

2017 High Injury Network Update

July 2017



Traffic Injuries: A Public Health Problem

30 Fatalities
per year



~500 People
hospitalized
with severe
injuries
annually at
ZSFG

\$35 Million in
medical costs
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.*²

High Injury Network: 2011-Present

- **2011:** Original ***Pedestrian High Injury Corridors***^a created in support of the Mayor's *Pedestrian Safety Executive Directive*
- **2013:** ***Pedestrian High Injury Corridors*** updated for *WalkFirst*^b
- **2014:** ***Cyclist High Injury Corridors*** created to inform SFMTA's *Livable Streets*^c
- **2014:** ***Vision Zero*** Adopted as City Policy
- **2014:** ***Vehicle High Injury Corridors*** created^d to inform Vision Zero
- **2015:** ***Pedestrian, Cyclist and Vehicle High Injury Corridors*** combined to create the ***Vision Zero High Injury Network***, released in early 2015 in the first *Vision Zero Two Year Action Strategy*
- **2015 - Present:** ***Vision Zero High Injury Network*** one of the tools agencies throughout the city use to inform Vision Zero planning, policy, traffic enforcement, education, and engineering improvements.

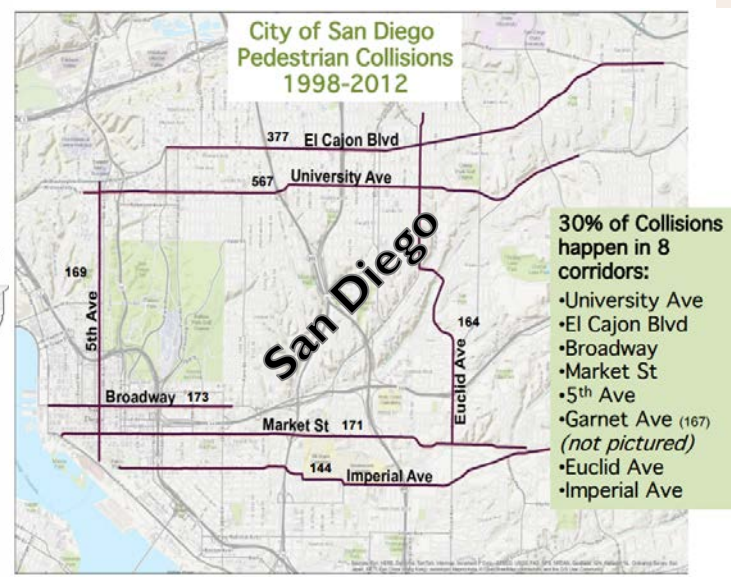
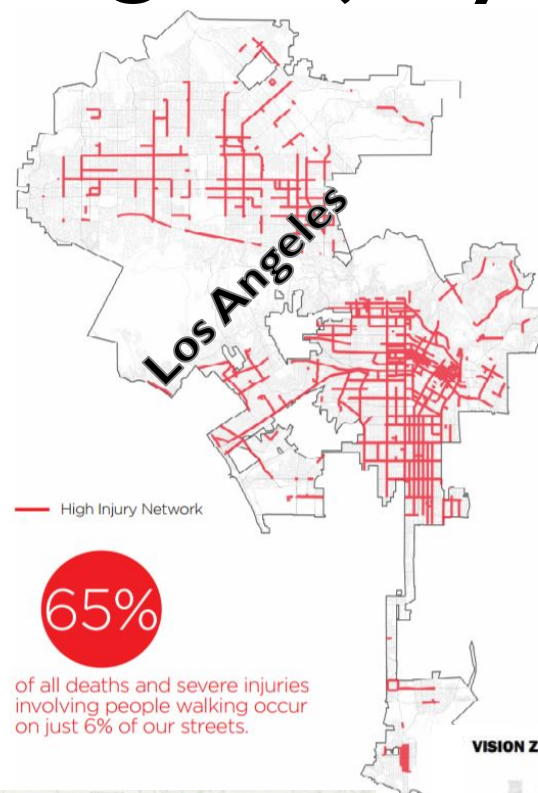
a Using Statewide Integrated Traffic Records System (SWITRS), 2005-2009, the most current available data at that time

b Using SWITRS, 2007-2011, the most current available data at that time

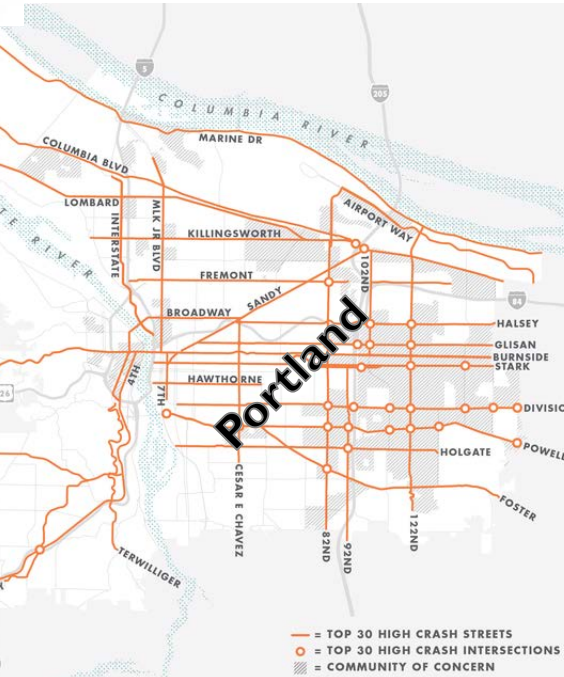
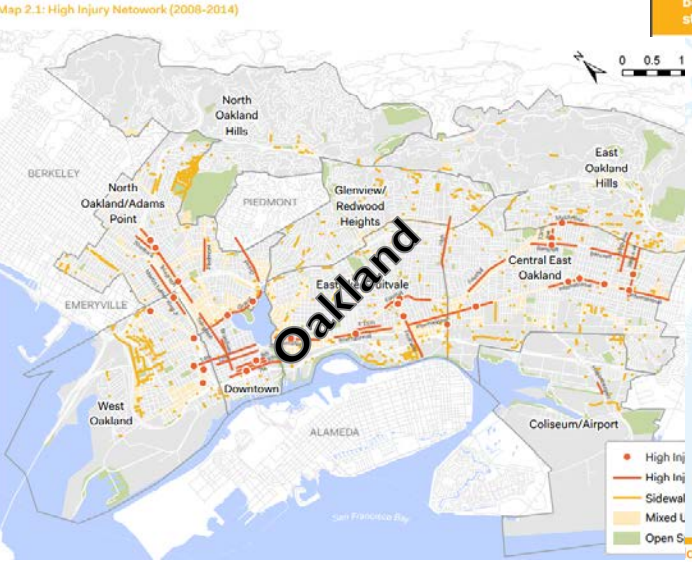
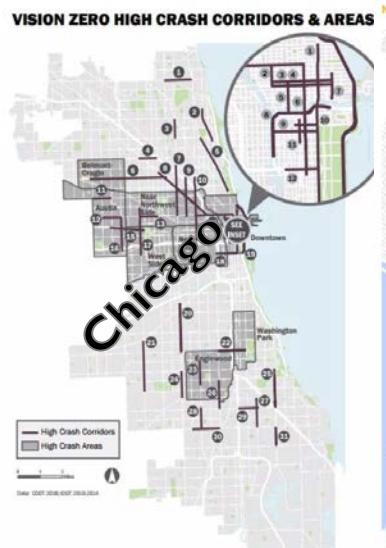
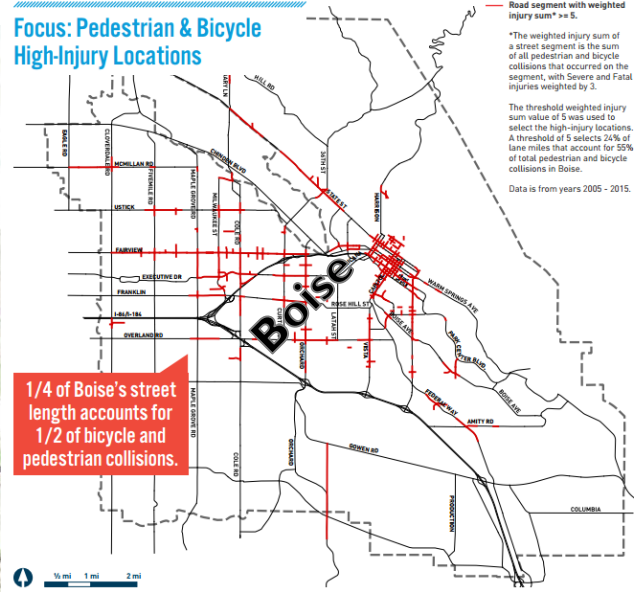
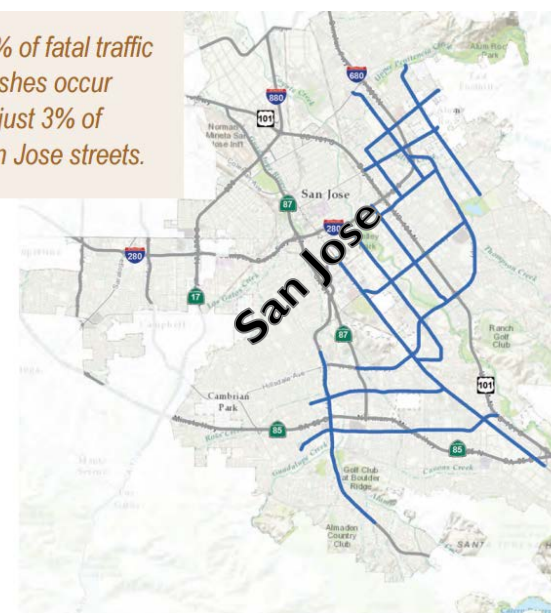
c Using SWITRS, 2007-2011, the most current available data at that time

d Using SWITRS, 2008-2012, the most current available data at that time

High Injury Network: Adoption by Other Cities



50% of fatal traffic crashes occur on just 3% of San Jose streets.



High Injury Network: 2017 Improvements

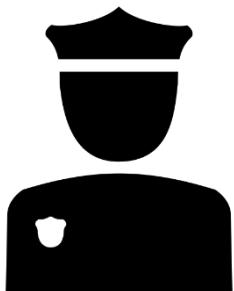
- **Access Hospital Data from Zuckerberg SF General* to:**
 - **improve the assessment of injury severity** for police-reported traffic injuries; and
 - **identify and map traffic injuries not reported in police data** to have a more comprehensive assessment of injury locations.
- **Refresh the Network:**
 - focus more directly on corridors with higher numbers of people killed and severely injured, regardless of transportation mode, to **better align the network's purpose with the goals of Vision Zero.**

** Utilizing the Transportation Injury Surveillance System (TISS) which links police and hospital data, created for Vision Zero SF by SFDPH's Vision Zero Epidemiologist*

Transportation Injury Surveillance System: Leveraging Public Health Data to Help Solve a Public Health Problem

Standard Practice: Police Reported Injury Collisions

- Detailed crash factor data, including location
- Limited data on injury
 - 4 categories of injury severity assessed at the scene
- Historic Underreporting of Injuries
 - Pedestrian Injuries: 21%
(Sciortino et al., 2005)
 - Cyclist Injuries: 27%
(Lopez et al., 2012)

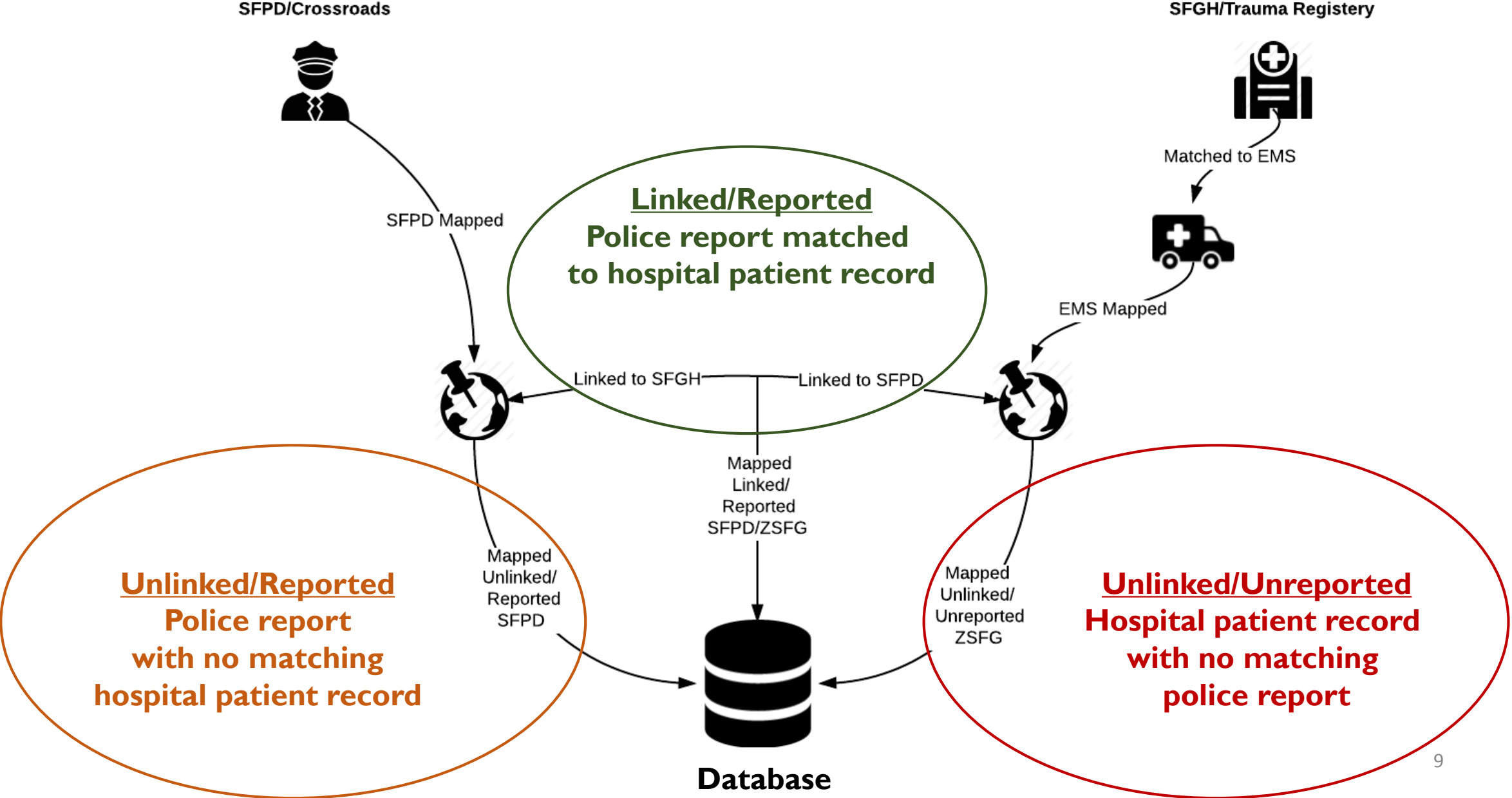


Linkage to Medical Data: Hospital Records provide:

- Detailed health outcome data
 - Clinically assessed injury severity
 - Body region of injury
- Patient characteristics
 - Disability Status
- Limited data on cause/location of injury
 - Limited to transportation mode(s) involved
 - Location information must be obtained from EMS



Linking Zuckerberg SF General Hospital and Police Data





Police Definition: *Visual Assessment*



Hospital-Based Definition: *Clinical Examination*

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.

Severe Injury:

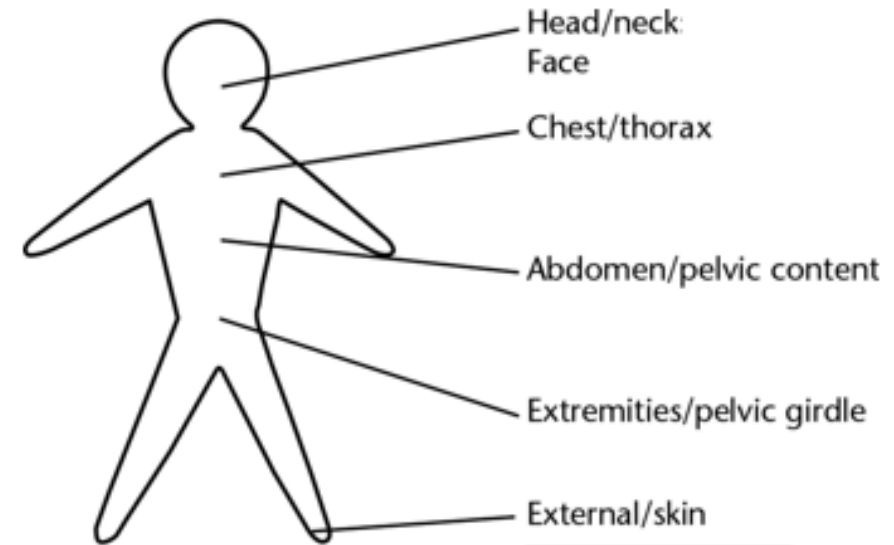
Admitted to ZSFGH
and/or

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)

Linked/Reported Severe Injuries
522



60%
Remain Severe
(also hospital severe)

40%
Reclassified
(not severe per hospital)

Linked/Reported Visible Injuries
1,367



20%
Reclassified to Severe per hospital

80%
Remain Visible Injury
(not severe per hospital)

Linked/Reported Complaint of Pain
2,047



12%
Reclassified to Severe per hospital

88%
Remain Complaint of Pain
(not severe per hospital)

Net Increase: 361 Severe Injuries in SFPD Records based on Hospital Data

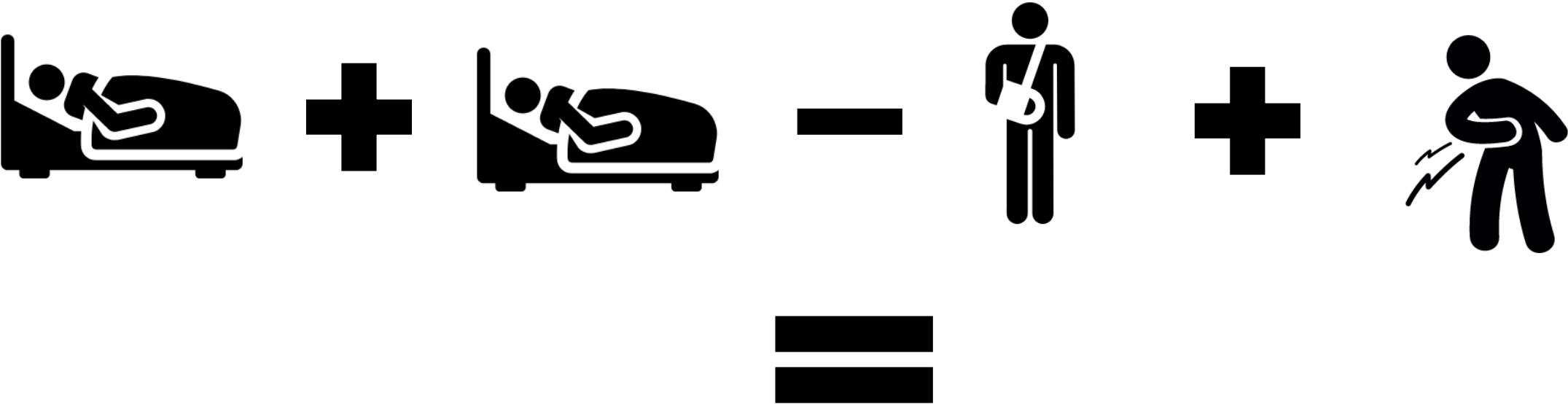
Reclassifying Injury Severity for Injuries with Linked SFPD-ZSFG Data (2013-2015)

104 SFPD *unlinked* initial reported severe injuries

522 *linked* SFPD initial reported severe injuries

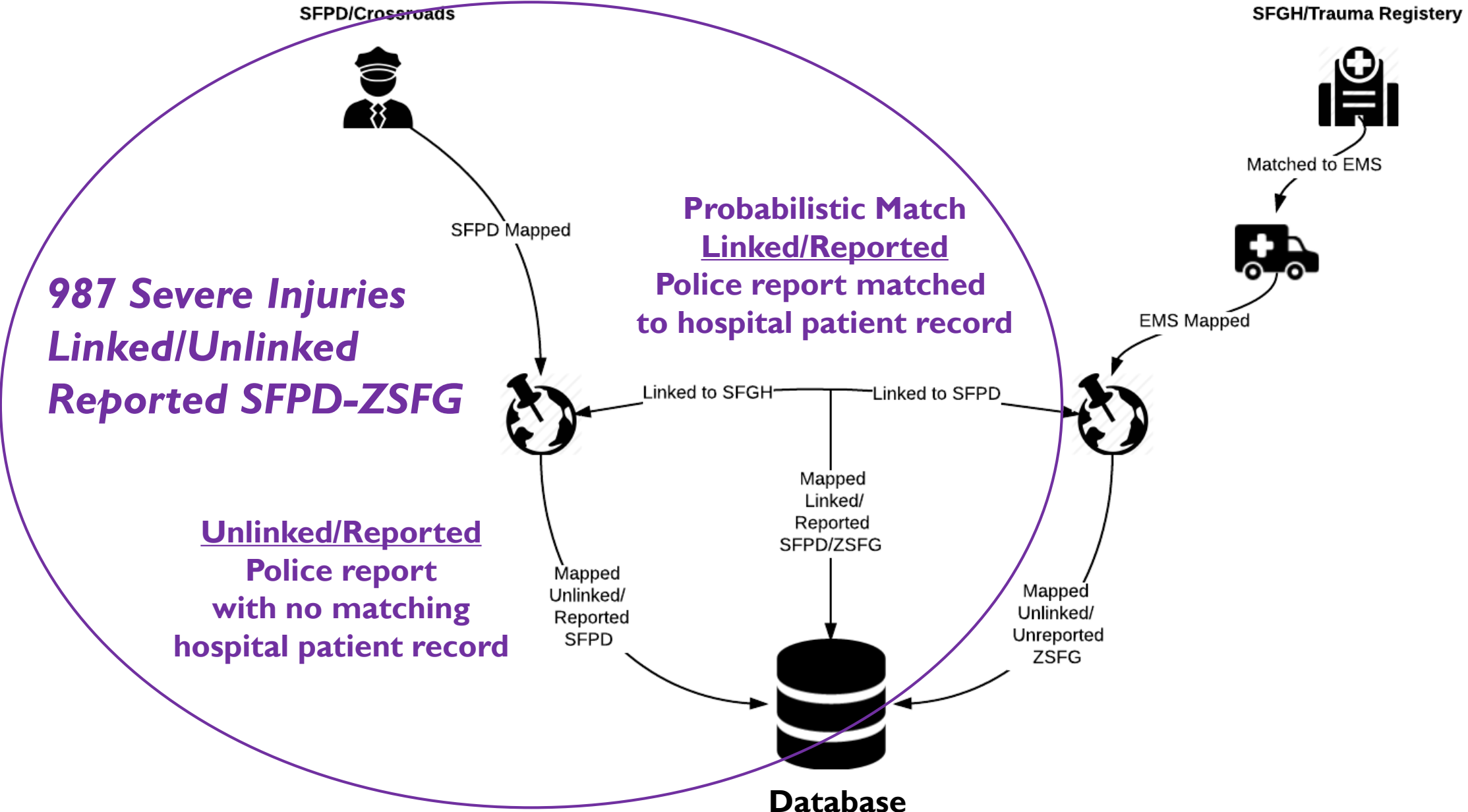
206 *linked* injuries SFPD reported not classified as severe per hospital

567 *linked* severe injuries hospitalized but not classified as severe in police reports



987 Severe Injuries in the Linked/Unlinked Reported SFPD-ZSFG Data Set

Linking Zuckerberg SF General Hospital and Police Data



High Injury Network: 2017 Improvements

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Unlinked/Unreported Hospital Data with Mappable EMS Data (2013-2015)

411 severe injuries with EMS transport to ZSFG not in police data



King-America, AMR, SFFD
Transported to ZSFGH



33% Severe Bicyclist Injuries
39% of total cyclist severe injuries unreported



28% Severe Pedestrian Injuries
24% of total pedestrian severe injuries unreported



39% Severe Injuries to People in Vehicles
28% of total severe injuries to people in vehicles unreported

Linking Zuckerberg SF General Hospital and Police Data

SFPD/Crossroads



SFGH/Trauma Registry



987 Severe Injuries
Linked/Unlinked
Reported SFPD-ZSFG

Probabilistic Match
Linked/Reported
Police report matched
to hospital patient record

411 Severe Injuries
Unlinked/Unreported
Hospital patient record
with no matching
police report

Unlinked/Reported
Police report
with no matching
hospital patient record

SFPD Mapped

Matched to EMS

EMS Mapped

Linked to SFGH

Linked to SFPD

Mapped
Linked/
Reported
SFPD/ZSFG

Mapped
Unlinked/
Reported
SFPD

Mapped
Unlinked/
Unreported
ZSFG

Database

Unlinked Records: Why some injuries treated at ZSFG don't link to SFPD records, or vice versa?

In ZSFG but not SFPD:

- Injury was not in SFPD records
 - Injured person did not report to police
 - Police were not at the injury scene or did not report
 - Reported to CHP
- Not enough data to link records
 - Missing key linking variables to produce a match

In SFPD but not ZSFG:

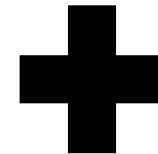
- Injury was fatal, victim died at the injury scene and was not transported to ZSFG
- Injury was not treated at ZSFG
 - Patient treated at another SF hospital or clinic – less severe injuries
- Not enough data to link records
 - Missing key linking variables to produce a match

Accounting for Unreported Injuries and Linked SFPD-ZSFG Data (2013-2015)

987 SFPD-ZSFG *linked/*
unlinked reported
severe injuries



411 severe injuries
hospitalized but
unlinked to a police
report (unreported)



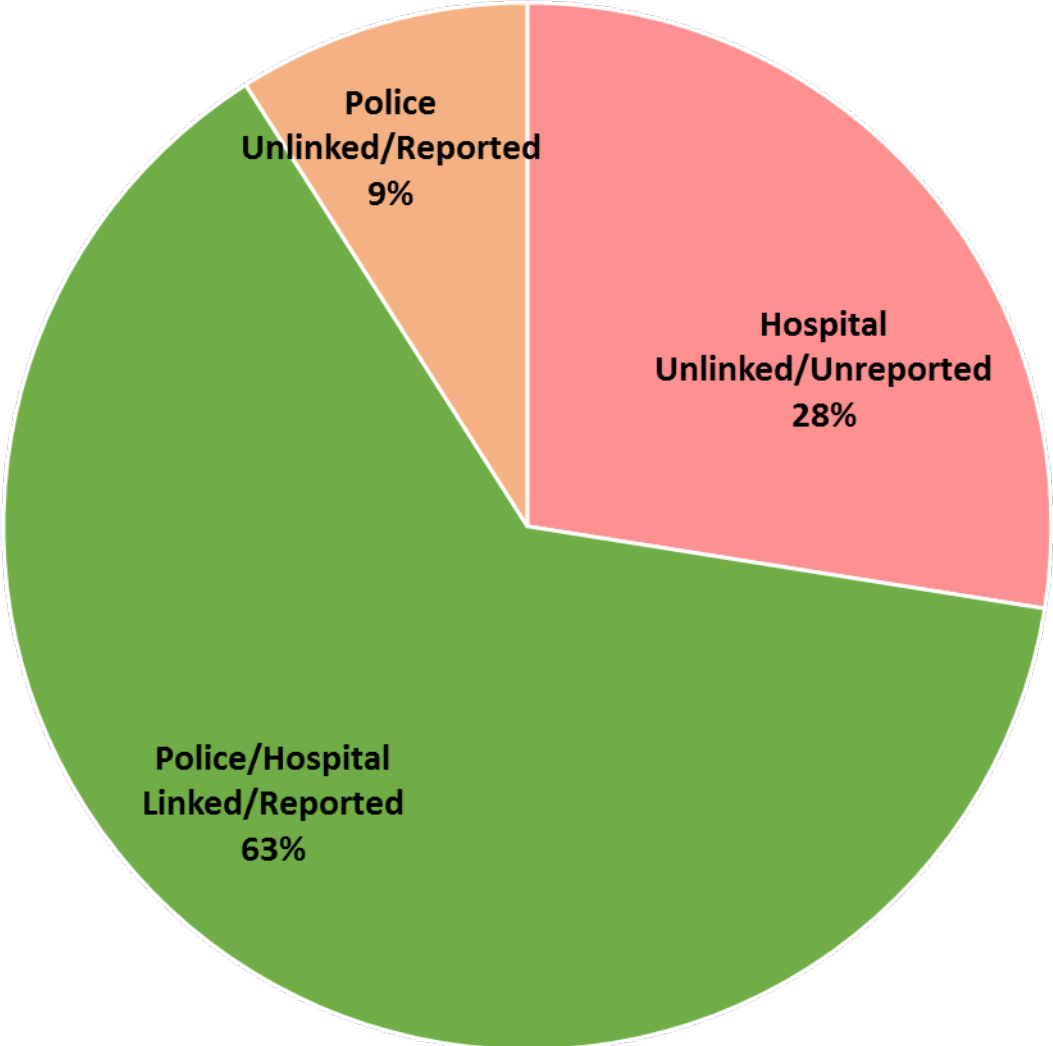
96 fatalities
recorded by the
Office of the
Medical Examiner



1,494 Severe and Fatal Injuries in the Final Linked/Unlinked SFPD-ZSFG Data Set

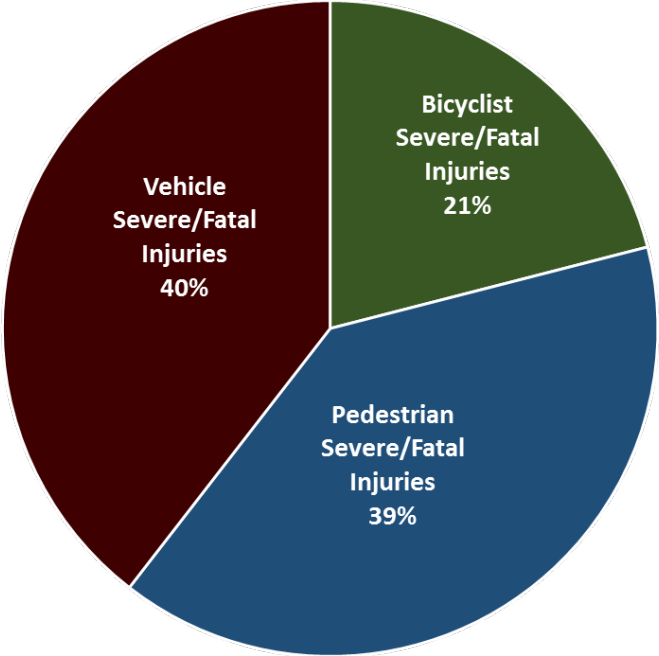
High Injury Network: Final Breakdown of Severe and Fatal Injuries by Data Source (2013-2015)

Severe/Fatal Injuries by Data Source, N=1,494



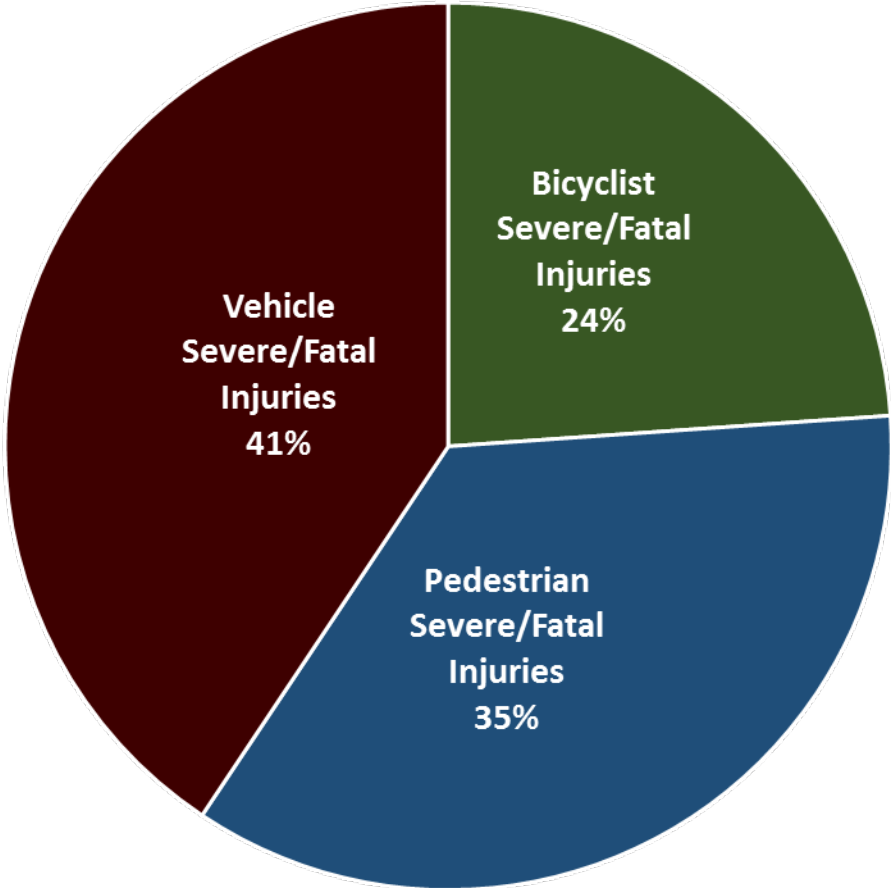
High Injury Network: Final Breakdown of Severe and Fatal Injuries by Data Injury (2013-2015)

**SFPD Data Only,
Reported Only, No Injury Reclassification**



722 Police Reported Severe/Fatal Injuries

**Combined SFPD:ZSFG Data,
Reported/Unreported, Injury Reclassification**




1,494 Police/Hospital Reported Severe and Fatal Injuries


High Injury Network: 2017 Improvements

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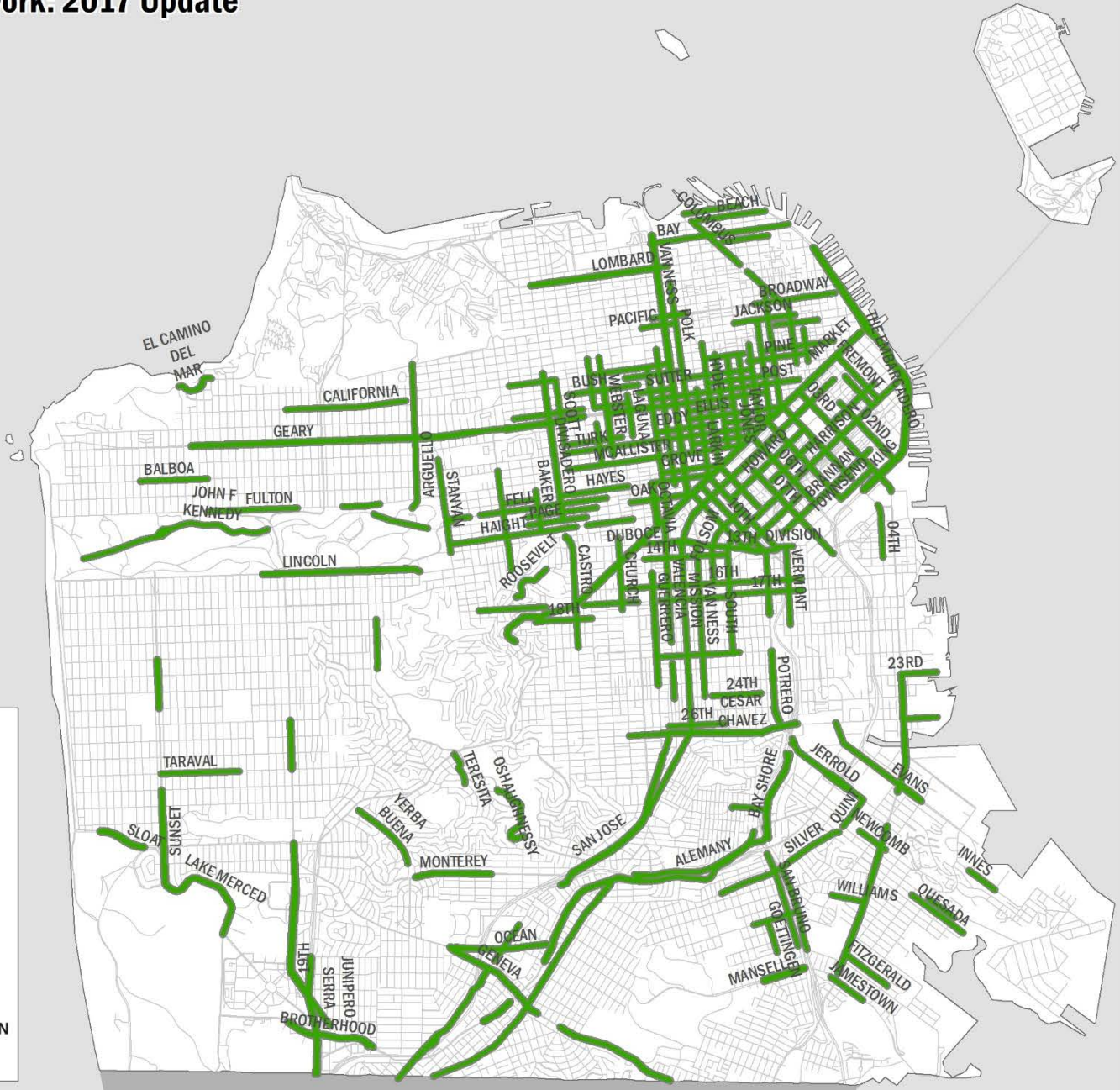
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Vision Zero High Injury Network: 2017 Update San Francisco, California

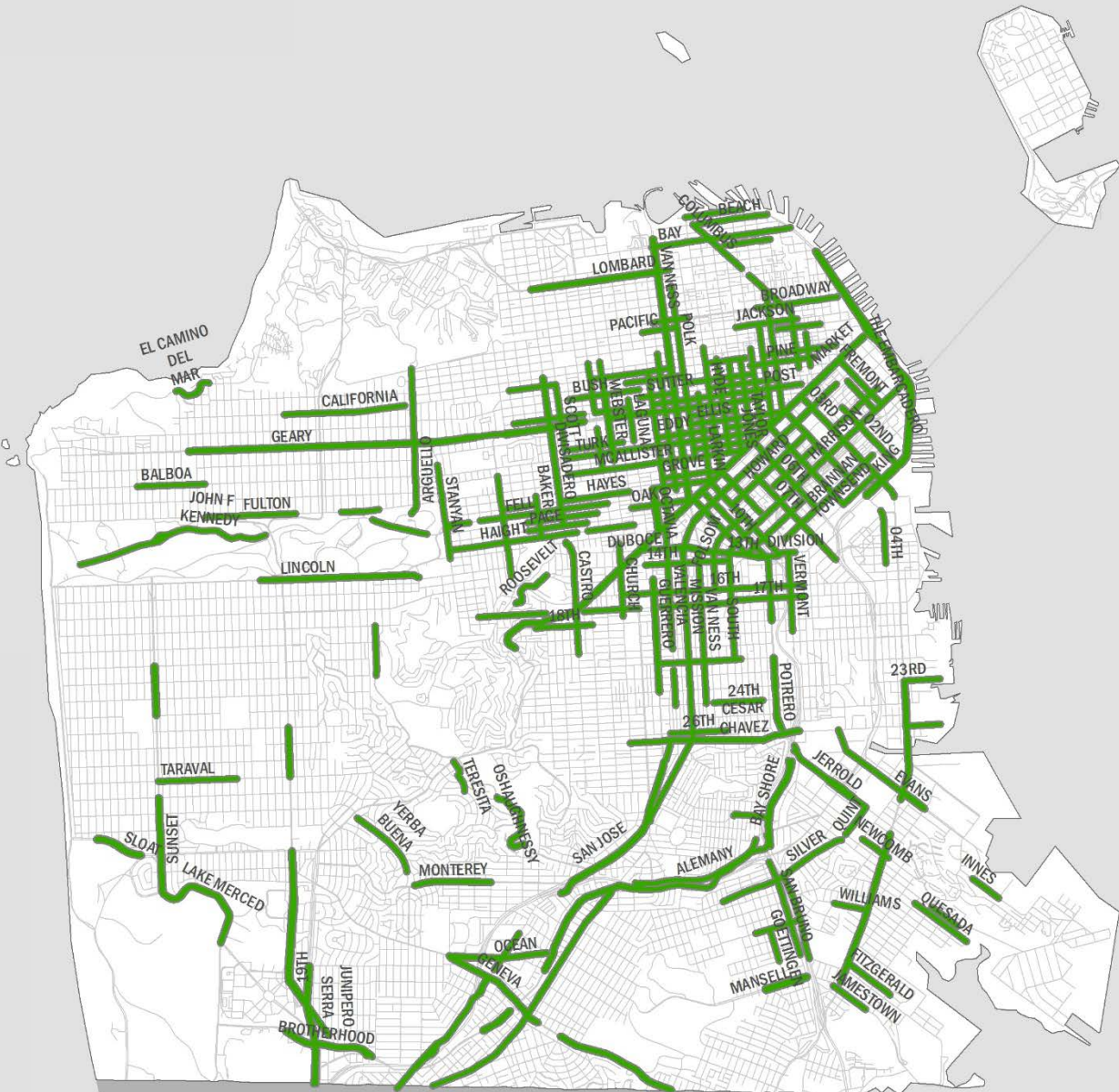
 2017 VZ High Injury Network


 0 0.5 1 2
Miles

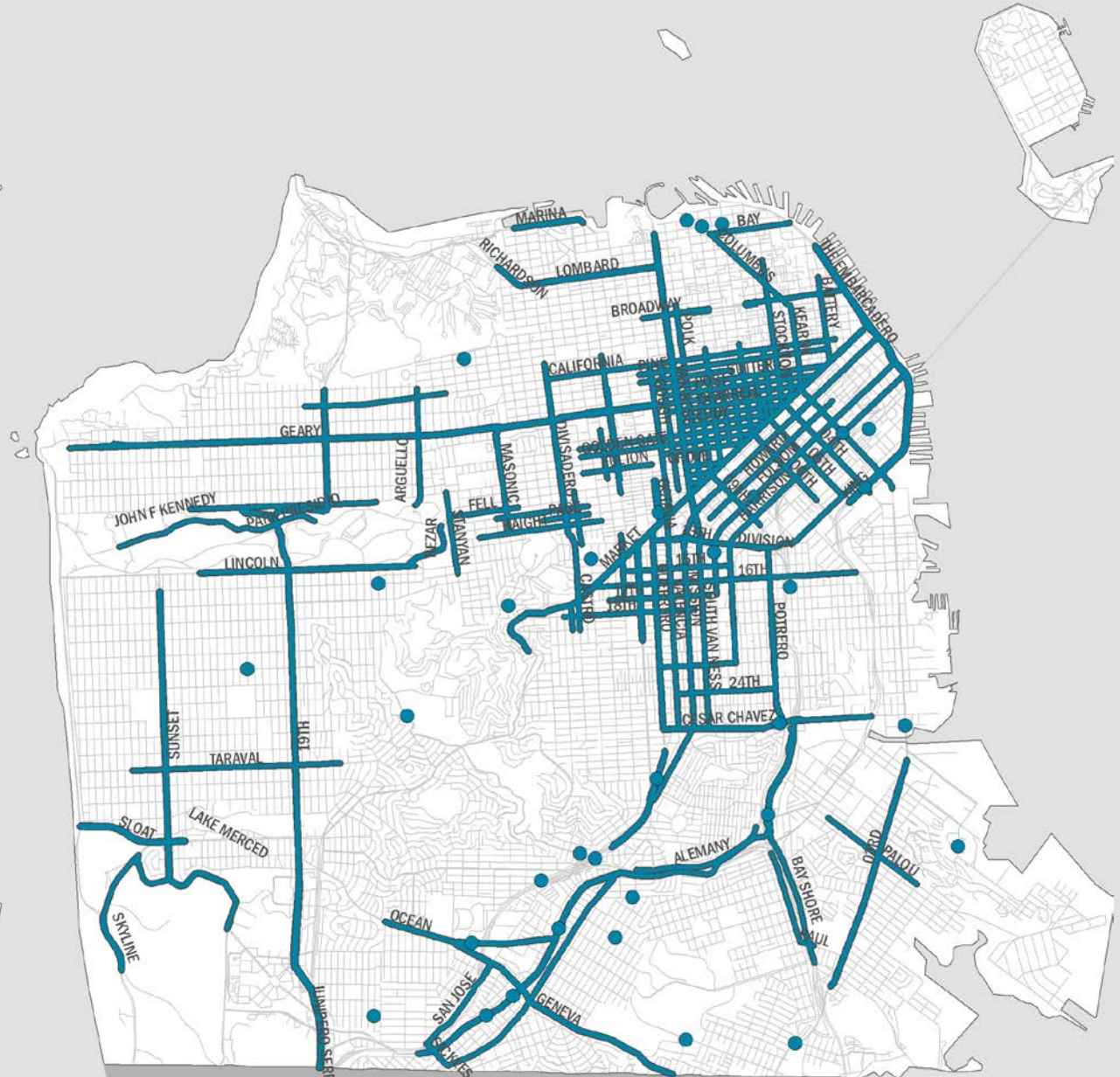
Source: SFPD 2013-2015; ZSFG 2013-2015
 City and County of San Francisco Department
 of Public Health: Environmental Health
 Program on Health, Equity, and
 Sustainability - www.sfpbes.org

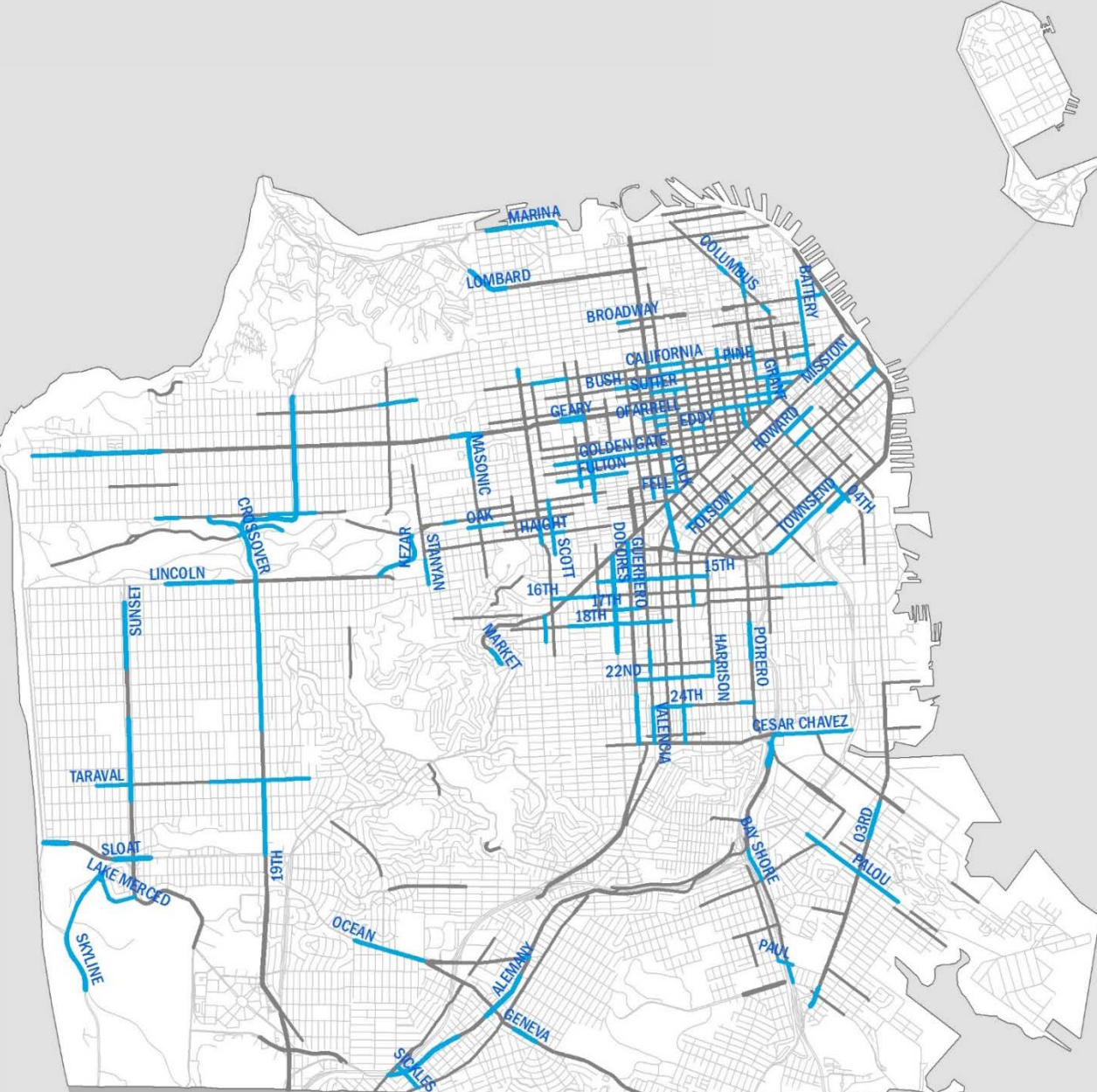
2017 Vision Zero High Injury Network



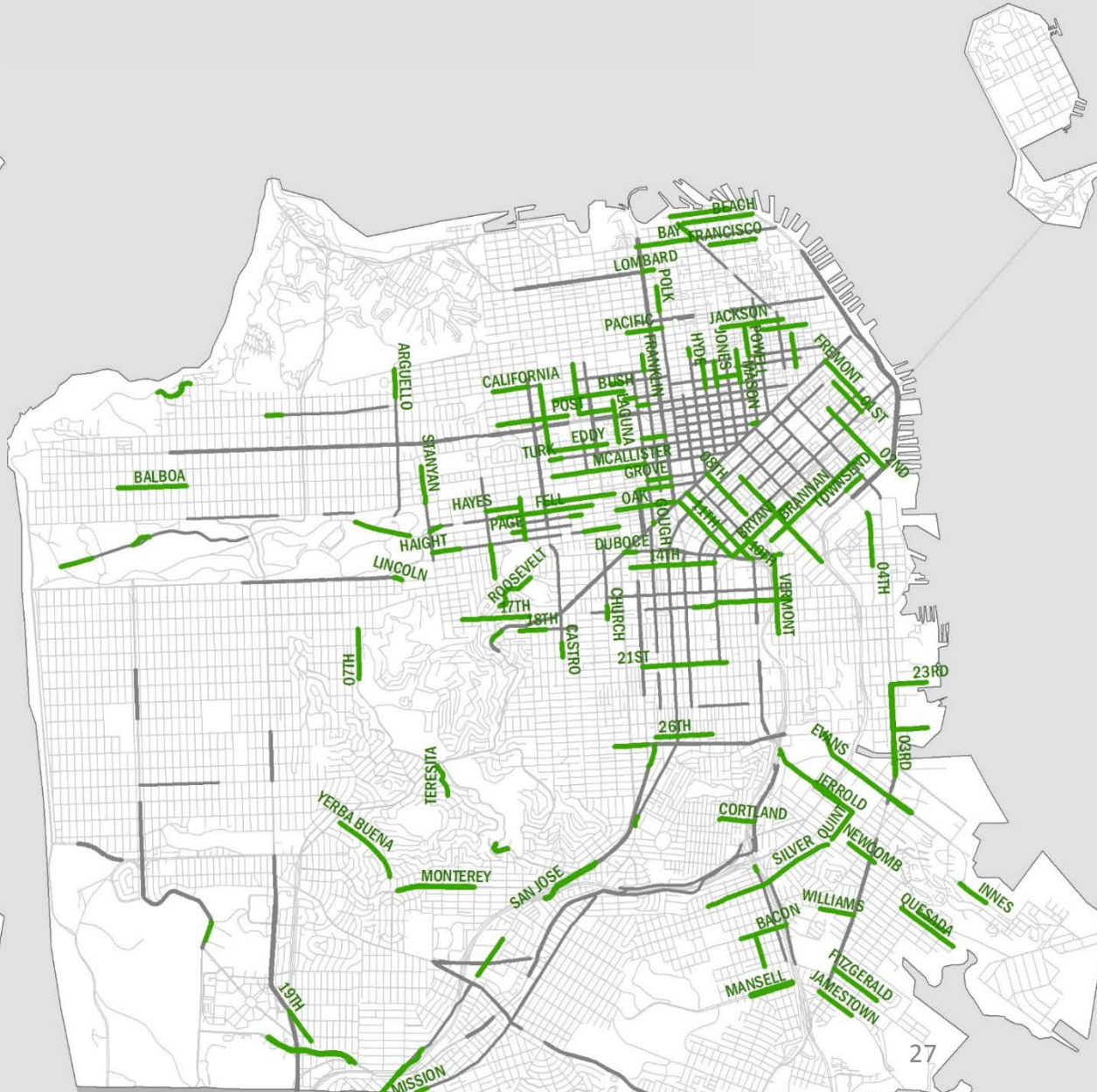
2015 Vision Zero High Injury Network








Segments Dropped from the Network



Segments Added to the Network



2013-2015 SFPD/ZSFG Collision Injuries

		2017 Vision Zero High Injury Network	2015 Vision Zero High Injury Network
	Street Miles	12.8% (68.1% Overlap)	12.6%
	Pedestrian Severe Injuries and Fatalities	77%	65%
	Cyclist Severe Injuries and Fatalities	71%	60%
	Vehicle Severe Injuries and Fatalities	75%	63%
	All Injuries	61%	62%

Why Might a Corridor Have Been Removed or Added?

MORE DATA, BETTER DATA

- Addition of unreported severe injuries
- Improved assessment of injury severity
- Enhanced focus of the network on the worst injury outcomes (severe and fatal)

CITYWIDE FACTORS

- Vision Zero prevention initiatives:
 - engineering
 - enforcement
 - education
- Changing population growth and transportation patterns
- *Other factors*

2017 VZ HIN: One of Many Vision Zero Tools

- Mayor's Executive Directive Analysis: Seniors, Youth, People with Disabilities
- Proactive Traffic Calming Program
- Predictive Modeling
- Controller's Office Focus on Enforcement Report
- SFPD/SFMTA Enforcement/Education Campaigns
- TransBASEsf.org Dashboard (*Coming in Fall 2017!*)

Thank you VZ HIN Working Group members:

SFDPH –

- Leilani Schwarcz
- Megan Wier
- Mimi Tam

SFMTA –

- Mari Hunter
- Chava Kronenberg
- James Shahamiri
- Ricardo Olea
- Mike Sallaberry
- Luis Montoya
- Jamie Parks
- Kaitlin Carmody
- Jennifer Wong

SFPD –

- Karen Li

Controller –

- Joe Lapka
- Corina Monzón

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San Francisco Department of Public Health

Acknowledgements: Transportation Injury Surveillance System

Zuckerberg San Francisco General Hospital

- Dr. Rochelle Dicker
- Dr. Catherine Juillard
- Adaobi Nwabuo
- Sue Peterson
- Lillian Li

San Francisco Police Department

San Francisco Office of the Medical Examiner

San Francisco Fire Department

American Medical Response

King-American Ambulance Company

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San Francisco Department of Public Health