

Vision Zero Program Update Summer 2023

July 18, 2023 SFMTA Board of Directors Meeting

Overview

- Collisions and fatalities a deep dive into the trends since 2017
- What we can address through street design and traffic management...
 - ... and what requires a more comprehensive approach
- Updates on legislation, engineering efforts, programs
- Where we've been, where we are headed





2017-2022 Crash Trends

June 20, 2023

Ricardo Olea, City Traffic Engineer Streets Division



Report posted on SFMTA and SF Vision Zero websites

https://www.sfmta.com/sites/default/files/reports-anddocuments/2023/05/san francisco collisions report 2017 2022.pdf



San Francisco Fatal Crashes (1990-2022)



Fatal Collisions

1



SF Injury Reported Crashes (1990-2022)





Injury Collisions





Year



Pedestrian Collisions

Pre and Post Pandemic Changes

Crash Category Totals	Pre-pandemic 2017-2019	Pandemic 2020-2022	Total Change	Percent Change
Fatal	72	96	1 24	1 33%
Injury	10,091	7,905	♥ 2,186	↓ 22%
Fatal - Pedestrian	46	45	V 1	↓ 2%
Injury - Pedestrian	2,588	1,712	♦ 876	↓ 34%
Fatal - Person on Bicycle	6	5	↓ 1	↓ 17%
Injury - Person on Bicycle	1,747	1,255	♦ 492	♦ 28%
Fatal - Motorcyclist	7	22	1 5	↑ 214%
Injury - Motorcyclist	1,245	960	♥ 285	↓ 23%
Fatal – Stand Up Device	0	7	↑ 7	•
Injury – Stand Up Device	145	454	1 309	1 213%



Pandemic: Less Injury Crashes, More Fatals

	Pre-pa	ndemic	Killed per	Pano	lemic	Killed per	Fatality/Injury
County	2018-202	19 Victims	1000 Injured	2020-202	21 Victims	1000 Injured	Ratio Percent
	Killed	Injured	Ratio	Killed	Injured	Ratio	Change
Alameda	181	21,575	8	206	16,403	13	+ 33%
Contra Costa	157	11,846	13	196	8,284	24	+ 44%
Fresno	255	8,951	28	379	9,343	41	+ 30%
Los Angeles	1465	178,917	8	1612	123,401	13	+ 37%
Orange	383	37,494	10	415	29,782	14	+ 27%
Sacramento	319	24,357	13	381	21,843	17	+ 25%
San Diego	524	39,859	13	614	32,762	19	+ 30%
San Francisco	67	10,097	7	68	7,687	9	+ 25%
San Mateo	58	7,941	7	76	5,377	14	+ 48%
Santa Clara	251	21,029	12	235	14,043	17	+ 29%
Ventura	103	11,119	9	120	8,904	13	+ 31%
Above total	3,763	373,180	10	4,302	277,829	15	+ 35%
United States	72,931	5.4M	14	81,946	4.78M	17	+ 21%

California Source: SWITRS, includes freeways. US: NHSTA

2017-2022 Collision Types

Collision Type	Injury Collisions	Percent	Fatal Collisions	Percent
Broadside	5500	30%	31	19%
Vehicle/Pedestrian	3457	19%	73	45%
Rear End	2752	15%	5	3%
Sideswipe	2637	15%	10	6%
Head-On	1206	7%	6	4%
Other	1003	6%	7	4%
Hit Object	680	4%	21	13%
Not Stated	604	3%	6	4%
Overturned	316	2%	3	2%



2017-19 compared to 2020-22 by BOS Districts



Supervisor District	Percent Change All Injury	Percent Change Pedestrian
District 1	-26%	-34%
District 2	-15%	-24%
District 3	-32%	-51%
District 4	-23%	-31%
District 5	-15%	-23%
District 6	-30%	-41%
District 7	-32%	-48%
District 8	-21%	-38%
District 9	-15%	-15%
District 10	-3%	-15%
District 11	-21%	-26%



Why SF did injuries decline during pandemic?

Reported Traffic Injury Collisions by Month (2019-2022) Red Line is 2019 Monthly Average





.... there were fewer people moving in SF



- San Francisco County Congestion Era Tracker map for 12/2022.
- Pandemic era shows estimated drops in vehicle miles travelled during the pandemic in the order of 10 to 30 percent along major streets.
- Effects are most pronounced downtown and on commute routes to downtown.

https://covid-congestion.sfcta.org/

Fewer people walking, biking and in transit in SF

Muni Metro Ridership Recovery Dipped to 51% in May

While Downtown BART Dropped to 33% of 2019 Levels



June 2023, SF Controller's Office

07/Status%20of%20the%20San%20Francisco%20Economy%20June%202023 final.pdf



But then why more fatalities in SF?

- SF fatality increase limited to 2022, not right after pandemic.
- Closer look at the data indicate that San Francisco did not follow national trends in terms of increases in pedestrian and bicycle related fatalities, which are both slightly down (2020-22)
- 92% of the pandemic increase in SF fatalities were involving stand up electric devices (new mode) and motorcycles (deaths tripled!).
- Motorcycle fatalities increase during pandemic matched a national trend.

Fatal Crashes San Francisco	Pre- pandemic 2017- 2019	Pandemic 2020- 2022	Total Change
Total	72	96	+ 24
Pedestrian	46	45	- 1
Person on Bicycle	6	5	- 1
Motorcyclist	7	22	+ 15
Stand Up Device	0	7	+ 7
Excluding			
Motorcycles and Stand Up Devices	65	67	+ 2

U.S. Motorcycle Rider Deaths

"While motorcycle travel accounts for less than one percent of annual VMT in the U.S. (0.6 percent in 2021), there were 6,000 motorcyclist fatalities in 2022, representing 14 percent of traffic fatalities. U.S. motorcyclist fatalities increased by 20 percent from 2019 to 2022, from 5,015 to 6,000" - TRIP Report, June 2023





Figure 7. Which countries saw the steepest drop in road deaths during the pandemic? (Road fatalities in 2020, % change on 2017-19 average)

> Finland Lithuania

Canada

Australia

Chile

Serbia Israel Norway

Poland Germany

Colombia United Kingdom Japan Greece

Korea Slovenia Belgium

Portugal

France

Spain

Italy Argentina

5.0

10.0

0.0

-5.0

-10.0

Czech Republic Austria New Zealand

Netherlands Luxembourg



Why did U.S. fatalities go up?

https://www.itf-oecd.org/sites/default/files/docs/irtad-road-safety-annual-report-2021.pdf

-40.0

-35.0 -30.0

-25.0

-20.0

-15.0



U.S. pedestrian fatalities up

Figure 9. Trends in pedestrian fatalities per 100,000 population relative to 1990 in the USA compared with Canada, Japan, and 8 European Countries 1990–2020. Source: [26]. Note: To control for annual fluctuations in the number of pedestrian fatalities, we used five-year averages to generate this comparison of trends in pedestrian fatality rates. For each country the fatality rate for 1990–1994 was set at 100% as base year. All other years are presented as percentage relative to 1990–1994.

1000.500

Per Capita

https://www.ghsa.org/resources/Pedestrians23

1007-100

2040.225

2015-2020



*Projected Sources: FARS and GHSA analysis of SHSO data





USDOT adopts the Safe System Approach (2022)



https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA SafeSystem Brochure V9 508 200717.pdf

Safe speeds



- The rate of speed related crashes increased nationally.
- In San Francisco "unsafe speed for conditions" share went up

San Francisco Crash Category Totals	Pre-pandemic Total 2017-2019	Pre-pandemic Percent of Total 2020-2022	Pandemic Total 2020-2022	Pandemic Percent of Total 2020-2022
Fatal - Unsafe Speed	8	12%	22	23%
Injury – Unsafe Speed	1,630	16%	1,597	20%

- Unsafe speeds increase likelihood of crashes by reducing the time to notice and react to unexpected situations.
- Severity of crashes is often proportional to speed of impact.



Safe roads



- Redesign on roadways to reduce severe crashes is one of the core duties of the SFMTA and key focus of the Safe Systems approach.
- Almost all American Vision Zero cities struggling despite millions spent on making thousands of roadway changes.
- At a national level, American cities depend in large part on arterials to move large number of vehicles at high speeds over many miles. In the United States, 60 percent of pedestrian deaths occur on these types of non-freeway multi-lane streets.
- Redesigning the entire 20th Century American street network to have zero fatality potential will require more time and funding than previously thought. It may also require changes to the built environment and the modal choices people have where they live.



Safe Road Users



The Safe Systems approach assumes that people make "mistakes." The system should be designed to consider these errors. But can any actions be taken to make human mistakes in transportation less likely? Factors:

- Lack of skills, experience and training in mode used
- Overconfidence and lack of awareness of actual risks
- Impairments from alcohol, prescriptions, and illegal drugs
- Fatigue
- Inattentiveness and technological distractions
- Untreated mental illnesses, homelessness
- Emotions such as anger, boredom, fear and sadness



AAA Fatal Crashes Relative to Pre-Pandemic Trends, United States, May-December 2020



Category	U.S. Fatalities Percent Over Statistical Forecast
License Expired	84.3
Driver Under 16 Years Old	76.9
Never Licensed	44.8
Driver Licensed Suspended/Revoked	37.5
Hit and Run Crashes	31.2
Prior DUI during past 5 years	27.2
Crash Time 10 PM to 2 AM	21.9
Police Reported Speeding	21.8
Vehicle Age Over 20 Years Old	21.3
Blood Alcohol Over 0.08 g/dL	20.1
No Motorcycle Helmet Used	18.6
No Seat Belt Used	18.2

https://aaafoundation.org/wp-content/uploads/2022/12/22-1339-AAAFTS Impact-of-COVID-19 Research-Brief r3.pdf



Education versus Public Service Ads



Viena Convention on Road Traffic Safety. Contracting Parties will take the necessary measures to ensure that road safety education be provided on a systematic and continuous basis, particularly in schools at





Where the action is (Europe as example)

What departments of transportation can spend money on:





Traffic enforcement



- During the pandemic police traffic enforcement declined in many U.S. cities due to contact avoidance, staffing shortages, and concerns with racial equity of pretext traffic stops.
- In SF traffic enforcement has declined significantly in recent years. Injury crashes however are down, though fatalities increased in 2022.
- Enforcement should not substitute for good roadway design, but not all roadway devices and rules can be made "self-enforcing."
- What is the exact relationship between citations and fatalities? What types of police enforcement works best given limited resources?
- Automated speed enforcement: common in Europe, not allowed in California yet.





San Francisco enforcement trends

Figure 9: Percentage Changes with 2016 as Base Year Focus on the Five Citations, All Fatal Crashes, and All Injury Crashes (2016-2022)



National enforcement trends (TransUnion)



Figure 3. Violation rate vs. death rate (Jan. 2019 to Jan. 2023)



"Since the onset of the pandemic, traffic violation citations have decreased nationally by 13%"

Figure 5. Percentages of accidents involving drivers with prior violations



TransUnion Insurance Research Highlights Link Between 13% Decrease in Traffic Enforcement and 22% Rise in Driving Fatalities

Reckless behavior



 THEORY: Part of the increase in severe crashes is part of a fraying of the social fabric perhaps accelerated by the pandemic. Hit and run crashes are an example. In San Francisco alone these have significantly increased. Why?

San Francisco Crash Category Totals	Pre-pandemic Total 2017-2019	Pre-pandemic Percent of Total 2020-2022	Pandemic Total 2020-2022	Pandemic Percent of Total 2020-2022
Fatal Hit and Run	9	13%	24	25%
Injury Hit and Run	1,756	17%	1,736	22%

 "Some will say 'This focus on other-regarding behavior is a mistake. It's just the system'....But at the end of the day, we need both. Safe infrastructure is not sufficient if the drivers are road raged." – Kelcie Ralph, Associate Professor, Rutgers quoted in *Freakonomics*



Distractions / Inattention



- People's attention to the driving environment is decreasing as attention is diverted to phones and complex in-car dashboard systems. Studies say multitaskers underestimate risks and overestimate their skills.
- "Distracted driving is dangerous, claiming 3,522 lives in 2021." NHSTA
- New York City data: distraction/inattention is their top crash factor, more than unsafe speed. Here factor is not as well documented.



Serious Injury Response, Tracking & Analysis Program (SIRTA) Quarterly Report - Q1 2023 - NYC Department of Transportation

4. Factors:

Vehicle Contributing Factors are entered by the responding NYPD officer. Factors are not identified for every crash and there may be multiple factors entered for a single crash.



Vehicle Contributing Factors	Locations %	Locations
Driver Inattention/Distraction	32.7	175
Failure To Yield Right-Of-Way	19.1	102
Unsafe Speed	13.8	74



Homelessness



In San Francisco between 30 to 50 percent of pedestrian fatalities during the pandemic (2020-2022) were people that did not have a fixed address. We do not know the extent of the problem for all injury crashes.

	2017	2018	2019	2020	2021	2022
Victims Killed - Homeless	2	5	0	6	4	7
Percent of All Fatals	10%	22%	0%	20%	15%	18%
Percent of Pedestrian Fatals	7%	33%	0%	50%	31%	30%



Vehicle size and weight



- The size, weight and acceleration capacity of vehicles in the United States has grown each year. Electric batteries are adding additional weight and acceleration capabilities.
- Vulnerable road users around those vehicles are more at risk of severe injury due to larger front impact area and blind spots
- Vehicle size and design guidelines are a federal responsibility
- "We can redesign our streets as much as we want, but at a certain point we also have to start to look at the shape and the weight of these vehicles" -Philip Miatkowski, senior director of research and policy at New York City's Transportation Alternatives, quoted on *Curbed*.





Other vehicle factors



- Pedestrian Automatic Emergency Breaking Systems (PAEB)
- U.S. Vehicle Safety Ratings and Pedestrians
- Truck Side Underride Guard Rulemaking
- Stand Up Electric Scooters And Boards
- Alcohol In-Vehicle Detection Technology
- Intelligent Speed Assistance (Europe)
- Advanced Driver Assistance Systems (ADAS)
- Driving Automation and Driverless Vehicles



Post crash care

Haddon Matrix Model

PERIOD	HUMAN	VEHICLE/ EQUIPMENT	PHYSICAL ENVIRONMENT	SOCIO- ECONOMIC
PRE- CRASH	Poor vision or reaction time, alcohol, speeding, risk taking	Failed brakes, missing lights, lack of warning systems	Narrow shoulders, ill-timed signals	Cultural norms permitting speeding, red light running, DUI
CRASH	Failure to use occupant restraints	Malfunctioning safety belts, poorly engineered air bags	Poorly designed guardrails	Lack of vehicle design regulations
POST- CRASH	High susceptibility, alcohol	Poorly designed fuel tanks	Poor emergency communication systems	Lack of support for EMS and trauma systems

TABLE 4-6: Haddon Matrix for crashes in an urban area (Source: HSIP Manual)

unit4.pdf (dot.gov)



Swiss Cheese Model

All layers of a Safe System Approach are critical.



https://www.transportation.gov/sites/dot.gov/files/2022 -02/USDOT-National-Roadway-Safety-Strategy.pdf

One national estimate of impacts for facts (2022)





Summary of Key Trends

Background Trends

- The pandemic was associated with **fewer injury crashes but more fatalities**
- Rate of **pedestrian fatalities and motorcycle fatalities growing** nationwide
- Vehicles are getting larger and becoming more dangerous to vulnerable roadway users

San Francisco Trends

- Scooters and motorcycles significant part of fatalities during pandemic
- Vehicles are traveling at speeds that are **too fast for conditions**
- **Reckless behavior** contributes to increase in severe crashes
- Pedestrian fatalities disproportionately affect people experiencing homelessness



Key Issues to Address



Vehicles are moving too fast

SFMTA can slow them down



Pedestrians are vulnerable roadway users

SFMTA can protect them



Streets feel unsafe for two-wheeled modes

SFMTA can create an active mobility network that addresses mode shift, equity, and climate goals



Non-infrastructure human behavior

Cannot be solved solely with street design, but SFMTA can mitigate some harms


Slow Down Speeding Vehicles





Slow Down Speeding Vehicles



Slow Down Speeding Vehicles

State Legislation Related to Vision Zero

- **AB 645 (Friedman)** would establish a speed safety pilot program
- **AB 251 (Ward)** requires the CTC to convene a task force to study the relationship between vehicle weight and traffic injuries
- **AB 361 (Ward)** authorizes a local agency to install cameras on city-owned or district-owned parking enforcement vehicles for the purpose of parking violations occurring in bicycle lanes, until January 1, 2030
- **AB 43 (Friedman)** continued implementation of speed reduction on corridors in business activity districts

















Quick-Build Toolkit on HIN



By 2024...

- Full implementation of the quick-build toolkit throughout the remaining HIN where work is needed with progress tracking (approx. \$5-6M)
- Complete 17 funded in-progress corridor redesign projects, including Beach Street, Larkin Street, Oak Street, and more

SCreate Safer Shared Streets



S Create Safer Shared Streets



SCreate Safer Shared Streets

Active Communities Plan - Process



- Create a long-term vision for infrastructure investment that expands a proposed Active Transportation Network for safer riding and rolling on our streets
- Community discussions (early spring to late summer) will directly influence priority recommendations for investment



SCreate Safer Shared Streets

Active Communities Plan - Projects

- Dedicated funding for safer walking, rolling, and riding infrastructure is necessary to expedite the installation of facilities and programs aimed at reducing deaths and injuries from traffic
- A more substantial update of the Active Communities Plan will be presented at the August 1
 SFMTA Board of Directors
 Meeting as an informational item, and in October for initial Board direction





Non-Infrastructure Components



Vision Zero Since 2014

What we thought then

We can rebuild all our highinjury streets, curb-to-curb

Speed safety cameras will be up and running in a few years

Vision Zero is mainly about "the 3 E's"

Police enforcement would be a cornerstone

We will reach zero in 2024



Vision Zero Since 2014

What we thought then	What we know now	
We can rebuild all our high- injury streets, curb-to-curb	Project delivery for >100 miles of streets would take decades	
Speed safety cameras will be up and running in a few years	Cameras would be a much harder lift in Sacramento	
Vision Zero is mainly about "the 3 E's"	We need long-term mode shift, supported by an active network	
Police enforcement would be a cornerstone	SFPD resources would be scarce and police alone cannot drive change	
We will reach zero in 2024	Zero is the right goal, but ten years not enough to fix deep societal issues	



Vision Zero Since 2014

What we thought then	What we know now	What we're doing about it
We can rebuild all our high- injury streets, curb-to-curb	Project delivery for >100 miles of streets would take decades	Launching Quick-Build program, applying proven tools on HIN
Speed safety cameras will be up and running in a few years	Cameras would be a much harder lift in Sacramento	Planning for camera implementation as we see a way forward
Vision Zero is mainly about "the 3 E's"	We need long-term mode shift, supported by an active network	Co-designing that network through the Active Communities Plan
Police enforcement would be a cornerstone	SFPD resources are scarce and police alone cannot drive change	Leading with design, focusing SFPD on worst behavior
We will reach zero in 2024	Zero was the right goal, but ten years not enough to fix deep societal issues	Reaffirming our commitment with humility and community partnership



Our Commitment

- Fund and implement the **Quick-Build Toolkit** to high-injury corridors
- Prepare for Speed Safety Camera rollout
- Active Communities Plan
 - Complete outreach
 - Provide opportunities for SFMTA Board guidance on key projects
 - Fund first generation of investments
- Collaborate with partners on deeper social challenges driving traffic fatalities
- Advocate for safer vehicles at state/national level

