

## MEMORANDUM

Date: March 2019  
To: Franz Loewenherz, City of Bellevue  
From: Sarah Saviskas, Chris Breiland, Dana Weissman, and Bianca Popescu, Fehr & Peers  
Subject: **Current and Best Practices Assessment Technical Memo**

SE18-0634

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The first section of this memorandum describes Bellevue's past and current policies, programs, and practices in support of traffic safety (Task 4). The second section identifies overarching strategies and specific actions under each strategy that cities around the country currently are implementing to improve safety and move toward zero fatalities and serious injuries on their roadways (Task 5). While some of the actions summarized here may not be applicable or appropriate in Bellevue, this full set helps illustrate what is possible. The forthcoming Task 6 memorandum will present a narrower list of safety actions that are recommended for Bellevue.

To help develop a cohesive and comprehensive safety program moving forward, this memo also outlines a new organizing framework – the Safe Systems approach – which identifies four key pillars: Safe People, Safe Streets, Safe Speeds, and Safe Vehicles. The City of Bellevue has identified four overarching elements that span the Safe Systems pillars and that, together with the pillars, are essential in achieving zero: Leadership, Culture, Partnerships, and Data<sup>1</sup>. The Task 5 section is organized around the Safe Systems pillars and overarching elements.

## Task 4 - Bellevue Policies, Programs, and Practices Summary

### Historical Overview

The City of Bellevue has a long history of implementing policies, programs, and practices in support of traffic safety. The City initially relied on federal and state policies, such as seat belt laws, to protect its residents on the road, but began taking action at the local level in the 1980s. In 1985, Bellevue

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<sup>1</sup> The Safe Systems pillars and overarching elements are consistent with the Core Elements identified in the joint ITE/Vision Zero Network resource "Core Elements for Vision Zero Communities": [https://visionzeronetwork.org/wp-content/uploads/2018/11/VZN\\_CoreElements\\_FINAL.pdf](https://visionzeronetwork.org/wp-content/uploads/2018/11/VZN_CoreElements_FINAL.pdf)



launched its **first traffic safety program**, becoming one of only two cities in Washington State with a formal program. In the first few years of the program, Bellevue led pilot projects and tried physical interventions. For example, in 1985, Bellevue was the first city in the state to implement speed humps. This initial traffic safety program had a heavy emphasis on education – it published traffic safety newsletters and organized a speed watch program, where residents could borrow radar speed guns from the police to measure speeds.

In 1987, Bellevue launched the **Siggy Safety City Program**, which specifically targeted children. The Police Department had a designated traffic safety officer who served as the program’s mascot, Siggy, and traveled to schools to talk to kids about how to safely walk and bike. Bike rodeos taught kids how to ride bikes and properly wear a helmet, which took place until the early 2000s. This program, along with some of Bellevue’s traffic calming interventions, won awards in the late 1980s and early 1990s from American Automobile Association (AAA) and the Washington Traffic Safety Commission (WTSC) for traffic safety and documented crash reductions.

In addition to programs internal to the City, Bellevue led the **Eastside Pedestrian Safety Task Force** in the late 80s and early 90s in collaboration with Issaquah, Mercer Island, Kirkland, and Redmond. While the Task Force ultimately disbanded, the group distributed safety literature in the community (which state grants helped fund) and organized a pedestrian safety week every year to raise awareness and educate the public on pedestrian safety challenges. Similarly, Bellevue used to organize a **Neighborhood Traffic Calming Forum** every one or two years, which provided an opportunity for jurisdictions across Washington State to learn about what is being done around the state and share lessons learned. Based on discussions with City staff, these early safety programs, leadership roles, and forums were very successful, but largely ended because of limited staff resources and shifting priorities within the City.

Bellevue launched its **Pedbee Education Program** in 1993, which teaches children in grades K-5 about pedestrian and traffic safety. The program stemmed from the City’s desire to focus on walkability and improving the pedestrian environment. Its safety mascot, “Pedbee”, is a singing bumblebee that visits schools, leads pedestrian safety activities such as how to properly cross a street, and hands out fun, educational workbooks. The program also installed a playground game that messaged traffic safety tips to kids through a hands-on activity. Pedbee is still used in school presentations, though it operates on a more ad hoc basis based on when the city receives grant funding and schools request training. The last Pedbee event was in 2015.

Over the years, Bellevue has continued trying new, innovative ideas to further traffic safety – winning additional awards along the way. Some other programs and initiatives have included:



- The **Eyes on the Road campaign** created car window decals to raise awareness on distracted driving. They were put on all City vehicles and there was some outreach to high school students, but resources for broad outreach were limited. This program eventually wound down.
- **Streets are for Everyone (SAFE) blog** was created by Bellevue Transportation Department's Neighborhood Traffic Safety Services (NTSS) group and offers tips on making neighborhoods safer places to live, links to articles and stories about traffic safety concerns, and services the city offers. It won an award from APWA. The site is still viewed today even though there hasn't been new content since 2016.
- Bellevue's **Residential Traffic Guidebook** highlights services offered by NTSS, a traffic safety toolkit, and how these services are implemented. The Guidebook was written for residents so they can easily understand the advantages, disadvantages, and constraints associated with each safety tool in nontechnical terms.
- **Yard Sign Program** – Students did art projects on traffic safety in art class, and the City converted kids' artwork into yard signs.
- Bellevue School District brought in an artist that worked with kids to create **tiles on traffic safety**.

In the 2000s, Bellevue began shifting towards a holistic, complete streets approach that strives to safely accommodate all travel modes. Bellevue implemented its first official **road diet** on 116<sup>th</sup> Avenue NE in 2015, but the City has been doing road diets since 1990 – even though they were not branded as such. Eleven roadways went on a diet between 1990-2000, and several other road diet projects have since followed. In 2015, Bellevue City Council passed a resolution providing a framework to achieve Vision Zero, and just a year later, Council passed a **Vision Zero Ordinance**, which established the goal of zero fatalities and serious injuries in Bellevue by 2030. Also in 2016, Bellevue adopted a **Complete Streets Ordinance**. Since the adoption of the ordinance, more than 75 percent of implemented road projects have included bicycle facilities.

One of the original traffic safety programs that began in the 1980s has been an ongoing city priority and continues to be a key element of Bellevue's transportation safety strategy. The City's neighborhood traffic safety budget has increased over time, starting at \$50,000 in 1985, increasing to \$450,000 in 2007, and increasing once again in 2016 with the voter-approved Neighborhood Safety, Connectivity, and Congestion Levy, which provides approximately \$7.4 million in funding – \$900,000 of which is specifically for annual bicycle facility improvements. This 20-year levy supplements existing safety, sidewalk, maintenance, traffic management, and bicycle facility programs, and it has enabled additional City staff member positions and more rapid project implementation.



## Transportation Safety in Bellevue Today

This section summarizes some of Bellevue's current policies, programs, and practices on transportation safety. While there are many great examples in Bellevue, there is currently no overarching, organizing principle that ties these strategies together – something that Bellevue seeks to change through its Vision Zero Action Plan. They are organized by theme in this memorandum for legibility, but these themes are not used as organizing principles within the City.

Bellevue's current programs, policies, and practices are in line with those found in many similar communities around the country, though there is room for improvement to elevate transportation safety in Bellevue to the next level. The Task 5 section focuses on strategies that cities around the country currently are implementing to improve safety and move toward zero fatalities and serious injuries on their roadways. A future memorandum will identify specific actions that Bellevue could consider implementing in the 0-3 year time frame to advance toward Vision Zero.

### Administration/Policy

The City of Bellevue has established a variety of plans, regulations, and policies to improve transportation safety in the city. The **Transportation Commission** is an advisory body of seven Bellevue residents appointed by the mayor that advises the City Council on transportation-related issues, including transportation safety and project prioritization.

Bellevue's **Transportation Element** in the Comprehensive Plan contains speed management and safety policies, and it establishes 2035 commute trip non-drive alone mode share targets for citywide residents (45%), citywide workers (40%), and Downtown workers (65%).

The **Multimodal Level of Service (MMLOS) Metrics, Standards and Guidelines report** approved by the Bellevue Transportation Commission in 2018 introduces performance metrics, standards, and guidelines for every travel mode. Transportation safety will be improved with a more complete set of infrastructure for all modes. Bellevue is updating its Transportation Design Manual to incorporate MMLOS standards, and MMLOS is now being routinely applied as part of city-led transportation planning, design, and engineering projects.

Bellevue has a **Pedestrian-Bicycle Plan** (2009) and its associated project list is found in the **Transportation Facility Plan**, which is updated every two years and supports the construction of complete streets projects. The City's **Pedestrian and Bicycle Implementation Initiative** advances project designs and programs identified in the Pedestrian-Bicycle Plan, such as the Downtown Demonstration Bikeway. Additionally, the **Pedestrian and Bicycle Access Improvements program**



is used to design and construct small projects from the plan. All of these plans have a safety component related to improving the pedestrian-bicycle infrastructure and addressing safety issues.

The City has numerous other regulations and policies to enhance land use patterns that promote safe walking, biking and transit:

- Bellevue has officially endorsed NACTO's Urban Street Design Guide.
- In recent years, there have been amendments to the Land Use Code related to downtown that improve conditions for people cycling, such as the Green and Sustainability Factor score applied to new development.
- Bellevue has a variety of other complete streets policies and guidelines, some of which include mixed-use zoning or incentives; streetscape design guidelines; connectivity standards; schedule and budget for routine maintenance of bike facilities; maximum car parking standards; shared-parking allowances; a bike parking ordinance for all new developments that specifies required quantities and location; a public program that provides grants or free bike racks upon request; etc.

### **Engineering, Operations, and Maintenance**

Several different City departments have engineering, operations, and maintenance programs and practices in place to make streets in Bellevue safer.

Bellevue utilizes **adaptive traffic signal systems (SCATS)**, and Bellevue's Traffic Management Center continually adjusts most of their signal timing to keep traffic moving. As a result of using this system, waiting times for pedestrians and bicyclists have been reduced by an estimated 20 to 30 percent. At the Bellevue Transit Center and other locations along the downtown pedestrian corridor, all-way walk phases with diagonal crossings (also known as pedestrian scrambles) have recently been implemented. Leading pedestrian intervals (a short period of time when the pedestrian gets the walk indication but all vehicles are stopped) have recently been implemented at several signals across Bellevue. Additionally, the City began systematically installing flashing yellow arrows as part of the citywide signals upgrade in 2010, and this **Flashing Yellow Arrow Program** involves monitoring and reviewing crashes every 6 months. At many locations, the traffic signal has a red arrow indication when there is a pedestrian crossing the intersection to reduce potential conflicts.

The Transportation Department has several programs relating to engineering solutions. The **Collision Reduction Program** aims to reduce the number of crashes on city streets by annually analyzing and reviewing all traffic collisions occurring in Bellevue and identifying countermeasures to mitigate these crashes. It provides proactive measures such as road re-channelization, access revision, pedestrian crossing enhancements, and lighting improvements. The **Crosswalk Program**



takes a systemic approach to considering requests for new crosswalks or improvements, prioritizing locations with the greatest need. The **Traffic and Street Lighting Program** enables community members to request new lighting or report burned out street lights. In May 2016, the City in concert with Puget Sound Energy (PSE) completed a project that converted approximately half (4,242) of the City's streetlights from old low-pressure sodium streetlights to new, energy-efficient LED (light-emitting diode) fixtures, at which time street corridors were brought to the City's current lighting standards. Further, in the 2019-2020 CIP budget proposal, the City Council approved the funding of upgrading approximately 1,500 City-owned and 700 PSE-owned streetlights from low-pressure sodium to LED on all remaining arterial streets in Bellevue.

Bellevue is also experimenting with new tools and approaches to transportation safety. In 2018, the Downtown Demonstration Bikeway was constructed, promoting safety for all modes. The project closed a critical 0.8 mile gap in one of eleven cross-city bicycle priority corridors, connecting the I-90 trails and 520 trail. As part of this project, Bellevue installed a Zicla modular bus platform between the bike lane and vehicle traffic on 108<sup>th</sup> Avenue NE.<sup>2</sup> The first in Washington, it results in safer and smoother operations, reduces travel time by 5 – 20 seconds, and provides space for bicyclists to safely pass buses. In addition, this project included several other innovations, including a green-painted bike box with "no right on red" signage, buffered bike lanes, and planter-separated protected bike lanes.

## **Enforcement**

The City has been monitoring and enforcing traffic speeds for decades. Bellevue has used **stationary radar signs** for approximately 20 years, and there are over 30 signs throughout Bellevue. Currently, all speed monitoring from radar signs is complaint based – there is not an ongoing monitoring program or unified data portal. To implement a more systematic approach to speed signs, Bellevue is in the process of evaluating which locations are most effective at reducing speeding. Bellevue has also been using **automated speed enforcement (ASE) cameras in school zones** since 2009. Nine ASE cameras are currently in operation.

The Bellevue Police Department accepts online **Traffic Service Requests**, enabling community members to report speeding vehicles, problem traffic areas, or parking problems in city limits. Police officers are dedicated to investigating complaints from the public and taking enforcement action necessary to address the issue. From 2015-2017, the traffic management group responded to 1,721 related inquiries—many of which were safety-related, and more than 200 of those calls were

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<sup>2</sup> <https://bellevuewa.gov/archived-news/transportation-archived-news/bus-platform>



explicitly related to speeding. A Traffic Analysis Report is prepared for each resident concern that involves data collection, a summary of previously implemented improvements, and staff recommendations, which generally consist of tools detailed in the **Residential Traffic Guidebook**<sup>3</sup>.

Through Bellevue School District's **Stop Paddle Camera Program**, cameras have been installed on 20 percent of school buses, and citations are given to drivers who do not stop as required when a school bus's stop sign is out. Additionally, the school district, in partnership with the City has been distributing educational materials about how drivers are expected to respond to the stop paddle (for example, what to do on a divided road compared to an undivided road). The program's pilot showed an average of three violations per day, so this program helps enforce driver behavior and improve student safety.

## Education

In February 2019, the City of Bellevue announced a new partnership with the Bellevue School District and Washington DECA. The **TINO (Tune In / Not Out) program** is a campaign by students for students that will bring together high-schoolers, their families, the music community, and community partners to raise awareness and ultimately reduce the occurrence and devastating impact of distracted driving. The program will encourage conversation amongst young adult peers on the seriousness of distracted driving through events, social media, and mobile engagement.

Some other education initiatives in Bellevue include:

- Bellevue Fire Department does a DUI re-enactment for high schools annually in the spring.
- Most Bellevue Elementary Schools (14 out of 17) participate in the **AAA School Safety Patrol program**, which organizes and teaches dedicated student volunteers to direct their peers in safely interacting with school traffic.
- Bellevue encourages and provides support for annual **Walk to School Day** in October – 11 school participate each year.
- Bellevue's Transportation Department partners with the Police Department on traffic safety education efforts with schools and the greater community, and it provides information that supports enforcement efforts. This is implemented on a request-basis.
- **StoryBook Theater**, an organization based out of Kirkland, offers some theater performances that pertain to traffic safety, such as "The Little Engine That Could." Families and school groups around the region attend these performances, and the Bellevue School District could include StoryBook theater on its field trip list.
- The **"Alive at 25" driver awareness course** teaches young drivers to be aware of many of the typical driving hazards facing young motorists.

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<sup>3</sup> [https://transportation.bellevuewa.gov/UserFiles/Servers/Server\\_4779004/File/pdf/Transportation/Guidebook\\_Web.pdf](https://transportation.bellevuewa.gov/UserFiles/Servers/Server_4779004/File/pdf/Transportation/Guidebook_Web.pdf)



- A 4-hour **defensive driving course** provides key information, skills, and techniques to avoid crashes, reduce traffic violations and change driver behaviors and attitudes.
- The **SchoolPool Program** (formerly Trips to School) provides kits and information on walking, biking, carpooling, and riding the bus to school. This is distributed to all families with students in the school district.
- The Bellevue Police and Transportation Department staff collaborated on developing a [bike safety brochure](#) for parents and children. These brochures are distributed at Bellevue schools and at community events.
- In the fall of 2018, the City offered **biking classes** in Bellevue through the Cascade Bicycle Club on commuting and maintenance.

## Data

In comparison with other communities around the country, Bellevue is quite advanced in data collection and analysis. Bellevue's Transportation Department **reviews crash data every year**, identifies locations based on the number of collisions they observe and their facility type, and identifies appropriate countermeasures for these locations. They perform a before and after safety comparison at sites that receive improvements and calculate the cost benefit to the public. Bellevue is also working to collect **bicycle and pedestrian counts**. In March 2015, WSDOT installed inductive loop counters and infrared person-counters at two key locations in Bellevue on the I-90 and SR 520 regional trails. These provide accurate data on bicycle and pedestrian activity and help to identify trends over time to facilitate informed, data-driven policies and infrastructure decisions. Similar counters have been installed along the downtown demonstration bikeway along 108<sup>th</sup> Avenue NE.

Bellevue is not as far along as some communities in proactively identifying crash priority areas based on a systemic safety approach. However, the City has a **Local Road Safety Plan** (updated biennially) in place and developed a **High Injury Network (HIN)** as part of the Vision Zero Action Plan process, which will inform safety projects moving forward. The HIN in particular uses data to identify the parts of the City with the greatest number of crashes, with additional emphasis on killed and serious injury crashes. The HIN is a powerful tool to guide decisions on physical infrastructure, enforcement, and education.

The **Video Analytics Toward Vision Zero** project was developed through a collaboration between the City of Bellevue, Microsoft, the University of Washington, and organizations across North America. This project developed and tested new technologies to analyze available traffic camera video footage to identify crashes and near-miss incidents to predict where future crashes are likely to occur. Brisk Synergies is currently working with the City of Bellevue to carry this work forward, monitor the citywide network, develop a road safety dashboard, conduct a safety diagnosis at high-risk locations, and identify recommendations for those locations.



## Outreach

Bellevue has utilized a wide variety of outreach techniques to engage the community on transportation safety efforts, including:

- The **Neighborhood Enhancement Program** empowers residents to propose and select City funded capital projects to enhance their neighborhoods. Many of these projects address safety and access concerns from residents.
- The City frequently uses **citywide questionnaires** to keep the public informed about projects and receive input. In 2015-2016, a Wikimap and survey asked the public to identify locations in Bellevue that feel unsafe for people walking and bicycling.
- In 2019, a **community questionnaire and internal staff questionnaire on traffic safety and Vision Zero efforts** in Bellevue revealed that the Bellevue community is more optimistic than staff about achieving safety goals. 230 staff members and 1,515 community members participated in the questionnaires.
- City staff host informal communications with community members through focused **social media**.
- Bellevue hosts face-to-face **open houses and "listening sessions"** in neighborhoods throughout the City. These sessions can provide a venue for residents to identify and express concerns/opportunities around transportation safety.
- The City publishes an **electronic newsletter** "Neighborhood News" and a quarterly publication "It's Your City". These are used as platforms to distribute information about transportation safety, as appropriate.
- Neighborhood Traffic Safety Services uses a **traffic committee** model, consisting of approximately 12-15 neighborhood volunteers, that work with City staff to develop solutions to neighborhood traffic concerns.
- Since 30 percent of Bellevue's population do not speak English at home, the City provides key transportation outreach materials in the top five non-English languages and offers direct **translation services** via a "LanguageLine Solutions" toll free number. There have also been targeted outreach events and surveys to community groups such as the English Language Learners Alliance (ELLA), YouthLink, Network on Aging, and India Association of Western Washington.
- The **Safe Walk Committee** includes parent volunteers and the Police Department, and it reviews concerns with student walking routes to school.
- Neighborhoods partner with the City to create **neighborhood strategy plans**. Northwest and Northeast Bellevue are currently working on their plans. These plans can help identify localized transportation safety issues and potential solutions.
- Bellevue published an online crash map portal – an interactive tool that enables the user to view all crashes where someone was killed or seriously injured in Bellevue.<sup>4</sup>

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<sup>4</sup> <https://cobgis.maps.arcgis.com/apps/MapSeries/index.html?appid=8964b232b8ec4a0180e0b56b1c29071d>



## Awards

The Transportation Department has been recognized nationally for its recent work in transportation safety:

- Transportation Achievement Award for Safety; Institute of Transportation Engineers (2017)
- Safer People, Safer Streets Initiative Award; Mayor's Challenge, US Department of Transportation (2016)
- Walk Friendly Communities Silver Award; Highway Safety Research Center (2013)
- Transportation Planning Excellence Award, Federal Highway Administration (2012)

## Task 5 – Best Practices Summary

To help develop a cohesive and comprehensive safety program moving forward, the City of Bellevue has organized its Vision Zero Action Plan around the Safe Systems approach. Safe Systems identifies four key pillars: Safe People, Safe Streets, Safe Speeds, and Safe Vehicles. It represents a holistic approach to traffic safety, in which all parts of the system must be strengthened to achieve zero deaths and serious injuries. The Safe Systems approach recognizes that people make mistakes on the roadway and are vulnerable to serious injury when mistakes are made, and it calls on all of us – from system designers to roadway users – to work together and take responsibility for traffic safety. The City of Bellevue

has identified four overarching elements that span the Safe Systems pillars and that, together with the pillars, are essential in achieving zero: Leadership, Culture, Partnerships, and Data<sup>5</sup>.

This section identifies overarching strategies and specific actions under each strategy that cities around the country currently are implementing to improve safety and move toward zero fatalities and serious injuries on their roadways. The section is organized around the Safe Systems pillars and overarching elements. While some of the actions summarized here may not be applicable or



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appropriate in Bellevue, this full set helps illustrate what is possible. The forthcoming Task 6 memorandum will present a narrower list of safety actions that are recommended for Bellevue.

## Safe Streets

Safe Streets strategies reduce the likelihood of crashes occurring and minimize the consequences of the crashes that do occur. There are five overarching strategies that cities employ to achieve safe streets, and for each of those strategies, there are several specific actions cities have used to improve safety.

### **Strategy 1: Implement projects citywide that make it more comfortable, accessible, and safe to walk and bike.**

#### ***What are the specific actions that cities use to implement this strategy?***

For walkability, cities can construct new **sidewalks** to fill in gaps in the network and include **landscaping buffers** so people are not walking directly next to the roadway. They can install **crosswalks** at intersections and mid-block that are appropriate for a given roadway's geometry, volumes, and speeds. At intersections, **bulb outs** help shorten crossing distances for pedestrians and make pedestrians more visible to motorists, **pedestrian scrambles** remove the potential for conflicts with vehicles when crossing, and **daylighting intersections** help clear sight lines for motorists, making pedestrians more visible.

Traffic signals can include **automatic pedestrian phases** so people do not have to push a button to get a walk sign, provide additional time to pedestrians to accommodate all ages and abilities, and provide **leading pedestrian intervals** (LPIs) so pedestrians get a head start when crossing the street.<sup>6</sup> A study in State College, PA found that LPIs reduced pedestrian-vehicles crashes by almost 60 percent.<sup>7</sup> Oakland, CA is in the process of enacting a new signal policy that includes automatic pedestrian phases.<sup>8</sup>

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<sup>6</sup> [https://www.boston.gov/sites/default/files/document-file-03-2017/go\\_boston\\_2030\\_-\\_7\\_projects\\_and\\_policies\\_spreads\\_1.pdf](https://www.boston.gov/sites/default/files/document-file-03-2017/go_boston_2030_-_7_projects_and_policies_spreads_1.pdf)

<sup>7</sup> [nacto.org/docs/usdg/safety\\_effectiveness\\_of\\_lpi\\_fayish.pdf](https://nacto.org/docs/usdg/safety_effectiveness_of_lpi_fayish.pdf)

<sup>8</sup> [https://www.boston.gov/sites/default/files/document-file-03-2017/go\\_boston\\_2030\\_-\\_7\\_projects\\_and\\_policies\\_spreads\\_1.pdf](https://www.boston.gov/sites/default/files/document-file-03-2017/go_boston_2030_-_7_projects_and_policies_spreads_1.pdf)



**Restricting turn movements on red** for drivers reduces the potential for conflicts between pedestrians and vehicles. Washington DC's Transportation Department plans to install "No Turn on Red Light" signs at 100 intersections.<sup>9</sup>

NYC found that left turns were particularly problematic and involved in a high proportion of serious crashes, particularly those injuring people walking. Crash patterns helped staff focus on certain trends and develop solutions that could be implemented across the city to proactively address potentially problematic left-turn locations. Staff rolled out design solutions with the specific goal of slowing vehicle speeds during left turns and making pedestrians and bicyclists more visible. The solutions include painted turn boxes, hardened centerlines, and rubber speed bumps, which are also discussed in more detail under Safe Speeds Strategy 1.<sup>10</sup>

For bikeability, cities can construct new **bike facilities** to fill in gaps in the network, such as bike lanes, neighborhood greenways, shared use paths, etc. To ensure that people of all ages and abilities can comfortably and safely utilize these facilities, a **low stress network** should be provided citywide. This may include **bike parking, green paint for mixing zones, protected intersections, and bike signal phases**. Cities adopt a variety of **policies and design guidelines** that provide additional direction on implementing new bike facilities, such as where it is appropriate to use green paint.

One emerging area related to bikeability is bikeshare and micromobility. As shared e-bikes and e-scooters become more prevalent in cities around the country, it can be helpful to **clarify the rules of the road, establish clear city guidelines, and create designated spaces in the public right-of-way for use by mid-speed (10-20 mph) motorized road users** separate from slower speed users on sidewalks and higher-speed motor vehicles in general purpose travel lanes. For instance, cities can pass an ordinance that (1) makes it illegal to drive or park a motor vehicle in a marked bike lane, and (2) defines what vehicles may use bike lanes including bikes, e-bikes, foot scooters, skateboards, and other manual human-powered conveyances or electric-powered vehicles whose motor assistance does not exceed 15 mph. San Francisco, Chicago, Portland, Seattle, and Austin are among the many cities with micromobility policies and regulations.<sup>11</sup> It will be important that cities **consider the concerns and needs of people with disabilities** when establishing policies and guidelines on micromobility.

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<sup>9</sup> <https://wapo.st/2F78KS3>

<sup>10</sup> <https://visionzeronetwork.org/developing-a-proactive-approach-to-safety/>

<sup>11</sup> <https://blog.remix.com/micromobility-data-policy-survey-7adda2c6024d>



Other actions benefit both people walking and bicycling. **Road diets** are a proven safety countermeasure. As noted under Task 4, Bellevue has implemented several road diets over the years. By reallocating space previously designated for motor vehicles to other modes, like walking and biking, roadways become more welcoming of those modes. Cities can install **benches, trees,** and **street lights** to improve the environment for walking and biking. **Wayfinding** is also important to ensure people can comfortably and safely find their destinations.

One concern in many communities is neighborhood cut-through traffic, which is influenced by a variety of factors such as travel route companies like Waze, arterial network failure, land use patterns, and lack of travel options. Cities can address this through neighborhood design treatments and non-neighborhood based approaches, such as congestion management and improving options for traveling by foot, bike, or transit. Cities such as Berkeley and Seattle utilize **traffic diverters** in strategic locations, which can range from temporary (paint and delineators, or paint and bollards) to more permanent options (islands with mountable curbs). Other traffic calming treatments like **traffic circles** and **speed humps** can have a similar effect. Edmonton has performed a Traffic Shortcutting Audit to identify priority areas for citizens in conjunction with the City's guidelines.<sup>12</sup>

There are a variety of guides that cities can reference to assist in the design and implementation of these treatments. NACTO's *Urban Street Design Guide* and *Urban Bikeway Design Guide* and FHWA's *Achieving Multimodal Networks* guide are frequently used by Vision Zero cities. Smart Growth America also has a resource outlining the different elements of a Complete Streets policy, which can be helpful when implementing projects to make it more comfortable, accessible, and safe to walk and bike.<sup>13</sup>

When implementing these infrastructure improvements, cities may want to focus on high-priority projects in their Pedestrian Master Plan, Bicycle Master Plan, Active Transportation Plan or Complete Streets Plan.

A major co-benefit of this strategy is that it makes walking and biking more attractive travel options and reduces vehicle miles traveled (VMT), which not only helps Bellevue meet its environmental goals but also directly supports its Vision Zero goals by helping make the roadways safer.

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<sup>12</sup> [https://www.edmonton.ca/transportation/VisionZero\\_EdmontonRoadSafetyStrategy\\_2016-2020.pdf](https://www.edmonton.ca/transportation/VisionZero_EdmontonRoadSafetyStrategy_2016-2020.pdf)

<sup>13</sup> [https://smartgrowthamerica.org/app/uploads/2017/12/CS-Policy-Elements\\_web\\_2017.11.30.pdf](https://smartgrowthamerica.org/app/uploads/2017/12/CS-Policy-Elements_web_2017.11.30.pdf)



## **Strategy 2: Implement projects citywide that make it more comfortable, accessible, and safe to take transit.**

Research has shown that public transit plays a key role in advancing Vision Zero and eliminating traffic fatalities. Using data from the National Highway Traffic Safety Administration and Federal Transit Administration, an American Public Transportation Association (APTA) study found that large metro areas with higher levels of public transportation (more than 40 annual transit trips per capita) have lower traffic fatality rates than cities with fewer than 20 transit trips per capita.<sup>14</sup> Additionally, in previous research, APTA found that public transportation is ten times safer per mile than traveling by car in terms of traffic casualty rate.<sup>15</sup>

### ***What are the specific actions that cities use to implement this strategy?***

Cities can install infrastructure that supports transit and makes riding transit a more pleasant experience, such as **shelters, platforms, benches, lighting, and wayfinding**. Cities like San Diego and LA are implementing **neighborhood mobility microHUBs** that use branded kiosks or nodes with real-time interactive information displays about transit schedules and shared vehicle availability. They help people connect between different modes, such as buses, ride-hailing pick up spots, bikeshare, etc. and can be coupled with free Wi-Fi. To help make first-last mile connections, some cities and agencies are partnering with rideshare companies like Uber and Lyft to provide subsidized rides to access transit. Other cities and agencies, such as King County Metro with its Ride2 program, are providing on-demand rides in shuttle vans to help people connect to/from transit hubs.

## **Strategy 3: Implement projects citywide that make it safer to drive.**

### ***What are the specific actions that cities use to implement this strategy?***

To improve safety for motorists, cities can implement a variety of street design changes. **Roundabouts** have been found to be a safer alternative to traffic signals and stop signs, helping reduce injury crashes by lowering travel speeds through the intersection. Roundabouts are discussed in more detail under Safe Speeds Strategy 1 "Design (or redesign) roadways and intersections to manage speed", along with other **traffic calming measures** such as medians and narrowed lanes.

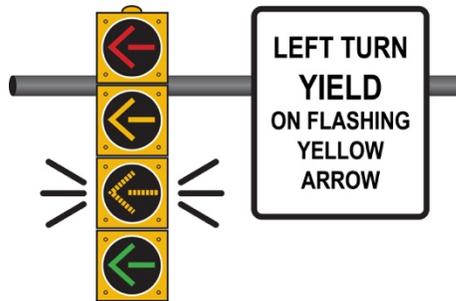
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<sup>14</sup> <https://www.apta.com/resources/hottopics/Documents/APTA%20VZN%20Transit%20Safety%20Brief%208.2018.pdf>

<sup>15</sup> <https://www.apta.com/resources/reportsandpublications/Documents/APTA-Hidden-Traffic-Safety-Solution-Public-Transportation.pdf>



**Access management** is another approach where cities carefully consider and potentially limit the number of driveways and left turns along an entire corridor. An example in Bellevue includes the access management along Factoria Boulevard or 148<sup>th</sup> Avenue.



Source: Virginia DOT  
[http://virginiadot.org/VDOT/Newsroom/Culpeper/2016/asset\\_upload\\_file143\\_96284.jpg](http://virginiadot.org/VDOT/Newsroom/Culpeper/2016/asset_upload_file143_96284.jpg)

**Signal timing and phasing changes**, such as protected turns, may encourage people to make safer driving decisions by providing a dedicated phase for people to make the turn, reducing the ambiguity and gap judgment caused by permissive left turns. For streets with highly variable left-turn volumes, **flashing yellow arrow** signals can balance the benefits of protected left-turn phasing during busy periods and when there is a pedestrian in the crosswalk with permissive phasing during low-volume times which reduces driver delay and frustration.<sup>16</sup>

Policies also help make it safer to drive. Since drivers stuck in traffic can become impatient and make unsafe decisions, **congestion management** can improve safety outcomes (as long as less congestion does not translate to high speeds). Examples can include some of the signalization timing and phasing mentioned above along with other techniques like **variable lane assignments** at intersections where certain movements are permitted at different times of day. Bellevue implements another best practice through its **adaptive traffic signal** control system, which changes the signal operations constantly throughout the day to adapt to changing traffic volumes.

#### **Strategy 4: Create public spaces where pedestrians and bicyclists are given priority greater than or equal to motorists.**

##### ***What are the specific actions that cities use to implement this strategy?***

In addition to the somewhat more conventional actions discussed under Strategy 1 to make streets more walkable and bikeable, cities can take action to shift their community's mindset away from streets being built for cars and towards streets being built for all roadway users. This shift will, over time, make streets safer by making drivers more aware of pedestrians and bicyclists.

Seattle, Burlington VT, Madison WI, Denver, and Bellevue are examples of cities that have implemented **pedestrian-only streets** and spaces. These spaces can be implemented on a permanent basis, like Church Street in Burlington, or on a temporary basis through events like

<sup>16</sup> <http://www.dot.state.mn.us/trafficeng/signals/flashingyellowarrow.html>



PARK(ing) Day, Play Streets, and Open Streets. **PARK(ing) Day** is a global placemaking event in which community members lead the temporary transformation of parking spaces into people spaces.<sup>17</sup> **Open Streets** are programs that temporarily close vehicle access to neighborhood streets to provide space for socializing, playing, block parties, and physical activity. Examples include Seattle's Play Streets<sup>18</sup> and People Streets<sup>19</sup> programs, and Seattle and Portland's festival streets programs.

**Shared streets** are another related approach, where roadway space is shared among all users. Segregation between modes is minimized by removing traditional roadway features such as curbs, road surface markings, traffic signs, and traffic lights. Shared streets are common in Europe and are becoming more popular in American cities such as Pittsburg, Seattle, San Francisco, Cambridge, Portland, and Chicago.

Cities can create a **Public Realm Plan** that focuses on putting people first and creating high quality public spaces (plazas, sidewalks, streets) through placemaking, public art, wayfinding, etc. This can include guidelines for community members to follow for installing parklets, painting street murals, and other tactical urbanism interventions.<sup>20</sup> San Francisco<sup>21</sup> and Toronto<sup>22</sup> have created these plans. Cities can also launch **citywide placemaking initiatives to treat streets as places** by incorporating public art, green infrastructure, and neighborhood amenities into traffic safety initiatives. These could be prioritized on the High Injury Network and in Communities of Concern, as was done in Jersey City.<sup>23</sup>

### **Strategy 5: Establish clear priorities for curb usage.**

#### ***What are the specific actions that cities use to implement this strategy?***

With the growth of transportation network companies (TNCs) like Uber and Lyft, as well as an increase in online shopping and associated deliveries, demand for curbside pickups, drop-offs and

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<sup>17</sup> <https://parkingday.org/about-parking-day/>

<sup>18</sup> <http://www.seattle.gov/transportation/projects-and-programs/programs/public-space-management-programs/play-streets>

<sup>19</sup> <https://www.seattle.gov/transportation/projects-and-programs/programs/public-space-management-programs/people-streets>

<sup>20</sup> [https://www.boston.gov/sites/default/files/document-file-03-2017/go\\_boston\\_2030\\_-\\_7\\_projects\\_and\\_policies\\_spreads\\_1.pdf](https://www.boston.gov/sites/default/files/document-file-03-2017/go_boston_2030_-_7_projects_and_policies_spreads_1.pdf)

<sup>21</sup> Lower Haight: <https://civiccentersf.org/>; [http://default.sfplanning.org/plans-and-programs/in-your-neighborhood/lower-haight-public-realm-plan/LHPR\\_Plan\\_web.pdf](http://default.sfplanning.org/plans-and-programs/in-your-neighborhood/lower-haight-public-realm-plan/LHPR_Plan_web.pdf); Central Waterfront Dogpatch: [http://default.sfplanning.org/Citywide/Dogpatch\\_CtrlWaterfront/Central-Waterfront-Dogpatch-Public-Realm-Plan\\_ADOPTED-October-2018.pdf](http://default.sfplanning.org/Citywide/Dogpatch_CtrlWaterfront/Central-Waterfront-Dogpatch-Public-Realm-Plan_ADOPTED-October-2018.pdf)

<sup>22</sup> <https://www.toronto.ca/wp-content/uploads/2018/05/8ed9-2018-05-23-MIF-Parks-and-Public-Realm.pdf>

<sup>23</sup> <http://www.visionzerojc.com/action-plan>



dwelling times is expanding rapidly. When curb space is not available, and sometimes even when it is, motorized vehicles can block traffic and hinder visibility of other road users when using the curb.

Cities can develop a **curbside management policy** to regulate curb space usage by TNCs, delivery trucks, and shared mobility like bikeshare and scooters. Having clear regulations in place will help cities meet the multi-modal demands at the curb in a safe and efficient way. The ITE *Curbside Management Practitioners Guide* is a handbook for local jurisdictions on how to inventory, assess, enhance, and prioritize curb spaces.<sup>24</sup> This can include things like bikeshare and scooter parking, ADA access, EV charging, loading zones, and more. For example, Long Beach, Santa Monica, and Bellevue (as part of its pilot bikeshare program) marked designed drop zones/parking areas to help guide people where to park bikes, and these can be designed to show up in bikeshare apps.<sup>25</sup>

## Safe Speeds

Safe Speeds strategies set and maintain vehicular speeds to lower the risk of bodily harm for people inside and outside of vehicles. Research has shown that speed is the most critical factor in the frequency and severity of crashes<sup>26</sup>, and the strategies under this pillar play a particularly important role in helping Bellevue achieve its Vision Zero goals. There are six overarching strategies that cities employ to achieve safe speeds, and for each of those strategies, there are several specific actions cities have used to improve safety.

### **Strategy 1: Design or redesign roadways and intersections to manage speed.**

#### ***What are the specific actions that cities use to implement this strategy?***

Since higher speeds are directly correlated with more severe injuries, it is important to reduce speeds to a level that minimizes injury. There are a variety of traffic calming measures that cities can implement to help lower traffic speeds. Their application is context dependent, so it is critical that jurisdictions carefully weigh which treatments are appropriate based on local context and professional judgement. Some of these treatments are commonly found throughout the country; other approaches are more unique, and specific case studies are included here as a reference for Bellevue. As noted in the Task 4 section, Bellevue has a long-standing and very robust

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<sup>24</sup> <https://www.ite.org/technical-resources/topics/complete-streets/curbside-management-resources/>

<sup>25</sup> [https://uploads-ssl.webflow.com/58bef71a278da7e44a2de93a/5c7d48b0314d16d165dc31b6\\_RemixMobilityBrief\\_03\\_MicroMobilityPolicy\\_Survey\\_v08.pdf](https://uploads-ssl.webflow.com/58bef71a278da7e44a2de93a/5c7d48b0314d16d165dc31b6_RemixMobilityBrief_03_MicroMobilityPolicy_Survey_v08.pdf)

<sup>26</sup> <https://sdotblog.seattle.gov/2018/07/30/new-speed-limit-map/>



neighborhood traffic safety program to manage speeds, which already incorporates many traffic calming measures.

### Common Traffic Calming Measures

Common traffic calming measures include **chicanes, bulb outs, speed humps, refuge islands, narrowed lanes, and medians**. Chicanes and bulb outs can range from temporary options (paint and delineators, or paint and planters), which are more affordable, to more permanent options (curb). As discussed in the Safe Streets section, road diets can also be an effective way to slow vehicular speeds.

**Traffic signal coordination** can also have measurable safety benefits, primarily in two ways. “Coordinated signals produce platoons of vehicles that can proceed without stopping at multiple intersections. Reducing the number and frequency of required stops and maintaining constant speeds for all vehicles reduce rear-end conflicts. In addition, signal coordination can improve the operation of turning movements. Drivers may have difficulty making permitted turning maneuvers because of a lack of gaps in through traffic. Crashes may occur when drivers become impatient and accept a gap that is smaller than needed. Such crashes could be reduced if longer gaps were made available.”<sup>27</sup> As noted at the Vision Zero Summit, both Seattle and Portland have recently re-timed their traffic signals downtown to reduce speeds. Seattle’s signals are set to progress traffic at 20 MPH and Portland’s at 15 MPH, which more closely matches the speed traveled by bicyclists.

**Roundabouts** are another common traffic calming measure. The tight circle forces drivers to slow down, reducing and/or eliminating the most severe types of intersection crashes: right-angle, left-turn, and head-on crashes.<sup>28</sup> Roundabouts have been found to be a safer alternative to traffic signals and stop signs, specifically reducing injury crashes since the speeds in the roundabout are lower than with traffic signals or signs. “When surveyed, public opinion generally favors the implementation of roundabouts as a traffic calming strategy. In addition, pedestrian crossing distances within roundabouts are short and traffic speeds are drastically reduced [particularly for single-lane roundabouts]. Two studies have reported reductions in pedestrian crashes of about 75% after conversion to roundabouts.”<sup>29</sup>

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<sup>27</sup> [https://safety.fhwa.dot.gov/intersection/other\\_topics/fhwasa08008/sa4.cfm](https://safety.fhwa.dot.gov/intersection/other_topics/fhwasa08008/sa4.cfm)

<sup>28</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeeding19.pdf)

<sup>29</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeeding19.pdf)



### Less Common Traffic Calming Measures

New York City<sup>30</sup> and Washington, DC<sup>31</sup> are two cities implementing **hardened left turns** or **hardened centerlines**, which add rubber bumpers and posts to the centerline at intersections to slow drivers and prevent left-turners from crossing the centerline to make a turn, as shown in the photo. In NYC, research shows this treatment resulted in a 19 percent speed reduction and a 79 percent decrease in the number of vehicles crossing the double yellow lines while turning left.<sup>32</sup> In NYC, this Vision Zero campaign is called “Don’t Cut Corners.”



Photo: David Meyer.  
<https://usa.streetsblog.org/2018/11/09/cities-are-making-left-turns-safer-with-slow-turn-wedges/>

**Slow turn wedges** and **rubber bumpers** are other treatments that New York City is implementing. These treatments (typically posts and/or speed bumps, as shown in the photos) force drivers to slow down and follow a tighter turn radius when making left turns. Research shows this treatment results in up to a 40 percent speed reduction and provides drivers with better visibility of crosswalks by forcing them to make wider left turns that orient them more perpendicular to the crosswalk as they approach.<sup>33</sup>



Photos: Google Maps (top) and qz.com (bottom)

Safety is often an issue on curved roadways as a result of drivers misjudging appropriate speeds for the curves, and FHWA identifies effective countermeasures for reducing speeds specifically at horizontal curves.<sup>34</sup> These include **flashing beacons; profile thermoplastic markings; and raised pavement markers, reflectors, or panels of retroreflective sheeting.** “The attachment of reflectorized tape or other delineation device to trees, utility poles, and other roadside obstructions is a low-cost way to reduce the crash hazard from fixed objects. In addition, a combination of speed measuring devices with a flashing beacon and a variable message sign has been found to have an effect on high-speed drivers in high-crash locations. These strategies present low-cost solutions to reducing speeding-

<sup>30</sup> <https://qz.com/1315305/one-small-change-to-new-yorks-intersections-is-saving-pedestrians-lives/>

<sup>31</sup> <https://wapo.st/2F78KS3>

<sup>32</sup> <https://usa.streetsblog.org/2018/11/09/cities-are-making-left-turns-safer-with-slow-turn-wedges/>

<sup>33</sup> <https://qz.com/1315305/one-small-change-to-new-yorks-intersections-is-saving-pedestrians-lives/>

<sup>34</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeding19.pdf)



related fatalities where less expensive countermeasures have failed. For example, in California, installation of these devices resulted in a 44% reduction in crashes in the first year and 39% in the second year.<sup>35</sup> While Bellevue already implements several of these treatments, given the topography of the area, additional streets could potentially benefit from these types of improvements.

## **Strategy 2: Assess and evaluate speed limits citywide and create a speed management program to address speeding concerns.**

### ***What are the specific actions that cities use to implement this strategy?***

Some cities around the country are opting to **lower speed limits** where data and community experience show a need.<sup>36</sup>

Boston lowered its default speed limit on city streets from 30 mph to 25 mph beginning in January 2017, which came after the State of Massachusetts passed laws in 2016 to allow cities and towns to lower speed limits from 30 mph to 25 mph on municipal roads in densely populated areas or business districts. Unless otherwise posted, the speed limit on all City of Boston roadways was reduced to 25 mph.<sup>37</sup> An IIHS study that focused on Boston found that the odds of a vehicle speeding declined by 29.3 percent for vehicles traveling faster than 35 mph, 8.5 percent for vehicles going faster than 30 mph, and 2.9 percent for vehicles exceeding 25 mph.<sup>38</sup>

In 2016, Seattle City Council passed a law reducing speed limits from 25 to 20 mph on all residential streets and from 30 to 25 mph on arterials, unless otherwise noted.<sup>39</sup> This went hand in hand with an educational campaign “20 is Plenty”, described under Strategy 3 “Educate people on the importance of speed for safety”.

Austin City Council voted in late 2016 to lower its default speed limits from 30 mph to 25 mph on residential streets.<sup>40</sup> Similarly, Portland City Council approved an ordinance in January 2018, reducing the speed limit on all residential streets to 20 mph.<sup>41</sup> New York City reduced its citywide

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<sup>35</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeeding19.pdf)

<sup>36</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>37</sup> <https://www.iihs.org/iihs/news/desktopnews/city-drivers-slow-down-for-lower-speed-limit-in-boston>

<sup>38</sup> <https://www.iihs.org/iihs/news/desktopnews/city-drivers-slow-down-for-lower-speed-limit-in-boston>

<sup>39</sup> <https://sdotblog.seattle.gov/2018/07/30/new-speed-limit-map/>

<sup>40</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>41</sup> <https://www.portlandoregon.gov/transportation/article/669625>



speed limit to 25 mph as authorized by a 2014 NY State law.<sup>42</sup> In 2018, DC City Council established 15 mph speed limits adjacent to schools, recreation facilities, and senior centers.<sup>43</sup>

**Strategy 3: Educate people on the link between speed and safety, and, in the process, change drivers' risk perceptions of getting a ticket or causing a crash.**

Several studies have shown that drivers speed despite recognizing the safety risks associated with speeding. "Drivers likely exceed speed limits by small amounts every day, observe nearly every other motorist doing the same, and determine that 'nothing bad happens,' reinforcing this risky behavior. Drivers often assume that they can exceed the speed limit by 10 or even 15 miles per hour before they will be pulled over."<sup>44</sup> Changing driver behavior and attitudes will require increased public safety education.<sup>45</sup>

***What are the specific actions that cities use to implement this strategy?***

Several cities have implemented **public safety education campaigns targeting safe speeds**. Seattle's Vision Zero program provides five different yard signs for free to slow down drivers. The yard signs are brightly colored and include phrases like, "20 is plenty," "Keep kids safe," and "SLOW DOWN. Drive like you live here."<sup>46</sup> People can pick up a bundle of five signs at locations around the city.

San Francisco's award-winning safe speeds media campaign, "It Stops Here", was blasted everywhere in the city for 31 weeks. It "included freeway bulletins located at prime city locations, wall boards and posters in prime injury-corridor neighborhoods, ads on bus exteriors, general and non-English language radio, and digital outreach in San Francisco and the surrounding commuter counties. Additionally, over 750,000 bonus digital impressions, sponsored email blasts, and a bonus nonprofit sponsorship were donated to the cause. Police also increased enforcement in specific locations to compliment the media campaign."<sup>47</sup>

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<sup>42</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeeding19.pdf)

<sup>43</sup> <https://ddot.dc.gov/release/mayor-bowser-highlights-key-2019-regulations-underscoring-her-commitment-change-reflects-our>

<sup>44</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeeding19.pdf)

<sup>45</sup> [https://www.ghsa.org/sites/default/files/2019-01/FINAL\\_GHSASpeeding19.pdf](https://www.ghsa.org/sites/default/files/2019-01/FINAL_GHSASpeeding19.pdf)

<sup>46</sup> <https://www.seattle.gov/visionzero/resources/yard-signs>

<sup>47</sup> <https://www.sfmta.com/getting-around/safety/safety-education-campaigns/safe-streets-campaign>



Other cities are using innovative strategies that give **positive reinforcement for adhering to the speed limit**. Scotland's automated speed signs show drivers who travel the speed limit a smiley face and message such as "thanks for driving safely."<sup>48</sup>

Another educational strategy is installing **permanent roadside memorial signs** at fatal crash locations to commemorate the lives of loved ones lost. These typically include flowers, photos, handmade signs, white bikes (for locations where a bicyclist was killed), and other displays. (This is also noted under Safe People Strategy 1 "Launch citywide campaigns to build awareness around safety and Vision Zero".)

Several other examples of broader educational campaigns on safety and Vision Zero are discussed under Safe People Strategy 1 "Launch citywide campaigns to build awareness around safety and Vision Zero".

#### **Strategy 4: Create and promote neighborhood-based programs that aim to lower traffic speeds.**

##### ***What are the specific actions that cities use to implement this strategy?***

Several cities have created **programs targeting speed** specifically, and these are often tied to public safety campaigns (discussed in Strategy 3 "Educate people on the importance of speed for safety"). For example, Boston created a neighborhood traffic calming program called "Neighborhood Slow Streets" to reduce the number and severity of crashes on residential streets. Instead of planning and implementing changes on one street at a time, Boston will address an entire "zone" within a neighborhood. In collaboration with community members, the City looks at every street within the zone to find safety challenges and design solutions. The City selected five zones to participate in the program in 2018.<sup>49</sup>

NYC has a community-based program called "**Neighborhood Slow Zones**" that reduces the speed limit from 25 mph to 20 mph and adds safety measures within a select area to change driver behavior.<sup>50</sup> The program aims to lower the incidence and severity of crashes, as well as enhance quality of life by reducing cut-through traffic and traffic noise in residential neighborhoods. The DOT selects appropriate locations in response to applications from communities. Selected locations are typically in areas serving children, seniors, public transit users, commercial activity, and pedestrian/bicycle activity. Along with lower speed limits, self-enforcing traffic calming measures,

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<sup>48</sup> Email from Bellevue resident

<sup>49</sup> <https://www.boston.gov/departments/transportation/neighborhood-slow-streets>

<sup>50</sup> <https://www1.nyc.gov/html/dot/html/motorist/slowzones.shtml>



such as speed bumps, signage, and pavement markings, help mark these areas as different and encourage safe behavior.<sup>51</sup> Areas where Neighborhood Slow Zones have been implemented have seen a 10-15 percent decrease in speeds, 14 percent reduction in crashes with injuries, and 31 percent reduction in vehicles injuries.<sup>52</sup>

### **Strategy 5: Use and expand automated speed enforcement.**

#### ***What are the specific actions that cities use to implement this strategy?***

Several jurisdictions around the country utilize **automated speed enforcement (ASE) cameras**, which law enforcement officers use to monitor speeds remotely and issue speeding violations. While ASE is gradually becoming more common around the country, it is still relatively rare, with only 138 jurisdictions operating such programs as of 2015.<sup>53</sup> A major barrier is public opposition to automated traffic law enforcement, even when safety data support the deployment of this type of equipment. ASE is much more common in Europe, Asia, and Australia.

Strategic deployment of automated speed enforcement cameras can have numerous benefits – they have been found to be effective at influencing driver behavior and reducing speeds; they enable law enforcement departments to allocate scarce resources away from time-consuming speed patrol and towards other duties; and they address some of the equity challenges associated with officer-initiated enforcement, which can have disproportionate impacts on low-income communities.<sup>54</sup> The National Highway Traffic Safety Administration completed a survey of automated enforcement around the world and found that speed safety camera enforcement reduces injury crashes by 20 to 25 percent.<sup>55</sup> A more recent Cochrane survey found that speed cameras reduced total crashes by up to 49 percent and deadly and serious-injury crashes by up to 44 percent.<sup>56</sup>

Chicago, NYC, DC, Seattle, and Portland have effectively discouraged speeding through the use of automated speed enforcement cameras. In Chicago, within the first year of ASE, the number of speeding events recorded by each camera reduced by an average of 43%.<sup>57</sup> NYC uses speed

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<sup>51</sup> [https://nacto.org/wp-content/uploads/2012/10/ViolaRob\\_Neighborhood-Slow-Zones-NACTO-Conference-2012.pdf](https://nacto.org/wp-content/uploads/2012/10/ViolaRob_Neighborhood-Slow-Zones-NACTO-Conference-2012.pdf)

<sup>52</sup> <https://www1.nyc.gov/html/dot/html/motorist/slowzones.shtml>

<sup>53</sup> <https://www.iihs.org/iihs/news/desktopnews/speed-cameras-yield-long-term-safety-benefits-iihs-study-shows>

<sup>54</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>55</sup> <https://www.portlandoregon.gov/transportation/article/576452>

<sup>56</sup> <https://www.portlandoregon.gov/transportation/article/576452>

<sup>57</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>



cameras to deter speeding during school hours in school zones, and the number of violations issued at a typical speed camera location declined by over 50%.<sup>58</sup>

After their cameras were installed, DC saw a reduction in drivers speeding more than 10 mph over the speed limit from 1 in 3 to 1 in 40 and reported a 70% reduction in fatalities.<sup>59</sup> DC utilized \$500,000 in revenue from the traffic cameras to provide grants to nonprofits and agencies partnering to advance Vision Zero; one grant went to support a local nonprofit to do bicycle education and provide free safety equipment to young people biking in the lower-income wards of the city.<sup>60</sup>

Seattle has installed a number of **speed enforcement cameras within school zones** (the only areas where Washington State Law allows these cameras) and saw the average number of traffic speed violations decrease by 64% after installing their cameras.<sup>61</sup> One study found that when police issued tickets for speeding based on automated photo enforcement, the rate of speeding violations decreased by 50% in school zones, compared to when drivers received written warnings.<sup>62</sup> Bellevue has also installed nine school zone speed enforcement cameras.

Portland currently has four speed enforcement cameras, which are located on high crash corridors, and its Vision Zero Action Plan calls for expanding the program to additional locations on the high crash network.<sup>63</sup> Prior to 2015, Oregon state law only allowed photo radar systems to be operated in mobile vans for no more than four hours in one location with a uniformed police officer present. This resulted in inconsistent enforcement, and motorists returned to speeding once the van left. The newer fixed speed enforcement cameras provide more consistent and predictable speed control on Portland's most dangerous streets.<sup>64</sup>

Additionally, in 2018, the Pennsylvania state legislature approved installing cameras and electronic equipment to monitor the speed of vehicles and give speeding tickets in construction zones on state routes.<sup>65</sup>

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<sup>58</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>59</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>60</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>61</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>62</sup> <https://newsroom.uw.edu/news/photo-enforcement-slows-school-zone-speeders>

<sup>63</sup> <https://www.portlandoregon.gov/transportation/70763>

<sup>64</sup> <https://www.portlandoregon.gov/transportation/article/576452>

<sup>65</sup> <https://www.post-gazette.com/news/transportation/2018/10/07/Pennsylvania-Legislature-cameras-in-work-zones-PennDOT-Pennsylvania-Turnpike-speeding-fines/stories/201810040200>



The purpose of ASE cameras is not to generate revenue, but rather to change behavior and reduce speeding to the point that cameras are issuing fewer tickets and are revenue neutral. Several measures can be taken to minimize public opposition and ensure drivers do not feel blind-sided by tickets, such as launching education campaigns, issuing warnings instead of tickets for the first offense, and putting up signage informing people of upcoming cameras.

Several examples of broader, data-driven enforcement efforts are discussed under Safe People Strategy 6 “Use data to inform enforcement of behavior”, and Culture Strategy 4 “Prevent enforcement efforts from disproportionately impacting low income and minority populations” highlights the importance equity in enforcement.

### **Strategy 6: Implement other speed enforcement strategies to help fund Vision Zero efforts.**

#### ***What are the specific actions that cities use to implement this strategy?***

In addition to automated speed cameras, there are other actions cities can take to enforce speeds. These generally involve **raising fines in general or instituting “double” fines** in areas where speeding is particularly risky (construction zones, school zones, and downtown areas). In 2018, Washington, DC implemented tougher penalties and additional fines for speeding a certain amount over the speed limit and overtaking a vehicle stopped at a crosswalk for a pedestrian.<sup>66</sup>

The state of Missouri established **“Travel Safe Zones” along major interstates** in high crash locations, and speeding citations in these zones result in double fines.<sup>67</sup> Other states have taken a similar approach, including Washington.<sup>68</sup> While many locations have implemented higher fines in areas where crashes are of a higher concern, there could be equity considerations for the impacts of high fines on people with low incomes.

Several examples of broader, data-driven enforcement efforts are discussed under Safe People Strategy 6 “Use data to inform enforcement of behavior”.

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<sup>66</sup> <https://wapo.st/2F78KS3>

<sup>67</sup> <http://revisor.mo.gov/main/OneSection.aspx?section=304.590&bid=16270&hl=travel+safe+zone%u2044>

<sup>68</sup> <http://www.wsdot.wa.gov/safety/brake/doubleFineLaw.htm>



## Safe People

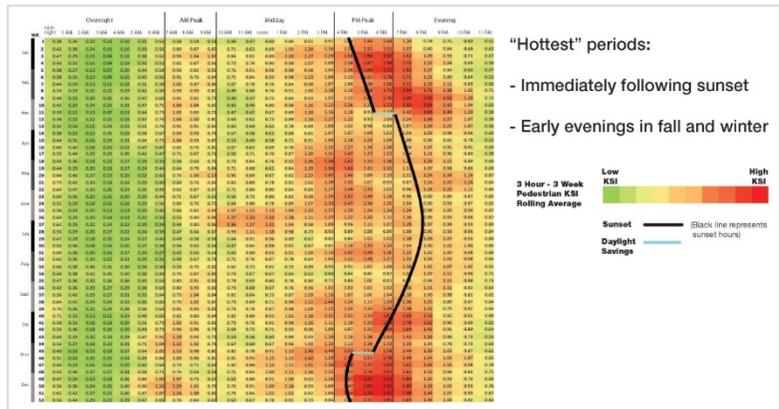
Safe People policies, programs, and practices focus on educating and encouraging people to use the transportation system as intended, be aware of other roadway users, and know how to utilize their vehicles' safety systems. They motivate people to play a role in Vision Zero work by humanizing transportation safety in a way that resonates. There are six overarching strategies that cities employ related to safe people, and for each of those strategies, there are several specific actions cities have used to improve safety.

### Strategy 1: Launch citywide campaigns to build awareness around safety and Vision Zero.

#### What are the specific actions that cities use to implement this strategy?

While many citywide public safety education campaigns target safe speeds, as discussed under Safe Speeds Strategy 3 "Educate people on the importance of speed for safety", there is a wide range of examples of broader safety campaigns. A strategy that is commonly used is to provide stories that put a human face on the crash statistics and describe how individuals have been affected by Vision Zero. The idea behind these campaigns is that safety data represents human lives, and it's easy to forget about the people behind the statistics.

After New York City's crash data showed a concentration of serious crashes during the late afternoon and evening hours, a Task Force developed and implemented a multi-pronged, **seasonal education and enforcement campaign** aimed at night safety. The City measured a 30 percent decrease in traffic fatalities for the time period that year compared to the same time period during the three previous years.<sup>69</sup>



Pedestrians Killed or Severely Injured (KSI) Weekdays by Week and Hour  
<http://www.nyc.gov/html/dot/downloads/pdf/seasonal-fatalities-2016.pdf>

<sup>69</sup> [https://visionzeronetwork.org/wp-content/uploads/2017/12/VZN\\_ActionPlan\\_FINAL.pdf](https://visionzeronetwork.org/wp-content/uploads/2017/12/VZN_ActionPlan_FINAL.pdf)



The **Safe Streets for Seniors program** in San Francisco provides funds to local non-profits serving individuals aged 65+ to conduct outreach and education on safety, especially to monolingual, non-English speaking populations.<sup>70</sup>



Photo: walksf.org

The Portland Bureau of Transportation received \$300,000 in emergency funding for **multilingual outreach and education** in neighborhoods adjacent to fatal pedestrian crashes, many of which had significant populations of people whose native language is not English.<sup>71</sup>

St. Paul has a **“Stop for Me” campaign** that uses physiological concepts like “social norming” to increase driver yielding at crosswalks. The City posted signs at eight intersections documenting yield rates (pictured right).<sup>72</sup> “Social norming works really well when you can show people that the majority of their peers do a certain behavior that’s a good behavior and to encourage people to be more like their peers. If you convince drivers that most people do stop for pedestrians, then they’re going to feel more pressure. They want to be part of the pack.”<sup>73</sup>



Photo: @Indy\_Austin/Twitter

Some other educational campaigns that have been utilized around the country include **permanent roadside memorial signs** at fatal crash locations (as discussed under Safe Speeds Strategy 3 “Educate people on the importance of speed for safety”) and **R1-6 signs** (pictured right), which have been effective at getting drivers to stop for pedestrians at crosswalks.<sup>74</sup>



Photo: [Steton](#)

The City of Seattle launched a **distracted driving campaign** in 2016, and many people viewed their video and engaged on social media.<sup>75</sup>

Seattle also runs an app-based safe driving competition called **Seattle’s Safest Driver**, modeled off a similar program in Boston.<sup>76</sup> The app measures speed, distraction, cornering, and harsh

<sup>70</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>71</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>72</sup> <https://usa.streetsblog.org/2018/10/18/want-drivers-to-yield-to-pedestrians-you-gotta-play-mind-games/>

<sup>73</sup> <https://usa.streetsblog.org/2018/10/18/want-drivers-to-yield-to-pedestrians-you-gotta-play-mind-games/>

<sup>74</sup> <https://usa.streetsblog.org/2018/10/18/want-drivers-to-yield-to-pedestrians-you-gotta-play-mind-games/>

<sup>75</sup> <https://www.youtube.com/watch?v=8ZbPMzUuRSY&t=5s>

<sup>76</sup> <https://www.seattle.gov/transportation/projects-and-programs/safety-first/vision-zero/safest-driver>



braking/acceleration. The competition is open to residents of King, Pierce, Snohomish, and Kitsap counties who drive into Seattle, and PEMCO Insurance sponsored prizes. The first iteration of the competition engaged 4,000 people in positive behavior change, including significant reductions in speeding and distraction. There is the potential for neighboring cities to partner on campaigns like this for cost savings and to extend reach.

## **Strategy 2: Improve motorist training on safety and rules of the road.**

### ***What are the specific actions that cities use to implement this strategy?***

Cities can take action to ensure that everyone is better informed about the rules of the road and are therefore better equipped to safely navigate the roads. Trainings and campaigns can offer unique messaging on how to be a safer driver. For example, AARP and insurance companies offer **training for older drivers** that cities can promote,<sup>77</sup> and San Francisco created a public education video on **how to safely ride a motorcycle**.<sup>78</sup>

Many cities, including San Francisco, New York City, and Fort Collins, offer **City-led training for for-hire drivers** (i.e. taxis and rideshare) **and bus operators**. San Francisco developed a first of its kind **training program for drivers of large vehicles** – the Large Vehicle Urban Driving Safety Program – which includes a short training video.<sup>79</sup> Cities can also collaborate with state agencies to implement **transportation network company (TNC) regulations** to ensure safe vehicle operation and safety data sharing.<sup>80</sup>

As more cities are using innovative roadway treatments that many people are not familiar with, cities can use **“how to” signs** that teach drivers, bicyclists, and pedestrians about the intended use of a new or existing piece of infrastructure. San Francisco uses this type of signage at locations with new parking protected bike lanes, bicycle signals, and bike boxes. Seattle created signage and a video on how bicyclists should use a left turn box.<sup>81</sup> Fremont, California developed a brochure that addresses a mix of “how” Vision Zero infrastructure treatments work and “why” they are being installed because many of these treatments are new to the public.<sup>82</sup>

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<sup>77</sup> <https://www.aarp.org/auto/driver-safety/>

<sup>78</sup> <https://www.youtube.com/watch?v=qjKs8nB9AA8>

<sup>79</sup> [https://www.youtube.com/watch?v=\\_LbC3FQeZqc](https://www.youtube.com/watch?v=_LbC3FQeZqc) <https://visionzerosf.org/vision-zero-in-action/educating-the-public/>

<sup>80</sup> <https://usa.streetsblog.org/2018/10/24/study-uber-and-lyft-are-increasing-traffic-deaths/>

<sup>81</sup> <https://www.seattlebikeblog.com/2013/08/01/sdot-on-how-to-use-two-stage-left-turn-boxes/>

<sup>82</sup> <https://fremont.gov/DocumentCenter/View/40366/Fremont-Vision-Zero-2020-brochure>



Photos: Seattle Bike Blog; SFMTA; @SexyGrammar/Twitter

Cities can also **develop educational materials for new residents to update their drivers' licenses**. Ensuring that drivers are properly licensed improves safety outcomes in a number of ways. While many people who do not have a proper driver's license may have inadvertently let theirs lapse, some unlicensed individuals may have a suspended or revoked license due to prior unsafe behaviors. While educational materials may not address these unsafe drivers, reducing the number of unlicensed drivers will help concentrate enforcement efforts on those who have lost the privilege to drive. Other unlicensed individuals may never have received a license and therefore never learned the rules of the road. In communities with immigrant populations, it is important to ensure new residents (especially those immigrating from locations where they did not previously drive) obtain a license and learn the rules of the road and how to safely operate a vehicle.

Cities can **send mailers to new residents** to encourage they update the address on their licenses and remind people about rules of the road. New residents could be identified as those having recently established utility services or filled out a change of address form with USPS. This type of effort could be a standalone program or an extension of the educational campaigns discussed under Safe People Strategy 2 "Improve motorist training on safety and rules of the road". Additionally, Portland's Active Transportation Ambassador Program recruits **Transportation Ambassadors** to help inform people about different transportation options and state law on vehicle registration and licensing.<sup>83</sup>

<sup>83</sup> <https://www.portlandoregon.gov/transportation/article/571698>



### **Strategy 3: Educate bicyclists and scooter riders on safety and rules of the road.**

#### ***What are the specific actions that cities use to implement this strategy?***

Cities frequently **partner with local agencies, school districts, bikeshare companies, and non-profits and activist organizations** to educate bicyclists and scooter users on safety and rules of the road. In the Puget Sound region, cities work with the Cascade Bicycle Club, who hosts a wide range of classes, educational programs, and summer camps for children and adults.<sup>84</sup> These types of organizations exist around the country and serve similar roles for other communities. Bike East Bay serves a similar role in the Bay Area.<sup>85</sup>

E-scooter and e-bikes are growing in popularity, but many riders are new to the technology, particularly if they are using a shared fleet. NACTO's *Guidelines for the Regulation and Management of Shared Active Transportation* encourages cities to **require that shared mobility companies provide outreach and education**. "As new mobility options emerge, cities may want to require companies to provide community engagement and education programming to offset the burden to the city of explaining what is going on. Cities should also ensure that education and engagement efforts are provided in all the languages commonly spoken in the area."<sup>86</sup> NACTO recommends education and engagement programming in the following areas:

- Shared mobility company participation or attendance at public events and meetings
- Company participation or attendance at community-led events or gatherings
- Company participation or provision of bike education classes, distributed equitably throughout all neighborhoods
- Companies partner with job-training programs and youth programs
- Multilingual mobile app and/or other interfaces, as applicable
- Companies pursue grants with municipal and/or non-profit organizations to develop ambassador programs

### **Strategy 4: Educate children and students on safety and rules of the road.**

#### ***What are the specific actions that cities use to implement this strategy?***

Cities frequently **partner with school districts, non-profits, and activist organizations** to educate children and students on safety and rules of the road. Through these partnerships, safety is incorporated into targeted **safety programs, assemblies, field trips, and classroom curriculum**. Schools and their partners organize **bike rodeos, bike trains, walking school buses, Bike to School Day, Walk to School Day**, and other safety-focused events. For example, Cascade

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<sup>84</sup> <https://www.cascade.org/learn>

<sup>85</sup> <https://bikeeastbay.org/education>

<sup>86</sup> <https://nacto.org/wp-content/uploads/2018/07/NACTO-Shared-Active-Transportation-Guidelines.pdf>



Bicycle Club's *Let's Go* curriculum provides physical education teachers with the resources to implement an in-school bicycle and safety program.<sup>87</sup> Bellevue already implements many education programs through the PedBee program, which is discussed in the Task 4 section.

Many cities around the country participate in **Safe Routes to School (SRTS) programs**, which aim to make it safer for students to walk and bike to school and encourage more walking and biking where safety is not a barrier. San Francisco recently expanded SRTS to 40 schools.<sup>88</sup> The following paragraph describes Eugene's experience in establishing its SRTS program:

A pilot program began in 2007 with federal funding for an SRTS coordinator, presentation equipment, bicycle helmets, safety vests, and incentives for events. These investments were met with contributions of in-kind services and equipment by the middle school. During the 2007–08 school year, 22% of sixth graders participating in a bicycle safety program. The school set a goal to achieve 100% participation in subsequent program years. In addition to the SRTS funds, the school received a Eugene Education Fund grant to buy bicycles for a training course. Other SRTS program elements have included regular walk and bicycle to school events, presentations about SRTS for parents, and continued encouragement to reduce parent drop-offs at school. The SRTS program at Roosevelt has also helped increase physical activity for students. The percentage of children walking or bicycling to school increased from 27% in 2007 to 42% in 2010. The school also reported a decrease of 59 motor vehicles per day bringing children to school, a 24% reduction. Roosevelt Middle School is one of six schools included in a \$500,000 SRTS federal grant awarded to the city of Eugene in 2010 to make infrastructure improvements to improve walking and bicycling conditions.<sup>89</sup>

A key element to successful youth transportation safety education is the development of **effective, age-appropriate curricula** that resonate with children at different stages of development.<sup>90</sup> For example, Bellevue uses PedBee to target elementary school children, a strategy that would be ineffective for older students.

Literature suggests that mock crashes and DUI drills are not the best approach to teaching students about traffic safety:

School-based alcohol misuse and drinking/driving interventions have been shown to produce short-term changes in knowledge and attitudes, but do not produce changes in behavior... Programs tailored to be culturally relevant also show greater positive effects. Successful programs involve parents; not only educating parents but also providing skills for addressing and discussing alcohol-related issues at home. The most recent Cochrane meta-study conducted on this topic suggests that more generic life-skills training

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<sup>87</sup> <https://www.cascade.org/learn-school-based-programs/lets-go>

<sup>88</sup> <https://visionzerosf.org/vision-zero-in-action/educating-the-public/>

<sup>89</sup> <https://www.transportation.gov/mission/health/Safe-Routes-to-School-Programs>

<sup>90</sup> <https://www.dshs.wa.gov/sites/default/files/SESA/publications/documents/22-1662.pdf>



interventions that address the full spectrum of potential problem behaviors are more effective for long-term outcomes than the topic-specific interventions (like focusing on just alcohol).<sup>91</sup>

### **Strategy 5: Foster and promote safety champions in the community.**

#### ***What are the specific actions that cities use to implement this strategy?***

Cities frequently collaborate with and encourage the work of non-profits and activist organizations advocating for transportation safety. **Families for Safe Streets (FSS)** is a national group of Vision Zero advocates that have lost loved ones or been injured in traffic crashes<sup>92</sup>, and individual chapters are popping up around the country, such as in New York City (where the movement started) and San Francisco<sup>93</sup>.

In the Puget Sound Area, the Cascade Bicycle Club's **Advocacy Leadership Institute** offers a two-day training once a year to give people the skills, confidence, knowledge, and connections to effectively advocate for getting more people on bikes.<sup>94</sup> The **Seattle Neighborhood Greenways** is a safe streets advocacy organization that empowers communities to advocate for safe, healthy streets for all people, and it has 20 neighborhood-based, volunteer-led chapters.<sup>95</sup>

San Francisco's Vision Zero program has a mascot – **the Vision Zero Hero** – who makes appearances at city events, such as Bike to Work Day and the Bay to Breakers race, to advocate for safer, more livable streets.<sup>96</sup> Mexico City has a similar public figure, **Peatónito**, a caped defender of pedestrian rights who advocates in a variety of quirky ways, such as interacting with cars that stop in the middle of crosswalks. "It started a joke, but it became a great way to do civic culture in the streets."<sup>97</sup>



Photo: SFMTA

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<sup>91</sup> [http://wtsc.wa.gov/wp-content/uploads/2016/05/School-Based-Prevention-Programs\\_May2014.pdf](http://wtsc.wa.gov/wp-content/uploads/2016/05/School-Based-Prevention-Programs_May2014.pdf)

<sup>92</sup> <https://www.transalt.org/familiesforsafestreeets>

<sup>93</sup> <https://walksf.org/families-for-safe-streets/about-us/>

<sup>94</sup> <https://www.cascade.org/blog/2018/09/advocacy-leadership-institute-applications-open-fall-2018-class>

<sup>95</sup> <http://seattlegreenways.org/about/>

<sup>96</sup> <https://www.visionzerosf.org/vision-zero-heroes-press-the-flesh-for-street-safety/> and

<https://www.sfmta.com/blog/meet-vision-zero-hero-bay-breakers-sunday>

<sup>97</sup> <https://www.citylab.com/transportation/2016/03/peatonito-pedestrian-rights-superhero-new-york-city-mexico/473067/>



## **Strategy 6: Use data to inform coordinated actions across city departments to influence public commitment to Vision Zero.**

### ***What are the specific actions that cities use to implement this strategy?***

Building off the enforcement actions discussed under Safe Speeds Strategies 5 and 6, there are other actions cities can take to enforce safe behavior on roadways that are specifically driven by data. Equity should be a key consideration in enforcement, and this is discussed further under Culture Strategy 4 “Prevent enforcement efforts from disproportionately impacting low income and minority populations.”

Cities can **use crash history and corridors on the High Injury Network as one criterion** for where to concentrate enforcement efforts. For example, Portland uses photo enforcement in locations with high crash rates,<sup>98</sup> and the Police Department reviews maps and crash statistics weekly to determine enforcement priorities.

Cities can also **base enforcement priorities on crash trends**. For example, the San Francisco Police Department (SFPD) has a “Focus on the Five” mandate, which requires that roughly 50 percent of all SFPD traffic citations must focus on the five most dangerous driving behaviors.<sup>99</sup>

From a policy perspective, cities can place a greater emphasis on the need for traffic enforcement, such as through **increased funding**. They can also **work with the state legislature** to authorize automated enforcement technologies and identify where to deploy ASE cameras.

## **Safe Vehicles**

Safe Vehicles policies, programs, and practices implement improvements to vehicle design and technology to reduce risk of injury to passengers and people outside the vehicles. There are six overarching strategies that cities employ to achieve safe vehicles, and for each of those strategies, there are several specific actions cities have used to improve safety.

## **Strategy 1: Improve safety of private vehicles on our roads.**

### ***What are the specific actions that cities use to implement this strategy?***

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<sup>98</sup> <https://www.portlandoregon.gov/police/article/649328>

<sup>99</sup> <http://www.sfexaminer.com/citys-ambitious-goal-eliminate-traffic-deaths-slipping-sight/>



While there are limited actions cities can take at a local level to achieve this strategy, cities can collaborate with state agencies to implement **Transportation Network Company (TNC) and autonomous vehicle (AV) regulations** to ensure safe vehicle operation and safety data sharing.

For instance, cities and states can **require minimum safety equipment for TNCs**, such as crash avoidance systems. Cities also can advocate for legislative agenda at the state and national level to push for additional safety features in vehicles, including the latest in sensors and connected vehicle technology that are either available today or being developed by AV manufacturers, such as ADAS, Electronic Stability Control (ESC), rearview video system (RVS), Adaptive (Automatic) Cruise Control (ACC), Lane Departure Warning (LDW), Lane Departure Prevention (LDP), Forward Collision Mitigation (FCM), Forward Collision Warning (FCW), Automatic emergency braking (AEB), and Automatic Crash Notification (ACN), among others.<sup>100</sup>

## **Strategy 2: Improve safety of public vehicles on our roads.**

### ***What are the specific actions that cities use to implement this strategy?***

Cities have more authority to improve the safety of public vehicles on our roads. Cities can work to transition and **incorporate safety features into both municipal vehicles and contract utility vehicles** like garbage trucks, including high vision truck cabs and pedestrian crash warning.

Boston, NYC, Philadelphia, San Francisco, and Seattle have established procurement procedures and policies that encourage systematically bringing municipal and contract fleets up to a higher standard of safety with driver trainings, side guards, and blind spot mirrors and cameras.<sup>101</sup> In 2018, NACTO and Volpe released two guides on strategies to help make large vehicles safer to operate on city streets.<sup>102</sup> Volpe offers information on sideguards as a safety strategy and best practices for installation.<sup>103</sup> Some cities, such as Portland, are also working to **downsize fire truck vehicles**, as this enables narrower streets and intersections, and thereby slower speeds. Since fire trucks are a large investment, cities could explore downsizing fire trucks at a future date when vehicles are being phased out. Lastly, cities can work with transit agencies to install additional safety systems in buses, such as pedestrian crash warning.

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<sup>100</sup> <https://www.teendriversource.org/learning-to-drive/self-driving-cars-adas-technologies>

<sup>101</sup> <https://visionzeronet.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>102</sup> <https://nacto.org/optimizing-large-vehicles/>

<sup>103</sup> <https://www.volpe.dot.gov/our-work/truck-side-guards-resource-page>



### **Strategy 3: Improve safety around shared mobility.**

Micromobility is an emerging form of transportation that refers to the shared use of bikes, e-bikes, and e-scooters. While there are many benefits of these services, there are some concerns about safety. Several studies have come out recently that begin to explore this topic, including one from the International Transport Forum.<sup>104</sup> The Center for Disease Control and Prevention (CDC) is partnering with the City of Austin's Public Health and Transportation department to examine dockless scooter use and safety by studying EMS calls and scooter injuries.<sup>105</sup> Similarly, there are studies exploring safety of shared mobility services more broadly, including rideshare, as ridesharing is associated with a 2-3 percent increase in the number of motor vehicle fatalities and fatal accidents.<sup>106</sup>

#### ***What are the specific actions that cities use to implement this strategy?***

Cities can form agreements with shared mobility operators to **acquire crash data** and work with these companies to **monitor crash risk**. This could include developing dashboards that include crash reporting. While several cities have requested data from shared mobility operators, such as LA, Santa Monica, Chicago, and Houston, safety-specific data is an emerging area.<sup>107</sup>

As discussed under Shared Streets Strategy 1 "Implement projects citywide that make it more comfortable, accessible, and safe to walk and bike", it can be helpful for cities to develop policies around micromobility to clarify the rules of the road and establish clear city guidelines. For instance, cities should determine if it will mandate helmet use citywide. There are three primary resources that can help guide city policy on micromobility: NACTO's *Guidelines for the Regulation and Management of Shared Active Transportation*<sup>108</sup>, Remix's *Micromobility Policy Survey*<sup>109</sup>, and Transportation For America's *Shared Mobility Playbook*.<sup>110</sup>

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<sup>104</sup> <https://www.itf-oecd.org/sites/default/files/docs/safety-bike-share-systems.pdf>

<sup>105</sup> <https://www.smartcitiesdive.com/news/cdc-to-conduct-epidemiological-study-of-scooters-in-austin-tx/544037/>

<sup>106</sup> <https://research.chicagobooth.edu/-/media/research/stigler/pdfs/workingpapers/27thecostofconvenience.pdf?la=en&hash=A15B1513F98D7A17B9E37F78DD2EBDC4C6338BFA>

<sup>107</sup> [https://uploads-ssl.webflow.com/58bef71a278da7e44a2de93a/5c7d48b0314d16d165dc31b6\\_RemixMobilityBrief\\_03\\_MicroMobilityPolicySurvey\\_v08.pdf](https://uploads-ssl.webflow.com/58bef71a278da7e44a2de93a/5c7d48b0314d16d165dc31b6_RemixMobilityBrief_03_MicroMobilityPolicySurvey_v08.pdf)

<sup>108</sup> <https://nacto.org/wp-content/uploads/2018/07/NACTO-Shared-Active-Transportation-Guidelines.pdf>

<sup>109</sup> [https://uploads-ssl.webflow.com/58bef71a278da7e44a2de93a/5c7d48b0314d16d165dc31b6\\_RemixMobilityBrief\\_03\\_MicroMobilityPolicySurvey\\_v08.pdf](https://uploads-ssl.webflow.com/58bef71a278da7e44a2de93a/5c7d48b0314d16d165dc31b6_RemixMobilityBrief_03_MicroMobilityPolicySurvey_v08.pdf)

<sup>110</sup> <https://playbook.t4america.org/>



## **Strategy 4: Leverage new technologies for safety data collection.**

### ***What are the specific actions that cities use to implement this strategy?***

Technology is rapidly changing, and cities should stay on top of what technologies are available for collecting data on safety.

For example, the Washington State Patrol is using Unmanned Aerial Vehicle (UAV) Technology (i.e. drones) to conduct crash and crime scene investigations.<sup>111</sup> The program aims to reduce road closure time associated with collision investigations, improve the quality of forensic mapping capabilities, and improve officer safety. In 2018, this technology saved \$3.4M in detective investigations (91 investigations) and \$800k in patrol investigations (35 investigations).<sup>112</sup> Cities in Washington State can work with the Washington State Patrol to learn how to leverage this technology. Cities may also want to establish **UAV policy** at the city level.

**Zendrive** is a data vendor that uses sensors on a smartphone to detect near-misses and conflicts by looking at potential infraction behavior such as hard breaking, speeding, and other elements of driver behavior.<sup>113</sup> Alongside this unique form of data related to travel safety, they provide trip trace and origin-destination information from TNC drivers, fleets, and general drivers. They are able to segment their data by population. **Brisk Synergies** uses video data from traffic signal cameras to detect near-misses at intersections using computer vision and artificial intelligence techniques.<sup>114</sup> Bellevue's partnership with Brisk Synergies is discussed under the Task 4 section.

**HAAS Alert** is a vehicle-to-vehicle startup that sends real-time data to autonomous and connected vehicles on the location of emergency responders that are en route to a call and on scene, as well as municipal, commercial, or maintenance fleet operators on the road.<sup>115</sup> This type of technology has the ability to keep autonomous vehicles away from active emergency vehicles and maintenance vehicles, aiding in emergency vehicle response and reducing risk to maintenance workers.

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<sup>111</sup> Bellevue Vision Zero Summit, February 13, 2019

<sup>112</sup> Bellevue Vision Zero Summit, February 13, 2019

<sup>113</sup> <https://www.zendrive.com/>

<sup>114</sup> <https://brisksynergies.com/briskvantage/>

<sup>115</sup> <https://www.haasalert.com/company>



Source: HAAS Alert

### **Strategy 5: Create a safe environment for autonomous vehicle (AV) testing and implementation.**

#### ***What are the specific actions that cities use to implement this strategy?***

AVs have the potential to eliminate human driver error as a cause of fatal and serious injury crashes. Since this type of error is at the root of many crashes, this has the potential to help cities achieve Vision Zero. At the local level, jurisdictions can develop a **citywide autonomous vehicle policy**. LA was the first city to specifically address AV policy. Their plan, *Urban Mobility in the Digital Age*, looks at integrating autonomous vehicles into the City's transportation fleet and overall system.<sup>116</sup> Cities can also work with transit agencies for **adoption of AV buses**.

At a broader scale, cities can collaborate with state agencies to **implement legislative strategies** that promote and encourage safe AV testing, and cities can promote AVs when deemed ready.

### **Strategy 6: Implement safety enforcement technologies on public vehicles.**

Cities can use technologies on public vehicles, such as **enforcement cameras on school buses and emergency vehicles**, to ensure drivers follow the rules of the road. School buses are the safest mode of motorized transportation for getting children to and from school, yet four to six school-age children die each year on school transportation vehicles.<sup>117</sup> Although, that's less than one percent of all traffic fatalities nationwide, school buses should be as safe as possible. Cities can

<sup>116</sup> <http://www.urbanmobilityla.com/strategy>

<sup>117</sup> <https://www.nhtsa.gov/road-safety/school-bus-safety>



implement programs like the Bellevue School District's **Stop Paddle Camera Program**, which installed enforcement cameras on 20 percent of school buses. Citations are given to drivers who do not stop as required when a school bus's stop sign is out. Additionally, the school district, in partnership with the City has been distributing educational materials about how drivers are expected to respond to the stop paddle (for example, what to do on a divided road compared to an undivided road).<sup>118</sup> This program helps enforce driver behavior and improve student safety. Cities could implement a similar program for drivers that fail to yield to emergency vehicles.

## Leadership

Leadership policies, programs, and practices involve City leadership taking appropriate steps to realize the goal of zero, including ongoing commitment, authentic engagement, strategic planning, and project delivery. There are four overarching strategies that cities employ to achieve strong leadership, and for each of those strategies, there are several specific actions cities have used to improve safety.

**Strategy 1: The Mayor, elected officials, and department leaders commit to collaborating to achieve zero traffic fatalities and serious injuries within a specific timeframe.**

***What are the specific actions that cities use to implement this strategy?***

There are several actions cities can take to demonstrate this commitment, beginning with a **City Council Resolution** or other official public statement from elected official(s) committing to Vision Zero. It is important to commit to a **specific timeframe** for eliminating fatalities and serious injuries, with clear interim goals. Most Vision Zero cities have a permanent home within city government with a website and strategy for keeping the community informed about progress. For example, San Francisco's Police Department updates its Commission on Vision Zero progress on a quarterly basis, in a public hearing format to also inform the public.<sup>119</sup> Cities can establish a cross-sector **Vision Zero working group** and structure for resource-sharing to help prioritize safety. Edmonton hosts an annual International Urban Traffic Safety Conference to share leading and best practices in global Urban Traffic Safety Research and practice.<sup>120</sup>

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<sup>118</sup> <https://bsd405.org/departments/transportation/stop-paddle-camera-program/>

<sup>119</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>120</sup> [https://www.edmonton.ca/transportation/VisionZero\\_EdmontonRoadSafetyStrategy\\_2016-2020.pdf](https://www.edmonton.ca/transportation/VisionZero_EdmontonRoadSafetyStrategy_2016-2020.pdf)



## **Strategy 2: Employ meaningful and accessible community engagement toward Vision Zero with a focus on equity.**

### ***What are the specific actions that cities use to implement this strategy?***

A key component of Vision Zero efforts is engaging the community in meaningful, culturally relevant ways to ensure that community concerns are heard and reflected. Cities may prioritize support of communities most impacted by traffic crashes and most traditionally underserved by safety efforts.

There are a variety of different ways to approach this. LA and DC set strong examples for new models of outreach and community partnerships that focus on underrepresented communities affected by Vision Zero plans.<sup>121</sup> For instance, DC held 10 **pop-up events** in the community to engage residents early in the planning stage. Events were located at active public spaces, often outside of metro stations.<sup>122</sup> LA spreads the Vision Zero message by **tying into existing forums**, rather than using stand-alone city-hosted public meetings. When they have a project ready for conceptual design, rather than create a separate public hearing forum, they look to plug into a local effort or neighborhood event.<sup>123</sup> Edmonton uses a **Traffic Safety Culture Survey** biennially to understand the behaviors and beliefs of the community. Based on the findings, they commit to developing new education programs and review and enhance existing program, as well as prepare and execute an annual traffic safety communications plan.<sup>124</sup>

Cities can also spread the word by **involving respected community leaders**. Seattle uses its Community Liaisons program in the Department of Neighborhoods to reach underrepresented communities. Community Liaisons are paid city contractors, oftentimes leaders in these communities, who serve as a bridge for city agencies.<sup>125</sup> In Portland, Vision Zero brought together a diverse group of agency and community partners to engage in honest conversations and share serious concerns about the role of enforcement in Vision Zero, stemming from the awareness of real and perceived racial profiling.<sup>126</sup>

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<sup>121</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>122</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>123</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>124</sup> [https://www.edmonton.ca/transportation/VisionZero\\_EdmontonRoadSafetyStrategy\\_2016-2020.pdf](https://www.edmonton.ca/transportation/VisionZero_EdmontonRoadSafetyStrategy_2016-2020.pdf)

<sup>125</sup> [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>126</sup> <https://www.portlandoregon.gov/transportation/71731> and [http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwork.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)



### **Strategy 3: A Vision Zero Action Plan guides work and includes clear goals, measurable strategies, timelines, and responsible stakeholders.**

#### ***What are the specific actions that cities use to implement this strategy?***

Action Plans are a key component in the goal of achieving zero and lay out measurable strategies for achieving zero. Each strategy typically includes a lead agency responsible and a timeline for implementation, as is the case with Austin and DC's action plans.<sup>127</sup> Philadelphia's Vision Zero Action Plan distinguishes between short-term (1 to 3 years) and long-term goals.<sup>128</sup> Many Action Plans are built on Safe Systems approach. No single agency is counted on to provide traffic safety data – it requires a coordinated effort.

### **Strategy 4: Decision-makers and system designers advance projects and policies that prioritize safety over conflicting transportation goals.**

#### ***What are the specific actions that cities use to implement this strategy?***

Cities have numerous and sometimes conflicting transportation priorities, so it is critical that decision-makers provide **leadership to advance the policy reforms needed to prioritize safety**. For instance, decision-makers and system designers can advance cross-cutting measures to reduce car dependence, improve transit, and support safe walking and biking. Edmonton provides \$1 million annually for pedestrian safety enhancements specifically allocated for signals, flashers and RRFBs.<sup>129</sup> Some cities (Seattle being a notable local example) implement speed limit changes and road rechannelizations to improve safety outcomes as a priority over other city transportation goals like congestion reduction or freight mobility.

**Interdepartmental collaboration** can help advance safety projects and policies. As an example, multiple LA departments, including Transportation, Public Works, and Police, submitted a coordinated Vision Zero budget request in 2015. This joint proposal highlighted the shared commitment to Vision Zero and was favorably reviewed by the City's budget committee, resulting in more funding being available for LA's early Vision Zero efforts.<sup>130</sup>

There are also actions cities can take at the state level. Studies have shown that there is a statistically significant increase in traffic crashes on the Monday following the Springtime daylight savings switch and on the Sunday in the Autumn switch, so cities can advocate for legislative agenda at the

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<sup>127</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>128</sup> [https://visionzeronetwork.org/wp-content/uploads/2017/12/VZN\\_ActionPlan\\_FINAL.pdf](https://visionzeronetwork.org/wp-content/uploads/2017/12/VZN_ActionPlan_FINAL.pdf)

<sup>129</sup> [https://www.edmonton.ca/transportation/VisionZero\\_EdmontonRoadSafetyStrategy\\_2016-2020.pdf](https://www.edmonton.ca/transportation/VisionZero_EdmontonRoadSafetyStrategy_2016-2020.pdf)

<sup>130</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>



state level to remove daylight savings time and enact a standard time throughout the calendar year.<sup>131</sup> Also, as mentioned in the Safe Speeds and Safe Streets sections, many states require legislative approval for broad speed limit changes or automated speed/traffic law enforcement that can improve safety outcomes.

## Data

Data policies, programs, and practices involve the City collecting and using a variety of data sources to analyze and routinely evaluate safety in Bellevue. There are three overarching strategies that cities employ to achieve data-driven safety, and for each of those strategies, there are several specific actions cities have used to improve safety.

**Strategy 1: The performance and implementation of all safety interventions is routinely evaluated, made public, and shared with decision makers to inform priorities, budgets, and updates to the Vision Zero Action Plan.**

### ***What are the specific actions that cities use to implement this strategy?***

Cities should keep its leaders and community at large apprised of Vision Zero efforts by **regularly updating data** on traffic deaths and serious injuries, and **progress reports** should be regularly developed and posted publicly on the project website, through social media, and other avenues as appropriate. Seattle<sup>132</sup> and New York City<sup>133</sup> proactively monitor, evaluate, and share progress, including releasing regular public progress reports.<sup>134</sup>

More and more cities are using **pilot programs or projects** to test out safety strategies on a shorter timeline at a lower cost. These can either be implemented on a temporary basis (tactical urbanism) or permanent basis with room for modification (quick builds). Cities should evaluate pilots through data collection and community feedback, making modifications or ending the pilot as appropriate.

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<sup>131</sup> <https://www.ncbi.nlm.nih.gov/pubmed/11152980>

<sup>132</sup> [http://www.seattle.gov/Documents/Departments/beSuperSafe/VZ\\_2017\\_Progress\\_Report.pdf](http://www.seattle.gov/Documents/Departments/beSuperSafe/VZ_2017_Progress_Report.pdf)

<sup>133</sup> <https://www1.nyc.gov/assets/visionzero/downloads/pdf/vision-zero-year-4-report.pdf>

<sup>134</sup> <http://www.seattle.gov/visionzero/materials> and <https://www1.nyc.gov/assets/visionzero/downloads/pdf/vision-zero-year-3-report.pdf>



## **Strategy 2: Collect and analyze data to inform evidence-based strategies and interventions.**

### ***What are the specific actions that cities use to implement this strategy?***

Many Vision Zero cities develop a **High Injury Network (HIN)** derived from quantitative (“hot spot” crash locations) and qualitative data (based on community input) to inform its safety project prioritization and implementation. The HIN identifies and maps locations of serious crashes and top risk factors. Cities that have developed a HIN include LA, San Francisco, Boise, San Diego, San Jose, Portland, New York City, Oakland, Sacramento, Chicago, Eugene, Brighton, Denver, and Philadelphia, among others.<sup>135</sup> Cities are increasingly including equity-based elements in the HIN analysis, such as locations of low-income communities and communities of color, and committing to prioritizing actions and funding in areas of overlap with the HIN. This is discussed further under Culture Strategy 3 “Continually use data and public input to identify populations who are disproportionately and negatively impacted by crashes.”

As discussed under Safe Vehicles Strategy 3 “Improve safety around shared mobility”, cities can form agreements with shared mobility operators to **acquire crash data** and work with these companies to **monitor crash risk**. This could include developing dashboards that include crash reporting. As previously mentioned, while several cities have requested data from shared mobility operators, safety-specific data is an emerging area. If acquired, cities could identify strategies and interventions to address safety, be it at a citywide policy level or at specific locations where crash risk is highest.

Using data and evidence-based approaches can make projects more compelling, and it can help cities prioritize scarce funding and staffing resources. Making safety commitments based on data-proven needs helped LA pass a sales tax measure in 2016 bringing in an estimated \$860 million per year for transportation improvements countywide.<sup>136</sup> Edmonton uses a data driven approach to Crime and Traffic Safety. A multi-disciplinary analysis helps the City identify and target traffic and crime hotspots for prioritized police enforcement.<sup>137</sup>

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<sup>135</sup> <https://visionzeronetwork.org/hin-for-the-win/>

<sup>136</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>137</sup> [https://www.edmonton.ca/transportation/VisionZero\\_EdmontonRoadSafetyStrategy\\_2016-2020.pdf](https://www.edmonton.ca/transportation/VisionZero_EdmontonRoadSafetyStrategy_2016-2020.pdf)



### **Strategy 3: Apply a proactive, systems-based approach to identify and address top risk factors and mitigate potential crashes and crash severity.**

Vision Zero's Safe Systems approach moves away from purely looking at where crashes have occurred in the past to a more forward-facing identification of problem areas and working to prevent severe crashes before they happen. Data is used to identify trends of problems, which are addressed systematically rather than as isolated incidents. This means determining, analyzing, and addressing the underlying risk factors that influence dangerous actions: the where, how, and why serious crashes happen.<sup>138</sup>

#### ***What are the specific actions that cities use to implement this strategy?***

Cities can use a variety of data sources to identify trends in safety issues. They can **partner with big data providers**, such as Inrix, Waze, and Google, to identify areas seeing high speeds, trends in dangerous behaviors, and unreported crashes, and implement proven safety countermeasures. For example, based on analysis showing a trend of left-turn vehicle movements being particularly dangerous on certain types of streets, New York City's Department of Transportation is proactively addressing these areas with proven countermeasures, rather than reacting to each individual problem after serious crashes occur. Cities can also use data to conduct **predictive modeling**, moving beyond simply reacting to past problems. As discussed under Safe Vehicles Strategy 4 "Leverage new technologies for safety data collection", cities can use **Unmanned Aerial Vehicle (UAV) Technology** (i.e. drones) to conduct crash investigations.<sup>139</sup>

**Video analytics** can be used to identify near misses and underreported crashes, and to quantify the factors that are contributing to those situations. In the future, video analytics also has the potential to serve as a predictive tool by relating areas with high crashes with certain driver/pedestrian/bicycle behaviors. Cities can then continuously monitor high-risk intersections, looking for trends and changes over time. Cities can identify and implement proven safety countermeasures to address these risk factors, and evaluate over time how roadway improvements have affected safety. In addition to Bellevue, Edmonton is using advanced video-based road safety analytics to proactively identify crash risk, using potential time to crash conflicts.<sup>140</sup>

In Washington State, cities can develop **Local Road Safety Plans** to systemically identify sites for safety improvements. Having this type of plan in place makes cities eligible to apply for Highway Safety Improvement Program (HISP) funding through WSDOT. The NCHRP Research Report 893:

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<sup>138</sup> [https://visionzeronetwork.org/wp-content/uploads/2018/11/VZN\\_CoreElements\\_FINAL.pdf](https://visionzeronetwork.org/wp-content/uploads/2018/11/VZN_CoreElements_FINAL.pdf)

<sup>139</sup> Bellevue Vision Zero Summit, February 13, 2019

<sup>140</sup> [https://www.edmonton.ca/transportation/VisionZero\\_EdmontonRoadSafetyStrategy\\_2016-2020.pdf](https://www.edmonton.ca/transportation/VisionZero_EdmontonRoadSafetyStrategy_2016-2020.pdf)



Systemic Pedestrian Safety Analysis can serve as a helpful resource in identifying sites for safety improvements.<sup>141</sup>

Seattle has used a proactive, systems-based approach to identify risk factors and safety projects. Seattle found that people walking, bicycling, and riding motorcycles in 2017 were involved in 7 percent of crashes but made up 89 percent of fatalities. Staff identified the risk factors contributing to pedestrian and bicycle injuries and deaths to systemically address and mitigate potential serious crashes. They created the Bicycle and Pedestrian Safety Analysis (BPSA), which found 16 statistically significant risk factors contributing to bicycle and pedestrian crashes, including that a disproportionate number of crashes happened on arterial streets. Staff created a ranked list of intersections and identified which signal and design changes would be needed to treat known and modeled crash types.<sup>142</sup>

## Culture

Culture policies, programs, and practices involve the City making a commitment to an equitable approach and outcomes, including prioritizing engagement and investments in traditionally underserved communities and adopting equitable traffic enforcement practices. There are five overarching strategies that cities employ to achieve a culture of safety, and for each of those strategies, there are several specific actions cities have used to improve safety.

### **Strategy 1: Ensure city staff fully embrace the goal of reaching zero fatality and serious injuries by 2030.**

#### ***What are the specific actions that cities use to implement this strategy?***

Cities can recommend that key staff members attend safety and Vision Zero **trainings** and **conferences**, as well as participate in **webinars**. These are helpful to stay apprised of the current technologies and thinking on Vision Zero, as well as revive a sense of commitment for achieving zero fatality and serious injuries in one's community.

Cities can also **administer an annual/biennial survey** among staff to assess staff commitment to Vision Zero. Cities should evaluate how the internal culture around Vision Zero is shifting and take action as needed to revive understanding, commitment, and energy around safety. If a city already administers a periodic survey to staff, this could be integrated as a new section. Cities could also

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<sup>141</sup> <http://bit.ly/2FiL643>; <https://bit.ly/2P29jRC>

<sup>142</sup> <https://visionzeronetwork.org/developing-a-proactive-approach-to-safety/>



use this opportunity to track how the City's safety educational programs are performing, lessons learned, and areas for improvement.

## **Strategy 2: Prioritize safety improvements on roadways for people walking and biking and in historically underserved communities.**

### ***What are the specific actions that cities use to implement this strategy?***

There are a variety of ways cities can take action on this strategy. When prioritizing projects, cities can include **prioritization criteria related to equity**. For example, LA developed a prioritization framework that includes more traditional criteria like crash severity, but also less common criteria such as involvement of children or older adults and if the crash location is in a "target community" traditionally underserved.<sup>143</sup> Olympia is using transportation disadvantaged communities as a prioritization metric in its upcoming Transportation Master Plan, which includes improvements to address safety outcomes.

Cities can also put forward **bond measures** to raise funds for projects supporting walking and biking. For example, San Francisco found that bicyclists and pedestrians were over-represented in traffic fatalities and severe injuries, which led the City to focus more attention on improving safety for those road users. This included a successful local bond measure that raised \$500 million in new funds for more roadway design improvements aimed at safety for those walking and bicycling.<sup>144</sup> Bellevue's recently-passed Neighborhood Safety, Connectivity and Congestion Levy is another example.<sup>145</sup>

## **Strategy 3: Continually use data and public input to identify populations who are disproportionately and negatively impacted by crashes.**

### ***What are the specific actions that cities use to implement this strategy?***

As discussed under Data Strategy 2 "Collect and analyze data to inform evidence-based strategies and interventions", many cities develop a High Injury Network (HIN) derived from quantitative ("hot spot" crash locations) and qualitative data (based on community input) to inform its safety project prioritization and implementation. Cities can **overlay the HIN onto other equity data** to inform city priorities. For example, LA overlaid its HIN with data from Healthy Los Angeles to see how the HIN streets overlap with communities already burdened with the poorest health outcomes and economic conditions. They used a Health and Equity Index, which compares health conditions

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<sup>143</sup> [http://visionzeronet.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronet.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>144</sup> <https://visionzeronet.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

<sup>145</sup> <https://transportation.bellevuewa.gov/projects/transportation-levy-projects>



citywide using demographic, socio-economic, health conditions, land use, transportation, food environment, crime and pollution budget data.<sup>146</sup> Similarly, San Francisco<sup>147</sup> and Jersey City<sup>148</sup> overlaid their HIN with areas they identify as “Communities of Concern” — communities with a concentration of vulnerable residents including low income residents and people of color.

#### **Strategy 4: Ensure enforcement, outreach, and education is equitable across the city’s diverse populations.**

Some communities have raised concerns about equity and enforcement efforts related to Vision Zero:

“The same emphasis on a data-driven approach may justify focusing traffic law enforcement in certain neighborhoods that are experiencing high levels of traffic violence. Yet these are often the same neighborhoods and involve the same communities experiencing the greatest tensions with police. So, while our goal in Vision Zero is to increase safety from a transportation perspective, we run the risk of promoting over-policing in a harmful way and contributing to the disintegration of trust between police and the communities they serve. Experience and research tell us the communities that suffer the most from traffic violence also stand the greatest chance of being subject to inequitable traffic enforcement. We need police to be empowered to enforce traffic laws to save lives. But how can we be sure that we’re not contributing to a bigger problem?”<sup>149</sup>

The actions that fall under this strategy help address some of these concerns.

#### ***What are the specific actions that cities use to implement this strategy?***

Some cities are choosing to **exclude increased enforcement by police officers from their Action Plans** and placing a greater emphasis on enforcement through automated enforcement cameras. For example, Portland’s Vision Zero Action Plan explicitly excludes increased enforcement by police officers, limiting enforcement actions to reduce the possibility of racial profiling and disparate economic impacts. Portland also offers education classes as alternatives to increased penalties for first time offenders.<sup>150</sup>

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<sup>146</sup> [http://visionzeronetwerk.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwerk.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>147</sup> [http://visionzeronetwerk.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwerk.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)

<sup>148</sup> <http://www.visionzerojc.com/action-plan>

<sup>149</sup> <https://visionzeronetwerk.org/vision-zero-equity-law-enforcement/>

<sup>150</sup> [http://visionzeronetwerk.org/wp-content/uploads/2017/05/VisionZero\\_Equity.pdf](http://visionzeronetwerk.org/wp-content/uploads/2017/05/VisionZero_Equity.pdf)



Other cities are utilizing **creative fine structures**. New York City is investigating strategies to implement a more equitable fine structure and fee payment process. They keep fines low (\$50) and do not add points to the license. Despite this more lax approach, most people do not re-offend.

Cities can also **target enforcement efforts on the most dangerous traffic behaviors**. San Francisco set a measurable goal to focus 50 percent of its traffic enforcement efforts on the top five most dangerous traffic behaviors, rather than on lower level infractions like expired tags that do not affect safety and impact certain communities more than others.<sup>151</sup>

### **Strategy 5: Systematically reach out to the community to build a culture of safety.**

#### ***What are the specific actions that cities use to implement this strategy?***

To spread the word about Vision Zero efforts and build a culture of safety across an entire city, cities should **get the word out (in a context sensitive way) that crashes are occurring**. Using social media and other methods, cities should inform communities about Vision Zero efforts generally and inform them after a fatal crash has occurred, framing these incidents as crashes not accidents. For instance, LA Department of Transportation has hosted community meetings after a fatal crash has occurred.<sup>152</sup>

This strategy goes hand in hand with Safe People Strategy 4 “Educate children and students on safety and rules of the road,” but it takes those actions one step further. Having children and students participate in outreach and programs throughout their schooling will help instill a culture of safety and the next generation of safety stewards in a community.

**School Districts can update their strategic plans to incorporate transportation safety** as a stated priority with specific strategies aimed toward improving travel to and from schools, as outlined in Jersey City’s Vision Zero Action Plan.

## **Partnerships**

Partnership policies, programs, and practices involve the City identifying and working with other agencies, organizations, and groups to advance transportation safety. There are three overarching

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<sup>151</sup> <https://visionzeronetwork.org/wp-content/uploads/2017/11/VZN-Moving-from-Vision-to-Action.pdf>

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strategies that cities employ to form partnerships, and for each of those strategies, there are several specific actions cities have used to improve safety.

### **Strategy 1: Work with partner safety agencies to develop a more complete crash database.**

A key challenge in working towards the goal of zero is that most cities' crash data is incomplete. Typically, a city's crash data stems from police reports, which tend to be incomplete and inconsistent. It often does not account for crashes that Fire and EMS respond to, and many more collisions are unreported – especially those involving bicyclists.

#### ***What are the specific actions that cities use to implement this strategy?***

Cities can help establish **education, training, and equipment for police officers and other first responders** to improve the quality and reliability of crash reports, which requires partnerships with a variety of departments and agencies. To address underreporting of bicycle crashes, police can be trained to add more detail on reports involving bicycles, such as more detailed information on bike through movements, so safety projects can more easily be identified from crash history.

Cities can also work to **incorporate other data sources** to provide a more complete picture of crashes and injuries. For instance, San Francisco, New York City, and Chicago supplement crash record data with public health data, such as **hospital records**.<sup>153</sup> As previously mentioned, **video analytics** can be used to identify near misses and underreported crashes, and to quantify the factors that are contributing to those situations. Cities can then continuously monitor high-risk intersections, looking for trends, changes over time, and how roadway improvements have been affecting safety. The underreported crashes can also be added to a city's crash database. Additionally, cities can request data from **shared mobility providers** (TNCs and bikeshare), which should include safety and crash data.

In addition to having a more complete dataset, cities also need to organize that data in a **unified crash database**. NORCOM, the 911 center for 6 agencies in Washington State, is working to combine different datasets through a system called RAADAR. Several cities around the country have similar real-time data centers with a consolidated data report. Creating such a database often requires partnerships and information exchange agreements to address public disclosure, liability, third party use, etc.

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<sup>153</sup> <https://visionzeronetwork.org/project/the-central-role-of-public-health-in-vision-zero/>



## **Strategy 2: Revise/standardize crash reporting data for consistent results across all modes.**

In reviewing crash data across many jurisdictions, it is not uncommon to find that certain types of crashes generate more information about the cause of the crash. For example, in Bellevue, there is limited data on whether bicycle crashes involve a turning vehicle, while in contrast, most pedestrian-vehicle and vehicle-vehicle crashes have this data reported. Similarly, crash data outside of Denver have relatively detailed information related to vehicle-vehicle crashes (speed, vehicle positions, and turning status), but limited information is collected for vehicle-pedestrian and vehicle-bicycle crashes – the data only shows that one of these modes (pedestrian or bicycle) was involved.

### ***What are the specific actions that cities use to implement this strategy?***

Cities can develop a **standardized reporting form** for all crashes that includes important factors like estimated vehicle speed, turning movement, pedestrian crossing activity, bicycle direction (through, left-turn, right-turn, etc.), bicycle speed, and potentially other factors to help diagnose crash causes and potential interventions. Many jurisdictions, such as Chicago<sup>154</sup>, use a **standardized electronic crash reporting form** to document crash conditions, which is an improvement over paper forms because hand written reports can be miswritten and misinterpreted later. Including additional questions to prompt police officers to collect data on pedestrians and bicycles involved in crashes could improve the consistency of data collection. As mentioned under Partnerships Strategy 1 “Work with partner safety agencies to develop a more complete crash database”, **police officer training** can also help improve crash data consistency.

## **Strategy 3: Continually identify new transportation safety partners.**

### ***What are the specific actions that cities use to implement this strategy?***

To keep up to date on the latest safety analytic techniques, city staff should **attend conferences** and **talk with peer cities** to learn about new data sources and vendors. Cities can **host forums** like the Bellevue Vision Zero Summit to learn about what is being done around the state/country and share lessons learned.

Cities can also **partner with existing data vendors** to assess the data’s applicability to one’s city. Bellevue has actively been doing this through its partnerships with Waze, Brisk Synergies, and Microsoft. Cities can also **offer data to new data providers/researchers as a testbed** to develop new products, transportation safety research, and refine existing analyses.

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<sup>154</sup> <http://www.trafficconf.com/presentations/2018/Electronic%20Crash%20Reporting%20in%20Chicago.pdf>