Implementing the Safe System Approach

Strategies to improve pedestrian and bicyclist safety

UC Berkeley SafeTREC

California Walks
Stepping Up for Health, Equity, & Sustainability

OTS CALIFORNIA OFFICE OF TRAFFIC SAFETY

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About the Community Pedestrian and Bicycle Safety Program

Safe System Approach to Road Safety

The Safe System Approach is a framework committed to zero traffic fatalities or serious injuries on our roads. It is human-centered and proactive, focusing on the most vulnerable populations who experience a disproportionate rate of traffic fatalities and serious injuries. The framework focuses on saving lives through the understanding that humans make mistakes and bodies are fragile. The Safe System Approach aims to reduce the kinetic energy generated in a traffic crash through a holistic approach that integrates layers of protection for all road users, thereby minimizing the severity of injuries to the human body. It recognizes that roadway design, management, and investments must prioritize the safety of all road users.

The Community Pedestrian and Bicycle Safety Program (CPBSP) team adapted the Federal Highway Administration's (FHWA) Safe System elements and principles to make them more impactful for grassroots community engagement. The FHWA identifies six key principles within its framework; the CPBSP identifies seven key principles in order to emphasize the need to prioritize equity throughout the system to address persistent disinvestments and institutional biases. We also replaced the FHWA's safe vehicles element with two new elements: capacity strengthening and policies, planning, and safety data. This adaptation reflects the need to engage marginalized communities and invest in active transportation safety.

Federal Highway Administration Safe System Approach
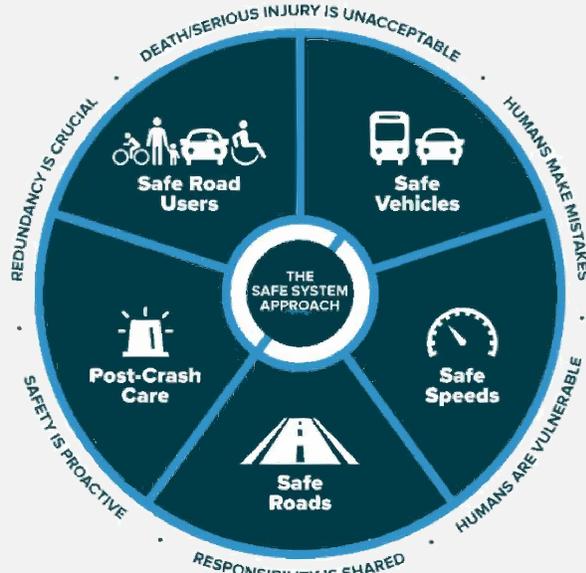
CPBSP Safe System Approach

With our adapted Safe System Approach framework, the CPBSP team:

1. Reviews pedestrian and bicycle crash data and safety strategies;

2. Facilitates walking and biking assessments;

3. Strategizes with participants to define specific community pedestrian and bicycle safety goals and actionable next steps; and

4. Empowers participants to strengthen collaborations in order to implement specific walking and biking safety recommendations in their communities.

Our toolkit aims to help participants create safer communities for walking and biking across California through the use of the Safe System Approach. There are many ways to plan a bikeable and walkable community; this toolkit aims to serve as a starting point.

Within the toolkit, each strategy is organized into key categories and can be easily navigated using the listed keywords. These keywords include:

- **Advocacy and policy:** Actions and plans that aim to garner support for a particular cause, which can be used as a basis for decision-making within different institutions.

- **Data collection and analysis:** Strategies that systematically gather and examine information to discover patterns and relationships in transportation-related data.

- **Infrastructure**: Permanent or temporary structures, systems, and facilities that establish the layout of the roadway.

- **Programming:** An integrated set of planned strategies, activities, and services that address community concerns and promote pedestrian and/or bicycle safety and activity.

Advocacy and policy

Actions and plans that aim to garner support for a particular cause, which can be used as a basis for decision-making within different institutions.

Bicycle and/or pedestrian advisory committee

A volunteer or appointed group of residents, community stakeholders, and subject matter experts that advise and make recommendations to decision-makers on walking and biking programs, projects, and policies.

Example: The Campbell Bicycle and Pedestrian Advisory Committee holds meetings every other month to discuss pressing bicycle and pedestrian issues, guide the development of planning and policies, and review proposed and planned bicycle- and pedestrian-related projects.

When to use: To provide opportunities for residents, community stakeholders, and subject-matter experts to help shape their community.

Bicycle and/or pedestrian master plan

An official government document used to guide funding decisions and/or prioritize specific walking and biking improvement programs, projects, and policies.

Example: The Santa Rosa Bicycle and Pedestrian Master Plan (BPMP) is a tool for guiding city staff and the development community in building a transportation system that is pedestrian and bicycle-friendly. It encourages residents to shift from single-occupancy vehicles to active transportation like walking and biking.

When to use: To create a city-wide or regional government plan that prioritizes walking and biking.
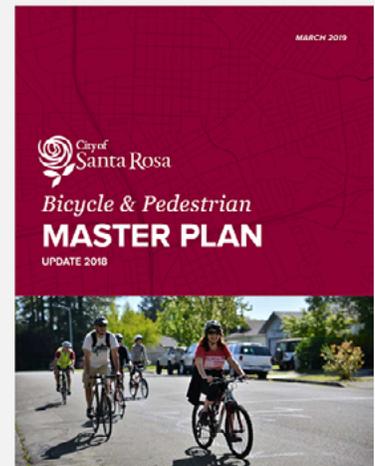
Community benefit agreement

A legally binding contract between a community coalition and the developer of a proposed development project. In exchange for public support of the project, the developer contributes benefits identified by the local community, such as pedestrian and bicycle safety improvements, open green space, affordable housing, and more.

Example: Richmond's City staff members and community members created a community benefits policy to support community goals in tandem with developments in the city.

When to use: To improve the safety of people walking and biking or increase open green space for the community at or near new development projects.

Community coalition

A variety of partners in a community that work together to improve active transportation safety. This can include work in affordable housing and active transportation, land use solutions, public transportation investments, and more. Coalitions can bring together a large group of advocates and stakeholders (i.e., community residents, local organizations, school representatives, agencies, decision-makers, and others) who combine resources and collaborate towards their shared goals. By taking collective action, members of a coalition can generate increased visibility and have their perspective elevated through a broader effort.

Example: The South Los Angeles Community Coalition is made up of community residents, youth, service providers, and organizations working together to address inequities and build a better future.

When to use: To provide a well-rounded, safe community for those living in and traveling to it.

Comprehensive safety action plan

A comprehensive safety action plan aims to reduce and eliminate serious injury and fatal traffic crashes affecting all roadway users. This plan uses data analysis to understand roadway safety concerns and strengthen a community's approach through projects and strategies that address the most significant safety risks.

Example: The City of Hawthorne developed a Comprehensive Safety Action Plan focusing on traffic safety improvements and addressing factors contributing to local traffic collisions.

When to use: To develop a comprehensive strategy to reduce or eliminate serious and fatal traffic crashes on roadways.

Engaged elected official

Engaging a decision maker for walking and biking safety in a community may help bring much-needed support for safety improvements and policies. They can raise awareness and gain public funding support for bicycle and pedestrian projects.

Example: Alongside community members, Dorothy Wong advocated for and took part in a Community Pedestrian and Bicycle Safety Training workshop in 2018 and has since won funding to implement projects named in the report. Most notably, Dorothy Wong applied for and won an AARP Community Challenge Grant in 2021 to advocate for safe and healthy access to parks which allowed the City to implement a demonstration project at a local park.

When to use: To prioritize biking and walking in a community through the adoption of policies, plans, and laws at the government level.

Funding opportunities that prioritize safety

Local, regional, statewide, and national funding sources identified that can fund traffic safety improvements. This can include Office of Traffic Safety (OTS) grants, Caltrans' Active Transportation Program, local mini-grant opportunities, and more.

Example: The California OTS provides yearly grants to public entities to address priority program areas including pedestrian and bicycle safety.

When to use: To fund the implementation of walking and biking safety programs and infrastructure projects.

Local Road Safety Plan (LRSP)

A framework and plan that identifies, analyzes, and prioritizes traffic safety improvements on local roads tailored to local issues and needs. The purpose of the plan is to reduce serious injuries and fatalities.

Example: The City of Arcata and Redwood Community Action Agency has developed a LRSP to analyze and prioritize street safety improvements.

When to use: To identify, analyze, and prioritize traffic safety improvements on local roads, aiming to reduce crashes, injuries, and fatalities by addressing specific traffic safety concerns within the jurisdiction.

Participatory campaign

A campaign that invites the community to participate in the planning process for traffic safety projects and programming, which may include educational safety activities such as mural painting, crosswalk performances, and neighborhood walking, biking, and/or bus tours.

Example: The City of San Francisco's District Seven has engaged in participatory budgeting, which is a democratic process in which community members propose projects and decide how to spend part of a public budget.

When to use: To provide ways for the community to get directly involved in the planning process for a project and provide their input directly to those planning the project.

Vision Zero

A policy to eliminate all traffic fatalities and serious injuries on city, county, or state streets. This is accomplished while increasing safe, healthy and equitable mobility for all people using the street but especially vulnerable users. Agencies adopt these policies to signal their priorities to residents, guide future development and decision-making, and demonstrate their commitment to safety.

Example: The City of Fremont has developed a Vision Zero Action Plan to implement City's Vision Zero policy of eliminating all traffic fatalities and serious injuries by 2040.

When to use: To encourage more residents to walk, bike, or take transit and improve the safety of vulnerable populations using the corridor. To reach zero deaths and serious injuries within a city, county, or state.
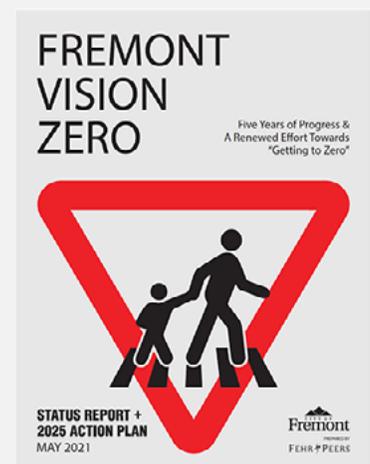
Data collection and analysis

Strategies that systematically gather and examine information to discover patterns and relationships in transportation-related data.

Evaluation

The collection and analysis of data to help make program and funding decisions, as well as understand the impacts of the project or program.

Example: SafeTREC's 2024 CPBSP Highlight Report provides a high-level summary of the program activities for the CPBSP and its impacts on communities across California.

When to use: To use data to prioritize actions and to track progress related to transportation safety efforts. Evaluation may also support future requests for funding.
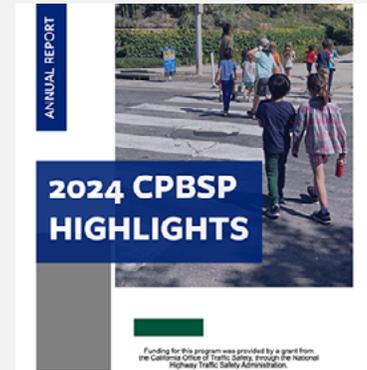
High-Injury Network (HIN)

A data-driven approach to safety that maps fatal and serious crashes to identify streets where the highest concentrations of crashes have occurred. This data can be used to prioritize funding and safety projects in those areas.

Example: The Oakland High Injury Network (HIN) is a map of the corridors and intersections where the most severe and fatal crashes are concentrated, through an analysis of 2017-2021 data.

When to use: To use data to prioritize actions and to track progress related to transportation safety efforts.
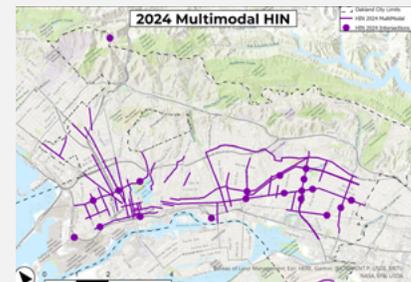
Linking crash and medical data

A link between hospital, police, emergency response, and other traffic crash data can provide accurate, coordinated, and timely monitoring of traffic crash injuries and deaths. This data can also be used to support prioritizing traffic safety projects, the evaluation of projects, and monitoring traffic safety projects.

Example: The Injury and Violence Prevention Branch at the California Department of Public Health launched a project to integrate medical and crash data to better understand how to prevent people from being injured or killed in traffic crashes.

When to use: To use data to prioritize actions and to track progress related to transportation safety efforts.

Pedestrian and bicycle count

A data collection of how many people are walking and/or biking on a street or path to demonstrate the need for more pedestrian and bicycle infrastructure. This can be collected either manually or through automated counters.

Example: In 2016, Long Beach installed its first pedestrian/bicycle counter that displays daily and annual counts. The counter captures both pedestrians and bicyclists via infrared and inductive loops in real time.

When to use: To collect volume data to demonstrate the need for traffic safety improvements on a street or path or to evaluate how a project has affected multimodal volumes.

Photo and VideoVoice

The use of images or videos to communicate perspectives and raise awareness of safety issues in a community. Photo and VideoVoice testimonials offer greater flexibility for residents to engage in community planning.

Example: In 2021, SafeTREC's CPBST Project Team worked with the community of Castro Valley on a workshop where the team recommended a VideoVoice Project, one that came to fruition during a technical assistance project in 2023.

When to use: To gather more information and data directly from those impacted by traffic violence, near misses, and unsafe streets in a community. This data can then be used as a tool to advocate for traffic safety improvements.
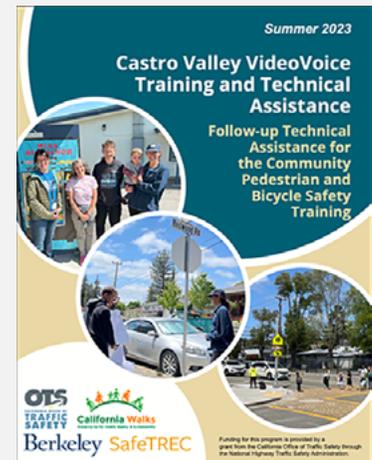
Safe Routes to School (SRTS) data collection

The gathering of information on how students travel to and from school and parents' thoughts about their children walking and biking to and from school. The National Center for Safe Routes to School offers the Student Travel Tally and Parent Survey forms.

Example: The City of Palo Alto's Office of Transportation has collected SRTS data, ranging from classroom tally data gathered by Palo Alto Unified School District teachers to reported numbers of parked bicycles at each public middle and high school in Palo Alto.

When to use: To better understand how a school currently travels to and from the campus and look to encourage students to walk and bike to school.
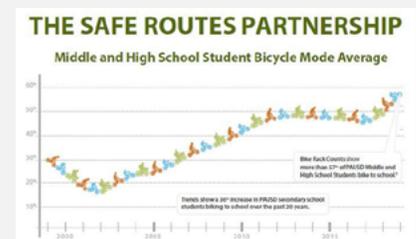
Safe System Approach

The Safe System Approach is a framework committed to zero traffic fatalities or serious injuries on our roads. It is human centered and proactive, focusing on the most vulnerable populations who experience a disproportionate rate of traffic fatalities and serious injuries. The framework focuses on saving lives through the understanding that humans make mistakes and bodies are fragile. The Safe System Approach aims to reduce the kinetic energy generated in a traffic crash through a holistic approach that integrates layers of protection for all road users, thereby minimizing the severity of injuries to the human body. It recognizes that roadway design, management, and investments must prioritize the safety of all road users.

Example: The City of Menlo Park developed a Vision Zero Action Plan using the Safe System Approach, a commitment to safety that began with a group of parents who advocated for road safety near schools. The action plan affirms the city's goal to eliminate all traffic fatalities and serious injuries by 2040 through the creation of a Safe System.

When to use: The Safe System Approach can be applied to urban areas with high traffic fatalities, especially in neighborhoods with vulnerable populations such as pedestrians, bicyclists, and children. By incorporating strategies like lower speed limits, safer street designs, and better enforcement, cities can reduce the severity of crashes and save lives.

Street Story

A tool that allows community residents and agencies to collect and share information about transportation experiences, including near misses, safety concerns, and safe locations to travel. The platform is publicly accessible, anonymous, and free to use. Learn more about this tool by visiting the Street Story webpage.

Example: SafeTREC's Street Story tool is a community engagement platform where community members can share experiences about where they've been in a crash, experienced a near miss, or where they feel safe or unsafe while traveling. To promote access to the tool, the Street Story team offers technical assistance, including workshops, webinars, and one-on-one assistance for communities, agencies, and organizations.

When to use: To gather crowdsourced information and data directly from those impacted by traffic crashes, near misses, and unsafe streets. This data can then be used as a tool to advocate for safety improvements.
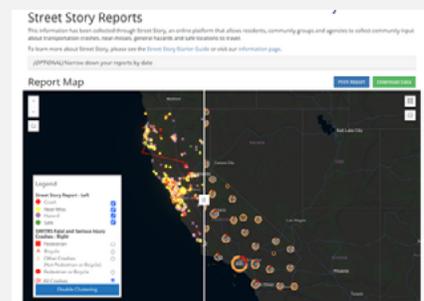
Walking or biking assessment

An assessment to identify safety concerns, barriers, and opportunities for key safety improvements, along specific routes in a community. Key safety improvements can include community programs and/or infrastructure projects.

Example: SafeTREC's Complete Streets Safety Assessment Program offers free technical assistance to communities across California to create safe spaces for people to walk and bike.

When to use: To gather information from residents and others on unsafe conditions on specific streets for people walking and biking. This is a way to gather data to advocate for safety improvements.

Transportation Injury Mapping System (TIMS)

A web-based tool that allows users to analyze and map crash data from California's crash database (Statewide Integrated Traffic Records System - SWITRS). The TIMS platform is publicly accessible and free to use.

Example: Elk Grove Unified School District, the fifth largest school district in the state, is using the TIMS Safe Routes to School Maps Viewer to guide its four-year Safe Routes to School program.

When to use: To use data to prioritize actions and to track progress related to transportation safety efforts.
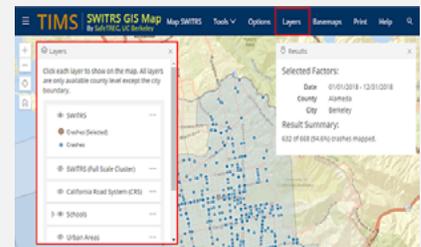
Infrastructure

Permanent or temporary structures, systems, and facilities
that establish the layout of the roadway.

Bicycle infrastructure

Bicycle box

A designated space, usually painted in a high-visibility green paint, where people biking can stop in front of people driving at a red light at an intersection. A bicycle box improves visibility of people biking and encourages more predictable approaches to and through the intersection by all road users. Some bicycle boxes serve as two-stage turn boxes which simplify turn movements and provide a safe place to wait while waiting to complete a turn.

Example: This bicycle box located in Long Beach gives bicyclists a safe, visible space to wait in front of traffic at a red light.

When to use: To provide a safe place for people biking to stop at a red light and to create predictable road movements.

Bicycle lane

A section of a roadway exclusively for people biking or using another micromobility device[1], which reduces conflicts between people walking, biking, and driving. Colored pavement, striping, signage, and other pavement markings may be used to increase visibility.[2]

*Protected bicycle lane
(Class 4)*

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1   A micromobility device includes any small, low-speed, human or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles (e-bicycles), electric scooters (e-scooters), and other small, lightweight, wheeled conveyances. https://www.fhwa.dot.gov/livability/fact_sheets/mm_fact_sheet.cfm

2   Regulations vary by city and/or county for where and how different types of micromobility devices are allowed to operate.

Bicycle lane, continued

There are different types of bicycle lanes:

- Protected bicycle lanes (also known as separated bicycle lanes and cycletracks): These are physically separated from vehicle travel lanes using features such as bollards, jersey barriers, curbs, planters, or parked cars. They offer the highest level of security and safety for all road users.

- Buffered bicycle lanes: These are separated from vehicle lanes with a painted buffered space alongside the conventional bicycle lane, providing additional space and safety.

- Conventional bicycle lanes: These are separated from vehicle lanes, and typically striped with white paint and located on the right side of a road.

- Bicycle boulevards: Shared roads that prioritize bicycle travel, typically marked with painted white sharrows, to indicate to all road users to share the space.

Example: The City of Berkeley has implemented seven bicycle boulevards to encourage biking and discourage through traffic on smaller, residential streets. These streets have been identified as optimal routes for bicyclists.

When to use: To provide safer, more comfortable roads for people biking or using another micromobility device in the community. Bicycle lanes separate people biking from people driving, reducing the risk of serious injuries in the event of a crash due to differences in their driving speeds. This helps all road users navigate the road predictably and safely. Oftentimes, they also improve the safety of people walking along the corridor.

Buffered bicycle lane (Class 2B)

Conventional bicycle lane (Class 2)

Bicycle boulevards (Class 3, or Class 3B)

Bicycle parking

A designated location for bicycles and other micromobility devices to be safely stored, including bicycle corrals, bicycle racks, bicycle lockers, bicycle stations, and other parking options. They encourage people to bike or roll to their destinations because they have a safe place to store them.

Example: Three Bay Area Rapid Transit (BART) stations in Oakland operate bicycle stations to secure BART users' bicycles to incentivize multimodal transportation.

When to use: To encourage more people to bike or roll by providing them with safe ways to park bicycles or micromobility devices at their destinations.

Bicycle sensor/detector

A sensor or detector that captures when a bicycle or other micromobility user passes over it to trigger the traffic light. Most commonly, they are either video detectors or in-pavement sensors. In-pavement sensors are often paired with road markings to let people biking know where to position themselves at an intersection to activate the traffic signal via the sensor or detector.

Example: The City of Danville has installed bicycle detection cameras at key intersections to improve bicyclist safety and signal responsiveness. These video detection systems accurately recognize bicycles and trigger traffic signals, replacing magnetic sensors. A green bicycle sign with a blue light confirms with the bicyclist that they have been detected. So far, 15 systems have been installed at seven major intersections.

When to use: To prioritize people biking or rolling along a roadway and to create a safe, accessible path of travel.

Bicycle signal

A traffic signal that directs people biking or rolling through an intersection and reduces potential conflict with other road users like people walking or driving.

Example: A bicycle signal located in the City of Monterey accommodates increased bicycle and pedestrian traffic along a major road. The bicycle signals are coordinated with traffic signals so that bicycles can safely enter and exit the median bicycle lanes.

When to use: To provide dedicated signals for people biking or rolling, especially on corridors with protected bicycle lanes. By separating their movements from people driving and people walking, the movement of people biking and rolling is more predictable which improves their safety.

Public bicycle repair station

A station that houses tools to perform basic bicycle repairs and maintenance, such as inflating a flat tire or adjusting brakes, to support safer biking.

Example: The Los Angeles Department of Transportation (LADOT) works with local businesses and community groups to set up bicycle repair stations around Los Angeles. These stations help bicyclists fix their bicycles with tools like wrenches, screwdrivers, and a bicycle pump.

When to use: To provide free access to tools for people biking in the community, regardless of their economic status. They also help improve the safety of people biking by providing regular access to bicycle tools to make sure their bicycles are safe to ride.

Green infrastructure

Median gardening

The addition of trees and landscaping to medians to provide aesthetic benefits and traffic calming.

Example: The City of La Palma contracted a landscape designer to create a modern, drought-tolerant median design with the goals of reducing water usage, improving visual appeal, and implementing a consistent design throughout the city.

When to use: To calm traffic and add greenery to communities.

Permeable sidewalk/pavement

Sidewalk or pavement that allows stormwater to filter through to the soil below. Since water seeps through the pavement, puddles and ice will not form on the road which improves safety for people walking, biking, or driving.

Example: The City of Santa Barbara has installed permeable pavement at city-owned parking lots, sidewalks, streets, alleys, and parks, in order to allow stormwater and urban runoff to filter into the ground below.

When to use: To manage stormwater on low-traffic roads and provide safe road conditions for people walking, biking, or driving.

Rain garden

A landscaping feature designed to reduce flooding along a street. They can be installed along with bulbouts to make an area more inviting to walk and bike. They can help manage stormwater, add greenery to a corridor, and replace concrete curb extensions to provide an aesthetic alternative.

Example: In 2023, the City of Lafayette opened its first rain garden. Their rain garden collects, filters, and absorbs stormwater runoff.

When to use: To calm traffic along a corridor, while managing stormwater, and provide an aesthetic green element for the street.

Shade tree

A tree that provides shade and decreases noise pollution, which improves a street's walkability and bikeability, and supports mental well-being in a community

Example: The Sacramento Shade program has planted more than 600,000 shade trees in the Sacramento area and has recently expanded both the number and types of trees offered. Currently, the program offers up to 10 free trees per customer and over 30 varieties to choose from.

When to use: To provide a comfortable environment for people walking, slow traffic, manage stormwater, and other community improvements.

Sidewalk landscaping

The conversion of a concrete sidewalk space into a landscaped area. It can include native plants and other neighborhood improvements like rain gardens.

Example: San Francisco Public Works issues low-cost permits for sidewalk landscaping so property owners can convert a portion of their sidewalk into an attractive landscaped area. These sidewalk improvements provide wildlife habitats, reduce flooding, and increase property values.

When to use: To enhance existing sidewalks and add greenery to communities.

Pedestrian infrastructure

Curb ramp

A ramp that provides safer access between the sidewalk and roadway for people, especially those using wheelchairs and other assistive mobility devices. Without curb ramps, people with mobility disabilities are often forced to travel in the street alongside traffic. Curb ramps also provide benefits to those using strollers, bicycles, or anyone else who may have trouble stepping up and down from curbs. Curb ramps should include truncated domes (also known as tactile paving) which serve as a detectable warning that can be seen, felt, and heard.

Example: The City of San Francisco improved pedestrian access at the intersection of Sotelo Avenue and Lopez Avenue. The project involved redesigning and rebuilding four curb ramps to meet safety and accessibility standards.

When to use: To create roads and sidewalks that are accessible and safe to use for all people using the road, especially people with disabilities. It is often difficult, or even impossible, for a person using a wheelchair or other assistive mobility device to cross a street if the sidewalk on either side of the street ends without a curb ramp. Curb ramps must be provided in order for people of all ages and abilities to have equal access to public spaces.

Pedestrian head start (leading pedestrian interval)

A traffic signal that gives people walking a three to seven seconds head start to enter an intersection before people driving receive a green light. This improves the visibility of people walking in the intersection and highlights their right-of-way over turning vehicles. The National Manual on Uniform Traffic Control Devices (MUTCD) recommends a pedestrian crossing speed of 3.5 feet per second. California's MUTCD recommends 2.8 feet per second where people with disabilities or seniors walk. This allows vulnerable populations, like school children or older adults, more time to cross the street safely.

Example: As of 2022, intersections operated by the State of California must program the signal to give pedestrians a three to seven second head start before the light turns green for vehicle traffic moving in the same direction, according to AB 2264.

When to use: To increase the safety of people walking by allowing them a head start to cross at an intersection, which also increases their visibility to people driving.

Pedestrian lane

A defined space on the roadway for people walking which can be implemented on one or both sides. The lane is a temporary pedestrian facility usually placed on roads with low to moderate speeds and volumes.

Example: The City of Detroit, Oregon has implemented a separated pedestrian lane that also accommodates bicycles, providing a designated space for pedestrians within the roadway.

When to use: To provide a space for people walking on roads with low to moderate speeds and volumes.

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Pedestrian zones

A section of a roadway exclusively for people walking, which reduces conflicts between people walking, biking, and driving. Pedestrian zones can be either permanently, periodically, or occasionally closed to vehicular traffic. Colored pavement, striping, signage, greenery, and other elements may be used to create these spaces.

There are different types of pedestrian-only spaces:

- Pedestrian plaza: A pedestrian-only plaza repurposes an underutilized street, alley, or other community space. It improves the safety of those walking and provides more green space that can incorporate elements like benches, tables, greenery, and bicycle racks.

- Pedestrian street (pedestrian mall): A pedestrian street is a pedestrian space created on what used to be a vehicular street and is typically in larger, urban areas where there are high volumes of pedestrian traffic and ample shopping, eating, and other local destinations along the corridor. The space provides opportunities for dining outside, gathering, and other social activities.

Example: The City of Gilroy launched their Gourmet Alley Project to transform an alley into a public pedestrian plaza. This alley was converted into two blocks of newly-paved, pedestrian-only space, lined with trees, public seating, planters, and lighting.

When to use: To provide more open spaces for people walking and create more green space in a community.

Pedestrian plaza
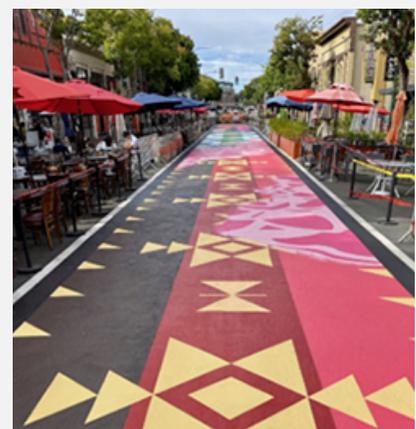
Pedestrian street

Pedestrian safety island (pedestrian refuge island)

A designated area in the middle of a crosswalk where people walking can stop and rest between light signals. Typically housed within a median made of concrete, pedestrian safety islands may also feature high-visibility road striping and signage for added safety.

Example: The City of San Francisco has installed pedestrian refuge islands in the middle of Market Street to create safer conditions for pedestrians crossing the street, alongside other traffic calming measures.

When to use: To create safe places of refuge for people walking across wide, multi-lane roads where people walking have trouble crossing due to high volumes of traffic or long crossing distances. These can also be used in areas where there's a large presence of vulnerable road users like school children or older adults.

Pedestrian-scale lighting

Lighting that is positioned towards sidewalks and pedestrian paths, typically located closer to the ground, and installed closer together to improve the walking experience.

Example: The City of Oakland's International Boulevard Pedestrian Lighting and Sidewalk Improvement Project installed pedestrian-scale lighting and repaired sidewalks to provide safer pedestrian conditions for people along International Boulevard. These improvements aim to improve pedestrian travel, encourage transit ridership, and provide health and environmental benefits.

When to use: To provide sufficient lighting for people walking and improve sightlines for people walking, biking, or driving at night. It can also provide a sense of safety on previously dark roads that people may have avoided walking on at night.

Pedestrian scramble

An intersection that stops driver traffic in all directions and allows people walking to simultaneously cross in all directions of the intersection, including diagonally. This allows people to cross the street without having to worry about potential conflicts with those driving who are turning right on a red light.

Example: The City of Santa Monica has pedestrian scrambles operating throughout its downtown, giving pedestrians exclusive access to the intersection.

When to use: To provide safety improvements for people walking at intersections with a large volume of people walking. These are oftentimes used in downtown city corridors where people walking often outnumber people driving.

Raised crosswalk

A type of speed table that brings the roadway to the same level as the sidewalk. It allows people to cross without a curb ramp and makes people walking in the crosswalk more visible to people driving. Raised crosswalks can be located at intersections or mid-block. At intersection locations, the raised area can be extended to include the entire intersection.

Example: As part of San Francisco Municipal Transportation Agency's Wiggle Neighborhood Green Corridor Project, raised crosswalks were installed to further highlight pedestrian crossings and encourage safe speeds through intersections.

When to use: To physically encourage people driving to slow down before passing over the crosswalk, yield to pedestrians, and provide a level path from curb to curb for people walking.

Sidewalk

A separate, designated place for those walking outside of the road. Typically, they are installed in urban areas and have a minimum width of six feet with sufficient lighting, shade, and level surfaces.

Example: A physically separated sidewalk in Los Molinos was installed during a safety enhancement project on the main street for Los Molinos by Caltrans District 2.

When to use: To make roads accessible to all ages and abilities, especially for residents with disabilities, and in areas where people walking are forced to travel in the street due to insufficient or missing sidewalks.

Traffic safety infrastructure

Complete Streets

Streets that are designed to provide a safe, comfortable space for all people using the street, regardless of age or ability. Complete Streets policies are set at the state, regional, and local levels and are frequently supported by roadway design guidelines.

Example: California Department of Transportation (Caltrans) created a Complete Streets Elements Toolbox 3.0 that translates complex statewide policies into concepts and practices for project delivery purposes aimed at more effective Complete Streets implementation. The Toolbox provides guidance to assist project staff-planners, project managers, engineers, designers, etc., in the selection of Complete Streets elements to meet relevant goals and objectives in Caltrans' Strategic Management Plan, Complete Streets policy (DP-37).

When to use: To encourage more residents to walk, bike, or take transit, and improve the safety of vulnerable populations using the corridor.

Curb extension (bulb-out)

An extension of the sidewalk in order to narrow the roadway, slow driver speed, and shorten crossing distances for pedestrians. They can be used at corners or mid-block and can be built with paint, bollards, or planters. Curb extensions can often be lengthened to create public spaces, landscaped areas, or transit waiting areas.

Example: San Francisco Municipal Transit Agency implemented three new bulb-outs throughout the city to shorten crossing distances, improve visibility, and encourage drivers to slow down.

When to use: To increase the visibility of people walking at intersections, shorten crossing distances, reduce turn speeds of those driving, increase sidewalk space for people walking, provide additional public space, reduce illegal parking at corners, crosswalks and bus stops, and provide the space needed to install curb ramps.

Daylighting

The practice of pushing parking spaces at least 15 to 20 feet back from a pedestrian crossing, which increases the visibility between people walking or biking and those driving, which in turn reduces conflicts.

When to use: To increase the safety of people walking or biking along a corridor and improve the visibility between them and those driving.

Example: As of 2025, daylighting is a law ([AB 413](#)) in California. This law prohibits a person from parking a vehicle within 20 feet of either side of any marked or unmarked crosswalk, or within 15 feet of any crosswalk where a curb extension is present.
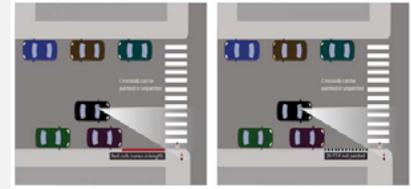
High-visibility road striping and signage

Road striping and signage that is installed to emphasize or indicate designated space and safety messaging for particular road users and help them detect each others' location on the road. The high-visibility striping and signage also increase visibility at night or in low-light conditions because the paint used for striping and materials used to create signs reflect back the light source. For example, when a car's headlights reach high-visibility road striping, the light will reflect back at the driver.

Example: The City of San Rafael has installed [high-visibility](#) crosswalks, added red curbs at intersections in a practice known as 'daylighting' for visibility, and has added pedestrian crossing signage at uncontrolled crossings.

When to use: To emphasize or indicate where each road user should be on the road, especially at night when regular paint alone is hard to see.

Multi-use trail/Shared path

A separated off-road space for people walking and biking. Some multi-use trails may even separate people biking and walking into their own lanes. These are most commonly implemented along rivers, shorelines, canals, utility rights-of-way, railroad rights-of-way, within school campuses, or within and between parks.

Example: Sonoma County Regional Parks implemented nine [Class 1 Multi-Use Trails](#) designed to accommodate many types of users.

When to use: To provide safe, off-road paths for people walking and biking in the community, especially near parks and other green spaces.

Neighborhood traffic circle (mini roundabout)

A small raised circular island in a residential intersection that directs traffic to flow in one direction. These are smaller than roundabouts and are intended to keep speeds as low as possible while also improving the safety of pedestrians.

Example: The City of East Palo Alto installed two temporary traffic circles at intersections on Pulgas Avenue near schools to calm traffic and improve safety for students walking and biking. The goal is to convert these temporary traffic circles into permanent mini roundabouts to reduce collisions, injuries, and vehicle emissions, while making travel safer for both students and local residents.

When to use: To reduce the speeds of people driving through neighborhoods and improve the safety of those walking.

Paved shoulder

A functional space for people walking and biking on the edge of a roadway where there is an absence of other infrastructure like bicycle lanes or sidewalks, typically in rural communities.

Example: The community of Capay has implemented a visually separated paved shoulder using colored and stamped asphalt designed to mimic bricks. This design choice emphasizes pedestrian space while maintaining roadway efficiency, improving visibility and safety for those walking along the corridor. The project was developed with input from Alta Planning + Design.

When to use: To provide space for people walking and biking on roads that lack other facilities, sidewalks or bicycle lanes.

Pedestrian hybrid beacon (high-intensity activated crosswalk [HAWK] beacon)

A marked crossing signal with flashing lights that are activated by push signals to help pedestrians safely cross the street. The beacon alerts people driving to stop at an intersection or mid-block crosswalk for a pedestrian and brings more visibility to those crossing the road.

Example: The City of El Cerrito has implemented a pedestrian hybrid beacon along a busy intersection to make crossing safer for pedestrians by reducing pedestrian-vehicle conflicts.

When to use: To increase the safety of people crossing major streets where side-street volumes do not support the installation of a conventional traffic signal and to increase the safety of people walking by signaling those driving to stop so people walking can safely cross the street.

Protected intersection

The physical separation and protection of people walking, biking, and rolling at and in intersections. They can include posts, bollards, concrete, or other infrastructure. Bicycle crossings are placed next to, but separated from, pedestrian crossings to minimize potential conflicts between those walking and biking as well.

Example: The City of San Luis Obispo launched its first protected intersection in 2021 to increase safety for those walking, biking, and rolling.

When to use: To improve the safety of people walking or biking at and in intersections with a history of collisions. They can also facilitate left turns for people biking by providing a waiting area to complete the crossing in two stages.

Quick-build project

A semi-permanent project that can be implemented quickly to prioritize the safety of those using the street. Oftentimes, they are intended to test improvements and can undergo changes after installation to make them more impactful. They can be completed with as little as paint and posts, but can include concrete and other more permanent elements. They can be planned rapidly and installed roughly within a year of planning.

Example: San Francisco has completed 40 quick-build projects with many additional quick-build projects on the way. These safety improvement projects are constructed within weeks or months and are reversible and adjustable.

When to use: To create impactful, money-saving safety projects. Quick-builds are a tool that can improve the safety of a street for a margin of what a full project would cost. They can be used as a way to test out a project or new infrastructure element before committing to it fully.

Rectangular rapid flashing beacon (RRFB)

Flashing signals that are activated by a button by people walking at a crosswalk. The rectangular rapid flashing beacons also typically include high-visibility striping and signage that improves the safety of those walking and cues people driving to yield for pedestrians. They are particularly effective for crossing multi-lane streets with speed limits of less than 50 mph.

Example: The City of Fremont added rectangular rapid flashing beacons at Dorne Place and Mento Drive as part of the Paseo Padre Parkway Improvements Project. These RRFBs provide a high-visibility strobe-like warning to drivers when pedestrians use an uncontrolled crosswalk.

When to use: To increase the safety of people walking by encouraging those driving to yield to pedestrians at a crosswalk.

Reduced speed limit zone

Designated areas with a decreased speed limit of 25, 20, or 15 miles per hour (mph), typically near schools, senior zones, or commercial corridors. The reduced speed limits prioritize the safety of those walking and biking in the area, especially those most vulnerable to traffic crashes like seniors and school kids.

Example: The City of San Mateo has implemented reduced speed limit zones near schools. To ensure a safe environment for students, speed limits around schools have been lowered to 15 and 25 mph.

When to use: To reduce the speed of people driving and improve the safety of people walking and biking.

Road rightsizing (road or traffic diet)

Road rightsizing typically involves the conversion of an existing four-lane, undivided roadway into a three-lane roadway. This can allow the newly reclaimed space to be used as bus lanes, bicycle lanes, sidewalks, or other uses. It can also reduce the speed of people driving which makes it safer for people who walk and bike along the corridor.

Example: The California Street Road Diet Project in Stockton reduces lanes from four to two, adding a center turn lane, bicycle lanes, and pedestrian improvements to enhance safety. The project, which began in October 2023, includes ADA-compliant sidewalks, upgraded traffic signals, and a high-visibility crosswalk near medical facilities.

When to use: To provide more street space for people walking, biking, or taking transit. It also reduces vehicle speeds along a corridor.

Roundabout

A circular island in an intersection that directs high-volume traffic to slow down and yield before entering the intersection. Roundabouts are an alternative to traffic signals and are designed for roads with speeds greater than 25 mph.

Example: The City of Burlingame completed a roundabout project at a complicated intersection. The roundabout implements traffic calming measures by slowing down motorists, clarifying right-of-way for various movements of traffic and prioritizing pedestrian and bicycle safety.

When to use: To promote slower speeds in an intersection. To reduce T-bone and head-on crashes which typically result in more serious injuries.

Slow Streets

The reduction of through vehicle traffic on low-volume and low-moderate speed streets with temporary signage and barriers aimed to create a shared space for people walking and biking.

Example: The City of Oakland's Department of Transportation developed a network of Slow Streets to promote sustainable transportation and to encourage the use of neighborhood streets as community spaces.

When to use: To create cost-effective ways to lower the speed of people driving and create safer, more comfortable routes for people walking and biking.

Temporary demonstration project

A project that installs short-term safety enhancements that allow community residents to experience and give feedback on a project before it is permanently installed. They differ from quick-build projects because they are installed before a decision is made by the local government body. They provide a way to test out potential projects before voting on making them permanent.

Example: The City of East Palo Alto launched a temporary demonstration project involving the installation of temporary traffic circles at two intersections of concern in the city near schools.

When to use: To create a way to test out a potential project, provide residents a tangible way to experience the potential changes, and gather community feedback on the project before permanently installing it.

Vertical speed control elements

Vertical speed control elements help manage and reduce vehicle speeds due to the increased height of the street. They are typically implemented on neighborhood, residential, and low-speed corridors.

There are different types of vertical speed control elements:

Speed hump

- Speed hump: A piece of raised pavement in the roadway, approximately 3 to 4 inches high at its center and 12–14 feet wide which extends the full width of the street to slow vehicle speeds. These can also act as raised crosswalks in certain instances. Oftentimes, speed humps are referred to as speed bumps but the two are different. A speed bump is much shorter, between 1 to 2 feet in length and as high as 6 inches in height. They are typically found in parking lots and not on public roads.

- Speed table: A midblock traffic calming device that raises the entire wheelbase of a vehicle to reduce its traffic speed. They are 3-3.5 inches high and 22 feet wide, with a flat top. These can also act as raised midblock crosswalks in certain instances.

Speed table

- Speed cushion: Either speed humps or speed tables used on corridors that also act as major emergency access routes. They include wheel cutouts to allow emergency vehicles like fire trucks to pass unaffected.

Example: The Oxnard Speed Hump Program allows residents to request the City install stop signs and/or speed humps to combat speeding on streets. Approvals of speed hump and/or stop sign requests vary by case, depending on the corridor's current condition. Certain corridors may need an Engineering and Traffic Study (E&TS) and/or community support of the infrastructure in the form of a circulated petition, and all requests are subject to a ranking/scoring system.

Speed cushion

When to use: To reduce the speed of people driving and improve the safety of people walking and biking.

Wayfinding

A system of signage and pavement markings that guide people walking and biking to popular community destinations. Wayfinding tells someone walking or biking the distance or the time it will take to walk or bike to a destination.

Example: The City of Berkeley designated a grid of traffic-calmed streets as bicycle boulevards and added a comprehensive signage system that enables citywide point-to-point wayfinding, with connections to schools, parks and transit.

When to use: To make navigating for people walking and biking as easy as possible. Wayfinding can also encourage walking and biking because navigating the community is easier for those new to walking or biking.

Programming

An integrated set of planned strategies, activities, and services that address community concerns and promote pedestrian and/or bicycle safety and activity.

Bicycle programming

Bicycle rodeo

A bicycle rodeo is an on-bicycle education event, typically for youth, to teach them the skills needed to ride a bicycle safely. They can include bicycle safety inspections, helmet and other safety gear distribution to those in need, and teaching bicycle maintenance skills and the rules of the road. They can also include scooters, skateboards, roller skates, and other forms of micromobility.

Example: Solano County's Safe Routes to School Program organizes bicycle rodeos to teach youth how to safely use the road as a pedestrian, bicyclist, and scooter rider.

When to use: To encourage school children to bike or roll to school and educate them on how to do so safely.

Bicycle safety diversion program

A sponsored program by a local law enforcement agency that offers bicycle traffic school to remove or reduce a traffic violation fine for people who bike. Attendees learn bicycle laws and safe riding skills.

Example: The Bicycle Safety Diversion Program, run by Active SGV, allows bicyclists ticketed for minor infractions to take a free bicycle education class instead of paying a fine. The program, available in multiple languages, teaches bicycle laws and safe street riding to improve bicyclist safety and provide a fairer alternative to fines or jail time. The City of Bakersfield offers a monthly bicycle court diversion program for youth cited for bicycle-related violations instead of formal court proceedings.

When to use: To provide a way for people who bike to remove or reduce a traffic violation fine, similar to what is already provided for those who drive.

Bicycle train

A group of students who bike or roll to school accompanied by an adult along a designated route. Students can join the bicycle train along any of several identified stops and oftentimes bicycle trains include those on scooters, skateboards, and other micromobility devices.

Example: Sonoma County's Safe Routes to School program organizes bicycle trains to encourage safe group bicycle rides to schools.

When to use: To encourage more students to bike or roll to school, improve their safety, and involve students and parents directly in Safe Routes to School work.

Earn-A-Bicycle program

A program that offers community members, typically youth, the opportunity to earn a bicycle by participating in classes that teach them the rules of the road, bicycle safety, and basic bicycle mechanic skills.

Example: Trips for Kids Earn-A-Bike program an online month-long course that provides youth with the opportunity to learn bicycle mechanics, bicycle safety and earn their own bicycle.

When to use: To provide more equitable access to bicycles, given that not every resident can afford one.

Helmet/light distribution

Helmet and bicycle light distribution to residents in need to prioritize their safety and visibility. They typically run in conjunction with bicycle education to promote helmet use to prevent head injuries and encourage safe riding.

Example: UC Santa Cruz Transportation and Parking Services offers free bicycle helmets to all students, staff, and faculty.

When to use: To provide more equitable access to helmets and bicycle lights, which greatly improve the safety of people biking.

Community safety programming

Community liaison/promotores program

Community liaisons and promotores help bridge the gap between local residents and traffic safety agencies and stakeholders. In addition to building trust among members of their community as well as across partners, they may promote education, increase awareness of community safety concerns, and/or advocate for changes to improve road safety. They can help strengthen and build coalitions while also ensuring that projects and programs are culturally appropriate.

Example: The Safe Street Community Promotora Educators at Los Angeles Walks advocate for secure safe street infrastructure and host local workshops for neighborhood residents. The program envisions a city where community residents with lived experiences are the ones creating community design and equitably compensated for their work.

When to use: To promote safe walking and biking in communities by teaching and uplifting community members as their own advocates.

Community walk or bicycle ride

An event that encourages residents to walk or bike together and may explore local themes, such as art, music, history, and architecture.

Example: Monroe Practice Days, a program that serves San Francisco's southeast neighborhoods, empowers the community through free bicycle education and resources. In partnership with Monroe Elementary, local groups, and non-profits like YBike, the program distributes bicycles, helmets, and u-locks, while offering multilingual bicycle instruction.

When to use: To encourage more residents to walk or bike. This can be a more comfortable introduction to walking or biking in the community for those with no experience.

Neighborhood speed awareness program

The use of radar trailers and changeable message sign boards to make people driving aware of their speed and encourage them to adhere to the posted speed limit.

Example: The City of Napa's Neighborhood Traffic Calming Program (NTCP) aims to reduce speeding and cut-through traffic on local streets with speed limits of 35 miles per hour or less by installing speed signs to help control traffic flow and improve safety.

When to use: To increase traffic safety awareness and lower speeds along specific streets.
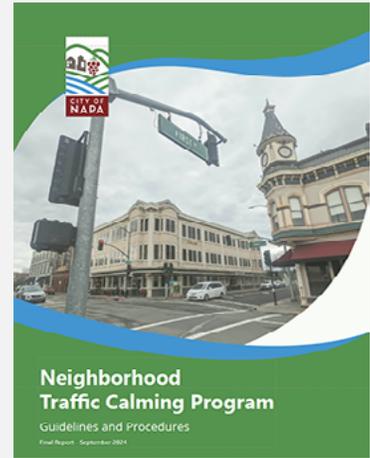
Open streets

A temporary closure of streets to vehicle traffic which opens them to people walking, biking, and participating in other social activities.

Example: Morgan Hill held an open street event by closing the road to vehicle traffic, allowing residents to enjoy activities and entertainment along the road.

When to use: To create temporary closures on community streets to provide a safe, more comfortable place for people walking and biking.

Parklet

A sidewalk extension that provides public space to anyone in the community. Parklets may include benches, tables, greenery, bicycle racks, and more. They also provide space for people to sit and enjoy the space next to restaurants and other businesses. They may provide traffic calming effects to the corridor as well.

Example: The City of Richmond piloted a parklet program to repurpose and activate public space innovatively, repurposing road space for all users.

When to use: To provide more open space for residents, including spaces for sitting, eating, and bicycle parking. They widen sidewalks and can also slow traffic by taking a portion of the roadway.

Placemaking

An approach that deeply engages the arts, culture, and creativity — especially from underrepresented communities — in planning and designing public spaces so that the resulting communities better reflect and celebrate local culture, heritage and values.

Example: San Diego's Quartyard in East Village was redesigned as an eco-friendly outdoor community space made from repurposed shipping containers. Through these placemaking improvements, the Quartyard now thrives as a social spot, with a beer garden, a restaurant, a music venue, and a dog park.

When to use: To get residents directly involved with improvements in their community and ensure any changes align with their vision for the community.

Provide rapid response

Physical and emotional care to crash survivors and their families. It can provide a way to get planners in the community to reassess key intersections or streets for safety improvements.

Example: Families for Safe Streets has composed a post-crash resource guide for those who have lost a loved one or have been seriously injured in a traffic crash, or for those who are providing support to someone affected by a traffic crash.

When to use: To support those impacted by a traffic crash and the families who have lost a loved one to traffic violence.

Safety messaging campaign

A campaign that informs the general public of a safety message or call to action through the use of tabling at community events, public service announcements, pamphlets, billboards, commercials, and art.

Example: Merced County has a driver awareness safety campaign where California Highway Patrol (CHP) uses a comprehensive statewide approach to promote and enforce safe pedestrian, bicyclist, and motorist behavior, ensuring all road users are sharing the road in a safe manner.

When to use: To educate residents on how to create safer streets for all and create an atmosphere where the community can look after one another's safety.

Traffic garden

A traffic garden is a scaled-down street network where children and new riders practice biking and road safety in a car-free space. The mini system contains elements people regularly find on real roads: vehicle lanes, bicycle lanes, stop signs, pedestrian crossings and a bus stop.

Example: The Transportation Agency of Monterey County opened a traffic garden at San Antonio Park in King City where residents can bring scooters and bicycles to test the route or participate in the safety training, or partake in bicycle and scooter repair workshops.

When to use: To provide a safe, fun environment for children and adults to learn about road safety and practice navigating streets and intersections, free from actual traffic.

Safe Routes to School programming

Designated safe route

A route identified as safer than other options for community members to walk and bike. These routes typically provide better walking and biking infrastructure to and from their destination.

Example: The City of Hayward's Safe Routes for Seniors (SR4S) Program is a collaborative effort between the City and local senior housing facilities, senior centers, and community-based organizations that work to identify areas in Hayward at which to focus accessibility and walkability improvements.

When to use: To provide safe routes, especially for vulnerable populations in a community, to walk and bike to local destinations, which may include community hubs like schools, libraries, and recreational centers.

Safe Haven program

A program that partners with local businesses and community organizations to serve as safe places where students can go and ask for help on their walk to and from school.

Example: The Valley Transportation Agency, a transit provider in Santa Clara County, is an active participant in the Safe Haven Program and ensures that any child in need of assistance can ask for or about "Safe Place" and the operator will ensure the child is safe and secure.

When to use: To improve the safety of students walking and biking in the community and provide opportunities for local businesses and community organizations to get involved directly in Safe Routes to School work.

Safe Passages program

A program that places parents and volunteers at key locations where students travel to get to and from school to support their safety and help them make it to school safely.

Example: The San Francisco Tenderloin Community Benefit District Safe Passage Program works to build a culture of safety, helping students feel and be safe through education, visibility, and engagement.

When to use: To improve the safety of people walking and biking in the community and provide opportunities for parents and volunteers to get involved directly in the Safe Routes to School work.

Safe Routes to School (SRTS) community program

A program that consists of a broad partnership of community stakeholders working together to promote walking and biking to school through education, incentives, and infrastructure improvements. The Active Transportation Resource Center (ATRC) created a resource library that includes a bicycle and pedestrian safety curriculum for students, a guide to start a walking bus or bicycle train, training for crossing guards and more.

Example: Cupertino's Safe Routes to School (SRTS) was created to promote a safer environment for Cupertino students and families to travel to and from school actively.

When to use: To create opportunities to promote walking and biking for school children, as well as create safer streets at and surrounding the campus.

School or community crossing guard program

A program that trains adults to direct the traffic of people walking, biking or driving at key intersections, typically near schools. These can be volunteer, part-time, or full-time positions. The Active Transportation Resource Center has provided a guidebook for the crossing guard program for administrators and employees.

Example: Los Angeles City's Crossing Guard Program deploys crossing guards to enhance the safety of students, especially those walking, biking, and rolling in school zones.

When to use: To improve the safety of people walking or biking to and from the school campus and provide new opportunities for local jobs.

Student Safety Patrol program

A program that enlists upper elementary, middle, and high school students to direct their peers to and from school during arrival and dismissal. Students can also be walking buddies and provide safe walking and biking education to younger classmates.

Example: The City of San Diego's Student Safety Patrol Program promotes the safe crossing of elementary students to and from school and provides classroom education to improve student safety behavior.

When to use: To get school children involved in advocating for and creating safer routes to their schools.

Walking school bus

A group of students who walk to school accompanied by an adult along a designated route. Students, including those driven to school, join the walking school bus along several identified stops.

Example: The Orange County Health Agency's Walking School Bus is an organized group of students that safely walks to school together with adult supervision. Similar to a carpool, the adult "bus driver" either meets the students at a designated meeting spot or picks them up along the walking route to school.

When to use: To encourage more youth to walk to school, improve the safety of people walking to school, and get students and their families involved directly in Safe Routes to School work.

About the Community Pedestrian and Bicycle Safety Program

The CPBSP is a statewide active transportation and community engagement project of UC Berkeley Safe Transportation Research and Education Center (SafeTREC) and California Walks (Cal Walks) that aims to reduce pedestrian and bicyclist fatalities and serious injuries in communities across California. The program engages residents, traffic safety stakeholders, and both traditional and non-traditional partners alike in active transportation planning and strengthens the capacity of community partners to create safer and more accessible streets for those walking and biking in their neighborhoods. It uses the Safe System Approach framework to engage residents and advocates to develop a community-driven action plan and context-sensitive recommendations informed by community feedback and participation in the program. Follow-up technical assistance is offered to communities that previously received training to support their pedestrian and bicycle safety efforts.

Photo credits

Advocacy and policy

- Bicycle and/or pedestrian advisory committees: https://www.campbellca.gov/175/Bicycle-Pedestrian-Advisory-Committee
- Bicycle and/or pedestrian master plan: https://www.srcity.org/2711/2018-Bicycle-and-Pedestrian-Master-Plan
- Community benefit agreement: https://www.ci.richmond.ca.us/4126/Community-Benefits-Policy-Development
- Community coalition: https://cocosouthla.org/sc-x-sc/youth-organizing/
- Comprehensive safety action plan: https://www.cityofhawthorne.org/home/showpublisheddocument/7635/638742608956000000
- Engaged elected official: https://catsip.berkeley.edu/sites/default/files/styles/openberkeley_image_full/public/general/altadenagohumancampaign.jpg?itok=rmIBhZ_1&timestamp=1649281804
- Funding opportunities that prioritize safety: https://files.constantcontact.com/5f52d7af701/020c3be9-1557-4463-84d0-93fe8c38d055.pdf
- Local Road Safety Plan (LRSP): https://www.cityofarcata.org/DocumentCenter/View/14368/Arcata_Local_Road_Safety_Plan-2024?bidId=
- Participatory campaign: https://www.threads.net/@myrnamelgard7/post/DF8Yq4GyvaM
- Vision Zero: https://www.fremont.gov/home/showpublisheddocument/759/637750212463000000

Data collection and analysis

- Evaluation: https://escholarship.org/uc/item/2sn1j0cr
- High-Injury Network (HIN): https://www.oaklandca.gov/resources/high-injury-network-2024
- Linking crash and medical data: https://skylab4.cdph.ca.gov/epicenter/_w_c23a14f8/image4a.png
- Pedestrian/bicycle count: https://www.longbeach.gov/goactivelb/resources/eco-totem-counter/
- Photo and VideoVoice: https://safetrec.berkeley.edu/sites/default/files/cpbst_fy23_castrovalley_follow-up_report.pdf
- Safe Routes to School (SRTS) data collection: https://www.cityofpaloalto.org/Departments/Transportation/Safe-Routes-to-Schoo

- Safe System Approach: https://www.transportation.gov/sites/dot.gov/files/images/Grants/Safe-System-Approach-Infographic_500px.png

- Street Story: https://safetrec.berkeley.edu/tools/street-story-platform-community-engagement

- Walking or biking assessment: https://safetrec.berkeley.edu/programs/complete-streets-safety-assessments

- Transportation Injury Mapping System (TIMS): https://tims.berkeley.edu/help/images/GISMapNew/1g_MapCon.png

Infrastructure

Bicycle infrastructure

- Bicycle box: https://www.longbeach.gov/goactivelb/mobility-toolkit/bicycle-treatments/bicycle-boxes/

- Bicycle lane: https://www.modestogov.com/DocumentCenter/View/1722/Non-Motorized-Transportation-Plan-PDF?bidId=

  - Protected bicycle lanes: https://www.calbicycle.org/the_california_bicycle_coalition_seeks_to_demystify_building_protected_bicycle_lanes_for_californian_cities/

  - Buffered bicycle lanes: https://www.longbeach.gov/goactivelb/mobility-toolkit/bicycle-treatments/buffered-bicycle-lanes/

  - Conventional bicycle lane: https://www.modestogov.com/DocumentCenter/View/1722/Non-Motorized-Transportation-Plan-PDF?bidId=

  - Bicycle boulevards: https://berkeleyca.gov/city-services/getting-around/walking-and-biking/bicycle-boulevards

- Bicycle parking: https://uptownstationoakland.com/new-uptown-oakland-bicycle-station-now-open/

- Bicycle sensor/detector: https://www.danville.ca.gov/736/Traffic-Signal-Bicycle-Detection-Upgrade

- Bicycle signal: https://www.kimley-horn.com/project/north-fremont-street-bicycle-pedestrian/

- Public bicycle repair station: https://ladotlivablestreets.org/content-detail/Bicycle-Repair-Stations/

Green infrastructure

- Median gardening: https://www.cityoflapalma.org/198/Street-Medians
- Permeable sidewalk/pavement: https://sustainability.santabarbaraca.gov/sites/default/files/2024-03/2014-01-29%20037.jpg
- Rain garden: https://www.lovelafayette.org/city-hall/city-departments/engineering/city-construction-projects/first-street-rain-garden
- Shade tree: https://www.sacbee.com/entertainment/living/home-garden/article45623676.html
- Sidewalk landscaping: https://static.wixstatic.com/media/e4f6ab_152ffc8c18f64e499d1d1363f50eba88~mv2.png/v1/fill/w_2500,h_3333,al_c/e4f6ab_152ffc8c18f64e499d1d1363f50eba88~mv2.png

Pedestrian infrastructure

- Curb ramp: https://www.agsinc.com/projects/curb-ramp
- Pedestrian head start (Leading pedestrian interval): https://www.calbicycle.org/governor-signs-bill-that-gives-pedestrians-a-head-start/
- Pedestrian lane: https://ruraldesignguide.com/files/2016-12/20160714-9.jpg
- Pedestrian zones: https://www.cityofgilroy.org/1009/Gourmet-Alley-Project
    - Pedestrian plaza: https://www.cityofgilroy.org/ImageRepository/Document?documentID=15669
    - Pedestrian street (pedestrian mall): https://www.cityofsanmateo.org/4448/B-Street-Pedestrian-Mall-Improvements
- Pedestrian safety island (Pedestrian refuge island): https://www.sfmta.com/projects/upper-market-street-safety-project
- Pedestrian-scale lighting: https://drive.google.com/drive/folders/136-eg0cMaBBiYEAOdcDH-987FP7r7JH-
- Pedestrian scramble: https://www.santamonica.com/transportation/safety-information-getting-around-santa-monica/
- Raised crosswalk: https://www.sfmta.com/projects/wiggle-neighborhood-green-corridor
- Sidewalk: https://ruraldesignguide.com/files/photos/Los-Molinos-Sidewalk-Cropped.jpg

Traffic safety infrastructure

- Complete Streets: https://catsip.berkeley.edu/sites/default/files/styles/openberkeley_image_full/public/general/complete-street.png?itok=nT6kL4Qu&timestamp=1552430157
- Curb extension (Bulbout): https://www.sfmta.com/getting-around/walk/pedestrian-improvements-toolkit/intersection-bulb-outs
- Daylighting: https://www.pinole.gov/sb-413-california-daylighting-law/
- High-visibility road striping and signage: https://www.cityofsanrafael.org/crosswalk-improvements/

- Multi-use trail/Shared path: https://parks.sonomacounty.ca.gov/visit/find-a-park/sonoma-valley-regional-trail
- Neighborhood traffic circle (mini roundabout): https://epasun.org/converting-two-east-palo-alto-temporary-traffic-circles-to-mini-roundabouts/
- Paved shoulder: https://ruraldesignguide.com/files/photos/pg3-9_Photo_Alta.jpg
- Pedestrian hybrid beacon (High-intensity activated crosswalk [HAWK] beacon): https://el-cerrito.org/1641/Pedestrian-Hybrid-Beacons
- Protected intersection: https://www.slocity.org/government/department-directory/public-works/programs-and-services/transportation-planning-and-engineering/madonna-road-protected-intersection-project
- Quick-Build project: https://www.sfmta.com/projects/folsom-street-quick-build-project
- Rectangular rapid flashing beacon (RRFB): https://www.fremont.gov/government/departments/public-works/public-works-projects/paseo-padre-parkway-improvements-project
- Reduced speed limit zone: https://www.cityofsanmateo.org/4715/Slow-for-Students
- Road rightsizing (Road or traffic diet): https://siegfriedeng.com/wp-content/uploads/2022/09/California-St-Road-Diet-0.1-Striping-Conceptual-Rendering_2021-12-13_Page_1_Image_0003.png
- Roundabout: https://www.burlingame.org/839/California-Drive-Roundabout-City-Project
- Slow Streets: https://cao-94612.s3.us-west-2.amazonaws.com/documents/23.02.01-SlowStreets-framework-presentation-rev1.pdf
- Temporary demonstration project: https://www.cityofepa.org/publicworks/page/temporary-traffic-circles
- Vertical speed control elements: https://nacto.org/publication/urban-street-design-guide/street-design-elements/vertical-speed-control-elements/
  - Speed hump: https://i0.wp.com/fresnoland.org/wp-content/uploads/2023/09/speedhump.jpg?fit=1024%2C473&ssl=1
  - Speed table: https://highways.dot.gov/sites/fhwa.dot.gov/files/images/Safety/tceprimer61.jpg
  - Speed cushion: https://signalscv.s3.us-west-1.amazonaws.com/wp-content/uploads/2019/03/09225705/032719_Abelia_TM-1535x1024.jpg
- Wayfinding: https://studiolimage.com/wf07-bbb.html

Programming

Bicycle programming

- Bicycle rodeo: https://solanosr2s.ca.gov/programs/biking-walking-programs/bicycle-rodeo/
- Bicycle safety diversion program: https://cal.streetsblog.org/2018/10/10/california-needs-more-bicycle-ticket-diversion-programs
- Bicycle train: https://sonomasaferoutes.org/content/bicycle-trains
- Earn-A-Bicycle Program: https://www.tripsforkidsbayarea.org/uploads/1/2/9/0/129099217/20190802-134712_orig.jpg
- Helmet/light distribution: https://taps.ucsc.edu/bicycle-programs/free-helmets.html

Community safety programming

- Community liaison/Promotores campaign: https://www.losangeleswalks.org/our_promotoras
- Community walk or bicycle ride: https://catsip.berkeley.edu/safety-story-adrian-cardenas
- Neighborhood speed awareness program: https://www.cityofnapa.org/DocumentCenter/View/13575/NTCP-Guidelines-and-Procedures-Document---Sep-2024-PDF
- Open Streets: https://www.morganhill.ca.gov/2381/Open-Streets-Morgan-Hill-Event
- Parklet: https://www.ci.richmond.ca.us/4618/Parklet-Program
- Placemaking: https://www.sandiego.gov/economic-development/business/starting/placemaking
- Provide rapid response: https://www.familiesforsafestreets.org/about
- Safety messaging campaign: https://www.countyofmerced.com/3190/Campaigns
- Traffic garden: https://www.montereycountynow.com/blogs/news_blog/tamc-will-open-a-traffic-garden-at-san-antonio-park-in-king-city/article_b96b082a-909b-11ee-9705-9bb8dc853cbb.html

Safe Routes to School programming

- Designated safe route: https://www.hayward-ca.gov/SR4S
- Safe Haven program: https://www.vta.org/faq/will-bus-driver-help-my-child-and-offer-safe-place-if-they-are-trouble
- Safe Passages program: https://tlcbd.org/safe-passage/
- Safe Routes to School (SRTS) community program: https://www.cupertino.gov/Your-City/Departments/Public-Works/Transportation-Mobility/Safe-Routes-to-School-SR2S/About-SR2S
- School or community crossing guard program: https://ladot.lacity.gov/crossingguard
- Student safety patrol program: https://goldenhill.sandiegounified.org/programs/safety_patrol
- Walking school bus: https://www.ochealthinfo.com/services-programs/pregnancy-and-parenting/child-safety/injury-prevention-program/walk-school-day-6

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For more information, please visit the CPBSP page at <u>https://safetrec.berkeley.edu</u>.