Collaborative Sciences Center for
ROAD SAFETY

Guide to Developing a Vision Zero Plan

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Introduction

The United States' crash death rate is more than twice the average of many other high-income countries (1). Pedestrians and bicyclists are especially vulnerable in road traffic crashes and, as a group in the United States, have experienced significant increases in traffic-related deaths in the past few years (2, 3) (**Figure 1**).

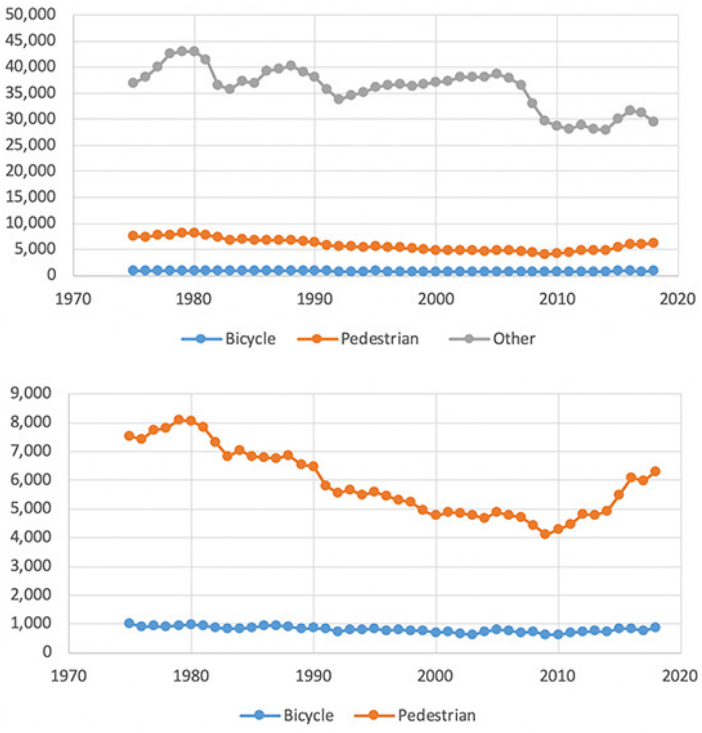

Figure 1. *Pedestrian, bicyclist, and all other motor vehicle crash deaths from 1975 to 2018.*

In response to this growing public health crisis, many communities are adopting ambitious safety goals and developing plans and programs to help them more effectively address roadway fatalities and serious injuries. Some communities are coalescing this work around Vision Zero.

In the United States, New York City was the first city to approve a Vision Zero Plan in 2014. Other early cities in the movement included Fort Lauderdale, San Francisco, San Jose, Seattle, and Washington D.C. Vision Zero continues to spread, with high awareness of Vision Zero among safety professionals (4).

A Vision Zero Plan provides direction specifically around the vision to eliminate all traffic-related deaths and severe injuries in the community. Communities that join this movement typically acknowledge that everyone has the right to move safely in their communities, that loss of life is not an acceptable consequence of mobility, and that the only acceptable goal is to eliminate traffic-related deaths and severe injuries, while increasing safe, healthy, and equitable mobility for all.

> The Vision Zero Network offers information about Vision Zero, including a resource library, case studies, and a US map of some participating cities.

To make progress toward ambitious Vision Zero goals, communities should underpin their approach with Safe Systems. Safe Systems is a set of principles based on a large body of research from fields of behavioral science and economics, public health, traffic psychology, and organizational systems safety. When applied to Vision Zero, the Safe Systems approach focuses roadway safety efforts on ways to effectively:

1. Design for the humans in the system;
2. Recognize the importance of speed and energy transfer in safety;
3. Employ proactive tools to manage risks across an entire roadway network or population; and
4. Foster integrated, collaborative, and coordinated action.

> More information about Safe Systems can be found on page 13 of this Guide.

These concepts, and how they appear in practice and in Vision Zero plans, are complex and may require some "unpacking" into smaller, manageable parts. Nonetheless, Safe Systems concepts are foundational to traffic safety and injury prevention. For a more thorough explanation of these principles, refer to Section 3 of this Guide.

Purpose of this Guide

The purpose of this Guide is to assist communities in developing a Vision Zero Plan. The Guide describes the major steps involved in developing a plan, with an emphasis on best practices. It is also useful for communities looking to update an existing Vision Zero Plan. When updating the plan, this Guide can serve to provide insight into components that could be improved or may not have been included in earlier plans.

There are many benefits to developing a thorough Vision Zero Plan.

1. The process of creating a plan brings the community together towards a common agenda, ideally to create a strong vision, framework, goals, and actions to achieve Vision Zero. This collaboration can promote more effective coordination across departments, organizations, and stakeholders.
2. Included in a plan are activities that support a safer system, such as changes to the built environment (e.g., installing bicycle lanes), policy changes (e.g., institutionalizing Complete Streets, working across city departments), planning changes (e.g., aligning local plans with new priorities), and programming (i.e., safe routes to school funding).
3. Having a plan that includes measures of progress and methods for evaluation promotes accountability, outlining who will be responsible to carry out an action and by when. A collaborative plan can promote better coordination across departments, organizations, and stakeholders.
4. Plans can be used to document conditions, challenges, and opportunities, serving as important points of reference when other community plans are developed or updated. Overlapping goals with other community plans can be identified and better supported.
5. Having a written plan can accelerate learning around best practices, as it documents community activities and can provide an example to others.

Audience

This Guide is for anyone who might contribute to a Vision Zero Plan. A variety of stakeholders work toward creating plans, including community members, advocates, and community officials, such as mayors and council members, and personnel from departments of Public Works, Emergency Services, Law Enforcement, Transportation, Planning, Chamber of Commerce, Schools, and Public Health. It is vital to receive input from the community, making a concerted effort to reach those who are underrepresented. More detail on this process can be found in Section 1 of this Guide.

Since Vision Zero Plan stakeholders come from disparate fields, they often do not use the same terminology to discuss safety or may be new to certain terms or acronyms. Appendix A provides a glossary that may be useful in helping different readers of this document developed a shared "language."

Guide Organization

Foundational elements that contribute to a robust Vision Zero Plan usually include the following:

1. **Public participation**, which includes stakeholder involvement in development of the plan, and routine activities supporting community engagement. This is covered in Section 1: Involving the Community.
2. **Analysis of current conditions and trends**, which includes considering safety concerns, available data and other resources, the broader context that affects safety, and relevance to issues identified in other existing plans or initiatives. This is covered in Section 2: Analyzing Current Conditions and Opportunities for Change.
3. **Development of plan vision, goals, and objectives** and connecting these to actions, responsible parties, time frames to complete the actions, and performance measures to track progress toward achieving objectives and goals. This is covered in Section 3: Developing Evidence-based Metrics and Planning Action.
4. **A way to measure implementation of plan action items**, which includes outcome indicators. This is covered in Section 4: Evaluating Implementation Progress.

The four sections of this Guide are organized to provide further detail on these four major components of a Vision Zero Plan. This Guide also includes a Resource section for more information and four appendices:

Appendix A: a glossary of key terms;
Appendix B: a checklist for Vision Zero plan development;
Appendix C: examples of local, regional, and state plans to review when developing a Vision Zero plan; and
Appendix D: a brief history of traffic safety paradigms in the United States.

Section 1: Involving the Community

The most effective Vision Zero plans secure cross-sectoral collaboration and community engagement and buy-in. Robust Vision Zero planning efforts harness the collective knowledge of the community and align plans and actions with the unique needs and interests of the community. Further, they understand that planning is an iterative, collaborative process, one that does not end once the plan has been completed or adopted.

There are many ways to foster integrated, collaborative engagement in Vision Zero Plan development. Perhaps the most powerful approaches involve: (1) identifying and engaging leaders; (2) building a foundation for inclusive communication, coordination, and partnership; and (3) planning for the longevity of Vision Zero programming.

Identify and Engage Leaders

Stakeholders are individuals who have a vested interest in a particular policy, program, or project—in this case, roadway safety. Input gathered from stakeholders regarding the public's safety-oriented problems, needs, and opportunities helps shape the policies, practices, and procedures included in the Plan.

Vision Zero planning presents an opportunity to build a team of leaders, most often comprising city staff and policymakers, as well as community representatives. Leaders can serve as a primary audience to review planned actions, advocate for adoption and implementation of the Vision Zero Plan, connect professional staff with the broader community, and provide resources for longer term program sustainability.

Equitable and effective community engagement ensures representation of those most impacted by transportation system legacy issues. Thus, planning leaders should prioritize input from traditionally underrepresented communities, making sure their voices help guide Vision Zero Plan development and updating processes. One promising involvement method is to identify and engage "community liaisons." These are trusted leaders living within the community who can assist in involving their friends and neighbors in Vision Zero planning and programming.

The strategies for engaging stakeholders will vary based on a community's assets and resources. Local residents are often the best judge of what stakeholder engagement strategies work in their community. Engagement of diverse Vision Zero stakeholders often requires providing supportive services such as childcare, hosting community forums in places well served by transit, language translation services, and consistently updated platforms (e.g., public-facing websites, community surveys, social media posts).

Build a Foundation for Effective Communication, Coordination, and Partnership

Equitable, effective Vision Zero plans require commitment from a core coalition or task force who meets regularly, makes key decisions about Vision Zero plan development and implementation, and maintains close coordination. This coalition or task force should have substantive representation from a variety of community sectors, including public health, law enforcement, planning, schools, healthcare, industry, mode-specific advocacy organizations, developers, and community members, among others.

One agency within the coalition should take lead responsibility for coordination of the coalition. The lead agency should have a list of key contacts within each partnering organization and establish procedures for regular meetings and updates. To ensure integration of the Vision Zero Plan into diverse agencies' practices and procedures, plan coalition should work toward:

- Creating a foundation of respect, trust, and inclusion.
  - Talk about why language matters (resources on inclusive use of language from other disciplines include (5,6)).

  - Define roles and governance structure (e.g., Who will schedule meetings? Who will lead development of different plan chapters? Who will lead and support monitoring of plan action item implementation?).

- Creating a safe space to acknowledge and work through intergroup differences, tensions, and competing priorities.
- Maintaining meeting schedules and timing to sustain momentum in developing and implementing the plan.

Either the lead agency of the coalition team or a partner agency should take responsibility for coordinating communication with the larger body of stakeholders and the public. Broader stakeholder engagement tasks can include:

- Developing consistency in the timing of broader stakeholder communications about Vision Zero planning progress.
- Proactively creating an online presence, including posting the plan drafts and relevant updates on websites and social media platforms.
- Providing creative outlets for stakeholder input at key points throughout the planning process, ones that welcome contributions from groups with limited English proficiency, children, low-literacy, and residents with disabilities, etc.

Plan for Longevity

Plans are effective to the extent that their thoughtful, proposed actions are implemented. Bringing partners together from across different sectors can improve the Vision Zero program's ability to address traffic injury problems from multiple angles. It can also increase awareness of resources and opportunities, reduce potential duplication of efforts, and unite communication strategies and activities. Moreover, partners can be powerful advocates for new Vision Zero-related policies and funding, which help ensure long-term program sustainability.

> Appendix B provides a checklist for Vision Zero Plan development on community engagement.

Nonetheless, it is imperative that Vision Zero programs remain transparent and inclusive. Too often communities and stakeholders report feeling engaged during Vision Zero Plan development yet forgotten upon plan implementation. Plan to continue the conversation after plan adoption and provide stakeholders with updates on progress and any changes made to the Vision Zero program's goals or objectives.

Examples of Community Engagement in Plan Development

Los Angeles, California
A fundamental value of Los Angeles's Vision Zero Plan (7) is to "maintain two-way communication at all stages: planning, design, implementation, and evaluation." The city developed a Vision Zero Education and Outreach Strategy, a community engagement approach that can be tailored to match the culture and context of neighborhoods within each project area. As part of this strategy, the City of Los Angeles committed to conducting 200 hours of door-to-door engagement with at least 5,000 people along ten miles of Vision Zero corridors. They planned to reach at least 1 million Los Angeles community members through social and traditional media.

Jersey City, New Jersey
Jersey City's Vision Zero planning (8) process included three rounds of public meetings and outreach events at key times to introduce the concept of Vision Zero to the community. Using online surveys, in-person meetings, information tables at public events, pop-up surveys near transit stops, and engagement materials in commonly spoken languages, the city's Vision Zero task force was able to engage traditionally underrepresented members of the community. Meeting materials, presentations, and surveys were posted to a project website to allow access for those unable to attend community meetings in person. In all, the city reached more than 5,400 individuals through community outreach and engagement. A draft Vision Zero Plan was shared with the community through an informal, open-house style meeting format to allow the community to review the materials as well as ask questions and receive answers. Common themes reported through community feedback were described in the Plan and built upon to develop community-driven goals and objectives.

> More plan examples can be found at the library of US Vision Zero Plans.

Section 2: Analyzing Current Conditions and Opportunities for Change

During Vision Zero Plan development, it is important to have a solid foundation of shared knowledge related to existing conditions, historical trends and future projections, and to take stock of community resources that can support plan development, implementation, and long-term viability. One way to approach this is to engage stakeholders to think about the "system" or context in which the Vision Zero activities will unfold, using an adapted framework called the six R's of systems (9). The six R's will be expanded upon next.

1. Record of the past
2. Roles
3. Relationships
4. Resources
5. Results we want to achieve
6. Rules and reward systems

(1) Record of the Past

Prior evidence of safety concerns, whether qualitative or quantitative help stakeholders develop a shared understanding of the nature of the problem, its magnitude, and offer insights into safety priorities and needs. Quantitative data should be used to tell a compelling story about the people and the neighborhoods most affected by traffic in the community. Many types of quantitative data can be mapped and used to detect spatial patterns in crashes and identify affected populations. In addition to who is impacted by serious and fatal crashes, it is critical to understand the factors that may have contributed to these collisions, as well as when and where these crashes have tended to occur. Four of these factors are described next and summarized in **Table 2.1**.

Location-based factors describe fatal and serious crash outcomes in relation to roadway characteristics, presence and quality of street lighting, nearby land uses, and the location of these crashes along corridors on the roadway network (often depicted in "high injury network" maps; **Figure 2.1**).

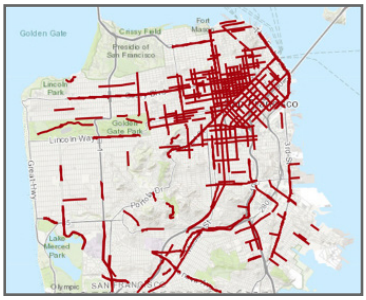

Figure 2.1. *San Francisco's Vision Zero High Injury Network: 2017. The high injury network is outlined in RED.*

Event-based factors are "crash-contributing factors" such as crash types (road user movements that may have anticipated the crash) and the travel modes victims were using at the time of the crash (**Figure 2.2**). Crash event factors also describe potential contributions of specific road user behaviors, including alcohol or drug use, distraction, or some other form of road user "impairment"; the speed of impact upon each collision; as well as crash-derived health outcomes, often drawn from the community's emergency departments, trauma centers, hospitals, and EMS (e.g., injury types).

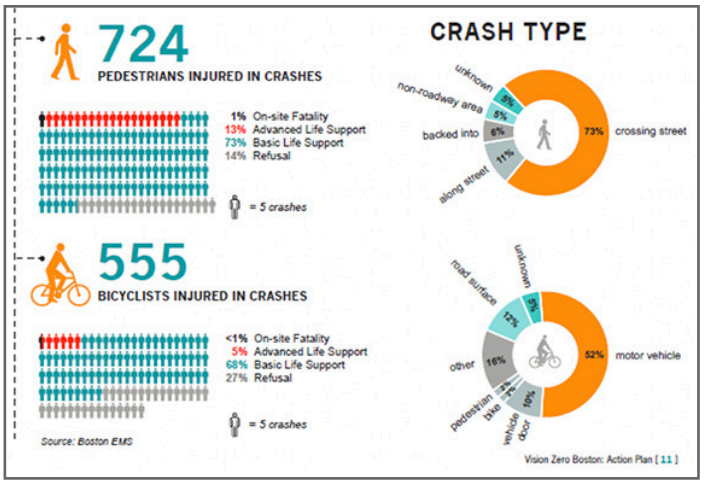

Figure 2.2. *Bicyclist and pedestrian crash types; Boston, MA*

Time-based factors describe the (a) times of year and (b) day of week, and (c) time of day fatal and serious injury crashes have occurred (**Figure 2.3**).

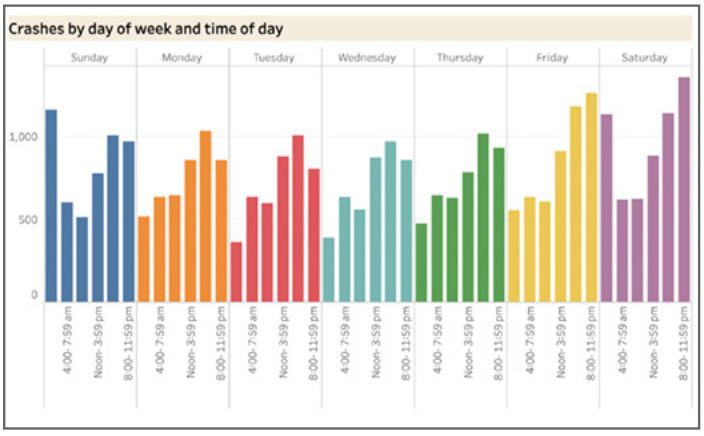

Figure 2.3. *Traffic collisions by time of daycollisions by time of day; Sacramento, CA*

Table 2.1. Crash factor classes and associated data to collect

Factor class	Example variables to collect (and potentially map)
Location-based factors	• fatal and serious crashes • roadway characteristics (e.g., number and width of travel lanes, presence of protected bike lanes, sidewalk coverage, crosswalk design, street lighting presence and condition) • nearby land uses, including key destinations (e.g., transit stops, employment centers) • precise location of crashes on the transportation network
Event-based factors	• crash types – movement that may have anticipated the crash (e.g., midblock, right-hook, left-turn crash types) • speed of impact of crash • victims' travel modes • drug or alcohol use or other form of "impairment" (e.g., distraction, fatigue, phone use)
Time-based factors	• times of year • day of week • time of day
Population-based factors	• person-level factors (e.g., victims' age gender, race/ethnicity, and income) • neighborhood-level factors (e.g., poverty rate within Census block groups)

Population-based factors describe the demographics of the victims—in terms of their age, gender, race/ethnicity, and income—and additional person- or neighborhood-level factors associated with traffic and safety outcomes (Figure 2.4).

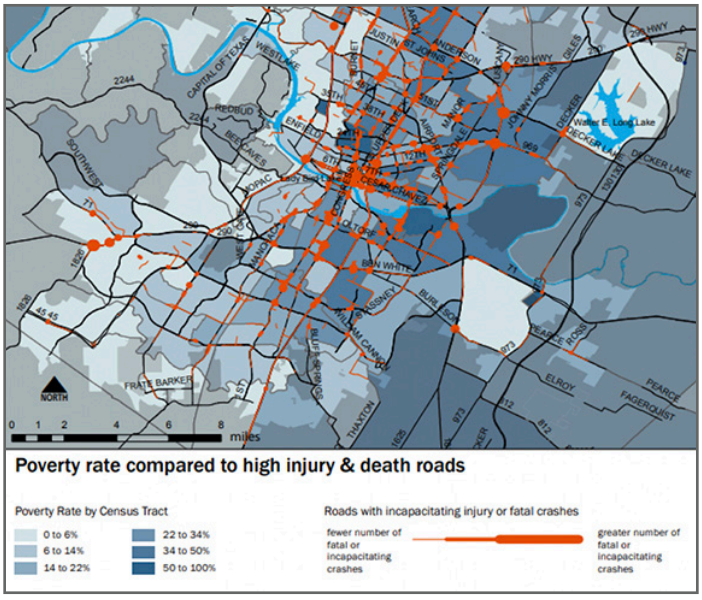

Figure 2.4. Spatial relationship between Census tract-level poverty levels and high injury crashes; Austin, TX

Systemic or risk-based approaches

After examining traffic crash factors and associated variables, Vision Zero partners can discern patterns in where, when, how, and with whom crashes tend to occur. Drawing upon this record of prior crashes, partners can identify those roadway characteristics that pose risks to road users' safety. Skewed intersections, multiple lane arterials, intersections with limited sight distances, and crossings that lack adequate lighting are all examples of locations that afford greater risk to road user injury.

Reducing a location's crash risk before safety problems develop is considered a proactive or "systemic" approach to traffic safety. For example, a systemic approach to improving pedestrian safety might be to install safety countermeasures (e.g., median refuge islands, high visibility crosswalks, LED lighted crossings) along five-lane roadways near transit stops, as people accessing transit frequently need to cross the street.

As an applied example of a systemic approach to road user safety, the Seattle Department of Transportation worked with a team of researchers to develop crash

prediction models for bicycle crashes. They found prior bicycle crashes and their exposure to crash risk were most common along arterial streets, downhill approaches, and commercial areas with higher vehicle traffic volumes. Further, large and complex intersections, locations with on-street parking, and intersections with center turn lanes were associated with high crash risk for bicyclists (10).

Conditions that extend beyond traffic crashes, such as health and well-being

In addition to reviewing local patterns in traffic crashes and safety risks, communities could document shifts toward bicycling, walking, and transit use and assess how these shifts interact with people's health and well-being. For example, with fewer people driving and more people using active travel modes, communities are likely to experience improvements in local air quality and reductions in traffic-induced noise; two phenomena directly associated with people's health (11,12).

(2) Roles

As noted in Section 1, members of a community's Vision Zero task force should include organizations and individuals that are most impacted by the transportation system, especially traditionally underrepresented populations. Questions to consider when developing the task force include:

- Which agencies and community stakeholders make up the task force?
- How often do members of the task force meet?
- How are decisions made on the task force?
- What do task force members share?
- Who should be but is not yet included in the task force?
- Does membership include representatives of traditionally underrepresented groups?
- Does it include a mix of professionals and community members?

Communities should consider involvement from these sectors:

- Advocacy or non-profit groups (e.g., groups working on solving homelessness or substance abuse other issues that overlap with transportation safety)
- Tribal governments or leaders
- Community or cultural organizations (e.g., El Pueblo)
- Office of aging, senior services
- English as a Second Language (ESL) service providers
- Schools
- Public health
- Office of the mayor and other public officials
- Police
- Transportation
- Public works
- Planning
- Fire and emergency services
- District attorney
- Parks and recreation
- Private businesses (e.g., local retailers, trucking industry representatives, auto dealerships, "mobility as a service" providers)

(3) Relationships

In the context of Vision Zero planning, the "relationships" element of systems includes existing and potential cross-sector Vision Zero partnerships. As many of these current or potential partners will have developed their own agencies' plans and programs, it is useful to identify complementary local, regional, and state initiatives that could inform the development of the community's Vision Zero Plan.

When exploring potential planning synergies, consider speaking with someone at the following agencies:

- Local health department
- Governor's Highway Safety Office
- Department of Transportation
- Planning department, including transportation and land use or zoning
- Metropolitan Planning Organization or Rural Planning Organization

In many cases, agency representatives could be members of a community's Vision Zero task force and thus serve as a liaison between Vision Zero and complementary programs and initiatives.

(4) Results We Want to Achieve

A significant amount of attention in the Vision Zero planning process will be devoted to the community's vision and goals (discussed further in Section 3), or in other words the "results" Vision Zero stakeholders wants to achieve. A promising way to both shape the goals of the community's Vision Zero Plan and to increase the likelihood of Plan implementation is to review existing plans, policies, and programs in the community. Such a review can inform Vision Zero Plan developers in several ways:

(1) It can help identify common goals and priorities across different plans, policies, and programs which can enhance the impact of complementary efforts.
(2) It can strengthen existing and formulate new partnerships in the process through collaboration on shared goals.
(3) It can promote data, knowledge, and resource sharing (e.g., funding, personnel, leadership) in the community, fostering the sustainability of Plan goals.
(4) It can save time by avoiding redundant activities.

Integration

> Examples of local, regional, and state level plans to review are shown below, with additional examples in **Appendix C**.

Communities should consider reviewing plans, policies, and programs at both the local level—referred to as *horizontal integration*—as well as at the regional or state level—referred to as *vertical integration*. A stronger Vision Zero Plan will have both horizontal and vertical integration, connecting to local, regional, and state level efforts.

Examples of local plans that the community may have to review include:

- Local safety action plan
- Mobility plan
- Neighborhood or area-specific plan
- Bicycle and pedestrian plan
- Greenway or trail plan
- Park and recreation plan
- Land use plan
- Complete streets plan

Examples of regional and state plans include:

- Statewide Strategic Highway Safety Plan
- Statewide Vision Zero Plan
- Commercial Vehicle Safety Plan
- Long-range transportation plan
- Statewide and metropolitan transportation improvement program
- Statewide or Regional Pedestrian Plan, including safety action plan
- Statewide or Regional Bicycle Plan, including safety action plan

(5) Rules and Reward Systems

Many rules and reward systems might impact Vision Zero work at the local, regional, and state level. For example, do our community policies incentivize the development of Complete Streets? Do the laws that govern the community prohibit automated speed enforcement? As change is a constant in most communities, understanding how rules and reward systems influence traffic safety is critical to identifying those systems that should be strengthened or modified.

Policies are rules that organizations develop to realize their main goals. There are several types of policies that affect Vision Zero work, including laws, codes, regulations, formal and informal rules, standards, and agreements. In addition to these formal and informal policies, social norms also play an important role in guiding traffic safety programming. Each of these rules and reward systems are further described in **Table 2.2**.

Many policies could impact Vision Zero work at the local, regional, and state levels. For example, a community may have a local policy that standardizes speed limits in neighborhoods to 30 mph unless otherwise specified. During the process of creating the Vision Zero Plan, communities can alter this policy to reduce default neighborhood speed limits to 20 mph.

Examples of policies to review at the local, regional, and state levels include those related to:

- Speed limits
- Automated speed enforcement
- Complete Streets
- Land use, parking, and site design
- Rezoning
- Maintaining connectivity through work zones
- Freight and delivery
- Alcohol
- Transit policies
- Bicycle helmet wearing
- Red light cameras

Example of policies and plans the Charlotte, NC Vision Zero Plan reviewed and highlighted in their plan (13).

- Urban Street Design Guidelines
- Transportation Action Plan
- Charlotte WALKS (pedestrian plan)
- Charlotte BIKES (bicycle plan)
- Shared Mobility – E-scooter plan

Table 2.2. Types of rules and reward systems to consider when developing a Vision Zero Plan, with examples.

Types of Policies	Description	Examples
Laws (state statutes or local ordinances)	Policies that have legal authority	Speed limits for certain road classification types, graduated driver licensing
Codes		Building codes regarding whether sustainable modes of transportation are required to be considered, street design types (eliminate cul-de-sacs), provide street grids, disallow gated communities, preference for multi-access points to communities, parking maximums
Regulations		Red light cameras, automated speed enforcement; speed setting
Rules	Policies that guide choices	Manual on Uniform Traffic Control Devices
Standards		Standards for how a road should be designed, speed setting, access management standards, street lighting standards, intersection spacing, cross walk markings, transit stop placement, transit service frequency, integration of pedestrian, bicycle, and transit access
Agreements or Guidance Documents		Agreement around reducing deaths and serious traffic-related injuries to zero
Social norms	Unwritten rules that guide appropriate and inappropriate attitudes, beliefs, values, and behavior	Whether speed limits are enforced in the community The prevalence of driver yielding to pedestrians in the community

(6) Resources

Vision Zero planning and programming rely on "resources" including time, skill sets, and money. When developing a Vision Zero Plan, one consideration is whether monetary allocations align with the community's Vision Zero goals. For example, if 18% of fatalities in the community involve pedestrians and bicyclists, does the budget allocate a proportional amount of funding to pedestrian and bicycle safety improvements?

Diversifying funding sources represents a key strategy in resource allocation. Seeking and leveraging a variety of funding opportunities can help Vision Zero programs adapt to new priorities, funding stream fluctuations, and budget cuts. Funding sources may include local, state, or federal government grants; local or community foundations; in-kind resources and donations of time; law enforcement fees or fines (e.g., automated speed enforcement, parking); and funding from private health care or insurance organizations, among others.

Additional resources include the capabilities, creativity, and time affluence of staff to develop and implement a comprehensive Vision Zero Plan. The core of these plans are the safety principles they are built upon and the resulting goals, objectives, and performance measures that guide actions toward improving road user safety.

> **Appendix B** provides a checklist for Vision Zero Plan development on conditions.

Section 3: Developing Evidence-based Metrics and Planning Action

An effective plan is rooted in scientific principles, aligned with the broader community vision, and organized with a hierarchy of connected vision, goals, objectives, agency actions, and performance measures (**Figure 3.1**). This section of the Guide defines each of the elements and provides illustrative examples of each.

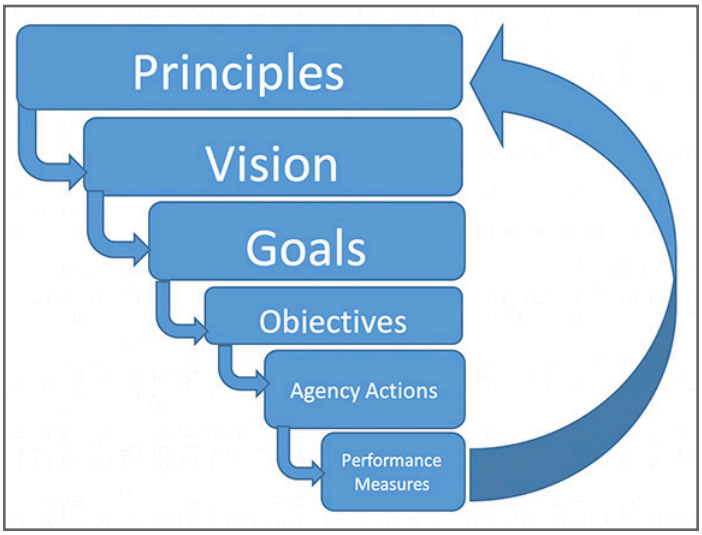

Figure 3.1. *Vision Zero Planning Framework*

Incorporating Principles of Injury Prevention

As discussed in the introduction, an effective Vision Zero Plan is built on a foundation of Safe Systems principles. These principles translate into evidence-based procedures that can be included as objectives and agency actions. Here we describe four underlying principles of four underlying principles of Safe Systems.

1) Adapt transportation systems to the complexities of human behavior.

Human behavior is extremely complex. Safe transportation systems assume that human mistakes will occur, and they are designed to reduce the likelihood of mistakes and mitigate the effects of those that occur. Simply sending out information through social media or at community events is not enough to change the way people behave while traveling. Instead, people learn most deeply by doing. Graduated Driver Licensing is a good example as a law that requires novice drivers to learn safe driving skills through the supervised practice of driving.

2) Manage kinetic energy transfer among road users.

Communities characterized by safe road systems effectively manage speed and, therefore, energy transfer in the event of a crash, reducing the likelihood of death and serious injury. Vehicle speeds determine both the likelihood and severity of traffic crashes (**Figure 3.2**). Higher travel speed can be especially problematic in "transition zones" between high-speed facilities, like highways, and more densely populated areas. Other places where speed plays an outsized safety problem is along rural areas where the roadway alignment curves substantially, as well as where rural residences cluster, often signified by a string of mailboxes along the roadside.

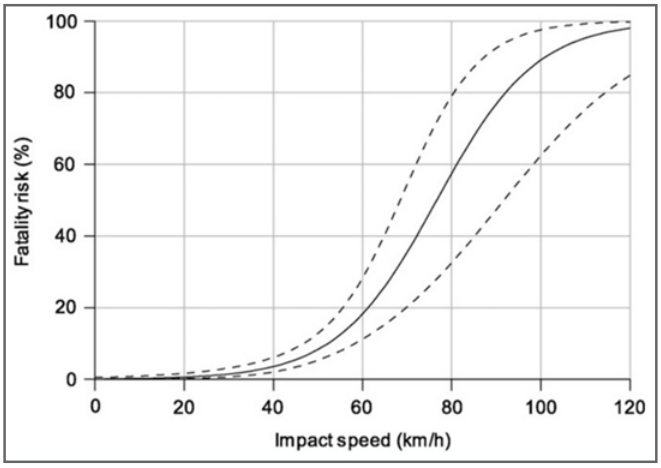

Figure 3.2. *Pedestrian risk of fatality by crash impact speed.*

3) Be proactive and population oriented.

Traffic injury is the result of a complex blend of interacting societal factors. As displayed in **Figure 3.3**,

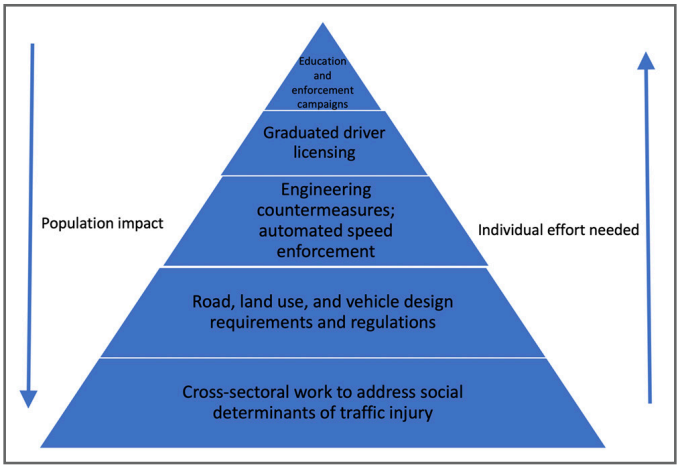

Figure 3.3. *Traffic safety impact pyramid. Adapted from the "health impact pyramid" (14).*

Since, the mid-1990s, the city of Cambridge, MA has maintained a Traffic Calming program that adapts the city's intersections to common human behaviors (15). Roadway elements like curb extensions and continuous sidewalks over intersections of major and minor streets, cue drivers that they are entering a pedestrian zone, which prompt them to slow down upon turning onto a minor street from a major street.

Richmond, VA Vision Zero efforts include a strong focus on speed management, which includes an emphasis on street design changes and evaluation of automated enforcement tools (16).

Austin, TX Vision Zero efforts include plans to revise transportation municipal codes to focus on safety and to conduct thorough reviews of transportation development projects with safety at the forefront (17). They also plan to keep a Complete Streets Policy in every construction, reconstruction, and development project.

impacts on road user safety at the level of the population require addressing the social determinants of traffic injury, such as poverty, physical and cognitive disability, and other socioeconomic factors. Therefore, Vision Zero calls for proactive, population-oriented approaches (e.g., Safe Systems) which identify safety risks before injury manifests and considers entire populations of road users when developing policies, programs, and practices designed to enhance safe access for the most vulnerable.

4) **Foster the creation of a shared vision and coordinated action.**
Effective Vision Zero communities consistently seek to improve coordination and integrated approaches. The "6 Rs of systems" framework in Section 2 provides an approach to consider different ways in which the transportation system can be leveraged or restructured to address the web of diverse factors affecting transportation safety.

Developing Goals

Framing Goals

Vision Zero is an approach to preventing serious and fatal traffic injuries in the United States. However, many communities continue to rely on traditional road safety frameworks, such as the "Es" of traffic safety—predominantly, engineering, education, and enforcement. A few communities include a fourth, fifth, or sixth "E" in the form of evaluation, equity, or emergency medicine.

The "Es" approach to traffic safety has succeeded in coalescing groups of stakeholders to work on the common goal of improving traffic safety. However, to realize a future without serious and fatal road user injury, diverse and inclusive coalitions of stakeholders must both develop more comprehensive ways to uncover common causes of traffic injury and institute more integrated and creative ways of addressing road users' safety. For example, the "Es" start with the assumption that the complex causes of serious traffic injury are known and that applying categories of interventions (e.g., education, enforcement, engineering) will solve them. The issue with such thinking is that the causes and contributors of traffic injury are complex and often require procedural (e.g., shifting from focusing on driver delay at intersections to focusing on the safety of vulnerable users of the intersections) or policy changes (e.g., regulating the size and weight of motor vehicles) to address traffic injuries in any meaningful way.

While the "E" framework has been a popular way to frame goals in Vision Zero Plans, many communities are framing their goals in other ways. **Table 3.1** shows examples of goals that Vision Zero Plans included. All of these plans are available online through the plan library at this link, and the specific page numbers are provided to view for more detail. Most of the goals also include specific actions, found by referring to the respective plan. The actions identified in the plans are wide ranging and varied, as well as specific to respective communities.

Table 3.1. Examples of how Vision Zero Plans framed their goals

Examples of Goal Themes	Example Plans (page number, reference)
Accountability, leadership	Cambridge (page 41-42) (15) Richmond (page 19) (18)
Advocacy	Montgomery County (page 28-31) (19)
Culture of safety	Alexandria (page 54-57) (20) Hillsborough County (page 64) (21)
Dangerous behaviors	Eugene (page 35-36) (22) Washington D.C. (page 47-56) (23)
Data	Los Angeles (page 38) (7) Philadelphia (page 20-23) (24)
Emergency response and services	Greensboro (page 47-48) (25) Montgomery County (page 26-27) (19)
Encouragement	Fort Lauderdale (page 37-38) (26) Miami-Dade County (page 41) (27)
Engagement with the public	Hillsborough County (page 52) (21) New York City (page 33-37) (28)
Equity	Cambridge (page 36-40) (15) Chicago (page 23) (29)
Evaluation	Austin (page 29-32) (17) San Jose (page 18, 26) (30)
Fleet management	Philadelphia (page 36-39) (24)
Impairment	Portland (page 23) (31) Tempe (page 21-23) (32)
Improve large and for-hire vehicle safety	Cambridge (page 32-35) (15)
Partnerships, external	Cambridge (page 47-48) (15) San Jose (page 25, 27) (30)
Partnerships, internal	Alexandria (page 46-48) (20) Denver (page 14-15) (33)
Policy, law	Cambridge (page 41-42) (15) Charlotte (page 36) (13)
Practices	Jersey City (page 45-47) (8) New York City (page 32) (28)

Examples of Goal Themes	Example Plans (page number, reference)
Promotion of Vision Zero	Hillsborough County (page 46) (21) Sacramento (page 46-47) (34)
Safe streets	Fremont (page 18) (35) San Francisco (page 11) (36)
Safer drivers and people	Chicago (page 23) (29) Tempe (page 21-23) (32)
Safer vehicle technology	Chicago (page 23) (29) San Jose (page 23, 27) (30)
Speed	Denver (page 18-19) (33) Portland (page 24) (31)
Street design	Boston (page 16-17) (37) Monterey (page 17-18) (38)

Prioritizing Goals

Using an organized and collaborative process, the Vision Zero task force should prioritize community concerns toward creating a community-driven Vision Zero Plan. Both quantitative and qualitative information should be discussed. Through group discussion, multi-voting, a prioritization matrix, or other decision-making techniques {see this link for more information}, the task force can build consensus around transportation-related concerns and develop justified reasons for each selection. The prioritized community concerns will be the central focus of the Vision Zero Plan.

Prioritization criteria may include:
- magnitude of the problem
- severity of the problem
- need among vulnerable populations
- availability of community resources
- importance of each concern to the community

Writing and Connecting Goals, Objectives, Agency Actions, and Performance Measures

The goals, objectives, agency actions, and performance measures are informed by Safe Systems principles and a community's vision for the transportation system as one designed for and protective of all road users. To ensure that the community develops a set of goals that provides a pathway to realize zero serious and fatal traffic injuries, we now define and provide examples of these terms.

Goals offer the desired end states or outcomes of the community's transportation system. That is, goals describe what a city's transportation future will look and feel like once the city has fully implemented its Vision Zero initiative.

Example goal:
Motor vehicles travel at safe speeds along all roadways in our city's network.

Objectives provide the standards to determine the extent to which each of the Vision Zero goals is achieved. Objectives should be *SMART*:

- *Specific* – Details on the approach that will be used to achieve the objective;
- *Measurable* – Can evaluate and track progress toward achieving the objective using quantitative data;
- *Agreed-Upon* – Consensus among planners, operators, and other key stakeholders;
- *Realistic* – Address what can be reasonably accomplished, given resource constraints and other cultural and political factors; and
- *Time-bound* – Establish a specific timeframe for achieving the objective.

Example objective:
By the end of 2030, 85% of traffic will travel at 30 mph or below on 100% of collector roads in our city.

Agency actions are the activities and procedures that naturally flow from associated goals and objectives.

Example agency action:
City traffic engineers and planners design collector roads to automatically encourage vehicle travel speeds of no more than 30 mph

Performance measures quantify the result of activities that indicate how much, how well, and at what level, agency actions produce desired results over a given time period (39).

Example performance measure:
% of collector roads where traffic operates at 30 mph or lower by 2030.

In general, objectives can be divided into four broad categories based on their anticipated timeframe for realization (i.e., shorter vs. longer term timeframes) AND whether they are described in terms of processes or outcomes (see **Table 3.2** for examples).

Table 3.2. *Types of rules and reward systems to consider when developing a Vision Zero Plan, with examples.*

	Shorter term (within 3 years)	**Longer term (3 years and beyond)**
Process or Outcome	*Process:* By the end of 2020, city staff in law enforcement, emergency medicine, engineering, public health, and planning will have formed a Vision Zero team that meets in person at least once a month.	*Process:* By the end of 2026, city staff will have implemented automated speed enforcement in 50% of school zones in the city.
	Outcome: By the end of 2021, Vision Zero team members will have developed a Vision Zero Plan that incorporates project and performance measure information from other city- and state-level traffic safety and travel mode plans.	*Outcome:* By the end of 2030, 100% of traffic will travel through school zones at or below 20 mph.

- Process objectives describe the actions, practices, and procedures that help agencies and communities achieve their goals.
- Outcome objectives describe the desired result of agencies' actions.

Examples

Example #1: Developing a goal framework for the Vision Zero Plan around speed management

Safe Systems Principle:
Manage kinetic energy transfer among road users

This section provides examples of goals, objectives, agency actions, and performance measures related to speed management. Speeding is widely regarded as a major contributor to both the likelihood and severity of injurious traffic crashes (40). In fact, many cities are transitioning to developing safety programs organized around managing kinetic energy transfer among road users rather than focusing on reducing the number of traffic crashes per se (41). This represents a core component of a Safe Systems approach to road user safety.

Consider the example of deciding whether to install a right-turn slip lane at an intersection. Installing a right-turn slip lane would likely reduce one frequent crash type: the rear-end crash. At the same time, a right-turn slip lane often increases the risk of severe car-pedestrian and car-bicyclist crashes at the intersection. This is because with slip lanes, drivers can make a right turn quickly through the intersection and tend to focus on watching for gaps in oncoming traffic, rather than the crossing pedestrian or the bicyclist riding to their right. Removing the slip lane may reintroduce some low severity rear-end type crashes, but it will also reduce the less frequent, though more severe crashes with pedestrians and bicyclists. This is an example of *managing kinetic energy* over *reducing low-severity crashes*.

What follows are two illustrations of "goal packages," ones that include interrelated goals, objectives—both process- and outcome-oriented, agency actions, and performance measures.

Goal 1: "Traffic speeds in the city are consistent with our public health goals to eliminate serious traffic injury." (42)

Process objective: By the end of 2022, city staff will have developed street classification standards for designing streets with operating speeds of no more than 20 mph on

local roads, 30 mph on collector roads, 35 mph on arterial roads, and 45 mph on highways.

- Agency action: Starting in 2020, city engineers will work with planners and public health professionals to develop a roadway classification scheme designed to provide all road users with safe mobility and access to key destinations.
- Performance measure: online publication of an updated street classification standard indicating intended traffic speeds by roadway type, as well as the weight and speed of expected road users by roadway type.

Outcome objective: By the end of 2026, city staff will have implemented road diets on 50% of roadways where such treatments are appropriate (e.g., roadway segments with more than two vehicle travel lanes and that possess traffic volumes < 20,000 AADT).

- Agency action: Starting in 2020, city engineers will work with planners, business owners, and residents to screen the roadway network for locations suitable for road dieting.
- Performance measure: % of suitable roadways that have undergone road diet lane reconfigurations.

Goal 2: "Drivers travel through school zones at safe speeds throughout the city."

Process objective: By the end of 2026, city staff will have implemented automated speed enforcement in 50% of school zones in the city.

- Agency action: Starting in 2020, city engineers will work with law enforcement and local school officials to conduct traffic speed studies in school zones to determine which zones are most suitable for automated speed enforcement.
- Performance measure: % of school zones featuring automated speed enforcement.

Outcome objective: By the end of 2030, 100% of traffic will travel through school zones at or below 20 mph.

- Agency action: Starting in 2020, law enforcement officers will conduct speed studies at least once a semester in each school zone.
- Performance measure: % of traffic traveling through school zones at or below 20 mph.

Example #2: Developing a goal framework around being proactive and population oriented in Vision Zero planning.

Safe Systems Principle:
Be proactive and population oriented

Another example set of goals, objectives, agency actions, and performance measures involves being proactive and population oriented in Vision Zero planning. According to the Vision Zero Network and evident in many cities' Vision Zero plans is the notion that Vision Zero should meaningfully engage a diverse set of stakeholders (43). Stakeholders may include the city Mayor or other high-level elected officials, as well as members of law enforcement, public health agencies, and planning and engineering departments, and community members. Together, these public officials, professionals, and stakeholders meet regularly to share safety-related data, resources, personnel, funding, and performance measures in the spirit of proactively improving the safety of the entire road using population.

Goal 1: "Professionals in law enforcement, emergency medicine, engineering, public health, and planning work together as part of a Vision Zero team."

Process objective: By the end of 2020, city staff in law enforcement, emergency medicine, engineering, public health, and planning will have formed a Vision Zero task force that meets in person at least once a month.

- Agency action: Starting in 2019, the city manager will convene a series of three meetings with leadership within law enforcement, emergency medicine, engineering, public health, and planning departments regarding forming a Vision Zero task force.
- Performance measure: Number of in-person Vision Zero task force meetings held each year.

Outcome objective: By the end of 2021, Vision Zero task force members will have developed a Vision Zero Plan that incorporates project and performance measure information from other city- and state-level traffic safety and travel mode plans.

- Agency action: Starting in 2020, the Vision Zero task force will audit city- and state-level traffic safety and travel mode plans to identify both those projects that advance city-wide safety, public health, and mobility goals, and those that do not.
- Performance measure: Online publication of the Vision Zero task force's audit, including findings of plan elements that are consistent and inconsistent

with improving road user safety, health, and mobility.

Goal 2: "Members of the city's Vision Zero task force draw systems maps to illustrate how changes in technology, demographics, and agency actions may interplay with the city's vision of zero serious and fatal traffic injuries."

Process objective: By the end of 2020, members of the Vision Zero task force engage in quarterly "systems mapping" exercises (see illustration in **Figure 3.5**) designed to describe interactions among changes in technology, demographics, and city agencies' Vision Zero-related actions.

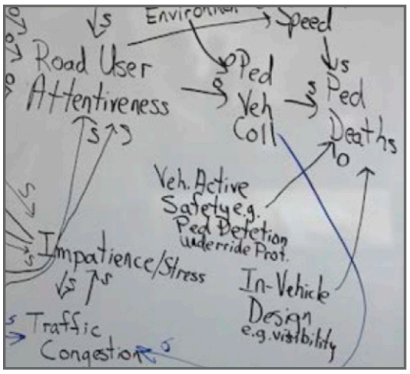

Figure 3.4. *Example schematic from a group systems mapping exercise.*

- Agency action: Starting in the first quarter of 2020, the Vision Zero task force engages with University partners to practice drawing systems diagrams and maps.
- Performance measure: Internal release of systems maps that illustrate interactions, reinforcing, and balancing feedback loops for two Vision Zero goals.

Outcome objective: "By the end of 2021, Vision Zero task force members will have developed a series of Vision Zero systems maps, one map for each articulated Vision Zero goal."

- Agency action: In each quarter of 2020 and 2021, Vision Zero task force members will engage elected officials and resident stakeholders in drawing goal-oriented systems maps.

- Performance measure: Public release of a series of Vision Zero systems maps that illustrate leverage points in the system, opportunities for public engagement with the system, and agency actions designed to address different aspects of the system.

Next, an illustration of how a Vision Zero task force might specify lead and supporting agencies to increase the likelihood of action implementation, agency accountability and goal attainment is included in **Table 3.3**. At regular Vision Zero meetings, each lead agency should report on progress toward performance measure completion.

Specify Funding Sources for Actions in the Vision Zero Plan

Some Vision Zero Plans specify funding sources for each action specified in their plan. The funding sources may be from secured funds, reallocation of existing funds, or include ideas for places to seek funding. In some instances, actions may not cost anything, but in other cases actions could be costly. Identifying funding sources is an excellent approach, to help address any monetary needs right away.

Iterating on the process

A draft of the proposed Vision Zero Plan goals, objectives, agency actions, performance measures, and other plan details should be shared with the community for feedback and comment, ideally at multiple times throughout the planning process. This allows the Plan to be further refined and tailored to the community's priorities and needs and ensures that stakeholders stay engaged in the process. Some communities with existing Vision Zero Plans have received public feedback online through surveys and comment forums, as well as in-person at community events.

Communities should share a complete draft of the Vision Zero Plan with the public. All affected stakeholders (see Section 1) must be given opportunity to access the plan and provide feedback. This may involve translating the draft into multiple languages, holding public events in prioritized neighborhoods, or meeting with community members at local businesses or places of worship. Understanding existing barriers prevent historically underrepresented groups from providing feedback is crucial in equitably engaging all affected populations for feedback.

After receiving public feedback on the draft Vision Zero Plan, the task force should evaluate the feedback and implement Plan revisions. Following these revisions, a final Vision Zero Plan is drafted for plan adoption.

Appendix B provides a checklist for the evidence-based metrics of Vision Zero Plan development.

Table 3.3. Assigning Roles within a Vision Zero Goal Framework

Goal	Objectives	Agency Actions	Performance Measures	Lead Agency	Supporting Agencies & Entities
Safe Systems Principle: Manage kinetic energy transfer among road users					
Traffic speeds in the city are consistent with public health goals	By the end of 2022, city staff will have developed street classification standards for designing streets with operating speeds of no more than 20 mph on local roads, 30 mph on collector roads, 35 mph on arterial roads, and 45 mph on highways By the end of 2026, city staff will have implemented road diets on 50% of roadways where such treatments are appropriate (e.g., roadway segments with more than two vehicle travel lanes and possess traffic volumes < 20,000 AADT)	Starting in 2021, city staff will develop a roadway classification scheme designed to provide all road users with safe mobility and access to key destinations Starting in 2021, city staff will screen the roadway network for locations suitable for road dieting	Online publication of an updated street classification standard indicating traffic design speeds by roadway type open to public input % of roadways that have undergone road diet lane reconfigurations	Engineering department	Planning department Public health department Business owners Local stakeholders
Safe Systems Principle: Foster the creation of a shared vision and coordinated action					
Professionals in law enforcement, emergency medicine, engineering, public health, and planning work together as part of a Vision Zero team	By the end of 2022, city staff in law enforcement, emergency medicine, engineering, public health, and planning will have formed a Vision Zero team that meets in person at least once a month By the end of 2024, Vision Zero team members will have developed a Vision Zero Plan that incorporates project and performance measure information from other city- and state-level traffic safety and travel mode plans	Starting in 2021, the city manager will convene a series of three meetings with leadership within law enforcement, emergency medicine, engineering, public health, and planning departments regarding forming a Vision Zero team Starting in 2021, the Vision Zero team will audit city- and state-level traffic safety and travel mode plans to identify both those projects that advance city-wide safety, public health, and mobility goals, and those that do not	Number of in-person Vision Zero team meetings held each year Online publication of the Vision Zero team's audit, including findings of plan elements that are consistent and inconsistent with improving road user safety, health, and mobility	City manager	Law enforcement agency Emergency medicine services Engineering department Public health department Planning department Local stakeholders

Section 4: Evaluating Implementation Progress

Plans are living documents. They must remain adaptable and evolve. Ideally, communities will build in a timeline for performing Vision Zero Plan updates into the activities outlined in Section 3. Progress toward realizing goals identified in the Plan should be summarized on a regular basis, such as quarterly and yearly. Moreover, celebrating early wins to increase momentum is important to show the community, stakeholders, and coalition members that progress is being made.

Evaluation of a community's progress toward realizing zero serious and fatal traffic injuries is another critical element of a robust Vision Zero Plan. Evaluation should be informed by the goals, objectives, and performance measures that Vision Zero stakeholders have documented in Section 3. The purpose is to help create a common understanding of the extent to which the community is moving toward an equitable, safe, and healthy transportation system.

Evaluation questions should be informed by the community's specific Vision Zero Plan. The following is an example evaluation prompt list:

- Which members of the task force have been especially active?
- Which stakeholder groups have yet to be included in Vision Zero planning, but should be?
- How often have task force members met, and how productive have meetings and professional relationships been for all involved?
- Which socio-economic groups have been most involved in Vision Zero planning? Which groups have not been engaged as much as others?
- To what extent is there representation from all parts of the community?
- Which socio-economic and geographic groups have thus far benefitted most from changes brought about by the community's Vision Zero program? Which groups have benefited the least from program-delivered changes?

Similar questions should be explored with respect to the financial and political realties Vision Zero stakeholders and task forces members are operating within. For example:

- How sustainable have the funding sources for Vision Zero been? Has the community received steady funding for Vision Zero initiatives each year over the past few years?
- Are there plans for funding Vision Zero programming into the future?
- Which political leaders have supported Vision Zero and will they continue doing so in the future?
- Which policies and organizational procedures may have been working against the community's Vision Zero goals and objectives?

Evaluation should also include contingency plans, which can help communities adapt and respond to disruptions and uncertainty in program funding, program staff, and local climate conditions (e.g., damage to transportation infrastructure due to flood events, earthquakes, pandemics, tornadoes, hurricanes, and other natural disasters).

Externally, Vision Zero stakeholders and task force members should evaluate several categories of outcomes, such as:

- Serious and fatal crash outcomes. Many Vision Zero-adopting cities have published reports on the progress of their cities' Vision Zero program. The most common reported outcomes in these reports are fatal and serious traffic crashes, as seen on Portland, OR's "Vision Zero Progress" website (**Figure 4.1**).

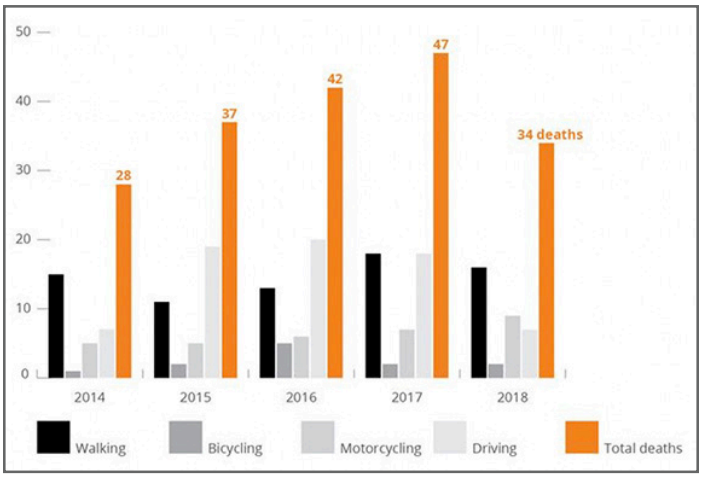

Figure 4.1. *Portland traffic deaths by travel type, 2014-2018*

Publishing progress reports helps to advance government and agency transparency to the public for the activities Vision Zero professionals and partners have performed, as well as associated program outcomes.

- Changes among common crash contributors. How frequent contributors to serious crashes change over time (e.g., speeding, impaired driving [including fatigued, drunk, drugged, and distracted driving], rates of yielding to pedestrians in crosswalks, etc.) can help communities draw out areas they may want to focus their safety interventions on. For example, if measured traffic speeds are rising along certain corridors, Vision Zero intervention teams can consider ways of reducing speeds along these corridors to prevent future serious crashes in these and similar locations.
- The prevalence of high risk crash locations across the transportation network. As discussed in Section 2, intersections, segments, or corridors that pose safety risks to different road users should be examined (e.g., often called "systemic safety analysis"; example: skewed intersections, which encourage higher turning speeds, which in turn pose risks to crossing pedestrians). Places across the transportation network that present risk to more vulnerable road users either (a) suppress trips that would have been made on foot, by bike, scooter, or transit; (b) predict future, often serious, crashes; or (c) both. Within the first two years of implementing elements of its Vision Zero Plan, the city of Eugene, OR, intends to "build a database of information on street design features to enable systemic safety analysis." (22). Similarly, Seattle, WA, incorporated systemic bicycle and pedestrian safety analysis into the city's Vision Zero program (44).
- Changes in community health, well-being, and quality of life. It is also critical to track factors related to community health and well-being. These are factors that are fundamentally part of our transportation system, yet often overlooked. Examples include: (a) numbers and distributions (across the community) of residents and visitors walking, riding bikes, using scooters, bike share, and transit; (b) residents' perspectives about their travel experiences and the extent to which the transportation systems affords them the ability to get to essential services, jobs, and to be a part of civic life; and (c) changes in the intensity and distribution of ambient noise levels and air quality, high levels of which produce ill health outcomes.

Appendix B provides a checklist regarding evaluation of the Vision Zero Plan.

Summary

The United States crash death rate is more than twice the average of many other high-income countries (1). Pedestrians and bicyclists are especially vulnerable in road traffic crashes and, as a group in the United States, have experienced increases in traffic-related deaths in the past several years. Based on the promising results from other countries, Vision Zero implementation began in selected municipalities in the United States in 2014 to address the disparity in transportation-related fatalities. Vision Zero sets a goal to eliminate all traffic-related deaths and serious injuries while increasing safe, healthy, and equitable mobility for all.

A Vision Zero Plan is a public document that provides the vision for future efforts to eliminate traffic fatalities and serious injuries. Creating a Vision Zero Plan requires advanced planning, collaboration, and community engagement. It also requires an understanding of the serious crashes and risks in the community. This Guide was developed to assist communities in the creation and updating of their Vision Zero Plans.

Employing the recommendations and resources in this Guide can directly and positively impact the creation of new Vision Zero Plans and assist municipalities as they update existing Vision Zero Plans. It is reasonable to expect that higher quality plans will create more positive impacts on crash fatalities and injuries. The ultimate purpose of this Guide is to reach and sustain the goals of Vision Zero more quickly through the planning process.

Resources

The intent of this section is to provide a sampling of key resources to help users of the Guide develop a better understanding of key topics addressed. It is not meant to be a comprehensive listing of all resources related to these themes.

This section is organized into the following themes:

- Organizations and Coalitions Devoted to Zero Traffic Deaths
- Advocacy
- Community Engagement
- Policy
- Safe and Equitable Mobility
- Safe Systems and Systems Science
- Safety Action Planning
- Speed Management
- Sustainability
- Systemic Safety and Risk-Based Analysis
- Transportation Equity

Organizations and Coalitions Devoted to Zero Traffic Deaths

Collaborative Sciences Center for Road Safety (CSCRS)
CSCRS is a National University Transportation Center supporting the FAST Act research priority of promoting safety.

Insurance Institute for Highway Safety (IIHS)
IIHS is an independent, nonprofit scientific and educational organization dedicated to reducing the losses—deaths, injuries and property damage—from motor vehicle crashes.

Road to Zero Coalition
The coalition aims to bring together a growing number of agencies and organizations with the goal of eliminating all traffic deaths by 2050. The Coalition's Safe System Innovation Grant program awards funding to evidence-based highway safety programs that support the National Safety Council's Vision Zero efforts.

Toward Zero Deaths
An initiative of the US Department of Transportation's National Strategy on Highway Safety, Toward Zero Deaths provides support for state-based Vision Zero efforts.

Vision Zero Network
A collaborative campaign aimed at building the momentum and advancing the shift toward safe, healthy, equitable mobility for all. The Vision Zero Network supports communities through technical assistance, highlights of recent research, and guidance documents.

Advocacy

Association of Public Health Nurses
Public Health Policy Advocacy Guide Book and Tool Kit compiles resources around planning advocacy efforts.

Advocacy Action Guide: A Tool Kit for Strategic Policy Advocacy Campaigns (developed by Campaign for Tobacco-Free Kids and Consumers International) provides guidance on planning and conducting effective advocacy campaigns. The Guide includes worksheets that can be applied to various advocacy-oriented topics.

Network for Public Health Law
The Network provides help using law and policy on public health topics including advocacy.

Safe States
Safe States is an alliance to strengthen the practice of injury and violence prevention. One focus area is on Policy Tools and Materials.

World Health Organization and Global Alliance of NGOs for Road Safety
Advocating for Road Safety and Road Traffic Injury Victims: A Guide for Nongovernmental Organizations is an advocacy guide that assists nongovernmental organizations.

Community Engagement

International Association for Public Participation
IAP2 Spectrum of Public Participation describes five levels of public participation.

National Institutes of Health
Principles of Community Engagement provides public health professionals, health care providers, researchers, and community-based leaders and organizations with both a science base and practical guidance for engaging partners in projects that may affect them.

Prevention Institute
Vision Zero: A Health Equity Road Map for Getting to Zero in Every Community brings a public health perspective to the topic of Vision Zero.

Vision Zero Network
Provides many resources, including Elevating Equity in Vision Zero Communications.

Policy

Community Preventive Services Task Force
The Community Guide, developed by the Community Preventive Services Task Force, is a collection of evidence-based findings (including policies) that helps communities select interventions to improve health and safety, including road safety.

National Conference State Legislators
Provides policy resources and links to legislative websites.

National Highway Traffic Safety Administration
Countermeasures that Work, 9th edition summarizes road safety-related strategy/countermeasure use, effectiveness, costs, and implementation time frames.

Transportation Investment Advocacy Center
The **Transportation Investment Advocacy Center** tracks current transportation investment bills in each state and provides other state-oriented resources.

Safe and Equitable Mobility

National Association of City Transportation Officials (NACTO)
Don't Give Up at the Intersection: Designing All and Abilities Bicycle Crossings expands upon the NACTO Urban Bikeway Design Guide, adding detailed guidance on intersection design treatments that reduce vehicle-bike and vehicle-pedestrian conflicts.

Pedestrian and Bicycle Information Clearinghouse
Pursuing Equity in Pedestrian and Bicycle Planning is a resource that provides examples, definitions, and identifies resources.

US Access Board
The US Access Board is a federal agency that promotes equality for people with disabilities through leadership in accessible design and the development of accessibility guidelines and standards pertaining to several industries, including guidelines and standards for the built environment and transportation.

US DOT Federal Highway Administration
Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations assists state and local transportation or traffic safety departments to develop policies related to installing safety countermeasures at uncontrolled pedestrian crossing locations, including best practices in selecting context-appropriate countermeasures.

Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts provides a resource for practitioners seeking to build multimodal transportation networks.

Safe Systems and Systems Science

Collaborative Sciences Center for Road Safety (CSCRS)
Safe Systems and the Role of Systems Science provides a brief introduction to core elements of Safe Systems and systems science that can be applied to the collective work of reducing traffic injuries and fatalities.

Implementing Safe Systems in the United States: Guiding Principles and Lessons from International Practice is a synthesis report examining the state-of-the-practice in Safe Systems. Also provides a review of the practices of the four countries with the most established Safe Systems programs—Sweden, the Netherlands, Australia, and New Zealand.

Institute of Transportation Engineers (ITE)
Speed, Kinetic Energy, and the Safe Systems Approach to Safer Roadways discusses the ways in which a Safe Systems approach allows rethinking and exploration into the systems that lead to fatal crashes. The document helps identify more effective approaches and opportunities for coordinated action.

The Vision Zero Toolbox offers informative podcasts, webinars, and journal articles as well as a crowd sourced video analytics program that can help cars recognize vulnerable road users.

National Academies of Science, Engineering, and Medicine
A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries provides state agencies responsible for traffic safety (and their traditional, as well as non-traditional, traffic safety partners) with guidance for a strategic approach to transform the traffic safety culture of road users and stakeholders.

North Carolina Governor's Highway Safety Program (GHSP)
Safe Systems Synthesis: An International Scan for Domestic Application transmits the results of a wide-ranging literature and policy scan of international practices that fall under the scope of Safe Systems.

US Agency for International Development (USAID)
Local systems: A framework for Supporting Sustained Development draws upon USAID's development

experience, established good practice, and systems thinking to advance a framework for promoting sustainability.

US DOT Federal Highway Administration (FHWA)
Road Safety Fundamentals: Concepts, Strategies, and Practices that Reduce Fatalities and Injuries on the Road provides an introduction to the fundamental concepts of road safety. The book's goal is to equip the reader with a broad base of knowledge about road safety.

Vision Zero Network
Moving from Vision to Action: Fundamental Principles, Policies, and Practices to Advance Vision Zero in the U.S. promotes a shared understanding of and a promise to uphold what constitutes a strong Vision Zero commitment in the US.

Word Resources Institute (WRI)
Sustainable and Safe: A Vision and Guidance for Zero Road Deaths reveals 53 countries' experiences with traffic fatalities and concludes that the most effective way to prevent traffic deaths is a systemic approach that shifts responsibility away from road users to road designers.

Safety Action Planning

National Highway Traffic Safety Administration (NHTSA)
Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices offers a basic reference to assist State Highway Safety Offices in selecting effective, evidence-based countermeasures for traffic safety problem areas. Such areas include alcohol- and drug-impaired driving; seat belts and child restraints; speeding and speed management; distracted and drowsy driving; motorcycle safety; young drivers; older drivers; pedestrians; and bicyclists.

Pedestrian and Bicycle Information Clearinghouse (PBIC)
How to Develop a Pedestrian and Bicycle Safety Action Plan provides transportation agencies step-by-step guide on how to develop and implement a safety action plan to improve conditions for bicycling and walking.

US Department of Transportation Federal Highway Administration (FHWA)
Strategic Highway Safety Plan Community of Practice features information on the fundamental elements of the SHSP process. This is helpful for states that are updating their Strategic Highway Safety Plans (SHSP) or assessing their SHSP development process, and it also provides a reference for professionals new to safety and planning.

Speed Management

National Transportation Safety Board (NTSB)
Reducing Speeding-Related Crashes Involving Passenger Vehicles examines causes of and trends in speeding-related passenger vehicle crashes and countermeasures to prevent these crashes. The document makes recommendations to the US Department of Transportation, the National Highway Traffic Safety Administration, the Federal Highway Administration, 50 states, the Governors Highway Safety Association, the International Association of Chiefs of Police, and the National Sheriffs' Association.

US Department of Transportation
Federal Highway Administration (FHWA)
Speed Management Safety presents a variety of materials on means of managing traffic speeds and improving road user safety.

Sustainability

Community Health Peer Learning Program
Strategic and Sustainability Planning for Population Health Collaborative: A Learning Guide is part of a series from the Community Health Peer Learning Program. Additional resources are provided at the end of the Guide.

US Department of Health and Human Services / Centers for Disease Control and Prevention
Building Sustainable Programs: The Resource Guide is an extensive resource that applies sustainability to adolescent health.

A Sustainability Planning Guide for Health Communities is an extensive resource that applies sustainability to healthy communities.

Scheirer Consulting – Scheirer MA.
Is Sustainability Possible? A Review and Commentary on Empirical Studies of Program Sustainability is a journal article by Mary Ann Scheirer that reviews sustainability of health related programs and summarizes key factors contributing to greater sustainability. Published in American Journal of Evaluation 2005; 26(3):320-327.

Washington University in St. Louis
The Program Sustainability Assessment Tool is a 40-item self-assessment to evaluate the sustainability of a program.

Systemic Safety and Risk-Based Analysis

The National Academies of Science, Engineering, and Medicine
Systemic Pedestrian Safety Analysis provides a safety analysis method that can be used to proactively identify sites for potential safety improvements based on specific risk factors for pedestrians.

USDOT Federal Highway Administration (FHWA)
Systemic Safety Project Selection Tool presents a process for incorporating systemic safety planning into traditional safety management processes.

Transportation Equity

Victoria Transportation Policy Institute (VTPI)
Evaluating Transportation Equity provides practical guidance for evaluating transportation equity, while defining various types of equity and equity impacts, and describing practical ways to incorporate equity evaluation and objectives into transportation planning.

Vision Zero Network
Equity Strategies for Practitioners uses an in-depth case study to highlight context-sensitive equity strategies to achieve traffic safety for all.

Appendix A: Glossary of Key Terms

The following key terms are defined specifically for their intended meaning in this Guide.

Active Travel
The Centers for Disease Control and Prevention defines active transportation, or active travel, as "any self-propelled, human-powered mode of transportation, such as walking or bicycling" (45). Active travel can contribute to an individual's ability to integrate physical activity into everyday life and/or to access other modes of transportation, such as transit or shared mobility services.

Agency Actions
The activities and procedures Vision Zero-involved agencies perform to improve road user safety. Agency actions should naturally flow from the community's Vision Zero goals and objectives.

Crash Type
Events and maneuvers of the involved parties that led up to a crash. The relative maneuvers of the parties such as road departure (single vehicle), angle crash (between two motor vehicles), or pedestrian crossing at midblock and struck by a vehicle traveling straight (pedestrian–motor vehicle crash type) are examples.

Equity
"The absence of avoidable, unfair, or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically or by other means of stratification" (46). The United States Department of Transportation defines transportation equity as "the way in which the needs of all transportation system users, in particular the needs of those traditionally underserved by existing transportation systems, such as low-income and minority households, older adults, and individuals with disabilities, are reflected in the transportation planning and decision-making processes and its services and products" (47).

Goals
The desired end states or outcomes of the community's transportation system (48). That is, goals describe what a city's transportation future will look and feel like once the city has fully implemented its Vision Zero initiative.

Health Effects
Changes in health resulting from exposure to a factor (which could include a policy, an environmental source, an intervention, etc.). In the transportation context, health effects are often measured in terms of changes in mortality (i.e., death frequency or rate), morbidity, or the associated costs of these. In the medical profession and the public health community, other health effects related to quality of life and well-being are increasingly being used. Health effects (also called health impacts) can be either positive or negative.

Morbidity
Refers to having a medical problem, illness, disease, or the symptom of such often referred to as a population-level rate per time. Morbidities frequently associated with transportation include diabetes, depression, cardiovascular disease, obesity, cancer, traumatic brain injury, chronic obstructive pulmonary disease, and others. A person can have multiple morbidities and they can be interrelated.

Mortality
Death; often referred to as a population-level rate per time. A more common term in the transportation context is fatality, typically associated with a motor vehicle crash. Mortality can be defined as all-cause or can be specific to a disease or injury.

Objectives
The standards to determine the extent to which goals are achieved. Objectives are described in terms of process or outcomes. Process objectives describe the actions, practices, and procedures that help agencies and communities achieve their goals. Outcome objectives describe the desired result of agencies' actions (47).

Performance Measures
Performance measures quantify the result of activities that indicate how much, how well, and at what level agency actions produce desired results over a given time period. Transportation agencies, influenced or mandated by Federal and state policies, often develop performance measures and targets related to convey various features of the transportation system, including safety, the condition/quality of the infrastructure, system reliability,

freight movement, economic vitality, environmental sustainability, and congestion reduction. Health indicators can be used as performance measures and relate to many of the domains traditionally considered in transportation performance measurement.

Risk
Probability of a crash at a specific location within a defined period. While true risks are rarely known, the traffic engineering field creates estimates of risk by identifying attributes of locations on a roadway network that are associated with crash frequencies or severities.

Safe Systems
A systems-based (or holistic) strategy which recognizes that crashes, injuries, and deaths ultimately result from a larger system of interacting factors. Implementing a Safe Systems approach means that there is a focus to actively understand the "whole" and to strategically intervene between interconnected factors in a way that optimizes safety. Taking a Safe Systems approach is to: 1) design for the humans in the system; 2) recognize the importance of speed and energy transfer in safety; 3) employ proactive tools to manage risks across an entire roadway network or population; and 4) foster integrated, collaborative, and coordinated action.

Systems Thinking or Systems Science
A set of tools and methods that help researchers and practitioners examine complex and persistent problems as systems in order to understand when, with whom, and how best to intervene; and consider how best to align action to improve outcomes. Depending on the research and/or practice goal, the tools include both qualitative and quantitative methods to study "wholes" or "systems" shaping a given problem or outcome.

Appendix B:
Checklist for Vision Zero Plan Development

The following checklist is designed to help communities "self-assess" their progress in developing strong Vision Zero plans.

	Key Considerations
Community Engagement	• Does the plan provide a description and timeline (including frequency and duration) of stakeholder involvement and the composition of key leadership? • To what degree do decision-making bodies represent or resemble the community, and to what extent are traditionally underserved communities involved in the process? • Are engagement strategies well-described in the plan, and are the methods used (such as maps, websites, surveys, open houses, public meetings) tailored to community needs? • Is there a description of how the draft plan was shared with the community, what the input and feedback included, and how feedback was received or incorporated into later or final versions?
Condition Assessment	• Did the assessment take into account a variety of sources of information to assess safety concerns and opportunities? • Did the assessment consider issues with respect to groups that are unfairly burdened or traditionally underserved, and how to equitably address safety concerns or reduce disparities in access to safe mobility options? • Did the assessment involve review of relevant local, regional, and state plans that inform Vision Zero plan development? • Does the plan describe how Vision Zero efforts overlap with or relate to existing plans, policies, and programs? • Did the assessment identify and describe relevant rules and reward systems (laws, codes, regulations, formal and informal rules, etc.) that inform or affect Vision Zero goals and activities?
Evidence-based Metrics	• Are plan activities and agency actions consistent with Safe Systems principles, the community's vision, and goals? • Do goals represent desired end states or outcomes of the Vision Zero program and transportation system? • Are objectives specific, measurable, achievable, realistic, and timely (SMART)? • Do performance measures quantify the result of activities (i.e., how much, how well, and at what level, agency actions produce desired results over a given time period)? • Does the plan include measures of fair distribution of the benefits resulting from Vision Zero plan activities?
Evaluation	• Does the plan include contingencies for responding to funding or staffing disruption or other circumstances that can compromise progress? • How will the community continually provide feedback following implementation of Vision Zero? • What strategies does the plan put in place to ensure that community engagement and partnership building continue?

Appendix C: Examples of local, regional, and state plans to review when developing a Vision Zero Plan

When working on a Vision Zero Plan, it is important to review other relevant or overlapping plans in the community. These plans could be at the local, regional, or state level. A stronger Vision Zero Plan will consider where there might be overlapping goals with other plans and how resources might be leveraged together.

The links to specific plans provide examples of plans that might exist in the community and may overlap with proposed Vision Zero work. These plans would be relevant to review for any overlapping goals with the Vision Zero Plan. This process may uncover other potential partners or community initiatives that overlap with Vision Zero goals. Working together towards shared goals can increase likelihood of success.

Examples of Local Plans

A library of local United States' Vision Zero Plans can be accessed here.

Local safety action plans focus on improving community safety, such as for walking and bicycling.

Other resources for these plans can be found here:
Example: Arizona Pedestrian Safety Action Plan
Example: Washington State Strategic Highway Safety Plan

Mobility plans, including sustainable urban mobility plans, support the integration and balanced development of all modes of transportation.
Example: Davidson (NC) Mobility Plan

Neighborhood or area-specific plans may address transportation safety concerns.
Example: Youngstown (OH) Neighborhood Plans

Bicycle and pedestrian plans provide a vision, goals, objectives, and performance measures for bicycling and walking in the community.
Examples: Sample Bicycle Pedestrian Master Plans from Alta Planning

Greenway or trail plans provide a vision, goals, objectives, and performance measures for development and connections of greenways and/or trails in the community.
Example: Wake County (NC) Greenway System Plan

Park and recreation plans, sometimes called "master plans", provide a vision, goals, objectives, and performance measures for development of new parks and recreation facilities in the community.
Example: Boulder Parks and Recreation Master Plan

Examples of Regional and State Plans

Statewide Vision Zero Plan: Some states have Vision Zero Plans that set goals for reducing serious and fatal traffic injuries for their state.
Example: North Dakota Vision Zero Plan 2018

State Health Improvement Plan: Provides a resource for state health departments who are developing a State Health Improvement Plan (SHIP).

Statewide Strategic Highway Safety Plan: In 2005, the U.S. Congress passed legislation requiring states to develop these plans and by 2007 all states and Washington D.C. each had a strategic plan. Since then, many states have updated their plans. These multidisciplinary plans are developed by state Departments of Transportation, with input from other stakeholders. These plans establish statewide performance measures, goals, and objectives, as well as present strategies to improve road safety. Some of these plans have a focus on Vision Zero. The Guidebook can be accessed here.
Example: North Dakota Highway Safety Plan

Commercial Vehicle Safety Plan: These plans outline a state's commercial motor vehicle safety objectives, strategies, and performance measures. The plan "aims to improve motor carrier, commercial motor vehicle, and driver safety and to reduce the number and severity of crashes and fatalities resulting from such crashes involving a commercial motor vehicle (e.g., motor coach/ bus, semi-truck, trailer, etc.) (page 26)."

Each approved state plan is available from the Federal Motor Carrier Safety Administration at this link.

Long Range Transportation Plan: These plans identify transportation goals, objectives, and performance measures over many years.

Statewide and Metropolitan Transportation Improvement Program: Each state is required to have a statewide transportation improvement program (STIP) covering at least four years. It is developed in coordination with the metropolitan and regional transportation planning organizations and public transit providers in the state.

Statewide or Regional Pedestrian Plan, including a safety action plan: Some states have developed a statewide vision for future walking in the state. Some plans may combine pedestrian and bicycling together into one plan. Other states develop safety action plans around pedestrian safety.

Example: Hawaii Statewide Pedestrian Master Plan
Example: Toward an Active California: State Bicycle + Pedestrian Plan
Example: New York State Pedestrian Safety Action Plan

Appendix D:
History of traffic safety paradigms in the United States

As historian Peter Norton reminds us, the "Es approach" has a long history in the U.S. (49). As far back as the 1920s, a time when cars became more prevalent on city streets and drivers were no longer perceived as "dangerous newcomers" who threatened pedestrians, a class of experts in crash prevention emerged. The foundation of this new crash prevention work generally relied on the "Three Es." At the same time, the term "highway safety" appeared in the professionals' lexicon, marking greater attention to motorists and highway design.

To understand why Vision Zero represents an improved path forward in traffic safety, it is helpful to have a thorough understanding of where the U.S. comes from based on traffic safety approaches, which have included the "Es approach" as well as other others. According to Norton (49), the evolution of traffic safety in the U.S. can be broadly grouped into four time periods, representing different prevailing paradigms:

1900s-1920s: A Safety First paradigm. Cars are introduced and drivers bear the responsibility of safety. Walking and other travel modes are predominant, and the blame of a vehicle-pedestrian crash is placed on the driver.

1920s-1960s: A Control paradigm emerges, focused on preventing crashes using the "Three Es"—engineering, education, and enforcement. Under this paradigm, the primary offenders were reckless or careless drivers, jaywalkers, and poorly designed roads. Highways were built, and speed was considered safe under the right conditions. Pedestrians were instructed that the street is for cars, and they were responsible for their own safety around roadways.

1960s-1980s: As the number of crash-related deaths exceeded 50,000 in the mid-1960s, a Crashworthiness paradigm emerged. Stakeholders called for improved vehicle crashworthiness, asserting that the "Three Es" were not enough. Seatbelts and airbags were introduced, and vehicle design was a principal traffic safety consideration.

1980s-present: The Responsibility paradigm overlaid, while not completely replacing, the previous paradigm. This represented a course correction from a strong focus on vehicle design to a revived emphasis on driver responsibility. Public health-informed behavior changes and traffic calming measures to improve drivers' attention and reduce speeds were promoted.

Over time, the "Es approach" transformed and adapted to shifting cultural realities and values. In 2006, the clearinghouse for the federal Safe Routes to School (SRTS) program, the National Center for SRTS, introduced a "Five Es" framework at the core of SRTS programs that included Engineering (bicycling and walking), Education, Enforcement, Encouragement, and Evaluation (Pedestrian and Bicycle Information Center, 2015). In more recent years, the SRTS National Partnership introduced Equity as the "Sixth E" of comprehensive programs, as a means of encouraging communities to ensure that traditionally disadvantaged groups benefit from the program.

The concept of equity refers to equitable access to employment, goods, and services. It also means equitable involvement and power in decision-making processes. Equity is a consideration that should be applied to all Vision Zero goals. For example, the Silicon Valley Bicycle Coalition's and California Walks' Vision Zero Toolkit (50) provides "Equity Check-ins" for each of their Vision Zero goals (e.g., "Pay attention to which neighborhoods the municipality invests in. Are bicycling and walking facilities being improved in the communities that need them most? Are residents in those communities being consulted so that any new infrastructure meets the needs, desires, and character of the community?"). Equity represents a goal that transcends Vision Zero and should be considered and applied across goals and objectives in a community's Vision Zero Plan.

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