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Through Vision Zero SF we commit to  
working together to prioritize street safety and  
eliminate traffic deaths in San Francisco.

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**POPULATION HEALTH DIVISION**  
SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH

# **TRAFFIC INJURY DATA AND PUBLIC HEALTH: *PARTNERSHIPS TO REALIZE VISION ZERO IN SAN FRANCISCO***

May 9, 2019 | Alameda County Transportation Commission

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San Francisco Department of Public Health

# TRAFFIC INJURY IN SAN FRANCISCO: A PUBLIC HEALTH PROBLEM

~30 Fatalities  
per year



~500 People  
hospitalized  
with severe  
injuries  
annually in  
our public  
hospital

\$35M in medical costs  
*alone* per year

On average, City Trauma Surgeons respond to a serious traffic injury **every 17 hours**.

**~50% of the patients** seen at **Zuckerberg San Francisco General's Trauma Center** *are people injured in traffic collisions.*

# SAN FRANCISCO ADOPTED VISION ZERO IN 2014



## **Saving Lives**

Safety and the preservation of human life is our highest priority.



## **Prevention**

Traffic deaths are preventable and unacceptable.



## **Equity**

The transportation system should be safe for all road users, for all modes of transportation, in all communities and for people of all incomes, races and ethnicities, ages and abilities.



## **Speed**

People are inherently vulnerable and speed is a fundamental predictor of crash survival. The transportation system should be designed for speeds that protect human life.



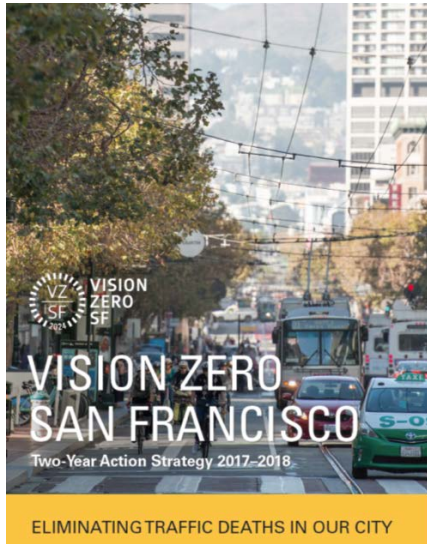
## **Safe Streets**

Human error is inevitable and unpredictable; we should design the transportation system to anticipate error so the consequence is not severe injury or death. Transportation and land use development policies, standards, programs and design decisions should prioritize preserving lives.



## **Safe People and Safe Vehicles**

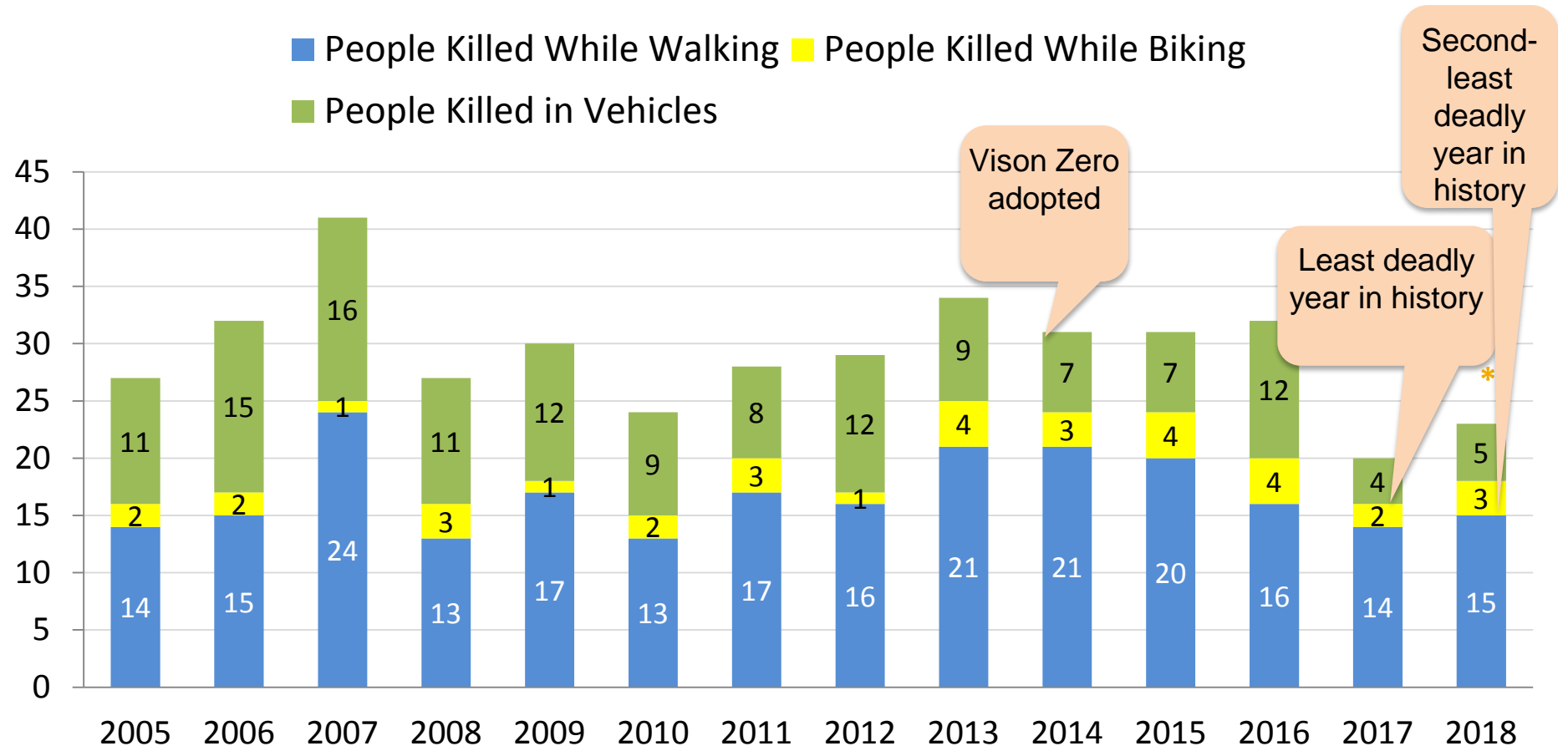
Safe human behaviors, education about and enforcement of safety rules, and vehicle technologies are essential contributors to a safe system.



# PEOPLE MAKE MISTAKES, NO ONE SHOULD DIE WHEN THIS HAPPENS

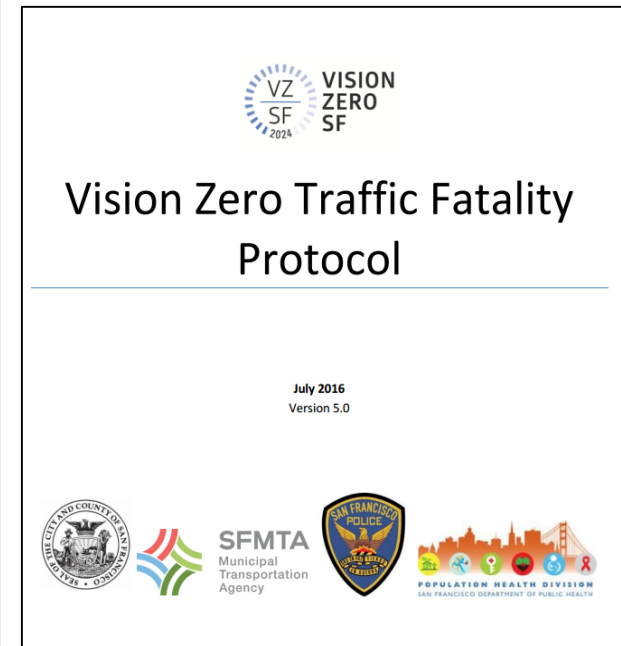
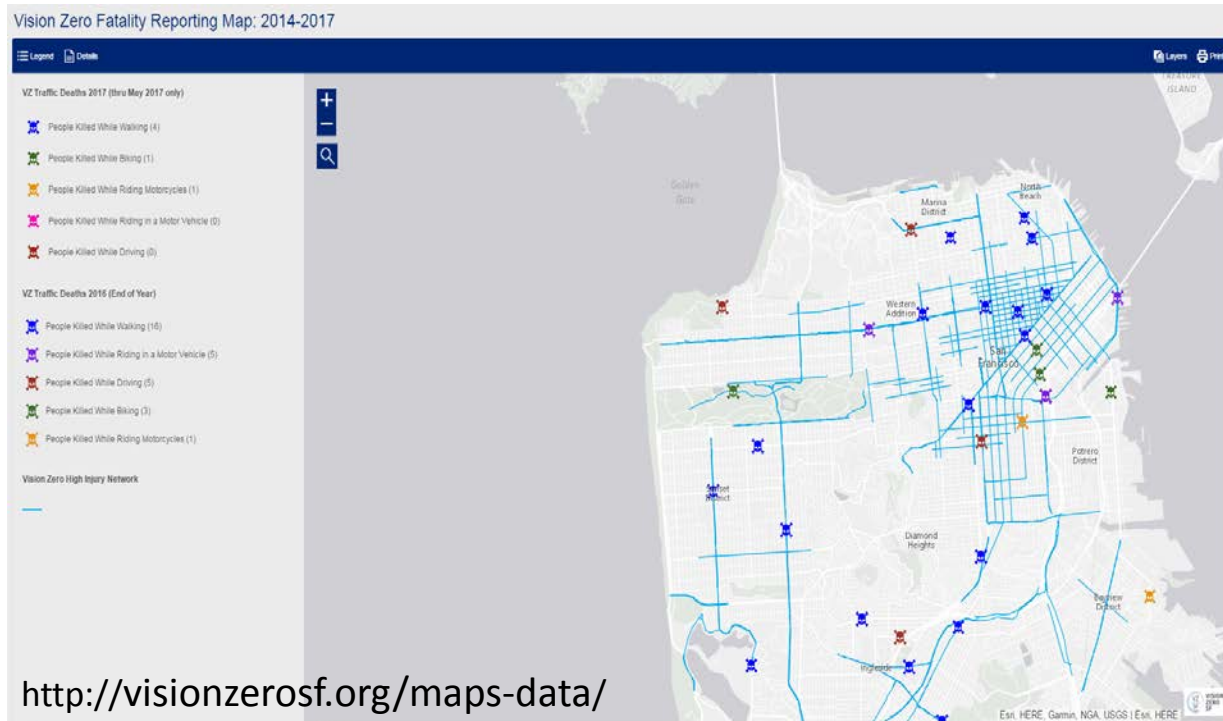


# 23 TRAFFIC-RELATED DEATHS IN 2018



\*2018 FATALITY COUNTS ARE PRELIMINARY

# MONTHLY REPORTING OF TRAFFIC DEATHS



# VISION ZERO INJURY PREVENTION RESEARCH COLLABORATIVE (VZIPR)

Working since 2014 to develop, institutionalize and utilize **comprehensive injury data** in support Vision Zero SF's **data-driven, evidence-based approach** to saving lives.



## Diverse group:

Epidemiologist funded by SFMTA

Trauma surgeons

Nurses

Geospatial analysts

& other key staff



ZUCKERBERG  
SAN FRANCISCO GENERAL  
Hospital and Trauma Center

# IMPROVING INJURY SURVEILLANCE FOR TARGETED INTERVENTIONS

## Standard Practice: Police Reported Injury Collisions

- Detailed data about **crash characteristics**
- Little data on injury severity (4 levels of injury severity classification)
- **Underreporting** of injuries
  - 21% underreporting of pedestrian injuries (Sciortino et al 2005)
  - 27% underreporting of cyclist injuries (Lopez et al 2012)



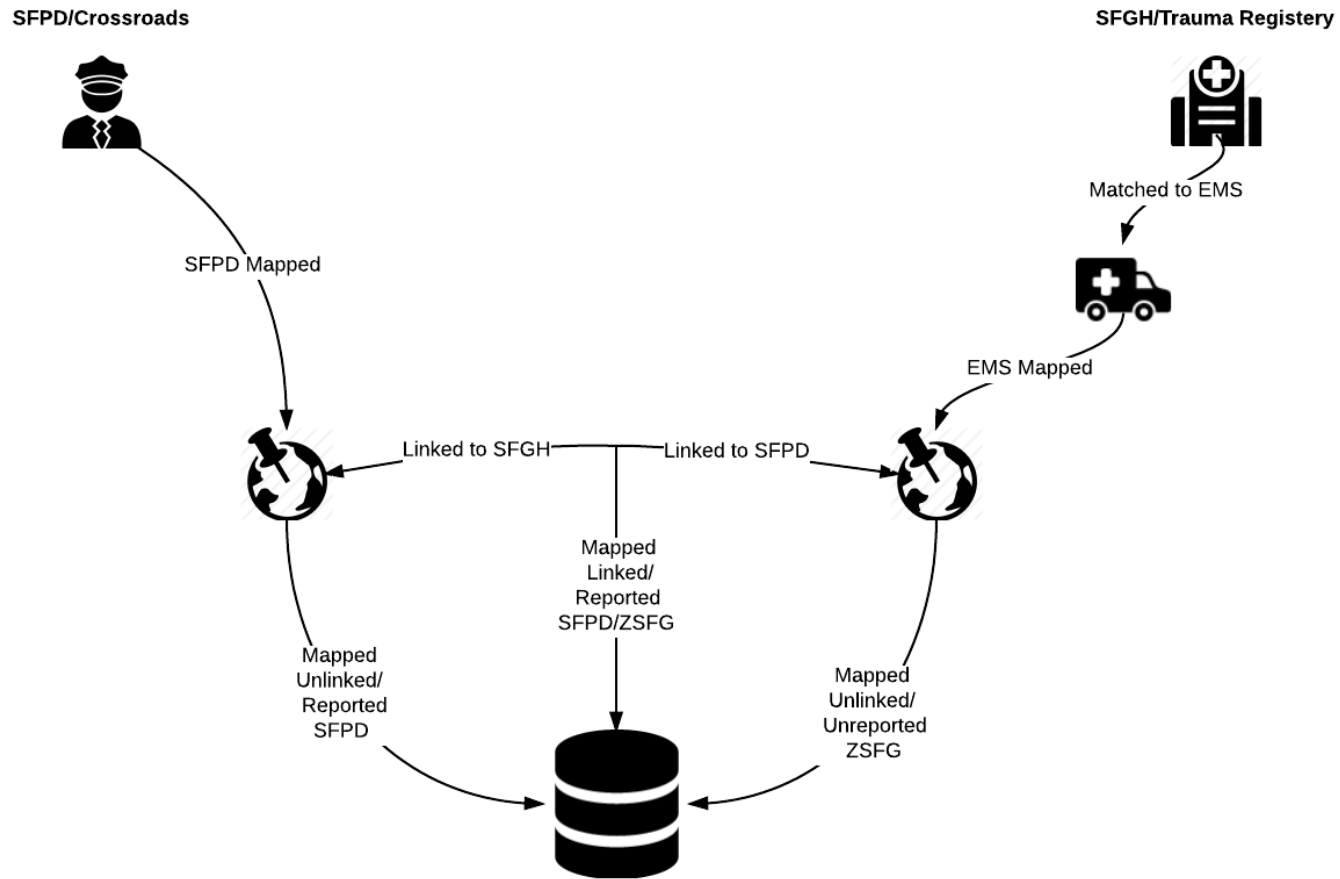
## Unintentional Injury: Hospital Medical Records

- Improved **injury severity assessment** and detailed health outcome data
- **Comorbidities** (mental illness, hypertension, etc)
- **Disability** status
- **Demographics** (race/ethnicity, insurance type)
- **Homelessness**
  - Little data on cause, injury location
    - Mechanism of injury code
    - No location info
    - No cause of crash info





# LINKING ZUCKERBERG SF GENERAL HOSPITAL AND POLICE DATA





## Police Definition: *Visual Assessment*

b. Severe Injury. An injury, other than a fatal injury, that includes the following:

- (1) Broken or fractured bones.
- (2) Dislocated or distorted limbs.
- (3) Severe lacerations.
- (4) Skull, spinal, chest or abdominal injuries that go beyond "Other Visible Injuries."
- (5) Unconsciousness at or when taken from the collision scene.
- (6) Severe burns.

CHP 555 Collision Investigation Manual

## Hospital-Based Definition: *Clinical Examination*



### Severe Injury:

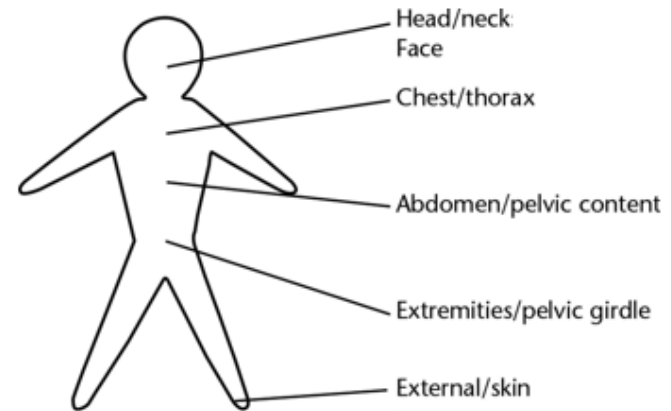
Admitted to ZSFGH

*and/or*

Injury Severity Score (ISS) > 15\*

Consistent with:

- American College of Surgeons
- National Trauma Data Bank
- California Dept. of Public Health
- World Health Organization



## Different Severe Injury Definitions

\* Injury Severity Scoring (ISS) correlates linearly with mortality, morbidity, hospital stay and other measures of severity.

# Reclassifying Injury Severity for Injuries with Linked SFPD-ZSFG Data (2013-2015) (N=4,289)

## Linked/Reported Severe Injuries



**60%**

Remain Severe  
(also hospital severe)



**40%**

Reclassified  
(not severe per hospital)

## Linked/Reported Visible Injuries



**20%**

Reclassified to Severe per hospital



**80%**

Remain Visible Injury  
(not severe per hospital)

## Linked/Reported Complaint of Pain



**12%**

Reclassified to Severe per hospital



**88%**

Remain Complaint of Pain  
(not severe per hospital)

**Net Increase in Severe Injuries based on Hospital Data**

## SEVERELY INJURED WITH EMS TRANSPORT AND IN HOSPITAL RECORDS ONLY



Severely-injured bicyclists seen at hospital who don't report to police

39%



Severely-injured pedestrians seen at hospital who don't report to police

24%



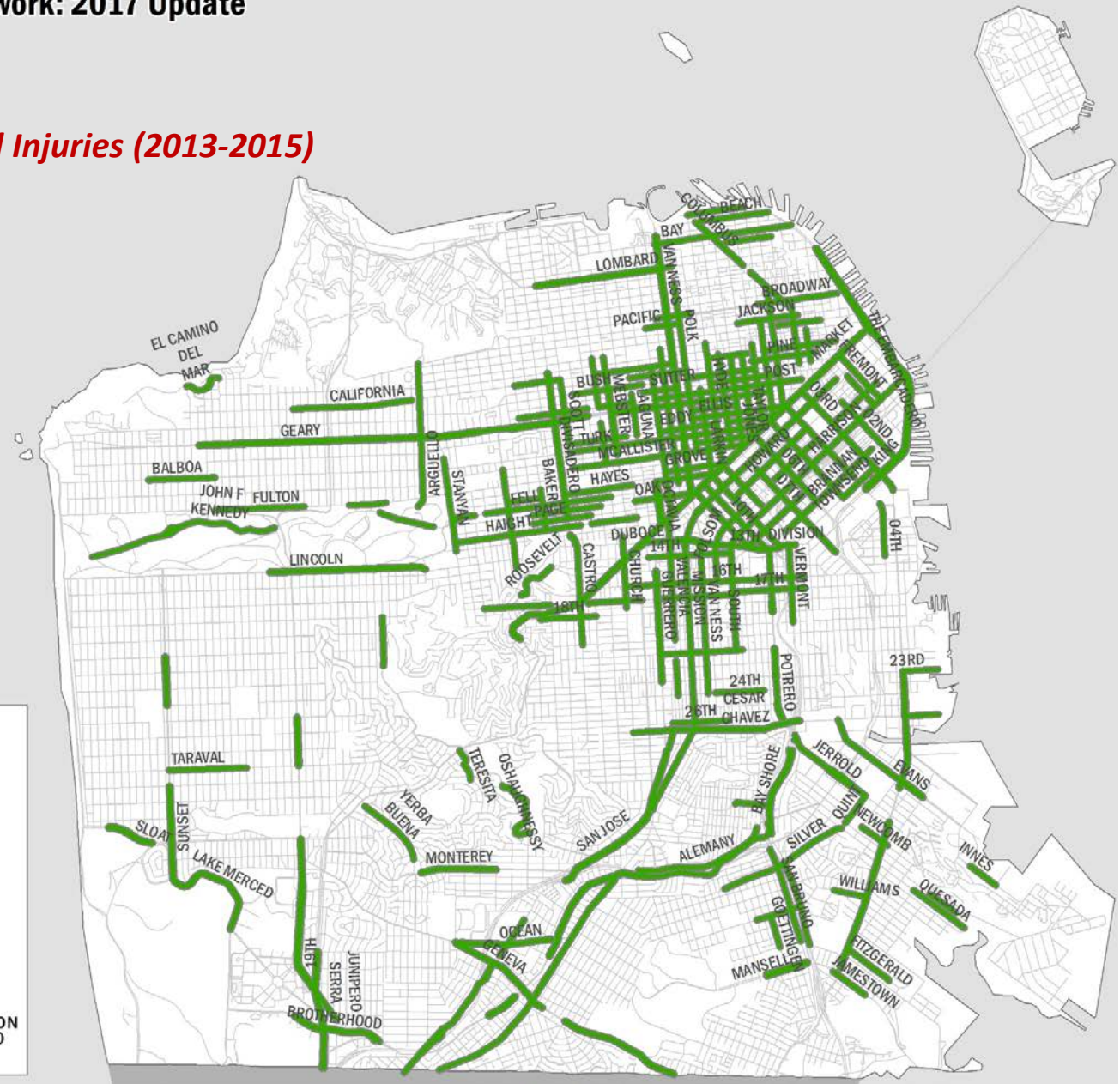
Severely-injured people in vehicles seen at hospital who don't report to police

28%

# Vision Zero High Injury Network: 2017 Update San Francisco, California

**13% of City Streets**

**75% of Severe and Fatal Injuries (2013-2015)**



— 2017 VZ High Injury Network

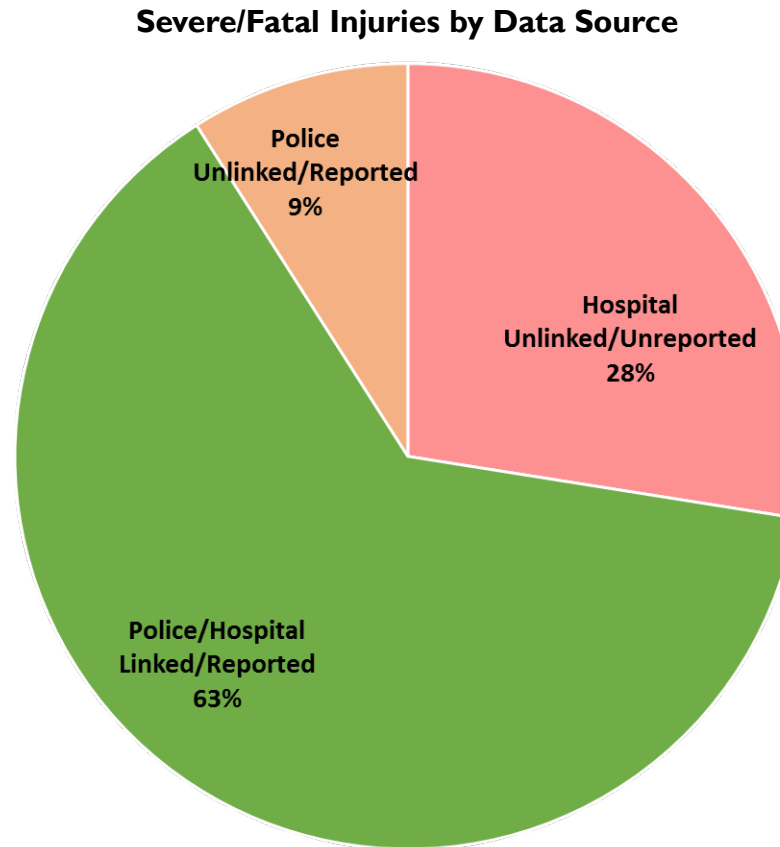
0 0.5 1 2  
Miles

Source: SFPD 2013-2015; ZSFG 2013-2015

City and County of San Francisco Department  
of Public Health: Environmental Health  
Program on Health, Equity, and  
Sustainability - [www.sfphes.org](http://www.sfphes.org)



# HIGH INJURY NETWORK (2013-2015, N=1,494): : 28% OF SEVERE IN HOSPITAL DATA, ONLY



*Hospital records are only those that were linked to EMS*



# DISPROPORTIONATELY CONCENTRATED IN VULNERABLE COMMUNITIES

Vision Zero High Injury Network: 2017 Update - Communities of Concern  
San Francisco, California

**31% of Surface  
Streets**

***51% of the High  
Injury Network***

## 2017 VZ High Injury Network

- Overlap with MTC Community of Concern
- No Overlap with MTC Community of Concern
- 2017 MTC Community of Concern

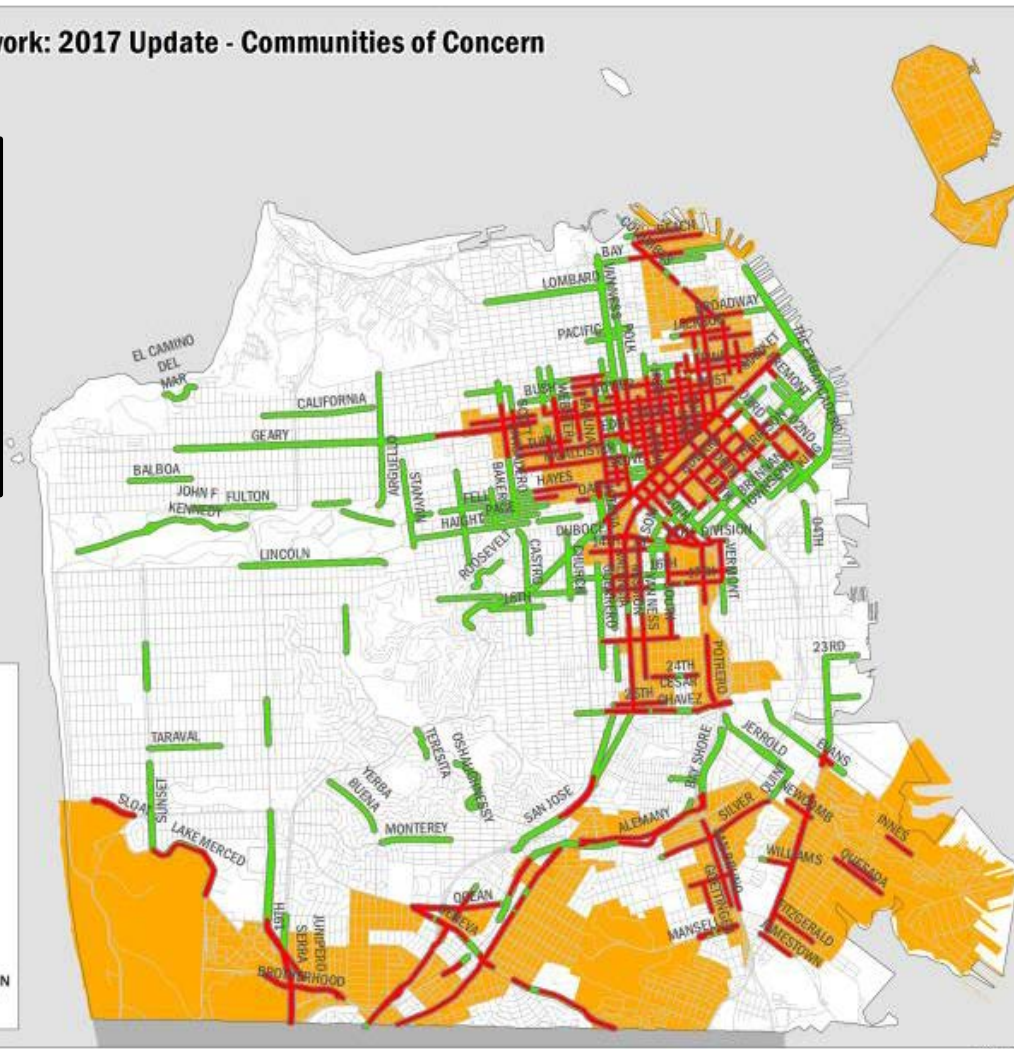


Source: SFPD 2013-2015; ZSFG 2013-2015

City and County of San Francisco Department  
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VISION  
ZERO  
SF

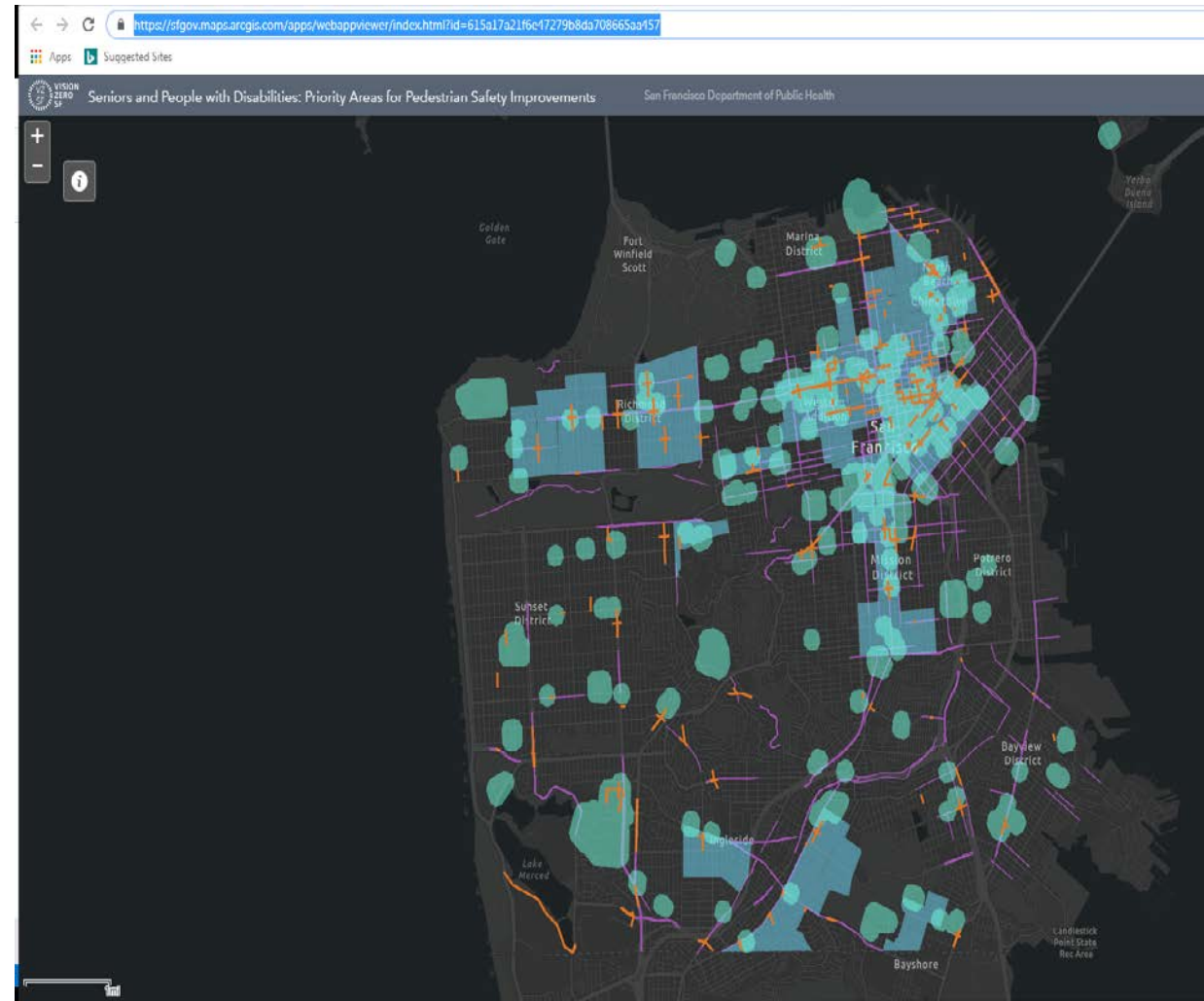


## ***Injury Segments in Priority Areas: ¾ of severe/fatal injuries***

- **57%** on the **VZ High Injury Network**
- **35%** on **Traffic Calm-able Streets**

## **Priority Areas: Where Seniors and People with Disabilities Live and Travel**

- Census Tracts with the highest 1/3 of population density
- Senior Centers
- Public Libraries
- Meal Programs, including Department of Agency and Adult Services Nutrition Sites
- Public Health Facilities
- Paratransit Drop Off/Pick Up Locations
- Other Key Services





# DEVELOPING SPATIAL ANALYSIS TOOLS

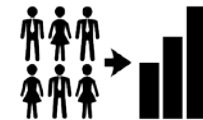
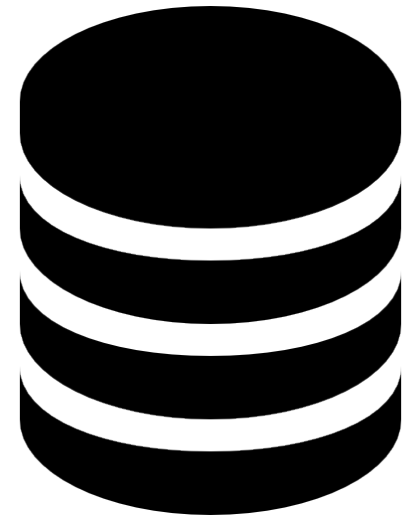
## Environmental Data

Infrastructure  
Transportation  
Community  
Business  
Demographics  
Land Use  
Health  
Education



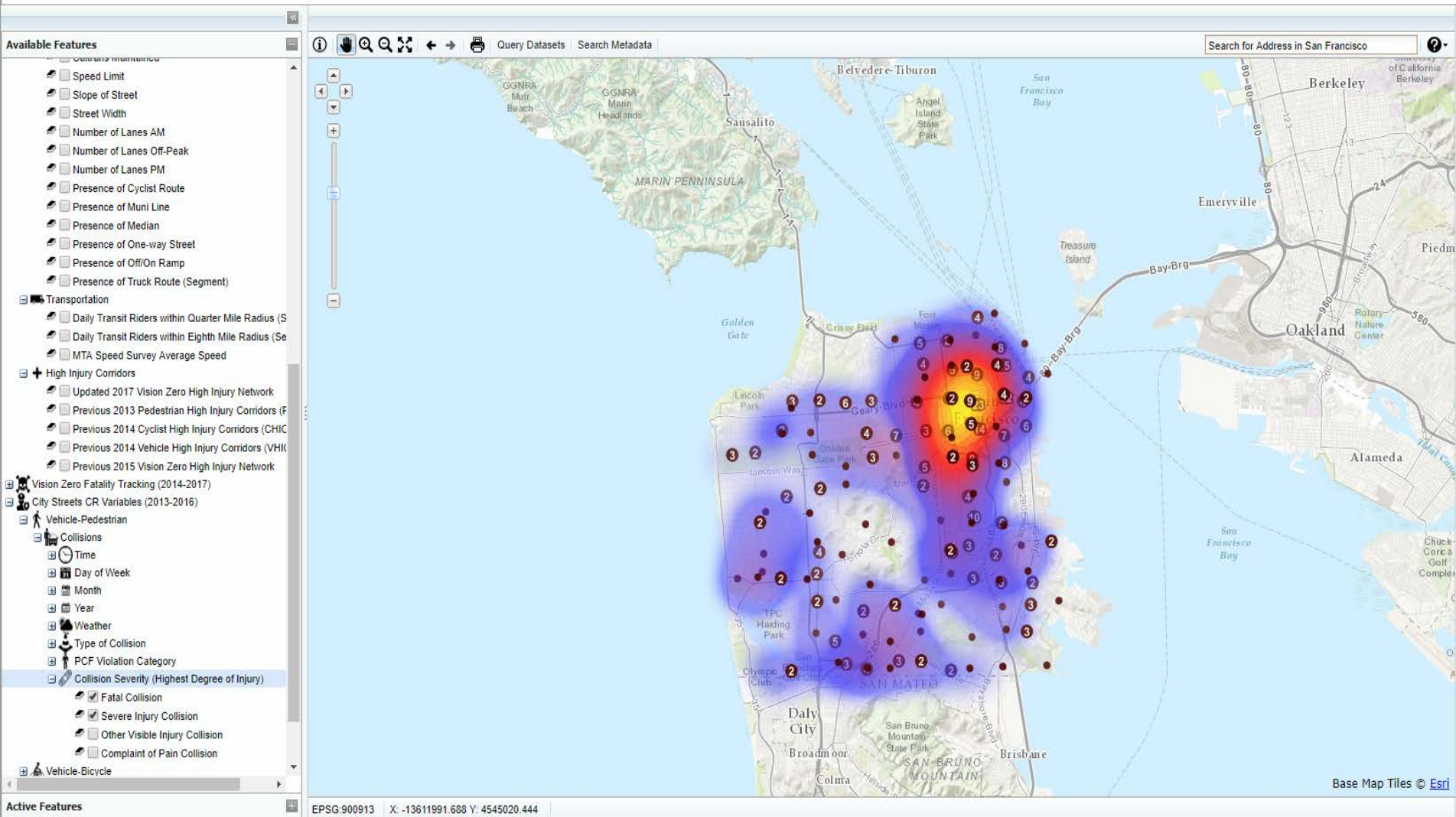
## Injury Data

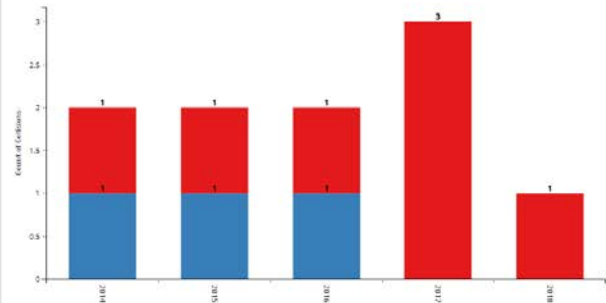
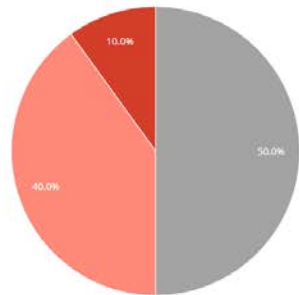
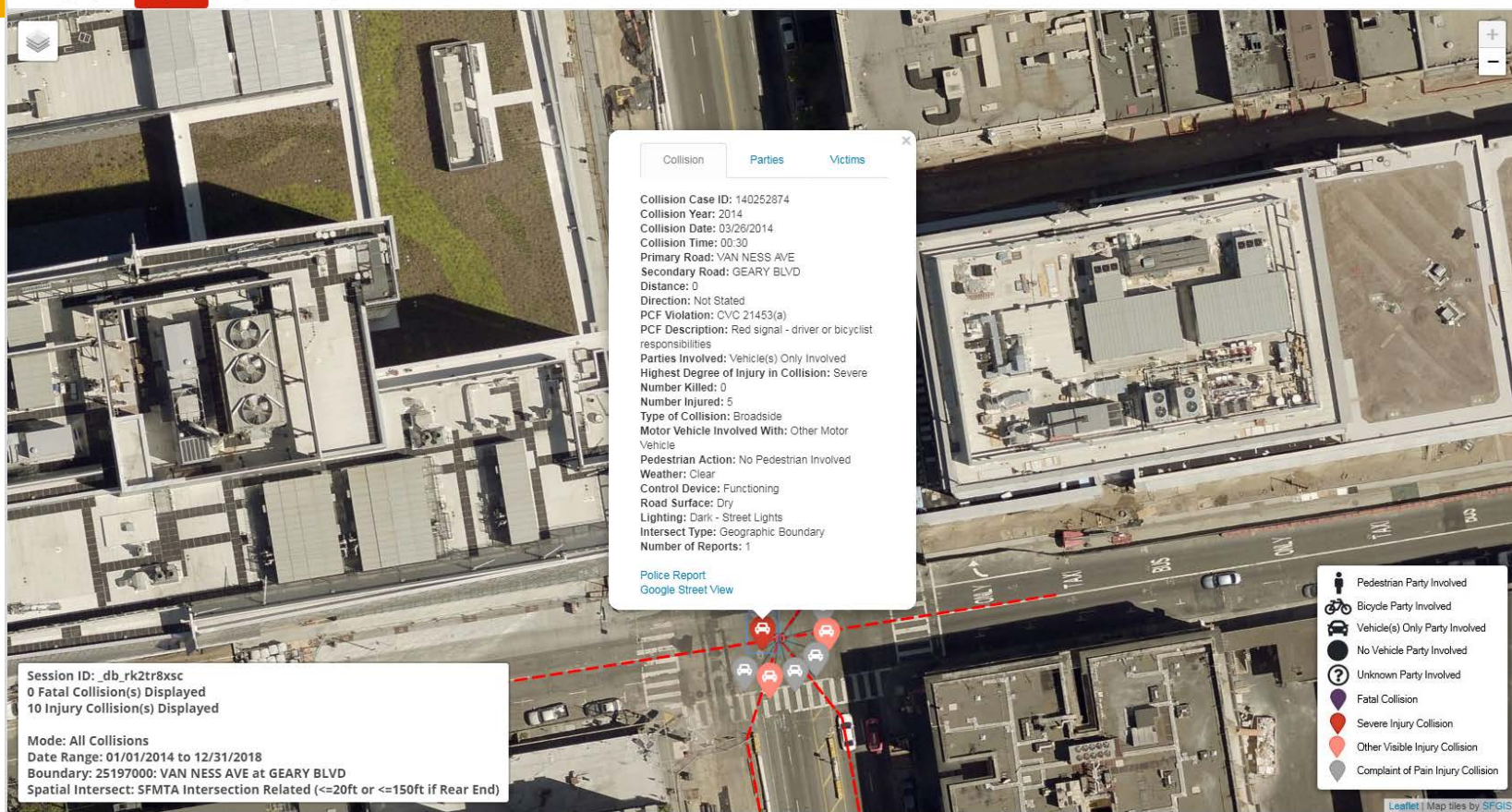
Time  
Severity  
Age  
Gender  
Movement  
Collision Factors  
Sobriety  
Code Violation



# TRANSBASESF.ORG

## TransBASE: Linking Transportation Systems to Our Health







# PARTNERSHIPS TO ADDRESS EMERGING INJURY DATA NEEDS

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The New York Times

WHEELS

*Health Officials Prepare to  
Track Electric Scooter Injuries*



# NEW VARIABLES IN SF TRAUMA REGISTRY

## 1. NEW VEHICLE TYPE

- Congruent with CHP/SFPD categories
- Balance desire for data with capacity to collect data
- Specific enough to respond to data and reporting needs

0 None (N/A)

1 Unknown

2 Electric bicycle



3 Powered scooter (standup)



4 Moped or motor-driven cycle



5 Electric skateboard



6 Hoverboard, electric unicycle, other electrically motorized board



7 Segway-type vehicle



8 Ride-hail vehicle, Transportation Network Company car (TNCs; e.g. Uber, Lyft)



9 Other

## 2. WAS AN EMERGING MOBILITY SERVICE OR TECHNOLOGY INVOLVED IN THE COLLISION?

Examples:

Skip
Lyft
Uber
Scoot
Ford GoBike
JUMP Bike
Lime

- 
- 0 Unknown
  - 1 No
  - 2 Yes
- 



## 3. WAS AN AUTONOMOUS VEHICLE (AV) INVOLVED IN THE COLLISION?

- 
- 0 Unknown
  - 1 No, conventional vehicle
  - 2 Yes
- 



# METHODS AND REPORTS

## EMERGING MOBILITY INJURY MONITORING IN SAN FRANCISCO, CALIFORNIA UTILIZING HOSPITAL TRAUMA RECORDS: A METHODOLOGY

VERSION 1.0  
SAN FRANCISCO, CALIFORNIA  
JANUARY 2019

Vision Zero SF Injury Prevention Research Collaborative  
A Collaboration between the  
San Francisco Department of Public Health's Program on Health, Equity and Sustainability  
and the Zuckerberg San Francisco General Hospital and Trauma Center

### Points of Contact:

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### Recommended Citation:

Vision Zero SF Injury Prevention Research Collaborative. 2019. A Methodology for Emerging Mobility Injury Monitoring in San Francisco, California Utilizing Hospital Trauma Records: Version 1.0. San Francisco, CA. Available at: <https://www.sfdph.org/dph/EH/PHES/PHES/TransportationandHealth.asp>

<https://www.sfdph.org/dph/EH/PHES/PHES/TransportationandHealth.asp>

# CHP 555 IMPROVEMENTS TO SFPD FORMS

- SFPD utilizing a **custom electronic CHP 555 form that allows collision data to be exported to a local database.**
- **Recent Form Improvements:**
  - Internal checks to prevent common data entry errors by police officers

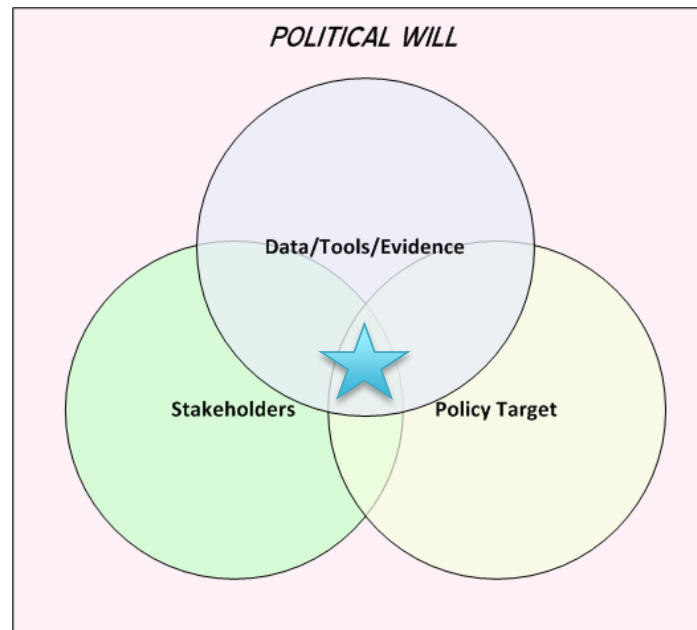
## *New questions for key Vision Zero issues:*

- Emergency Medical Services (EMS) patient run sheet number (for linkage to ZSFG patients)
- Party disability
- Bicycle Impact Point
- Autonomous vehicles
- Suspected cannabis use
- Transportation company (Uber, Lyft, taxis, etc.)

1	2	3	SPECIAL INFORMATION
			A HAZARDOUS MATERIAL
			B CELL PHONE HANDHELD IN USE
			C CELL PHONE HANDSFREE IN USE
			D CELL PHONE NOT IN USE
			E SCHOOL BUS RELATED
			F 75 FT MOTORTRUCK COMBO
			G 32 FT TRAILER COMBO
			H VEHICLE FOR HIRE (TAXI, UBER, LYFT, ETC.) WITH PASSENGER
			I VEHICLE FOR HIRE (TAXI, UBER, LYFT, ETC.), NO PASSENGER
			J



## DATA: CRITICAL BUT NOT SUFFICIENT



# ACKNOWLEDGEMENTS

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**San Francisco Fire Department**  
**American Medical Response**  
**King-American Ambulance Company**  
**San Francisco Transportation Authority**  
**San Francisco Department of Public Works**  
**San Francisco Planning Department**



# Thank you!

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