participant 7: That's increasing monthly, it seems like. It's getting better and better coordination with our enforcement. Yeah, the thing with the public, "Do something immediately. Too many people are dying."
- Participant 8: But not that.
- [Laughter]
- Participant 4: Here's the solution. "We don't like that solution."
- Participant 7: Here's the problem. "Oh, actually, yeah, maybe it's okay. It's fine the way it is." So, that's been an issue.
- Participant 4: [INAUDIBLE 01:01:48] the same thing.
- Participant 7: And the funding to implement but also, what we keep running up against is the funding to maintain. "Don't put trees. Those are too hard to maintain." It's just a cost that we... "And don't put in more signals." I mean, they're not really saying, "Don't put in more signals," they're saying, "If you add signals every three blocks or hybrid signals to facilitate pedestrian crossings, how will we maintain that in the future? You're going to triple or quadruple our assets."
- Participant 9: Operation budget.
- Participant 7: And so, those are the types of conversations we're having now. And nobody is really saying, "Don't do it," but at the same time they're saying, "No, we don't know how we're gonna sustain the system, maintain the system." Those kinds of things.
- Participant 8: Well, we have funding for one road, and we've got many more [INAUDIBLE 01:02:28]
- Participant 7: Yeah, we have partial funding here and there for lots of different things on lots of different roads, but those are the kinds of things that I keep hearing repeatedly. And then, the biggest challenge is just moving from auto-centric to PED. In City 4, PEDS, it's designed when car was king, and now, we're saying PEDS first. And so, to all the sudden say, "Cars, you can't have unlimited access like you've had. We're pushing you to the quarter mile spacing that our PEDS are now facing to have a signalized crossing." And that's been hard for the public to swallow and the businesses to swallow. And again, financially, it's just hard to make that turnover, even though we know that's what needs to happen.
- Participant 10: [01:03:12] So, some of those issues play out in our relationship with our state DOT [INAUDIBLE 01:03:14] we also have a couple of major roads that are owned by our state DOT. So, they have come a long way in terms of their openness to designs. I think they're almost... They have adopted [INAUDIBLE 01:03:26] guidelines in a lot of ways. And maintenance cost is huge for them. Their capital program is really... They don't have... The locals have more capital funds than they do. And so, we're at this point where we're actually pouring our own sales tax and bond money into rebuilding [INAUDIBLE 01:03:45], because we can't wait for them to get around. They're 12 years off their maintenance cycle. So, they might repave this street in 2027. People are dying now. Even when you deal with those initial jurisdiction and design issues, there's all these practical things from [INAUDIBLE 01:04:02] to lining up the [INAUDIBLE 01:04:04] to figuring out how much more maintenance burden can be [INAUDIBLE 01:04:10] out to them that makes the actual delivery of the products pretty complicated.

Participant 4:

Another thing that we've got to look at as far as these fatalities is cultural. [INAUDIBLE 01:04:20] in County 3, State 2 again, continues to lead to country in DWI fatalities for year after year after... I mean, for at least the last 10 years. That's not something you want to be number one at, but we're consistently number one, so we've got to change the culture there. That overall, we got a culture of traffic laws are kind of a suggestion, not really something you're supposed to obey. Within our police department we've got to have a cultural change. I'm trying to get them to understand that we're killing more people in the streets than we are with homicides. Chances are you're not going to prevent a homicide, but if you actually go out and actively, aggressively enforce the traffic laws of State 2, then hey, we may prevent a few. And so, those cultural changes are things that we go through. But part of that difficulty — particularly with the police department — is cops want to be good guys, and most of the interaction that we have with police on our day-to-day basis — unless you're in our profession — is when you get pulled over. Now, you're in a bad mood, and he's going to write you a ticket, and all this kind of stuff, and it's a negative impression that gets left behind. So, the cops, they don't want to write the tickets, and they don't want to do that.

But it's important, and we've got to find a way to get the basic street cop to understand he needs to be doing this. That he's saving lives when he does it. And then, we got to get the public to understand, "Hey, speed limits really are there for a reason." We've got one where a reporter is doing an expose on the thousands of dollars that people have been wasted by speed limit signs that aren't right. No, the speed limit signs are right. That's just that, hey, there are only like 3,000 speed zones in City 2. We screwed up 15. And so, the older speed limits are still on the books [INAUDIBLE 01:06:17] we've lowered them. And every single case the speed limit is lower. It's not higher. I'd be worried if we were going the other way. But he's doing this expose on how we need to raise these speed limits back up to match the ordinance. And we've been trying to tell him, "No, thank you for bringing this to our attention. We will go back and mend the ordinance to the lower speeds that we're showing out there." And as I keep on telling him, "If they actually done the speed that was on the sign, they never would've gotten stopped to get the ticket to start with."

Eric Dumbaugh:

And then, one last thing and we'll get you guys out of here quickly. So, we've got the opportunity to do just about anything that we want to do with [INAUDIBLE 01:06:56]. So, my question for you guys, what sort of information would be most helpful? If we could focus our efforts somewhere, what sort of guidance would you like to see? What would allow us to provide you with information that would help you advance safety? [INAUDIBLE 01:07:18] something like, "I wish I knew about X."

Participant 4:

I think that most DOTs are made up of engineers and planners, and we know how to do that. And we always talk about the 3 or 5 or 85 Es involved in safety. And if you go back to the original 3, there's enforcement, there's education, and there's engineering. We got the engineering part down. Supposedly, the cops got the enforcement part down. Where I think we don't do a good job and that we don't have good resources is on the education side. It's like I said, those cultural changes that we need to get, both from the police department and in the public. We struggle with, or at least I struggle with how to go about making that happen. I know how to time Q jumps into signals to prevent left turns from going in front of my light rail vehicles. I know how to do other things, but when it comes to getting the message across, "Hey, if you just slowed down and do the speed limit, we'd stop killing people." I don't know how to do that.

Participant 10:

So, there's almost this natural experiment going on right now actually where cities like... Our education campaigns, which we just blatantly stole from our colleagues in City 6, where this Vision Zero mindset which was meant to be a little more hard-

hitting, personal. The Vision Zero message being about saving lives versus the traditional stuff we've all seen around, click it or ticket, or DUI. I think a lot of the Vision Zero cities believe that the more hard-hitting stuff is more impactful, because we're all numb to the click it or ticket stuff by now, but I personally would love to see some proof as to what messages actually get through to drivers and cause them to speed less. And if we're wrong, we're wrong. We'll go back to the other way. We just don't really know.

- Group: Yeah.
- Participant 8: Yeah, I think that's a good point. I think back about to Mothers Against Drunk Driving, and that was a campaign that was waged for years that did change the culture, because I remember driving quite drunk when in high school, and 14 years later, my younger brother, by the time he was in high school, always a designated driver. And so, over that time period, the national conversation and understanding of drunk driving really changed, I think.
- Participant 4: Apparently, it didn't make it to City 2.
- Participant 8: Yeah, there's still people doing stuff. But I think we have a pretty good handle on the engineering, what encourages lower speeds.
- Participant 7: We do but... I think we're just now understanding, at least in City 4, that... How am I trying to say this here? A lot of times we say, "Well, they were speeding. That's not an engineering problem." Or, "They were drunk, and that wasn't an engineering problem." And we need to get to a place where people are going to make mistakes. Violations are going to occur, and so, how can we soften the roadside or how can we make the impact of those mistakes and violations less severe. And I don't know if we're there yet in City 4.
- Participant 8: Well, I was saying that I think we know the engineering, in that we know narrower travel lanes, other elements that can visually narrow the roadway, both in the median and on the sides of the road, I think we know that those kinds of things, more visual busyness along the sides of roadways. Yeah, I don't think we can expect a 76-foot wide landing strip, runway to encourage slow speeds, but we know how to... I think we know generally how to convert that.
- Participant 7: Maybe we have the tools but I feel like we need a mental shift in quit victim blaming or quit...
- Participant 4: How to sell a road diet?
- Participant 7: Yeah. Oh, we know how to do that in City 4.
- Participant 4: Can you send an instruction book?
- Participant 7: It's more like, "Oh, we don't have to deal with that crash because they were drunk."
- Participant 8: Talk to Participant 7.
- Participant 7: We still hear that from our engineers and from the DOT engineers like, "Well, that was a drunk driving crash, so we don't really have to do anything." But if the roadway was softer, maybe it wouldn't have turned out into a fatal or an injury. So, I feel like maybe that's the engineering piece that we need to focus on as, "Yeah, there's still things you can do, even though the person was drunk and maybe the cause wasn't an engineering problem," like the curb in the roadway or the lack of lighting or whatever. That's sort of where my mind is going these days. Because so many of the crashes, 91%, are driver error.

Participant 8: It'll be interesting to look at cars too, because of risk-taking behavior. People are comfortable with a certain level of risk, so as the cars become safer, people increase their risk. I'm glad you're not going to share information on who said what because I've often kind of joked that probably the way to dramatically reduce fatalities and serious injuries on the road would be to install a metal spike in the center of each steering column that pointed right at the driver. And that would probably bring speeds way down. It would probably bring attention levels way up. Nobody is going to be driving distracted. And yeah, some people would probably die, but overall, the risk of crashes would probably be greatly diminished if you knew that if you got into a crash, you were going to be severely hurt. So, I think maybe looking at the role of the vehicle itself in contributing towards unsafe behavior would be interesting.

Participant 4: And the other interesting thing based on what you were saying is you think about where our roads ended up, we ended up with the wide lanes and all this kind of stuff is we were trying to make the roads safer. And now, we're going backwards again. Put a few Corvairs out there.

[Laughter]

Participant 7: No airbags, no seatbelts.

Eric Dumbaugh: Thank you guys for taking the time today. I've kept you a few minutes over. I'm sorry about that. This has been very helpful.

Participant 8: Good. Thank you.

Participant 9: Thanks.

Participant 7: Thank you.

Participant 10: Are you going to follow up with us and [INAUDIBLE 01:13:41] sort of direction you want go [INAUDIBLE 01:13:43]

[Crosstalk]

Eric Dumbaugh: Yeah, [INAUDIBLE 01:13:44]. When I get the transcription done. [INAUDIBLE 01:13:47] if you guys want to change anything, if we got something wrong, you can correct that. And then, feedback too. There's going to be a survey that follows up. That doesn't go to just you guys but nationally to the 150 biggest cities. That's going to be more of the state of the practice on integrating the safe systems concept and the practice which gets pretty much at what you were suggesting earlier. And then hopefully, this will help us produce something that you guys might actually want to read. We love our journal articles, we academics, but sometimes you want to make a difference, so that's what we're hoping to do.

Participant 7: Great, thanks.

Eric Dumbaugh: All right, thank you guys very much



730 Martin Luther King Jr. Blvd.  
Suite 300  
Chapel Hill, NC 27599-3430  
[info@roadsafety.unc.edu](mailto:info@roadsafety.unc.edu)

**[www.roadsafety.unc.edu](http://www.roadsafety.unc.edu)**