



# Recommendations to Improve Pedestrian & Bicycle Safety for the City of Bakersfield



August 2018



# Acknowledgements

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We would like to thank the planning committee for inviting us into their community and for hosting the Community Pedestrian and Bicycle Safety Training in Bakersfield.

We thank the City of Bakersfield and Bike Bakersfield for providing dinner, snacks, and refreshments in support of this training. Thank you to the Kern County Department of Human Services for providing the Community Partnership Conference Room for this training. Additionally, we thank the Bakersfield City Mayor Karen Goh for welcoming participants to the training.

We would like to acknowledge the many community members and agencies present at the workshop and their dedication to pedestrian and bicycle safety. Their collective participation meaningfully informed and strengthened the workshop's outcomes.

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# Recommendations to Improve Pedestrian & Bicycle Safety for the City of Bakersfield

By Wendy Ortiz, Esther Postiglione, Yesenia Ocampo, California Walks;

Jill Cooper, Ana Lopez, UC Berkeley Safe Transportation Research & Education Center

## Introduction

At the invitation of the City of Bakersfield and Bike Bakersfield, California Walks (Cal Walks), the University of California Berkeley's Safe Transportation Research and Education Center (SafeTREC), and the Planning Committee collaboratively planned and facilitated a Community Pedestrian and Bicycle Safety Training (CPBST) in central Bakersfield. The CPBST is a joint project of Cal Walks and SafeTREC that aims to leverage a community's existing strengths to develop a community-driven pedestrian and bicycle safety action plan and to identify pedestrian and bicycle safety priorities and actionable next steps in collaboration with community partners.

The City of Bakersfield and Bike Bakersfield requested a workshop to 1) provide City and County staff, community organizations, and residents with a toolkit for promoting pedestrian and bicycle safety to inform future active transportation projects on State Route 204 (SR 204, locally known as Union Avenue); 2) strengthen working relationships between various agencies and organizations and other stakeholders to ensure the best outcomes for the residents of Bakersfield; and 3) develop consensus regarding pedestrian and bicycle safety priorities and actionable next steps for SR 204 and its adjacent streets.

Cal Walks and SafeTREC (Project Team) facilitated the workshop on May 10, 2018 from 4:00 PM to 7:30 PM at the Kern County Department of Human Services, Community Partnership Conference Room. Dinner was provided to maximize community participation. Twenty-nine (29) individuals attended the workshop, including residents and representatives from Kern County Public Works Department, Golden Empire Transit (GET), Kern County Department of Human Services, Sierra Club, Standard School District, Leadership Counsel Justice & Accountability, University of California Agriculture and Natural Resources, and the Bakersfield Police Department.

The three and a half (3.5) hour training consisted of: 1) walkability assessments along three key routes; 2) an overview of multidisciplinary approaches to improve pedestrian and bicycle safety using the intersectional 6 E's framework including: Equity & Empowerment, Evaluation, Engineering, Education, Encouragement, and Enforcement and; 3) small group action-planning discussions to prioritize recommendations for Bakersfield's active transportation efforts along SR 204. This report summarizes the workshop proceedings, as well as recommendations for projects, policies, and programs for pedestrian and bicycle safety in Bakersfield.

## Planning Process

For each training, the CPBST program convenes a local multi-disciplinary planning committee to tailor and refine the training's curriculum and focus to meet the community's needs. The Project Team conducts pre-training site visits to collect on-the-ground observations of existing walking and biking conditions to adapt the CPBST curriculum and to provide context-specific strategies for the community's existing conditions. The Bakersfield CPBST planning process was initiated on January 25, 2018. The planning process consisted of:

- **Community Plans and Policies Review:** Cal Walks conducted a review of current community planning documents to inform the training with local context and prepare to build off existing efforts. The following documents were reviewed prior to the site visit:
  - Kern Region Active Transportation Plan. Prepared by Alta Planning + Design for Kern Council of Governments. 2018.
  - City of Bakersfield Bicycle Transportation Plan. Prepared by Alta Planning + Design for City of Bakersfield. 2013.
- **Analysis and Mapping of Pedestrian and Bicycle Injury Data:** SafeTREC used the Statewide Integrated Traffic Records System (SWITRS) and the Transportation Injury Mapping System ([tims.berkeley.edu](https://tims.berkeley.edu)) to analyze injury data in Bakersfield, and along SR 204, between 21st Street and California Avenue, as well as census data to create collision rates based on population. Patterns of injury collisions, victim characteristics, and demographics were analyzed and presented to inform the planning process for the CPBST.
- **Identification of Priority Discussion Topics for Training:** SR 204, between 21st Street and California Avenue, was identified as the geographic focus of the Bakersfield CPBST due to the high rates of pedestrian and bicycle collisions in this area. The Planning Committee identified the following goals for the CPBST:
  - To assess existing conditions along SR 204, particularly between 21st Street and California Avenue, which is a high pedestrian and bicycle traffic area;
  - To identify potential joint pedestrian and bicycle infrastructure projects between the City of Bakersfield and Caltrans;
  - To explore future joint Active Transportation Program proposals for SR 204 between the City of Bakersfield and Caltrans;
  - To support Caltrans' traffic safety investigations along SR 204, with a focus on 19th Street and 18th Street, due to the high collision concentrations;
  - To further support Caltrans' review for funding for infrastructure improvements and;
  - To identify gaps in the sidewalk network to assess SR 204's accessibility for all users.
- **Site Visit:** The Project Team facilitated an in-person site visit on March 14, 2018 with the Planning Committee at the Bakersfield City Hall to 1) review existing pedestrian and bicycle collision data; 2) collect qualitative data based on in-person observations of existing conditions and travel behaviors and; 3) conduct preliminary walking assessments of the focal neighborhood. Site visit findings were used to develop the workshop presentation, including providing local infrastructure examples and developing the walk/bike assessment route maps. During the site visit, the Planning Committee identified local residents, churches, Department of Human Services, United Farmworkers Union, Salvation Army, Bakersfield City Councilmembers, Bakersfield Burrito Project, Kern County Housing Authority, and the Downtown Business Association as key stakeholders to invite to the CPBST.

# Existing Conditions

## Pedestrian & Bicycle Collision History

Between 2012- 2016, there were nineteen (19) pedestrian collisions, including four (4) fatalities and fifteen (15) injuries on SR 204, between 21st Street and California Avenue in the City of Bakersfield<sup>1</sup>. Collisions were concentrated between 17th and 19th Street on SR 204. Collisions primarily occurred during high-traffic times in the afternoon and evening, between 6:00 pm and 8:59 pm. The top three pedestrian collision factors for collisions involving pedestrians were pedestrians failing to yield the right-of-way to vehicles outside of a crosswalk (42.1%)<sup>2</sup>; drivers failing to yield to pedestrian right of way in a crosswalk (15.8%); pedestrians failing to stay close to the roadway (10.5%); and pedestrians failure to yield right-of-way to vehicles already in the crosswalk (10.5%).<sup>3</sup>

Between 2012-2016, there were fourteen (14) bicycle collisions and zero (0) fatalities on SR 204, between 21st Street and California Avenue in the City of Bakersfield.<sup>4</sup> Nine (9) out of the thirteen (13) victims involved in a bicycle collision were between the ages of 45-64; five (5) were male and four (4) were female. The top three primary collision factors for collisions involving bicycles were bicyclists or drivers failing to drive on the right half of the roadway (28.6%); bicyclists or drivers failing to stop at the limit line or crosswalk (14.3%); and drivers failing to pass bicyclist only under safe conditions (14.3%).<sup>5</sup>

A full discussion of the pedestrian and bicyclist collision data prepared by SafeTREC can be found in Appendix A.

## Equity Concerns

Research shows that residents living in low-income areas, predominantly populated by communities of color, experience higher risk of traffic collisions in their neighborhoods due to historical disinvestments into their neighborhood's infrastructure. Many cities in the Central Valley, including Bakersfield, have been affected by urban sprawl whereby middle-income and high-income earners move out of city centers, creating concentrated pockets of low-income neighborhoods in historic parts of cities. SR 204 used to operate as one of Bakersfield's main highways, consequently, the area is saturated with motels and affordable restaurants, and many homeless families and people have settled along SR 204. There are three homeless shelters in close proximity to the neighborhood with over 150 individuals seeking support during operating hours daily, many of whom depend on walking or biking to access services. Due to the greater number of people walking and biking in this area, the homeless population is

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<sup>1</sup> 2015 and 2016 SWITRS data are provisional as of November 2017.

<sup>2</sup> Within the 0.7-mile stretch of SR 204, between California Avenue and 21st Street, there are no marked crosswalks outside of fully signalized intersections.

<sup>3</sup> Pedestrians have the right-of-way in marked and unmarked crossings, and drivers are legally required to yield to pedestrians in these instances. However, when pedestrians cross outside of marked or unmarked crossings, pedestrians must yield the right-of-way to drivers. A pedestrian is legally able to cross outside of a marked or unmarked crossing between two intersections where one or none of the intersections is signalized but only if the pedestrian yields the right-of-way to oncoming drivers. This is not the same as the term "jaywalking," which refers to crossing outside of a marked or unmarked crossing between two signalized intersections.

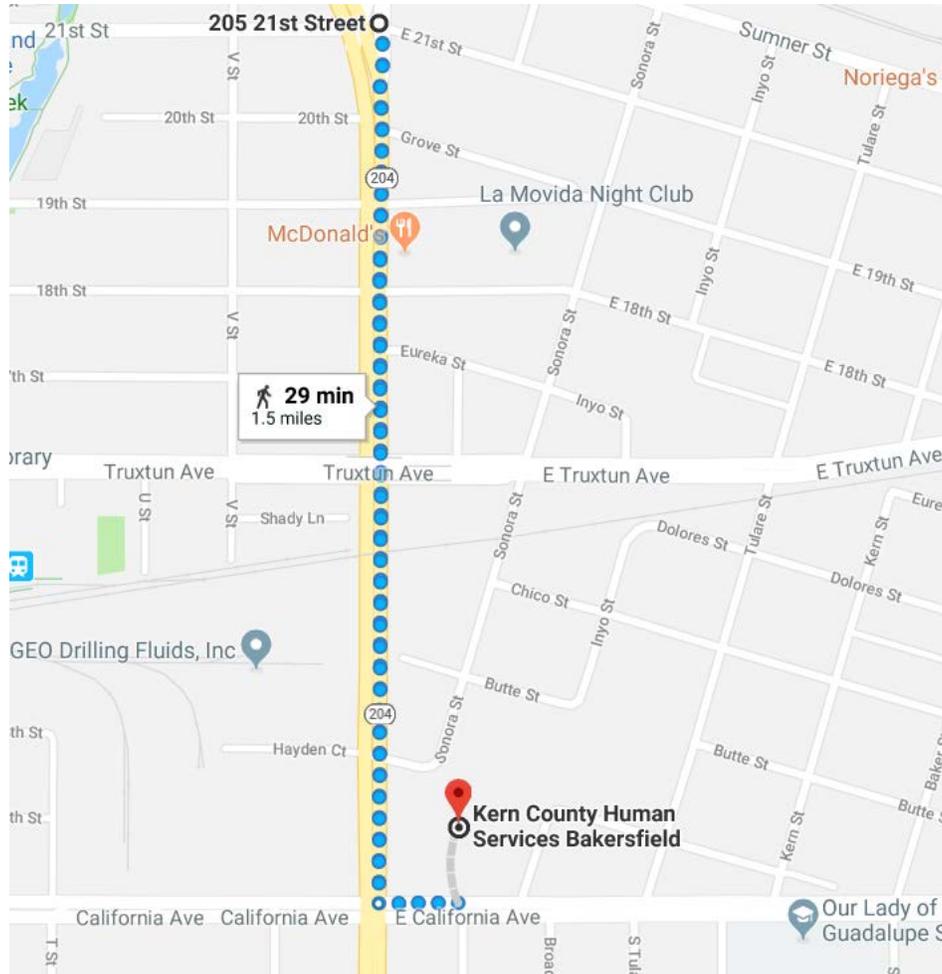
<sup>4</sup> 2015 and 2016 SWITRS data are provisional as of November 2017.

<sup>5</sup> According to California Vehicle Code 21200, bicycles are considered vehicles, therefore, bicyclists on public streets have the same rights and responsibilities as automobile drivers. This makes it difficult to discern whether a bicyclist or driver is at fault.

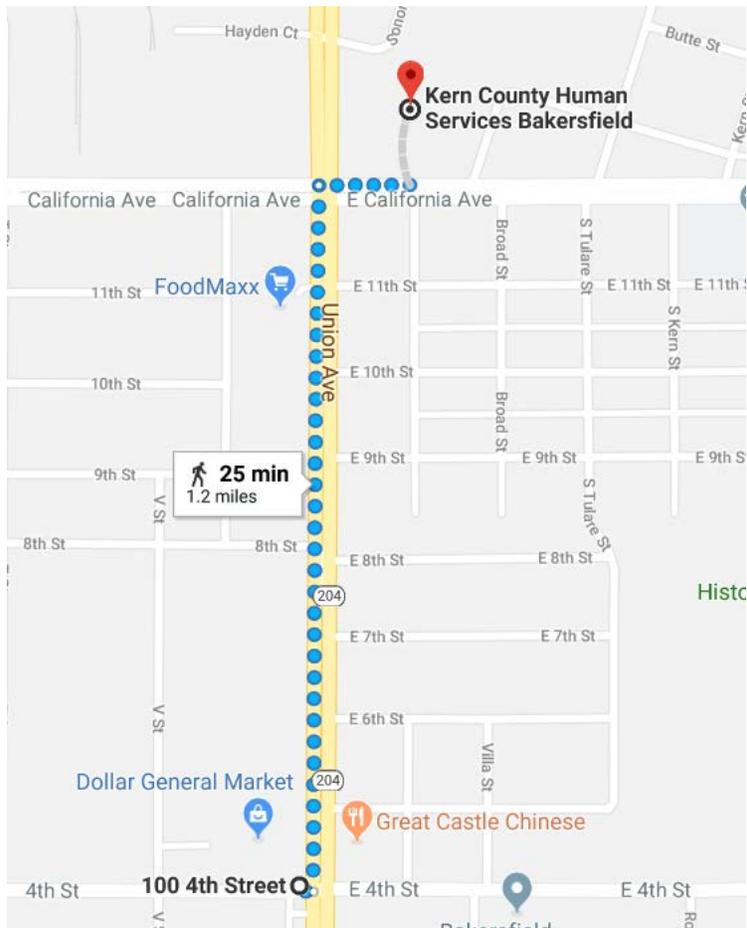
disproportionately at risk for pedestrian and bicycle collisions and are less likely to report collisions to the police or seek medical attention. The City of Bakersfield, as well as Planning Committee members, believe there is an extreme underreporting of pedestrian and bicycle collisions in this area due to a resistance to involve local law enforcement, as well as the potential for more severe charges related to other illicit activities when incidents are reported.

## Walkability & Bikeability Assessment Reflections

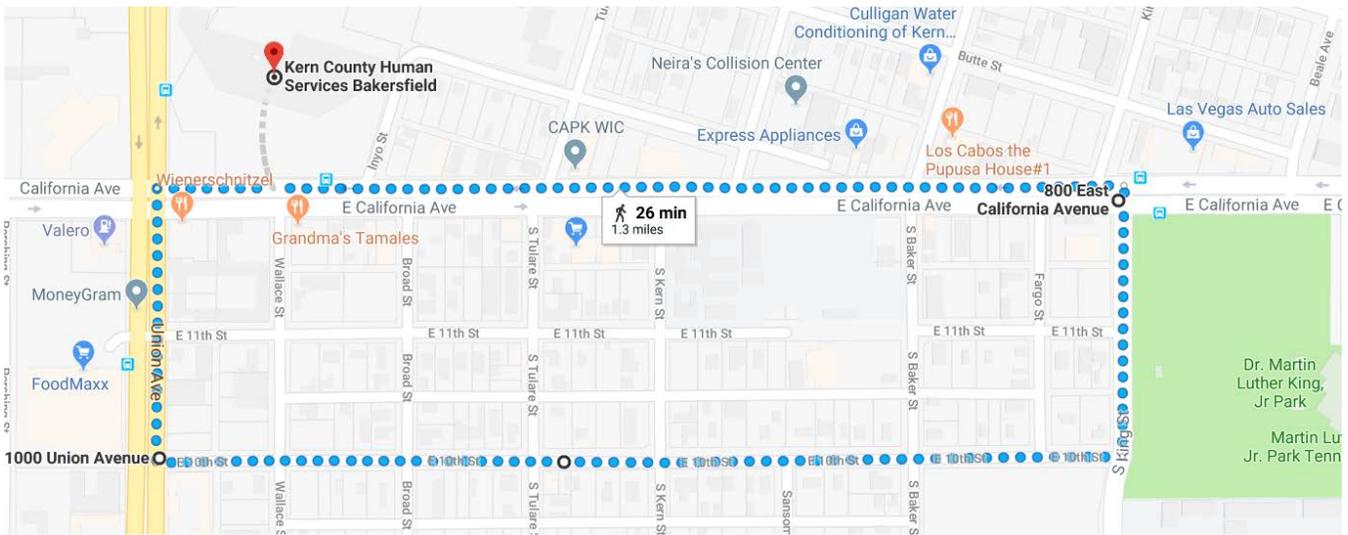
Workshop participants conducted walkability and bikeability assessments along three key routes:



The first walking route focused on the infrastructure and walking experience north on SR 204 from East California Avenue. Starting the walk assessment at the Kern County Department of Human Services, the group of observers walked west on East California Avenue, north on SR 204, south on SR 204 and east on East California Avenue.



The second walking route focused on the infrastructure and walking experience south on SR 204 from East California Avenue. Starting the walk assessment at Kern County Department of Human Services, the group of observers walked west on East California Avenue, south on SR 204, north on SR 204 and east on East California Avenue.



The third walking route focused on the infrastructure and walking experience around Dr. Martin Luther King Jr. Park. Starting the walk assessment at Kern County Department of Human Services, the group of observers walked east on East California Avenue, south on S King Street, west on E 10th Street, north on SR 204 and east on East California Avenue.

Participants were asked to 1) observe infrastructure conditions and the behavior of all road users; 2) assess the emotional experience of walking or biking along the route; 3) identify positive community assets and strategies which can be built upon; 4) consider how the walking and biking experience might feel different for other vulnerable users.

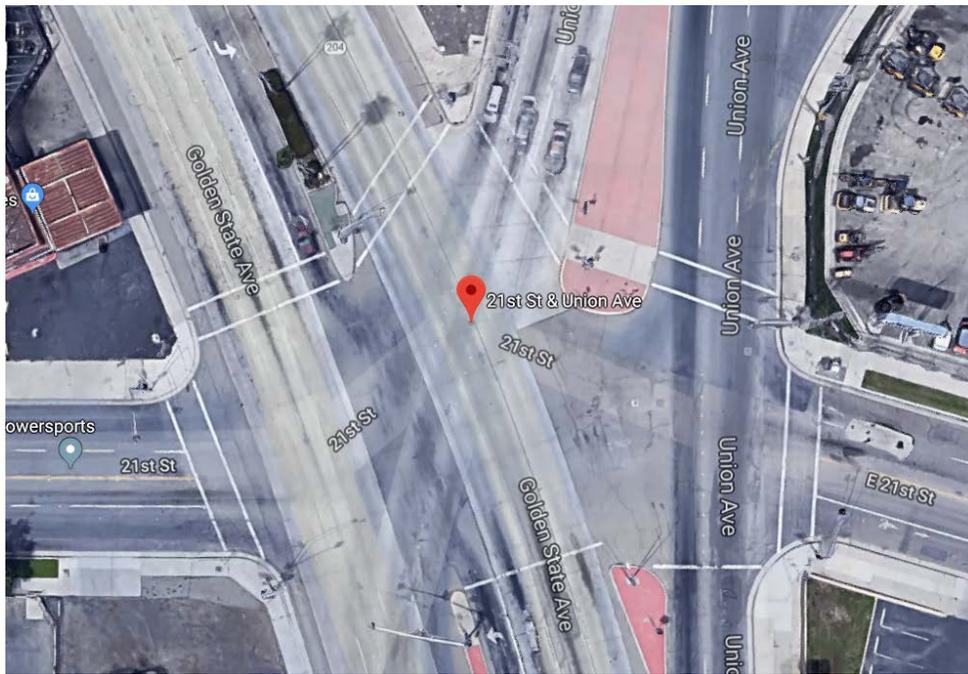
Following the walkability and bikeability assessment, the participants shared the following reflections:

- **Sidewalk Conditions:** Sidewalks conditions vary along SR 204. Participants observed obstructions in the sidewalk, including utility poles, advertisements, and debris. Many intersections lacked ADA-compliant ramps, which forces wheelchair users to ride in the street on the right side of the travel lane with cyclists and vehicles. Participants also noted uneven sidewalk pavement throughout, and a gap in sidewalk connectivity for approximately five blocks on SR 204, between 4th Street and 8th Street.



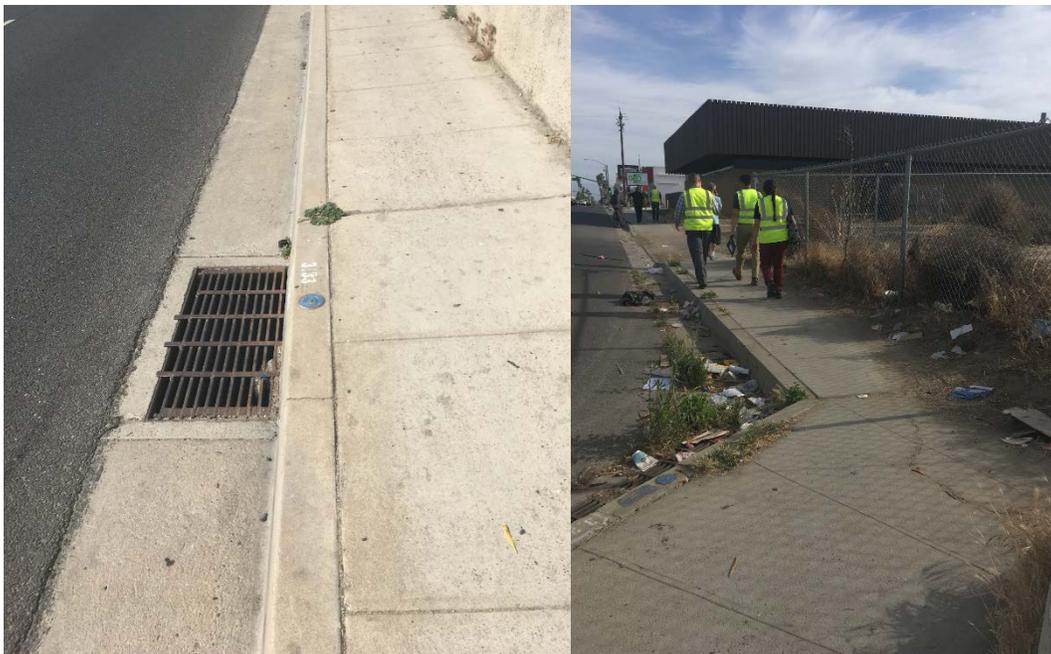
Sidewalk conditions along SR 204 are narrow and lack ADA ramps.

- **Signal Timing:** The SR 204 and 21st Street intersection is particularly challenging for pedestrians to cross in all directions. There is no direct crossing on SR 204 from east to west. Due to the skewed nature of the intersection, users are forced to cross six separate legs of the intersection if they are attempting to travel east or west on 21st Street. During the site visit, participants crossed and timed the intersection, which revealed it would take users 8 minutes and 55 seconds to get across the intersection. Additionally, the lack of ADA ramps and adequate safety islands at some of the crossings force people to wait for the pedestrian signal in the middle of the roadway with little physical separation from fast moving traffic. Participants witnessed many pedestrians and cyclists choosing to cross the intersection more directly by traveling outside the marked crosswalks, thus placing themselves in danger of collisions with vehicles.



An aerial view of the skewed intersection at SR 204 and 21st Street.

- **Road Conditions:** Along SR 204, grates for drainage are wide, long, and oriented parallel to the direction of travel making it difficult for bicyclists to ride over them. Bicyclists are forced to maneuver closer to the middle of the street with oncoming traffic to avoid getting their tires caught in the drainage gates. Participants also noted uneven and bubbled pavement throughout all of the walking assessment routes. Participants were also concerned that faded crosswalk markings made pedestrian visibility at non-signalized intersections difficult for drivers.
- **Blight:** Vacant lots and abandoned buildings on the east side of SR 204 between 10th and 11th Street made walking in the area feel uncomfortable for some training participants.



Sewer grates with large slats (left), and a fenced off empty lot on SR 204 (right).

- **Road User Behavior:** Participants observed people walking outside of marked and unmarked crosswalks while vehicles were travelling towards them. Participants also noted vehicles parked halfway up a driveway and halfway in the road, forcing pedestrians off of the sidewalk and on to the road with vehicular traffic. Bicyclists were also observed riding on the wrong side of the road.



A large truck parked on the sidewalk blocks the pedestrian's right-of-way on a sidewalk along on SR 204.

- **Homelessness:** The homeless population in Bakersfield, and particularly along SR 204, is increasing and changing in demographics. Andrew Miles from The Bakersfield Homeless Center explained that there are many more homeless young people and families in Bakersfield, partly due to the lack of adequate employment and housing in the area. Many people and families are living in motels along SR 204 as long-term residences. Andrew stressed that the Bakersfield community lacks awareness with homelessness issues and will require the community as a whole to develop deep compassion and understanding to solve these issues.
- **Strong Sense of Community:** Particularly along the 3rd route around Dr. Martin Luther King Jr. Park, participants witnessed many residents outside and at the park, which fostered a sense of safety and community through having more eyes on the street. Along the center median on East California Avenue, participants lauded the shade trees and the wide median, which people used as a safety island at both marked and unmarked crosswalks.

## Key Opportunities to Improve Walking and Biking Safety

Following the walkability and bikeability assessment, the Project Team facilitated small-group action planning discussions where participants prioritized and preliminarily planned infrastructure projects and community programs aimed at reducing the number of injuries and fatalities, as well as increasing the number of people and the frequency of walking and biking in Bakersfield.

Through a voting and self-selecting process during the training, participants chose to focus on a preliminary plan for Temporary Demonstration Projects, Crossing Enhancements, and Community Bike Rides/Events. Participants self-selected which project they wanted to collaboratively plan for with their fellow participants and discussed:

- The problem the project is intended to solve;
- The people, organizations, agencies, and resources needed to implement the project; and
- Short-term and long-term action steps to implement the project.



Training participants sharing their preliminary planned infrastructure and programmatic projects with the entire group.

## Community Recommendations

Workshop participants provided the following recommendations and next steps for overall pedestrian and bicyclist safety improvements:

### Infrastructure Projects

- **Temporary Demonstration Projects:** Participants were interested in implementing temporary demonstration projects as a means to educate all road users on the rules of the road and to cultivate political and community will to address pedestrian and bicycle safety throughout Bakersfield. Participants in this group imagined hosting temporary demonstrations at different locations in the City that highlights specific issues and aligns with a fun community event. For example, participants were interested in creating temporary high-visibility crosswalks in high pedestrian traffic areas as a way to educate the public about pedestrians having the right-of-way in marked and unmarked crosswalks. They wanted to include banners with quick facts and simple phrases about marked and unmarked crosswalks, such as, “x number of pedestrians/bicyclists were injured or killed at this unmarked crosswalk” or “give pedestrians the right-of-way at all crosswalks.” As a way to make the demonstration more interactive and increase the visibility of the messaging, participants identified coordination with existing community events, such as carnivals, First Friday events and other community gatherings, as paramount to the temporary demonstrations’ success. In order to see this project to fruition, the participants identified the City of Bakersfield, Department of Public Works, community groups, K-12 Schools, non-profit organizations, and local businesses as key partners for implementation.

- **Crossing Enhancements:** Training participants were interested in improving crossing conditions on roads with high pedestrian and bicycle traffic, especially along SR 204. The impetus for focusing on crossing enhancements was to provide pedestrians and cyclists with safer infrastructure to travel throughout the city, with the goal of increasing the number of people walking and biking throughout the City. Participants were interested in installing and/or enabling Leading Pedestrian Intervals (LPI), which gives pedestrians a 3–7 second head start when entering an intersection with a green vehicle signal in the same direction of travel. At signalized intersections with high pedestrian traffic, LPIs enhance the visibility of pedestrians in the intersection and are effective at reinforcing the pedestrian right-of-way over turning vehicles. They were also interested in but did not fully discuss the potential installation of pedestrian safety Islands, especially at E Truxtun Avenue and SR 204/Union Avenue; sidewalks at the SR 204/Union Avenue underpass; bicycle loop detectors; Rapid Rectangular Flashing Beacons (RRFB) at unsignalized, unmarked crosswalks; high-visibility crosswalk markings, especially at SR 204/Union Avenue and 18th Street; street repaving; and traffic warning signs for drivers to watch for pedestrians.

### **Community Programs, Policies, and Campaigns**

- **Community Educational Events:** Participants were interested in hosting events that are both educational and fun as a way to educate the community on the rules of the road for all modes of transportation. One strategy was to build a greater sense of community while relaying bicycle safety education principles by hosting group bicycle rides. Participants felt that starting the rides at the trails would help build confidence in riders’ ability to eventually ride on the street. Participants envisioned inviting community residents to the events and partnering with Bike Bakersfield who have League Cycling Instructors (LCIs) and bicycle mechanics on staff to lead the rides and provide maintenance help during the rides.

## **Cal Walks/SafeTREC Recommendations**

California Walks and SafeTREC also submit the following recommendations for consideration:

- **Create a Local Pedestrian Advocacy Group:** In addition to Bakersfield’s existing Bicycle/Pedestrian Advisory Committee (BPAC) which advises the City of Bakersfield on pedestrian and bicycle safety plans, the Project Team ***recommends that workshop participants form a local pedestrian advocacy group to collaborate with Bike Bakersfield on pedestrian and bicycle safety educational and encouragement programs for youth and families.*** A workshop participant commented that Bakersfield does not have a local pedestrian advocacy group because of its history with urban sprawl development patterns that have made travelling by car the default. While it may be difficult for communities to walk from their homes to commercial areas or other frequented destinations, a local pedestrian advocacy group could schedule regular walking groups and other educational and encouragement activities for youth and their families.
- **Creation of Neighborhood-Specific Transportation Plans to Prioritize and Strategize Needed Investments:** The Project Team ***recommends the City of Bakersfield create neighborhood-specific transportation plans*** that would encompass robust community engagement to help the City of Bakersfield gather information on the transportation needs and improvements requested by residents. With a city size of 142 square miles and a population of approximately 365,000 people, Bakersfield neighborhoods are very economically and geographically diverse and consequently, have unique needs. Creating neighborhood-specific transportation plans in coordination with the community can help guide future investments and support grants and

proposals for funding from state and local agencies. The City could consider submitting applications to the Caltrans Sustainable Communities Transportation Planning Grant Program to fund the development of these neighborhood-specific transportation plans.

- **Increase Collaboration between the City of Bakersfield, Caltrans, and Golden Empire Transit (GET):** The Project Team **recommends that the City of Bakersfield *continue to collaborate with Caltrans and GET to ensure that infrastructure improvements on City property are coupled with improvements on adjacent state routes and bus stops.*** Focusing on complete infrastructure improvements regardless of jurisdictional boundaries through increased coordination will ensure that the facilities are fully usable for all road users. Collaborating with entities responsible for infrastructure improvements within city limits can also enable cross-jurisdictional applications for state and federal funding. In coordination with the City of Bakersfield, the Project Team **recommends Caltrans conduct pedestrian and bicycle counts at the 21st Street/SR 204/Union Avenue intersection to decide if it is eligible for an infrastructure improvement.** While the implementation of a pedestrian scramble is eligible for intersections with at least 90 pedestrians crossing per hour, special considerations should be made as crossing this intersection is often avoided by pedestrians and cyclists because of the current lengthy and indirect crossing. Pedestrian and bicycle counts should also be conducted at mid-block crossing areas where people tend to cross to avoid the 21st Street/SR 204 intersection.
- **Implement Speed Calming Measures and Other Safety Improvements Along SR 204/Union Avenue:** While SR 204/Union Avenue was initially constructed as a highway, it is also a local road with 12-foot vehicle travel lanes. Research has demonstrated that wide streets and wide travel lanes are associated with higher vehicle speeds,<sup>6</sup> which affect the safety of people walking and bicycling. The Project Team **recommends that Caltrans consider speed calming and pedestrian and bicycle safety measures along SR 204/Union Avenue, such as reducing vehicle lane widths, installing Leading Pedestrian Intervals (LPI) at high traffic intersections, and vehicle right turn only lanes.**

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<sup>6</sup> See Kay Fitzpatrick, Paul Carlson, Marcus Brewer, and Mark Wooldridge, "Design Factors That Affect Driver Speed on Suburban Arterials": Transportation Research Record 1751 (2000):18–25.

## **Appendix A**

Pedestrian and Bicycle Collision Data Analysis

# 2012-2016 BAKERSFIELD UNION AVE ANALYSES

## Community Pedestrian and Bicycle Safety Training Workshop May 10, 2018

The goal of the Community Pedestrian and Bicycle Safety Training (CPBST) is to make communities safer and more pleasant for walking and bicycling. This workshop will train local residents and safety advocates in pedestrian and bicycle safety as well as create opportunities for collaboration with local officials and agency staff.

This fact sheet highlights 2012-2016 pedestrian and bicycle collision data to help your community better prioritize recommendations that emerge from this workshop.

### PEDESTRIANS

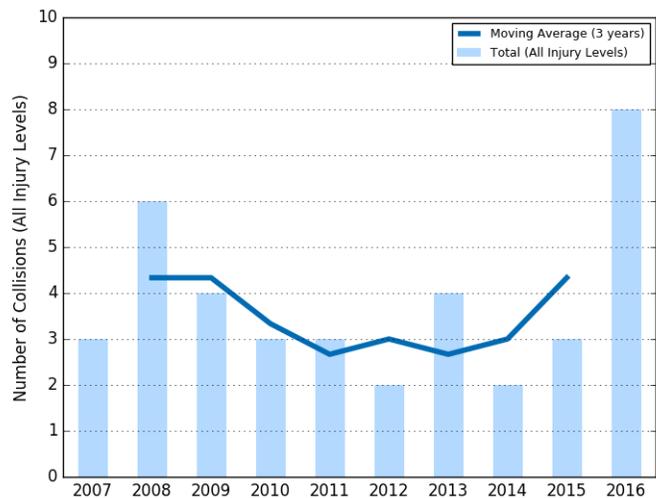


**38** people were killed or injured in **37** pedestrian collisions in the last 10 years (2007-2016).

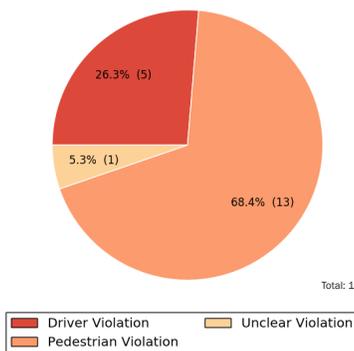
The **three-year moving average** line shows an **upward** trend in pedestrian collisions.\*

There were **3** pedestrian collisions in 2015, but an average of **4.3** pedestrian collisions per year for the 3-year rolling average between 2014 and 2016.

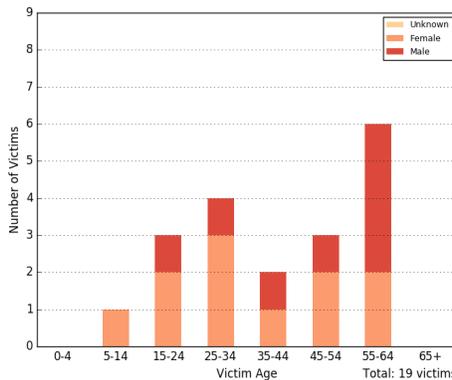
\*This line is useful for tracking change over time, especially when the number of collisions changes a lot between years. Data points are at the midpoint of the three years of data specified.



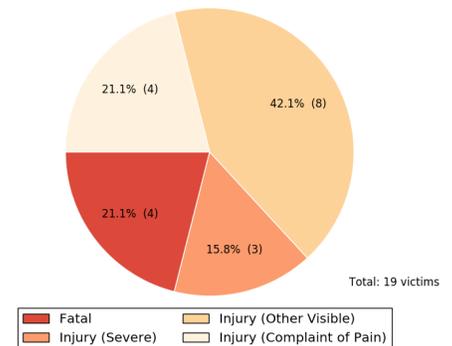
**26.3%** driver violations  
**VS.**  
**68.4%** pedestrian violations



\*Unclear violations were committed either by the driver, pedestrian or bicyclist.



**42.1%** of victims were male  
**10.5%** of victims were under age 20  
**47.4%** of victims were ages 45-64



**36.9%**  
of victims (or 7 people) were  
**KILLED or SEVERELY INJURED**

Data Source: California Statewide Integrated Traffic Records System (SWITRS). Collision data for 2015 and 2016 are provisional at this time.

# BICYCLES

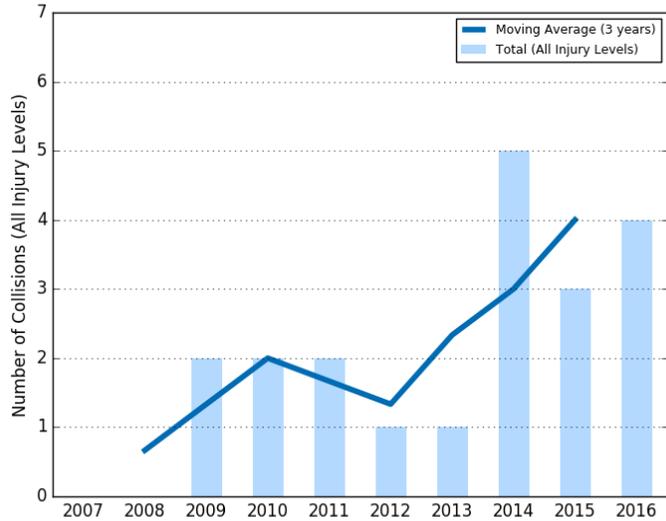


20 people were injured in 20 bicycle collisions in the last 10 years (2007-2016).

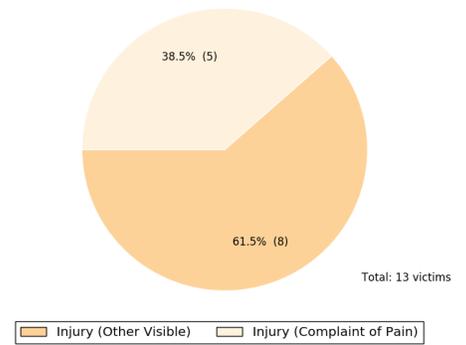
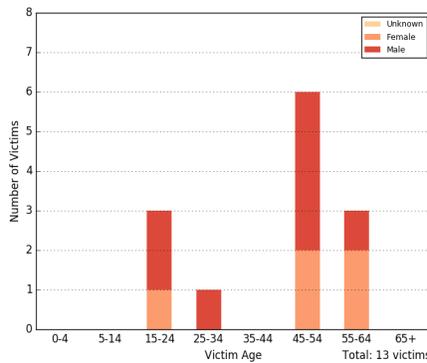
The **three-year moving average** line shows an **upward** trend in bicycle collisions.\*

There were **3** bicycle collisions in 2015, but an average of **4** bicycle collisions per year for the 3-year rolling average between 2014 and 2016.

\* This line is useful for tracking change over time, especially when the number of collisions changes a lot between years. Data points are at the midpoint of the three years of data specified.



Bicycles must follow all the same rules of the road as vehicles. As a result, we cannot break down violations by driver vs. bicyclist.



- 61.5% of victims were male
- 15.4% of victims were under age 20
- 69.2% of victims were ages 45-64

Most bicyclist collisions resulted in minor injuries.

# SUMMARY



**31.0** pedestrian fatalities & injuries per 100,000 population over the last five years, which is **4.4% more than** Kern County and **13.7% less than** California



**20.4** bicyclist fatalities & injuries per 100,000 population over the last five years, which is **18.0% more than** Kern County and **38.7% less than** California

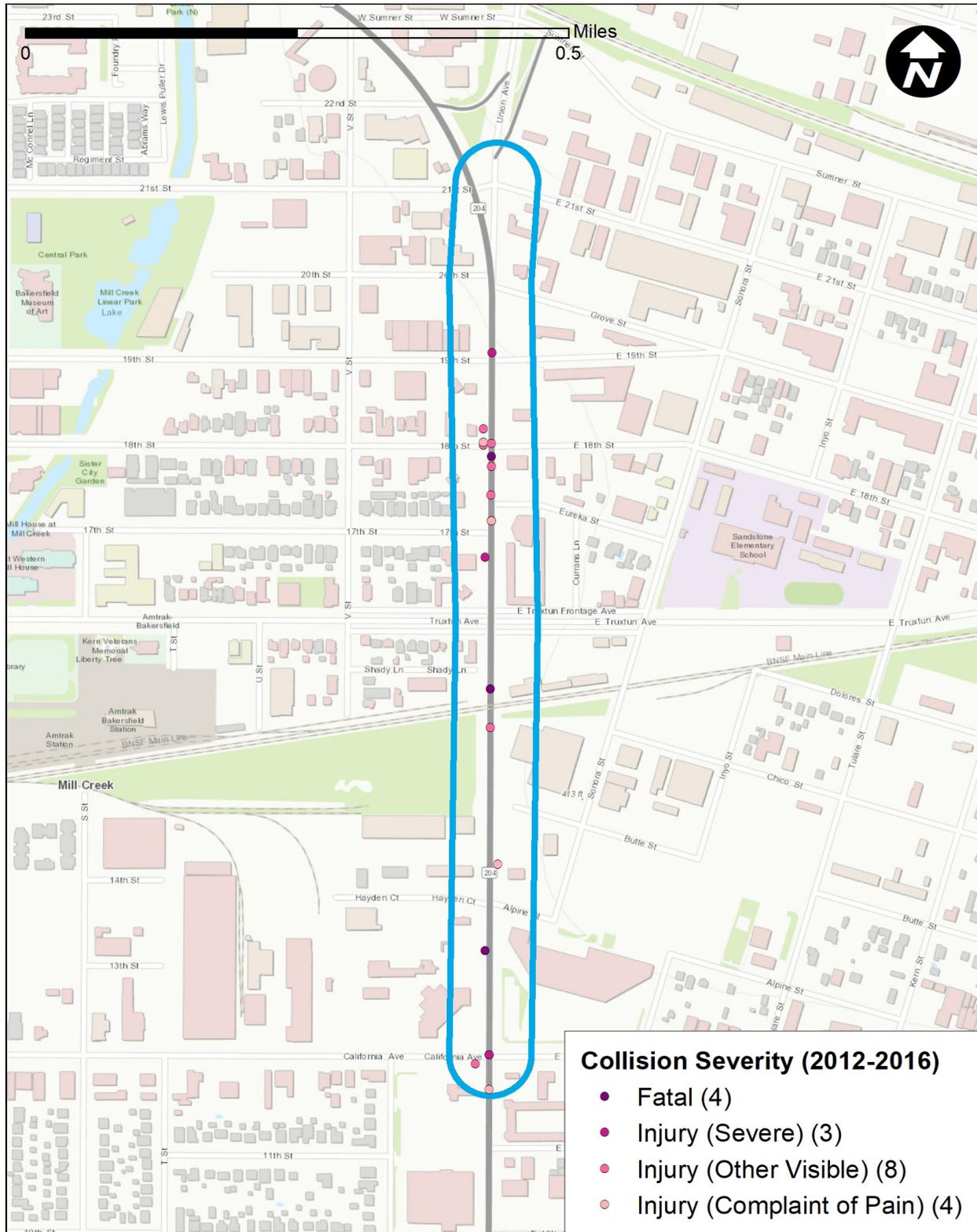
	Yearly Population Rate of Fatalities & Injuries per 100,000 Population Calculated Over a 5-year Period*	
	Pedestrian	Bicyclist
Bakersfield	31.0	20.4
Kern	29.7	17.3
California	35.9	33.3

Source: U.S. Census Bureau, Population Division (intercensal population data for 2016).

\* The rate per population is calculated by adding the number of fatalities and injuries from 2012 to 2016 divided by five times the population in 2016.

# Pedestrian Collisions 2012-2016

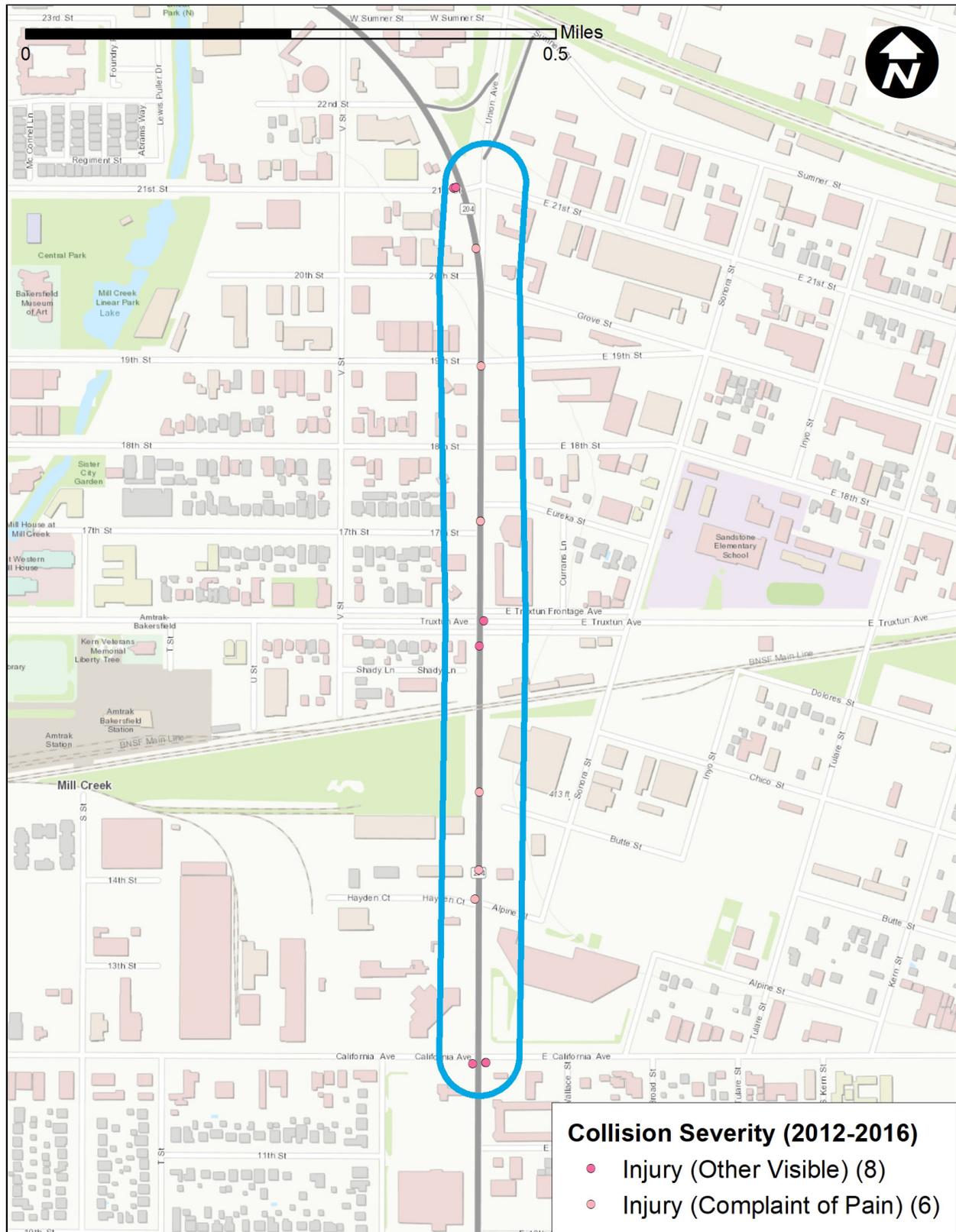
19 collisions mapped in Bakersfield, CA on Union Ave, between 21st St and California Ave.



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

# Bicyclist collisions 2012-2016

14 collisions mapped in Bakersfield, CA on Union Ave, between 21st St and California Ave.



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## **Appendix B**

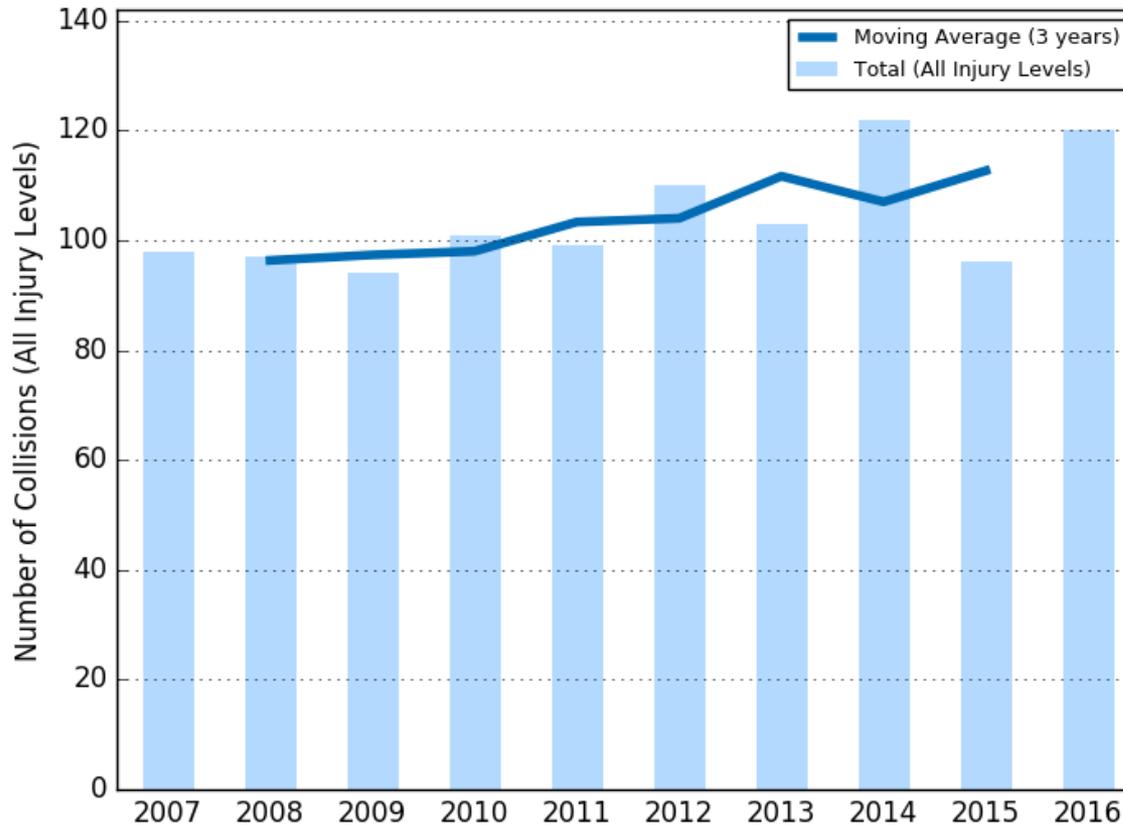
Pedestrian and Bicycle Collision Data Analysis  
Site Visit Presentation

# Community Pedestrian and Bicycle Safety Workshop Site Visit

## Bakersfield, CA

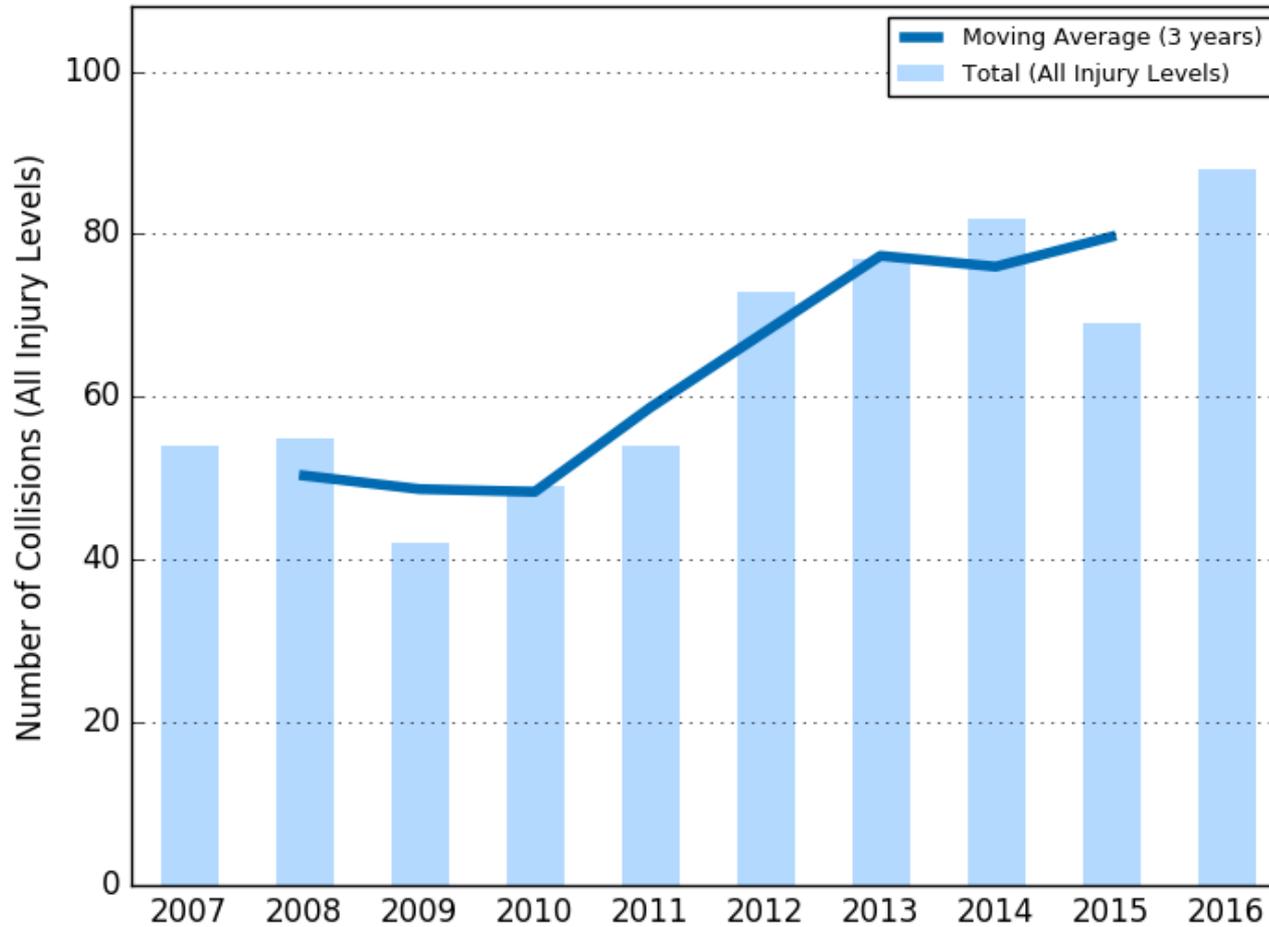
### 3/14/18

#### Pedestrian Injury Collision Trend with 3-year moving average



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## Bicycle Injury Collision Trend with 3-year moving average

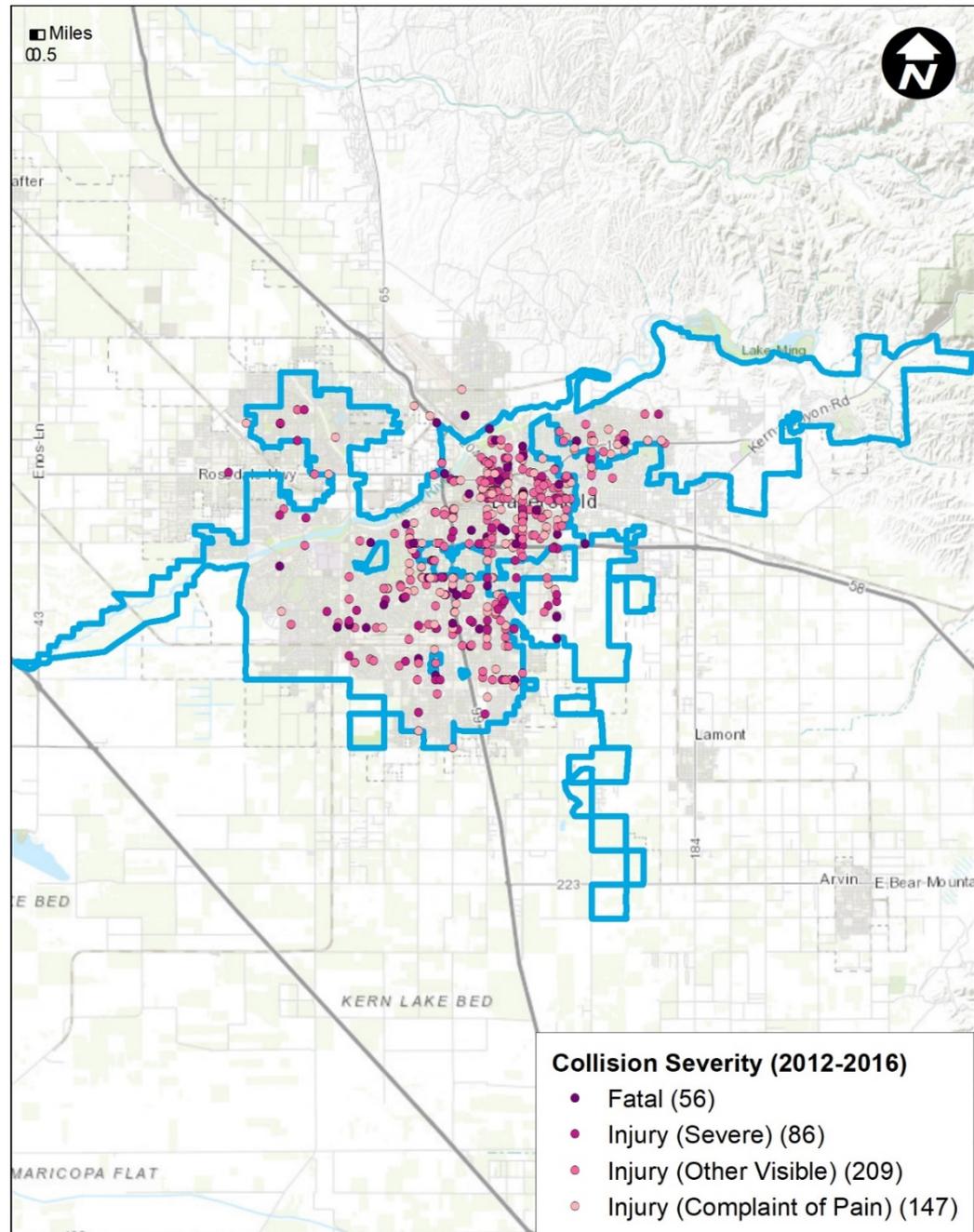


Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

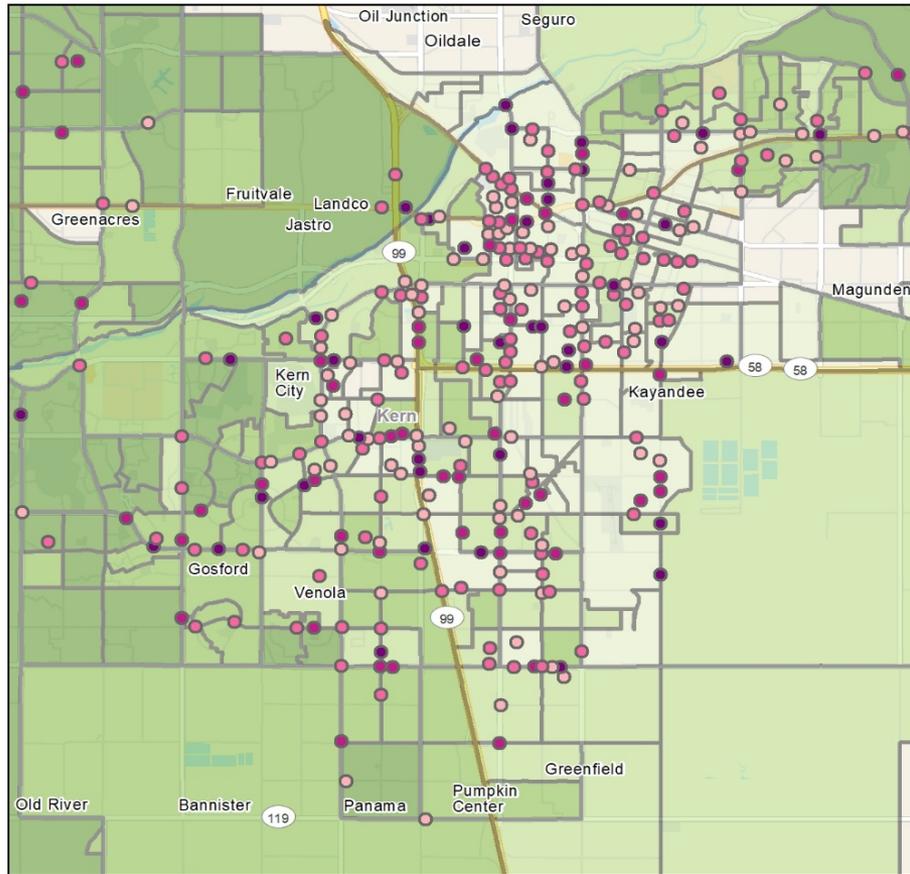
# Pedestrian Collisions 2012-2016

Only 498 of 551 collisions are mapped.

Note: 2015 and 2016 SWITRS data are provisional as of November 2017.



## Bakersfield Pedestrian Collision Map (2012 - 2016)



### Collision Severity (2012-2016)

- Fatal (54)
- Injury (Severe) (84)
- Injury (Other Visible) (206)
- Injury (Complaint of Pain) (143)

### 2016 Median Household Income

- < 35K
- 35K - 50K
- 50K - 75K
- > 75K

## Pedestrian Collisions by Time of Day and Day of Week (2012-2016)

09:00PM-11:59PM	7	9	10	9	15	12	8
06:00PM-08:59PM	25	20	17	25	25	23	16
03:00PM-05:59PM	17	21	18	20	23	11	13
Noon-02:59PM	8	18	16	7	5	7	4
09:00AM-11:59AM	9	7	6	3	4	5	3
06:00AM-08:59AM	15	8	9	10	9	4	3
03:00AM-05:59AM	2	3	2	2	1	3	1
Midnight-02:59AM	1	4	0	5	6	5	11
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

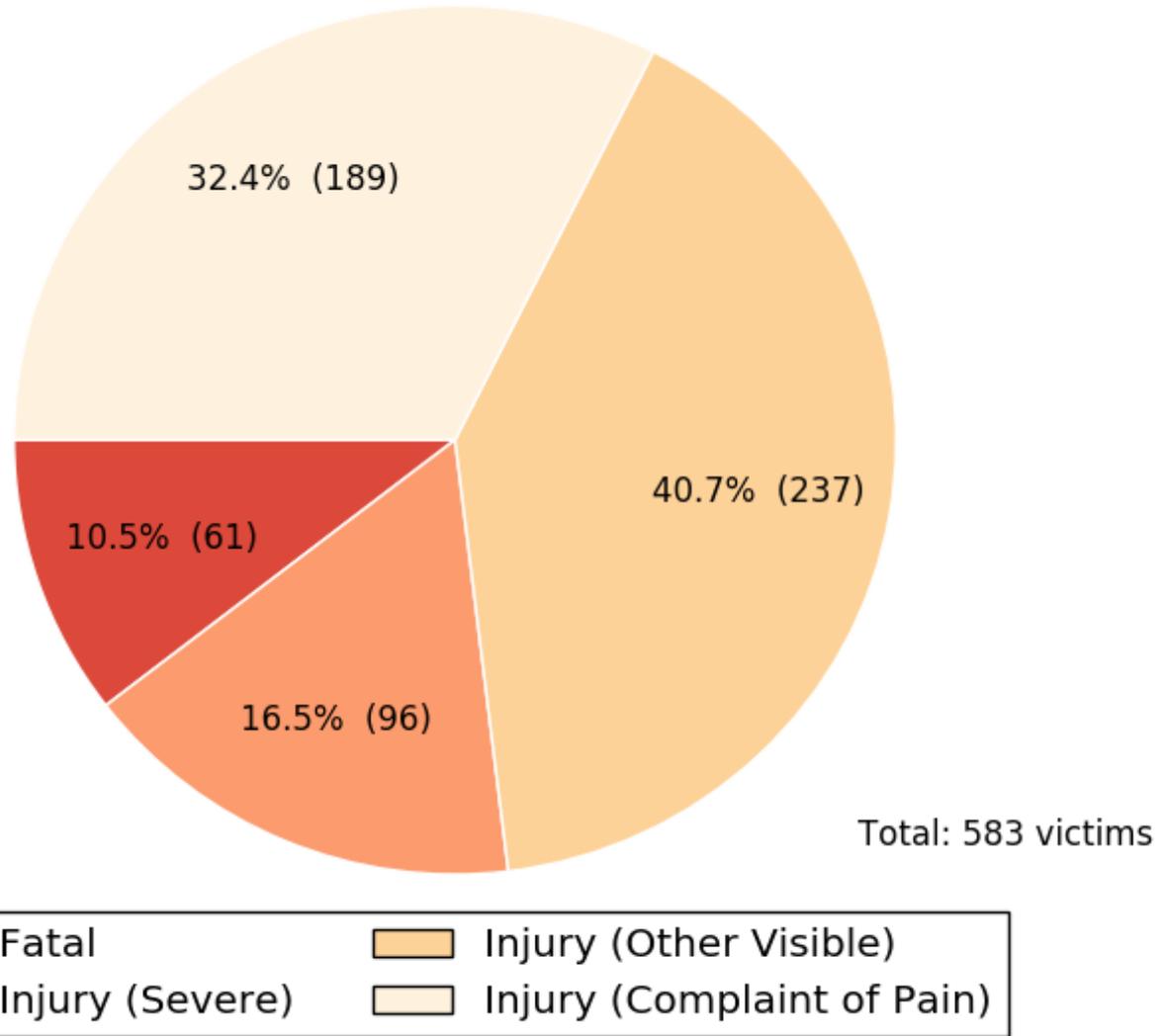
\*Color gradient corresponds to collision frequency.

Total: 551 collisions

## Top 10 Violations in Pedestrian Collisions (with # and %) Total: 551 collisions

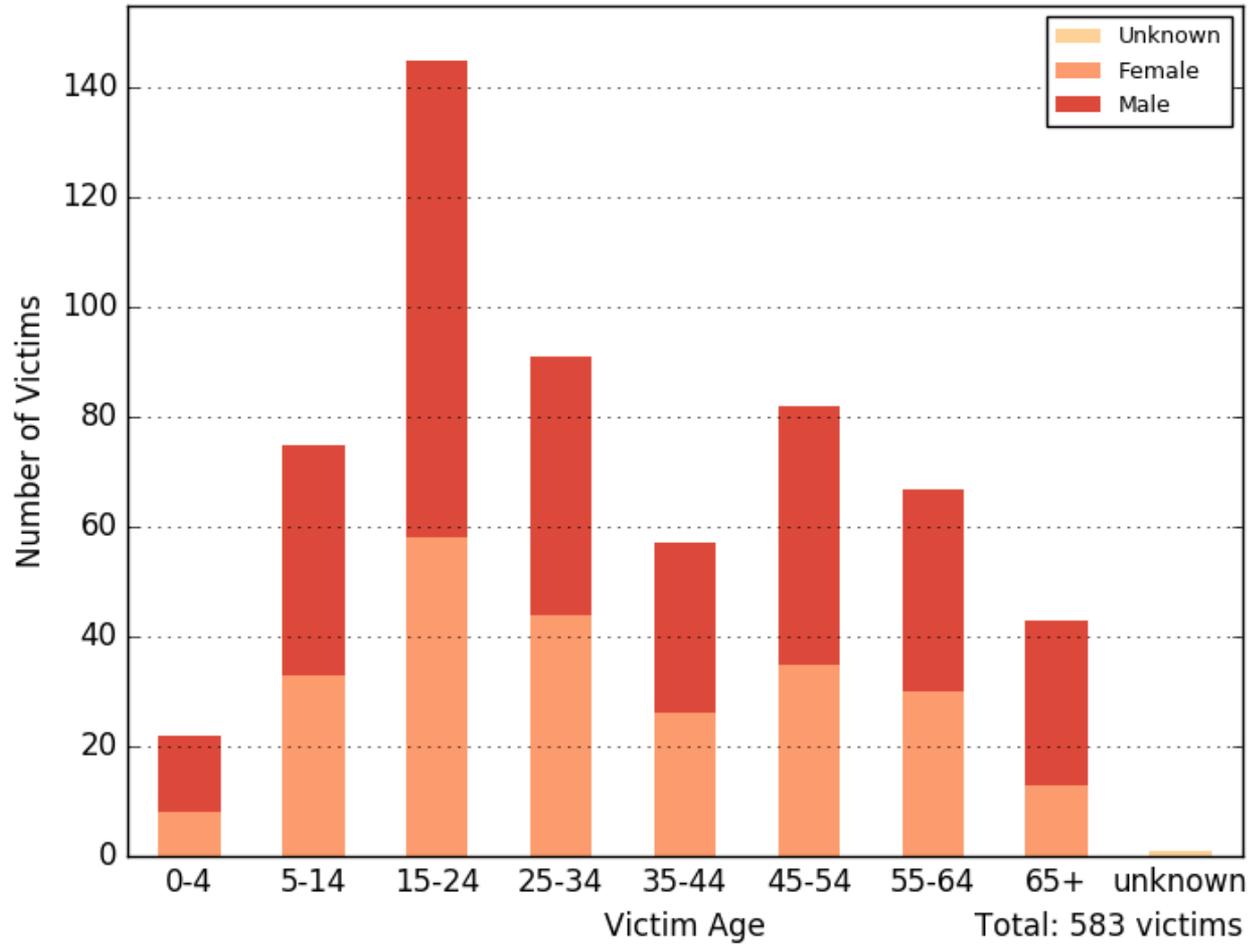
<b>CVC No.</b>	<b>Description</b>	<b>Violation Party</b>	<b>Freq.</b>	<b>Percent</b>
21954	Pedestrian must yield right-of-way to vehicles at areas that aren't crosswalks	Pedestrian	199	36.1%
21950	Driver must yield to pedestrian right of way in a crosswalk	Driver	135	24.5%
21956	Pedestrian must stay close to the roadway	Pedestrian	34	6.2%
21955	At intersections, pedestrians can't cross anywhere except at a crosswalk	Pedestrian	25	4.5%
21453	Red or Stop, vehicles stop at limit line or X-walk. When making right turn at a red light/stop sign driver required to yield to any vehicle approaching so closely as to constitute an immediate hazard	Driver	21	3.8%
0	Unknown	Other	21	3.8%
22107	Unsafe turn with/without signaling	Driver or Bicycle	20	3.6%
21456	"Walk" pedestrian failure to yield right-of-way to vehicles already in crosswalk	Pedestrian	18	3.3%
22350	Speeding on the highway	Driver	17	3.1%
21952	Motor vehicle drivers must yield to pedestrians	Driver	12	2.2%
<b>Total</b>			<b>502</b>	<b>91.1%</b>

### Pedestrian Victim Injury Severity (2012-2016)



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## Pedestrian Victims by Age and Gender

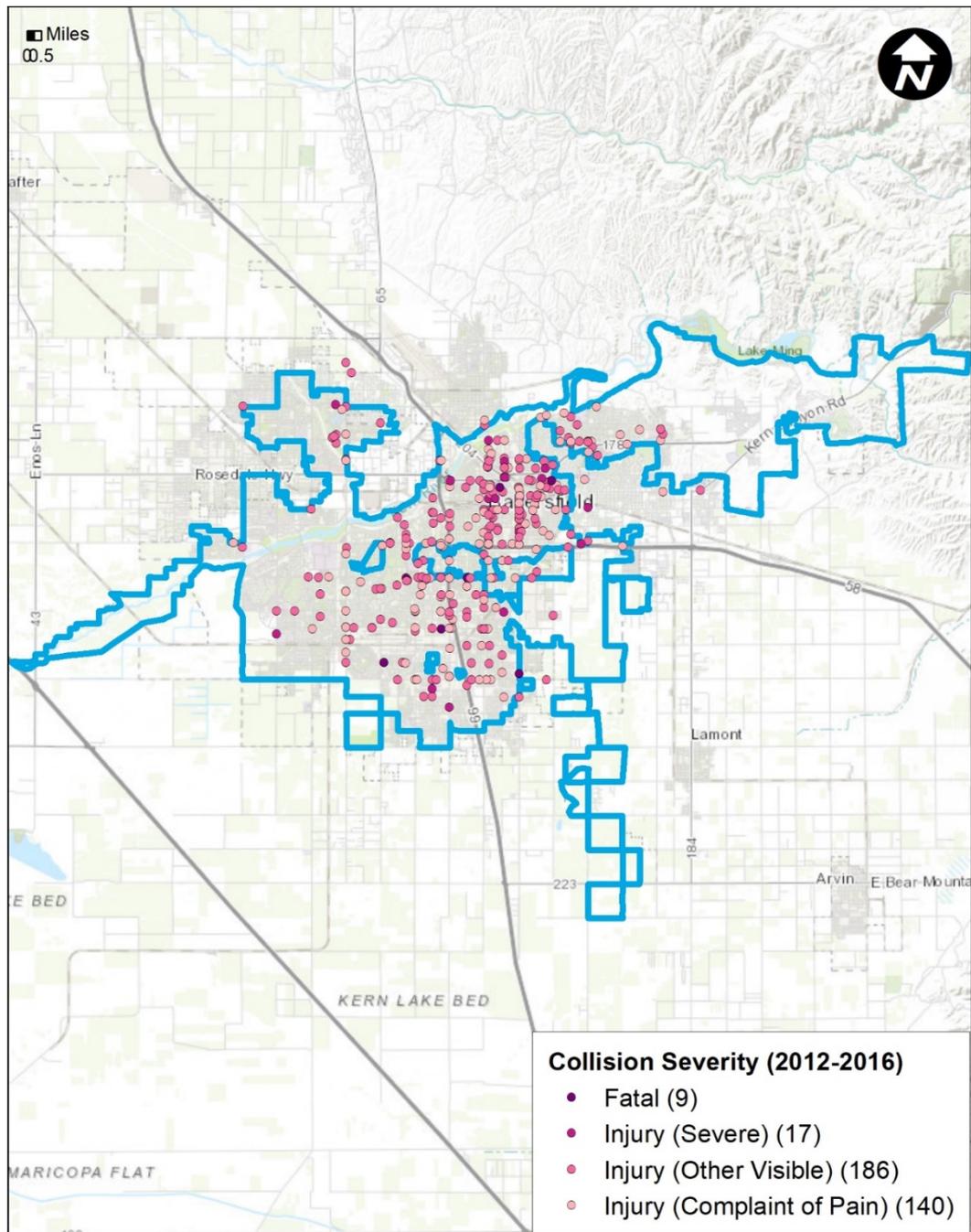


Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

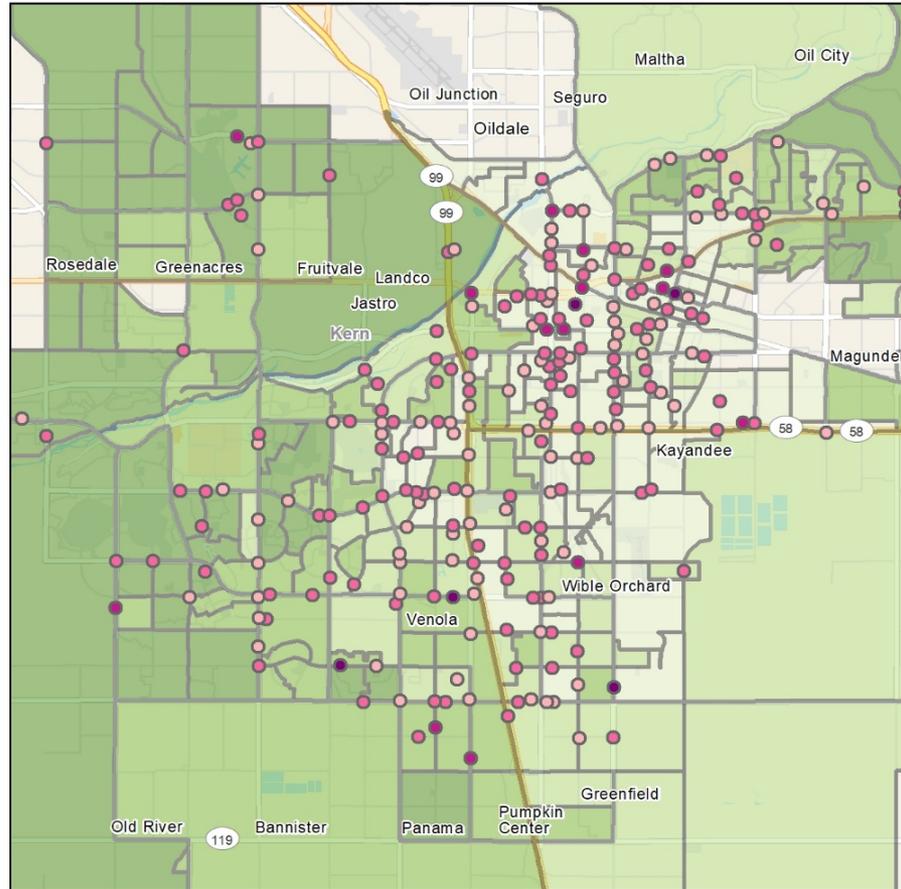
# Bicycle Collisions 2012-2016

352 of 389 collisions are mapped.

Note: 2015 and 2016 SWITRS data are provisional as of November 2017.



## Bakersfield Bicycle Collision Map (2012 - 2016)



### Collision Severity (2012-2016)

- Fatal (9)
- Injury (Severe) (16)
- Injury (Other Visible) (182)
- Injury (Complaint of Pain) (136)

### 2016 Median Household Income

- < 35K
- 35K - 50K
- 50K - 75K
- > 75K

## Bicycle Collisions by Time of Day and Day of Week (2012-2016)

09:00PM-11:59PM	3	5	2	6	4	7	5
06:00PM-08:59PM	13	10	15	9	11	9	11
03:00PM-05:59PM	22	17	19	13	14	11	12
Noon-02:59PM	16	9	12	12	10	9	4
09:00AM-11:59AM	7	7	5	3	7	4	4
06:00AM-08:59AM	8	10	7	7	8	2	4
03:00AM-05:59AM	1	2	1	1	1	0	1
Midnight-02:59AM	1	0	2	1	1	2	2
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

\*Color gradient corresponds to collision frequency.

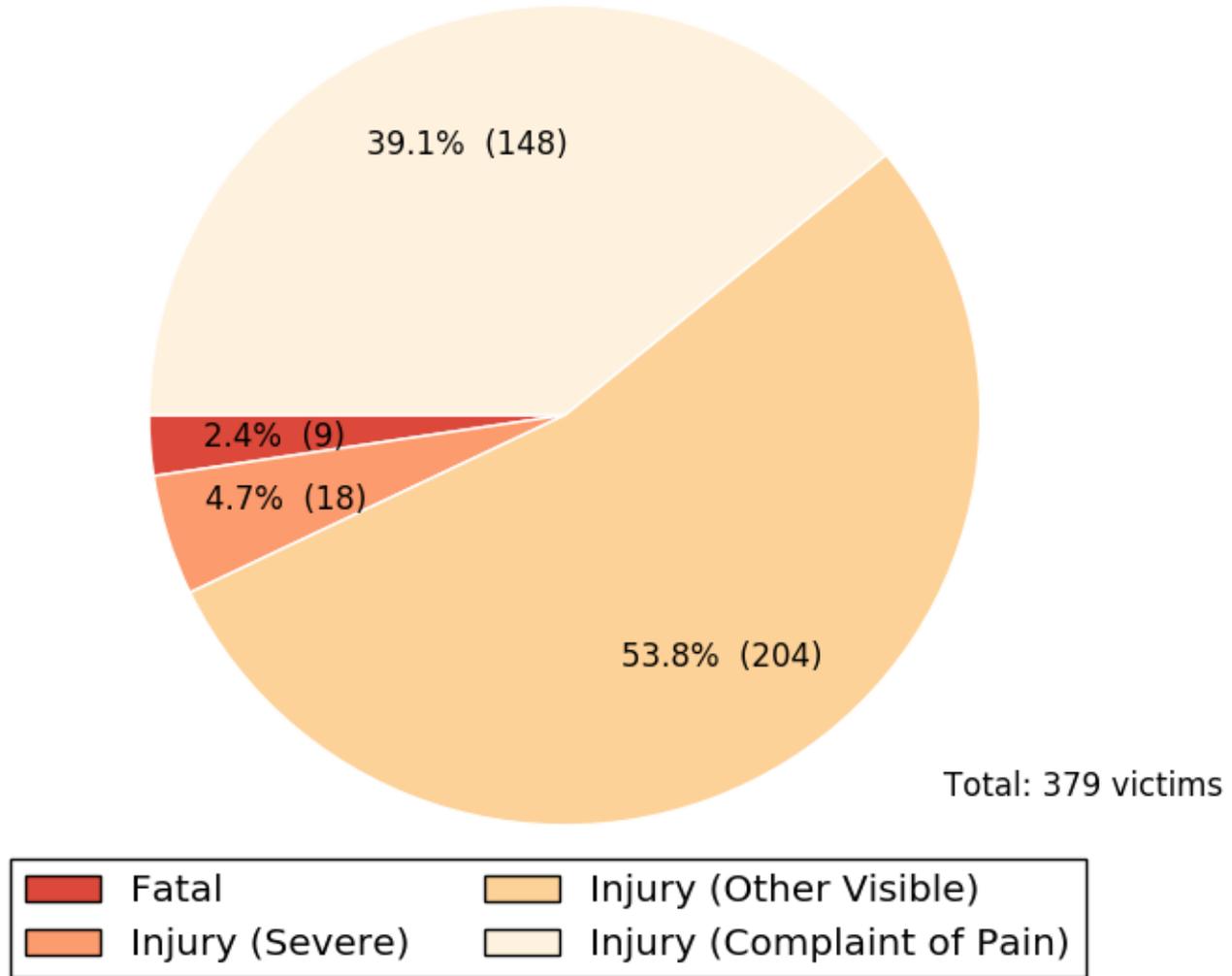
Total: 389 collisions

## Top 10 Violations in Bicycle Collisions (with # and %)

Total: 389 collisions

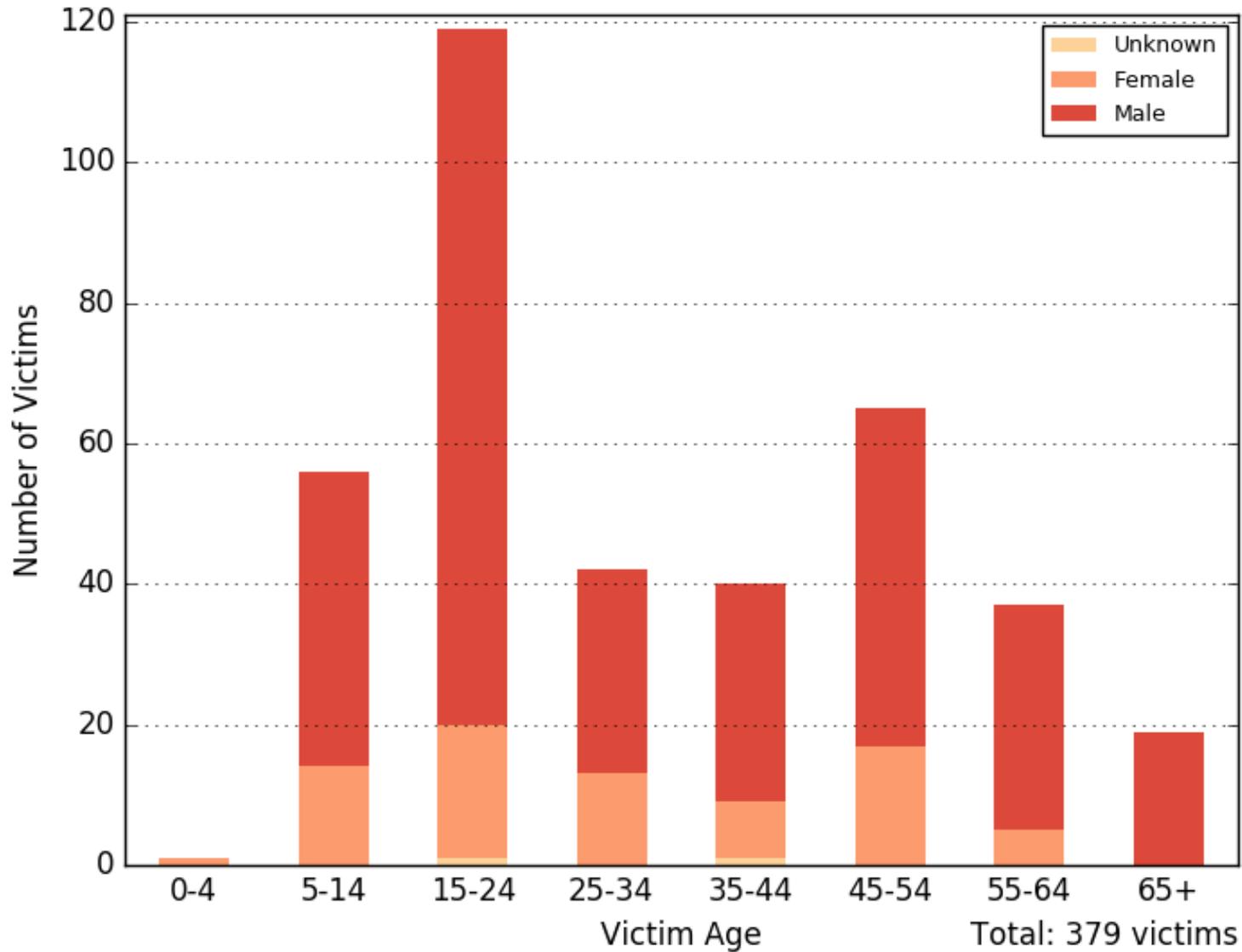
<b>CVC No.</b>	<b>Description</b>	<b>Violation Party</b>	<b>Freq.</b>	<b>Percent</b>
21650	Right half of roadway, failure to drive on	Driver or Bicycle	118	30.3%
22107	Unsafe turn with/without signaling	Driver or Bicycle	56	14.4%
21453	Red or Stop, vehicles stop at limit line or X-walk. When making right turn at a red light/stop sign driver required to yield to any vehicle approaching so closely as to constitute an immediate hazard	Driver	43	11.1%
21804	Did not yield when entering/crossing a highway	Driver	24	6.2%
21202	Bicyclist, failure to use right edge of roadway	Bicycle	23	5.9%
0	Unknown	Other	20	5.1%
21802	Did not stop/yield at stop sign	Driver	16	4.1%
21801	Failure to yield right-of-way to incoming cars while turning left or making U-turn	Driver or Bicycle	14	3.6%
22450	Driver didn't stop behind limit line at stop sign	Driver	11	2.8%
22350	Speeding on the highway	Driver	10	2.6%
Total			335	86.1%

### Bicycle Victim Injury Severity



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## Bicycle Victims by Age and Gender

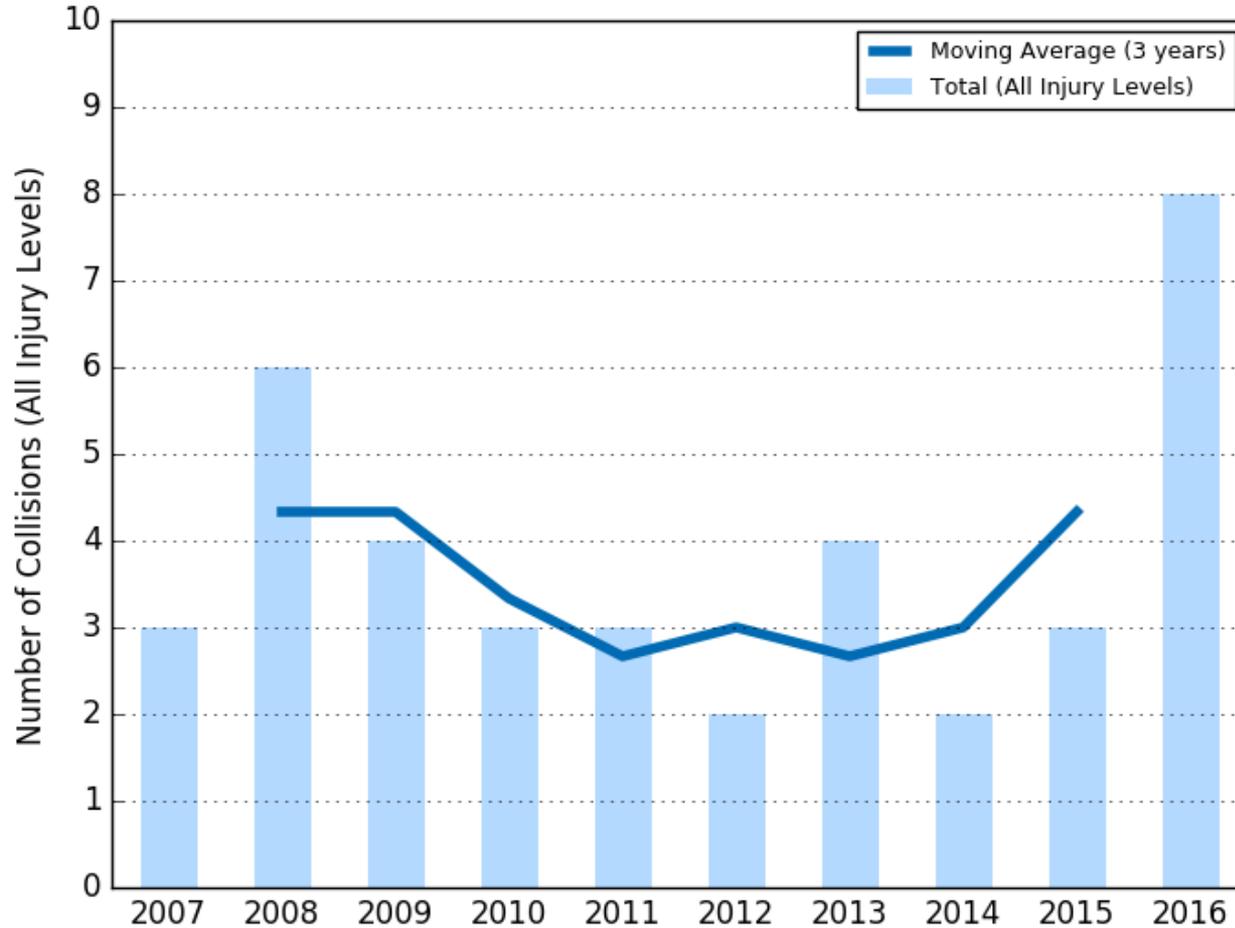


Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

# Pedestrian Collision Trend

## Union Ave (between California & 21st)

3/14/18

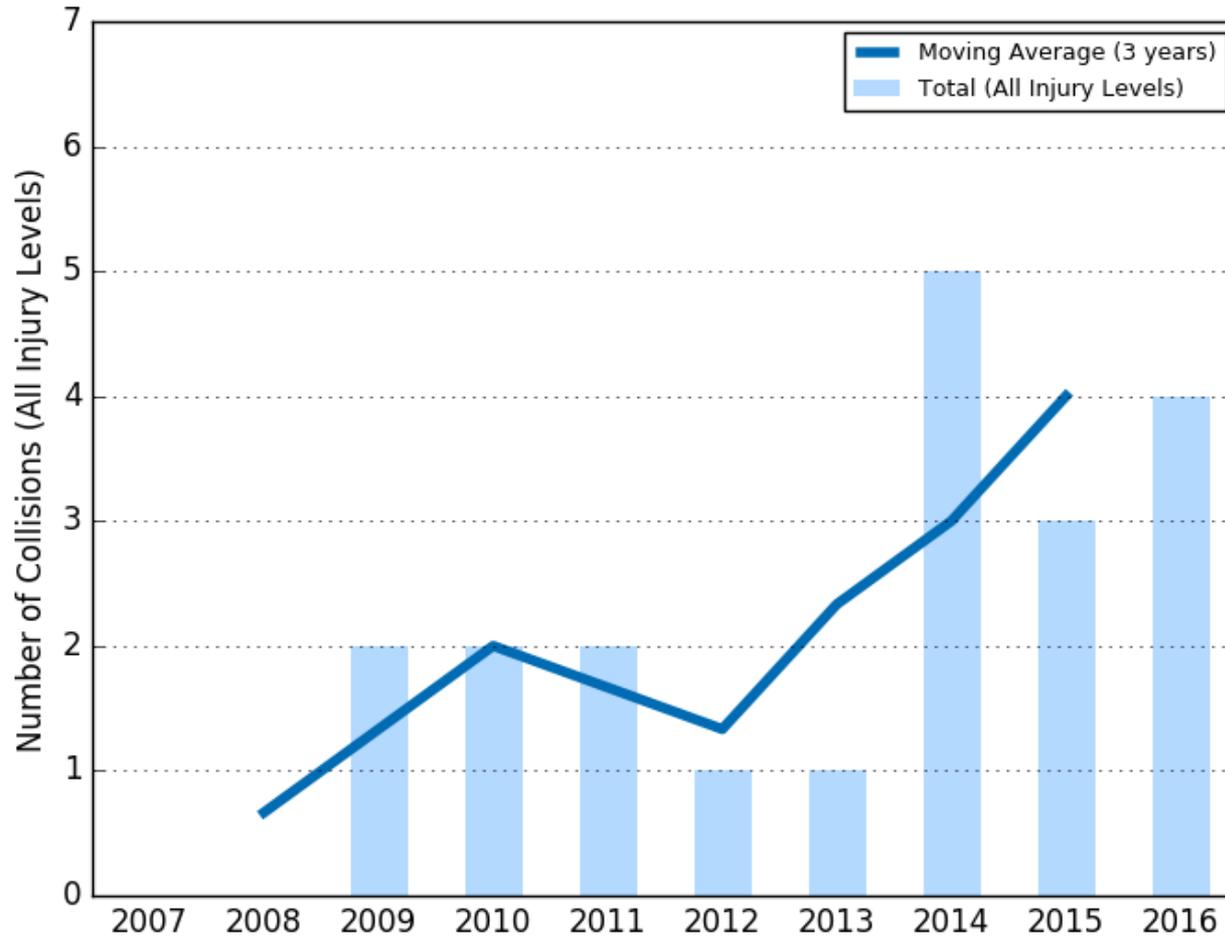


Total: 37 collisions

Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

# Bicycle Collision Trend

## Union Ave (between California & 21st)



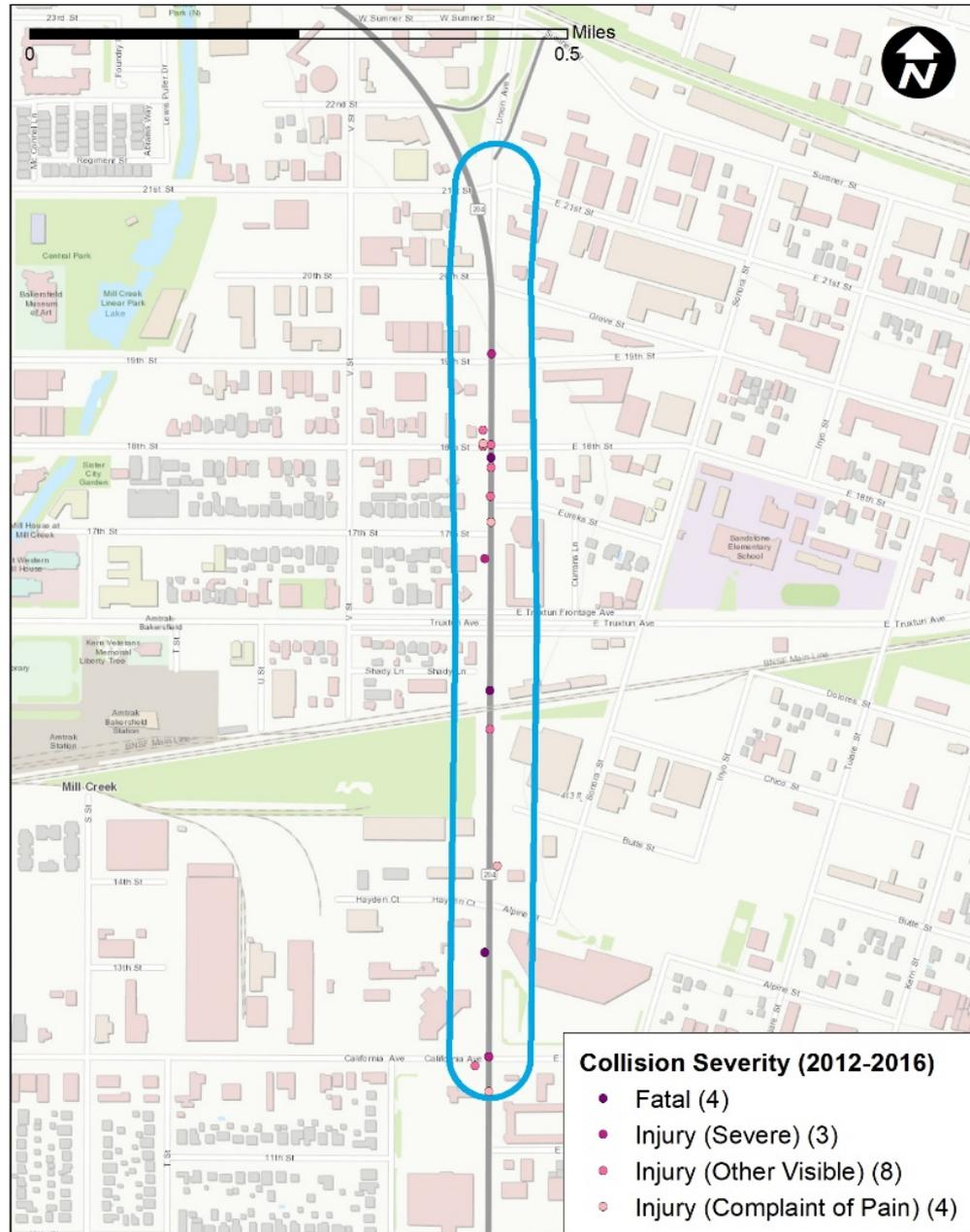
Total: 20 collisions

Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

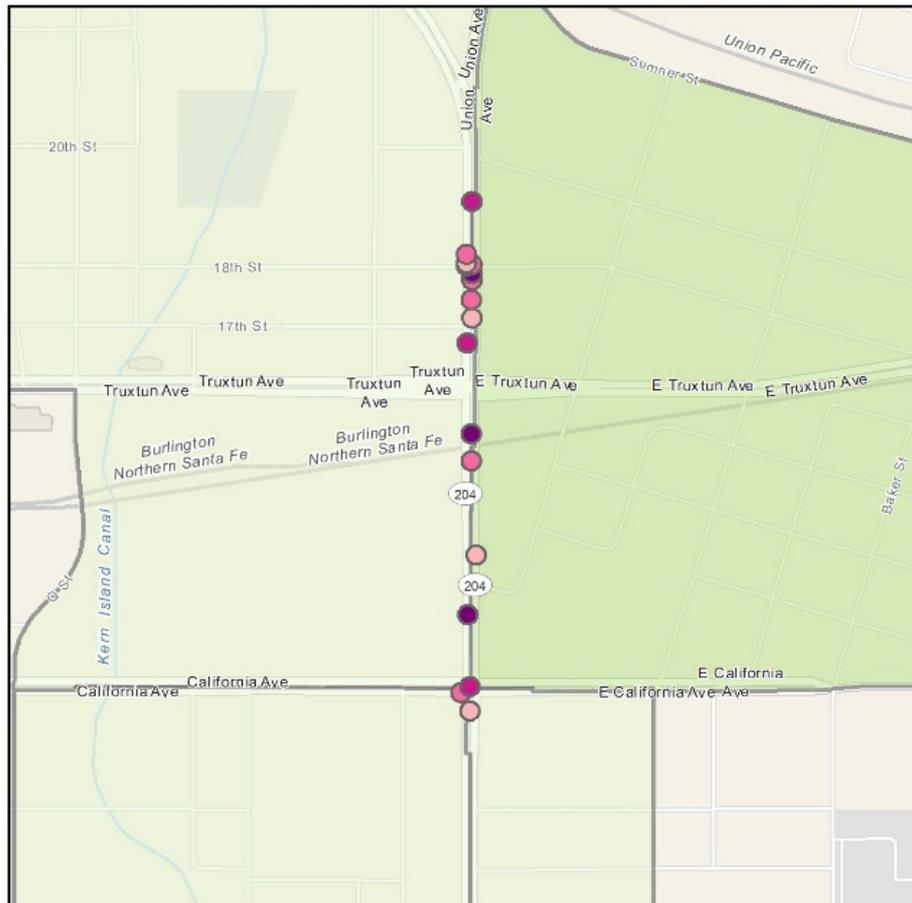
# Pedestrian Collisions 2012-2016

19 pedestrian collisions are mapped.

Note: 2015 and 2016 SWITRS data are provisional as of November 2017.



# Bakersfield Union Pedestrian Collision Map (2012 - 2016)



## Collision Severity (2012-2016)

- Fatal (4)
- Injury (Severe) (3)
- Injury (Other Visible) (8)
- Injury (Complaint of Pain) (4)

## 2016 Median Household Income

- < 35K
- 35K - 50K

## Pedestrian Collisions by Time of Day and Day of Week (2012-2016)

09:00PM-11:59PM -	1	0	1	1	0	1	0
06:00PM-08:59PM -	0	3	1	2	0	0	1
03:00PM-05:59PM -	0	0	0	0	0	1	0
Noon-02:59PM -	1	0	0	1	0	0	0
09:00AM-11:59AM -	1	0	0	0	0	2	0
06:00AM-08:59AM -	0	0	0	0	0	0	0
03:00AM-05:59AM -	0	0	0	0	0	0	0
Midnight-02:59AM -	0	0	0	0	0	1	1
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

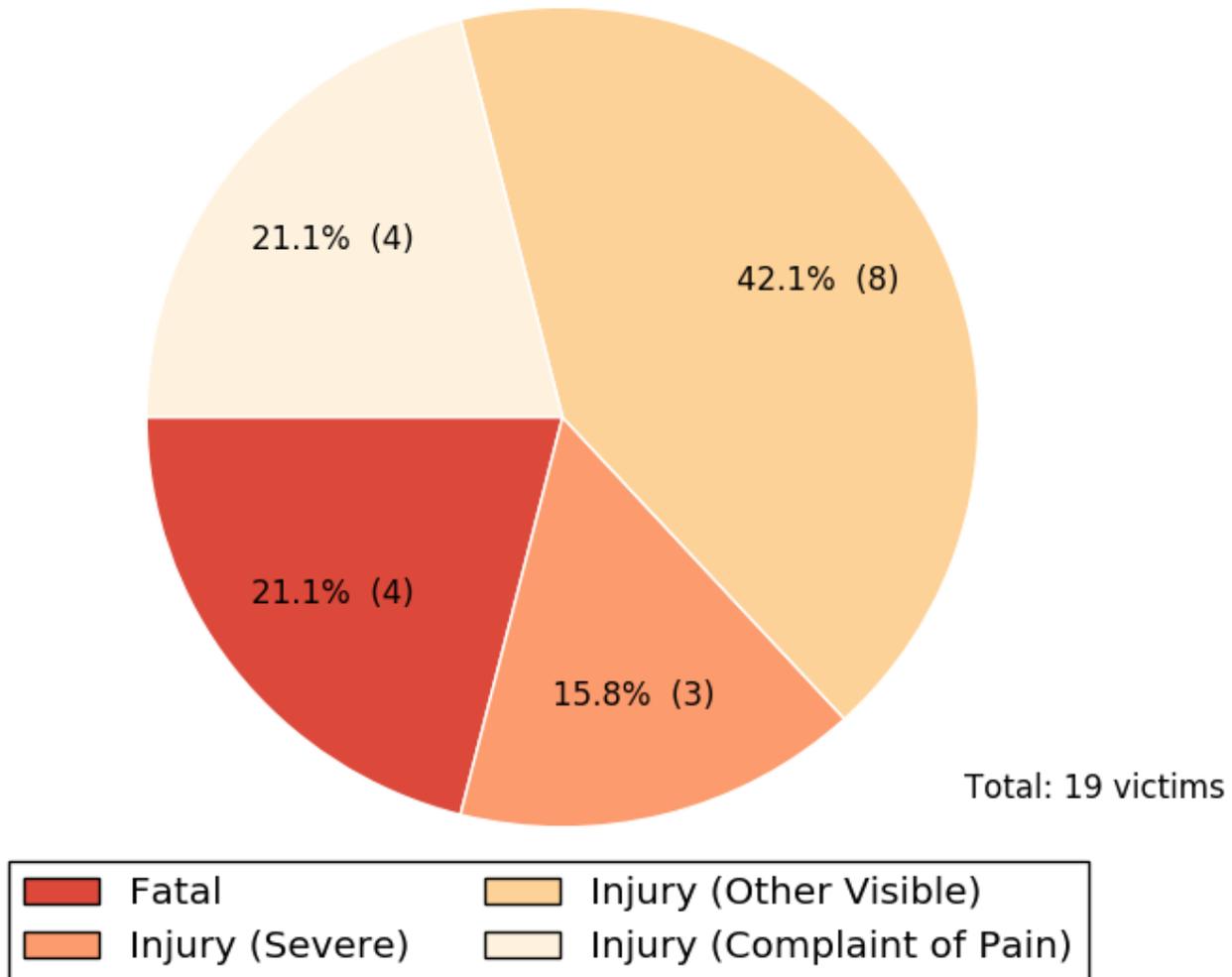
\*Color gradient corresponds to collision frequency.

Total: 19 collisions

## Top 10 Violations in Pedestrian Collisions (with # and %) Total: 19 collisions

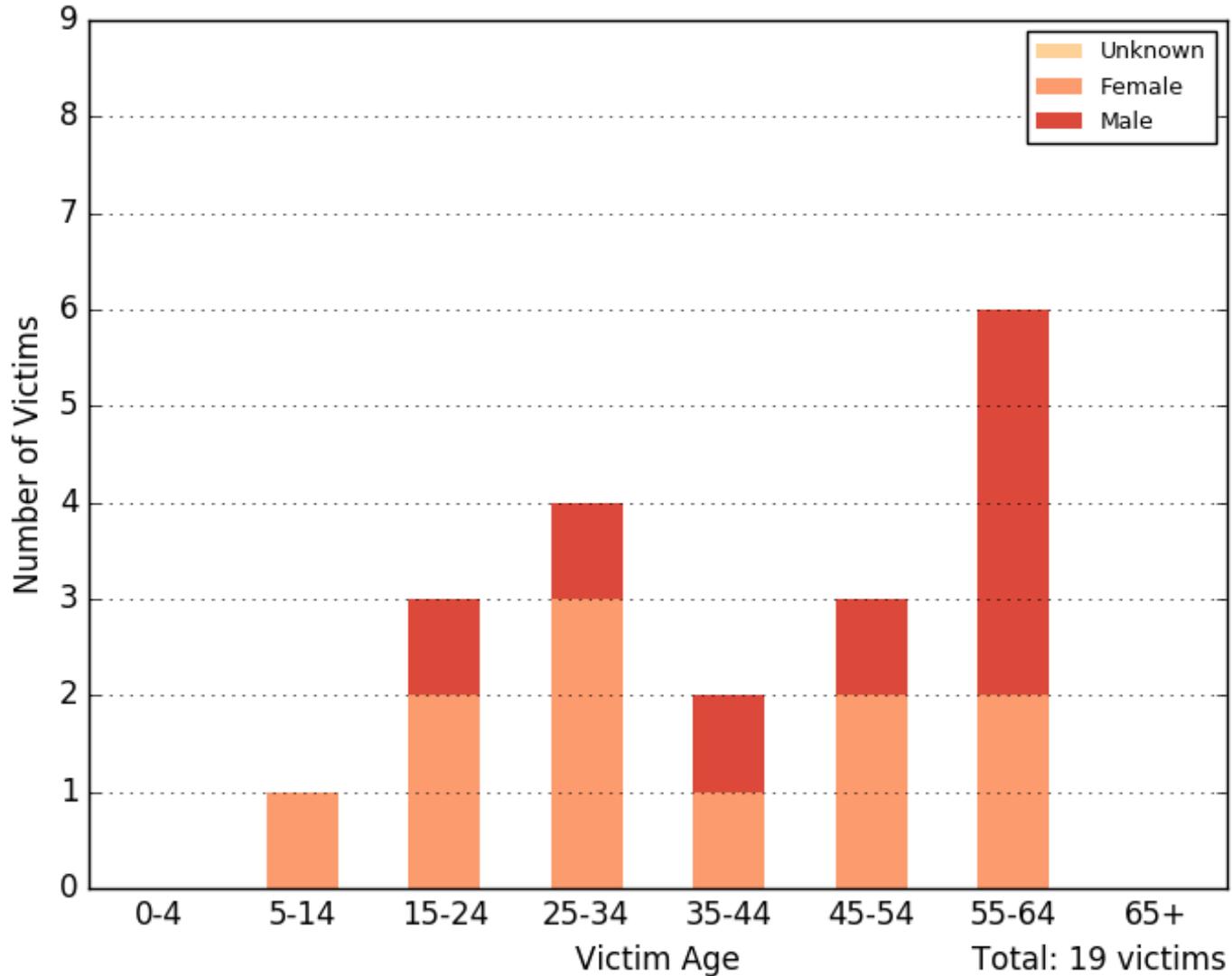
<b>CVC No.</b>	<b>Description</b>	<b>Violation Party</b>	<b>Freq.</b>	<b>Percent</b>
21954	Pedestrian must yield right-of-way to vehicles at areas that aren't crosswalks	Pedestrian	8	42.1%
21950	Driver must yield to pedestrian right of way in a crosswalk	Driver	3	15.8%
21456	"Walk" pedestrian failure to yield right-of-way to vehicles already in crosswalk	Pedestrian	2	10.5%
21956	Pedestrian must stay close to the roadway	Pedestrian	2	10.5%
21453	Red or Stop, vehicles stop at limit line or X-walk. When making right turn at a red light/stop sign driver required to yield to any vehicle approaching so closely as to constitute an immediate hazard	Driver	1	5.3%
21650	Right half of roadway, failure to drive on	Driver or Bicycle	1	5.3%
21952	Motor vehicle drivers must yield to pedestrians	Driver	1	5.3%
21955	At intersections, pedestrians can't cross anywhere except at a crosswalk	Pedestrian	1	5.3%
Total			19	100.0%

## Pedestrian Victim Injury Severity (2012-2016)



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## Pedestrian Victims by Age and Gender (2012-2016)

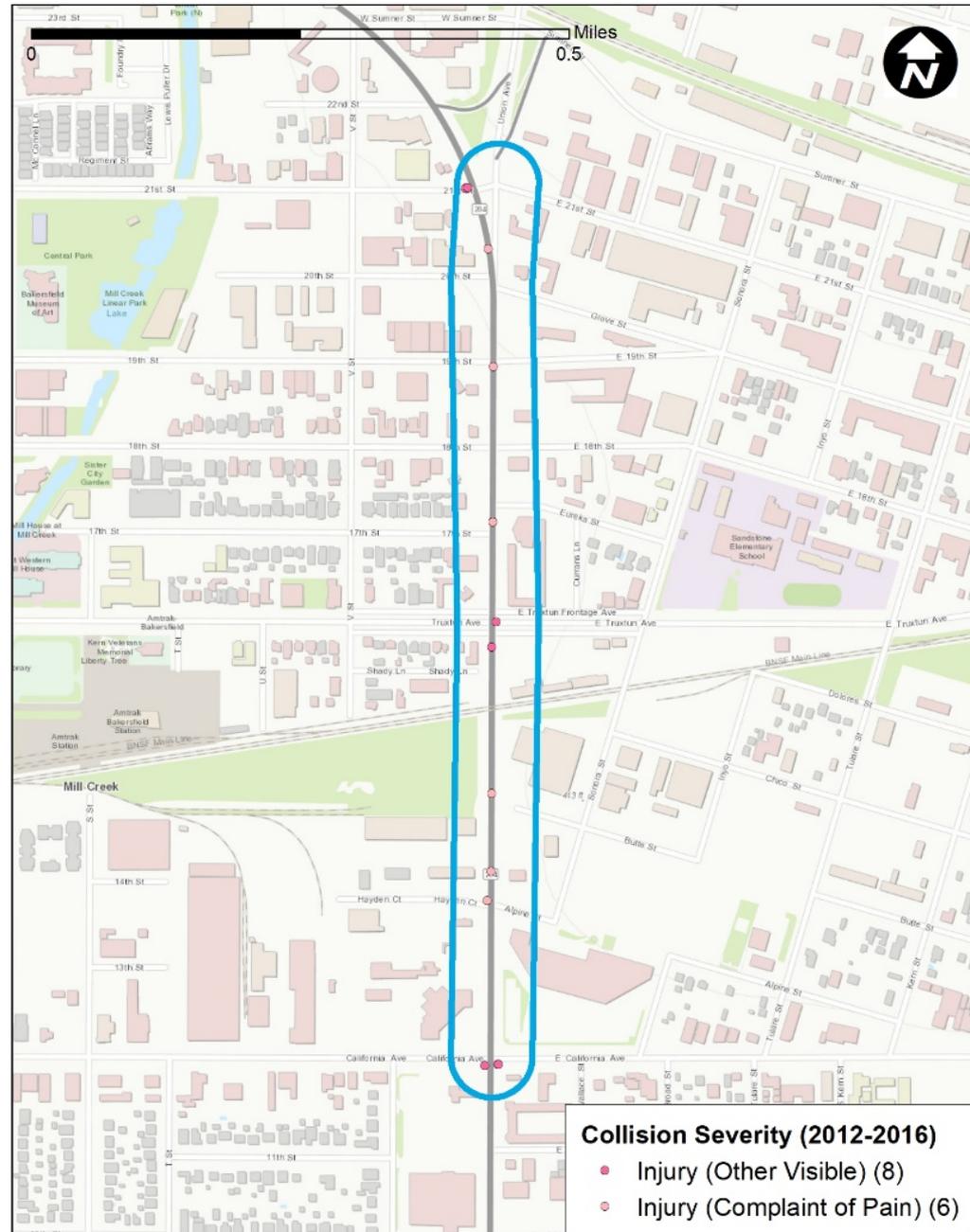


Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

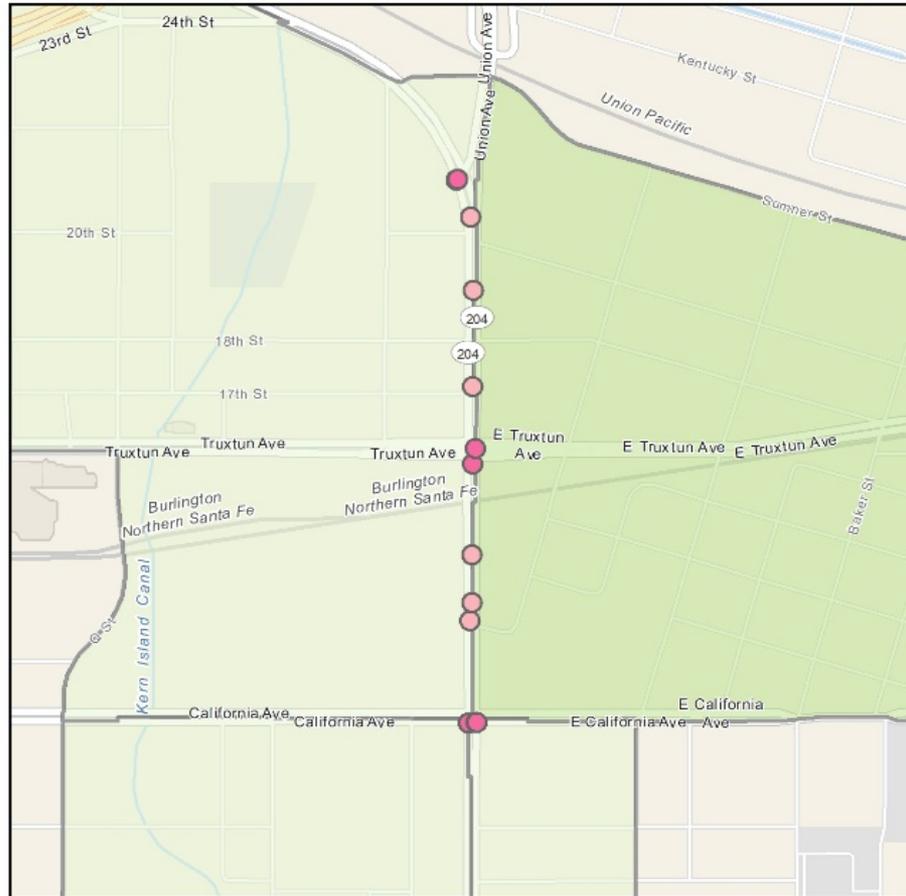
# Bicycle Collisions 2012-2016

14 collisions are mapped.

Note: 2015 and 2016 SWITRS data are provisional as of November 2017.



## Bakersfield Union Bicycle Collision Map (2012 - 2016)



### Collision Severity (2012-2016)

- Injury (Other Visible) (8)
- Injury (Complaint of Pain) (6)

### 2016 Median Household Income

- < 35K
- 35K - 50K

## Bicycle Collisions by Time of Day and Day of Week (2012-2016)

09:00PM-11:59PM -	0	0	1	0	0	0	0
06:00PM-08:59PM -	0	1	0	0	0	0	0
03:00PM-05:59PM -	0	1	1	1	0	0	0
Noon-02:59PM -	1	0	0	0	0	0	0
09:00AM-11:59AM -	0	0	0	0	0	1	0
06:00AM-08:59AM -	1	2	0	0	2	0	0
03:00AM-05:59AM -	0	0	0	0	0	0	1
Midnight-02:59AM -	0	0	0	0	0	1	0
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

\*Color gradient corresponds to collision frequency.

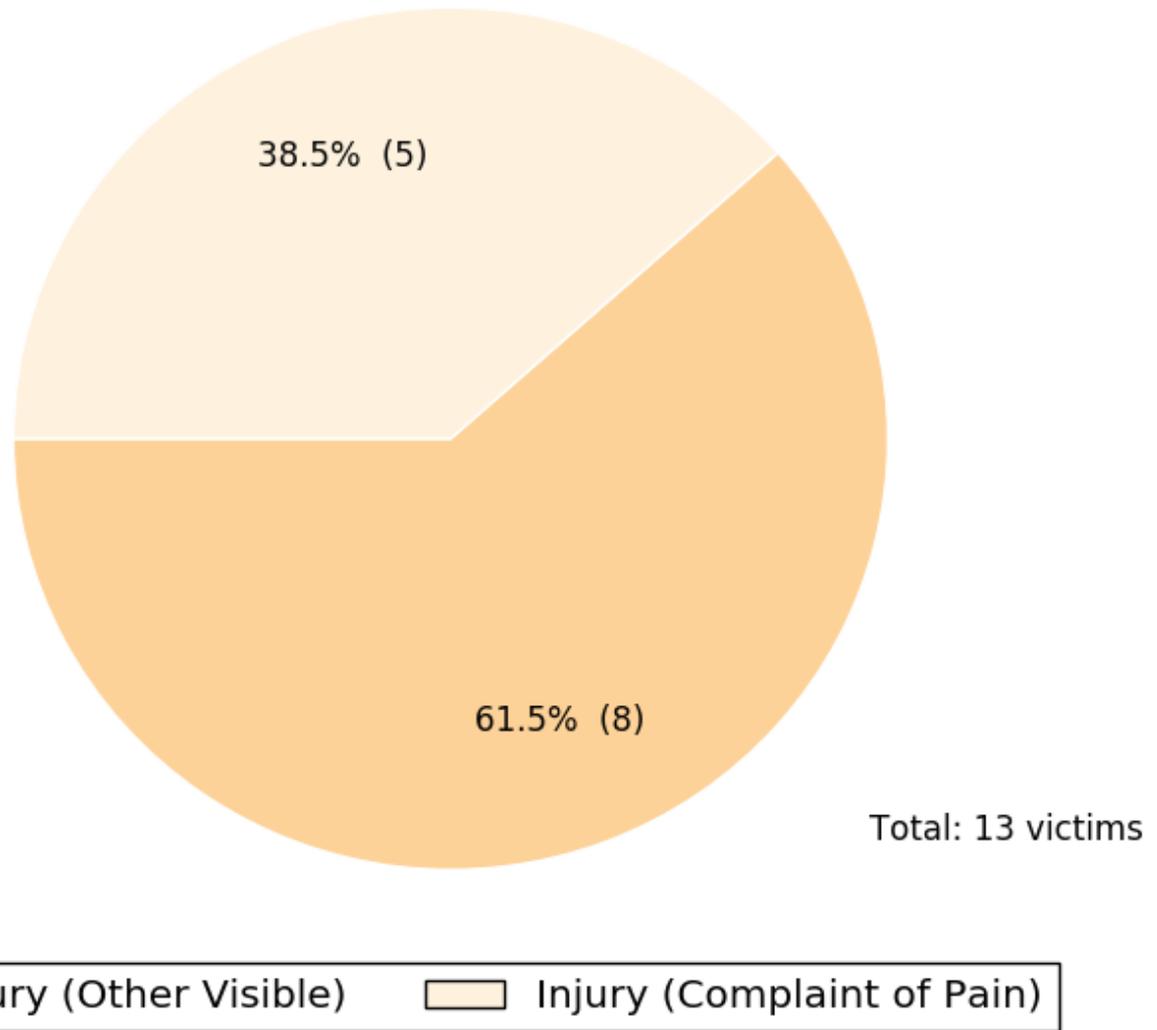
Total: 14 collisions

## Top 10 Violations in Bicycle Collisions (with # and %)

Total: 14 collisions

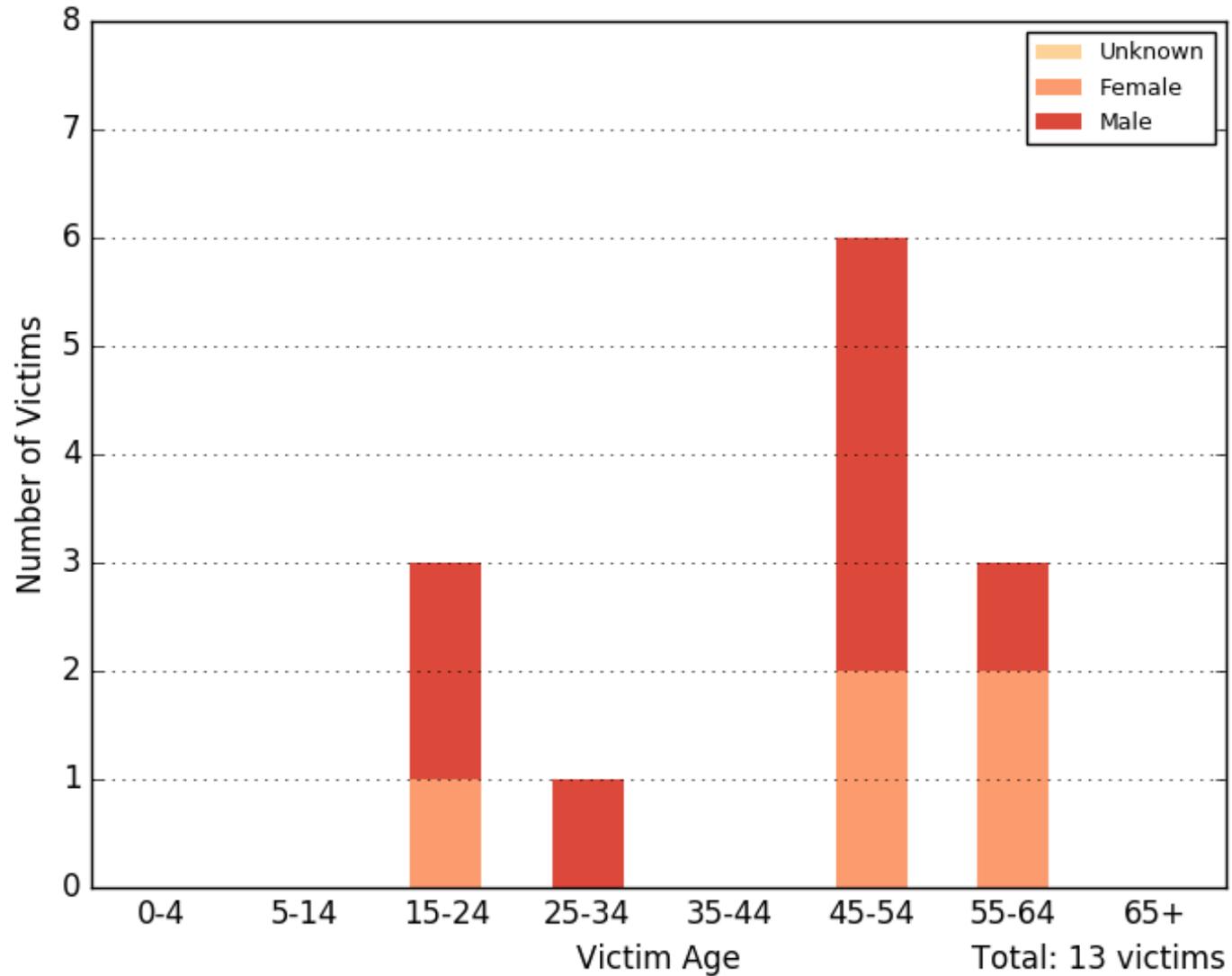
<b>CVC No.</b>	<b>Description</b>	<b>Violation Party</b>	<b>Freq.</b>	<b>Percent</b>
21650	Right half of roadway, failure to drive on	Driver or Bicycle	4	28.6%
21453	Red or Stop, vehicles stop at limit line or X-walk. When making right turn at a red light/stop sign driver required to yield to any vehicle approaching so closely as to constitute an immediate hazard	Driver	2	14.3%
21760	Drivers shall pass bicyclists only under safe conditions	Driver or Bicycle	2	14.3%
21801	Failure to yield right-of-way to incoming cars while turning left or making U-turn	Driver or Bicycle	2	14.3%
22107	Unsafe turn with/without signaling	Driver or Bicycle	2	14.3%
21800	Driver approaching an intersection must yield to driver who has entered the intersection from another highway	Driver	1	7.1%
21804	Did not yield when entering/crossing a highway	Driver	1	7.1%
Total			14	100.0%

## Bicycle Victim Injury Severity



Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## Bicyclist Victims by Age and Gender

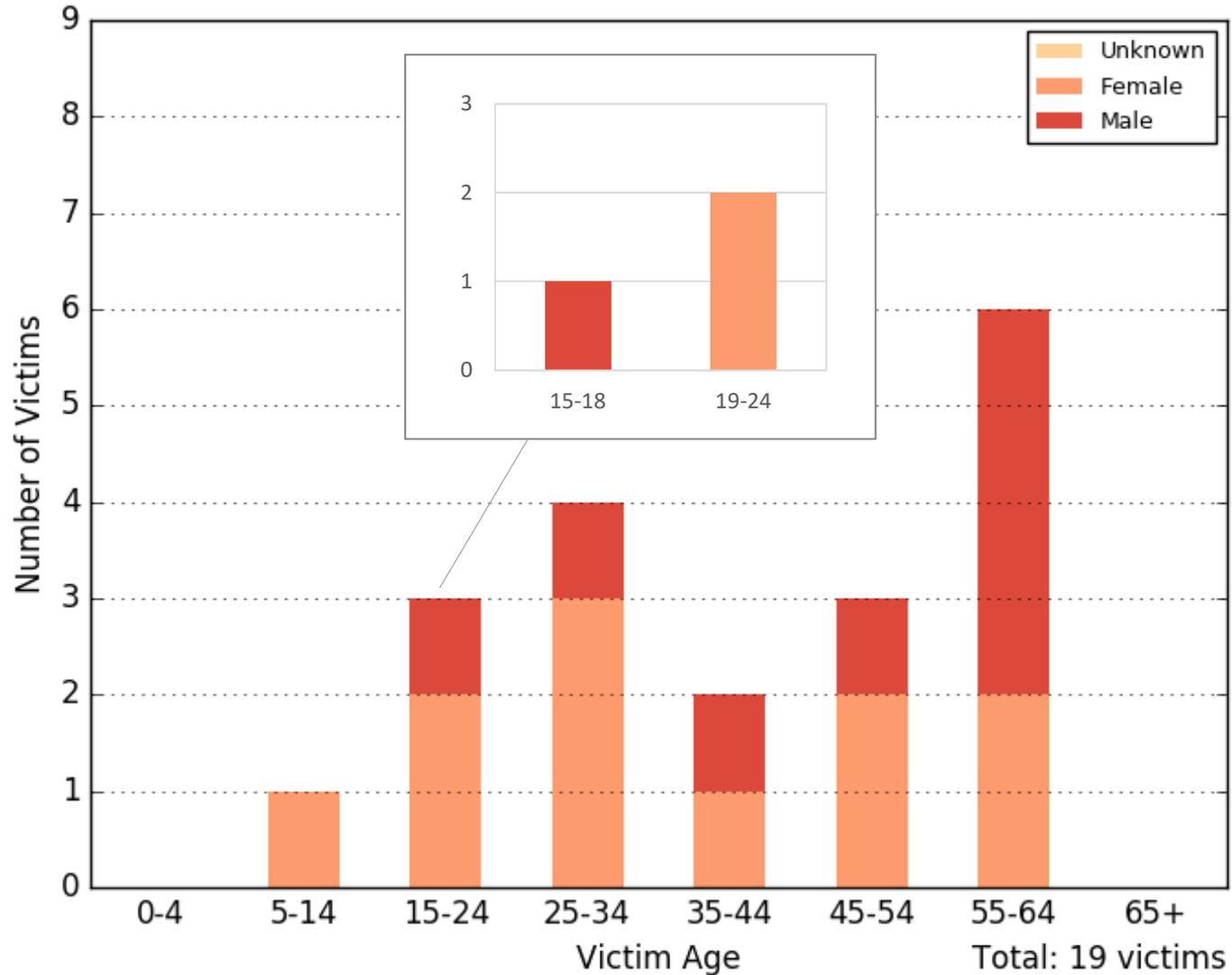


Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

# Bakersfield Union Ave

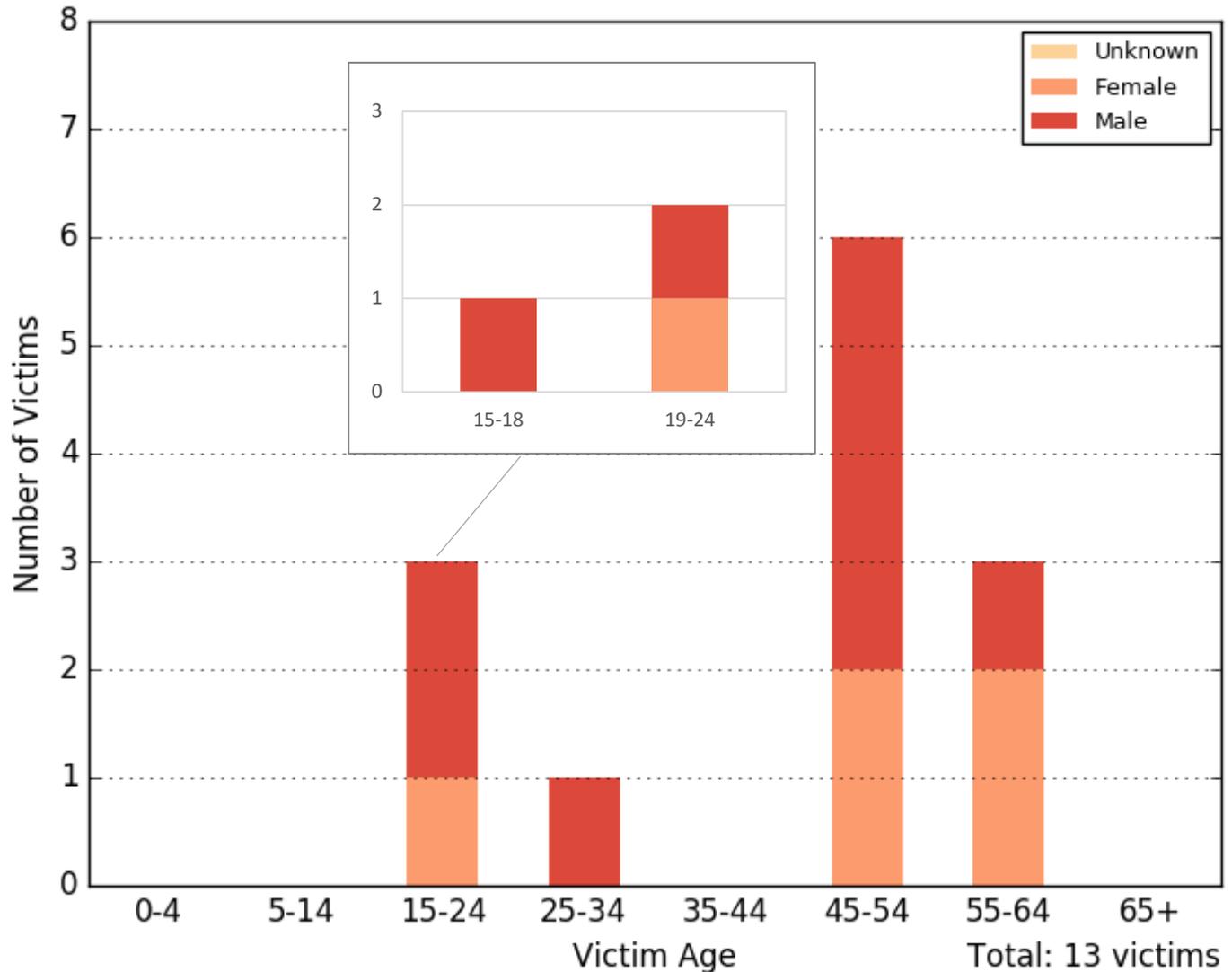
## Follow-up Data

## Pedestrian Victims by Age and Gender



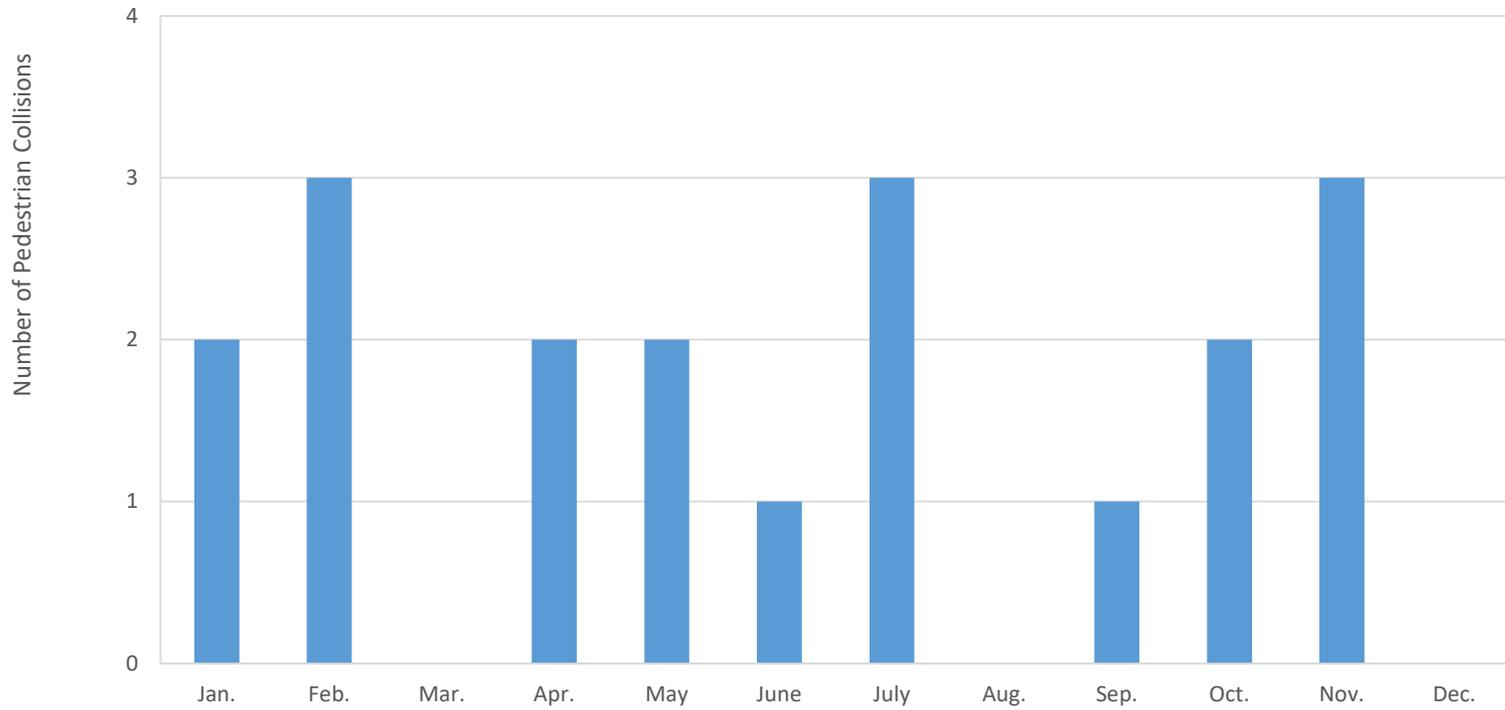
Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

## Bicyclist Victims by Age and Gender

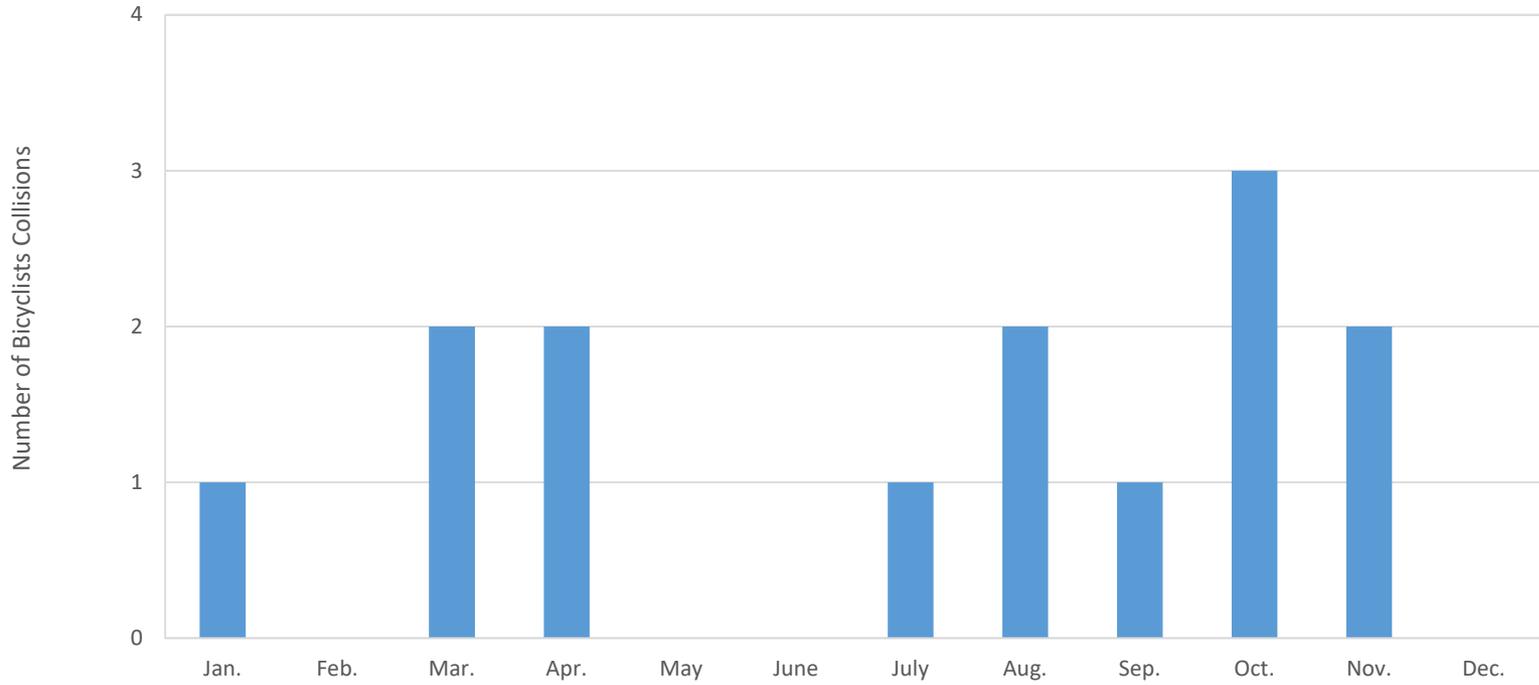


Note: 2015 and 2016 SWITRS data are provisional as of November 2017.

Pedestrian Collisions by Month on Union Ave, 2012-2016



Bicyclists Collisions by Month on Union Ave, 2012-2016



These collision analyses were prepared by UC Berkeley's Safe Transportation Research and Education Center (SafeTREC) using the Transportation Injury Mapping System (TIMS), a tool that provides quick, easy and free access to the state's crash data, Statewide Integrated Traffic Records System (SWITRS).

Register for a free account to access the tools and resources on TIMS.

[tims.berkeley.edu](https://tims.berkeley.edu)

Berkeley SafeTREC

SAFE TRANSPORTATION RESEARCH AND EDUCATION CENTER