SAFE SYSTEM CASE STUDY

Transit-only lanes in San Francisco

KEY TAKEAWAY: San Francisco reduced population-level injury risk by prioritizing transit-only lanes, lowering operating speeds through corridor design, and reducing and simplifying conflict points. This project demonstrates how exposure, severity and likelihood can be addressed simultaneously.

SAFETY LEVERS

San Francisco's Van Ness Improvement Project demonstrates how transit-priority design and street reallocation can reduce injury risk at a population scale by lowering VMT, managing speeds and eliminating high-risk conflicts. The centerpiece of the project was the creation of dedicated bus rapid transit (BRT) lanes. While the project was initiated to improve transit reliability and person throughput, the resulting changes to street geometry, operations and mode share substantially reduced kinetic-energy risk along one of the city's highest-injury corridors. The project also secured strong support from emergency responders by providing a reliable, unobstructed access lane, illustrating how sustainability, safety, multimodal mobility and emergency response goals can be aligned.

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Instead of focusing on moving vehicles …

Prioritizing vehicle throughput on a major cross-city corridor

Before the redesign of Van Ness Avenue, buses ran in the outside lane, in mixed-flow traffic. Three wide, general-purpose lanes per direction and permissive left turns created frequent conflicts for all users, particularly for pedestrians and buses. The avenue was part of San Francisco's High-Injury Network.

… San Francisco focused on moving people

Reallocating street space to safer, high-capacity modes, reducing exposure and conflict

Van Ness BRT created dedicated, center-running transit lanes, reduced general-purpose lanes from three to two in most segments, narrowed lane widths, added median pedestrian refuges, programmed signals with leading pedestrian intervals, and restricted left turns for private vehicles at most intersections. These changes reduced conflict points, shortened pedestrian crossings, improved transit operating speeds and increased person throughput without roadway expansion.

Instead of mixing modes …

Requiring transit to operate in mixed flow with frequent merging and weaving

Before the project, buses were required to pull in and out of curbside stops, mix with general traffic and navigate turning vehicles. This increased conflict points and degraded transit reliability.

… San Francisco separated modes

Providing dedicated transit lanes with coordinated signals

The BRT project added more than four lane-miles of center-running transit lanes. It also retimed signals and reprogrammed them to give buses priority. These measures reduced lane-changing and weaving, eliminated friction between buses and general traffic, shortened the time buses spent at stops and improved bus reliability. Eighty-six percent of surveyed bus riders reported faster trips.

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Instead of encouraging high speeds …

Leaving wide, multilane roads that make it easy to speed

Although Van Ness Avenue had long been intended to be a transit-priority street, there were few features to keep speeds in check. Fast-moving vehicle traffic increased the risk of severe crashes on a street with frequent pedestrian crossings.

… San Francisco designed for appropriate speeds

Using physical design to keep speeds in check

The redesign reduced the number and width of the lanes and incorporated median refuges and curb extensions. These elements help bring operating speeds down to the target speed for crash survivability in this multimodal context.

What levers did this intervention pull?

PRIMARY: BRT reduces **exposure** by shifting trips from private vehicles to high-capacity transit, lowering vehicle miles traveled. Fewer vehicle trips reduce the opportunities for high-energy crashes.

SECONDARY: The project reduced **severity** by reducing speeds and the involvement of heavy vehicles — in this case buses — in crashes. Changes in street design slowed traffic, especially during off-peak hours. Buses were separated from general traffic.

SECONDARY: The project reduced the **likelihood of a crash** by reducing and simplifying conflict points.

State and local DOTs can reduce crash injuries by lowering one or more of the following **SAFETY LEVERS**:

EXPOSURE	how much people drive
SEVERITY	how fast vehicles travel and how heavy they are
LIKELIHOOD OF A CRASH	how often road users come into conflict

These safety gains were achieved while improving emergency response reliability.

What were the results?

- Transit ridership along Van Ness rebounded to 103% of prepandemic levels, outpacing the systemwide recovery of 70%. Among surveyed riders, 52% reported riding more often.
- Transit-involved collisions declined 82%.
- Overall collisions declined 33% in multiyear before and after comparisons.

What else can be done?

Rapid-deployment steps: Extend hardened or restricted left-turn treatments, pedestrian refuges and leading pedestrian intervals to similar corridors using quick-build materials. Consider "Safe Waves" signal timing adjustments to reduce pedestrian delay and manage speed through shorter cycle lengths and coordinated progression designed for slower operating speeds.

Policy/process trigger: Expand center-running transit-only lanes to other high-injury corridors where transit carries a large share of people, using person throughput rather than vehicle throughput as the governing performance metric.

Continued data collection: Track corridor-level changes in transit ridership, general-purpose vehicle volumes, operating speeds and severe crash rates to monitor kinetic-energy risk over time. This is especially important as additional treatments and conditions, such as speed safety cameras and autonomous vehicles, are added in the city.