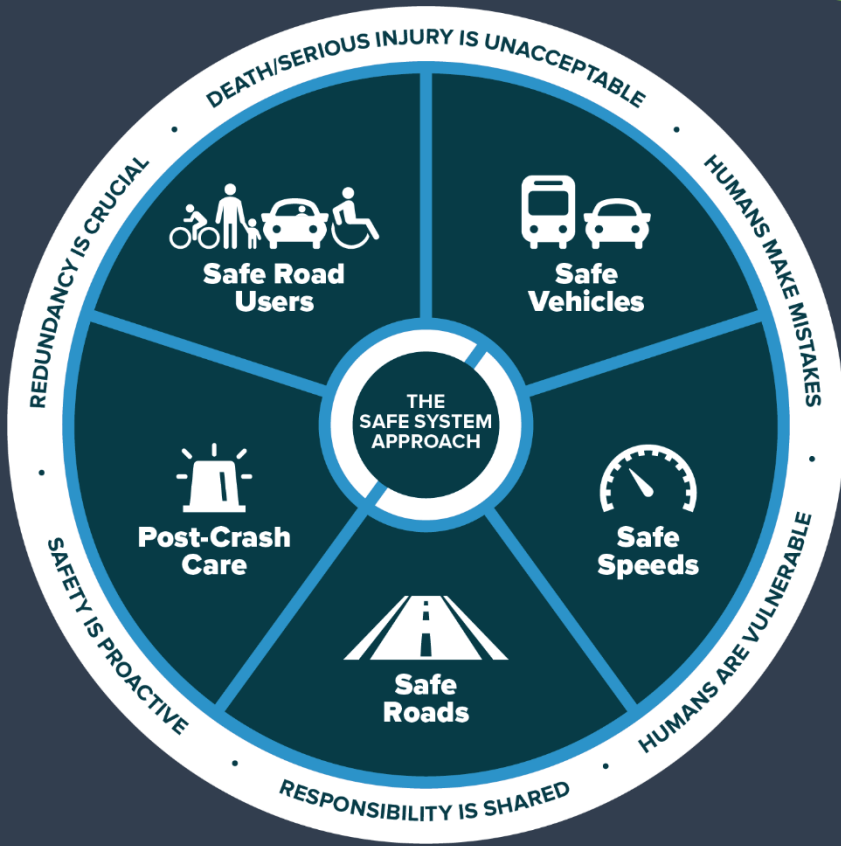


Lessons Learned from Development of Vision Zero Action Plans



U.S. Department of Transportation
Federal Highway Administration



Safe Roads for a Safer Future
Investment in roadway safety saves lives

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16. Abstract Vision Zero is a strategy to eliminate all traffic fatalities and serious injuries while increasing safe, healthy, equitable mobility for all. At the time of this report, more than 40 communities across the United States have committed to the Vision Zero strategy. The Federal Highway Administration (FHWA) is committed to eliminating traffic-related fatalities and serious injuries on the Nation's roadways. One of FHWA's activities is to provide local communities with technical assistance to aid in reaching their zero deaths vision. The FHWA has assisted in the development of Vision Zero Action Plans (VZAPs) for two communities—City of Daly City (California) and Macon-Bibb County (Georgia). The VZAPs serve as a framework that details goals, objectives, and action items, using the Safe System Approach to the extent possible, to implement the safety programs that will guide each community toward zero fatalities. The Transportation Safety Planning and the Zero Deaths Vision: A Guide for Metropolitan Planning Organizations and Local Communities served as a guiding document in the processes. The purpose of this report is to summarize and generalize the two communities' plan-development processes. This document draws from Daly City and Macon-Bibb County's experiences and summarizes the common elements that were applied for developing a VZAP. This report also includes information on opportunities, challenges and lessons learned.			
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1. INTRODUCTION

1.1 ABOUT VISION ZERO

Vision Zero is a strategy to eliminate traffic fatalities and serious injuries among all road users. First implemented in Sweden in the 1990s, Vision Zero has proved successful across Europe¹ — and since 2014 has been gaining momentum in the United States. At the time of this report, more than 50 U.S. cities, counties, and Metropolitan Planning Organizations (MPOs) have committed to the Vision Zero strategy.

Vision Zero is based on the Safe System Approach (Figure 1), which acknowledges that road users make mistakes and that system managers (transportation agencies, vehicle manufacturers, law enforcement, post-crash care personnel, etc.) should design and manage the road system and adopt related policies to ensure those mistakes do not result in serious injuries or fatalities.

In the United States, zero deaths initiatives are often referred to as Vision Zero, Toward Zero Deaths, or Road to Zero; regardless of the title, each initiative advocates for agencies to align with the Safe System Approach.



Figure 1. Safe System Approach (Credit: FHWA).

1.2 FHWA'S VISION ZERO COMMITMENT

The primary safety goal of the Federal Highway Administration (FHWA) is to reduce transportation-related fatalities and serious injuries across the transportation system, and for this reason it fully supports the vision of zero deaths. Additional information and resources relating to FHWA's zero deaths program are available on the [FHWA Zero Deaths](https://www.fhwa.gov/zero-deaths/) website.²

¹ <https://visionzeronetwork.org/about/what-is-vision-zero/>, accessed December 31, 2020.

² <https://safety.fhwa.dot.gov/zerodeaths/>, accessed December 31, 2020

1.3 PROJECT BACKGROUND

Using the report, [Transportation Safety Planning and the Zero Deaths Vision: A Guide for Metropolitan Planning Organizations and Local Communities](#)³ as a guide, FHWA provided technical assistance to develop Vision Zero Action Plans (VZAPs) for two communities— City of Daly City (San Mateo County, California) and Macon-Bibb County (Georgia).

A VZAP establishes a roadmap for how a community can eliminate traffic deaths and serious injuries on its streets through equitable and inclusive community engagement. It details goals, emphasis areas, and action items to guide Vision Zero implementation.

The VZAPs for both Daly City and Macon-Bibb County were developed using a data-driven process and the Safe System Approach and in consultation with agencies and organizations at the county/city, regional, State, and Federal levels.

1.4 PURPOSE OF THIS REPORT

The purpose of this report is to summarize and generalize the two communities' plan-development processes. This document draws from Daly City and Macon-Bibb's County experiences and summarizes the common elements that were applied for developing a VZAP. This report includes information about recruiting stakeholders and fostering partnerships to build support, analyzing crash data, and identifying emphasis areas. This report also includes information on opportunities, challenges, and lessons learned.

³ <https://safety.fhwa.dot.gov/tsp/fhwas18024/chp1.cfm>, accessed December 31, 2020

2. DEVELOPING A VISION ZERO ACTION PLAN (VZAP)

This section outlines key steps in developing a VZAP, based on the experiences of Daly City and Macon-Bibb County. Agencies will need to tailor these high-level principles to fit into their established structures and cultures. The steps outlined below can provide a starting point and built upon, as appropriate, to address the unique needs of each community.

2.1 PASSING A VISION ZERO RESOLUTION

Developing a VZAP is a natural step that follows the adoption of a Vision Zero Policy by the City/County council. Other partners such as departments of transportation, engineering, and public works; law enforcement agencies; schools; emergency response providers; and departments of health often endorse the policy and participate in its implementation. The basic goal is to achieve zero traffic fatalities and serious injuries among all road users (including people walking, biking, using transit, and driving). The Daly City Council adopted Vision Zero resolution in April 2016 to “achieve a singular goal of reducing death and serious injuries on our roads.” Similarly, in May 2016, the Macon-Bibb County Commission passed a resolution supporting Vision Zero as a strategy to create safer streets. By adopting a Vision Zero resolution, both Daly City and Macon-Bibb County demonstrated a commitment to and a desire for developing VZAPs.

2.2 CONVENING A VISION ZERO WORKING GROUP/IDENTIFYING A CHAMPION

Typically, the creation of a Vision Zero Working Group (VZWG) is essential to ensure collective alignment and coordination across agencies in support of Vision Zero. The VZWG could include representatives from departments and programs related to traffic safety, transportation, and public awareness of health and safety topics. The VZWG will ultimately be charged with advancing the VZAP and its recommendations within individual organizations. The responsibilities of the VZWG typically include the following:

- Using crash data to identify trends or potential problem areas.
- Recommending and prioritizing emphasis areas, strategies, and specific actions to include in the VZAP.
- Engaging relevant safety stakeholders and actively involving the public.
- Identifying funding sources to implement the VZAP.
- Participating in VZAP implementation and tracking progress after the initial plan is developed.

In Macon-Bibb County, the VZWG included county staff from planning, engineering, enforcement, schools, public affairs, the Pedestrian Safety Review Board (PSRB), and Bike Walk Macon. The VZWG met monthly and oversaw each step of the plan development. While there was no formal VZWG in Daly City, the Engineering Division of the Public Works Department acted as a ‘champion’ in leading the development of the VZAP.



Figure 2: Macon-Bibb County VZWG Meeting (Credit: Macon-Bibb County)

2.3 ADOPTING THE SAFE SYSTEM APPROACH AND SAFETY CULTURE

A Safe System Approach is holistic and requires the road system be considered in its entirety from infrastructure to policies. The Safe System Approach, shown in figure 1, acknowledges that traffic fatalities and serious injuries are preventable and that system designers (including transportation planners, engineers and policymakers) have a responsibility to put safety first. The six guiding principles of the Safe System Approach are:

- Deaths and serious injuries are unacceptable;
- Humans make mistakes;
- Humans are vulnerable;
- Responsibility is shared;
- Safety is proactive; and
- Redundancy is crucial.

To develop their VZAPs, both Daly City and Macon-Bibb County adopted the Safe System Approach to the extent possible by following the principles and segmenting implementation across the five elements of the Safe System: Safe Road Users, Safe Vehicles, Safe Speeds, Safe Roads, and Post-Crash Care.

In addition, Daly City and Macon-Bibb County demonstrated the existence of a safety culture – both at the organizational and public safety level. Safety culture can be defined as “the shared

values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands”.⁴ By adopting a Vision Zero policy and in developing VZAPs, both Daly City and Macon-Bibb County exhibited the extent to which safety is valued and pursued by the organization as a whole beginning with the highest-ranking officials (e.g. Mayor/Council). Both of these communities also encouraged a public safety culture through education and outreach programs to help citizens understand the risks associated with transportation and to make safe choices when using their transportation system (e.g., walking and bicycling tips, seat belt usage, limiting distracted driving, and wearing protective gear). For instance, Macon-Bibb County held two Pedestrian Safety Summits (2016 and 2017); launched *On the Move* (Figure 3) and *Cross the Walk* education campaigns; and led Open Streets events, opening streets to people on foot and wheels while closing them to cars.



Figure 3. Macon-Bibb County Pedestrian *On the Move* Campaign (Credit: Macon-Bibb County).

⁴ https://safety.fhwa.dot.gov/zerodeaths/safety_culture.cfm, accessed December 31, 2020

2.4 INVOLVING STAKEHOLDERS

2.4.1 SECURE LEADERSHIP SUPPORT

Vision Zero begins with community commitment. Community leaders who publicly commit to Vision Zero can be instrumental in the successful development, implementation, and evaluation of the VZAP. Gaining support from the community leaders can aid in developing the plan and achieving outcomes. Both Daly City and Macon-Bibb County benefited from strong support by the community leaders.

2.4.2 STAKEHOLDER KICKOFF MEETING

A project kickoff meeting with key stakeholders can set the tone and direction, as well as ensure all parties understand expectations and desired outcomes. This is also the time to ensure participants understand the Safe System Approach that underlies Vision Zero. Having this base knowledge and recognizing how the Safe System Approach is different from the traditional road safety approach is key to building buy-in for change, which will be important in moving the VZAP forward.

As the Safe System Approach promotes shared responsibility, involving stakeholders from backgrounds representing the five elements early in the process is crucial. The initial list of participants may include representatives from the following organizations:

- Community leadership
- Department of planning
- Department of transportation, engineering, and/or public works
- Emergency service providers
- Law enforcement agencies
- Metropolitan planning organization
- Department of health
- State safety engineer or district engineer
- Department of education and schools
- Pedestrian, bicycle, and transit coalitions
- Local Technical Assistance Program



**Figure 4: Daly City Stakeholder Meeting
(Credit: Daly City)**

Other organizations may include:

- Federal agencies such as FHWA and Federal Land Management Agencies
- Department of Motor Vehicles
- State Highway Safety Office
- Other community advocates and vested parties

The participation of interested stakeholders is important to show commitment to Vision Zero and to discuss key topics such as the following:

- Brief overview of Vision Zero and Safe System concepts;
- Community’s Vision Zero and safety background;
- Data available for analysis;
- Agency goals and expected outcomes;
- Identification of stakeholders and definition of roles and responsibilities
- Project schedule with major milestones and responsible agencies

Both Daly City and Macon-Bibb County hosted stakeholder kick-off meetings as a way to start their respective VZAP development processes. Macon-Bibb County conducted two meetings. First, the VZWG met with the executive leadership (mayor and county commissioners) to secure their buy-in and commitment to the project goals and objectives. Following this meeting, the County conducted a second meeting engaging a mix of county, regional, State, and Federal stakeholders.

2.5 REVIEWING EXISTING PLANS AND POLICIES

To strengthen understanding of the safety environment and coordinate safety efforts, jurisdictions may want to consider conducting an initial literature review that focuses on recent plans and policies related to the agency’s multimodal travel network. Policies from surrounding jurisdictions that appear relevant to improving the safety environment may also be identified and reviewed. In addition, plans and policies that are not transportation focused could be relevant in Vision Zero planning. Examples include those addressing equity, housing and land use, and public health, among others.

Both Daly City and Macon-Bibb County conducted a comprehensive review of existing policies, programs, and plans to gain a greater understanding of the safety context, strengths of the jurisdiction’s safety work, and policy gaps. Daly City was updating its pedestrian and bicycle master plan during the review and was able to incorporate Vision Zero into that document. In addition, examining existing plans provided opportunities to coordinate emphasis areas, strategies, and actions in the VZAPs. Similarly, Macon-Bibb County evaluated the Georgia SHSP emphasis areas to see if they are relevant in Macon-Bibb and included those that were, i.e., intersection

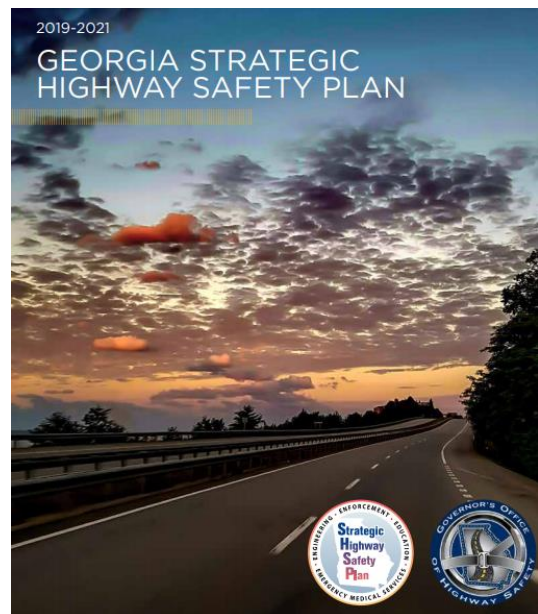


Figure 5: 2019-2021 Georgia SHSP (Credit: GOHS)

safety and pedestrians. Finally, the results of each community's findings were documented in a technical memorandum.

The below documents were reviewed as part of this process.

- Agency documents
 - Vision Zero resolution
 - Pedestrian, bicycle, and other modal master plans
 - Land use plans, urban development plans
 - Road safety audit (RSA) reports
 - Transportation studies and projects (system safety analysis reports, local road safety plans, speed management action plans, etc.)
- Regional and State documents
 - Strategic Highway Safety Plans (SHSPs)
 - Highway Safety Plans (HSPs)
 - Pedestrian safety action plans
 - Long-range Transportation Plans
 - Metropolitan Transportation Plans
 - Transportation Improvement Programs
 - Unified Planning Work Programs

2.6 ANALYZING CRASH DATA

Analyzing crash data is central to initiating Vision Zero efforts, as this provides a baseline understanding of crash trends across the jurisdiction and can also help define primary crash attributes:

- *Who*: Data may be available about crash victims, such as the age, gender, or ethnicity of the people, involved in serious crashes. This may be useful in understanding if children, seniors, or other traditionally underserved demographic groups are particularly vulnerable to serious and fatal crashes. This may also influence countermeasure selection.
- *What*: Describes crash type and crash severity. Crash type could relate to the modes of transportation for crash victims (e.g., pedestrian, cyclist, driver, passenger), as well as the manner in which the different users collided (e.g., rear-end, sideswipe, head-on).
- *Where*: Identifies locations of severe crashes, whether along roadway segments or at signalized or unsignalized intersections, as well as the land use context (e.g. schools, parks, activity centers) of those locations. Refer to Sections 2.6.1 thru 2.6.3 for discussion on the High Injury Network (HIN), incorporating land use, equity and normalizing data.

- When:* Crash data typically include the date and time of a crash. This can help jurisdictions identify when crashes generally occur. For example, crashes may spike on weekend evenings or during peak commute hours. Pinpointing when crashes occur most frequently can help agencies understand how to best allocate limited resources, as well as to target infrastructure improvements (e.g., lighting or traffic calming) or policies (e.g., time-based turn restrictions).

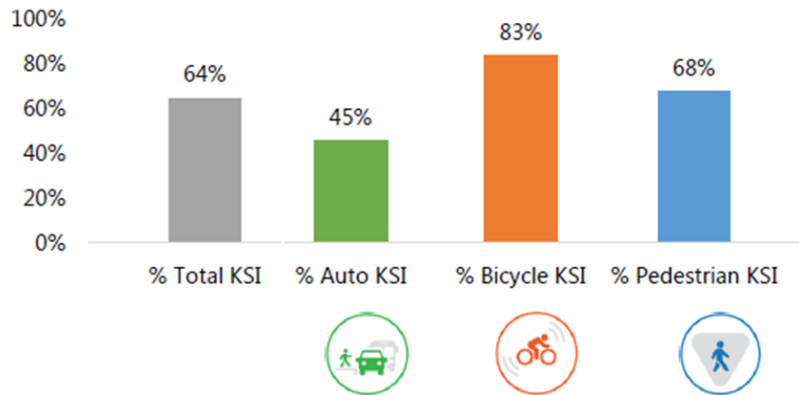


Figure 6: Daly City % of KSI on arterial roads, 2013-2017 (Credit: Daly City)

- Why:* Specifically describes the cause of crash, which may also be closely linked to the crash type. A rear-end crash may have occurred when the driver of the first vehicle stopped suddenly and the driver of the second vehicle did not have time to react. Or it may have occurred because the driver of the second vehicle was distracted. These crash attributes are often related to the traffic violations that cause the crash, such as failure to yield, traveling on the wrong side of the road, or driving while intoxicated.

In developing their VZAPs, both Macon-Bibb County and Daly City analyzed all crashes that resulted in fatality or serious injury (designated killed or seriously injured, or KSI, crashes) for a 5-year period. By limiting the analysis to KSI, the conditions that lead to the most severe crashes and their contributing circumstances can be identified. The KSI approach was consistent with the Safe System Approach’s principle of eliminating fatal and serious injuries for all road users.

2.6.1 HIGH-INJURY NETWORK (HIN) AND NETWORK SCREENING

A HIN identifies streets with a high concentration of traffic fatalities and serious injuries. Both Daly City and Macon-Bibb County used the roadway network, crash data, and geographic information system (GIS) software to create the HIN. The KSI crash data were joined spatially to the roadway network, allowing for crash analysis at the roadway segment level. Next, crash densities were developed for each roadway segment. Each roadway segment was then ranked based on its weighted crash density (measured as crashes per mile). Roadway segments with the highest weights were incrementally aggregated to create a set of corridors that contribute to the most KSI crashes.

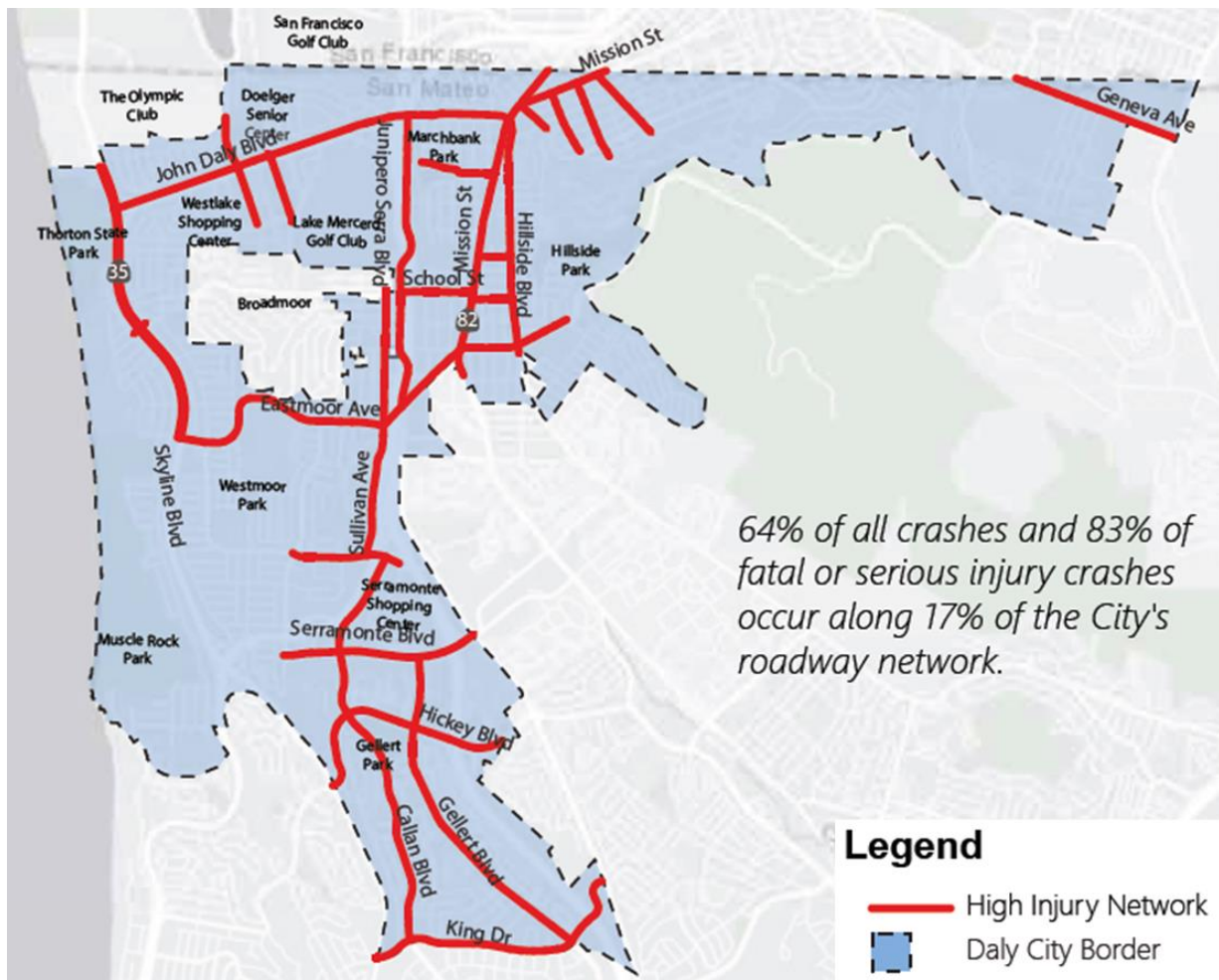


Figure 7: Daly City HIIN, 2013-2017 (Credit: Daly City)

Network screening is the process of identifying sites for further investigation and potential safety treatment. The intent is to identify sites expected to benefit the most from targeted, cost-effective treatments.

Macon-Bibb County conducted a network screening analysis of the HIN to identify the 1-mile segments within each HIN roadway that showed the most KSI crashes. Even with limited funding availability, these segments are short enough to further analyze and to implement low-cost proven safety countermeasures in the short term. The analysis also offered the opportunity to perform RSAs, which are a formal safety performance examination of an existing or future road or intersection by a multi-disciplinary team. The RSAs are used to identify potential solutions leading to both short-term improvements and longer-term efforts, including construction projects. It is a proactive and innovative approach that helps identify safety issues to be addressed in future road improvement projects.

In Daly City, the Vision Zero crash analysis was complemented by a previous Systemic Safety Analysis Report (SSAR) undertaken by the City. A systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. This approach helps agencies broaden their traffic safety efforts at little extra cost. Additional information on systemic approach to safety is available on the [FHWA website](#)⁵.

The VZAP crash analysis was built on the crash database developed for the SSAR with some minor differences - the SSAR analysis was

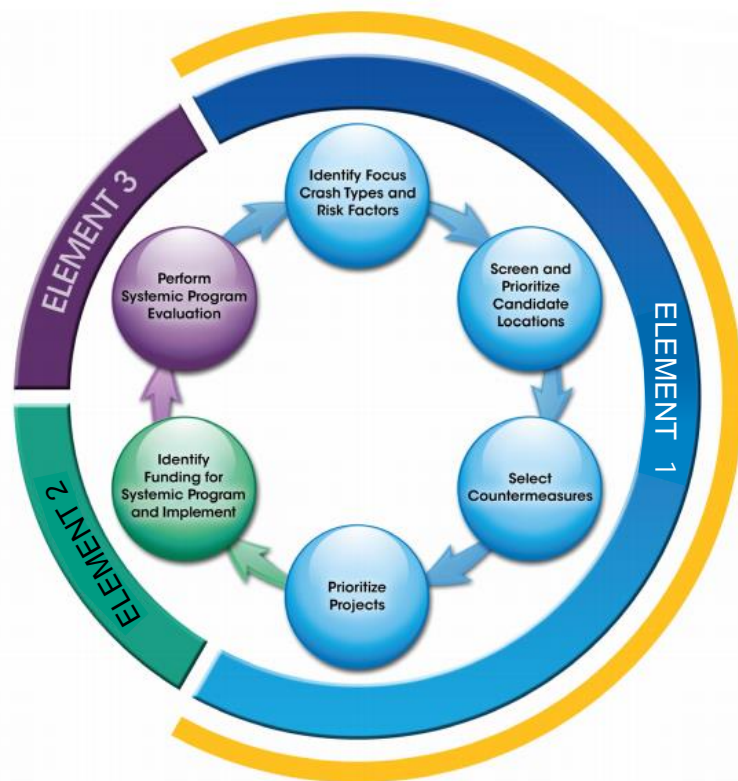


Figure 8: Systemic Safety Planning Process (Credit: FHWA)

based on trends associated with all traffic crashes, while the Vision Zero analysis focused specifically on KSI crashes. Another difference was that the SSAR included some crashes just outside the City limits, which were removed in the vision zero crash analysis. With these different focuses, the results for some key variables differed. For example, rear-end crashes were the second most prevalent crash type in the SSAR, comprising 24 percent of crashes between 2013

⁵ <https://safety.fhwa.dot.gov/systemic/>, accessed December 31, 2020

and 2017, but they made up just 7 percent of fatalities and serious injuries during the same time period.⁶ The city used the SSAR and the Vision Zero crash analysis to identify similarities and differences.

2.6.2 LAND USE AND EQUITY

Beyond evaluating attributes associated with a crash, the data analysis might also evaluate roadway characteristics and the land-use context surrounding the crash. This analysis requires knowing the crash locations and having data about the roadway network and surrounding environment. It can be completed by merging context data with the crash data, then evaluating how the crash data interact with roadway features like speed limit, bicycle and pedestrian amenities (e.g., crosswalk, sidewalk, bike lane), vehicle volumes, and number of lanes, or environmental features such as proximity to certain land uses.

For instance, equity was a priority for Daly City. As a result, the city analyzed crash trends through a socio-economic lens. Communities of Concern are locations with a high concentration of low-income and racial minority households and locations with a high concentration of four or more of the following characteristics: limited English-proficient residents, zero-vehicle households, seniors, persons with disabilities, single-parent families, and severely rent-burdened households.⁷ Residents in Communities of Concern make up 26 percent of Daly City's population. Yet 36 percent of fatalities and serious injuries occur in Communities of Concern, suggesting that disadvantaged populations may be more likely to be involved in serious traffic crashes.⁸

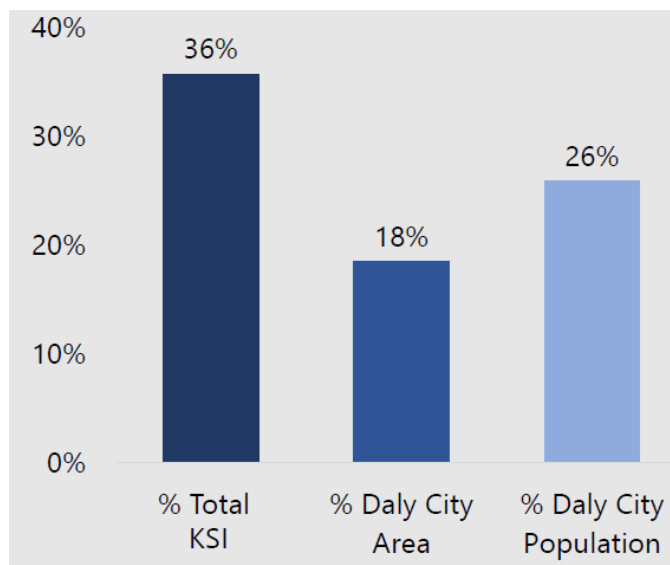


Figure 9: Daly City Communities of Concern
(Credit: Daly City)

⁶ <https://www.dalycity.org/DocumentCenter/View/3369/Vision-Zero-Action-Plan-2020-PDF>, page 8, accessed December 31, 2020

⁷ Metropolitan Transportation Commission Plan Bay Area 2050 Equity Analysis

⁸ <https://www.dalycity.org/DocumentCenter/View/3369/Vision-Zero-Action-Plan-2020-PDF>, page 17, accessed December 31, 2020

Similarly, the Community Vulnerability Index scores each of the 156 Census tracts in San Mateo County based on seven indicators: health insurance coverage, education, supplemental security income, gross rent as a percentage of income, poverty, unemployment, and disability status.⁹ Four of the county's 10 most vulnerable Census tracts fell within Daly City. These four tracts make up 9 percent of the land area in Daly City and include 29 percent of Daly City residents. Serious crashes are overrepresented within Daly City's vulnerable communities, with 40 percent of fatalities and serious injuries occurring in these four Census tracts.⁸

Macon-Bibb County adopted a similar socio-economic approach by establishing inclusive actions to provide safe transportation options for all road users across the county. This approach recognized that certain communities within the county are more affected than others. According to a 2016 Census survey estimates, 13.3 percent of households in Macon-Bibb County have no access to a private vehicle.¹⁰ Those without access to a car must rely on other means of transportation, such as public transit, bicycling, and walking.

2.6.3 CRASH DATA NORMALIZATION

In addition to calculating descriptive statistics for crashes and their contexts, it can be helpful to ground the data through comparison datasets or normalize the data.

2.6.3.1 Comparison Datasets to Understand Over-representation

Comparing descriptive crash statistics to the surrounding context can provide a better understanding of whether a certain crash type is over- or underrepresented in its environment. For example, the Daly City analysis looked at the percentage of serious and fatal crashes that occurred within one-half mile of schools, parks, and activity centers. In addition to reporting that value, the analysis also looked at the percentage of Daly City land area and the percentage of the Daly City population that lives within the half-mile buffers. This allowed a comparison between the percentages of serious and fatal crashes, area, and population, to determine whether the serious crashes were disproportionately represented near these location types and among certain communities.

2.6.3.2 Normalized Data to Understand Rates

Instead of (or in addition to) developing comparison datasets, analyze the crash data by normalizing them to another unit of measure (essentially creating a crash rate). For example, the crash analysis could compare serious injuries and fatalities to population instead of vehicle-miles traveled (VMT). This can assist with comparisons between different roadways in the same jurisdiction.

⁹ San Mateo County Community Vulnerability Index

¹⁰ <https://www.governing.com/archive/car-ownership-numbers-of-vehicles-by-city-map.html>, accessed December 31, 2020

As an example, Macon-Bibb County identified 13 roadways to receive low-cost proven safety improvements. The county also calculated the KSI rate (expressed as KSI crashes per mile) for each of the 13 HIN roadways. Using a KSI rate allowed the county to develop a more accurate comparison of segment crashes than a simple crash frequency, by improving the ability to compare crashes on roadways of differing lengths. For example, two roadways could have the same number of crashes but different roadway lengths. By factoring in a measure of exposure (in this case, route length), the calculation indicates which roadway may be a more promising choice for safety treatments, especially when funding is limited.

2.7 CONDUCTING A VISION ZERO WORKSHOP

An open-house Vision Zero workshop can be another important step in developing a VZAP. The workshop could inform stakeholders about the principles of Vision Zero and the Safe System Approach, share the results of the analytical process, and provide a forum to discuss emphasis areas, strategies and specific actions for consideration. In addition, the workshop serves to allow stakeholders to strategize with potential safety policies and programs to be included in the plan. The stakeholders who participate in the workshop typically represent organizations and groups that have a vested interest in road safety. Stakeholders can include decision-makers who can advance the VZAP process by helping plan and implement the goals, as well as evaluate progress. Table 1 below identifies typical stakeholders.

Table 1. Areas of Practice and Potential Vision Zero Stakeholders

Area	Potential Stakeholder
Engineering	<ul style="list-style-type: none"> • Director of Engineering/Public Works • County/City Engineer • Transportation Planner/Engineer • State DOT Region or District Office • FHWA Division Office • Bureau of Indian Affairs
Enforcement	<ul style="list-style-type: none"> • Chief of Police • County Sheriff's Department • Local/Tribal Police Department • State Police/Patrol • College Campus Police
Emergency Services	<ul style="list-style-type: none"> • Local Emergency Service providers • Emergency Service Director/Fire Chief • Hospitals • Department of Health

Area	Potential Stakeholder
Education	<ul style="list-style-type: none"> • Office of Communications/Public Affairs • Department of Education/Schools • Public Safety Organizations and Coalitions (e.g., pedestrian and bicyclist groups) • Driving education and training professionals (e.g., AAA, AARP) • Department of Public Health
Other Stakeholders	<ul style="list-style-type: none"> • Agency Mayor/Council/Commissioners • Local Planning and Zoning Department or Commission • Governor’s or State’s Highway Safety Office • Metropolitan Planning Organization/Regional Council of Governments • Local/Tribal Technical Assistance Program • Transit Agency • Community Advocates

The Macon-Bibb County conducted an open house-style workshop to provide the public and relevant stakeholders with an opportunity to provide input in developing its Action Plan. The workshop was well publicized prior to the event with the Macon-Bibb County Public Affairs Office sharing a press release in a newsletter distributed to more than 3,000 subscribers and an article posted on the Macon-Bibb County website.



Figure 10: Macon-Bibb Vision Zero Workshop (Credit: KLS Engineering, LLC)

Similarly, Daly City also conducted a workshop involving the various city, regional, State, and Federal stakeholders. Workshop participants came from different backgrounds, covering the five Safe System elements. An elected official was also present and contributed to the discussion. It is noted that Daly City intends to conduct a public workshop after implementing the Action Plan.

Both workshops' outcomes were positive which is reflected in the final VZAP's.

2.8 IDENTIFYING EMPHASIS AREAS

An emphasis area is an area of opportunity to improve safety through a comprehensive approach. The VZAP emphasis areas should be consistent with trends identified during data analysis. If data are unavailable, emphasis areas may address concerns of stakeholders and the community.

The State SHSP and HSP provide great starting points. In most cases, these plans have already used data analysis to identify emphasis or priority areas at the State level that may be applicable to the local agency. Local Road Safety Plans which follow the SHSP process are also another way to determine safety challenges and solutions for local agencies.

For example, Macon-Bibb County worked with the Georgia Governor's Office of Highway Safety (GOHS), which leads Georgia's SHSP and HSP, to review and incorporate the relevant emphasis areas and strategies from these two plans. This activity gave both the County and the GOHS an opportunity to collaborate for the first time. As a result of the partnership, Macon-Bibb County's VZAP includes emphasis areas and strategies that are consistent with the SHSP and HSP.

2.9 DEVELOPING THE VISION ZERO ACTION PLAN

A VZAP is a living document and includes information on existing safety plans and policies, feedback from community and stakeholders, crash analysis, HIN and emphasis areas and implementable actions. It is also typical of a VZAP to identify a reachable "zero year" date as the goal. Many agencies use a 15 to 20-year time frame as their target. For instance, Daly City and Macon-Bibb County identified 2035 and 2040, respectively, as the target years to eliminate all traffic fatalities and serious injuries.

2.9.1 DEVELOPING IMPLEMENTATION PLAN

An implementation plan is an integral component of VZAP and needs to include a discussion of implementation items such as actions, responsible parties, costs, and partners. The implementation plan, for each of Daly City and Macon-Bibb, was based on the Safe System Approach with implementation segmented across the Safe System elements: Safe Roads, Safe Speeds, Safe Road Users, Safe Vehicles, and Post-crash Care. In addition, a separate category called 'Vision Zero Program' was also included to establish a framework for the jurisdiction to institutionalize Vision Zero within its agencies. Each of the actions in the implementation plan

lists the timeline, cost, lead agency and partners. Both VZAPs categorized action items for implementation as short (<5 years), medium (5–10 years), and long-term (>10 years) with the understanding that any of the actions can be advanced or repositioned depending on the future needs and funding available of each local agency. In addition, both agencies indicated that working with their partners helped prioritize future actions on an annual basis. Coordinating other projects and programs through the Safe System Approach and approved action plan can leverage other funds and opportunities to achieve the Vision Zero goal. This is part of an evaluative approach whereby the actions are revised, as needed, to mobilize resources to those issues with the greatest need.

3. CHALLENGES, LESSONS LEARNED, AND OPPORTUNITIES

This section discusses challenges and opportunities that local agencies typically confront as they develop their VZAPs. Much of the information presented is drawn directly from the lessons learned by Daly City and Macon-Bibb County as they developed their VZAPs.

3.1 UNDERSTANDING THE LOCAL CULTURE AND EMBRACING SAFETY CULTURE

Challenge: Vision Zero provides an opportunity to comprehensively examine the agency's transportation goals and genuinely focus on safety as the highest priority. This different perspective may be challenging for some communities to embrace initially. A successful VZAP requires agency commitment to support and strengthen a safety culture which places safety first and foremost in road system-investment decisions. The challenge is to foster support from staff and community leaders who may believe in the vision but have a difficult time committing to the steps necessary to make it a success.

Lessons Learned: One way to address the challenge is for community and agency leaders to demonstrate strong commitment to the Vision Zero goals. Executive management of both Daly City and Macon-Bibb County enthusiastically supported a strong safety culture that encouraged agency staff to follow and actively effect change.

Opportunity: Vision Zero and the Safe System Approach requires support from a strong safety culture. Changing culture is often cited as key to transforming traffic safety. This starts internally with the agencies charged to lead and their willingness to modernize and embrace change. All agencies can be strong leaders in this respect.

Activities may include training and workshops to help staff learn about safety in general, and Safe System Approach concepts and Vision Zero examples and opportunities in particular. It may be helpful to directly engage participants by asking each what it means to create a safe organization where they integrate safety into their program areas. Participants could also discuss how to ensure safe travel options for everyone in their community. Another way to learn is to bring in external speakers to facilitate and present examples from other places (e.g. Road to Zero Coalition, Governors Highway Safety Association, Vision Zero Network, etc.).

A strategy for raising awareness—within agencies and among the public—is to help humanize traffic-safety issues. Vision Zero offers an opportunity to elevate the voices and stories of people who have been involved or who have lost loved ones in crashes. This may entail inviting victim advocates to share their stories during staff training events in public workshops. Note: Several Vision Zero cities have created working groups comprised of public advocates and other external stakeholders that allows their direct involvement in developing and/or implementing a VZAP.

3.2 NAVIGATING RELATED SAFETY CONCEPTS AND UNDERSTANDING CONCURRENT SAFETY EFFORTS

Challenge: Vision Zero, Systemic Approach to Safety, Safe System Approach, Complete Streets, SHSP, and HSP all have overlapping goals, objectives, and principles. The Safe System Approach has gained momentum across the United States and has increasingly become a core aspect of the Vision Zero. Because safety technology, terminologies, and frameworks are constantly evolving, it is more effective that plans reflect current thinking and appropriately address the correlation of different safety concepts. In addition, the scale, cost, and focus of a VZAP can vary based on the work the community has already completed, is currently working on, or plans to develop in the near future.

Lessons Learned: Daly City was able to take advantage of other ongoing activities, such as [systemic safety analysis](#) and the pedestrian and bicycle master plan, which allowed the city to spend time to develop strategies that would not otherwise be possible. Similarly, Macon-Bibb County reviewed the emphasis areas listed in the Georgia SHSP (2019), identified those relevant and included those that specifically related to intersection safety and pedestrians. The VZ effort was the first time that the County also worked with the Georgia GOHS, which leads Georgia's SHSP and HSP, to identify recommendations specifically relevant to Macon-Bibb County.

The Daly City VZAP was developed concurrently with a bicycle and pedestrian master plan and the SSAR. Similarly, Macon-Bibb County coordinated implementation of its VZAP with the Macon Action Plan, Macon Urban Development Plan and the region's 2040 Long Range Transportation Plan (LRTP).

Opportunity: It is important to develop a strong understanding of Vision Zero and the Safe System Approach. One strategy is to share Vision Zero resources (e.g., Safe System Approach principles, definition and meaning of the HIN, leading causes of injury crashes) with internal agency staff and other stakeholders. For example, the Denver Regional Council of Governments (DRCOG) is developing a toolkit tailored to help local jurisdictions in Colorado with the local safety plan-development process. Close coordination among various plans is also recommended to ensure analysis findings and recommended actions are consistent.

3.3 SECURING AGENCY LEADERSHIP COMMITMENT

Challenge: Successful Vision Zero Plans depends on sustained commitment. Multiagency collaboration is also crucial to Vision Zero success. For example, it is beneficial that the transportation department, which often leads Vision Zero efforts, may work closely with the public health department, the mayor's office, the police department, and other relevant agencies. Involving these leaders is essential to ensure consistent interagency coordination and ownership of activities and reminds everyone that safety is a shared responsibility.

Lessons Learned: In Macon-Bibb County, the mayor and county commissioners took an active role—they participated in kickoff meetings, the Vision Zero workshop, and demonstrated to agency leads that Vision Zero was important to the county and the community. This buy-in set the tone for follow-up agency involvement.

Similarly, Daly City received support from the mayor and city council throughout the process. Council members participated in kickoff meeting and workshop. In addition, Daly City had a champion at the Engineering Division of the Public Works Department who ensured that other key staff were involved and bought into the process; the success of this effort proved a significant help during staff turnover.

Opportunity: These components may not align initially, so jurisdictions can be proactive to involve various community leaders (and potential future leaders) and the relevant agencies to introduce them to the Vision Zero and build awareness of opportunities to improve safety throughout their communities. Recognize that events will occur that are not anticipated or easily controlled—such as a high-profile crash, a funding opportunity, or media attention—but that can motivate people to engage in traffic safety efforts. So, investing early and often and building interest and consensus can bring benefits later.

3.4 ESTABLISH A VISION ZERO WORKING GROUP (VZWG) AND IDENTIFY A CHAMPION

Challenge: Create a strong Vision Zero task force with diverse stakeholders—from the public realm and community groups—to share responsibility and sustain commitment to the work. Bringing diverse voices and ideas to the task can foster buy-in and commitment to the work necessary to make change. Similarly, identifying a leader and/or champion with sufficient organizational responsibility for the Vision Zero initiative can make a difference in the speed and adequacy of implementing action items relating to the Vision Zero Action Plan.

Lessons Learned: In Macon-Bibb County, the VZWG included county staff from planning, engineering, enforcement, schools, public affairs, the Pedestrian Safety Review Board (PSRB), and Bike Walk Macon. The VZWG met monthly and managed every step of the plan development. There was no formal VZWG in Daly City; however, the Engineering Division of the Public Works Department acted as a champion to lead the VZAP development.

Both Daly City and Macon-Bibb County assigned a staff member to advance the Vision Zero effort through implementation. In Macon-Bibb County, the need for a clearly designated champion was filled by the chair of the PSRB. Meanwhile the VZWG is trying to acquire funding to hire a transportation safety manager whose role would be to execute the VZAP and recommended safety improvements. Regular meetings are hosted with key leadership to increase awareness and keep the vision zero agenda at the forefront.

Opportunity: Community members, including the business community, can also play an important role in adopting a VZAP. The vehicle and technology industry can lend a hand in ensuring safety of vehicles is being addressed. Given that communities have many competing priorities and limited resources, public shows of support can help elevate Vision Zero to community-wide importance. Champions can emerge both inside public agencies and within the broader community.

3.5 CONDUCT DATA-DRIVEN SAFETY ANALYSIS

Challenge: Data is critical to a crash analysis. However, given various limitations related to data ownership and privacy issues, as well as reliability, it can be difficult to collect and analyze high-quality data on crashes and their context. When available, traffic and roadway data are essential to ensure an accurate safety analysis. Ideally, jurisdictions will have their own reliable data; if not, they can seek data from regional, State, or Federal agencies.

Another challenge for communities with fewer serious injuries and fatalities is the difficulty of drawing meaningful conclusions about crash trends or contributing contextual factors. These communities may consider broadening the pool of crashes they analyze to increase their datasets, for example, by looking at more years of crash data or looking at all injury crashes. In addition to traditional sources of data, such as crash, roadway, and first responders, engaging the public can also be an effective tool to ensure transparency in the process.

Lessons Learned: In developing their VZAPs, Macon-Bibb County and Daly City analyzed all crashes that resulted in fatality or serious injury (usually designated as *killed or seriously injured*, or *KSI*, crashes) for a 5-year period. By limiting the analysis to KSI, the conditions that lead to the most severe crashes and their contributing circumstances can be identified. The KSI approach was consistent with Safe System Approach's principle of eliminating fatal and serious injuries for all road users.

In addition, Macon-Bibb County collected public comments through an online interactive tool, which allowed citizens to pinpoint specific areas of concern on a map. The tool contained a map of the county—viewable as a street map or an aerial photo—that could be enlarged to identify specific streets/intersections. A drop-down menu in a sidebar next to the map provided a list of questions for users to provide feedback. The web tool was available online for approximately 6 weeks. The county received more than 200 comments, which were incorporated in the plan development.

Opportunity: Depending on a State's organizational structure, crash data can be stored by the State DOT, the Department of Public Safety, or the Department of Motor Vehicles. Thus, a close working relationship is needed with other expert data systems to help analyze the crash data.

Some jurisdictions may not have robust data, and therefore may have a difficult time advancing Vision Zero. However, limited data should not inhibit developing a VZAP. Agencies can use auxiliary data, such as traffic citations, census data, hospital records, public input, and speed monitoring. Other risk-assessment processes, such as RSAs or the United States Road Assessment Program (usRAP), provide systematic assessment of risk methods to identify major safety shortcomings. They can be used to identify safety issues for a VZAP.

3.6 IMPLEMENT LOW-COST COUNTERMEASURES

Challenge: Once the safety issues are identified, an agency can identify countermeasures to address them. A number of countermeasures have been developed over time to address safety issues, with varying costs and effectiveness. However, not all of them are practical at the local level because of cost considerations. By focusing on low cost, quick-build projects, jurisdictions can help build perception of and buy-in for Vision Zero. These may not be the most challenging or expensive projects, but rather they can demonstrate the ability to make changes and showcase possibilities. Vision Zero expands well beyond traditional individual-level solutions, such as pedestrian-education campaigns, and focuses more on low cost effective solutions that can be widely deployed (reduced speeds, crosswalk restriping, stop bar alignments, larger signs, etc.)

Lessons Learned: The VZAPs for both Macon-Bibb County and Daly City included a comprehensive list of improvements that the agencies and their safety partners will pursue in the years ahead. However, both agencies recognized that, because of cost constraints, not all actions will take place simultaneously. As a result, their VZAPs categorized action items for implementation as short (<5 years), medium (5–10 years), and long-term (>10 years) with the understanding that any of the actions can be advanced or repositioned depending on the future needs and funding available of each local agency. In addition, both agencies indicated that working with their partners helped prioritize future actions on an annual basis. Coordinating other projects and programs through the Safe System Approach and approved action plan can leverage other funds and opportunities to achieve the Vision Zero goal. This is part of an evaluative approach whereby the actions are revised, as needed, to mobilize resources to those issues with the greatest need.

As an example of short-term implementation, Daly City was awarded an \$180,000 grant in summer 2020 to retrofit crosswalks along roadways on the HIN with high visibility crosswalk striping, stop bar re-alignment and other improvements. Daly City began implementing Vision Zero improvements in its annual street resurfacing project by striping narrowed lanes to slow traffic on select streets.

Opportunity: Most agencies can implement improvements in the short term by using low-cost treatments, including traffic signs, pavement markings, and vertical delineators. Knowing the

road maintenance schedule can help implement treatments such as road diets and other traffic-calming measures that would otherwise be considered longer term. In short, all road projects—whether new, rehabilitation, maintenance, or some combination thereof—could be considered as candidates for safety improvements. In addition, Vision Zero communities can incorporate the Safe System Approach when selecting strategies and countermeasures. They can be countermeasures that ensure separation in space and time for different modes, engineering countermeasures that control speeds, and strategies that increase users' awareness.

3.7 MANAGING SCOPE AND FUNDING CONSTRAINTS

Challenge: Local agencies often have limited dedicated transportation safety funds and they often compete with other local agencies for Federal, State, regional, or local funds. Proposing projects through current safety funding programs can be time-consuming, with little guarantee of success for most local governments. Therefore, scoping the VZAP development is important and an agency should be clear about its expectations.

Lessons Learned: In Daly City and Macon-Bibb County, State Safety and State District Engineers, FHWA Division Safety Specialists, and Local Technical Assistance Program (LTAP) representatives were present at the kickoff meetings and the workshops. This involvement at the State and Federal levels created a partnership intended to last well beyond plan development and potentially pave the way for implementation.

Opportunity: Agencies could brainstorm *quick build* concepts or “institutional changes” when developing the VZAP so they can have projects ready when the action plan is adopted. This can be prepared at the staff level or, if desired, by the agency or through outreach to the stakeholder group or the VZWG, if there is one. Having a list of the top 5 quick-build projects allows the agency to get started and implement the plan as soon as possible after adoption.

For example, prior to adopting its VZAP, Daly City staff held a series of discussions to create and select the top 5 quick-build concepts; staff considerations included effects on traffic and parking, feasibility, cost, and timeline.

3.8 INEXPERIENCE WITH DATA ANALYSIS TOOLS

Challenge: A challenging issue is that crashes on locally managed roadways tend to be dispersed, especially on lower-volume roads. Using established methods to select countermeasures often proves unsuccessful if crashes are not spatially clustered. Determining what locations warrant countermeasures or low-cost, systemic improvements requires careful, sophisticated data analysis. But some local agencies do not have the personnel, resources, or software to analyze safety data and identify countermeasures—even if sufficient crash data is available.

Lessons Learned: The Georgia Department of Transportation (GDOT) made its Numetric tool available in early 2020 for network screening, diagnosis, and countermeasure selection. The Numetric tool was not available during the data analysis process but currently, Macon-Bibb is using the tool to query intersection crashes.

Opportunity: Local agencies can also use free mapping software, such as Google Maps and Google Fusion Tables, to perform spatial analysis and generate heat maps. Consequently, all relevant stakeholders can view the analysis. Even without advanced analytics, spatial representation of crashes, and coding roadway characteristics (e.g., wet/dry pavement or light/dark), agencies can use this software to perform quick visual inspections of conditions under which crashes occur. The results of these inspections can inform more detailed analysis and investigation.

4. SUMMARY AND STATUS

The VZAPs incorporated the guiding principles of the Safe System Approach to the extent possible and included the following primary components.

- **Safe System Approach.** The Safe System Approach acknowledges that traffic fatalities and serious injuries are preventable and that system designers (including transportation planners, engineers, and policymakers) have a responsibility to put safety first in the design and operations of a road system.
- **Multidisciplinary Leadership.** A multidisciplinary stakeholder group guided the development of the VZAP. The group included staff from planning, engineering, enforcement, schools, public affairs, and other agencies.
- **Data-driven.** Using the most recent 5 years of complete crash data. The data helped prioritize resources so that investments provide the most benefits, as driven by a reduction in fatalities and serious injuries. Crash trends and feedback from agency staff were used to identify HINs and emphasis areas.
- **Stakeholder and Public Engagement.** The plans were developed in consultation with agencies and organizations at the county/city, regional, and State levels through a series of meetings, as well as a Vision Zero workshop. These priorities and concerns, combined with the data analysis, formed the basis of the strategies and actions.
- **Equitable.** The plans took an equitable approach by establishing inclusive actions to provide safe transportation options for all road users across the jurisdictions. This approach recognizes the fact that certain communities are more affected than others.

4.1 DALY CITY IMPLEMENTATION STATUS

After the completion of the VZAP, Daly City conducted a stakeholder webinar to solicit final input prior to adoption. On April 27, 2020, the Daly City Council approved the VZAP, the very first plan of its kind in San Mateo County. The presentation of the VZAP to the City Council was conducted via teleconference and broadcast on the web.

Since the time of the VZAP adoption, Daly City has significantly advanced some of the recommended action items as described below:

- Posted the adopted VZAP on Daly City's website (<https://www.dalycity.org/936/Vision-Zero-Action-Plan>).
- Applied and received an \$180,000 grant in summer 2020 to retrofit crosswalks along roadways on the HIN with high visibility crosswalk striping and other improvements.
- Incorporated narrowing of travel lanes, stop bar re-alignment, and other Vision Zero style improvements into the annual slurry seal projects list.

- Applied for grants to perform Vision Zero style improvements from a quick build Active Transportation Program (ATP) grant, and have applied for a local grant of consultant funds to perform branding and marketing for Daly City Vision Zero.
- Began implementing Vision Zero improvements in its annual street resurfacing project by striping narrowed lanes to slow traffic on select streets.
- Implemented Vision Zero style improvements on Guadalupe Canyon Parkway, part of the HIN, during a resurfacing project near John F. Kennedy elementary school. Changes included narrowing travel lanes to reduce vehicle speeds and striping a buffer to shift travel lanes away from the curb-side school pick-up/drop off zones.
- Monthly Traffic Safety Committee now includes a report from the Police Department on any serious injury or fatal crashes. This was one of the items in the action plan. The group discusses the crashes and determines if and when improvements will be considered based on the analysis from police and the group.

4.2 MACON-BIBB COUNTY IMPLEMENTATION STATUS

The Macon-Bibb VZAP was presented and adopted by the full Macon-Bibb Commission on November 17, 2020. The hearing was streamed live on Macon-Bibb County's Facebook page and county website.

Currently, the County is conducting discussions with GDOT and GOHS to hire a Safety Manager, which was one of the items in the VZAP. The County also participated in a mandatory GOHS grant seminar; which they may need to file a grant proposal for the Safety Manager position.

5. RESOURCES

This section lists the various technical resources that were used in the development of the VZAPs. Some existing Federal funding resources that could be applied to Vision Zero projects are also provided. It is noted that many of these resources were introduced during the Daly City and Macon-Bibb County Vision Zero workshops.

5.1 TECHNICAL RESOURCES

- FHWA Zero Deaths and Safe System (<https://safety.fhwa.dot.gov/zerodeaths/>)
- Transportation Safety Planning and the Zero Deaths Vision: A Guide for Metropolitan Planning Organizations and Local Communities (<https://safety.fhwa.dot.gov/tsp/fhwasa18024/chp1.cfm>).
- Institute of Transportation Engineers Vision Zero (<https://www.ite.org/technical-resources/topics/transportation-safety/>).
- FHWA Systemic Approach to Safety (<https://safety.fhwa.dot.gov/systemic/>).
- Focused Approach to Safety (<https://safety.fhwa.dot.gov/fas/>).
- Local Technical Assistance Program (<https://www.fhwa.dot.gov/clas/ltap/>).
- Speed Management Action Plan (https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa18050/).
- FHWA Local Road Safety Plans (https://safety.fhwa.dot.gov/provencountermeasures/local_road/).
- FHWA Proven Safety Countermeasures (<https://safety.fhwa.dot.gov/provencountermeasures/>).
- FHWA Every Day Counts Initiative, Safe Transportation for Every Pedestrian (https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/step2.cfm).
- Crash Modification Factors Clearinghouse (<http://www.cmfclearinghouse.org/>).
- Pedestrian and Bicycle Safety Guide and Countermeasure Selection System (<http://www.pedbikesafe.org/>).

5.2 FUNDING RESOURCES

- Safe Routes to School (<https://www.transportation.gov/mission/health/Safe-Routes-to-School-Programs>).
- Surface Transportation Block Grant Program (<https://www.fhwa.dot.gov/specialfunding/stp/>).

- Congestion Mitigation and Air Quality Improvement Program (<https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm>).
- Motor Carrier Safety Assistance Program (<https://www.fmcsa.dot.gov/grants/mcsap-basic-incentive-grant/motor-carrier-safety-assistance-program-mcsap-grant>).
- NHTSA Highway Safety Grant Program (<https://www.nhtsa.gov/highway-safety-grants-program>).
- State Highway Safety Grant Programs (<https://nhtsa.dr.del1.nhtsa.gov/About-NHTSA/Highway-Safety-Grant-Programs>).
- Highway Safety Improvement Program Funding (<https://www.fhwa.dot.gov/fastact/factsheets/hsipfs.cfm>) available in States for all public roads.

ACRONYMS

ATP	Active Transportation Program
DOT	Department of Transportation
FHWA	Federal Highway Administration
HIN	High-Injury Network
ITE	Institute of Transportation Engineers
GHOS	Governor's Office of Highway Safety (Georgia)
KSI	Killed or Seriously Injured
L RTP	Long Range Transportation Plan
LTAP	Local Technical Assistance Program
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
PSRB	Pedestrian Safety Review Board
RSA	Road Safety Audit
SHSP	Strategic Highway Safety Plan
SSAR	Systemic Safety Analysis Report
USDOT	United States Department of Transportation
usRAP	United States Road Assessment Program
VZAP	Vision Zero Action Plan
VZWG	Vision Zero Working Group