

CITY OF KIRKLAND

VISION ZERO ACTION PLAN DRAFT

SPRING 2022



Comprehensive Plan Goal T-0: *Safety*. By 2035, eliminate all transportation related fatal and serious injury crashes in Kirkland.

Vision Zero is the goal for zero traffic fatalities and serious injuries on our streets.



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ACKNOWLEDGMENTS

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About Vision Zero



What is Vision Zero?

Vision Zero is the goal for zero traffic fatalities and serious injuries on our streets. Traffic deaths and serious injuries are preventable and unacceptable. Intervention requires a systems-based approach that not only integrates human behavior through engagement and education, but also incorporates engineering and street design as well as transportation policies and enforcement. The City of Kirkland has committed to making our transportation system safer by utilizing this holistic systems-based approach to strive toward zero traffic-related fatalities and serious injuries.

Vision Zero in Kirkland

Goal T-0. By 2035, eliminate all transportation related fatal and serious injury crashes in Kirkland.

The Kirkland City Council adopted a zero fatality, zero serious injury safety goal as a part of Kirkland's 2015 Transportation Master Plan (TMP). The Vision Zero safety goal is the very first goal listed within the plan. While Kirkland's fatality and serious injury rate is relatively low, there are still serious injuries and fatalities occurring every year. Moreover, these crash rates are not improving, particularly for people walking and bicycling. Any bicyclist or pedestrian crash is more likely to lead to serious or fatal injuries when compared to crashes involving less vulnerable users, such as vehicle drivers, who have more protection between them and other objects in a crash. Due to this, in addition to focusing on eliminating all transportation related serious and fatal injuries, the City of Kirkland Vision Zero Action Plan also prioritizes reducing *all* pedestrian and bicyclist injuries. The following goals and policies were adopted in the 2015 TMP as well, which are addressed by the creation of the VZ Action Plan:

Where it all began

The Vision Zero concept was created in Sweden in 1997 and is widely credited with a significant reduction in fatal and serious crashes on Sweden's roads since that time. Cities across the United States are adopting bold Vision Zero initiatives that share common principles:

- Traffic deaths are preventable and unacceptable.
- Street design should anticipate human error and reduce risk.
- Design for the most vulnerable users of the system.
- Speed is a fundamental factor in crash survival.
- Safe human behaviors, education and enforcement are essential contributors to a safe system.



Figure 1. City street in Stockholm, Sweden ([GEOTAB](#))

Policy T-0.1 Develop a vision zero safety plan that is multi-disciplinary and focuses on innovative approaches to safety

Goal T-1 Complete a safe network of sidewalks, trails and improved crossings where walking is comfortable and the first choice for many trips

Policy T-1.1 Improve the safety of walking in Kirkland

Policy T-1.6 Make it safe and easy for children to walk to school and other destinations.

Policy T-1.7 Improve street crossings

Goal T-2 Interconnect bicycle facilities that are safe, nearby, easy to use and popular with people of all ages and abilities

Policy T-2.1 Make bicycling safer

Policy T-2.2 Create new and improve existing on-street bike facilities

Goal T-4 Provide for efficient and safe vehicular circulation recognizing congestion is present during parts of most days

Policy T-4.6 Reduce crash rates for motor vehicles

Policy T-4.7 Mitigate negative impacts of motor vehicles on neighborhood streets

Transportation Master Plan Priorities

As part of the Vision Zero goal, four key elements of a safety plan are defined in the 2015 TMP. The following priorities shape this Vision Zero Action Plan and implementation strategies:

Emphasis: On crashes resulting in fatalities and serious injuries, with a date specific goal.

Partnerships: Policy makers, Education, Advocacy, Engineering, Emergency Services, Vehicle Manufacturers all work together

System Approach: Rather than exclusively faulting drivers and other users of the transportation system, Vision Zero places the core responsibility for accidents on the overall system design.

Data: Carefully analyze crashes and use data to make decisions for improvements.

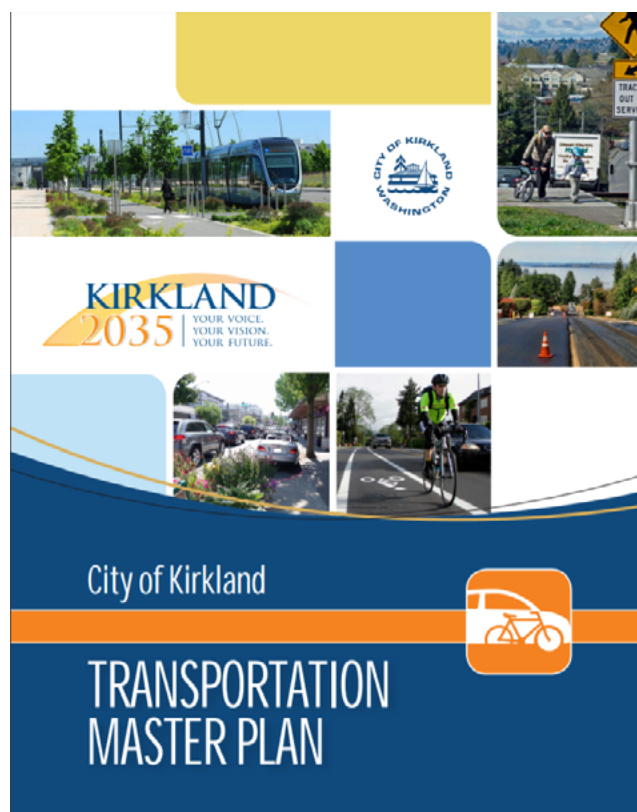


Figure 2. CoK 2015 TMP

What is a systems-based approach?

A systems-based approach focuses on the systems in place first and foremost, rather than blaming individuals as the sole cause of crashes. By targeting the system, recurring safety issues can be addressed at the root cause, rather than on a case-by-case basis. By adopting a systems-based approach, the bigger picture and trends become more defined, and lend themselves to long-term solutions.

Achieving Vision Zero: Safe Systems Approach

Kirkland has made great strides toward improving roadway safety both before and after adopting the Vision Zero policy, and has been a leader in the region with innovative safety initiatives, but there is still a long way to go. The Safe Systems approach acknowledges that human error can and will occur, and in order to significantly reduce injuries and fatalities on the road, actionable items must focus on making the systems that are in place safer. A successful Safe Systems approach minimizes the impact of life-altering human error.

Kirkland's systems-based approach will examine where collisions occur as well as the types of environments which are more susceptible to crashes. It also includes:

- **Street design** that encourages safe behavior and provides facilities to accommodate all travel modes while minimizing injuries if crashes do happen
- Use a **data-driven approach** to assess circumstances and environments that are more susceptible to crashes and implement countermeasures to prevent them.
- Building a **complete network** that supports our most vulnerable users through separation of modes, reducing speeds, discouraging fast driving behavior and designing for slower users.
- Creating a **culture of safety** by encouraging and incentivizing safe and positive behavior, informing residents and visitors about traffic laws and safe travel behaviors that respects people of all ages and abilities
- Monitoring and evaluating **how well we are doing** and **making adjustments** as needed.

Building off of the priorities from the 2015 TMP, the City of Kirkland has strategically decided on four objectives to lead the implementation process of Vision Zero throughout the city. These are addressed in greater detail in the Action Plan:

How does Vision Zero relate to Target Zero?



Figure 3. WA State Target Zero logo ([Source](#))

The Washington State Department of Transportation's (WSDOT) Target Zero shares the same goal of zero deaths and serious injuries, by 2030. The [WSDOT Strategic Highway Safety Plan](#) lays out their efforts in greater detail. Much of the sentiments align, but the WSDOT Plan was created with a much larger scale in mind.

With a larger scope, Target Zero focuses more on state highways than local roads, and doesn't identify pedestrians and cyclists as vulnerable users, nor does it account for mode share (VZ vs TZ.docx; define mode share?). Another notable difference is that Target Zero sets priority levels to determine implementation timelines, while Vision Zero does not. Due to the scope, the engineering aspect of Vision Zero and Target Zero are different.

Objective 1: Prioritize Safe Street Design

Objective 2: Operate Safe Streets

Objective 3: Build a Robust and Transparent Data Framework

Objective 4: Promote and Institutionalize a Culture of Safety

Legacy of Working Toward a Safer Kirkland

The City of Kirkland has a long history of working towards a safer community for all. Kirkland was the first city in the region to adopt a Complete Streets policy and the pedestrian flag program for high-traffic pedestrian crossings. Kirkland was the first of smaller, suburban cities to adopt a Vision Zero policy, and was at the forefront of implementing a high concentration of enhanced pedestrian crossings such as Rectangular Rapid Flashing Beacons (RRFB) compared to similar-sized cities.

Other programs that the City has implemented to increase safety include, but are not limited to:

- Neighborhood Safety Program
- Neighborhood Plan Process as part of the Comprehensive Plan
- Active Transportation Plan
- Achieving [TMP](#) goals since 2015; and monitoring goals through Progress Reports
- [Adopted Safer Routes to School Action Plans](#)
- Automated speed enforcement at school zones
- DUI prevention programs with local high schools
- Construction of neighborhood greenways



Figure 4. CoK 2020 SRTS Action Plans



Figure 6. RRFB along NE 116th St in the Juanita neighborhood ([City of Kirkland](#))



CRASH DATA ANALYSIS

CRASH HISTORY

Overview

Comprehensive crash data allows the City to focus on fatal and serious crashes, recognize overall trends of crashes, identify major contributing factors, and prioritize locations for safety improvements. Analysis of Kirkland's crash data provides clear direction for the guiding priorities outlined in this Action Plan. Five years of crash data is represented in most of the charts below as the City undertook a major annexation in 2011, however, future updates to the VZ Action Plan will include 10 years of historical data from the fully annexed City.

Overall Trends of Fatal and Serious Injuries

The chart below shows the serious injury and fatality rate as compared to some of Kirkland's neighbors and other Washington State cities with similar populations. Serious injuries are debilitating injuries and are [defined by](#) the National Highway Traffic Safety Administration's (NHTSA) as those that include broken bones, unconsciousness at the scene, paralysis, etc.

While there have been some years with relatively low (fatal/severe) crash rates, there have been years where the rates have not trended in the right direction. Between 2015 and 2019, there were **eight fatalities on Kirkland streets**. Three of these were people walking, four were people in motor vehicles and one was a motorcyclist.

Crash Rate per 10,000 People, Serious Injuries and Fatalities

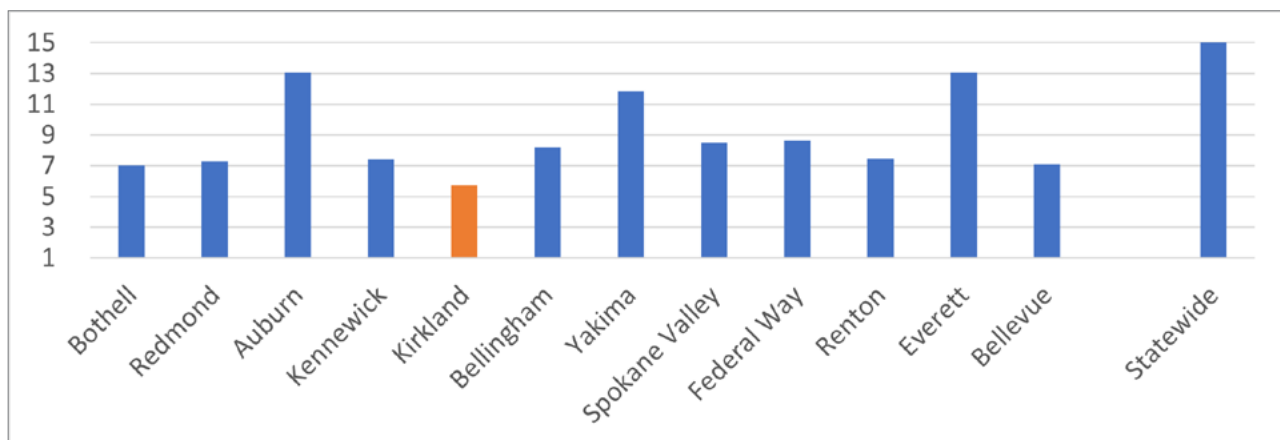


Figure 8. Crash rates across the state (2015-2019, WSDOT)

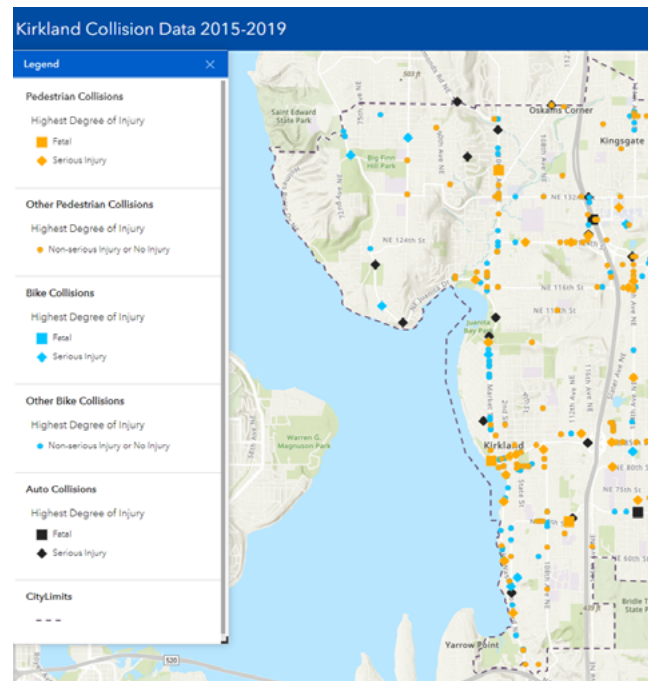
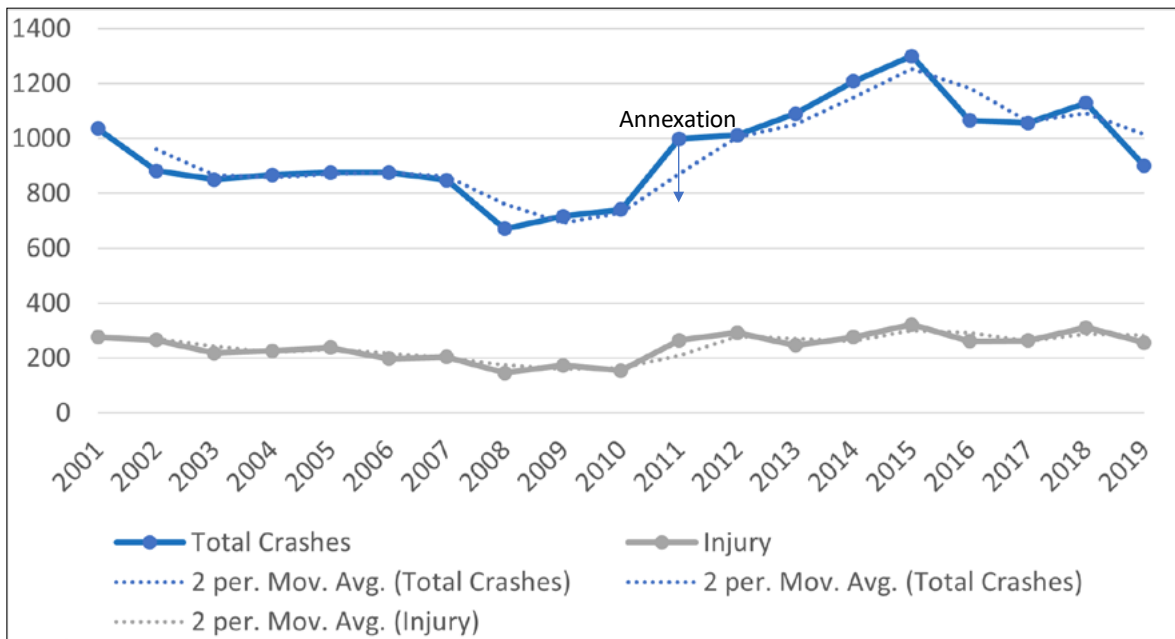
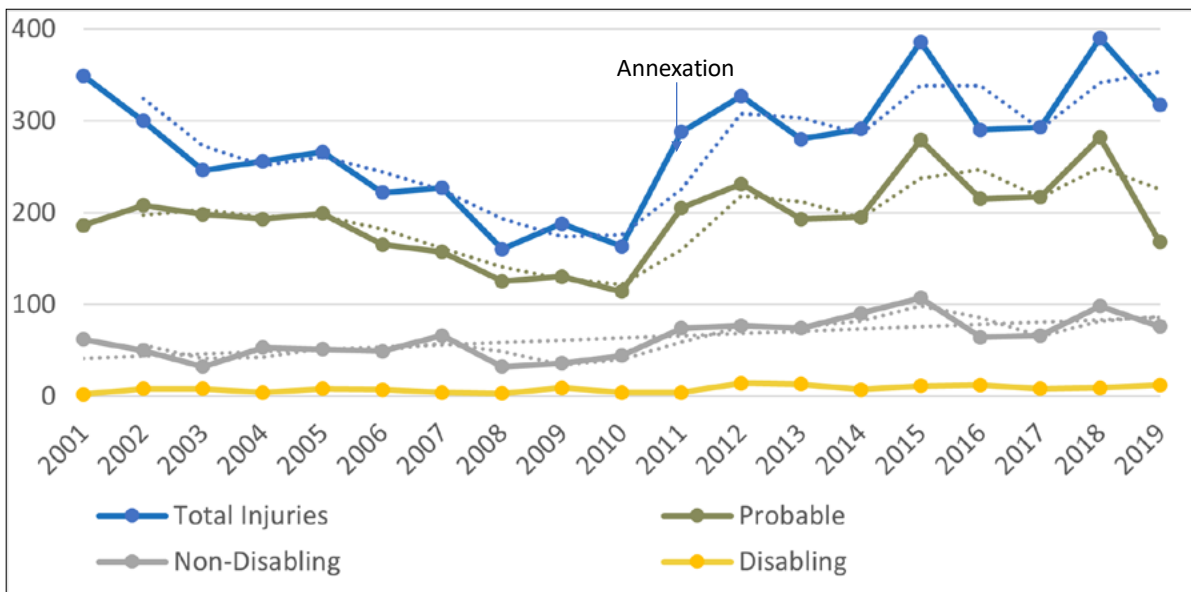


Figure 7. Crash locations can be viewed on the City's [interactive webmap](#)

Crashes by Type 2001-2019



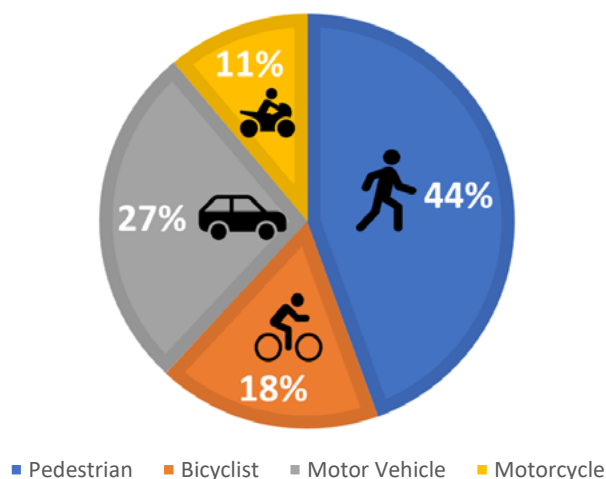
Injuries by Severity 2001-2019



**NOTE: Serious injuries are defined above. Probable injuries are suspected injuries noted by a reporting police officer but are yet to be determined as being serious (for instance, unable to determine if a limb is broken but still some obvious injury is reported).*

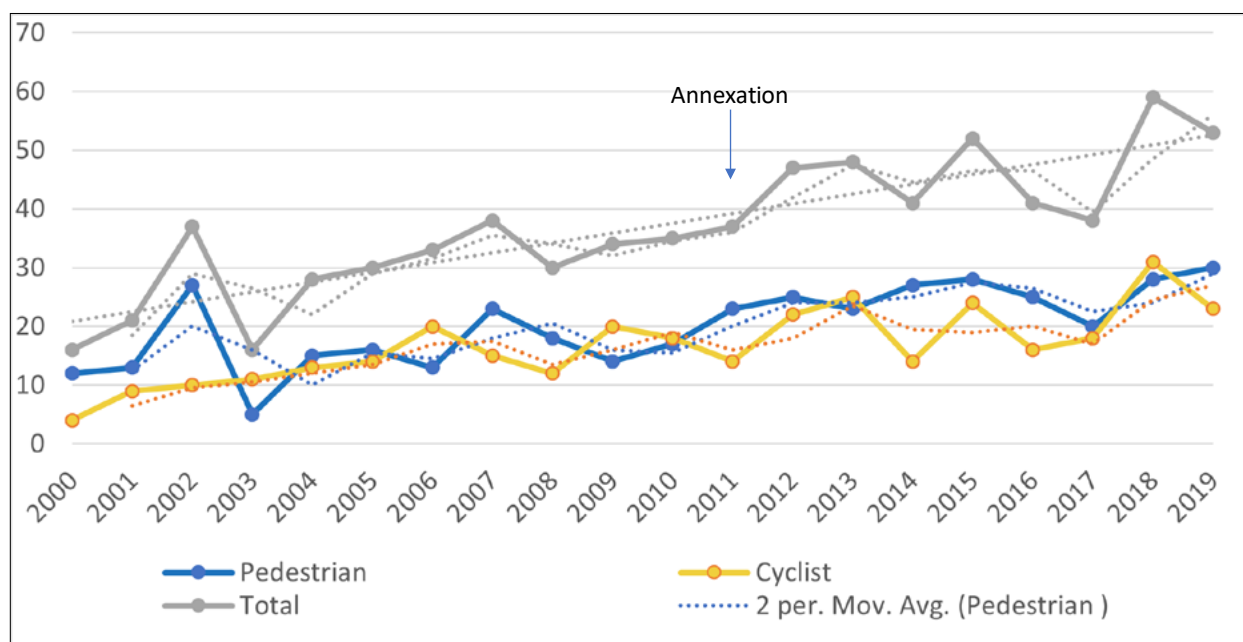
BICYCLIST AND PEDESTRIAN INJURIES

Fatal and Serious Injury Crashes by Mode
2015-2019



A particularly concerning trend is the rising rate of crashes and injuries involving people walking and bicycling. This trend is unfortunately also trending the wrong direction at the State and National levels in the last decade ([NHTSA](#) and [Washington State Target Zero](#)). In addition to the overall rising rate of pedestrian and bicycle crashes, the city also sees a higher rate of serious injuries associated with these crashes as compared to other modes. A total of 62% of all fatal and serious injury crashes between 2015 and 2019 in Kirkland are pedestrian and bicycle related.

Pedestrian and Cyclist Crashes in the Public Right-of-Way 2000-2019



Vulnerable Users

Rising pedestrian and cyclist crash rates are particularly alarming as these are most vulnerable users on the road. The speed of a motor vehicle in a crash has a significant impact on severity of injury for a pedestrian. As shown in Figure 12, the odds of surviving a collision with a car going 20 mph is 70% higher than if the car going 40 mph.

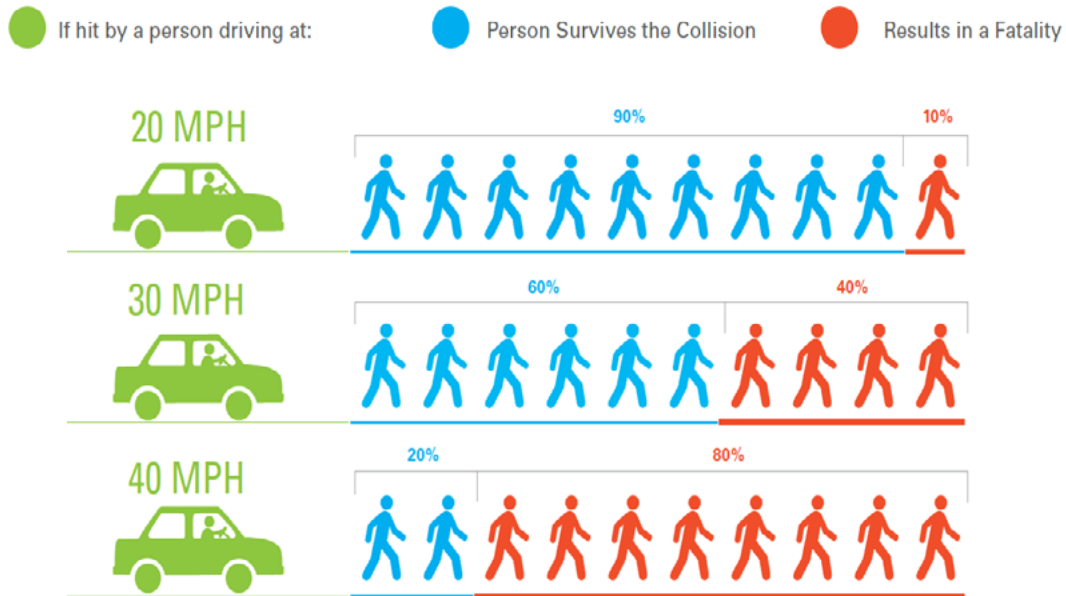


Figure 9. Fatality rates based on vehicle speed (Source - Vision Zero Two-Year Action Strategy, San Francisco)

In addition to people walking and bicycling being more vulnerable because they are more exposed and the crash rates not trending in the right direction, it is also notable that the serious and fatal injury rate is much higher when comparing to the share of total trips taken. When comparing crash rates and the share of trips on the roadway to other modes, the serious and fatal injury rate for people walking and bicycling is even more dire and important to address. Based on regional data, people walking and bicycling only take up 12% of the number of trips on the roadway (mode share) but take up 16% of all serious or fatal injuries compared to the total. Likewise, people in motor vehicles take up 81% of all trips but only 2% of crashes are serious or fatal.

Share of Fatal /Serious Injury Crashes Compared to Share of All Trips

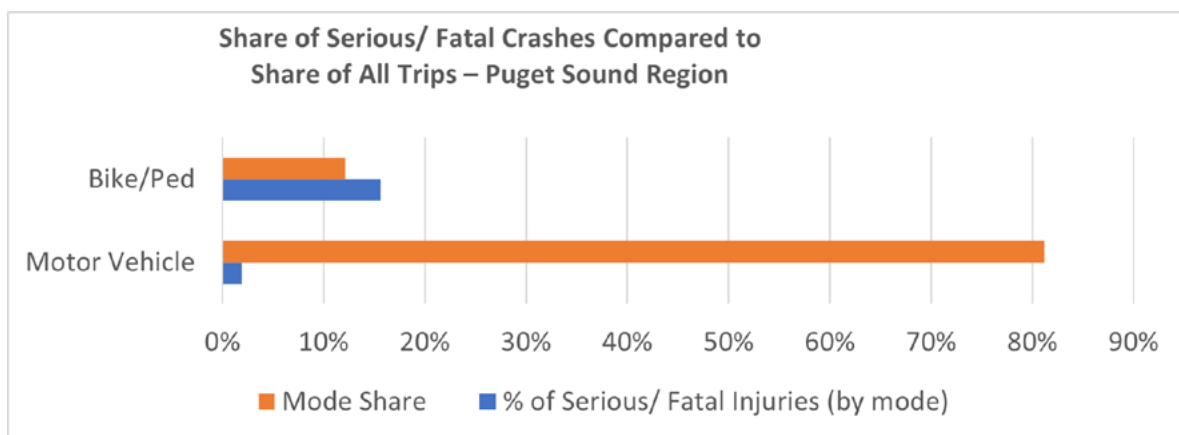


Figure 10. Source: PSRC 2017/2019 Household Travel Survey mode share, WSDOT (Puget Sound Region – 2019)

The following chart shows the rate of injury as compared to all total crashes. 76% of crashes that involve a motor vehicle result in no injuries whereas only 11% of total crashes that involve a pedestrian or cyclist result in no injury.

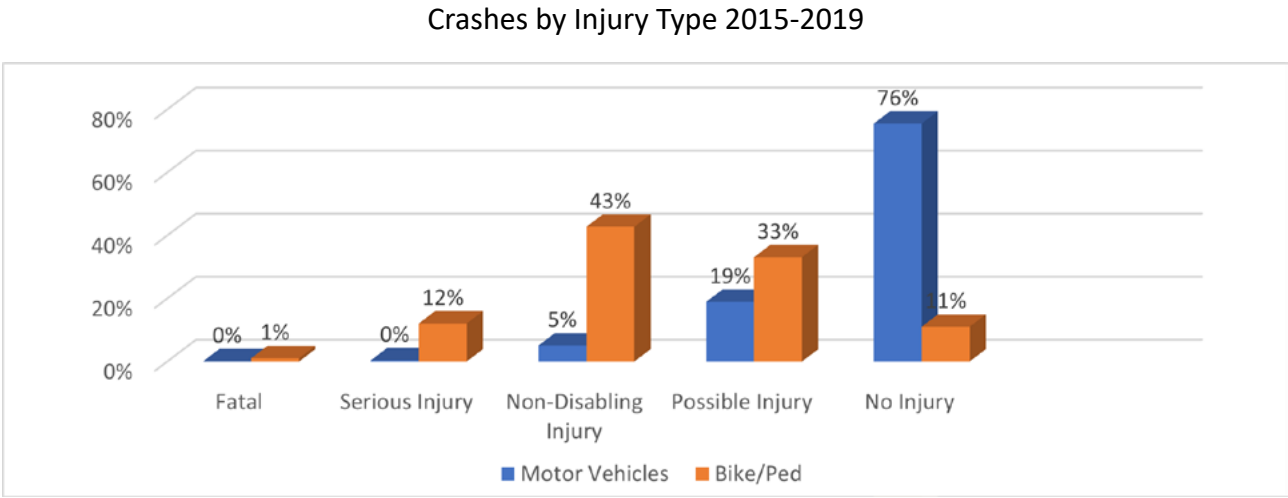


Figure 12. Crashes by Injury Type (2015-2019)

State data also demonstrates this trend, with motor vehicles having 2% share of all fatalities and serious injuries while bike/pedestrian share was 20%. For this reason, Kirkland’s Vision Zero Action Plan assesses all bike/pedestrian injuries regardless of severity in addition to all serious and fatal crashes.

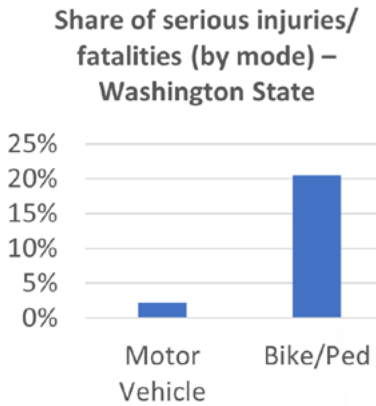


Figure 11. Source: WSDOT (Statewide – 2019)

All Pedestrian and Bicyclist Collisions 2015-2019

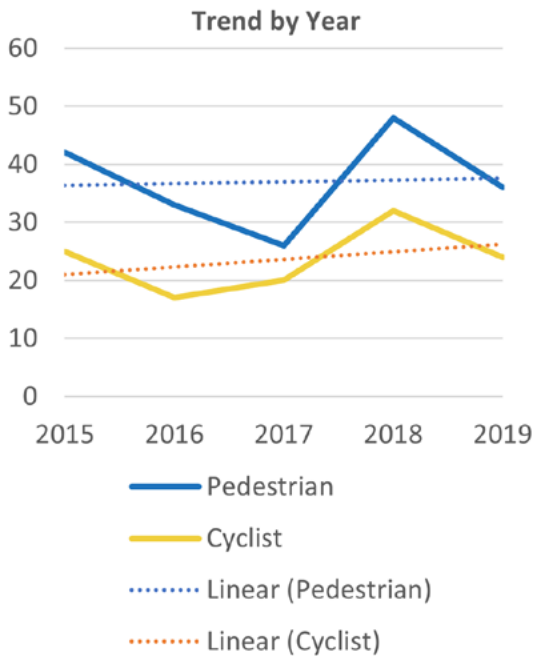


Figure 13. Trend by Year (2015-2019)

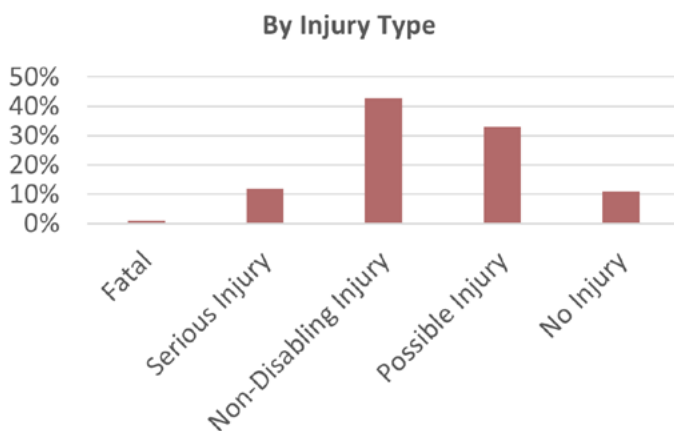
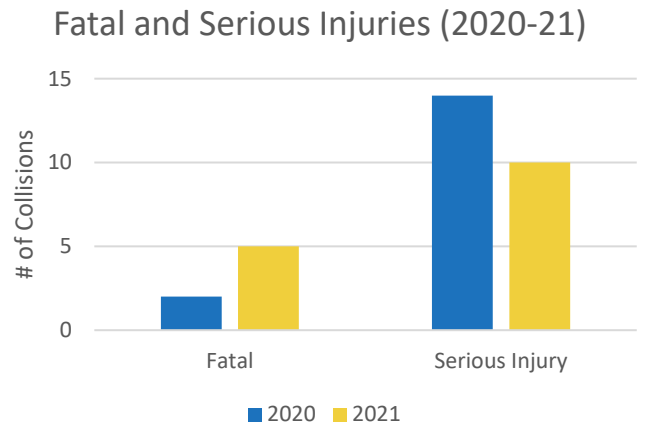


Figure 14. Crashes by Injury Type (2015-2019)

2020-21 Crash Data

The following data gives a snapshot of crashes in 2020 and 2021. As part of Objective 3 (Identified below in the Action Plan section), the City will use the Vision Zero website to report and post additional crash data analysis not included in this report. This will include a look at the COVID-19 pandemic related travel patterns and impacts on crashes in Kirkland.



Because people walking and rolling are more vulnerable users of the system, meaning they are more exposed and risk of injury is greater, and because the trend is not improving, this plan will also focus on evaluating and improving safety for people walking and rolling in addition to serious injuries and fatalities for all modes.

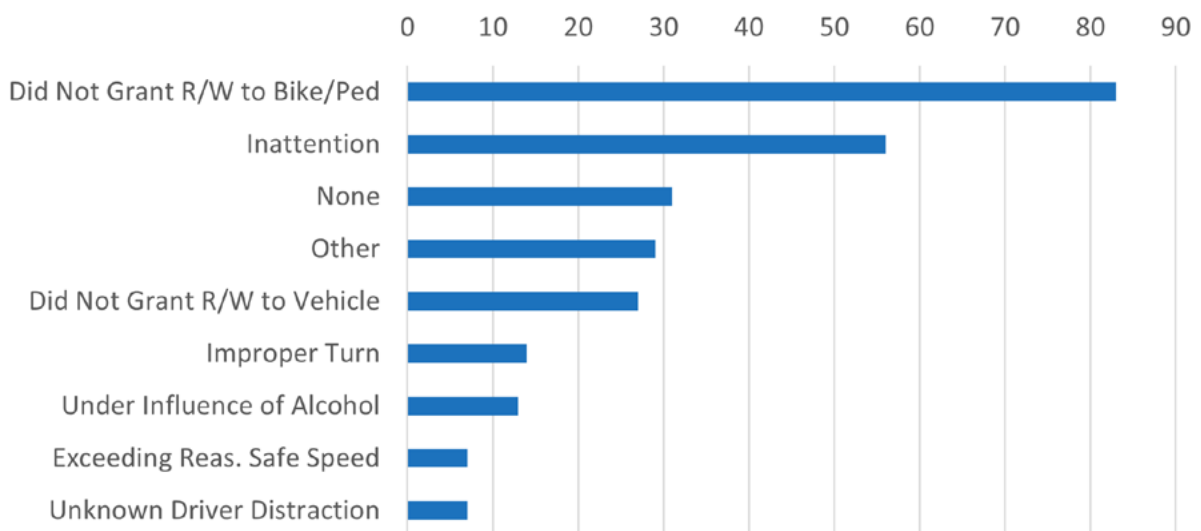
RISK AND CONTRIBUTING FACTORS

There are many factors that contribute to crashes. These include factors attributable to human behavior as well as to the physical environment.

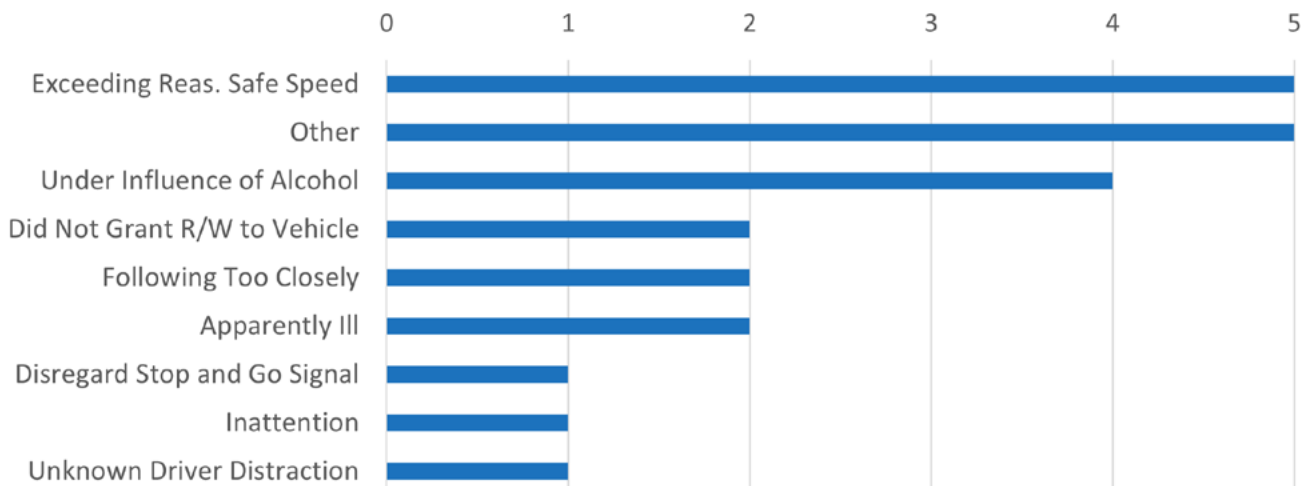
Human Element

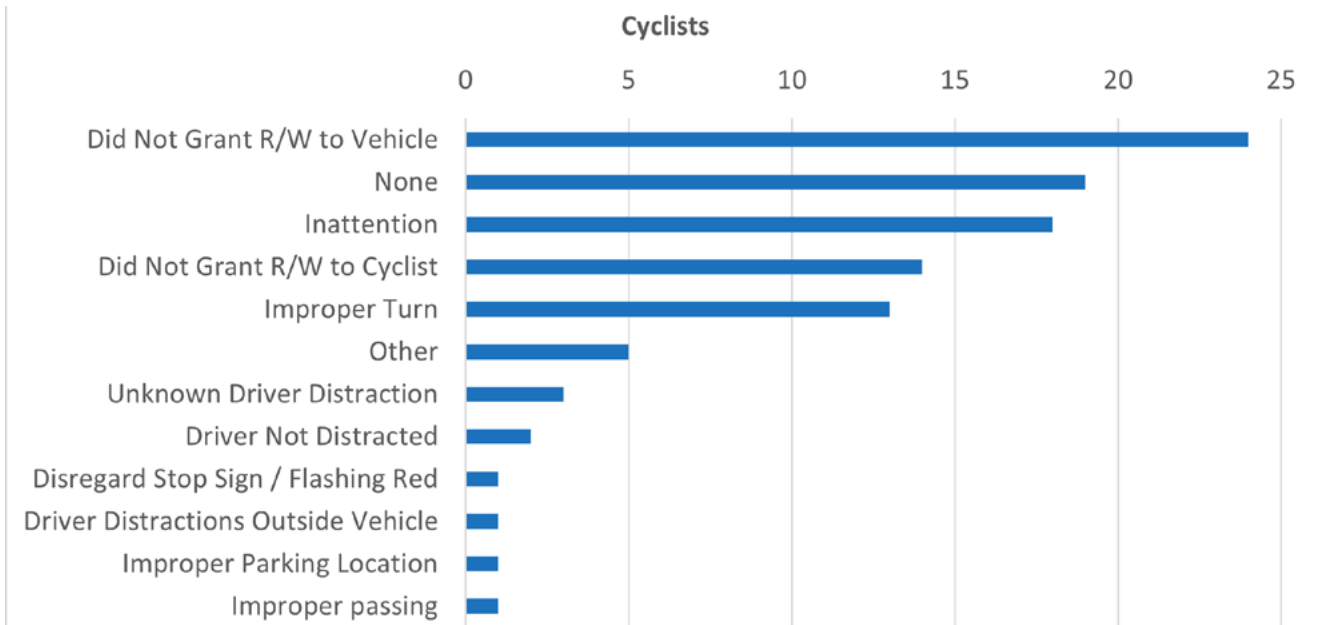
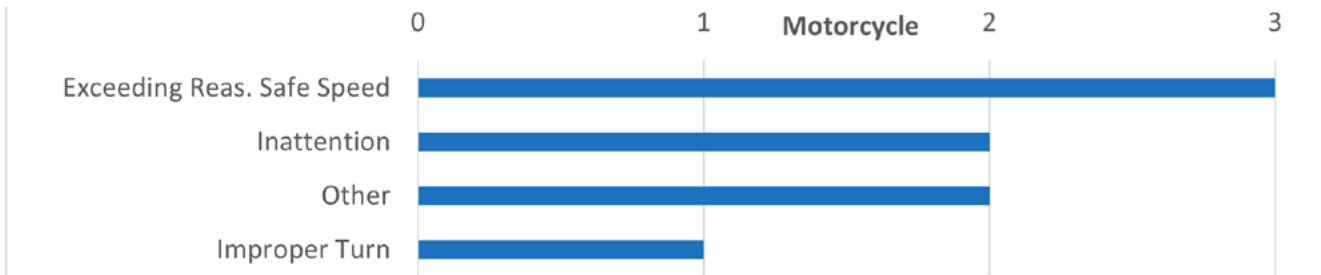
Contributing factors that fall under the human element include but not limited to attention, distraction, fatigue, sobriety, and driving speed. Kirkland's crash data indicates that the primary human factors contributing to serious injuries and fatalities are speeding and driving under the influence. Primary human factors that contribute to other pedestrian and bicycle injuries are failure to yield to other roadway users and inattention such as talking or texting while driving.

Top Contributing Factors: Human Element
All Fatalities, Serious Injuries, and Other Bike/Ped Injuries

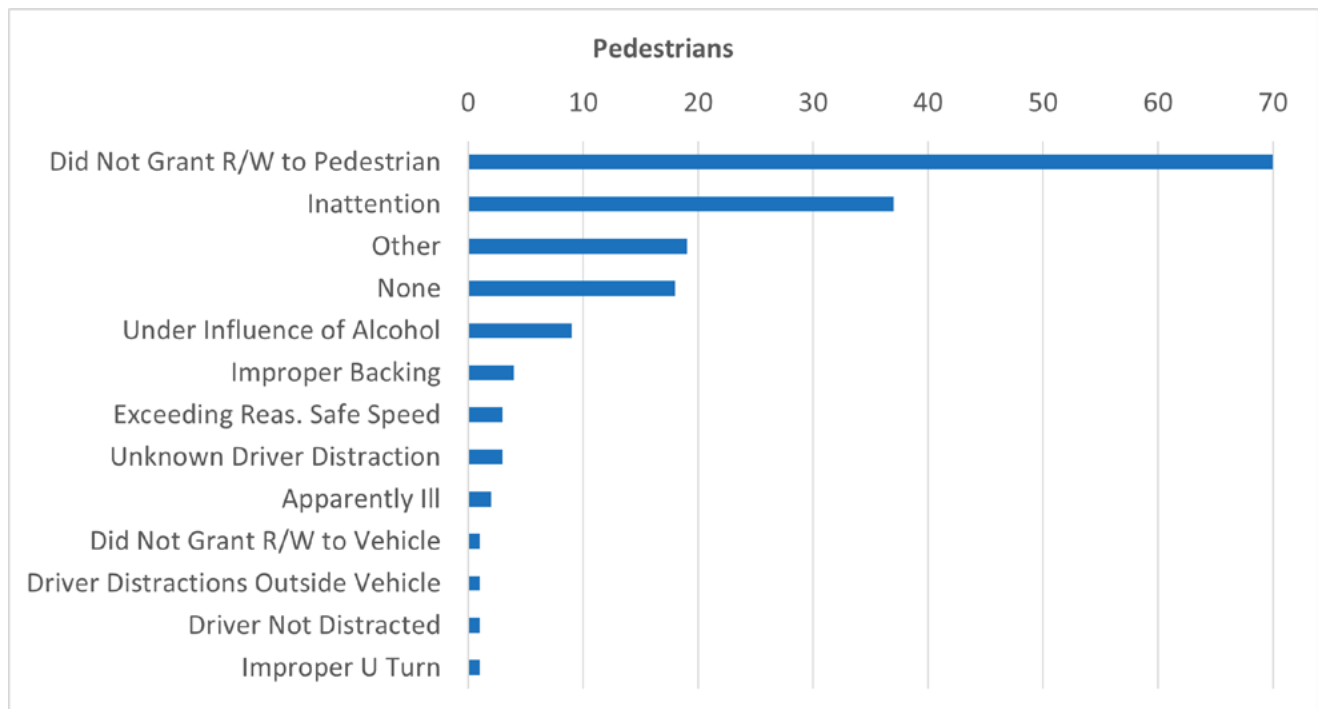


Motor Vehicle





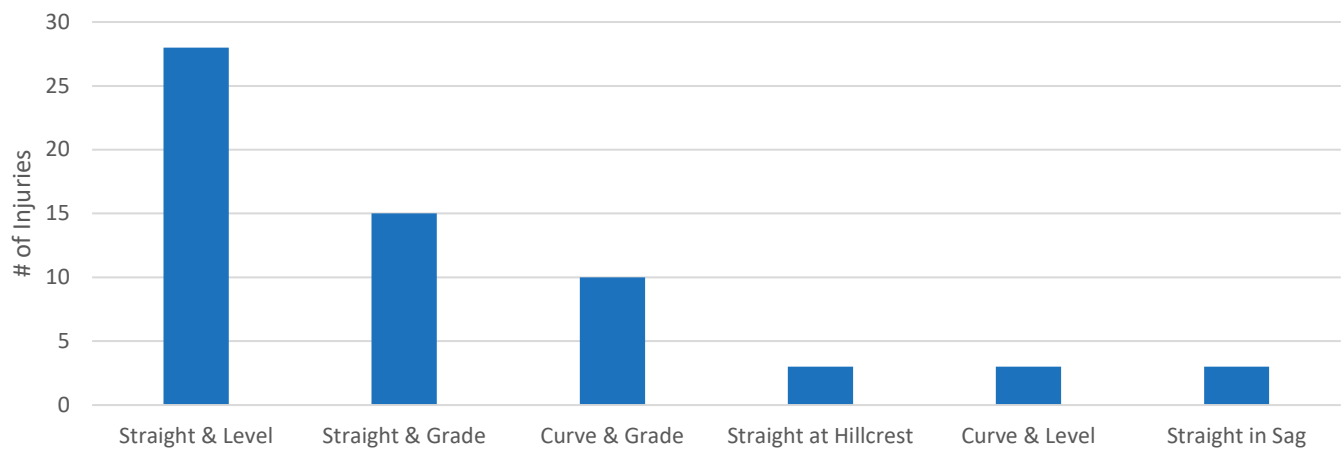
* Further analysis from the police department indicate the majority of these crashes are not the fault of the bicyclist failing to yield



Environmental Element

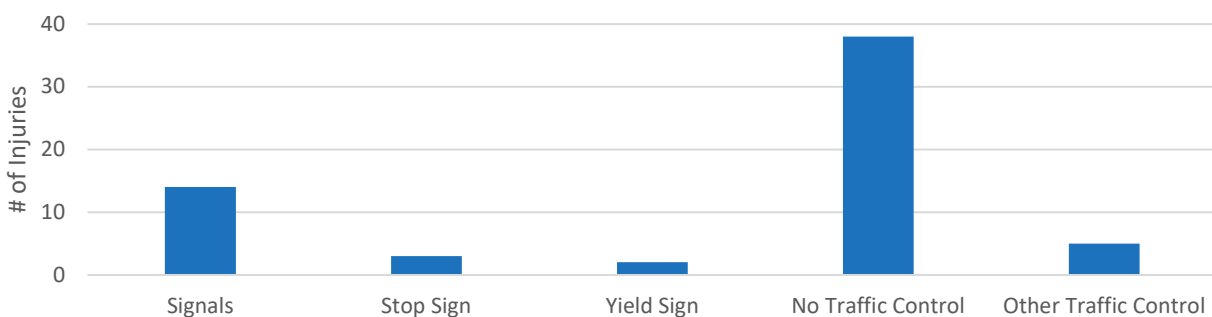
In terms of the physical environment, the primary environmental contributing factors are roadway characteristics including posted speed limit and design speed, type of intersection control, presence or absence of other traffic control devices, road alignment such as horizontal and vertical curves, grade and presence of marked crossings. Although weather and light can also be a factor, Kirkland's crash data has shown these are not significant contributors since most crashes occur during daylight and dry conditions. Icy roads are a contributor but not necessarily to fatal/severe crashes and are less frequent.

Fatal and Serious Injuries - Roadway Characteristics



The majority of fatal and serious injuries in Kirkland are in areas with no traffic control devices at intersections. In addition, long straight roadways combined with speed and inattention are major contributing factors but areas with slopes and horizontal and vertical curves are also areas that the City may consider for countermeasures. This information can be used in other areas of the city where crashes are less frequent but those contributing factors may indicate an environment for a future crash. Using this data and implementing countermeasures can prevent future crashes from occurring.

Fatal and Serious Injuries - Traffic Control Devices

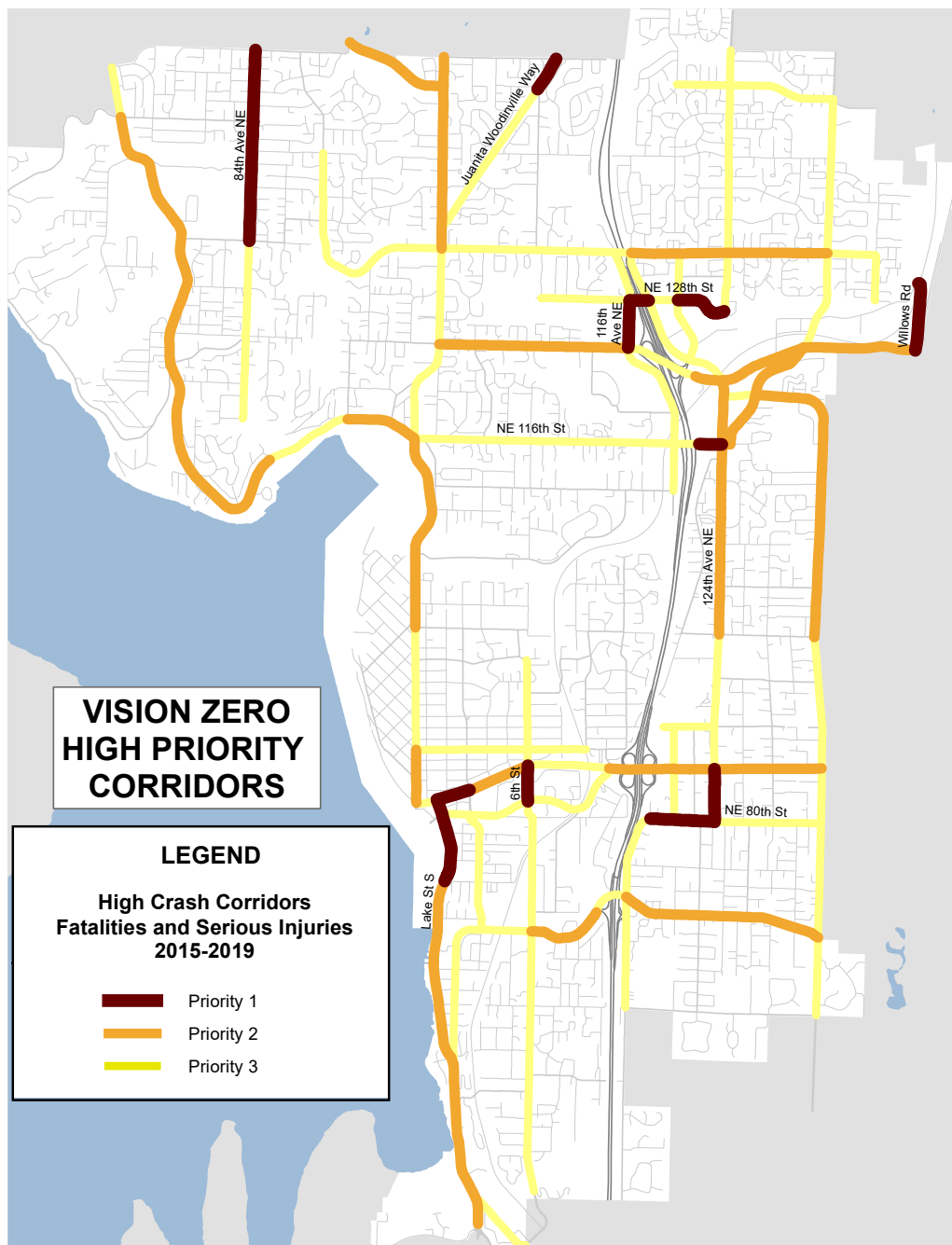


Examples of countermeasures include, but are not limited to, greater separation of modes, restrictive turn movements, lowering speed limits, narrowing lanes to reduce speeds, shortening crossing distances, creating dedicated walk and bike signal phasing, enhanced crossings, etc.

HIGH CRASH CORRIDORS (HCC)

TOTAL SERIOUS INJURIES AND FATALITIES

Assessing crash rates help identify locations in the system where crash patterns occur. High Crash Corridors (HCC) are street segments that have been analyzed to be more collision-prone than others based on fatal and serious injury collisions. These corridors are mapped in Figure XX to indicate where further analysis should be conducted and potential investments could be prioritized. Each corridor is divided into segments defined by roadway characteristics so each segment will have similar features such as speed, number of lanes, volume and number of crossings. The analysis calculates the crash rate by segment accounting for the total number of serious and fatal crashes along the corridor, the length of the facility and the average vehicle volume.







ACTION PLAN



OBJECTIVES

This Vision Zero Action Plan has one goal and that is to reduce serious injuries and fatalities to zero. The following objectives and strategies outline activities that the City will prioritize to address risk, design and operate safe streets, address a systems-based approach and encourage safe behavior from users of the transportation system.

OBJECTIVE 1: PRIORITIZE SAFE STREET DESIGN

Engineering and design of the roadway environment is one of the most important elements of the safe systems approach for Vision Zero. People make mistakes and the goal is to minimize harm when human behavior causes crashes.

Strategy 1a. Evaluate high crash corridors and intersections to identify potential engineering improvements and countermeasures

Strategy 1b. Grow system of separated bicycle and pedestrian facilities (such as protected bike lanes, network of neighborhood greenways, etc.)

Strategy 1c. Use best practices in the design of intersections and crosswalk enhancements

Strategy 1d. Use best practices when implementing capital projects

Strategy 1e. Conduct land use and transportation facilities analysis on high priority corridors (for example the 128th St Corridor Study)

OBJECTIVE 2: OPERATE SAFE STREETS

The operation of safe streets is another element where engineering and a safe systems approach can have great impact on meeting the Vision Zero goal. Assessing speed limits and looking at technologies to better control traffic flow and reduce conflicts can reduce crash rates and decrease harm if and when crashes do happen.

Strategy 2a. Evaluate and update speed limit setting policy citywide

Strategy 2b. Utilize signal modifications to increase safety (leading pedestrian intervals, bicycle specific signal phases and signal heads, pedestrian scrambles, etc.)

Strategy 2c. Grow school enforcement camera program

Speed plays a significant role in the severity of injury when crashes occur. Controlling speeds is done through a combination of strategies such as speed limit setting, design, enforcement, and technology (such as radar speed signs). The City is also growing the school enforcement camera program and implementing other safety improvements near schools. All of these strategies will continue to be used and evaluated further in areas where speeding is a factor in crashes. In addition, the city will re-evaluate how speed limits are set city-wide on arterials and on local streets.



and consider additional school zone safety improvements

Strategy 2d. Prevent blocking of crosswalks and bike facilities

Strategy 2e. Form a response team to evaluate crash factors, determine whether immediate safety improvements are needed after any fatal crash

OBJECTIVE 3: BUILD A ROBUST AND TRANSPARENT DATA FRAMEWORK

A data driven approach can help the city both assess where crashes are happening but also look at patterns and environmental characteristics that can help identify other similar locations to prevent future crashes from occurring. Reviewing serious injury, fatality and bicycle and pedestrian crashes will be a major component but this body of work will also include analyzing all crashes, even property damage crashes, to assess patterns and conflicts that can be identified and potentially prevented. Additional analysis will also include age groups and demographics to better identify outreach strategies. This helps the city identify countermeasures and tailored approaches to increase safety in specific locations. Additionally, communicating crash data to the public can be used educate and demonstrate the impact of behavior, and provides transparency about how the city is tracking and addressing safety related challenges.

Strategy 3a. Seek opportunities to improve collision data collection and analysis (such as additional sources, address data anomalies, etc.)

Strategy 3b. Improve web interface to provide more transparent data to public (web-map, dashboard)

Strategy 3c. Seek innovations in technology to improve understanding of contributing factors and preventative measures

Strategy 3d. Collect before/ after data for safety improvement projects (on high crash corridors)

Strategy 3e. Conduct risk exposure analysis for vulnerable users

Strategy 3f. Expand the traffic monitoring program to support additional analysis (pedestrian and bicycle counters, risk exposure analysis)

OBJECTIVE 4: PROMOTE AND INSTITUTIONALIZE A CULTURE OF SAFETY

As noted earlier in the report, human behavior is fallible and often contributes to crashes. Mistakes happen

but often choices such as speeding, driving under the influence or driving while distracted can have dire consequences. Education is a critical component to this Vision Zero Action Plan. Awareness and encouraging safe behavior are critical to meeting the goal for Vision Zero.

Strategy 4a. Educate the public on Vision Zero and contributing factors (human behavior, seasonal, weather related, specific laws, etc.)

Strategy 4b. Work with developers and contractors to provide safe routes through construction

Strategy 4c. Work with school district and resource officers to enhance traffic safety education in schools

Strategy 4d. Coordinate with City departments on data sharing, messaging the community, and continuing education to maintain culture of safety

IMPLEMENTATION

WHAT'S NEXT?

This Action Plan identifies specific strategies the city will take to meet the Vision Zero goal to reduce traffic fatalities and serious injuries to zero. These approaches involve coordinating across city departments and with other agencies. The city will engage a multi-departmental team, called the Vision Zero Service Team, to outline next steps to implement these objectives and strategies. Part of this work includes continuing to seek additional data, conduct more detailed assessments and continue to evaluate how well the city is doing to reach Vision Zero. Staff will report back to Council periodically on progress and will incorporate these strategies into the update of the Transportation Master Plan. These periodic updates to Council will also identify steps, progress and timelines for specific strategies.

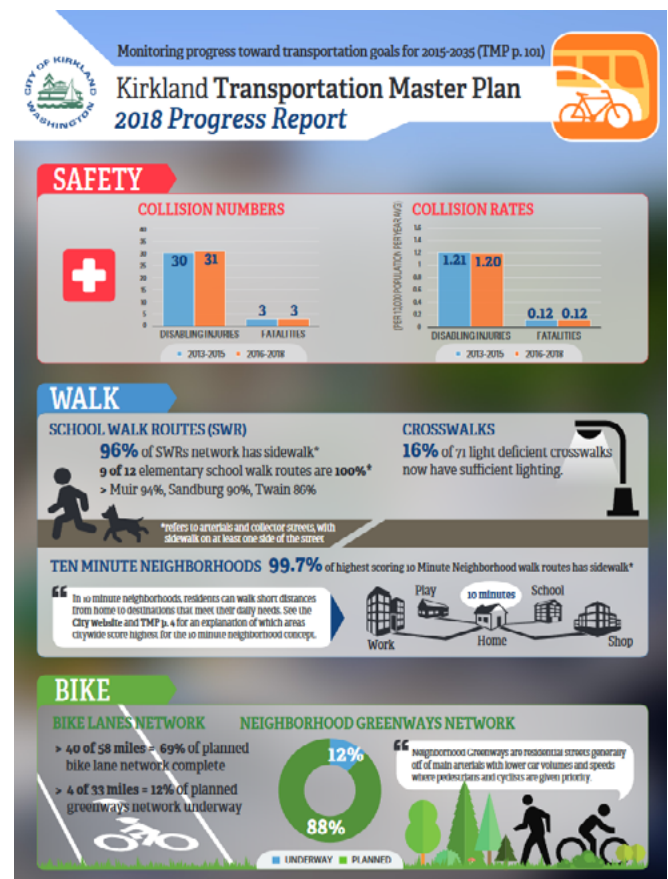


Figure 17. CoK TMP 2018 Progress Report

Additionally, as countermeasures and engineering solutions are identified, these will be brought back to Council on a case-by-case basis for approval and coordination on specific implementation strategies.

Most of the objectives included in this report are actions that are ongoing and work that evolves and changes over time. This Action Plan outlines these objectives to communicate Kirkland's work program in the form of action steps that will continue and grow.