Safer Streets Action Plan

City of Redmond, WA

Prepared for City of Redmond
Prepared by Transpo Group

March 2025

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Letter from Mayor Angela Birney

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Safety is at the forefront of Redmond's transportation projects. With Redmond advancing from suburb to city, strengthening the City's culture of safety within its transportation network becomes even more important. The City of Redmond is deeply committed to ensuring that our streets are safe for all residents, visitors, and commuters. Redmond's Safer Streets Action Plan formally establishes the City's goal to eliminate fatal and serious injury traffic crashes while fostering a culture where transportation systems promote safety, for everyone.

The Safer Streets Action Plan represents a crucial step forward in our efforts to reduce traffic-related injuries and fatalities, enhance mobility for all modes of transportation, and create a more connected and vibrant community. Developed through a cross-departmental effort with city staff, this plan includes possible policies, programs, and projects that are driven by data and community input. Backed by the United States Department of Transportation's Safe System Approach, Redmond's Safer Streets Action Plan provides opportunities for Redmond to pursue federal grant funding for transportation safety improvements. By implementing evidence-based safety measures, we will enhance pedestrian and bicyclist-friendly routes, further develop safe routes to schools, and establish a foundation for a citywide culture of safety. The Safer Streets Action Plan helps to address Redmond's immediate community needs while planning for a sustainable future.

Through this plan, our goal is to make our streets safer, and more accessible, fostering more opportunities for the community to gather in positive and creative settings. The City of Redmond will implement this plan with local partners and the community. With a collaborative approach to eliminating fatal and serious injury crashes, we are taking necessary steps toward reducing congestion, promoting alternative transportation options, and improving the health and well-being of our city. With the adoption of the Safer Streets Action Plan, together we can build a safer Redmond.

In partnership,

Angela Birney
Mayor, City of Redmond

City Hall
PO Box 97010
15670 NE 85th Street
Redmond, WA
98073-9710

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Safe Streets and Roads for All Safety Action Plan Checklist

The Safer Streets Action Plan (SSAP) for the City of Redmond meets the requirements of the US Department of Transportation's Safe Streets and Roads for All (SS4A) Program. The City's plan was developed using the SS4A's Action Plan components self certification checklist, as published in February of 2024. The SSAP also follows the State of Washington's guidance for the development of Local Road Safety Plans (LRSP). The two safety programs, one at the national level, and one at the state level, have similar goals and the City's plan needed to be flexible to meet the requirements of each program to not only guide the City's safety improvements and meet the goals of Vision Zero, but to remain eligible for implementation funding to assist in building safety improvements on the City's transportation network. The chapters of the SSAP have been titled to follow the SS4A checklist, but are ordered in a manner that allows the LRSP to be identified separately when used for the Washington State Highway Safety Improvement Program (HSIP) application process.

The SS4A Checklist requirements have been met by the following chapters:

Leadership Commitment and Goal Setting

Chapter 1

Planning Structure

Chapter 2

Safety Analysis

Chapter 5

Engagement and Collaboration

Chapter 2

Equity Considerations

Chapter 2

Policy and Process Changes

Chapter 4

Strategy and Project Selections

Chapter 5

Progress and Transparency

Chapter 6

Action Plan Date

Chapter 5

Executive Summary

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Introduction

The City of Redmond is committed to and invested in the improvement of transportation safety on its streets, sidewalks, trails, and other transportation facilities. City staff and elected officials have recognized the importance of integrating a culture of safety, through engineering practices, educational outreach, and equitable, targeted enforcement.

Through a safety-oriented culture, and using the guiding principles of the Safe System Approach, the City's goal is to eliminate fatal and serious injury crashes.

Excerpt from Resolution 1559 on the City of Redmond website:

> Through adoption of the Safer Streets Action Plan, the Redmond City Council is committing to a ***50 percent reduction*** in fatal and serious injury crashes by the end of the year 2030. Further, the Council is committed to ***eliminating all fatal and serious injury crashes*** by the end of the year 2035.

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Executive Summary

Leadership Commitment

The City of Redmond, including Mayor Angela Birney, the City Council, and City staff are invested in advancing the safety of the transportation network for all modes in the City. Using a Safe System Approach, leadership is committed to taking action to update policies and procedures, implement proactive infrastructure improvements and develop a safety culture among staff and users of the transportation network.

Planning Structure and Engagement

The City's actions include creation of a task force, and conducting outreach to engage with the community and understand an array of viewpoints on the improvements that can be made to increase transportation safety. The Task Force has provided valuable feedback and will continue to meet on a regular basis to update crash data, celebrate successes and continue to gather feedback on evolving transportation safety concerns. Outreach to the community has taken the form of Road Safety Assessments (RSA) with community members and with City staff. The RSAs, conducted in the Education Hill Neighborhood, involved walking on along a designated route to cite spot and systemic potential safety improvements, discuss what is and is not working, and gather real-time feedback.

Executive Summary

City Policies and Processes Review

As part of the review process, the City's current design manuals were reviewed for opportunities to incorporate current safety best practices and processes. The policy and process review was informed by the results of the Local Road Safety Plan development and the City's Roadway Safety Assessment and recommends methods to integrate the recommendations of both safety-focused planning efforts into the City's design standards, policies and guidelines. Many of the strategies included in the Safer Streets Action Plan require minimal additional funding to implement but may require adjusting current processes to optimize for better safety outcomes.

Three areas of focus were analyzed for **potential safety improvements**:

City policies and design standards revisions

New or revisited programs

Community outreach and engagement

Following a review of the above-listed areas of focus, the following **categories of changes** to City practices to improve safety outcomes are recommended for implementation:

Revision of City documented policies and standards

Adjustments of standard practices via cultural norms and advocacy

Development and execution of new programs

Details of the recommended changes to policies and processes are included in the implementation checklist.

Executive Summary

Local Road Safety Plan

The Local Road Safety Plan (LRSP) is a comprehensive safety analysis, identification and prioritization of risk factors, and conceptual design for proactive safety countermeasure projects to be constructed across the City of Redmond's transportation network. The LRSP is also a requirement for the state of Washington's Highway Safety Improvement Program (HSIP). The LRSP is a standalone document for the City's eligibility and application to the HSIP program, as well as a component of the Safer Streets Action Plan. The City of Redmond's Local Road Safety Plan follows a process developed by the Federal Highway Administration (FHWA) and promoted by WSDOT to proactively address safety concerns based on crash data. WSDOT's success with a similar program at the county level in reducing crash rates for targeted risk factors has led to the application of the LRSP process for cities to identify risk factors and targeted countermeasures. The LRSP analyzed crash data in a 5-year FHWA and WSDOT prescribed study period, 2018 through 2022, and identified trends in contributing factors to all crashes, but with a specific focus on crashes resulting in a severe injury or fatality. The crash data was analyzed statistically and spatially, resulting in the following risk factors for future crashes:

- **Pedestrians in Marked Crossings**
- **Crashes on 30 mph+ Roadways**
- **Bikes in Existing Facilities**
- **Crashes on Median Divided Roadways**
- **Crashes at Signalized Intersections**
- **Improper Speed for Conditions**

To proactively address the risk for crashes presented by the above risk factors, the following types of countermeasures are proposed to be implemented in both spot locations, and systemically across the City's transportation network. Working in combination with the policy and process changes, the following engineered changes will help to reduced the severity and incidence of future crashes.

- High Visibility Crosswalk Markings
- Signalized Crosswalk Improvements and Signage
- High Friction Surface Treatment Program
- Enhanced Bike Lane Protection
- Bike Lane Relocation
- Median Separated, 35 mph+ Limit Intersection Program
- Add Enhanced Pedestrian Crossings at High Demand Locations
- Reducing Vehicle Speeds Through Automated Enforcement
- Citywide Speed Limit Study

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Executive Summary

The LRSP process identified specific locations where implementation of countermeasures would result in safety improvements. The following projects are candidates for funding through grant programs such as HSIP and SS4A, and could be implemented by the City, as funding allows, in the short to long-term.

Project 01 - Citywide Speed Limit Study

A citywide safe speed study will evaluate the existing posted speed limits on all arterial and collector roadways owned and maintained by the city. The objective of the effort would be to develop speed limit setting policy and recommend speed limit changes based on the NACTO 2020 City Limits, Setting Safe Speed Limits on Urban Streets (City Limits) publication, and best practices incorporated recently by other nearby agencies. ***Estimated cost: $200,000.***

Project 02 - 148th Avenue NE Safety Corridor Project

The 148th Avenue NE safety corridor project would incorporate elements of several proposed countermeasures throughout the corridor, improving conditions for all modes, but with a specific focus on the safety and comfort of active mode users. ***Estimated cost: $1,518,000.***

Project 03 - 166th Avenue NE Safety Corridor Project

The 166th Avenue NE safety corridor project would incorporate elements of several proposed countermeasures throughout the corridor, improving conditions for all modes, but with a specific focus on the safety and comfort of active mode users. ***Estimated cost: $1,123,000.***

Project 04 - Old Redmond Road Safety Project

The Old Redmond Road safety project would include countermeasures to address risk factors around bike facilities, and crashes occurring in inclement weather at significant intersections. ***Estimated cost: $1,646,000.***

Project 05 - NE 85th Street Active Mode Safety Pilot Project

A pilot project that the City of Redmond is interested in implementing as a potential precursor to future modifications of bike facilities in other corridors is to flip the location of existing striped bike lanes and existing on-street parking on NE 85th Street between 154th Avenue NE and 164th Avenue NE. ***Estimated cost: $130,000.***

Project 06 - Avondale Road Bike Improvements Project

The Avondale Road Bike Improvements project would address risk factors associated with a roadway that has a higher speed limit (40 mph), a raised median, multiple lanes and an existing striped on-road bike facility. ***Estimated cost: $17,500,000.***

Executive Summary

- short range project (0-2 yr)
- medium range project (2-5 yr)
- long range project (5+ yr)

Next Steps

The first five chapters of the Safer Streets Action Plan identify many actions the City should take to proactively address safety risk factors and advanced towards the goal of eliminating all fatal and serious injury crashes by the end of the year 2035. A summary of those next steps is presented below:

Chapter 1

- Update the City's Complete Streets Policy
- Develop a Complete Streets checklist for project review

Chapter 2

- Continue to engage with the Safety Task Force
- Post-crash response task force
- Identify opportunities for future Road Safety Audits

Chapter 4

Update the City's code and design manual for traffic signals

- City code Section 10.24.070
- Section II(C) Pedestrian Scrambles
- Section IV(C) Lead Pedestrian Interval
- Section IV(I)(1) Backplates
- Section IV(P) Blank-out signs

Update roadway geometry standards

- Table 2 - Street widths
- Section A.7.b curb radii
- Section A.7.d.b.2 lane encroachment
- Section A.21 safety of vulnerable users

- Update speed limit policy
- High visibility enforcement in Pedestrian Zones
- Signal operational changes and signing modifications in Pedestrian Zones
- Pedestrian safety educational outreach

Programmatic safety strategies

- Automated speed enforcement
- Safe Routes to School
- Traffic Gardens
- Speeding educational and enforcement campaign
- Urgency reduction outreach campaign
- Celebrating success
- Pedestrian and bike user safety campaign

Chapter 5

- Project 01: Citywide Speed Limit Study
- Project 02: 148th Avenue NE Safety Corridor Project
- Project 03: 166th Avenue NE Safety Corridor Project
- Project 04: Old Redmond Road Safety Project
- Project 05: NE 85th Street Active Mode Safety Pilot Project
- Project 06: Avondale Road Bike Improvements Project

1

Leadership Commitment

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1 Introduction

The City of Redmond is committed to and invested in the improvement of transportation safety on its streets, sidewalks, trails, and other transportation facilities. City staff and elected officials have recognized the importance of integrating a culture of safety, through engineering practices, educational outreach, and equitable, targeted enforcement.

Through a safety-oriented culture, and using the guiding principles of the Safe System Approach, the City's goal is to eliminate fatal and serious injury crashes.

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1

Leadership Commitment

On June 19, 2022, the City of Redmond codified its commitment to safety and adopted Resolution no. 1559. The Resolution endorses Vision Zero to strive to achieve zero traffic deaths and serious injuries on Redmond streets. The resolution directs the administration to review the Comprehensive Plan and Transportation Master Plan to determine what updates, revisions, or additional policies are warranted to advance Redmond's Vision Zero goals. Resolution 1559 includes an endorsement of Vision Zero as part of a comprehensive effort to strive to achieve zero traffic deaths and serious injuries on Redmond streets but does not set a timeline for this effort.

The full text of Resolution 1559 can be viewed on the City of Redmond's website.

Through adoption of the *Safer Streets Action Plan*, the Redmond City Council is committing to a **50 percent reduction** in fatal and serious injury crashes by the end of the year 2030.

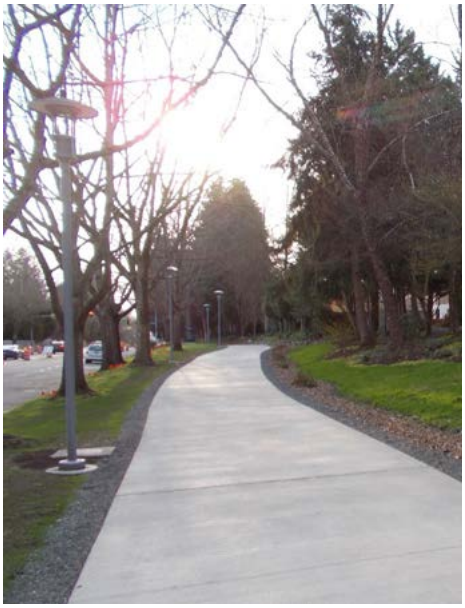
Further, the Council is committed to ***eliminating all fatal and serious injury crashes*** by the end of the year 2035.

1

Safety Successes

The City of Redmond has put safety at the forefront of past and ongoing projects and programs, and has implemented many traffic safety measures to date. The following list highlights completed and ongoing safety improvements in Redmond. The City looks to build upon these projects with the strategies outlined in the Safer Streets Action Plan.

- **156th Avenue NE separated bike lanes** – This high-comfort bicycle facility separates bicycles from pedestrian and vehicle traffic, reducing conflict points and creating a safe environment for all road users.
- **NE 40th Street shared use path** – Another low-stress and high-comfort facility in Overlake, the NE 40th Street shared use path separates the walking and rolling community from vehicles.
- **No right on red (NROR) blank out signs** – By continuing to implement no right on red signage, Redmond reduces vehicle conflicts between pedestrians and bicyclists in crosswalks and right-turning vehicles, especially during the morning and afternoon peak periods.
- **Leading pedestrian intervals (LPIs) –** Redmond looks to build upon current intersections with LPIs to give pedestrians more time to cross at signalized intersections, while making drivers more aware of pedestrians in crosswalks.
- **Adaptive signals** – Redmond's upcoming adaptive signals project planned for implementation in 2025 will improve vehicle movement along Redmond Way by adapting in real-time to improve congested conditions and will provide more time for pedestrians to cross signalized crossings when needed
- **Pedestrian crossing improvements including Rectangular Rapid Flashing Beacons (RRFBs)** – Redmond makes mid-block crossings safer for pedestrians with RRFBs that draw attention to pedestrians and improve driver yielding at crosswalks.
- **MioVision cameras** – Redmond is installing these cameras at nearly 20 additional signalized intersections allowing better traffic management while also providing data for more advanced conflict analysis, including near-miss incidents.
- **Reducing the number of travel lanes on streets**, including NE 85th St, Redmond Way, Cleveland St, and Bel-Red Rd, to make them easier for pedestrian to cross, provide bike lanes, and calm traffic.



NE 40th St Shared Use Path

156th Ave NE Separated Bike Lanes

1

Safe System Approach

The "Safe System" approach is based on the following principles:

Safer Land Use
Encourage land development and siting of facilities to minimize conflicts, encourage multimodal access and support other Safe System efforts.

Safer Vehicles
Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.

Safer Speeds
Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, targeted education, outreach campaigns, and enforcement.

Safer Roads
Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.

Post Crash Care
Enhance the survivability of crashes through expedient access to emergency medical care.

Safer Road Users
Encourage safe, responsible driving and behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.

The City of Redmond joins regional and local partners in their commitment to transportation safety and the application of the Safe System Approach to achieve Vision Zero, including efforts by the Puget Sound Regional Council to develop a Regional Safety Action Plan, King County's formal adoption of the Safe System Approach, and the efforts of Redmond's neighbors - Bellevue and Kirkland - to achieve Vision Zero.

The City's Local Road Safety Plan (2024), incorporated as Chapter 5 of the Safer Streets Action Plan, focuses on identifying risk factors and Safer Road and Safer Speeds strategies. This Safer Streets Action Plan furthers the work of the LRSP and incorporates additional strategies for Safer People as a whole, Safer Vehicles, and Post Crash Care strategies.

Redmond has adopted WSDOT's modified version of FHWA's Safe System Approach with six categories of systemwide safety improvements. WSDOT's modified version includes Safer Land Use as a critical complementary component of transportation safety. The following pages describe in detail how the City's approach to safety improvements, through the Safer Streets Action Plan, meet the six categories of WSDOT's modified Safe System Approach.

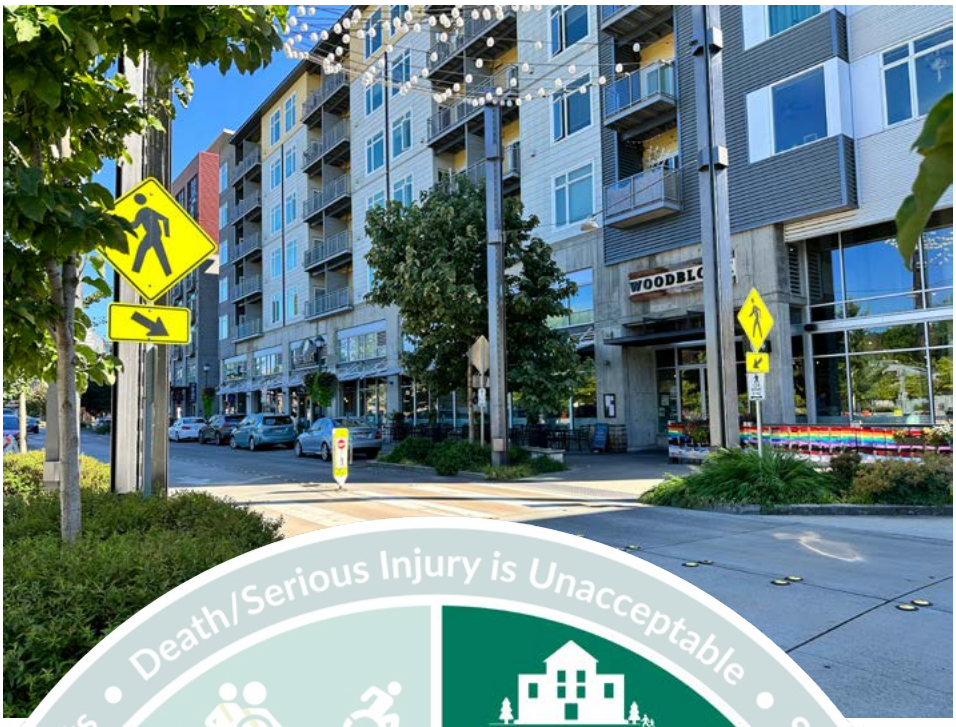
1

Safe System Approach

Thoughtful land use and transportation planning can bring daily needs closer together and easier to access, reducing exposure to crashes, promoting walking and biking, and reducing congestion and air pollution. Safer, more comfortable environments can increase human interaction, making communities healthier, safer, and more vibrant.

Safer Land Use in the City of Redmond

The City's commitment to safety in transportation is a collaborative effort among all city departments. The review and approval of development, future changes to zoning and land use, and siting of future community facilities such as parks and schools will incorporate the principles of the Safe System Approach as described in the Safer Streets Action Plan. Safer land use is a long-term goal and will complement the City's other short term work in implementing safety projects (Chapter 5) and supporting policy and procedural changes (Chapter 4).



1

Safe System Approach

Safer Vehicles in the City of Redmond

The City will lead by example, limiting use of larger vehicles to appropriate settings (maintenance activities, etc.), incorporating safety technologies into its fleet vehicles, and encouraging the use of compact vehicle parking spaces in the downtown area to encourage smaller vehicles in a more pedestrian-oriented area. City emergency responders are also investigating the potential for using smaller vehicles to respond to calls given the context of the emergency.

1

Safe System Approach

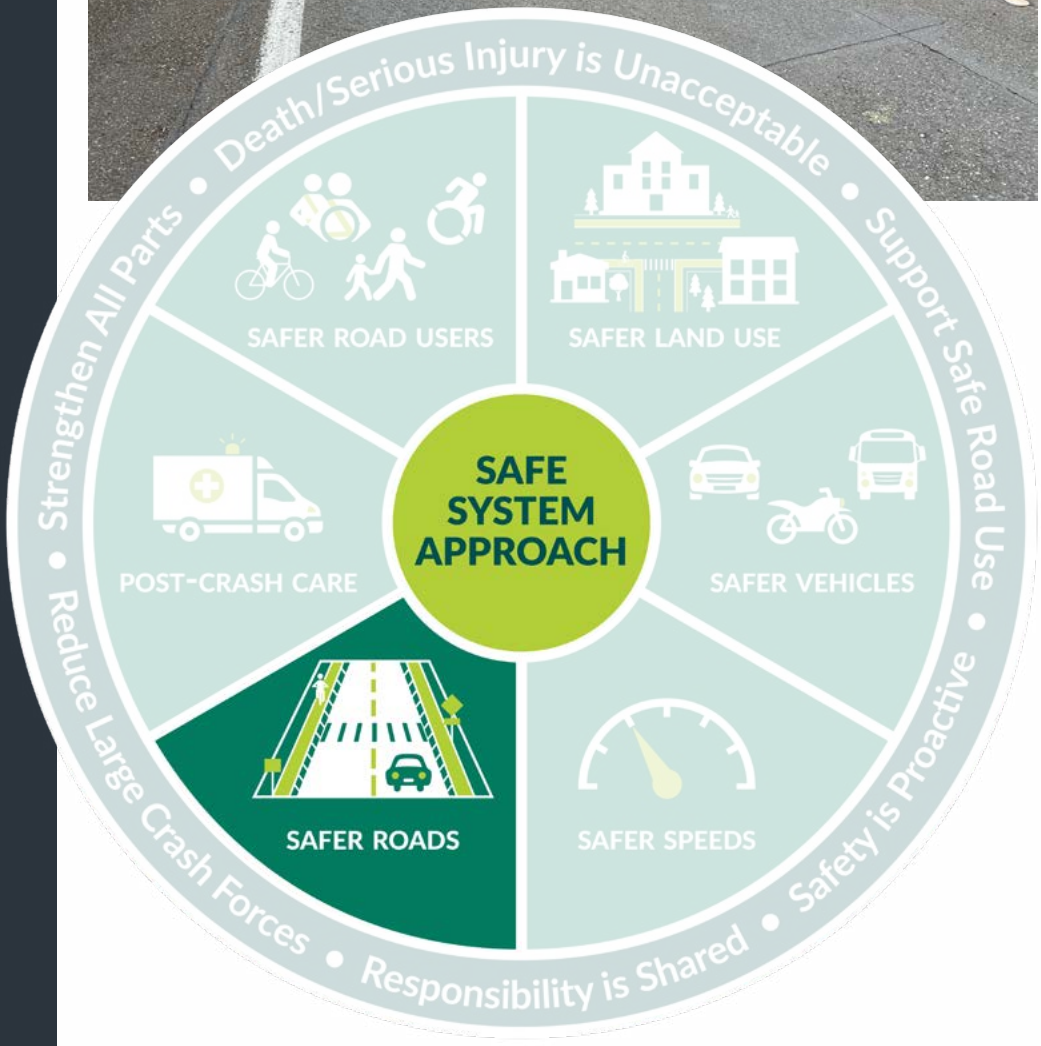
Safer Speeds in the City of Redmond

As identified in the LRSP (Chapter 5) the City will undertake a citywide speed limit study to identify locations where a lower limit is already feasible and recommended based on roadway context and usage. The City will also continue to undertake projects and apply the principles of modified policies and procedures which create roadway environments that passively limit speeds, encourage slower speeds, and limit speeds in areas with high pedestrian activity such as school zones and near parks. The City's engineering efforts will be combined with a targeted enforcement program, use of automated enforcement, and a broader campaign of education to encourage safer driving practices.

1 Safe System Approach

Safer Roads in the City of Redmond

Through the development of the Safer Streets Action Plan, the City has identified several specific projects (Chapter 5) and changes to design standards (Chapter 4) which will further the City's work towards safer streets. The City will continue to identify projects and procedural changes to create roads that passively calm vehicle speeds, roadside development and land use patterns that encourage safer movement of all modes, and a specific focus on pedestrian safety especially within Redmond's three Urban Centers and around transit hubs for light rail and bus service.



1

Safe System Approach

Post Crash Care in the City of Redmond

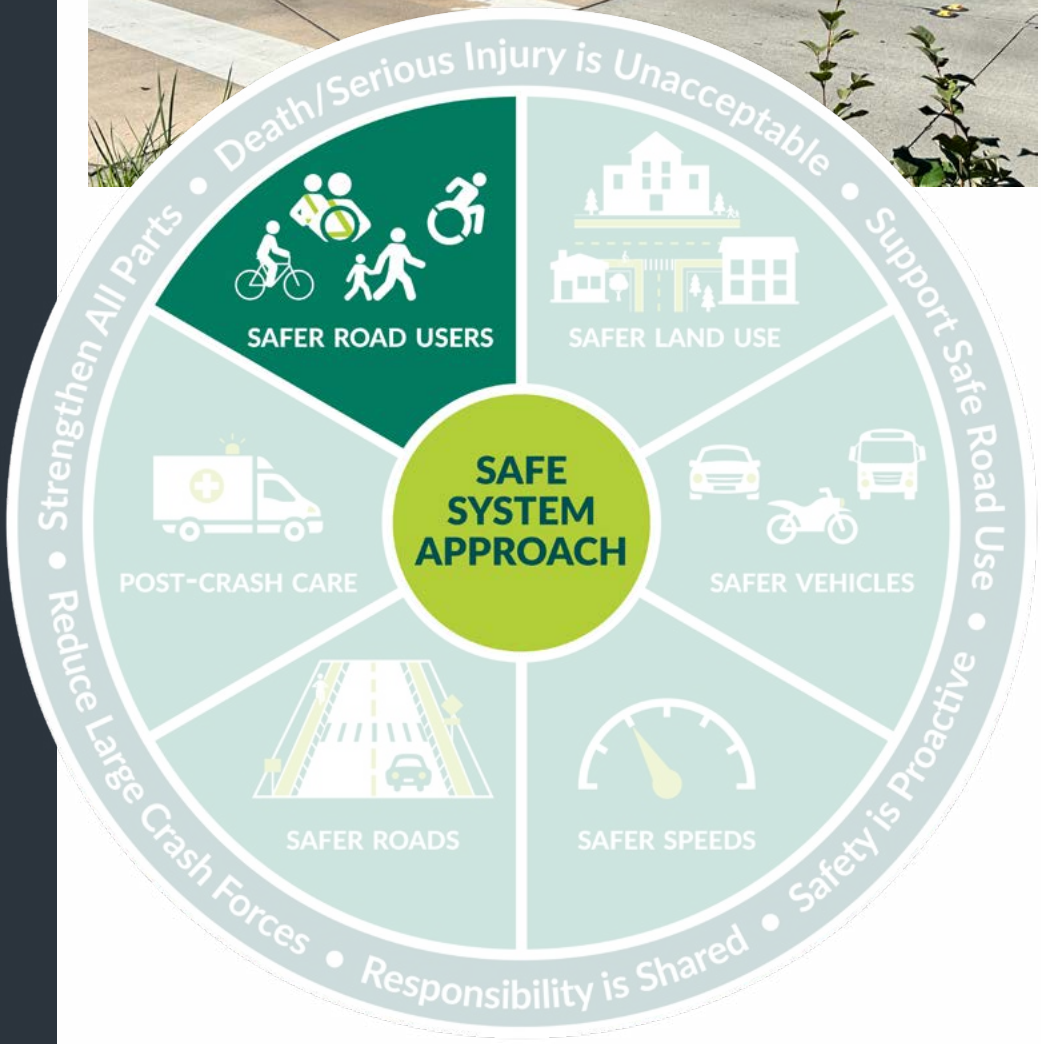
Crashes in Redmond occur in an environment where medical facilities are nearby. Creating a safer transportation system and maintaining fast emergency response times are both important city goals that need to be constantly evaluated as part of the Safe System approach. Post crash care also includes thorough evaluation of the factors contributing to a crash and identifying any possible solutions that could help prevent future crashes.

1

Safe System Approach

Safer Road Users in the City of Redmond

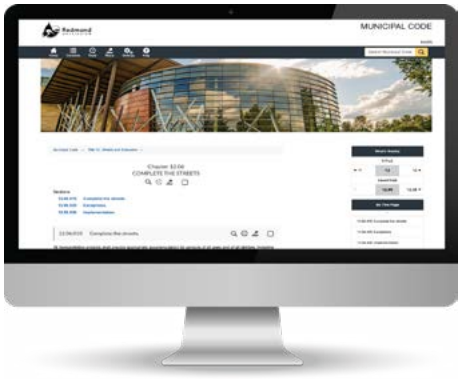
The city will be increasingly intentional about safety culture campaigns, with a specific focus on behaviors contributing most to severe crashes such as speeding and not yielding to pedestrians. The city recognizes the need to educate users of all modes. Incorporating Safe System principles into the City's policies and procedures, as described in Chapter 4, will help to create environments where safe and responsible transportation behavior is easy, natural and familiar for all users.



1

Complete Streets

Throughout this document, this graphic indicates an action for the city to take to address safety.



The City of Redmond has an existing Complete Streets policy that was passed via Ordinance in 2007 and updated in 2016. The application of Complete Streets to city capital projects and development review could be improved as a method of addressing safety risk factors that could help to achieve the goals of Vision Zero.

The City's Comprehensive Plan identifies the need to integrate the Complete Streets policy into the City's transportation procedures, policies, and projects:

> **POLICY:** ***TR-18 Adopt and implement a Street Plan in the Transportation Master Plan that results in multimodal access and connectivity in Redmond and the region. Require that all streets be complete streets, built to accommodate travel modes as defined in the Transportation Master Plan, and be no wider than necessary.***

The need for updating of the Complete Streets policy and processes for ensuring its implementation, including development of a checklist that can be used for all capital project and development review to ensure incorporation of Complete Streets and safety elements, is a future action to support the evolving impact of the Safer Streets Action Plan's goal to eliminate serious and fatal crashes.

2

Planning Structure, Engagement, and Collaboration

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2 Introduction

As part of the development of the Safer Streets Action Plan, the City of Redmond formed a task force to provide local insight, guidance, a diverse array of feedback on safety concerns and countermeasures, and continued monitoring of the City's plans for implementation of changes to the transportation system, policies and procedures.

The City also engaged the community using a Road Safety Assessment (RSA) to understand primary safety concerns of the community and discuss potential strategies and actions to address these concerns. The City of Redmond also conducted a community-wide questionnaire on proposed strategies and actions to gauge whether the community understands how proposed strategies will affect them and improve safety overall in Redmond.

Redmond WASHINGTON

2
Safety Task Force

The City of Redmond's Safety Task Force included City staff from Public Works, Planning and Community Development, Police, Fire, Parks and Recreation, and Executive departments. The task force allowed the project team to directly present ideas and solicit specific feedback from the group to ensure alignment of the Safer Streets Action Plan with the concerns and priorities of the Redmond community, and the objectives of various City departments and divisions.

The task force agreed with the targets of a 50% reduction in fatal and serious injury crashes by 2030 and elimination of fatal and serious injury crashes by 2035.

Many of the policy recommendations recorded in the policy and procedures chapter of this report were influenced by the task force discussions, including the use of slower walk times for calculating crossing intervals. The task force explored the concept of creating a Safety Campaign, performing additional corridor studies, and discussed ways to improve post-crash care. They also explored methods to improve communications internally, and potential strategies that could be deployed to support identified countermeasures such as enforcement.

The Task Force will continue to meet on an annual or bi-annual basis to review updated crash data analysis, celebrate successes in implementation of safety improvements, and continue to gather feedback on evolving transportation safety concerns.

2

Post-Crash Response Task Force

Post-Crash Response Task Force

One of the six pillars of the Safe System Approach is post-crash care. Redmond's roadways are nearly all adjacent to homes and businesses, with few rural roads in undeveloped environments. Because of the urban and suburban development of the city, the chances of a crash going unnoticed are low. The City hosts several medical facilities, many of which have urgent and/or emergency care departments. Efficient response to crashes, including traffic control and medical care, are important factors in achieving the City's safety goals.

The Post-Care Response Team will meet and conduct a site visit following any future crashes with a fatal or serious injury outcome to understand the circumstances and conditions that led to and contributed to the crash. The on-site meeting will help to develop potential solutions that could be implemented either through programmatic and practice changes, improvements constructed by City crews or via grant-funded projects. The Post-Care Response Task Force, which includes City engineers, planners and emergency service personnel, will meet one to two times a year to review recent case studies of crash contributing factors and identify potential improvements in post-crash care. The work of the Task Force will be a component of the City's yearly reporting on safety progress and next steps towards achieving the goal of the Safer Streets Action Plan.

2 Community Engagement

Road Safety Assessment

As part of the effort to develop a Safer Streets Action Plan, the City of Redmond, conducted a Road Safety Assessment (RSA) in the Education Hill Neighborhood with the assistance of the safety consultant team. The RSA was conducted following the completion of the safety analysis (Chapter 5), and the selection of the Education Hill neighborhood was intended to be representative of the safety risk factors observed in the data that could be applicable citywide. The site for the RSA was also intended to address equity concerns and be accessible to a wide range of transportation users among the general public. The Education Hill neighborhood was selected for several reasons, including;

- An area with a history of expressed transportation safety concerns by residents
- A representative area of the City's transportation network in residential areas. Education Hill includes schools, transit service, parks, existing complete and partial bike and pedestrian infrastructure, mixed with single and multifamily residential land uses.
- An area that, historically, had seen comparatively less investment in the transportation network compared to other areas of the city, such as the Downtown core.

The RSA involved a significant community outreach effort that included the development of a website and registration page, the on-site field audits, and a Debrief Workshop.

A full report from the RSA is included in the Appendix to the Safer Streets Action Plan.

What is a Road Safety Assessment?

- Conducted by an interdisciplinary team, and includes the community.
- Performed by a multi-disciplinary team, including non-technical members.
- Considers all possible road users.
- Accounts for road user capabilities and limitations.
- Generates a formal report and plan for action.

2 Community Engagement

The Community RSA, which was promoted on the city website calendar, social media (X and Facebook), Peachjar, and an email campaign, invited members of the community to evaluate the site area with a focus on transportation safety for travelers of all modes, ages, and abilities. The project team spent two hours working with attendees to identify safety concerns along a route that included 166th Avenue NE, NE 104th Street, NE 95th Street and 171st Avenue NE. The RSA staff encouraged attendees to identify issues that indicated common needs throughout the City's transportation system which could be addressed through systemwide application of countermeasures. The team used the time to point out key safety features, answer questions from the community, and take suggestions which were compiled into notes.

Observations from the Community RSA that were shared with the project team included:

- The school lacks consistent walking routes from most homes, even those that are located nearby
- Crossing times are not long enough
- Driver behavior during school pick-up and drop off results in vehicles in the bike lane and through traffic utilizing the turn lane
- Additional crosswalks connecting to transit stops are needed
- Walking along the roadway is uncomfortable and generally unpleasant
- Throughout the corridor, sidewalks are narrow and obstructed by overgrown trees and shrubbery

Many of the needs and hazards noted along the route walked by the Community RSA were representative of needs and hazards existing throughout the city and can be successfully addressed through systemic application of selected countermeasures. Using slower walk times and adding safe crossings in proximity to transit stops are two such needs that have been identified as necessary improvements which could be applied citywide.

2

Community Engagement

City RSA

The City RSA involved a multidisciplinary group of individuals including Road Safety Professional Consultants, City of Redmond Planning and Public Works staff, and representatives of the Redmond Fire Department.

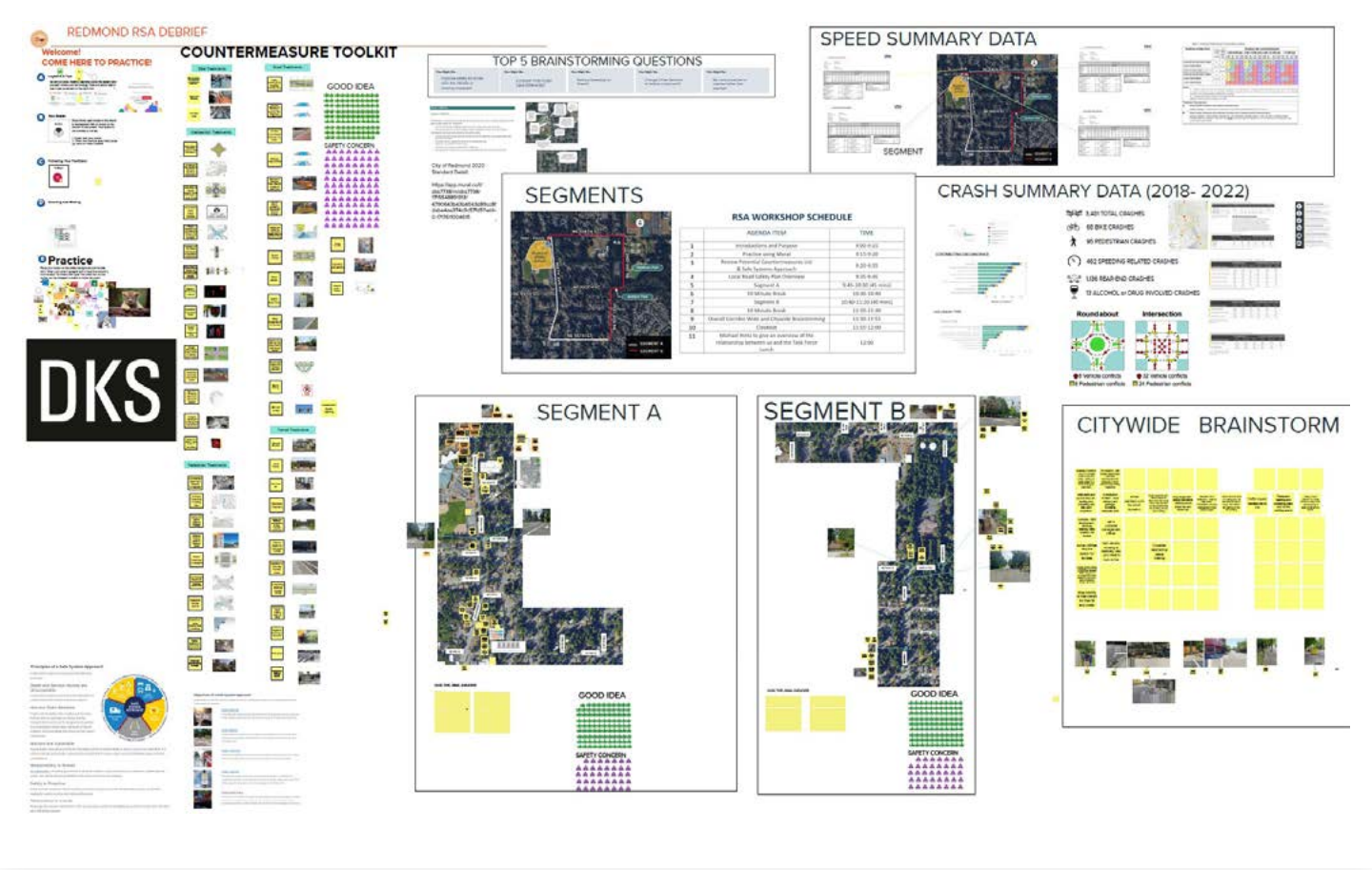
Over a dozen individuals performed a Roadway Safety Audit walk on the same route through the Education Hill neighborhood as the Community RSA, led by the same personnel who led the Community RSA for continuity between the two site questionnaires. The team discussed observations of safety concerns and how those could be applied to the wider city transportation system. The City RSA group, compared to the Community group, was much more familiar with similar roadway, transit, bike and pedestrian facilities across the citywide network, as well as the history of how some of the observed physical roadway conditions were designed and built. The additional insight led to more in-depth conversations around policy and standards that could be addressed to yield better safety outcomes. The team also made observations and had discussions of safety treatments that have additional considerations such as impact on maintenance times, costs and equipment, access for municipal services like garbage pickup or water and sewer maintenance access, and emergency response times and access.

2 Community Engagement

RSA Debrief Workshop

The Debrief Workshop was held with City RSA participants and representatives from the Fire and Police departments to discuss the Safe System Approach, introduce the Safer Streets Action Plan, and facilitate a brainstorming session of possible safety improvements for both citywide application and RSA specific treatments. To promote brainstorming, and encourage inclusive input, the consultant team utilized MURAL, a digital collaboration tool that allows anonymous, simultaneous input from all participants. A wide screen capture of the entire MURAL working document from the workshop is shown below.

The feedback the City received as part of the community outreach process was used to confirm the data-based analysis of risk factors for crashes and to inform the range of policy, procedural and engineering projects the City has committed to in the Safer Streets Action Plan. Together with the Equity Analysis, the Community RSA will ensure the safety needs of community members are equitably met. The City may use the format and the procedure that was developed around the RSA to conduct future RSAs in other areas of the City or as a method of following up on reoccurring or common concerns expressed about the safety of the City's transportation system.



3
Equity Analysis

Redmond
WASHINGTON

3 Introduction

An integral part of a Safer Streets Action Plan is the analysis of equity and the effect that inequities in the distribution of socioeconomic, demographic, and environmental burdens have on the history of crashes, both locations and contributing factors, and the City's planned future actions. The goal of the equity analysis is to develop a deeper understanding of the contributing factors to crashes and how these contributing factors are distributed across the City or impact certain populations that may be overburdened or otherwise underserved by safe transportation infrastructure.

Redmond
WASHINGTON

3

Equity Data Analysis

Per the amended fiscal year 2024 USDOT Safe Streets for All Notice of Funding Opportunity (NOFO), **underserved communities** are defined as any Tribal land; any territory or possession of the United States; or U.S. Census tracts identified in one of the following tools:

- The USDOT Equitable Transportation Community (ETC) Explorer; or
- The Climate and Economic Justice Screening Tool (CEJST).

The City of Redmond is fortunate to have a lower burden in nearly all of the equity factors that were considered in the equity analysis, compared to other cities in Washington state and across the country. Because of the City's lower rates of burden and underserved communities, the City may be less competitive for any grant programs have that equity as a scoring criteria.

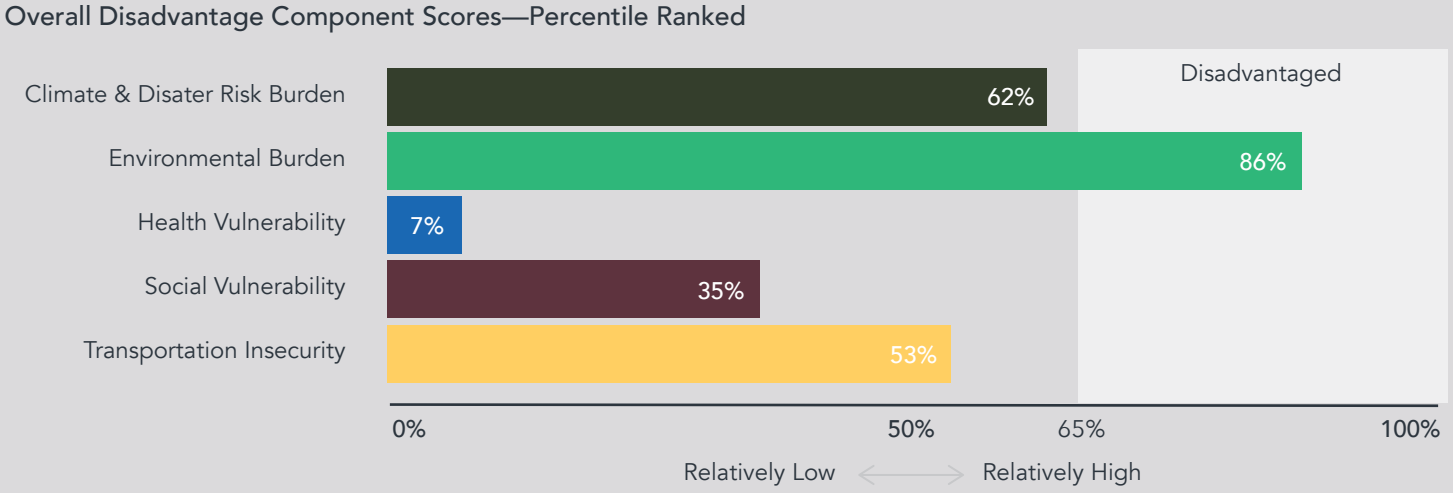
3 Equity Data Analysis

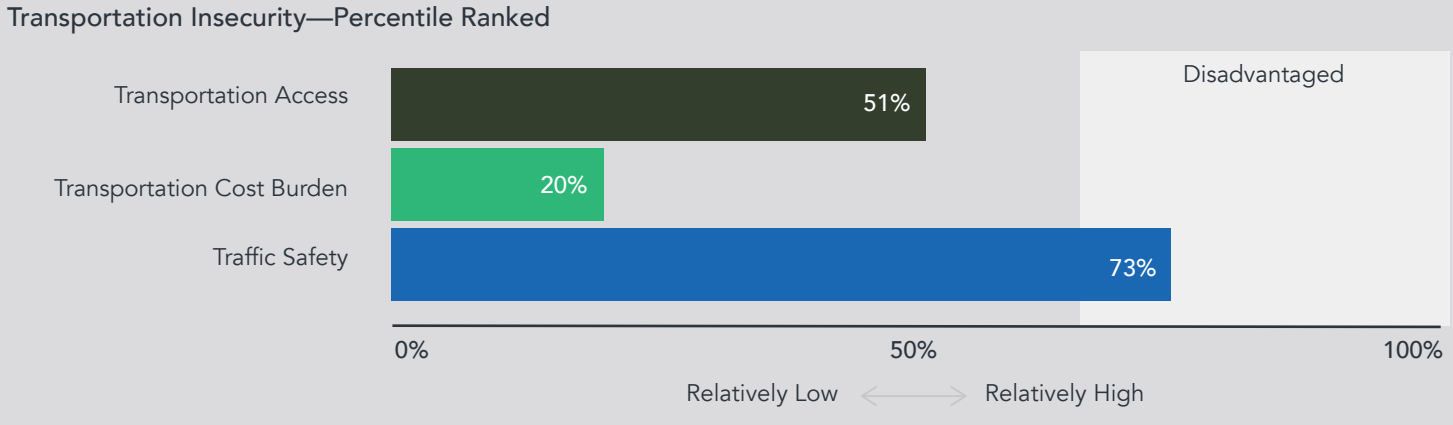
USDOT's ETC Explorer was chosen for the data analysis in the City of Redmond's Safer Streets Action Plan. The ETC Explorer provides a normalized numerical factor by census tract that can be used to compare the cumulative impacts of transportation disadvantage at a national level, using a percentile ranking. The metric established by USDOT and the SS4A NOFO consider a census tract to be experiencing disadvantage if the overall ETC index score places it in the 65th percentage (or higher) of all US census tracts. Of the five measures in the ETC, Redmond scored above the 65th percentile in only Transportation-related categories and only in the Downtown census tract.

The central Downtown Redmond tract had a "disadvantaged" ranking for the traffic safety sub-category, likely due to the low total population of the Downtown census tract, combined with the higher traffic rates in Downtown (from outside the tract), and related higher number of severe crashes from traffic exposure and volumes of all modes. As Redmond's Downtown continues to grow and add population, building out a multimodal transportation network that prioritizes walking, biking, and transit is critical to ensuring that the percentile ranking for Traffic Safety for the downtown census tract decreases over time.

A representation of the ETC Explorer graphics for the central Downtown Redmond tract, with a focus on transportation insecurity which directly relates to safety, are shown below. Additional detailed ETC Explorer graphs for the Downtown Redmond tract, as well as the rest of the City, can be found in Appendix C.

Downtown Redmond Census Tract - ETC Explorer Data





3 Summary

In the Downtown Redmond census tract, Transportation Access and Traffic Safety, two measures under the ETC's Transportation Insecurity category which scored higher for burdens, will be addressed over time as the City's land use plan is implemented and a multimodal transportation network is built out, providing more residents and employees access to safe walking and biking infrastructure. Furthermore, a focus on implementing Pedestrian Zones in the City's Urban Centers (see page 52) will result in the lowering of the Traffic Safety equity risk factor, particularly for the central Downtown Redmond census tract.

4
City Policies and Processes Review

Redmond
WASHINGTON

4 Introduction

One of the key elements of the Safer Streets Action Plan is a review of the City's existing policies and processes to identify changes to increase the focus on safety and proactively address crashes, helping the City advance towards the goal of eliminating fatal and serious injury crashes by 2035.

The recommendations identified through the policies and process review are intended to be implemented not only in the current practices of the City and future capital improvement projects, but also guide future project development by developers and other private entities.

Redmond
WASHINGTON

4

City Policies and Design Standards

Current Policy and Standards Review

As part of the review process, the City's current design manuals were reviewed for opportunities to incorporate current best safety practices and processes. The policy and process review was informed by the results of the Local Road Safety Plan development and the City's Roadway Safety Assessment, and recommends methods to integrate the recommendations of both safety-focused planning efforts into the City's design standards, policies and guidelines.

Many of the strategies included in the Safer Streets Action Plan require minimal additional funding to implement but may require adjusting current processes to optimize for better safety outcomes.

Three areas of focus were analyzed for potential safety improvements:

City policies and design standards revisions

New or revisited programs

Community outreach and engagement

Following a review of the above-listed areas of focus, the following categories of changes to City practices to improve safety outcomes are recommended for implementation:

Revision of City documented policies and standards

Adjustments of standard practices via cultural norms and advocacy

Development and execution of new programs

4

Safe System Roadway Policies and Processes

FHWA Safe System Roadway Hierarchy

Aligned with the City's safety goals and use of the Safe System Approach, the following elements of FHWA's Safe System Roadway Hierarchy were considered in identifying opportunities for safety-focused changes in the City's existing policies and design standards.

Space conflicts within intersections

The City's standards for roadway geometry were reviewed for opportunities to update with best practices, and identify ways to reduce roadway widths and intersection sizes for both passive traffic calming (not requiring enforcement or maintenance) and to reduce crossing distances and exposure to traffic for active mode users.

Time conflicts within signalized intersections

The City will adopt changes to the timing of traffic signals at intersections to prioritize vulnerable user movements. Changes to signal timing practices and signing to incorporate best practices into the traffic signal design manual can help to manage potential conflicts in the intersection related to timing of movements.

Reducing crash severity through speed management

The City's speed limit policies will be complemented by a citywide speed limit study. Speed limits will be matched to roadway context, including adjacent land uses. Passive traffic calming and active targeted enforcement of speeds, as resources allow, from both roadway physical changes, cooperation with the Redmond Police Department, and the use of automated enforcement will advance the goal of managing speeds.

Increasing all modes' awareness of potential conflicts

Educational campaigns will address the City's rates of distraction and inattentiveness among all modes, drivers, pedestrians, and cyclists, that have contributed to past crashes and are risk factors for future crashes. Awareness can also be facilitated by intentional geometric design of roadways, sidewalks, and bike facilities to ensure clear sight distances. Signalization, appropriate signing, and direct communications can help to manage awareness and expectations at intersections and crossings.

4

Policies and Processes:

Conflicts in Intersections

Space and Time Conflicts in Signalized Intersections

Policy and design standard recommendations are focused on traffic signals, speed limits, and elevated active mode activity zones. Several of the risk factors, countermeasures, and projects from the City's Local Road Safety Plan had a similar focus. The Roadway Safety Audit identified similar potential improvements that were desired by the community and supported by city partners across departments. Between 2018 and 2022, collisions with pedestrians or cyclists accounted for 47% of the City's serious injury and fatal crashes, many occurring at signalized intersections.

City of Redmond Traffic Signal Design Manual

The City of Redmond Traffic Signal Design Manual (2002) is used by city staff and other design professionals to communicate the City's preferred processes for signal phasing, signal equipment, and priority movements. While the manual does refer to WSDOT standards and allow for the most up-to-date design standards to be used, altering the City's preference language to include some specific safety measures would ensure that practices that may be common among current staff on recent projects continue to be implemented regardless of City personnel changes.

Incorporating additional pedestrian-focused safety countermeasures in the City's Traffic Signal Design Manual represents a proactive strategy to improve the safety and comfort of the pedestrian environment. Updating the Manual does not require the City to invest in immediate resource-intensive changes. Modifications would be forward-looking, making incremental improvements through new development and capital projects as they arise. Several of the recommendations are already being included in the City of Redmond's upcoming adaptive signal project that will be deployed in the Downtown pilot area.

4

Policies and Processes:

Conflicts in Intersections

Newer pedestrian safety-focused signal countermeasures may increase some delay times for vehicles at signals. The City should include language in the Manual acknowledging the potential for delay and confirming the City's preference for treatments that prioritize safety at signals, especially for vulnerable users. Crossing pedestrians more safely and efficiently can improve conditions for vehicle drivers as well, reducing frustration and haste. Each of the measures, if implemented, may require an educational period for drivers and pedestrians.

With the Manual on Uniform Traffic Control Devices (MUTCD)-compliant signing notifying the community of signal changes, and intentional proactive communication from the City about where changes are happening, the goal of the change, and the opportunity to provide feedback, the new and/or modified signal operations will soon become expected and habitual for drivers and pedestrians.

To reinforce changes to the Traffic Signal Design Manual, the City should consider an ordinance to modify the City of Redmond Municipal Code section 10.24.070 to more specifically identify the priority of safety, especially for pedestrians and cyclists, in the consideration of traffic signal timing.

10.24.070 Traffic signal timing.

The Traffic Engineer is authorized to regulate the timing of traffic signals so as to permit the movement of traffic in an orderly and safe manner upon the public streets. (Ord. 304 § 40, 1963).

4

Policies and Processes:

Conflicts in Intersections

Section II (C) Pedestrian Scrambles

Pedestrian scrambles allow pedestrian movement in any direction, including diagonally, during the pedestrian walk phase. All vehicular traffic is held during the crossing phase so there are no moving vehicles conflicting with pedestrians. The City should incorporate evaluation of pedestrian scrambles into Section II (C) as a potential treatment for increased pedestrian safety when operational and contextual development and pedestrian facilities warrant a scramble. The City should avoid specific design guidance on scrambles, as other guidance from WSDOT, MUTCD, or other sources may be updated and include best practices that the City would want to avoid making further updates to include.

Section IV (C) Lead Pedestrian Interval

The City has implemented Leading Pedestrian Intervals (LPI) in many locations and will continue to evaluate their use at more signals, unless the signal prohibits pedestrian movements, or where high right turn volumes may be present. LPI allows the pedestrian signal to activate four to seven seconds prior to the traffic signal for vehicle movements. The time allows pedestrians to enter the crosswalk, increasing visibility to drivers, and reduces crossing time while vehicle movements are permitted. LPI can potentially reduce vehicle delay waiting to turn across crosswalks, and allows slower moving pedestrians extra time to cross if the LPI time is added to the walk phase. This measure can provide a significant safety benefit with little impact to overall traffic operations. LPI may not be appropriate for all intersections. The City should incorporate a preference to consider LPI and require a documented reason a signal operation does not include LPI for allowable pedestrian signalized movements.

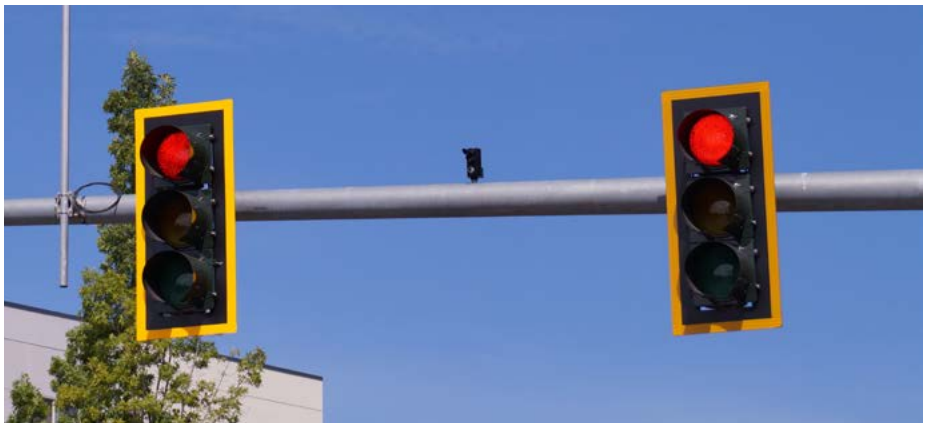
4

Policies and Processes:

Conflicts in Intersections

Section IV (I) (1) Backplates

Increasing the conspicuity of traffic signals by applying retro-reflective strips to the perimeter of the back plate can reduce crashes due to inconspicuous traffic signals by up to 15 percent. The City should include language in the listed section to require the use of backplates with perimeter reflective strips, on all future signals. The City should identify opportunities, including grant funding, to retrofit any existing signals lacking backplates and reflective strips for citywide consistency and to improve signal conspicuity.



No Turn on Red Guidance

The use of no turn on red restrictions needs to be carefully applied to situations where it will not cause excessive delay No turn on red signage, which could include both static and electronic "blank out" types that can be responsive to traffic, time of day, etc., should be applied in areas where there is a documented crash history, where sight distance may be restricted, or where abnormally high volumes of active mode users may be encountered. No turn on red is also required (per the MUTCD) at locations where there is a protected bike signal phase. High volume transit crossings, where pedestrian volumes will increase when transit vehicles arrive, could also be candidates for blankout no turn on red restrictions. A case-by-case traffic study should be conducted before applying no turn on red restrictions, even at only specific times of day.

Section IV (P) Blank-out signs

Blank-out signs, which restrict turns and can be programmed to be responsive to the signal phase, pushbuttons for crosswalk calls, or set to only be active at certain times of day, allow significant flexibility in balancing safety and signal operations depending on expected traffic. The City's crash data indicated a strong correlation between the time of day and crashes in crosswalks which could be mitigated by blank-out signage. The City should include in the Manual specific language allowing actuated, lit and non-continuous signage to be used in signal design. Evaluation of the placement of no turn on red blank out signage is included in the City's Local Road Safety Plan.

4

Policies and Processes:

Conflicts in Intersections

Regional Examples

In the Puget Sound region, lane width standards vary greatly between agencies. Land use and roadway classification/ context, historical priorities and expectations, and emergency and municipal service providers input are all factors in setting and/or changing lane width standards.

Some selected area agency examples include:

City of Seattle	City of Kirkland
25′ curb-to-curb width	20′ curb-to-curb width
on-street parking on both sides	on-street parking on one side
One 11′ two-way lane with two 7′ parking (Neighborhood Yield Streets)	One 12′ lane with one 8′ parking (Neighborhood Access Streets)

City of Redmond Roadway Geometry Standards

The City of Redmond Municipal Code (RMC) provides specific information on lane widths, curb returns, pavement widths, and other geometric information required for public and private projects in the City. While several positive safety measures are already included, such as lane widths as low as 10 feet on local roads and under 12 feet on arterial roads, there are some areas which could be modified to allow for greater flexibility when site conditions allow for measures that can increase safety and comfort, especially for vulnerable active mode users.

RMC, Appendix 2, Table 2, Local Streets, specifies a minimum paved width of 28 feet, with a minimum lane size of 10 feet and parking on one side. This standard should be updated to allow for narrower paved widths. Narrower roadways have been demonstrated to reduce speeding and can open up right of way width for other uses such as sidewalk, shared use paths, protected bike lanes and buffer strips for landscaping and/or stormwater treatment. Further coordination with the City's emergency response teams (medical, fire, and police) will include discussion of options to reduce service vehicle sizes where appropriate, as well as the minimum clear width standard for emergency access, to allow for further reductions in minimum geometry requirements for roadways that are tied to the need for access by emergency vehicles.

Typical residential street observed during City RSA

4

Policies and Processes:

Conflicts in Intersections

Section A. 7. b., the City should consider reducing or removing the minimum curb return radii, especially on local access streets, to allow for context-sensitive reductions in radius. Reduced or flexible minimum radii can reduce crossing distances and slow the speed of turning vehicles. Reduction of curb radii would be considered in the discussion of emergency response vehicle sizes. The optimal curb radii at intersections will be context-dependent based on the adjacent land uses and anticipated vehicle fleet mix. A radius as small as 10' should be considered in low volume, single family residential neighborhoods to limit roadway width and slow turning speeds.

Section A. 7. d. B. 2. requires that vehicles, including larger vehicles, not be allowed to encroach in the oncoming lane when evaluating curb return radii. The language of Section A.7.d.B.2. could be changed to be flexible and allow, when feasible based on site context such as on local streets, turning vehicles to encroach in the oncoming lane for a short distance. Modification of the provision in the Standards was raised during the Roadway Safety Audit when a garbage truck was observed turning on a local street with no other oncoming traffic present. In many situations, the safety benefit of a smaller radius for reduced crossing distances and speed calming would outweigh considerations around vehicle turning movement encroachment. Design solutions such as setting back the stop bar can allow for this encroachment while reducing conflicts that may result.

Section A. 21. Add a new section to the standards with a statement on the City's focus on safety, specifically for vulnerable active mode users, and encourage flexibility and creativity in identifying safety improvements. Statements that would allow for City, consultant and private development designers to bring the latest best practices and ideas for safety treatments would allow the City's code to incorporate the latest improvements without repeated updates.

4

Policies and Processes:

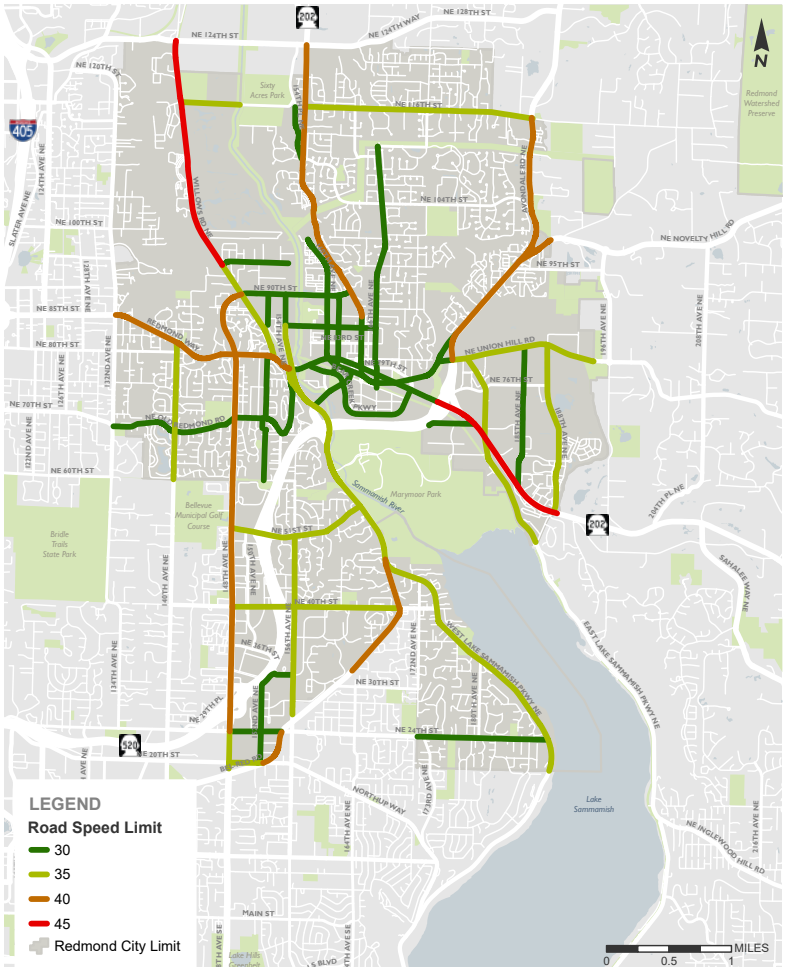
Speed Management

Reducing Crash Severity through Speed Management

Speed Limit Policy

The City of Redmond Municipal Code, Chapter 10.24.060 lists the schedule of regulatory speed limits for several city streets and state routes. With the exception of Cleveland Street from NE Redmond Way at 160th Avenue NE to 164th Avenue NE (25 miles per hour), the speed limits listed in the schedule range from 30–45 miles per hour. Reductions to the speed limit are permissible per Redmond Municipal Code Chapter 10.24.040, on the basis of an engineering and traffic investigation, provided that the maximum speed shall not be reduced to less than 20 miles per hour. In addition to local requirements, Washington State RCW 46.61.415 allows cities and towns to reduce speeds on non-arterial highways without a specific engineering study given procedures are adopted by the City to identify 20 mph speed limit areas, and the limit can be canceled and reset within one year.

The City's Local Road Safety Plan recommends performing a citywide speed limit study to identify locations where reducing the speed limit, via signing changes, would be possible without requiring significant investment in the modification of existing physical infrastructure or resulting in additional traffic enforcement. The citywide speed limit study could also identify locations where physical modifications of roadways would be warranted with the objective of encouraging slower speeds. The study should identify high priority capital projects related to speed reduction where physical traffic calming and/or roadway modification would be recommended to accompany a change in posted speed limits.



4

Policies and Processes:

Speed Management

Speed-Related Bicycle Policy

According to the National Association of City Transportation Officials (NACTO), traffic volume and traffic speed are the two most influential factors that contribute to levels of traffic stress for cyclists and pedestrians. Level of traffic stress impacts road users' actual physical safety as well as the perceived comfort level of their selected mode. High vehicle speeds, whether a result of drivers adhering to higher posted speed limits (e.g., 35 mph or higher), or driving faster than the posted speed, introduce significant risk to all road users by narrowing driver sight cones, increasing stopping distance, and increasing the severity of injuries and the likelihood of fatality when crashes do occur.

Studies show that most people are uncomfortable riding a bicycle immediately adjacent to traffic moving at speeds exceeding 25 miles per hour. The City should evaluate the most effective method for reducing bicycle level of traffic stress on a corridor by corridor basis. In some cases, reducing vehicle speeds on streets with bike lanes to 25 miles per hour or less may be an effective strategy to achieve a lower level of traffic stress for bicyclists while in other cases separated bike lanes will be the best solution. Generally, lowering vehicle speeds will achieve better safety outcomes for all users.

4

Policies and Processes:

Speed Management

Automated Speed Enforcement

Speed safety cameras are regulated, in specific detail, by the Revised Code of Washington (RCW 46.63.220). Implementation of camera enforcement for speeds is allowable in school zones, along school walking routes, near parks, in work zones, or in other locations with a demonstrated need by an engineering study and with an accompanying equity analysis. The City is implementing a program of speed safety cameras in school zones in 2025. Application of automated enforcement along school walking routes near parks may follow after a review of the effectiveness of the school zone program and application of any lessons learned.

The City should monitor the impact of speed safety cameras on overall traffic speed in the area of the cameras. Traffic data should be obtained prior to deploying cameras to understand volume and speed not only on the enforced segment, but on adjacent potential diversion routes that may see added traffic from drivers seeking to avoid the cameras.

Speed safety cameras are a highly effective safety tool the City of Redmond will use to encourage safer speeds and any excess revenue from the program will be directly applied to making more permanent street safety improvements that create "self-enforcing" streets. In this way, those who violate the speed limit and make Redmond streets unsafe for others help pay for making streets safer for everyone. Thus, speed safety cameras are intended to not be in place forever, but only until vehicle speeds are reduced.

The City's Safer Streets Action Plan Communications Plan identifies the importance of communication about automated speed enforcement, how the fines collected are applied to roadway projects, how vendor costs are related to fines, and the alignment of the program with broader goals of programs like Safe Routes to School (page 50) and the overall Vision Zero goal (Chapter 1).

4

Policies and Processes:

Speed Management

A Culture of Safety

Creating a safety culture is critical to achieving the City's goal of zero fatal and serious injury crashes and will require partnership and active participation of City staff, community-based organizations, employers, and everyone using Redmond's transportation system. To educate the community on the role they can play in proactively improving safety, several programs of targeted outreach and engagement are recommended. The City's Communications Division would be a key partner in executing the programs listed below.

Each of the programs listed below is suggested based on the data gathered on the crash history in the City of Redmond for the LRSP, or comments gathered through the City's safety task force meetings conducted in 2024. The programs are targeted at specific crash risks and are recommended as frameworks for conducting outreach. The specific elements of an outreach program would be developed with the City's Communications Division. The outreach around speed will be complementary to the citywide evaluation of speed limits (Chapter 5).

Speeding Educational and Enforcement Campaign

The crash data for the City of Redmond did not cite excessive speed as a contributing factor in a high number of crashes. The most often cited speed-related contributing factor to crashes is "exceeding reasonable safe speed for conditions." As a proactive measure, due to the correlation between speed and crash severity in research, the City will conduct education about the impacts of speed and actions the City is taking to address the relationship between speed and crashes. An educational campaign by traffic enforcement officers, as resources allow, to reinforce to drivers when conditions require a lower speed could be effective in addressing the risk factor to crashes. Enforcement of speed limits that is highly visible, such as near high volume intersections and school zones, can have a passive speed reduction effect on drive-by traffic, not just drivers that are stopped and cited by officers.

Gathering of speed data prior to focused enforcement campaigns can help to target hours when excessive speeds are most often observed, allowing for greater impact on the overall speed profile of the traffic in a corridor.

4

Policies and Processes:

Speed Management

Urgency Reduction Outreach Campaign

In the City's safety Task Force meetings, traffic enforcement officers, as well as others who work with schools and receive community feedback on traffic concerns, noted the prevalence of urgency at the source of many instances of observed speeding. Enforcement officers cited anecdotes about drivers stopped for speeding on local roads and especially around school zones concern with missing meetings at work, missing appointments, or generally an urgency to get to a destination being the reason for exceeding the posted speed limit.

As part of other communications from the City around traffic safety, an emphasis on the actual time savings from exceeding the posted limit by 5 mph may help to calm fears that drivers will miss appointments or meetings. For example, demonstrating that, across the length of Redmond (approximately 5 miles), the difference between traveling at 25 mph and traveling at 30 mph is only 2 minutes.

In addition, the City should leverage the presence of large employers in the City (Microsoft, etc.) to encourage avoiding scheduling meetings at times when it may encourage urgency among drivers, such as right after school drop off times, or just before school dismissal.

Questionnaires of drivers, conducted by the City, could help to understand other causes of urgency. Ensuring that responses to questionnaires are anonymous and only aggregated to calm fears of retaliation may help to gain more specific insight to the causes of urgency-related speeding. The results of such a questionnaire may be helpful in informing future outreach communications and could also contribute to the design of capital projects, such as signal timing, school zones, etc.

4

Policies and Processes:

Conflict Awareness

Increasing all Modes' Awareness of Potential Conflicts

Pedestrian Zones

One of the ways that Redmond demonstrates its commitment to active transportation is through the provision of a Downtown Pedestrian Zone. This zone is delineated by "Pedestrian Zone" signage at nine locations at the primary entrance roadways to the Downtown core. The existing Downtown Pedestrian Zone creates a logical area to emphasize pedestrian safety through a combination of education, enforcement, and street designs such as short pedestrian crossings, raised crosswalks, as well as signal operations that prioritize pedestrian movements. Existing Pedestrian Zone signage could be augmented with signage that indicates that pedestrian laws are strictly enforced. Signage should also be modified to more clearly explain what a Pedestrian Zone means for users of all modes.

The City has three existing Pedestrian Zones (Downtown, Overlake, and Marymoor) but only the Downtown Zone is clearly delineated by signage. The City should expand the signage and community messaging about the other two Pedestrian Zones, and look for opportunities to apply the recommended practices below in all three zones.

Adding Pedestrian Zones was identified in the Safer Streets Action Plan Communications Plan as a strategy to explore in 2026 or beyond once other complementary strategies have been implemented in the existing Downtown Pedestrian Zone. Additional citywide outreach on the intent and specific changes to typical transportation operations for all modes in the Pedestrian Zones should accompany changes to the zones.

4

Policies and Processes:

Conflict Awareness

The City's LRSP (Chapter 5) provides engineering recommendations to upgrade the City's existing Downtown Pedestrian Zone. In addition to the engineering recommendations, policy and process modifications that would contribute to upgrading all existing Pedestrian Zones, include the following:

High Visibility Enforcement

The objective of high visibility enforcement in the Pedestrian Zone is to focus on both education of and enforcement of yielding requirements to pedestrians in crosswalks. The ideal program of enforcement would need to be developed in collaboration with the City of Redmond Police Department to:

- Balance staffing requirements
- Identify ideal times for enforcement when both pedestrian and vehicle traffic are moderate, but not high
- Identify ideal locations so that the officers are visible, yet able to make appropriate stops of drivers
- Discuss the appropriate balance of educating drivers about violations and ticketing for offenses

Enforcement of pedestrian crossing laws is most effective when it is designed to:

- be highly visible and publicized
- educate about pedestrian crossing laws
- reinforce the required behavior of drivers and pedestrians,
- raise the expectation that failure to yield, aggressive driving, distraction or impairment may result in legal consequences, enforcement campaigns should be aimed at both drivers and pedestrians

Campaigns should start with communications and outreach efforts that announce, describe, and publicize the traffic safety campaign through community meetings, media coverage, social media, mass emails, and signage, a best practice identified by the National Highway Traffic Safety Administration (NHTSA).

High visibility enforcement in the Pedestrian Zone would need to be a regular, repeating program, rather than a "one-off" single action. The reinforcing of educational elements of the program, and the need to capture new drivers to the area, would be benefits of continued investment in high visibility enforcement of the Pedestrian Zone.

The City should, during the winter months when the program is less likely to occur due to lower volumes of pedestrian traffic, conduct a yearly review of the program to identify successes, opportunities for improvements and lessons learned. A collaborative meeting with law enforcement officers and the City's safety task force would provide valuable feedback to improve future enforcement periods.

4

Policies and Processes:

Conflict Awareness

Operational and Signing Modifications at Signalized Intersections

Several of the recommended operational and signing modifications that would be part of the Pedestrian Zones are described in the LRSP (Chapter 5). Other engineering-based changes that are complementary to operational changes, such as raised crossings, curb extensions, and narrowed lanes, are described in the LRSP (Chapter 5). The recommended Pedestrian Zone improvements align with the recommended modifications to the City's Traffic Signal Design Manual, and provide an opportunity for targeted implementation of some of the recommended safety-focused changes in the Manual.

Operational changes in the Zone will address:

- **Consider Pedestrian Scrambles** which will hold all traffic and allow pedestrians to cross in all directions, reducing conflicts, potentially improving vehicle operational flow, and reducing pedestrian walk times by allowing "two-stage" crossings to occur diagonally across intersections.
- **Implement Leading Pedestrian Interval (LPI)**, which gives pedestrians additional time to cross and increases visibility. Pedestrians will be in the crosswalk when traffic is allowed, by the signal, to turn across the crossing, rather than being at the curb ramp just preparing to cross. Pedestrians in the crossing can be easier for drivers to see, while assessing other potential traffic conflicts during turning maneuvers.
- **Implement right and left turn restrictions at certain intersections** which, especially when focused on certain times of day when high conflicts are expected. This can fully eliminate conflicts between turning traffic and pedestrians in crossings, which could lead to operational improvements for traffic. The use of a variety of signing, including static signs and electronic blank out signage to indicate turn restrictions, will help to reinforce turn restrictions that may only be in effect during certain times of day or when certain crossings are activated by the pushbutton.

In the Pedestrian Zone, using the operational pedestrian safety measures listed above could be set for specific times of day when conflicts have been observed in historical crash data. At other times of day when traffic is less and pedestrian conflicts are reduced, signals could run without features that could cause delay for traffic that is viewed as "unnecessary," when pedestrians are not present, and could lead to drivers not obeying signals and signage. Time of day programming will require assessment of the City's signal equipment to determine the programming capabilities of the controllers, installation of signage, similar to time-of-day turn restrictions on busy morning and evening peak routes, and educational outreach to the community to raise awareness of the changes.

Communicating to the community when operational changes go into effect, both to educate about the benefits and to celebrate the successes of the City's safety improvements, is an important component of the changes. The Safer Streets Action Plan communications plan and programmatic strategies are outlined in the following section.

4

Policies and Processes:

Conflict Awareness

Pedestrian Safety Educational Outreach in Pedestrian Zone

In addition to the education provided by officers during high visibility enforcement, longer-term educational outreach on pedestrian safety laws is recommended within the Pedestrian Zone. During the City's Safety Task Force meetings, and Roadway Safety Assessment, feedback was gathered from police officers as well as others with traffic safety involvement that there is not a high level of awareness of the legal requirements for drivers yielding to pedestrians. Education of pedestrians is also an important complementary action to proactively prevent conflicts and crashes in crossings. The Pedestrian Zone educational concepts align with recommended targeted community outreach programs covered in other sections of the policy and process improvements chapter.

Combining the outreach around pedestrian safety with the program described above for high visibility enforcement would help to efficiently utilize City outreach resources, and increase the likelihood of attention from the community. Similar methods as recommended by NHTSA would be effective in educating drivers and pedestrians about pedestrian crossing laws. In addition, signage (such as sandwich boards, flyers, and posters) within the Pedestrian Zone in targeted areas such as entrances to high volume businesses (popular restaurants, high volume retailers, gyms, etc.) from parking lots, at crossings where it does not distract or block visibility of pedestrians, and at city parks would provide passive opportunities for educating the community at or near the moment when they have or will soon be driving or walking through the Pedestrian Zone.

The City should also adopt a standard practice of providing educational materials about pedestrian crossing laws at all City events where tabling is occurring and community interactions with educational opportunities may occur. Education should also include reminders for vehicle operators of applicable traffic laws related to pedestrian safety, including: Blocking the Box, left-turn right of way, right turn on red, etc. City staff working at community events should be provided with training and materials to be able to convey information to the community and answer basic questions, or refer the community to existing online materials for more information.

4

Policies and Processes:

Conflict Awareness

Communication Strategies for Public Education

The City of Redmond recognizes that reaching the goal for Vision Zero and achieving a behavioral change to a safety focused culture in the City will require significant communications efforts with the community. The programmatic safety strategies are outlined in the next section, and also in the more detailed Safer Streets Action Plan Communication Plan. The Communication Plan contains additional detailed information on the existing or proposed media and channels to be used for communications strategies and programs, proposed dates for outreach tailored to the season and city events, details on messaging, and performance measures to monitor the Plan's impact.

The plan's key messages include:

- Build a safer Redmond together by doing your part (being part of the solution) in making our community safer.
- Redmond uses the Safe System Approach to reduce and eliminate the number of collisions and risks in the City
- Everyone has a role to play in making Redmond's streets safer, including drivers, pedestrians, and cyclists, as well as the City of Redmond as the organization planning, designing, and managing the operations of the transportation system.

Key performance metrics include:

- Quality engagement/feedback at tabling events to increase awareness and change behaviors.
- Share about Vision Zero at least once per month in city e-news

The following pages detail specific programmatic strategies for risk factors found in the City's crash data (see Chapter 5), in the communications with the Safety Task Force and community outreach (see Chapter 2) and general safety risk factors like addressing speeding and distraction. The strategies and the Communications Plan are intended to deliver safety messages to users of all modes in a Safe System Approach manner of shared responsibility for safety. The programs and Plan also encourage the community to provide feedback to the City on where improvements can be made, and to note and celebrate the City's success in proactively addressing safety through projects (Chapter 5) and policy and procedure actions (Chapter 4).

4

Policies and Processes:

Conflict Awareness

Safe Routes to School

The City of Redmond partners with Lake Washington School District (LWSD) in its participation in King County's School Pool program. The Schoolpool program is primarily focused on activities that encourage students to walk and bike to school. Safety is a paramount concern for students walking and biking to school, and providing safe infrastructure is a priority. To improve safety and thereby encourage more students to walk and bike to school and reduce the number of school-related vehicle trips, the City will expand its Safe Routes to School efforts in the following ways:

- Build on School Pool and identify engineering, education, and encouragement strategies to facilitate and encourage higher rates of walking and biking to school and a reduction of school-related vehicle trips.
- Work with schools to improve site circulation and access and arrival/dismissal procedures for enhanced safety
- Work with the LWSD and WSDOT to bring bicycle and pedestrian safety curriculum into Redmond schools.
- Establish a traffic garden to provide a safe space for students to learn and practice traffic safety.
- Implement Speed Safety Cameras in all school zones and assess other potential camera locations along school walk routes.

The goal of the Safe Routes to School program is to give students and parents/guardians a greater comfort in their ability to safely walk and/or bike to school. The program's success will be measured by a combination of safety-focused infrastructure improvements with two-way communications with students and families about safety and what changes can be made. The Safe Routes to School program is closely aligned with the implementation of automated speed safety cameras (page 49).

4

Policies and Processes:

Conflict Awareness

Traffic Gardens

One successful strategy that has been used to educate kids about transportation safety is a traffic garden. Traffic gardens are essentially mock, scaled transportation networks, set up on playgrounds, or in parks, that can be used as a safe space to practice traffic safety, understand how kids' choices can impact their safety, and help to instill a culture of safety that will have a long-term positive impact on not only Redmond but other cities' goals to reduce incidence rates and severity of crashes. The City could coordinate the efforts of educational outreach with local advocacy groups like MoveRedmond.

4

Policies and Processes:

Conflict Awareness

Pedestrian and Bike User Safety Campaign

In the City of Redmond, 45% of pedestrian-involved crashes and 55% of bicycle-involved crashes in the last 5 years involved impairment, distraction, or disregard on the part of the pedestrian or cyclist of traffic control devices or requirements to yield. While there are many actions the City can and will take to improve the transportation system to encourage safe user behaviors, the Safe System approach is premised on shared responsibility, which means that all users adhere to traffic laws and use infrastructure as it is intended.

A targeted community outreach campaign focused on active mode users' shared responsibility would be a beneficial proactive program. The outreach could include a mixture of messaging in the Downtown area, such as sandwich boards and flyers in popular restaurants, and at popular trailheads and locations where significant active mode activity is expected. Focusing outreach on the City's Pedestrian Zones, as described on page 44, will help improve the impact of the outreach efforts. Online messaging through social media and communication at City events would also be effective components of the program.

Program communications should focus on:

- Avoiding cell phone use and other distractions when in crosswalks or other conflict points.
- Making eye contact with drivers at crosswalks and mixing zones to ensure visibility and yielding of drivers before entering conflict zones.
- Highlighting visibility and awareness as a person walking/biking/rolling.
- While acknowledging that, by Washington state law, all intersecting roadways are legal crossings, consider choosing marked and/or enhanced (RRFB or signalized) crosswalks when available nearby. Predictability in when and where drivers should expect and watch for pedestrians and cyclists helps to avoid conflicts.
- Focus on the statewide issue of mixing alcohol and cannabis use and the increased safety risk of traveling when under the influence.

The City should engage partners, such as Cascade Bicycle Club, and other regional organizations, to assist in providing educational outreach regarding the use of e-bikes and e-scooters. The rise in the prevalence of these important mobility devices that help to expand the range of users that feel comfortable using active modes of transportation has created new challenges and unfamiliar situations that warrant further education. The City should help to facilitate the education and outreach, providing space and notifications to the community, in addition to signage in zones where e-bike and e-scooter use is anticipated in higher volumes.

4

Policies and Processes:

Proactive Improvement

Celebrating Success

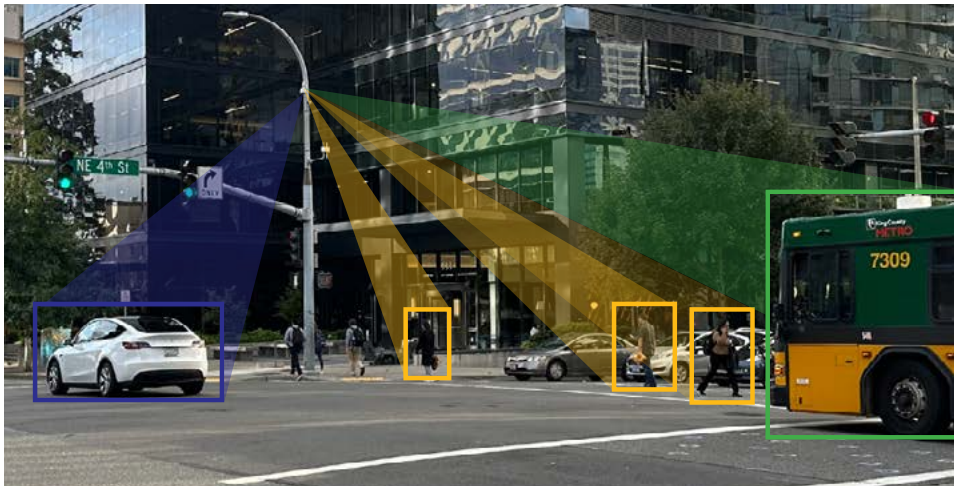
As part of the Safer Streets Action Plan's commitment for the City of Redmond to work towards a Target Zero goal, and report out annual progress, the City should make an intentional effort to celebrate successes around safety. Successes could take the form of:

- Reductions in crash rates or severe outcomes
- Highlighting new safety projects, including the "why" behind each project
- Highlighting the educational opportunities or a "caught you doing the right thing" version of enforcement during high visibility enforcement programs
- Maintaining a positive, forward-looking tone in outreach programs and staying focused on the City's safety goal

Best Practice Guidelines for Emerging Topics

Addressing transportation safety is an evolving practice area, and the City staff focused on the implementation of the Safer Streets Action Plan should stay apprised of new technologies and best practices. Some of the emerging topics and technologies that could have a safety benefit that are currently in development as of the writing of this Plan include;

- **Use of intelligent speed assistant technology or speed governors on City vehicles.** Ensuring City vehicles are driven at safe speeds can set a positive example and reduce speed-related risks for City employees.
- **Infrared detection signs.** SmartSigns is a product piloted by King County that detects cell phone use by occupants of a vehicles and displays an educational message to drivers to put their phones down. The signs also track data on cell phone use detection. The signs can also be used to detect seat belt usage and speeding. An article was published on the use of the signs by the County on April 5th, 2024 (www.seattletimes.com/seattle-news/new-traffic-signs-may-catch-you-looking-at-your-phone/).
- **Using AI technology to assess near-miss incidents at traffic signals.** Existing and/or new cameras at signalized intersections can be used to identify, through the help of AI-assisted review of footage, near-miss incidents that significantly impact comfort and perceived safety for active mode users, but which are not reflected in crash data.
- **Incorporate safety risk factors (see Chapter 5) into the City's updated Geographic Information System (GIS)-based asset management system.** Integration of safety into the asset management system will help the City identify high priority locations for safety improvements and assets that can be directly addressed to proactively address safety concerns.



Example of Real-Time Traffic Signal Safety Intervention technology

4 Summary

The review of policies and processes for the City of Redmond's Safer Streets Action Plan focused on identifying the practices, educational opportunities, and targeted enforcement programs that would have the most proactive impact on the risk factors for crashes in the City, as identified in the most recent 5-year crash history. The recommendations of Chapter 4 are complementary to the engineering improvements identified in the LRSP (Chapter 5), as well as other City plans, including the Transportation Master Plan and Bicycle Facility Design Manual. Each of the recommendations are aligned with a Safe System Approach. Many of the recommendations are also complementary to each other, building upon the momentum, community messaging, and cultural change to prioritize transportation safety in the City of Redmond and advance towards the Vision Zero goal.

5
Local Road Safety Plan

Redmond
WASHINGTON

Jump to Index

5 Introduction

The Local Road Safety Plan (LRSP) is a comprehensive safety analysis, identification and prioritization of risk factors, and conceptual design for proactive safety countermeasure projects to be constructed across the City of Redmond's transportation network. The LRSP is also a requirement for the state of Washington's Highway Safety Improvement Program (HSIP). The LRSP is a standalone document for the City's eligibility and application to the HSIP program, as well as a component of the Safer Streets Action Plan. The LRSP covers several sub-topics related to the safety analysis and identification of projects. An outline of the contents of Chapter 5 is as follows:

Redmond
WASHINGTON

5.1 Introduction

The City of Redmond places a high priority on the safety of its transportation system users. The City's commitment is to people-oriented travel, with a focus on the comfort of vulnerable active transportation users of all ages and abilities.

The City of Redmond seeks to reduce the incidence and risk of future crashes throughout the city, especially those with a severe injury or fatality. To more effectively address transportation safety, Redmond has created a Local Road Safety Plan (LRSP) which uses a data-based, proactive approach to identifying potential safety concerns. In addition to guiding spot treatments, the LRSP allows the City to identify systemic improvements to the citywide transportation network to address historical crashes, and proactively address risk factors and likely locations for future crashes.

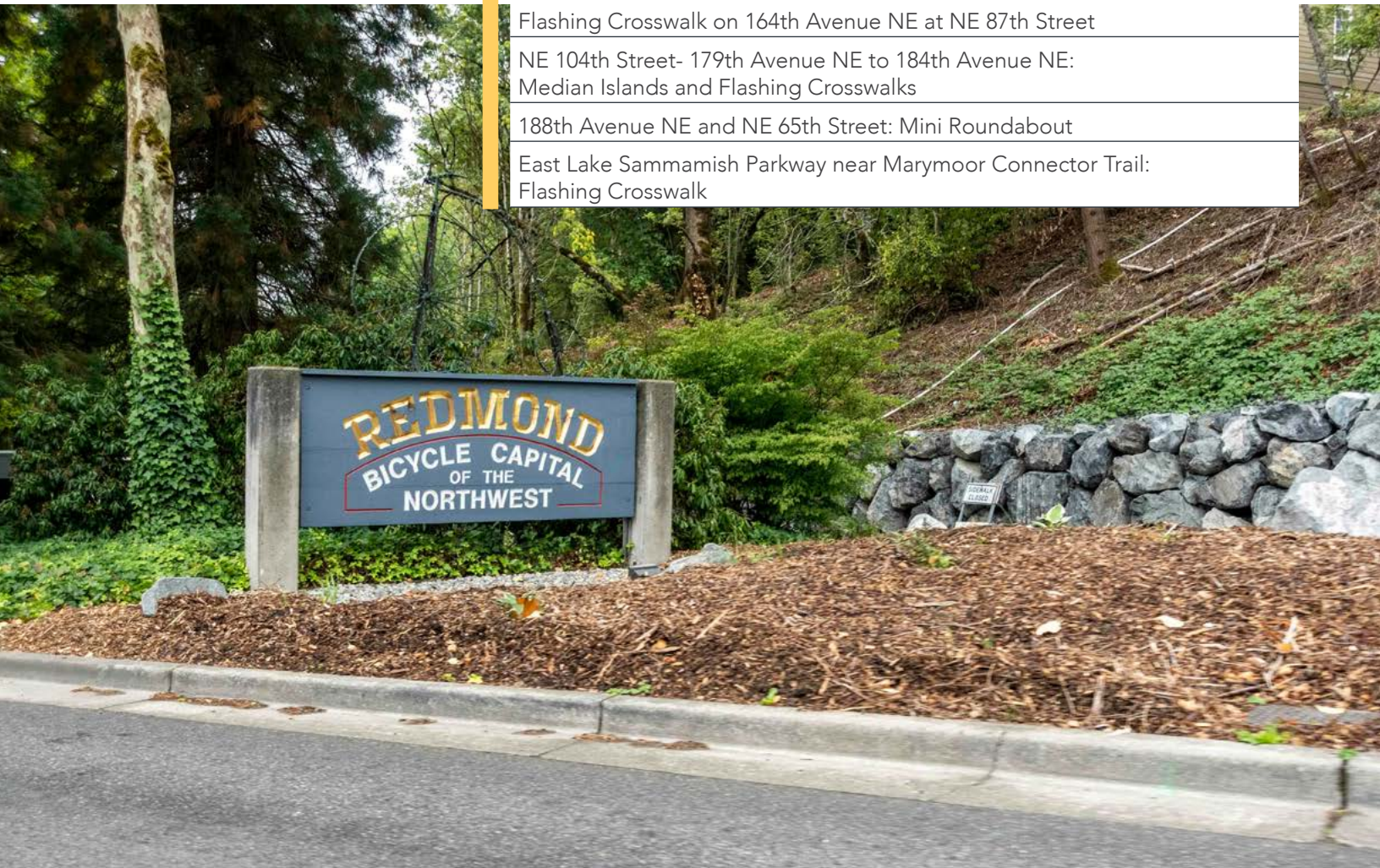
Redmond
WASHINGTON

5.2 History of Safety Projects

The City of Redmond has a legacy of working to improve the safety of the City's roadways and active transportation facilities. The Targeted Safety Improvement Program (TSIP) implements the policies of the City's Transportation Master Plan. The key elements of the program help to identify existing and potential traffic safety problem areas and implement projects to reduce traffic crashes using both proactive and reactive strategies.

Table 1. Targeted Safety Improvement Projects the City has Recently Completed or Plans to Complete

New Rectangular Rapid Flashing Beacon Crosswalk at the following locations scheduled for installation in 2023
NE 116th Street and 159th Avenue NE
180th Avenue NE and NE 70th Street
Bear Creek Parkway and 159th Place NE
Completed Targeted Safety Improvement Projects
Northbound flashing sign on 140th Ave NE approaching NE 80th St
Rectangular Rapid Flashing Beacon (RRFB) Crossing at Trader Joe's and 160th Ave NE
RRFB Crossing and new ADA curb ramp on the Northwest corner of Bear Creek Parkway and 166th Avenue NE
Projects proposed for the 6-year Capital Investment Strategy
Traffic Signal and pedestrian crossings at 151st Avenue NE and NE 90th Street
East Lake Sammamish Parkway and 187th Avenue NE: Add a southbound left turn lane and construct a wall to maintain bike lanes through the intersection
Flashing Crosswalk on 164th Avenue NE at NE 87th Street
NE 104th Street- 179th Avenue NE to 184th Avenue NE: Median Islands and Flashing Crosswalks
188th Avenue NE and NE 65th Street: Mini Roundabout
East Lake Sammamish Parkway near Marymoor Connector Trail: Flashing Crosswalk



5.3 Local Road Safety Plan Process

The City of Redmond's Local Road Safety Plan follows a process developed by the Federal Highway Administration (FHWA) and promoted by WSDOT to proactively address safety concerns based on crash data. WSDOT's success with a similar program at the county level in reducing crash rates for targeted risk factors has led to the application of the LRSP process for cities to identify risk factors and targeted countermeasures.

Transpo Group, on behalf of the City of Redmond, analyzed crash data reports to identify risk factors. Analysis includes a statistical look at the rate of contributing factors cited in crashes, as well as a spatial examination of the locations and groupings of crashes, and the contributing factors' spatial distribution. Prioritized risk factors are developed based on the combined statistical and spatial analysis.

Countermeasures to risk factors are assigned to sites of historical crashes as well as locations with similar characteristics that may be sites of future crashes. A program of prioritized countermeasure projects is developed based on the risk factors and an evaluation of historically underserved or vulnerable populations. The program will help to guide systemic, citywide improvements that enhance the safety and comfort of all modes of transportation.

> The data for the LRSP is limited to a 5-year study period, January 1, 2018 through December 31, 2022.

Data Sources

Data for the City of Redmond's Local Road Safety Plan comes from WSDOT resources, which are coordinated with the Washington State Patrol and the local Redmond Police Department through the Statewide Electronic Collision & Ticket Online Records (SECTOR) system. WSDOT verifies and calibrates crash data on a calendar year basis, therefore only data through the end of 2022 is included in the plan. Future updates to the plan will include a revised 5-year window and a historical comparison to identify trends or changes in crash frequency or severity.

5.4 Existing Transportation Infrastructure

Streets

The City of Redmond's transportation system is primarily a gridded urban street network in the downtown core, with irregular blocks ranging in size from about 400' by 300' to about 600' by 600' long. Outside of the downtown areas, Redmond's residential neighborhoods take the form of cul-de-sacs, occasionally enclosed within much larger blocks. There are 219 lane miles of arterial streets within the city limits, and 128 lane miles of local streets (each local street has two lanes and arterial streets have multiple lanes). At the eastern bounds of the city the grid size increases and becomes more irregular, along with lot sizes, but remains suburban in nature with sidewalks, curbs, illumination and bike lanes in most locations. Nearly 4,000 streetlights illuminate highways and city streets in Redmond and the city plans to install an additional 1,000 lights by 2030. Some of the streetlights in Redmond are owned and maintained by the city, while others are owned and maintained by Puget Sound Energy.

Redmond considers each street and its role or function within the context of the overall street network using a functional classification system. The functional classification system identifies the role of each street along with its planned cross-sectional design elements. In addition to their specific functional classification, selected streets in Redmond are designated as modal corridors, freight routes, or main streets to indicate their specific roles in the street network.

Table 2. Roadway Functional Classification Designations
State Routes (SR 520 and SR 202)
Principal arterials
Minor arterials
Collector arterials
Local streets including Connectors, Local access and Shared streets.

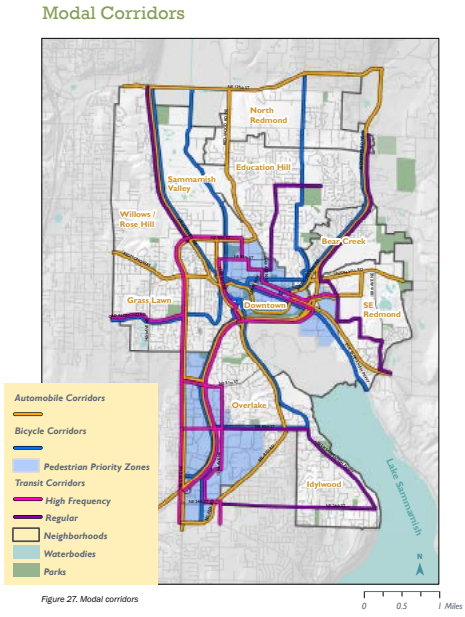


Figure 1. Redmond's Modal Corridors

WA State Highways 520 and 202 pass through the city, intersecting at NE 76th Street. Highway 520 runs generally east-west and turns northwest at the junction with Highway 202, before transitioning into Avondale Road NE. Highway 202 bisects the city from the northwest and continues toward the southeast at Redmond Way before exiting the city limits. I-405 lies approximately three-quarters of a mile to the west of the city limits.

The city contains numerous parks and greenbelts within its neighborhoods. To the north and west, neighborhoods are predominantly residential in character, with commercial and industrial lots primarily located south and east of Highway 520. The Sammamish River and local streams, including Bear Creek, in the city have wide buffers which interrupt the gridded transportation system. Large parks, including the Marymoor complex, Sportsman Park, Arthur Johnson Park, and the Evans Creek Natural Area fringe the city to the south and east.

Redmond has identified several critical modal corridors serving as the framework of its transportation system. Critical modal corridors include all principal and important minor arterial streets, the SR 520 corridor, and several multi-purpose regional trails. Critical modal corridors, together with the remaining arterial streets, local streets and trails, connect all nine neighborhoods and Redmond's two urban centers, and comprise the city's primary transportation network .

5.4 Existing Transportation Infrastructure

Intersection Control

Redmond's transportation system is designed to support travel by pedestrians, bicyclists, transit riders, motorists and freight. Intersections are controlled by a variety of traffic control devices such as traffic signals, roundabouts, and stop signs. Traffic signals are found throughout the city on its major principal, minor, and collector arterial corridors. If a traffic signal is not present, 4-way intersections

The city's 4-way intersections are a mix of uncontrolled, 2-way stop controlled, and 4-way stop controlled. Towards the eastern boundary of the city, there is a roundabout at the intersection of Union Hill Road and 196th Avenue NE, and another roundabout just outside of the city limits about three quarters of a mile to the north. Two more roundabouts lie to the north of downtown on NE 116th Street at the intersections of 162nd Avenue NE and 172nd Avenue NE.

Active Transportation

Redmond offers a wealth of opportunities to walk, bike or roll. There are numerous trails, sidewalks, and walking paths to utilize either for exercise, commuting, or merely for access to destinations within or outside of Redmond. The City maintains 235 miles of sidewalk, many of which are separated by vegetated buffer strips. There are 59 miles of public trails in Redmond, of which 39 miles are owned and maintained by the City. Pedestrian zones are located around Redmond's Downtown Pedestrian District and marked with special signage to communicate to drivers they are in an area where they can expect higher volumes of people walking.

Figure 2. Pedestrian Zone Sign in Redmond

Table 3. Pedestrian Zone Sign Locations
Leary Way north of West Lake Sammamish Parkway
Redmond Way west of West Lake Sammamish Parkway
NE 85 Street east of 154 Avenue NE
NE 90 Street east of 154 Avenue NE
Redmond-Woodinville Road north of NE 90 Street
166 Avenue NE north of NE 85 Street
Redmond Way near Bear Creek Crossing
Avondale Way from westbound Union Hill Road
NE 80 Street at 170 Avenue NE

5.4 Existing Transportation Infrastructure

Marked crosswalks are provided at all legs of signalized intersections unless their absence is warranted. The City of Redmond defines crosswalks as: "any portion of the road outlined with white paint or created by reflective pavement markings or a different texture of concrete-like brick pavers." The City has a number of mid-block crosswalks, designed to discourage pedestrians from making random crossings by offering a convenient location to cross in an area which does not have frequent intersection crossings. The City maintains over 45 Rectangular Rapid Flashing Beacon (RRFB) arrays throughout Redmond which enhance the safety and visibility of crossing locations where they are installed. Pedestrian countdown signals are installed at all of Redmond's signalized intersections.

To promote the safety of active transportation users in school zones, 20 mph school zone speed limit signs with interactive radar feedback are installed around schools throughout the city. Speed feedback signs calm traffic near schools and improve the safety of pedestrians using school crosswalks by displaying the driver's speed, a prominent "Slow Down" message when exceeding the 20-MPH speed limit and flashing amber beacons to notify drivers when the 20-MPH speed limit is active.

With the Eastside's largest share of bike commuters, Redmond is one of 19 cities in Washington designated as a Bicycle Friendly Community (BFC) by the League of American Bicyclists and has an extensive network of both on-street bike lanes and off-street trails for easy access to downtown, neighborhoods, businesses, parks, and even to other cities. Redmond is currently designated as a Silver-level by the League of American Bicyclists.

In the City of Redmond, segments of the bicycle modal corridor network are considered "complete" if they are served by a trail or another type of physically separated bikeway, such as a cycle track. Bicycle lanes are not considered physically separated bikeways. Within the modal corridors, bike boxes are provided at intersections.

5.4 Existing Transportation Infrastructure

Transit

Redmond is connected to the region by all-day frequent bus service and light rail. Construction of the first two East Link light rail stations in the Overlake Urban Center started in 2015 with service to Bellevue and Seattle to begin sometime after 2024. The future light rail station across from Microsoft's main campus, in the southern part of the city along 156th Avenue NE, will expand the existing Overlake Transit Center into one of the most significant multi-modal transit hubs in the region. A mile to the south a new station at the northern tip of the planned Overlake Village will become the catalyst for a dense and highly accessible urban community from which residents can walk to the train and be in Seattle in under one hour.

Light Rail Development Impact

The vision for downtown Redmond is for a primary community gathering place where housing, retail, and office uses coexist in a pedestrian-friendly environment. With comfortable access to an East Link light rail station at Overlake Village, the area will grow into a vibrant urban neighborhood offering a key mix of housing, retail, and short commutes to the Microsoft campus and downtown Bellevue.

Within two urban centers, a strategic mix of land uses will allow more trips to be made conveniently and quickly by walking or bicycling. The City of Redmond expects to reach a population mix of 78,000 residents and about 119,000 jobs by 2030. The forecast gap between the number of jobs and the number of residents indicates many people who work in Redmond in 2030 will continue to commute to their jobs from outside the city.

To service the demand for commuter travel, the Downtown Redmond Link Extension will add two new light rail stations in southeast Redmond, one serving Marymoor Village at NE 70th Street near Marymoor Park, and another in the downtown residential and retail core at 166th Avenue NE. The new link extension is projected to open by 2025 and will take travelers to Westlake center in Downtown Seattle in 45 minutes and provide access from Marymoor Village Station to downtown Bellevue in 15 minutes. Sound Transit estimates the project will attract an estimated 40,000 – 50,000 daily riders within a year of opening, introducing a large volume of pedestrians and cyclists to station areas and changing the volume and pattern of vehicular traffic near stations.

While observed traffic volumes have trended downwards between 2001 and 2010, the city's traffic models predict the downward trend will reverse between 2010 and 2030 in response to population and employment growth in the region. Trips in Redmond occur throughout the day, are mostly for purposes other than commuting, and are for short distances: as the majority are under five miles. Commute trips tend to be longer than other types, are concentrated in the am and pm peak travel periods, and, with the expansion of Light Rail into southeast and downtown Redmond, are expected to increase the mode share of transit trips in the area. The City's travel forecast model predicts the number of trips taking place by single-occupant-vehicle may decrease as much as 47 percent in response to programmed transportation system changes and transit expansion.

5.5 Crash Data Statistical Analysis

The summary data for all crashes on city roads was analyzed for statistical outliers where factors surrounding crashes were overrepresented compared to statewide crash data, as well as data for western Washington cities. Contributing factors or conditions which were cited in a significant percentage of crashes within Redmond have also been identified. Crash data statistical analysis allows for targeted research into the causes related to the transportation user (drivers, cyclists, and pedestrians) and the transportation environment (roadway geometry, characteristics, enhancements, etc.) which contribute to crashes. While the focus of the LRSP is on crashes with severe injuries or fatalities, the data for all crashes was analyzed for over-representation of contributing factors to avoid any statistical bias that could miss larger crash trends.

During the 5-year study period (2018-2022), the total number of crashes on city roads was 3,481. Of all crashes, 53, (0.2 percent) resulted in a serious injury or fatality (SIF). Table 4 displays the SIF crashes for each of the years in the 2018-2022 period compared to the total SIF crashes for the previous five-year period.

The total number of crashes was 7 percent lower in the current 5-year (2018-2022) period than the previously analyzed 5-year period (2016-2020), however the percentage of fatal crashes has increased by 2 percent, and the number of serious injury crashes has increased by 4 percent. The statistical difference between the two five-year periods reflects the random nature of crashes and is not necessarily indicative of an overall trend in crashes in the City.

Table 4. Summary of all Crashes and Serious Injury and Fatal Crashes

	2018–2022	% of Total 2018–2022	2022	2021	2020	2019	2018	2016–2020	% of Total 2016–2020
Fatal Crashes	5	9%	0	1	0	2	2	7	13%
Serious Injury Crashes	48	91%	10	5	14	6	14	46	87%
Total Crashes	3,481		601	553	465	885	977	3,718	

Source: WSDOT November 2023
Does not include SR 520 in limited access areas

30–40 mph Divided Arterials

52 percent of all crashes in Redmond which resulted in serious injury or fatality occurred on roads where the posted speed limit is between 30 mph and 40 mph. Redmond likely has a higher-than-average proportion of roadways with 30-40 mph posted speeds. Many of the facilities with posted speeds in the 30-40 mph range are of a design that does not provide passive management of vehicle speeds, with elements including wider lane widths, directional division, the presence of turning lanes, and a lack of friction at the street edges. Table 5 provides a breakdown of the statistical summary for crashes on 30 mph to 40 mph roads.

Table 5. Statistical Summary 30 mph to 40 mph Roads

	Total Crashes			**Serious Injury and Fatal Crashes**		
Speed Limit Posting	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
30-MPH	24%	39%	23%	9%	18%	35%
35-MPH	36%	33%	16%	27%	42%	0%
40-MPH	4%	4%	12%	7%	5%	5%

Source: WSDOT November 2023. Does not include SR 520 in limited access areas

5.5 Crash Data Statistical Analysis

Active Mode Involved Crashes

The city's rate of reported active mode (pedestrian and bicycle) crashes is 4.6% which is slightly lower compared to other similar western Washington cities. The severity of active mode crashes that do occur represents the top two categories of severe crashes in the City, and nearly half of all severe crashes with 47 percent of active mode crashes resulting in a severe injury or fatality. Table 6 includes the crash data for active modes.

The rate of pedestrians and cyclists being struck in marked crosswalks is very high for both total reported crashes in the city and for crashes with fatal or severe injury outcomes. For pedestrians, the rates are 65 percent of total reported pedestrian crashes and 60 percent of pedestrian crashes reported with severe injury or fatal outcomes. For bicyclists, the rates are 31 percent of total reported bike crashes.

Other overrepresented crash circumstances cited in more detailed crash data include pedestrians hit while the vehicle is making a left turn across a crosswalk, and pedestrians hit in marked crosswalks. Table 6 provides a summary of the pedestrian and bicycle involved crashes in Redmond for the 2018-2022 period.

Table 6. Statistical Summary of Contributing Factors to Pedestrian and Bike Crashes

	% of Total Crashes			% of Serious Injury and Fatal Crashes		
Contributing Circumstance	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
Pedestrian and Bike Crashes	5% (10,208)	5% (8,338)	5% (159)	24% (2,595)	37% (1,408)	47% (25)
Failure to yield to Ped/Cyclist	0.7% (3,061)	0.7% (2,416)	0.8% (6)	4% (384)	4% (301)	6% (4)
Ped in Marked Crosswalk	45% (3,100)	46% (2,573)	65% (46)	33% (488)	34% (400)	60% (9)
Bike in Marked Crosswalk	31% (629)	46% (2,573)	15% (21)	10% (47)	9% (35)	0% (0)
Cyclist Failure to Yield to Vehicle	12% (488)	12% (425)	12% (7)	15% (79)	13% (56)	8% (1)

Source: WSDOT November 2023. Does not include SR 520 in limited access areas

5.5 Crash Data Statistical Analysis

Rear-End Crashes

The proportion of both total and Serious Injury or Fatal (SIF) rear end crashes, as shown in Table 7, is higher in Redmond than in comparison jurisdictions. In Redmond, rear ends accounted for 8 percent of the SIF crashes compared to 6 percent on all Washington city streets, and 4 percent in other Western Washington cities. Rear ends accounted for one third of the total crashes in Redmond. Following too closely was contributing factor in 8 percent of all crashes in Redmond and 4 percent on other Western Washington city streets. Rear-end crashes are typically indicative of congestion, especially for agencies with a significant number of signalized intersections, and with heavier traffic volumes, as are present in Redmond.

Table 7. Incidence Rate of Rear End and Following Too Close Crashes

	% of Total Crashes			% of Serious Injury and Fatal Crashes		
Contributing Circumstance	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
Rear End	19% (41,071)	19% (30,847)	33% (1,136)	9% (937)	4% (152)	8% (4)
Following Too Close	5% (20,079)	4% (13,246)	8% (25)	0.8% (69)	0.6% (43)	3% (3)

Source: WSDOT November 2023. Does not include SR 520 in limited access areas

5.5 Crash Data Statistical Analysis

Intersection Crashes

Serious injury and fatal crashes related to intersections were comparable to other Western Washington cities, but 8 percent higher in Redmond than for all city roads in Washington state. Signalized intersections followed a similar percentage distribution, with disregard for stop and go lights cited as a contributing circumstance in 5 percent of the SIF crashes in Redmond. Intersection-related crash data is shown in Table 8.

Intersection crashes include angle-type crashes at intersections with no traffic control, stop sign control (2 or 4-way) and with signal control. Angle crashes at intersections may include disregard for a posted stop sign or a red signal. The highest percentages of all types of crashes in Redmond occurred at signalized (43 percent) and uncontrolled (53 percent) intersections. Angle type crashes accounted for 23 percent of all crashes in the city, and 9 percent of SIF crashes in Redmond.

Table 8. Incidence Rate of Intersection-Related Crashes

	% of Total Crashes			% of Serious Injury and Fatal Crashes		
Contributing Circumstance	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
Intersection Related	42% (90,005)	41% (65,453)	40% (1,407)	32% (3,427)	42% (1,583)	40% (21)
Disregard Stop and Go Light	0.7% (2,909)	0.6% (2,096)	1.2% (3)	0.7% (61)	0.7% (47)	5% (3)
Signalized Intersection	42% (140,356)	41% (107,539)	41% (1,170)	32% (3,574)	42% (2,599)	40% (16)

Source: WSDOT November 2023
Does not include SR 520 in limited access areas

Fixed Object Crashes

While fixed object crashes in Redmond compared favorably to the rates of fixed object crashes in other locations, summarized in Table 9, the proportion of SIF crashed involving fixed object strikes is proportionally high compared to other crash types in the city. Fixed object crashes accounted for 17 percent of SIF and 11 percent of total crashes in Redmond between 2018 and 2022. Collisions with trees and stumps were the most frequently cited type of fixed object collision, accounting for 15 percent of Redmond's total crashes.

Table 9. Statistical Summary of Roadside Fixed Object Crashes

	% of Total Crashes			% of Serious Injury and Fatal Crashes		
Contributing Circumstance	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
Fixed Object Crashes	13% (27,271)	13% (20,910)	11% (392)	23% (2,435)	19% (711)	17% (9)
Hit Tree/Stump	14% (4,049)	16% (3,441)	15% (60)	23% (207)	26% (184)	11% (1)

Source: WSDOT November 2023
Does not include SR 520 in limited access areas

5.5 Crash Data Statistical Analysis

Median Divided Roadways

Several of Redmond's major arterials, other than highway access-controlled segments of SR 520, are divided by curbed medians. WSDOT's categorization of crashes for the LRSP process separates crashes that occur on these types of roadways as "two way divided". The majority of the crashes during the study period in Redmond, 68 percent, occurred on these divided arterials. 38 percent of all crashes occurred in areas of these arterials with raised, curbed medians. Compared to statewide data, Redmond's crash rate on divided arterials with barriers is significantly higher, but this could be an anomaly based on categorization of crashes, and Redmond's relatively unique configuration of arterials compared to other cities. Table 10 summarizes the WSDOT categorized crash data related to divided arterials and barriers.

Table 10. Incidence Rate of Crashes on Median Divided Roadways

	% of Total Crashes			% of Serious Injury and Fatal Crashes		
Contributing Circumstance	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
Two Way Divided with Barrier Arterials	8% (28,339)	8% (8,428)	38% (1,018)	8% (738)	7% (526)	30% (9)
Two Way Divided without Barrier Arterials	35% (132,084)	37% (35,054)	30% (792)	37% (3,500)	39% (2,857)	20% (6)

Source: WSDOT November 2023
Does not include SR 520 in limited access areas

Drug and Alcohol Related Crashes

Crashes involving the influence of drugs or alcohol were comparatively low for Redmond, as shown in Table 11, with only about 2 percent of all crashes and about 6 percent of SIF crashes compared to about 5 percent for total crashes on both all city streets in the State and for other cities in Western Washington, and 14 percent for SIF crashes in the comparison locations.

Table 11. Incidence Rate of Under the Influence Crashes

	% of Total Crashes			% of Serious Injury and Fatal Crashes		
Contributing Circumstance	All WA City Roads	Western WA City Roads	Redmond Roads	All WA City Roads	Western WA City Roads	Redmond Roads
Drugs or Alcohol	5% (13,162)	5% (9,639)	2% (13)	14% (732)	14% (551)	6% (7)

Source: WSDOT November 2023
Does not include SR 520 in limited access areas

5.6 Spatial Analysis

Data on crashes that includes geolocation data from SECTOR public records were obtained for each reported crash in Redmond in the study period, to produce maps of reported contributing circumstances. Mapping of the crash data allows for identification of patterns by physical location and the roadway environment and a statistical analysis of risk factors. The spatial analysis complements the statistical analysis and helps to identify specific risk factors for future crashes. A selection of the maps generated for analysis in the comprehensive safety planning process are included in the Appendix.

Crashes Concentrated on Arterials

Several SIF crashes involving pedestrians and or bicyclists were reported along SR202/Redmond Way southeast of the city center, between SR 520 and 188th Place NE. Minor and principal arterials leading into the City have posted speed limits ranging from 35–45 mph. The spatial pattern of crashes indicates SIF crashes involving pedestrians struck by vehicles are clustered in the downtown core, particularly along NE 85th Street between 160th Avenue NE and 166th Avenue NE, and along 160th Avenue NE and 161st Avenue NE between NE 85th Street and SR202/Redmond Way.

In residential neighborhoods, presumably due to the many cul-de-sacs, narrower roadways, and increased friction from parked cars and other roadside objects, there are far fewer clusters of data points representing crashes with pedestrians and cyclists. The vast majority of crashes occurring on narrower residential roadways were drivers striking parked cars or fixed objects such as trees.

Crashes at Intersections

152nd Avenue NE/ NE 24th Street Intersection

The intersection at 152nd Avenue NE and NE 24th Street is signalized. 152nd Avenue NE has right turn pockets on both sides of the intersection. NE 24th Street is a multi-lane approach with left turn lanes on both sides of the intersection. Sight distances may be obscured by the rock retaining wall at the southwest corner of the intersection and by trees at the other three corners. Mapping the crash data shows the number of crashes with pedestrians is unusually high at this intersection.

140th Avenue NE/ Redmond Way Intersection

The intersection at 140th Avenue NE and Redmond Way is signalized, with multi lane approaches on all four legs. Both Redmond Way and 140th Avenue NE have posted speed limits of 40-MPH. The data indicates a concentration of angle and sideswipe crashes occurred on Redmond Way between 139th Avenue NE and 142nd Avenue NE.

W Lake Sammamish Parkway/ NE Leary Way Intersection

Spatial analysis of data points indicates a dense cluster of angled and rear-end crashes at the intersection of W Lake Sammamish Parkway at NE Leary Way and a cluster of Angled type crashes occurring on W Lake Sammamish Parkway at the driveway to Sunrise Donuts and Espresso. A concentration of similar type crashes occurred on SR 202 between 166th Avenue NE and 170th Avenue NE, on 164th Avenue NE between Redmond Way and NE 87th Street, and on 166th Avenue NE between NE 80th Street and NE 85th Street.

Pedestrians and Bikes in Downtown Core

Redmond's pedestrian and bicycle crashes are primarily clustered along Redmond Way between 160th Avenue NE and SR 520. Crashes on Redmond Way/SR 202 corridor resulting in serious injuries or fatality tend to be at signalized crossings and near transit stops or parks. Several crashes with pedestrians on NE 90th Street at 161st Avenue NE and at intersections along 161st Avenue NE between NE 90th and Redmond Way involved drivers failing to yield to non-motorists. A cluster of pedestrian involved crashes resulting in injury occurred on 156th Avenue NE, at the entrance to the Overlake Transit Center Access Road.

5.6 Spatial Analysis

Roadside Objects

Roadside object crashes are heavily concentrated along the SR 520 on ramps at SR 202/Redmond Way, and the SR 520 on and off ramps at W Lake Sammamish Parkway. On facilities owned by the city, high concentrations of crashes with parked cars were reported along Cleveland Street, especially at the intersections with Leary Way and 161st Avenue NE. A cluster of crashes with parked cars was reported at the intersection of 170th Avenue NE and NE 80th Street. Farther to the west, data points indicate an increased incidence of vehicles colliding with fixed objects, likely street trees, along Old Redmond Road between 132nd Avenue NE and 140th Avenue NE.

Sideswipes at Intersections

Sideswipe crashes are concentrated at intersections along the Cleveland Street and Redmond Way corridors between 154th Avenue NE and NE 76th Street. Reported sideswipe incidents have occurred frequently along Avondale Road NE, from the junction with SR 520 to NE Novelty Hill Road, along SR 202 from the northern boundary of the city to where SR 202 transitions to NE Redmond Fall City Road and the intersection with 188th Place NE, and on Willows Road NE from the northern city boundary to 148th Avenue NE.

Sideswipe and rear-end crashes are heavily concentrated on the SR 520 on and off ramps at several intersections along Cleveland Street and Redmond Way between 160th Avenue NE and 168th Avenue NE, and at the intersection of SR 202 and 180th Avenue NE. Crashes of a rear end and sideswipe type near the off-ramps are thought to be primarily the product of congestion. Sideswipe crashes resulting in severe injury or fatality appeared concentrated along the Redmond Way/SR 202 corridor between 161st Avenue NE and 185th Avenue NE.

Angle Crashes at Intersections

A concentration of angle crashes which cited driver disregard for traffic signals occurred on SR 202/Redmond Way near Anderson Park and on SR 202/Redmond Way at the intersections of 170th Avenue NE and 166th Avenue NE. A cluster of angle crashes occurred at the intersection of SR 520/Avondale Road and NE 80th Street/Union Hill Road. A similar pattern of driver disregard for signals resulting in angle and other type crashes was observed on NE 85th Street at all but one (NE 85th and 158th Avenue NE) intersection between 154th Avenue NE and 166th Avenue NE.

Active Mode Crashes Along Transit Routes

Active mode crashes were closely associated with locations where transit facilities are or will soon be found. Clusters of pedestrian and cyclist crashes were observed at the entrance to the Overlake Transit center currently under construction, near transit stops in the downtown core, and at several locations located within the one-half mile walkshed of future light rail access.

Active mode crashes in other areas of the city clustered around all-day service routes, defined as those with headways of 30 minutes or greater, and frequent service, defined as those with headways of 15 minutes or less. The correlation between active mode crashes and transit routes can be seen in the maps in the Appendix.

5.7 Risk Factors

Based on a combination of the statistical and spatial analysis of the crash data for Redmond, the following risk factors were identified and prioritized. Risk factors will provide guidance to the City's implementation of countermeasures in a focused effort to reduce the frequency and severity of future crashes. The following list of factors is not inclusive of all potential risks for future crashes but is a prioritized set of factors that can be addressed through systemic implementation of countermeasures citywide. The use of a systemic approach to prioritized risk factors provides a higher potential safety benefit for investment ratio when compared to a more reactionary spot-treatment approach, or when attempting to spread limited resources to address all possible risk factors. The risk factors outlined below are presented in priority order.

Pedestrians in Marked Crossings

A majority of crashes involving pedestrians have occurred in marked crossings. Crossings are the primary location where different modes have potential conflicts. Improvements to increase the visibility of crossings and users in and entering the crossing are a high priority to address a significant risk factor to vulnerable users.

Bikes in Existing Facilities

Redmond has a well-developed bike network, but improvements to incorporate current best practices and guidance on separation and crossing improvements can address a risk factor for crashes with bikes in existing facilities. Risk factors based on crash history are present in both linear and crossing bike facilities.

Crashes at Signalized Intersections

Signalized intersections are complex environments with many demands on the attention of all users. Redmond's signalized intersections represent a risk factor for vehicle and active mode crashes. Improvements to visibility, operations and predictability of signalized intersections can reduce risks and improve overall system safety.

Crashes on 30 mph+ Roadways

Roadways in Redmond with a posted speed limit of 30 mph or greater experience a higher percentage of crashes than similar cities. Faster vehicle speeds can mean less time to react to changing roadway conditions or grant right of way to active mode users. Addressing the risk factors for higher speed roadways could include a study of appropriate speed limits.

Crashes on Median Divided Roadways

Median-divided roadways in Redmond are typically associated with higher speeds and are another common risk factor for crashes involving all modes. Identification of countermeasure projects on divided roadways works together with other risk factors to reduce the overall crash risk in the city.

Improper Speed for Conditions

Speed affects not only the risk for a crash occurring, but the severity and outcomes of the crash on people. While Redmond's rate of speed compliance with posted limits in crash data is a positive, there is a common risk factor of improper speed for conditions, indicating a need to address speeds and roadway conditions in inclement weather or in heavy traffic conditions.

5.8 Countermeasures

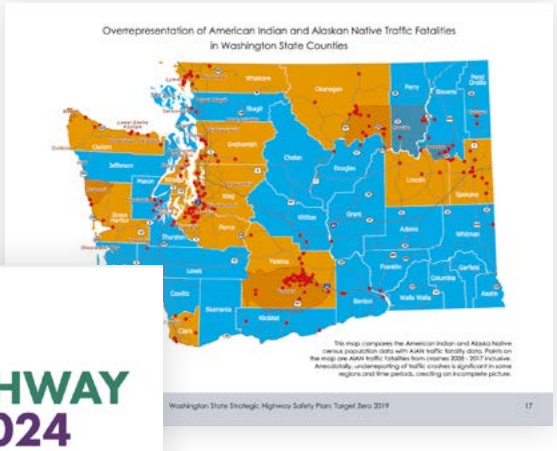
Countermeasures are the actions the City of Redmond can take to proactively address the risk factors identified through the crash data analysis. To identify projects and programs that could address the risk factors for crashes, a full range of potential countermeasures was evaluated. The most broadly effective countermeasures which addressed the prioritized risk factors within reasonable resource constraints were selected for the LRSP and associated project list. Each of the listed countermeasures has proven effective in addressing the risk factors identified in Redmond's transportation system.

Effectiveness of the selected countermeasures was evaluated using:

- National Highway Traffic Safety Administration's Countermeasures That Work publication,
- Washington State's Target Zero plan, and
- FHWA's Crash Modification Factor (CMF) Clearinghouse website.

The listed resources help to identify appropriate solutions and provide research backed documentation of the anticipated effectiveness of selected treatments on reducing crash rates.

The countermeasures shown on the following pages can be systemically applied to many locations throughout the city. The recommended modifications to the city's transportation system will improve safety and comfort for users of all modes and proactively limit the severity and reduce the incidence of future crashes. The descriptions of the projects and programs are designed to be open-ended to allow for updating of the Safety Plan in the coming years to note completed actions, and continue to address recommended locations as local and grant funding resources allow.



High Visibility Crosswalk Markings

Risk Factors

Countermeasures

Expand use of Continental style crossings

Mark crossings at slip lanes and ped islands

Green/white combined markings for multimodal crossings

The use of Continental style crosswalk markings for improved visibility is now the City of Redmond's standard. The larger bars improves the visibility of crossings for drivers and can create contrast with crossing pedestrians compared to thinner crosswalk marking styles. Using green and white combined colors highlights the increased presence of bicycles and widens the crossing for the comfort of all modes. Marking crossings at slip lanes improves driver yielding and visibility of pedestrians.

Updated markings are prioritized at;

- Signalized intersections with existing crosswalks
- Arterial and higher volume collector roadway intersections
- On or near transit routes (bus and light rail) especially with more frequent service
- Near schools, parks and other high volume pedestrian generators

The City has been upgrading crossings, but the following intersections have been identified as a priority for the next round of grant-funded or maintenance upgrades to the current City Standard 311B.

For the city's projects which address intersection control, the CMF Clearinghouse research indicates improvements to the visibility, signing and markings at controlled intersections can reduce total crashes by 10 to 20 percent.

Multimodal continental crossing

Continental, high visibility markings

Estimated Project Construction Cost:

$15,000–30,000

per intersection

Costs would include marking removal, and new pavement markings at selected intersections

Time to Construct:

3-6

months from design kickoff

High Visibility Crosswalk Markings

Candidate locations for upgraded markings include:

- Avondale Road (NE 90th Street to 116th)
- 148th Avenue NE (Willows Road to NE 38th St)
- 161st Avenue NE/NE 83rd Street
- 160th Avenue NE/NE 83rd Street
- NE 85th Street/154th Avenue NE
- Willows Road/NE 90th Street
- Redmond Way/185th Avenue NE
- Old Redmond Road/148th Avenue NE, 140th Avenue NE

Multimodal continental crossing:

- Bear Creek Parkway/161st Avenue NE, Leary Way

Figure 3. Candidate Locations for Upgraded Crosswalk Markings

Signalized Crosswalk Improvements and Signage

Risk Factors

Countermeasures

- **Lighted and actuated warning and blankout turn restriction signage**
- **PM peak turn restrictions**
- **Lead pedestrian interval**
- **Pedestrian "scrambles"**
- **ADA pushbutton and ramp upgrades**

Pedestrian and cyclist risk factors in marked crossings varies by time of day. Starting in the evening peak hours, a greater concentration of pedestrian and cyclist-involved crashes occurs in marked crossings. Pedestrians are more often involved in left turn crashes with vehicles, while cyclists are involved in right turn crashes. Lead pedestrian interval, lead cyclist intervals with bike boxes, or turn restrictions limited by time of day, controlled by electronic blank-out signage that can be actuated to pedestrian push buttons or bicycle presence detectors can remove some of the conflicts contributing to historical crashes, while balancing impacts to traffic operations.

Based on the results of traffic studies, restrictions on turns, all-way pedestrian crossing signal phases or "scrambles" where all traffic is held, and lead pedestrian intervals can all assist in increasing pedestrian visibility, considering a range of pedestrian abilities and crossing speeds and improve comfort for users.

Some existing crossings, because of intersection geometry, make visibility of pedestrians in marked crossings difficult from some approaches. Installation of lighted signage actuated to pedestrian push-buttons, combined with leading pedestrian intervals can improve visibility of pedestrians in crossings prior to the permitted movement of traffic.

Estimated Project Construction Cost:

$15,000–100,000
per intersection

Costs could vary widely depending on the need to upgrade signal control equipment, cost of static and electronic signage, pushbutton upgrades and associated curb ramps, and traffic studies.

Time to Construct:

12–15
months from design and traffic study kickoff

Signalized Crosswalk Improvements and Signage

Candidate locations for signalized operational and signing improvements include:

- Redmond Way (all downtown intersections)
- Cleveland Street (all downtown intersections)
- 160th Avenue NE, 161st Avenue NE and 166th Avenue NE, Redmond Way to NE 85th Street
- EB Avondale Road at 170th Avenue NE
- EB Redmond Way at Cleveland

The CMF clearinghouse indicates pedestrian crossing improvements can reduce crashes between vehicles and users of active modes by 40-60 percent. Yellow change intervals, when appropriately timed, can reduce the incidence of red-light running by up to 50 percent.

Programming signals to provide increased walk phase times or leading pedestrian intervals, which give pedestrians a head start of several seconds to cross before the signal changes to green for vehicles, can result in up to a 13 percent reduction in pedestrian-vehicle crashes alone.

Reconfiguring the crossings at intersections to provide pedestrian 'scrambles' which allow pedestrians and other active mode or micro-mobility users to cross in all directions during the crossing interval can reduce pedestrian-vehicle conflicts by 34 percent.

'Blank-out' signs can be added to the signal array and programmed to restrict vehicle drivers from turning for a portion of the signal phasing and can result in a 45 percent reduction in all crash types. Assessments of visibility including sight distance and lighting can be beneficial countermeasures to improve the safety of active mode users at signalized intersections.

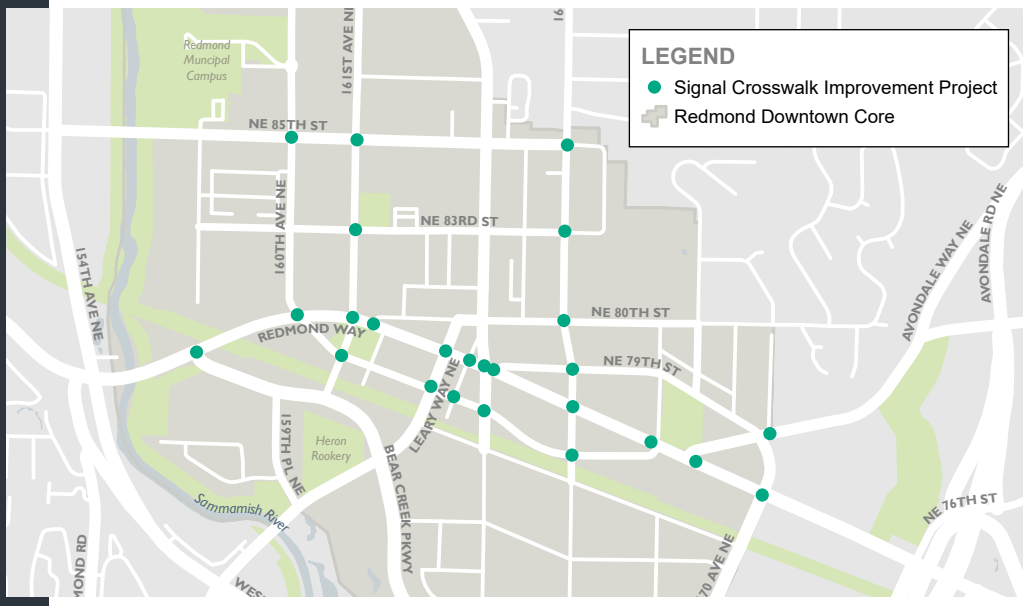


Figure 4. Candidate Locations for Upgraded Signal and Signage Improvements

High Friction Surface Treatment Program

Risk Factors

Countermeasures

High Friction Surface Treatment

High friction surface treatments (HFST) are a method of applying higher quality aggregate and binder to an existing roadway to improve vehicle grip in wet conditions as well as dry. The crash history at signalized intersections and higher volume and speed roadways in the city is correlated with wet surface conditions. HFST is a relatively inexpensive method of reducing crash rates, especially in the vicinity of horizontal curves and high-volume intersection approaches.

HSFT does not involve the overlay of long sections of roadway but is a spot treatment applied in critical areas. HFST does require some long-term maintenance in excess of that for a traditional asphalt roadway, but there is a tangible benefit in reduced crash rates that has been demonstrated by pilot and research projects using the treatment.

A HFST program should also include a field assessment of existing pavement conditions to determine the appropriate extents of HSFT to be applied to the candidate roadways identified in the list below.

Estimated Project Construction Cost:

$35,000–50,000

per 100 LF depending on roadway curb-to-curb width

High Friction Surface Treatment Program

Candidate locations for spot location installation of HFST include:

- Avondale Road–NE 85th Street to Avondale Way, NE 95th Street, south of NE 116th
- 148th Avenue NE and Willows Road
- Union Hill Road–178th Place
- Redmond Way–148th Avenue NE, Willows Road, Cleveland Street, Cleveland Street through 170th Avenue NE,
- West Sammamish Lake Parkway–Leary Way, NE 51st, Bel-Red Road
- NE 104th Street and 166th Avenue NE
- Old Redmond Road–148th, 154th, east of Snyder's Corner Park

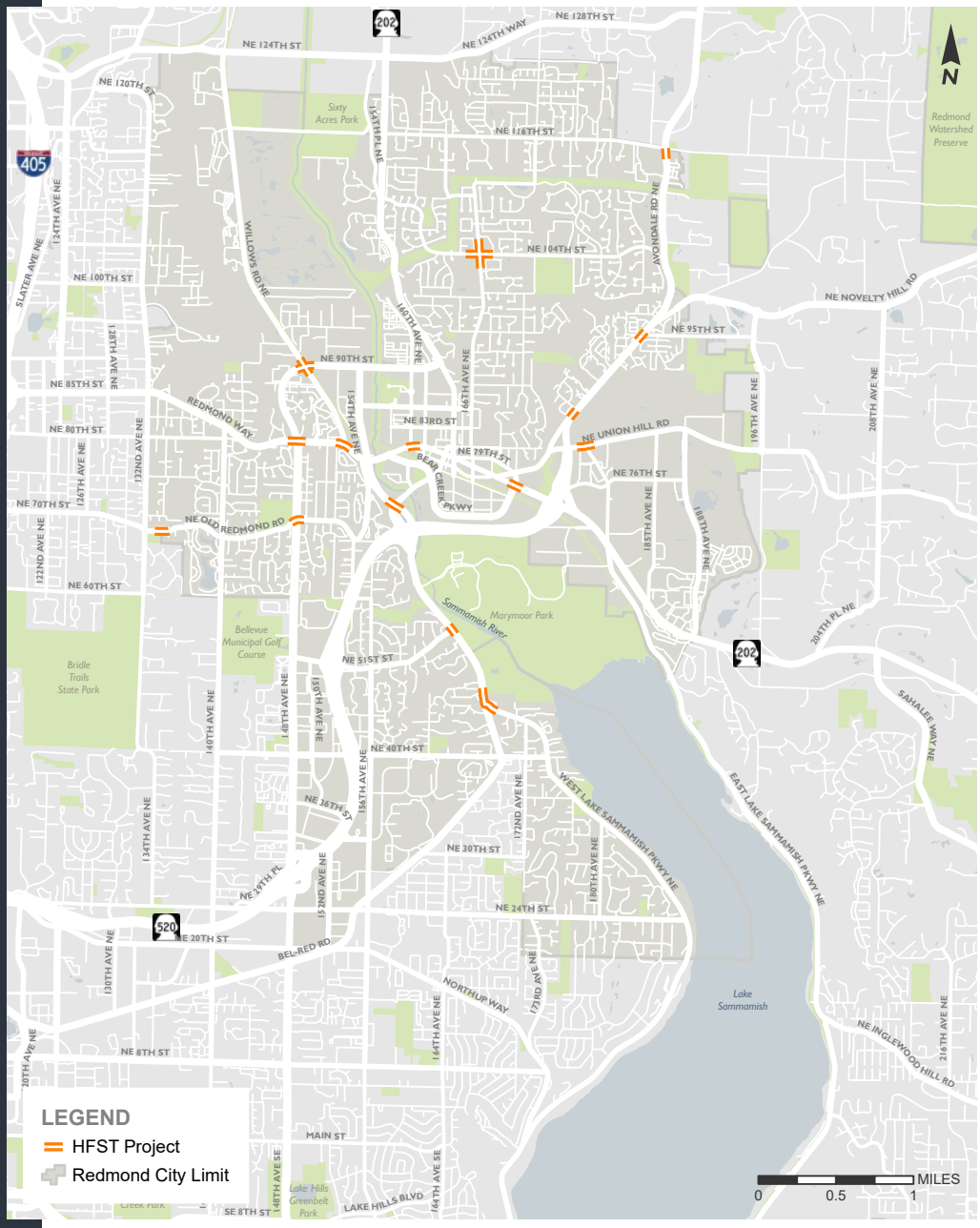


Figure 5. Candidate Locations for High Friction Surface Treatments

Enhanced Bike Lane Protection

Risk Factors

Countermeasures

Physical barriers at bike lane buffers

Physical protection of bike lanes can help to avoid incursion by vehicles, improve the comfort of bike lanes for a wider range of users, address conflicts with vehicles approaching intersections, and improve the visibility of bikes and awareness of drivers of the presence of bike lanes. Linear crashes with cyclists in marked bike lanes could be significantly reduced by the increased physical protection.

The use of single unit curbing from vendors, equipped with a vertical reflective marker, significantly increase the visibility of bike lanes, and also provide a physical separation from traffic. The units do require long-term maintenance and potential replacement, but allow for increased protection of existing bike lanes without modification of curbs, hardscape or other more expensive capital improvements. Acquisition of specialized bike lane width cleaning equipment by the city would help to maintain the safety and utility of physically separated bike lanes.

Other low-cost modifications to improve the physical barriers to existing bike lanes, which could be piloted as a demonstration project, would be to flip the location of on-street parking adjacent to bike lanes. Bike lanes would be placed at the curb line, and on-street parking would occur separated from the curb. On-street parking can be accessed without crossing the bike lanes, drivers' doors do not open into bike lanes, and bikes are protected from moving vehicle traffic by the space of the parking lane and any parked vehicles. There is an educational requirement for drivers to avoid parking occurring in the bike lane.

Estimated Project Construction Cost:

$1,000

per 100 LF of bike lane stripe

Spaced at 50 foot intervals, curbs could be installed directly overtop of existing bike lane striping.

Time to Construct:

3–6

months from design kickoff

Enhanced Bike Lane Protection

Candidate locations for physical buffers include:

- NE 85th Street
- NE 90th Street
- 164th Avenue NE
- 166th Avenue NE
- 156th Avenue NE
- NE 104th Street
- Old Redmond Road

Candidate locations for flipping on-street parking and bike lanes include:

- NE 85th Street (pilot project potential)
- 156th Avenue NE (pilot project potential)
- NE 104th Street

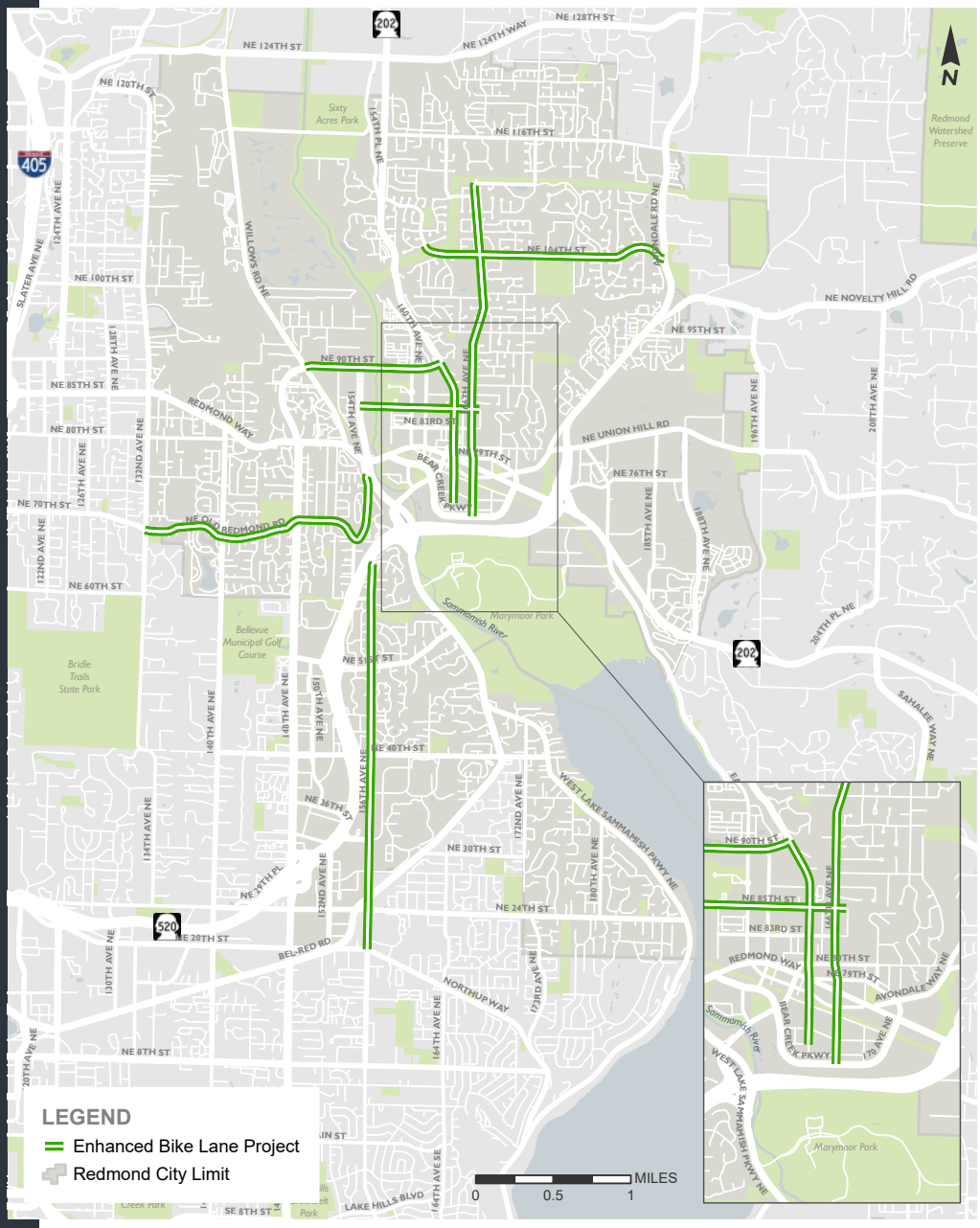


Figure 6. Candidate Locations for Bike Lane Protection

Bike Lane Relocation

Risk Factors

Countermeasures

Separated bike facilities

Redmond-Fall City Road NE has experienced a history of bike crashes at intersections and linearly along the roadway. The existing bike facilities on the roadway consist of marked bike lanes. Current best practices for bike facilities would not recommend the use of striped bike lanes on Redmond-Fall City Road NE due to the posted speed limit and traffic volume. To improve the comfort and safety of biking on Redmond Way, a project to relocate the existing curb line would provide for a separated bike facility, and could have a calming effect on vehicle traffic by increasing side friction with a narrower roadway curb-to-curb width.

The relocation of the curb would allow, with some reconstruction of the existing vegetated buffer strip, for either a side-by-side bike and pedestrian facility, a shared use path on both sides of the roadway, or a raised bike lane with the existing sidewalk and vegetated buffer retained in place.

The limits of the raised bike facility would ultimately be between the SR 520 ramps and 187th Avenue. Phasing of the relocated bike facility at logical termini with significant intersections, such as at East Lake Sammamish Parkway and 185th Avenue would allow the city to pursue multiple grant funding sources to implement the project while also making incremental safety and comfort improvements for cyclists.

Estimated Project Construction Cost:

$3,000,000+

Costs would include curb relocation, stormwater and utility modifications, new buffer strips and bike lane pavements.

Time to Construct:

18–24+

months from design kickoff

Bike Lane Relocation

Avondale Road would also be a strong candidate for a bike lane relocation behind a new curb line to remove the bikes from the higher volume roadway lanes. The historical crash rate for cyclists on Avondale Road is lower than for Redmond Way, but this could be a result of uncomfortable existing conditions that limit the number of cyclists in the corridor. Avondale Road meets the criteria for the risk factors and should be considered as a bike lane relocation project location as well.

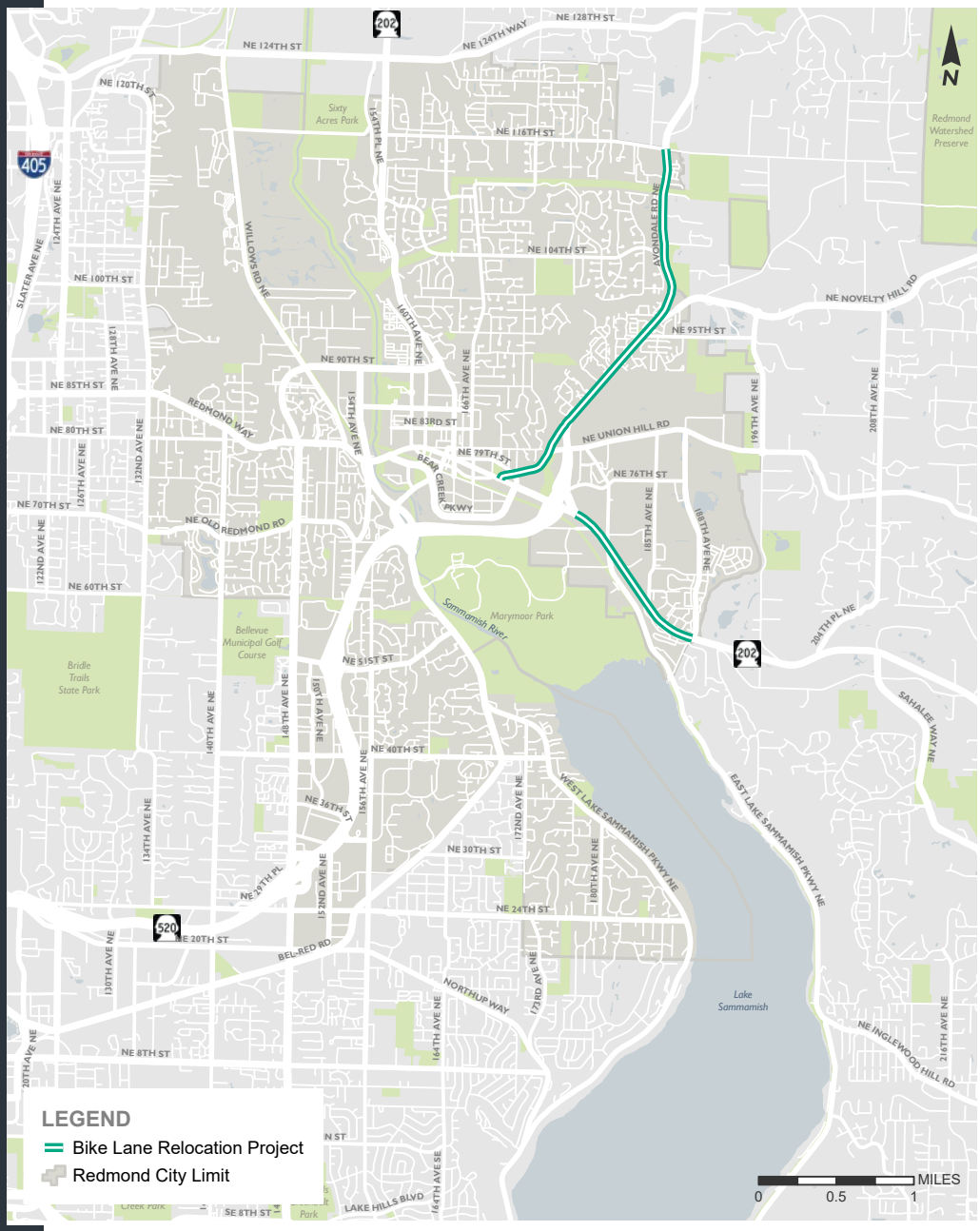


Figure 7. Candidate Locations for Bike Lane Relocation

Median Separated, 35 mph+ Limit Intersection Program

Risk Factors

Countermeasures

Corridor-wide improvements to;

High visibility crosswalk markings	**Signal timing**	**Crosswalk length**

The City of Redmond's highest priority risk factors come together in two corridors that meet all of the risk factors and could be upgraded throughout the city to improve comfort and reduce risk of crashes for not only users of the crossings, but vehicle traffic as well.

The recommended program of improvements in each corridor would seek to implement at all existing signalized intersections, one or all of the following projects;

- High visibility crosswalk markings
- Curb extensions using either full height curbs or 2" truck apron-style curb extensions to avoid impacts to bike facilities and low frequency truck turning movements, to shorten the crossing distance of vehicle lanes.
- Reduce lane widths to shorten the distance a pedestrian is exposed to traffic lanes.
- Widen sidewalks, add vegetated buffers, and reduce driveway lengths along high volume, higher speed arterials in the vicinity of transit stops.
- Increase pedestrian phase times and/or introduce lead pedestrian interval, especially near transit stops. Update pedestrian pushbuttons and curb ramps for Americans with Disabilities Act (ADA)/ Public Right-of-Way Accessibility Guidelines (PROWAG) compliance.
- Conduct corridor-wide signal timing, adaptive signal control, or interconnect signals to improve traffic flow at peak hours and reduce congestion that can lead to crashes and risky behaviors to reduce travel times.

Estimated Project Construction Cost:

$100,000–$2,000,000+

Costs will vary depending on the amount of hardscape changes, sidewalk extensions and need for signal equipment replacement

Time to Construct:

12–24

months from design kickoff

Median Separated, 35 mph+ Limit Intersection Program

Two corridors are recommended for a full-length program of improvements at signalized intersections:

Avondale Road, including the intersections with

- NE 116th Street
- NE 104th Street
- Novelty Hill Road
- NE 180th Street
- 85th Avenue NE (new pedestrian signal)

148th Avenue NE

- All intersections within the city limits

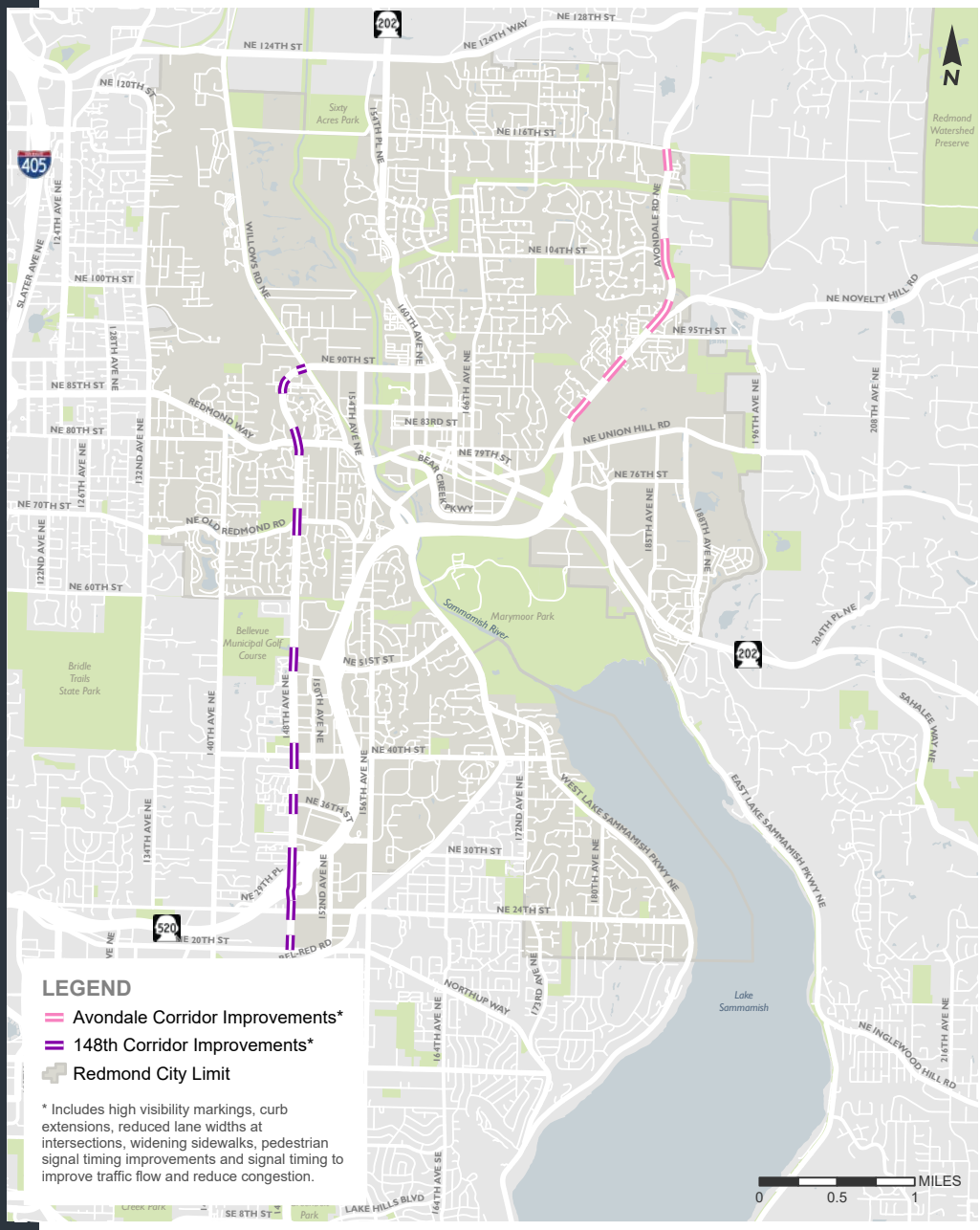


Figure 8. Candidate Locations for Corridor Safety Improvements

Add Enhanced Pedestrian Crossings at High Demand Locations

Risk Factors

Countermeasures

Pedestrian crossings with high visibility markings and pedestrian-actuated beacons or signals

Locations at cross streets where there are no existing markings are legal crossings under Washington state law. But, without markings, signage and pedestrian-actuated beacons or signals, unmarked crossings of higher volume or higher speed roadways can be an elevated risk for crashes. The City of Redmond has experienced crashes at unmarked crossings, indicating a demand for crossings that could warrant new enhanced crossings.

Selecting locations for enhanced crossings along high frequency and high demand transit routes is recommended based on the strong spatial relationship between active mode crashes and transit routes. Corridors with frequent service, including 148th Avenue NE, 156th Avenue NE, 164th Avenue NE near downtown, and Avondale Road should be strongly considered. Other regular service route candidates would include 166th Avenue NE and NE 104th Street.

Estimated Project Construction Cost (RRFB):
$100,000

Costs include solar powered RRFBs, new curb ramps, markings and signage.

Time to Construct:
6–9
months from design kickoff

Estimated Project Construction Cost (Pedestrian Signal):
$300,000

Costs include a new pedestrian signal, new curb ramps, markings and signage.

Time to Construct:
12–15
months from design kickoff

Add Enhanced Pedestrian Crossings at High Demand Locations

Candidate locations for enhanced location crossings include:

- Avondale Road NE and NE 85th Street (pedestrian signal)
- NE 166th Street and 79th Avenue NE (rectangular rapid flashing beacon) – planned city project
- NE 166th Street at Redmond Middle School (RRFB)
- NE 166th Street at 87th Avenue NE (RRFB)
- NE 148th Street at 61st Court (RRFB)
- NE 148th Street at 31st Street (Pedestrian signal)
- Other locations on transit routes to be identified

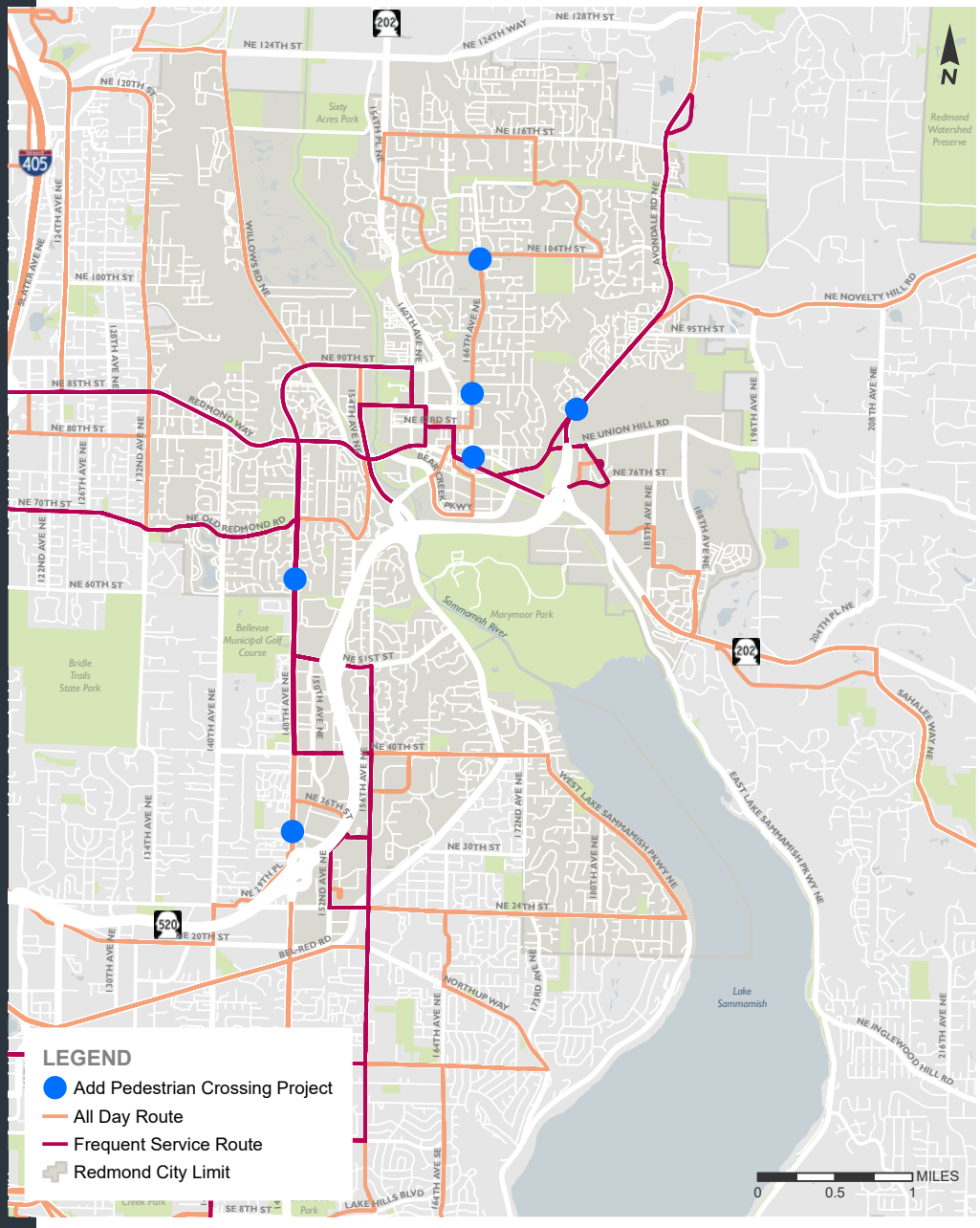


Figure 9. Candidate Corridors for Enhanced Pedestrian Crossings

Reducing Vehicle Speeds Through Automated Enforcement

Risk Factors

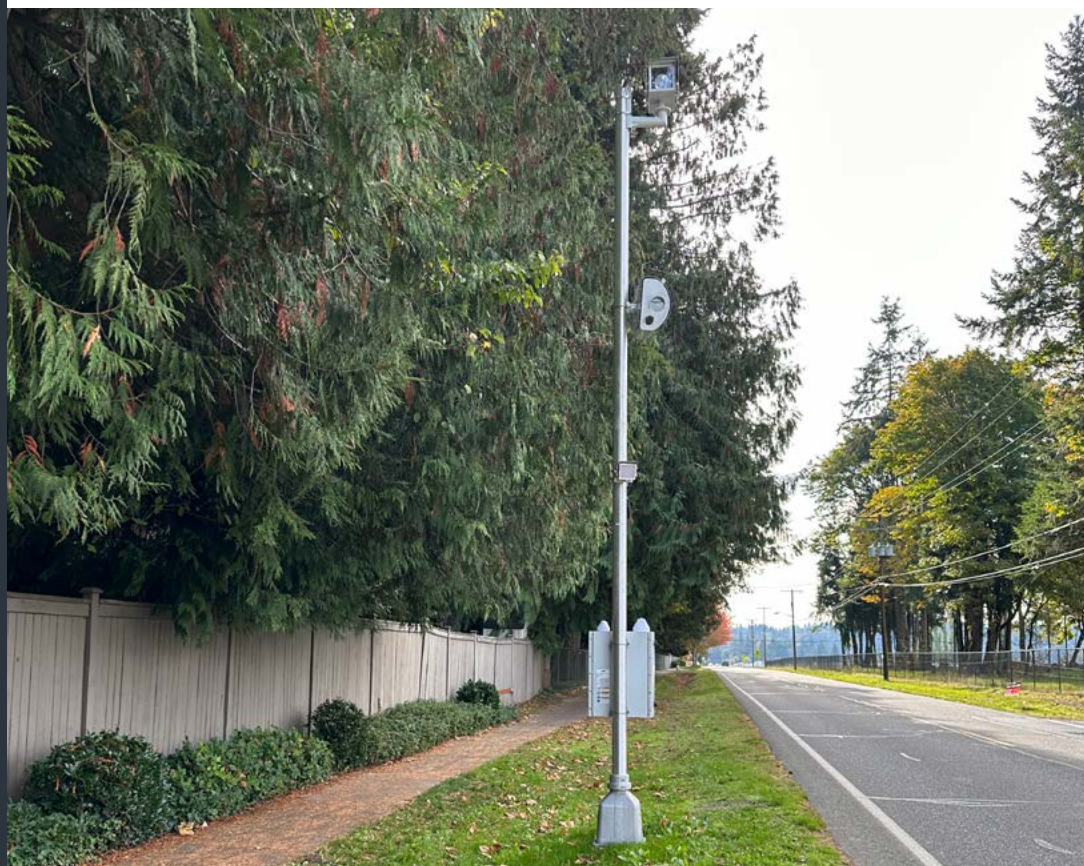
Countermeasures

Automated speed enforcement (compliant with RCW 46.63.170)

The state of Washington recently passed RCW 46.63.170 which grants Cities the expanded authority to install speed cameras. Historically, automated speed enforcement cameras could only be installed in designated 20 mph school zones, now cities can also install them along school walk routes, and in park and hospital zones. The legislation also allows automated speed enforcement cameras in locations with safety concerns as documented in a Local Road Safety Plan.

The City of Redmond's crash history does cite speed in excess of that which would be appropriate for the given conditions in nearly 10 percent of all crashes. Crashes that cite speed as a contributing factor cite speeds in excess of the posted limits at a significantly lower rate than other cities. The City would be able to pilot an automated speed enforcement system and monitor the impact on nearby crash rates for crashes of all types. Implementation of automated enforcement would likely require policy discussions and a community outreach program prior to implementation.

An automated speed enforcement program would not be intended to replace existing traffic calming programs, such as the Traffic and Pedestrian Safety Program or existing enforcement.



Estimated Project Construction Cost:

N/A

Costs will be dependent on vendor contracts and scale of community outreach program however revenue from the citations typically covers all ongoing maintenance and operations of the cameras

Time to Construct:

12–18 months

Reducing Vehicle Speeds Through Automated Enforcement

Candidate locations for automated speed enforcement include:

- Old Redmond Road or 148th Avenue NE at Grass Lawn Park
- West Lake Sammamish Parkway at Marymoor Park
- NE 104th Street at Hartman Park

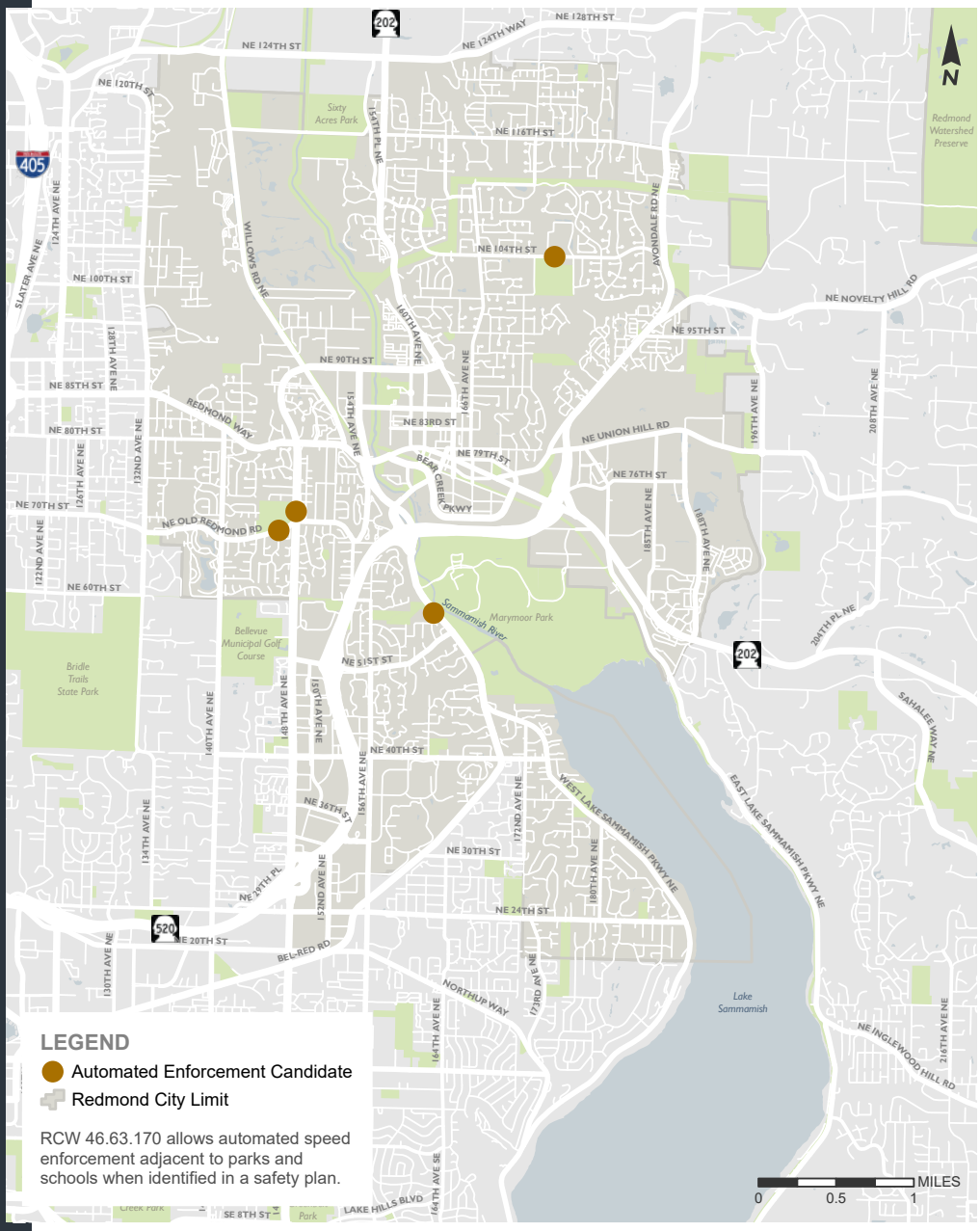


Figure 10. Candidate Locations for Automated Speed Enforcement Cameras

Citywide Speed Limit Study

Risk Factors

Countermeasures

Identify feasibility of reducing speed limits

Reducing speed limits can help reduce a number of risk factors for crashes, but the determination of speed limits is a complex task that balances the roadway physical environment, operating conditions, and passive and active enforcement measures. A comprehensive citywide speed limit study would help the city to identify where existing speed limits may be able to be reduced based on existing conditions without significant investment in physical modification to the roadway, or enforcement.

A citywide study of speed limits could also identify locations where physical modifications of higher volume arterial roadways, which are not candidates for traditional physical traffic calming devices, would be warranted in order to provide passive enforcement of a lower speed limit. The speed limit study could help to identify other high priority safety capital projects related to speed reduction for addressing crash risk factors.

Estimated Project Cost:

$200,000

Costs include acquisition of current speed data, field study of existing conditions, an analysis of potential changes in speed limits that are warranted by existing conditions, and identification of conceptual projects to modify the roadway environment of arterials that are identified for lower speed limits.

5.9 HSIP Projects

Specific projects to be applied for in the 2024 WSDOT Highway Safety Improvement Program (HSIP), a state-administered federal safety funding program, are included in Section 5.9.

The specific projects are designed to be strong candidates for the HSIP, meeting the typical criteria of the program:

- Systemic safety improvements applied to multiple locations within the city
- Addresses a data-based risk factor identified through a Local Road Safety Plan
- Scalable project with the potential for partial funding
- Deliverable project within 2 1/2 years of award
- Anticipated award in (late 2024) or less

Projects were developed from the recommended countermeasure projects and programs in Section 5.8. The projects are based on coordination with the City of Redmond's City Council, Transportation Commission, Public Works and Planning groups. Projects that are not funded through HSIP may be considered for implementation through local funding resources or applied for funding in future cycles of the HSIP or other grant programs. The next HSIP is anticipated to hold a call for projects in early 2026, with a future award in late 2026.

Systemic improvements for citywide implementation have been consolidated into projects by corridor. The corridor approach, while still applying systemic improvements, seeks to realize efficiencies in design, mobilization and construction efforts during the project completion process. The City also anticipates a more limited impact on the community during construction from a corridor-focused project.

5.9 HSIP Projects

Project 01

Citywide Speed Limit Study

A citywide safe speed study will evaluate the existing posted speed limits on all arterial and collector roadways owned and maintained by the city. The objective of the effort would be to develop speed limit setting policy and recommend speed limit changes based on the NACTO 2020 City Limits, Setting Safe Speed Limits on Urban Streets (City Limits) publication, and best practices incorporated recently by other nearby agencies. The speed limit policy changes move away from using the observed 85th percentile speed of traffic as the sole determinant of appropriate posted speed limits, and considers a wider range of factors and criteria, including the presence of active mode facilities, roadway geometry and classification, roadside access, parking and development, etc.

The citywide evaluation of speed limits will help to ensure consistency in speed limits with the City's policies of prioritizing the safety of all modes, but especially for vulnerable active mode users across the city based on the overall land use context of the street. Consistency in posted speed limits also helps with compliance as drivers have an expectation of the speed limit and are not reliant on signage alone to inform them of the expected speed for each roadway. The citywide speed limit evaluation will utilize speed and traffic volume data collected in the field, along with the methodologies outlined in the City Limits publication to propose maintaining or changing speed limits on arterials and collectors.

FUNDED BY HSIP FOR FY 2025

Estimated Project Cost:
$200,000

Anticipated Schedule
Project obligated for funding by April 2027

5.9 HSIP Projects

Project 02

148th Avenue NE Safety Corridor Project

148th Avenue NE, west of downtown Redmond, connects the northern half of the city to the Overlake area and the Microsoft Campus. The road connects to a major arterial at Willows road and a regional highway at SR 520. 148th Avenue has seen recent improvements from the implementation of the Sound Transit Link Light Rail project, but additional systemic safety improvements can be made in the corridor. The 148th Avenue NE safety corridor project would incorporate elements of several proposed countermeasures throughout the corridor, improving conditions for all modes, but with a specific focus on the safety and comfort of active mode users. A new location signal at NE 31st Street will provide a controlled and protected at-grade active mode connection to the new pedestrian bridge at the Overlake Village Station. The project limits are from Willows Road NE to NE 29th Place. The project has been consolidated into a single corridor to maximize efficiencies of scale for design and construction of citywide systemic improvements. Project elements from the systemic countermeasures include:

Replacement of all crosswalks in the corridor with high visibility markings

- 37 total crossings throughout the project corridor.

Signal improvements at all corridor signals (9 intersections)

- Incorporate lead pedestrian intervals and a 3.5 ft/sec walk speed at all signals
- Evaluate the feasibility of removing right turn lanes and shortening crossings with curb relocations at NE 36th Street, NE 40th Street, Old Redmond Way and Redmond Way

New-location protected crossing near NE 61st Court

- Protected crossing utilizing existing median island to provide a high comfort refuge, connecting existing transit stops.
- Evaluate reducing length of existing left turn pocket(s) to provide median refuge and shorten crossing distance.

New-location signalized intersection at NE 31st Street

- Pedestrian signal incorporating safety elements including high visibility markings, 3.5 ft/sec walk time, and advanced signage.

Estimated Project Cost:
$1,518,000

Anticipated Schedule
Project obligated for construction by April 2027

FUNDED BY HSIP FOR FY 2025

5.9 HSIP Projects

Project 03

166th Avenue NE Safety Corridor Project

The 166th Avenue NE safety corridor project would incorporate elements of several proposed systemic countermeasures throughout the corridor, improving conditions for all modes, but with a specific focus on the safety and comfort of active mode users. The project limits are from NE 104th Street to Redmond Way (SR 202). 166th Avenue connects the northeastern part of the City of Redmond, to the downtown core. The road is a 2-lane road with a continuous two-way left turn lane and marked bike lanes. Several signalized intersections are present within the corridor, primarily in the southern part near the downtown. There are several existing marked and protected pedestrian midblock crossings. The 166th Avenue corridor project has been consolidated into a single corridor to maximize efficiencies of scale for design and construction of citywide systemic improvements. Project elements from the systemic countermeasures include:

Replacement of all crosswalks in the corridor with high visibility markings

- 5 crossings at the north end of the project corridor.

Signal improvements between Redmond Way and NE 85th Street (4 intersections)

- Incorporate lead pedestrian interval and a 3.5 ft/sec walk speed at all signals.
- Evaluate the feasibility of pedestrian "scramble" signal phases at all signals.
- Add blankout-style no right turn on red electronic signage, actuated to pushbuttons at all four signals, in all directions.
- Replace existing pushbuttons with APS-style buttons at locations meeting current ADA/PROWAG standards at 83rd and 85th Streets.
- Evaluate and upgrade curb ramps to the Maximum Extent Feasible (MEF) at 83rd and 85th Streets.
- Add perimeter-LED lit crosswalk signs at north/south crossings at 166th Ave NE and NE 79th Street

Physical buffering and barriers to the existing bike lane, where feasible

- Removal of the two-way left turn lane (TWLTL) in areas where there are no left-turn access points and/or left turn volumes do not warrant a left turn lane, and widening of existing bike lane buffers in areas of TWLTL removal.
- Installation of plastic curbing and/or vertical reflective markers intermittently along the existing bike lane striping, especially near intersections, to provide a physical buffer for the bike lane in locations where incursion by vehicles is more likely.

New-location protected crossing at Redmond Middle School

- RRFB-protected crossing with median island and/or curb extensions at the north entrance path to the school, co-located with a connection between existing transit stops.

New-location protected crossing near NE 87th Street

- RRFB-protected crossing utilizing existing median island to provide a high comfort refuge, connecting existing transit stops.

Estimated Project Cost:
$1,123,000

Anticipated Schedule
To be determined

5.9 HSIP Projects

Project 04

Old Redmond Road Safety Project

Old Redmond Road, on the west side of the city, has significant vertical and horizontal features that are a challenge for roadway safety. The road also includes on-street marked bike lanes. Between Redmond Way and 148th Avenue NE, the road is a 2-lane roadway with bike lanes. West of 148th Avenue NE, the roadway section widens to include a two way left turn lane with intermittent raised medians. The City of Redmond is constructing locally-funded crossing improvements at NE 68th Street and 137th Avenue NE, adding rectangular rapid flashing beacons to existing marked crossings near transit stops. Old Redmond Road connects to parks and residential areas, and is a transit route. The limits of the project are Redmond Way and NE 69th Way at the city's western limit.

The Old Redmond Road safety project would include countermeasures to address risk factors around bike facilities, and crashes occurring in inclement weather at significant intersections. Project elements from the systemic countermeasures include:

Physical buffering and barriers to the existing bike lane, where feasible

Installation of plastic curbing and/or vertical reflective markers intermittently along the existing bike lane striping, especially near intersections, to provide a physical buffer for the bike lane in locations where incursion by vehicles is more likely.

High Fiction Surface Treatment (HFST) at select intersections.

HFST typically is provided for 200 LF +/- on either side of an intersection to provide increased friction for traffic stopping or accelerating in response to signals in rainy or snowy conditions. The exact limits of the HFST would be confirmed during the detailed design of the project.

- Old Redmond Road at Redmond Way
- Old Redmond Road and 148th Avenue NE
- Old Redmond Road and 140th Avenue NE

CANDIDATE PILOT PROJECT

Estimated Project Cost:
$1,646,000

Anticipated Schedule
To be determined

5.9 HSIP Projects

Project 05

NE 85th Street Active Mode Safety Pilot Project

A pilot project that the City of Redmond is interested in implementing as a potential precursor to future modifications of bike facilities in other corridors is to flip the location of existing striped bike lanes and existing on-street parking on NE 85th Street between the Sammamish River Trail and 166th Avenue NE. The project would not modify the motor vehicle travel lanes, but would restripe in a way to minimize marking removal and shadowing to flip the location of the bike lanes and on-street parking on NE 85th Street. The relocated bike lanes would be at the curb line, while on-street parking would be allowed at the edge of the travel lane.
The relocation of the bike lane has safety benefits from:

- Removing the incidence of drivers' side dooring risk, although passenger side dooring remains a risk factor. The rate of single occupancy vehicles makes it significantly more likely that drivers' side doors would be used to enter and exit parked vehicles.
- Moving bike lanes further from active travel lanes, and providing a physical buffer between cyclists and vehicles when parked cars are present.
- Removing the need for vehicles entering and exiting parking to cross the bike lanes.

The project will require education and monitoring to ensure drivers understand the expected position for on-street parking, and to understand the impact the changes may have on cyclist comfort, usage of the road by cyclists, and impact to on-street parking usage.
The City may elect to incorporate the countermeasure of providing a physical barrier to the bike lane, by use of plastic curing and/or vertical reflective markers intermittently along the bike lane striping to reinforce to drivers where the limits of on-street parking are and to assist in educating the community about the new roadway section and the intended use of each space within the curb limits.

Estimated Project Cost:
$130,000

Anticipated Schedule
To be determined

5.9 SS4A Projects

Project 06

Avondale Road Bike Improvements Project

The Avondale Road Bike Improvements project would address risk factors associated with a roadway that has a higher speed limit (40 mph), a raised median, multiple lanes and an existing striped on-road bike facility. The project would be between NE Union Hill Rd and NE 116th St. Improvements would consist of removing the existing striped bike lanes from the roadway and replacing with shared sidepaths on both sides of the road, relocating the existing curb line inwards, towards the center of the road. The sidepaths would replace the existing narrow sidewalks and bike lanes with a wider high comfort facility shared by bicyclists and pedestrians within street right-of-way. Connections between the new sidepaths and the City's existing trail network will increase the utility for users. The cost estimate for this project also includes:

- Signal improvements at Redmond Way to assist cyclists in comfortably getting through the intersection
- A new RRFB protected crossing at Avondale Way, north of Union Hill Rd
- Reduction of the two-way left-turn lane to fit a wider sidepath and landscape buffer where feasible
- A new shared use path connection to Bear Creek Trail.

The project's conceptual design assumes that no right of way acquisition will be required, and all improvements can be constructed within the existing roadway footprint. Constructing within the right of way avoids impacts to existing development and preserves the existing mature trees in the corridor that provide a significant aesthetic feature of the corridor and, as side friction, can help to keep traffic speeds within acceptable ranges. The sidepaths are estimated at a minimum of 10 feet wide, with 12 feet of width where feasible. The existing roadway illumination was not identified in the safety analysis as a risk factor and is not intended to be modified within the project's scope, but with work occurring in the corridor, inclusion of illumination improvements could be an addition to the project's scope as the City programs the project and identifies funding sources and partnerships.

Estimated Project Cost:
$17,500,000
(in 2025 dollars)

Anticipated Schedule
To be determined

Example of a bicycle sidepath along 156th Ave in Redmond

6
Next Steps

6

Summary of Actions

- ☐ short range project (0-2 yr)
- ☐ medium range project (2-5 yr)
- ☐ long range project (5+ yr)

The previous five chapters of the Safer Streets Action Plan have identified many actions the City should take to proactively address safety risk factors and advanced towards the goal of eliminating all fatal and serious injury crashes by the end of the year 2035. A summary of those next steps is presented below:

Chapter 1

- ☐ Update the City's Complete Streets Policy
- ☐ Develop a Complete Streets checklist for project review

Chapter 2

- ☐ Continue to engage with the Safety Task Force
- ☐ Post-crash response task force
- ☐ Identify opportunities for future Road Safety Audits

Chapter 4

Update the City's code and design manual for traffic signals

- ☐ City code Section 10.24.070
- ☐ Section II(C) Pedestrian Scrambles
- ☐ Section IV(C) Lead Pedestrian Interval
- ☐ Section IV(I)(1) Backplates
- ☐ Section IV(P) Blank-out signs

Update roadway geometry standards

- ☐ Table 2 - Street widths
- ☐ Section A.7.b curb radii
- ☐ Section A.7.d.b.2 lane encroachment
- ☐ Section A.21 safety of vulnerable users

- ☐ Update speed limit policy
- ☐ High visibility enforcement in Pedestrian Zones
- ☐ Signal operational changes and signing modifications in Pedestrian Zones
- ☐ Pedestrian safety educational outreach

Programmatic safety strategies

- ☐ Automated speed enforcement
- ☐ Safe Routes to School
- ☐ Traffic Gardens
- ☐ Speeding educational and enforcement campaign
- ☐ Urgency reduction outreach campaign
- ☐ Celebrating success
- ☐ Pedestrian and bike user safety campaign

Chapter 5

- ☐ Project 01: Citywide Speed Limit Study
- ☐ Project 02: 148th Avenue NE Safety Corridor Project
- ☐ Project 03: 166th Avenue NE Safety Corridor Project
- ☐ Project 04: Old Redmond Road Safety Project
- ☐ Project 05: NE 85th Street Active Mode Safety Pilot Project
- ☐ Project 06: Avondale Road Bike Improvements Project

6

Prioritizing Implementation

Prioritizing implementation of safety projects takes into account both history of crashes, especially those with severe outcomes, and a proactive approach to preventing severe crashes or any crashes at all, through addressing risk factors. The risk factors for crashes were identified, in priority order, in Chapter 5, section 5.7.

For the Safer Streets Action Plan, the development of high risk and high injury networks applies the data on crash history and the identified risk factors across the City of Redmond's transportation network in a systemic manner to identify locations where implementation of safety countermeasures is likely to have the greatest positive impact on crash rates and severity. The city's transportation network was digitized in GIS and a "sliding window" method of analysis was used to avoid concentrating risk too heavily based on single crashes.

For the high injury network, which is a reactive display of historical crash data, the following scores were applied to individual roadway segments in the GIS map, based on crash history and location;

Mode	Severity	Points assigned
Ped/Bike	Property damage only (PDO)	3
Ped/Bike	Minor injury	4
Ped/Bike	Severe injury or fatal crash	5
Vehicle	Property damage only (PDO)	2
Vehicle	Minor injury	3
Vehicle	Severe injury or fatal crash	5

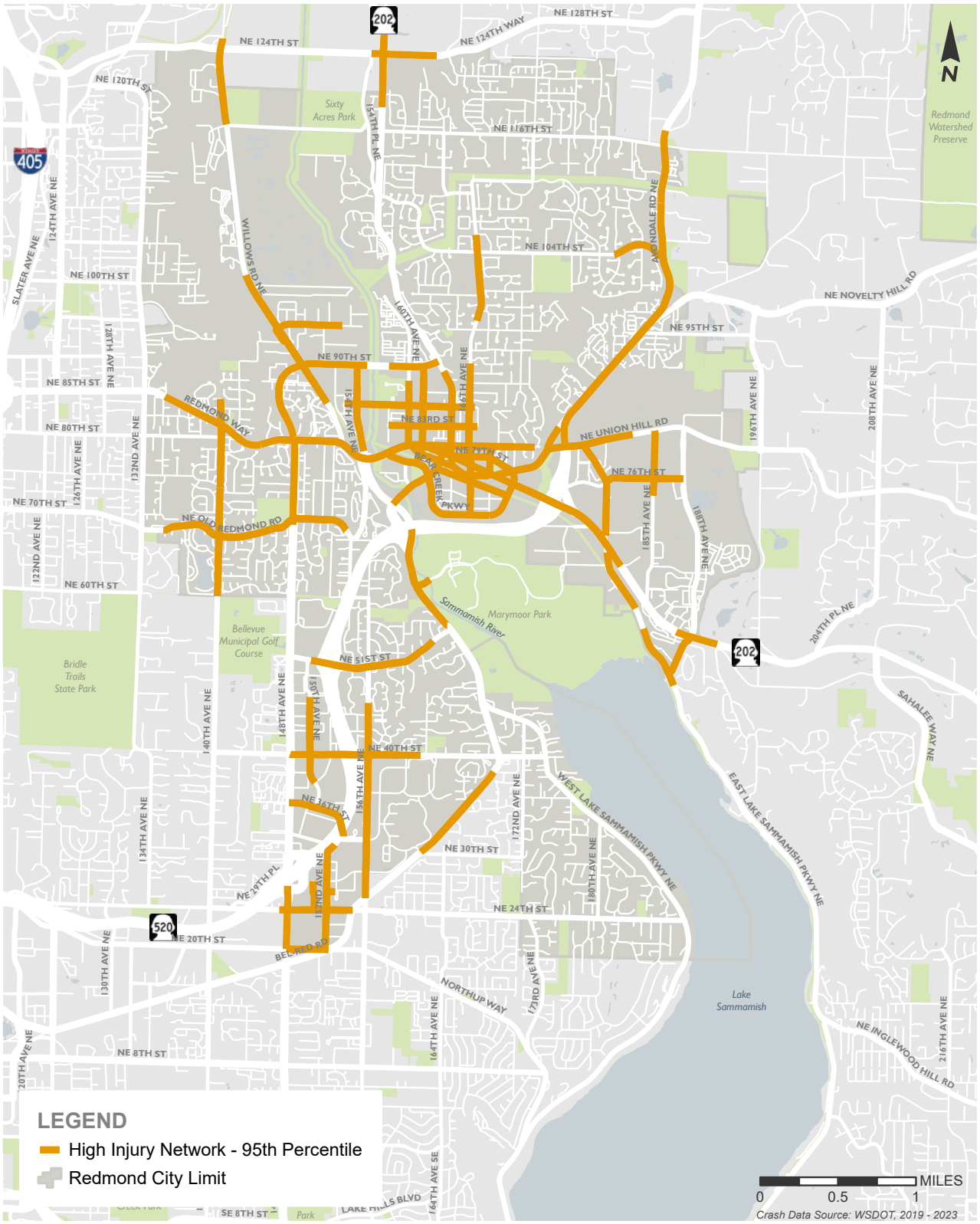
The scores for each segment were smoothed using the sliding window. The scores were normalized on a 0-10 scale. the resulting map of Redmond's entire transportation network identified areas where severe crashes have occurred more often.
The high risk network is a proactive assessment of risk based on the factors included in Chapter 5. In a similar manner, scores were applied to each roadway segment based on having the following risk factors present or in close proximity:

Roadway Risk Factor	Points assigned
30-35 mph speed limit	3
40-45 mph speed limit	4
Painted Bike Lanes	3
Median Divided Roadway	3
"Two Bar" Crosswalk markings	5
"Piano Key" Crosswalk markings	4
Signalized Intersections	4
Park proximity	3
Trail Crossing proximity	3
Collector functional classification	2
Arterial functional classification	2

The scores for each segment were smoothed using the sliding window. The scores were normalized on a 0-36 scale. the resulting map of Redmond's entire transportation network identified areas where more numerous risk factors are present, and could be ideal locations for safety interventions and countermeasure projects.

6 High Injury Network

The 95th percentile map of the high injury network shows the top 5% of locations where injury-related crashes have occurred in the last five years. The map provides a reactive tool to help guide City investment in safety countermeasures in locations where crashes have occurred. The most effective locations for investment are likely to be identified through a combined analysis of historical crash locations and locations with a higher number of risk factors that can be proactively mitigated.



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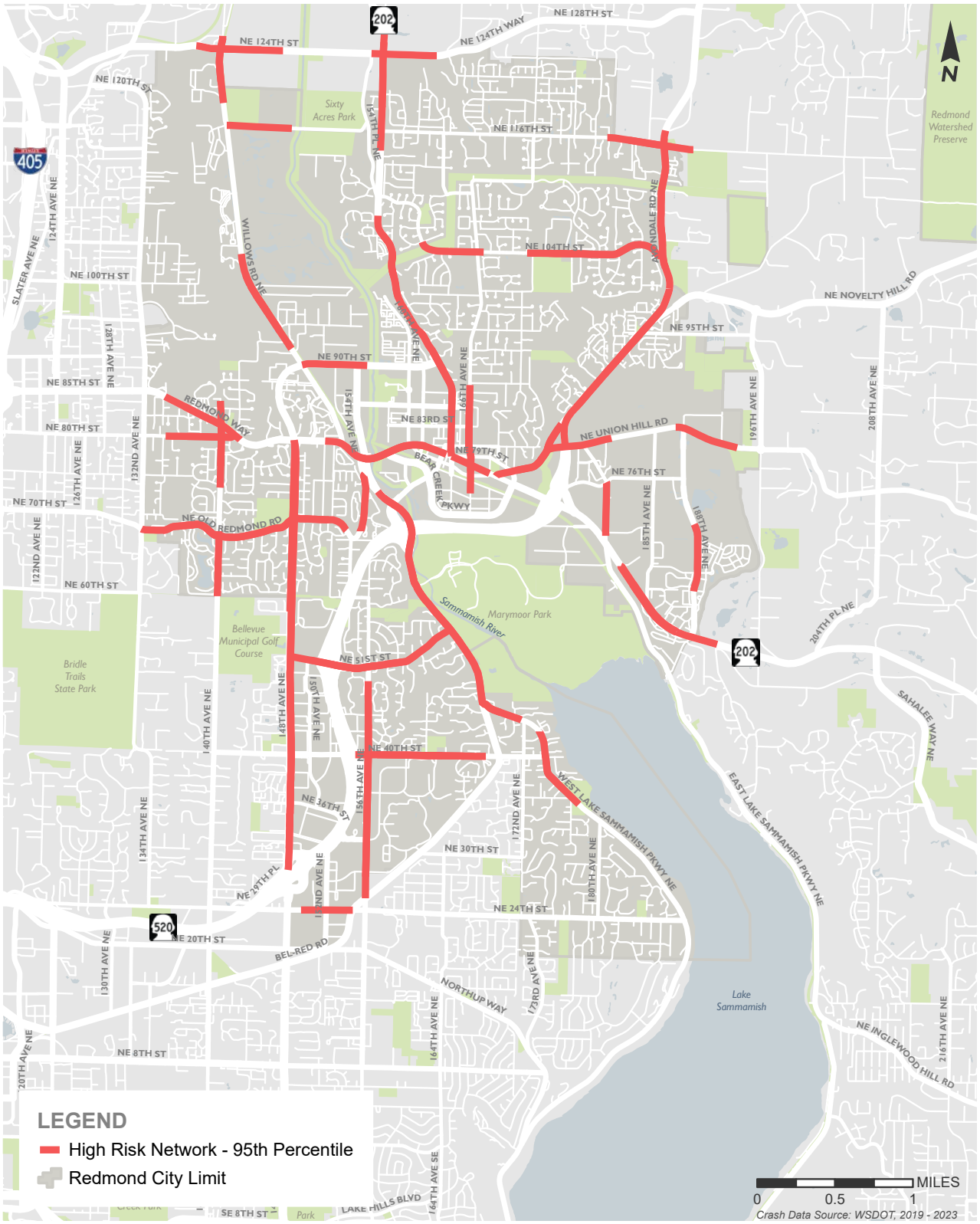
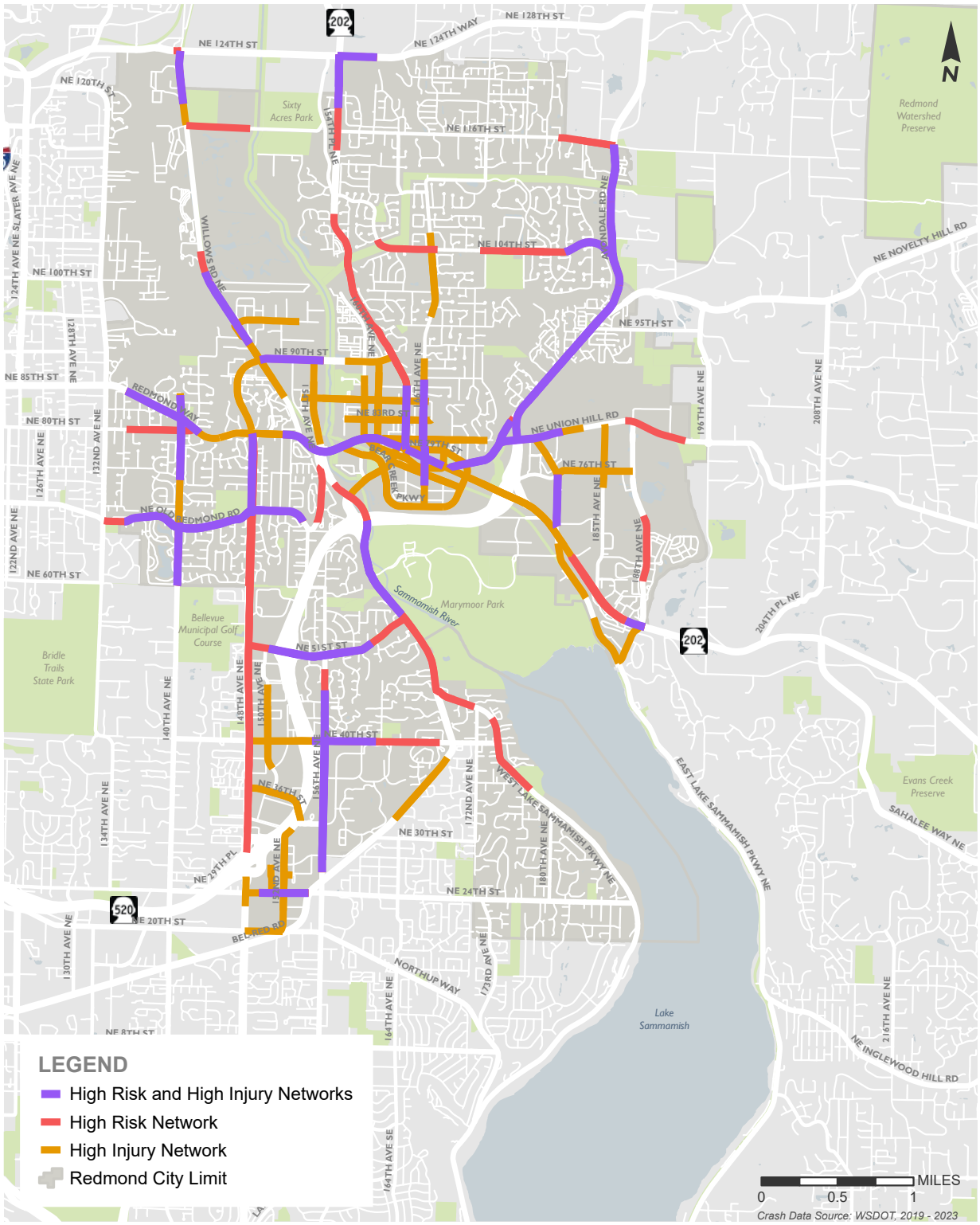
High Risk Network

The 95th percentile map of the high risk network shows the top 5% of locations where the risk of crashes is highest. The map provides a proactive tool to help guide City investment in safety countermeasures in locations where the most risk factors are present. The most effective locations for investment are likely to be identified through a combined analysis of locations with a higher number of risk factors that can be proactively mitigated and historical crash locations.



6 Combined Prioritization Network

Combining the 95th percentile segments identified in the high risk and high injury networks provides a guide to the highest priority locations for investment which will address both historical and proactive safety for all modes of travel. Segments and locations on the combined map should be prioritized for investment in countermeasures. Further investigation into the risks present, the geometry and operational characteristics of the corridor, and traffic data such as speed and volume will be necessary to identify specific improvements.



6

Reporting and Future Updates

Reporting
The City of Redmond will prepare yearly public reports of the progress in addressing the safety concerns of the LRSP and other elements of the Safer Streets Action Plan. Reports will be prepared and provided to the City Council and will document;

- An overview of changes made to City policies and procedures in the last 12 months
- A summary of completed safety improvement projects
- A summary of funded safety improvement projects
- An update on the scope and cost of unfunded safety improvement projects
- A summary of any barriers to further safety improvements identified by the City team that could be addressed in the coming year

The Safer Streets Action plan, including the Local Road Safety Plan is planned for future updates. The Local Road Safety Plan (Chapter 5) will be updated on a biennial basis, aligned with the WSDOT cycle for HSIP applications and project funding.

The safety analysis will be updated to consider the most recent crash data. Risk factors will be re-confirmed to verify applicability and priority based on the new data. If new risk factors arise in the data, they will be incorporated into the plan appropriately. Projects will be updated to align with risk factors, prioritization, and completion of complementary infrastructure, either through safety projects, other transportation improvements, or development.

Future updates will:

- Update crash data with the most recent 2-year verified period of crashes from WSDOT and the Washington State Patrol
- Continued coordination and partnership with WSDOT on state routes and safety actions that affect Redmond's transportation system
- Document completed projects, including safety-oriented projects not identified within the Safer Streets Action Plan
- Document funded projects, through HSIP or other grant programs or local funding, that are in design

The remainder of the Safer Streets Action Plan will be updated on a regular basis. Updates for the full Action Plan will identify, in addition to the changes listed above:

- Document policy and procedural changes and assess if any additional changes are warranted.
- Review the effectiveness of policy, procedural and program changes and incorporate lessons learned.

Collecting pedestrian and bike volume data to evaluate overall safety trends will help to document progress towards the City's Vision Zero goal. Presentation of pedestrian, bike and vehicle volume data, along with crash data, in public-facing dashboards hosted on the city website help to provide transparency to the City's Vision Zero efforts, accountability, and reporting to the community on progress.

7

Appendix A: LRSP Countermeasure Project Maps

7 Appendix

Figure A1. Location of High Visibility Crosswalk Projects

7 Appendix

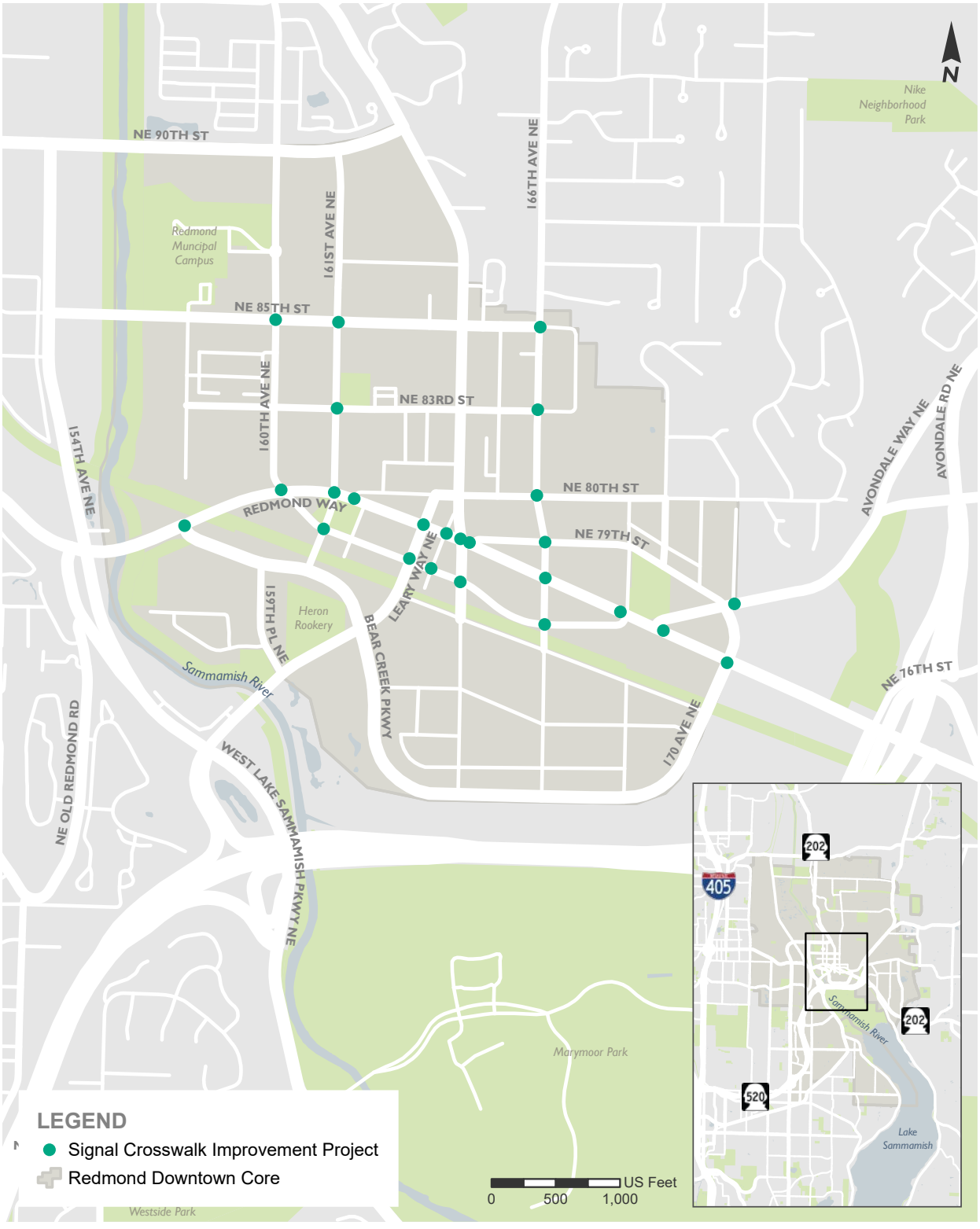


Figure A2. Location of Improve Signal for Pedestrian Crossing Projects

7 Appendix

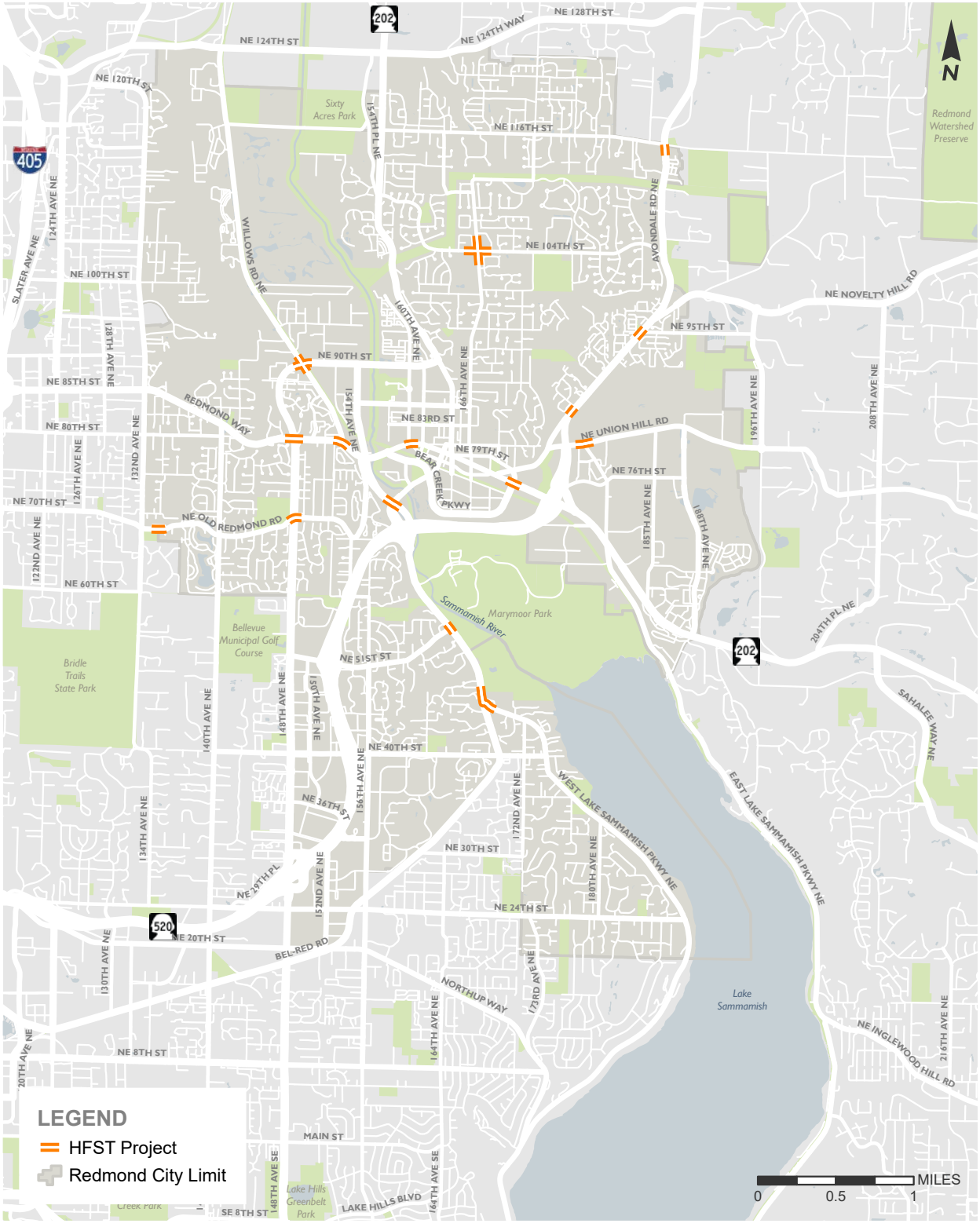


Figure A3. Location of High Friction Surface Treatment Projects

7 Appendix

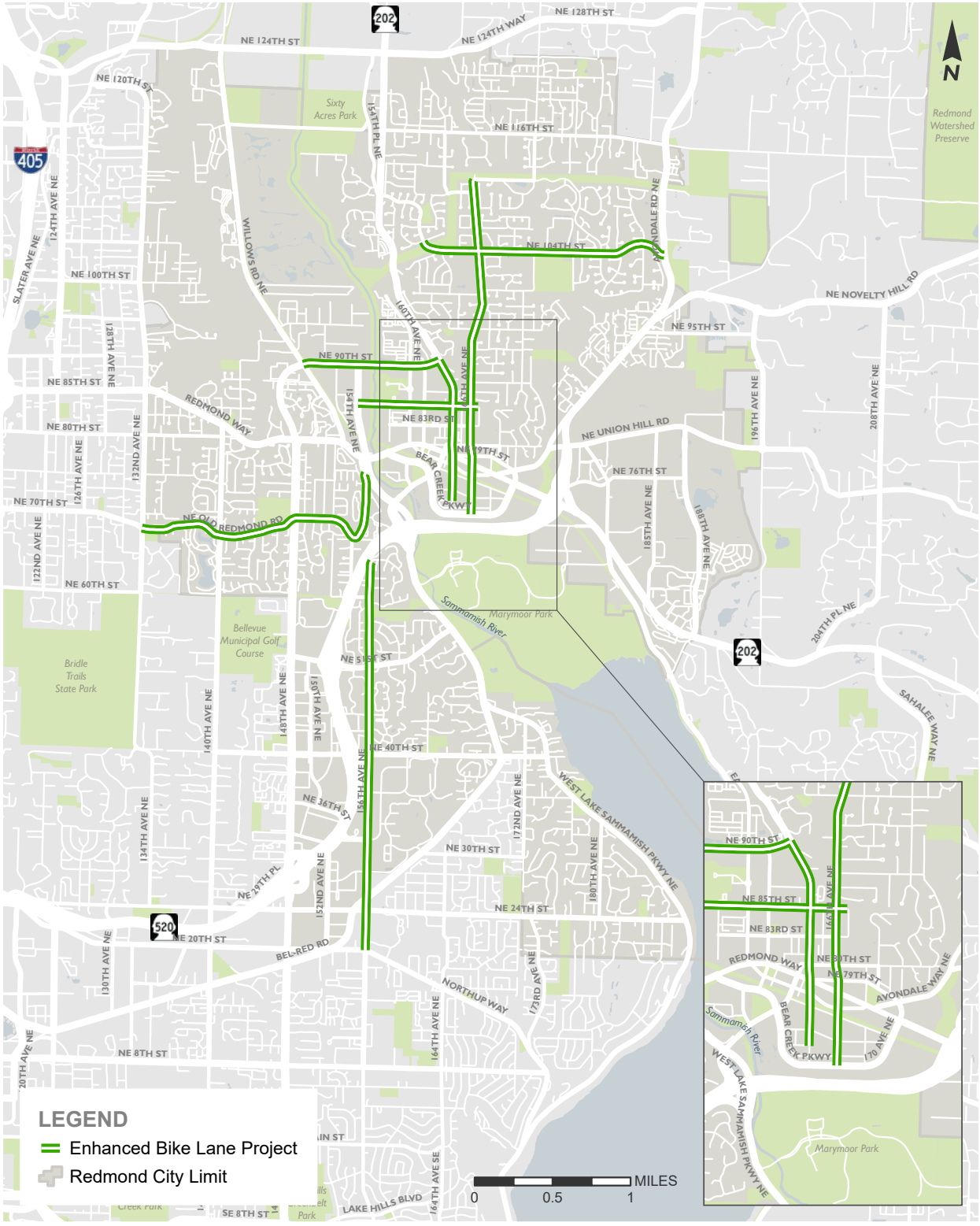


Figure A4. Location of Enhanced Bike Lane Projects

7 Appendix

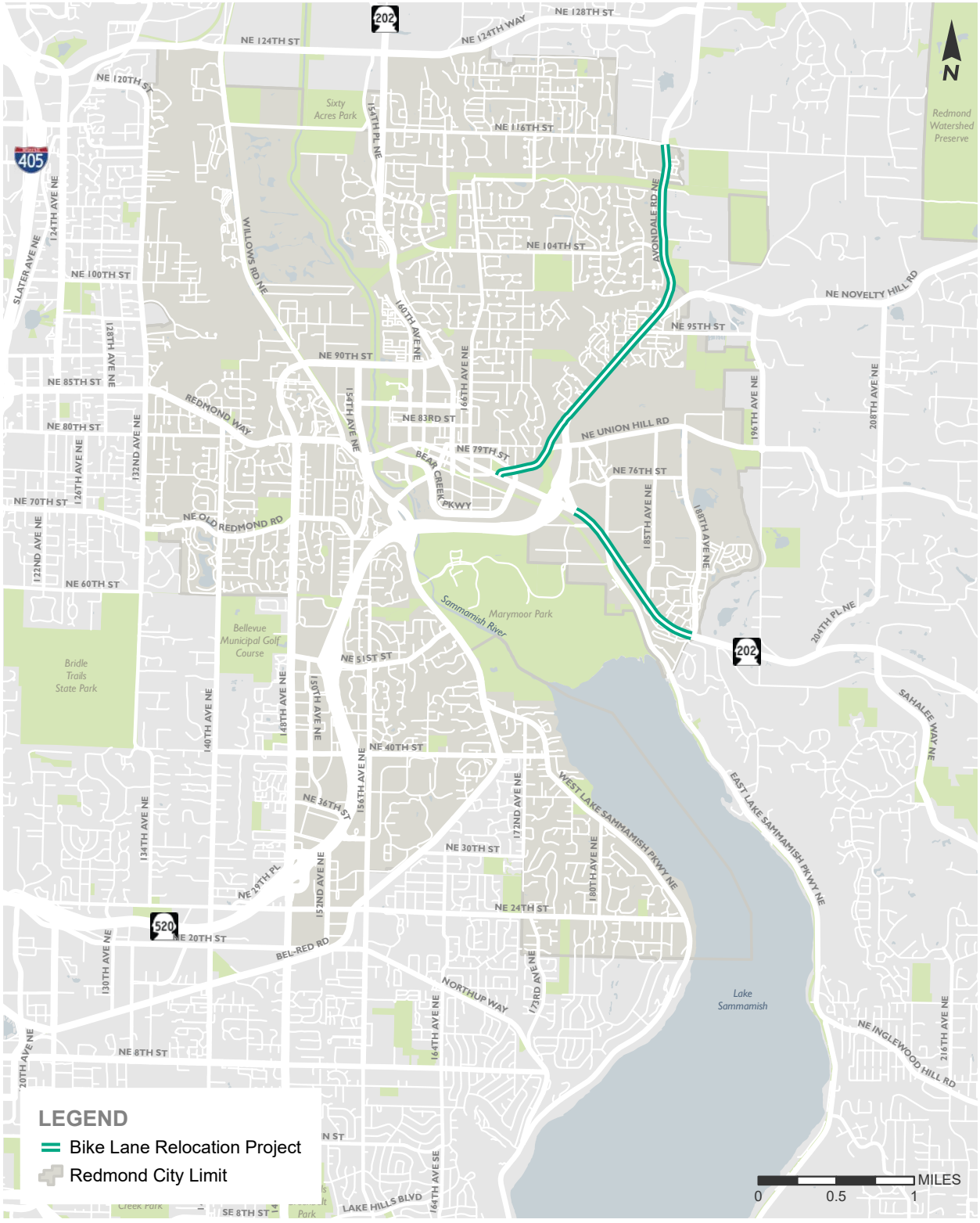


Figure A5. Location of Bike Lane Relocation Project

7 Appendix

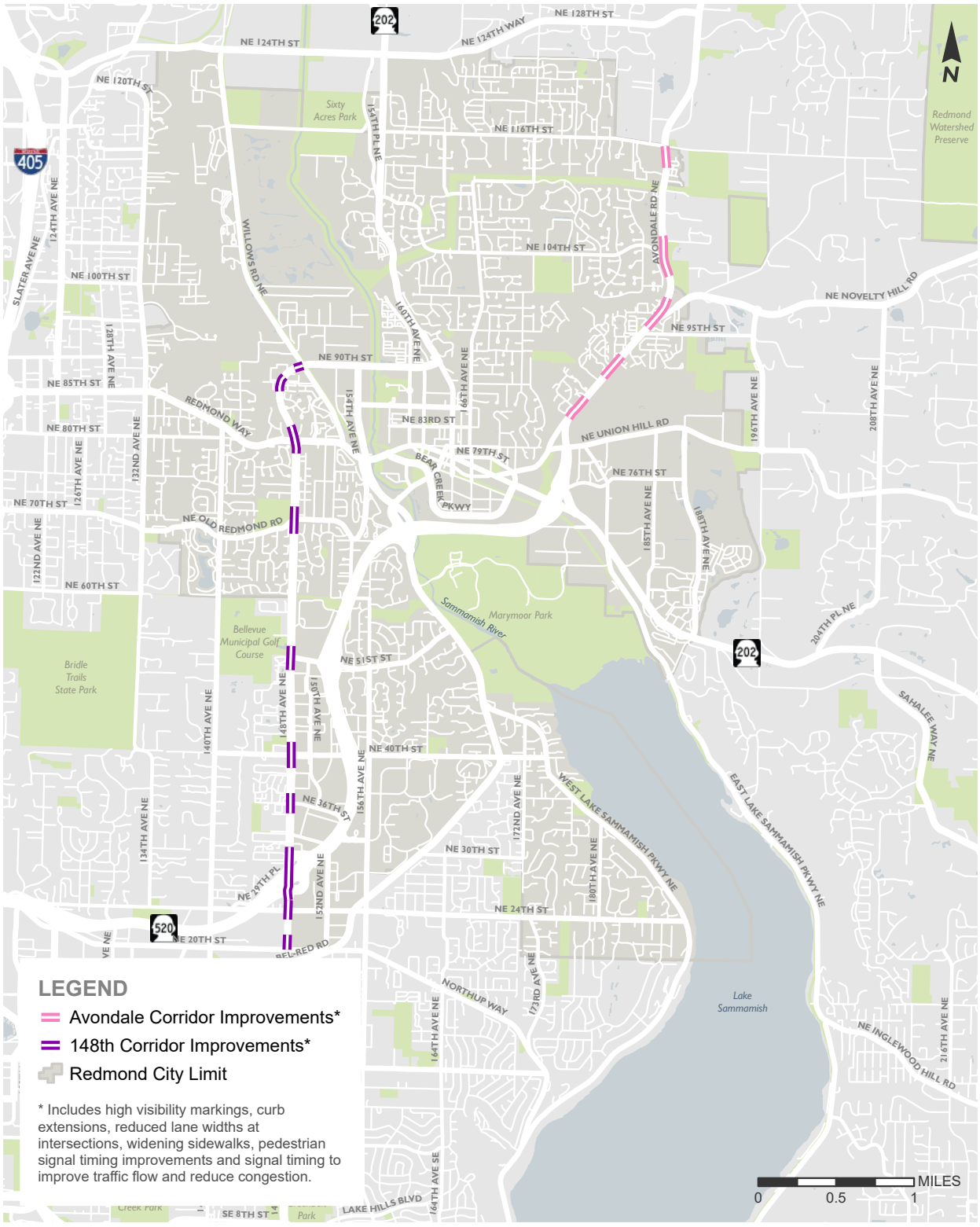


Figure A6. Location of Divided Highway/Reduced Speed Projects

7 Appendix

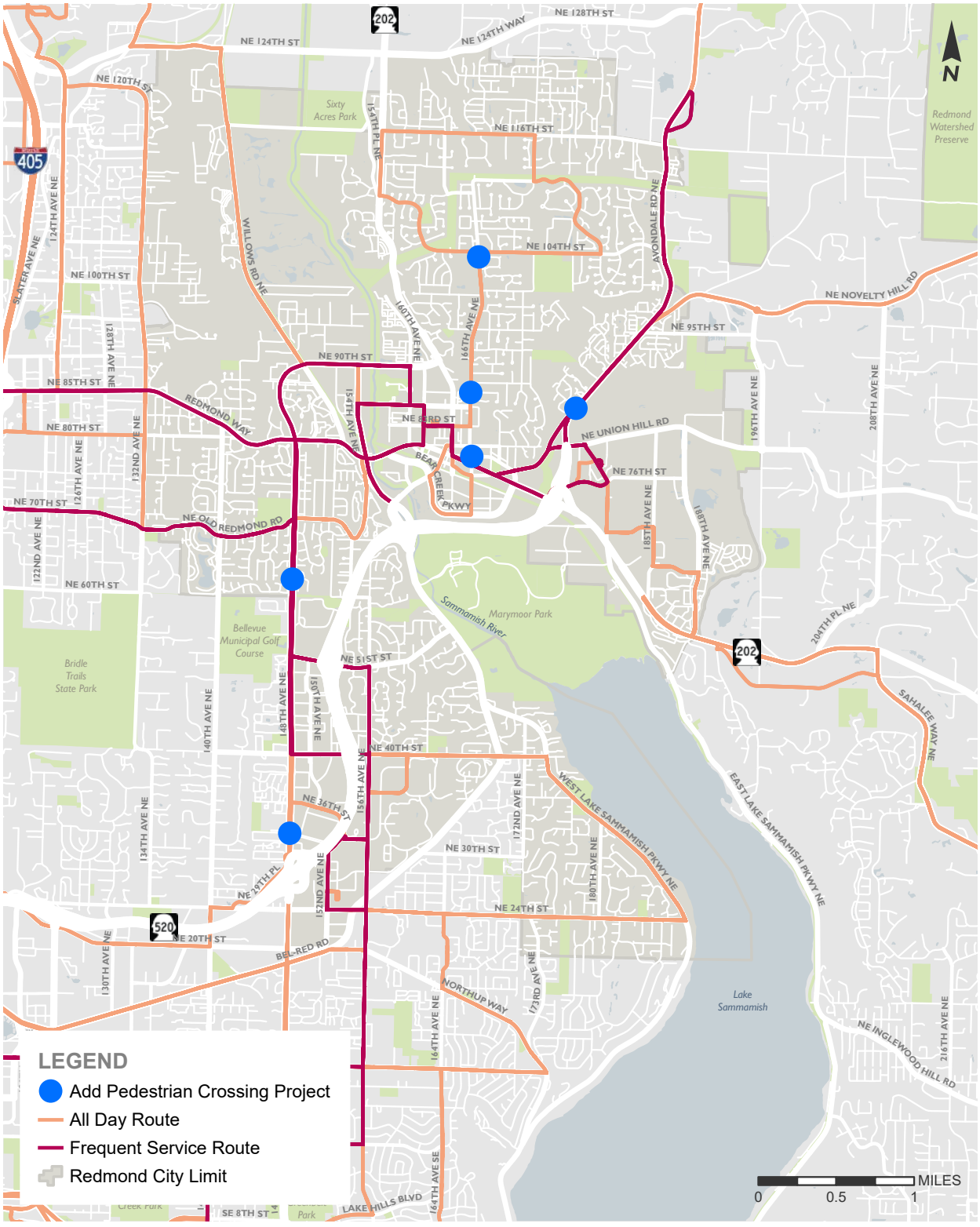


Figure A7. Location of Add Pedestrian Crossing Projects

7 Appendix

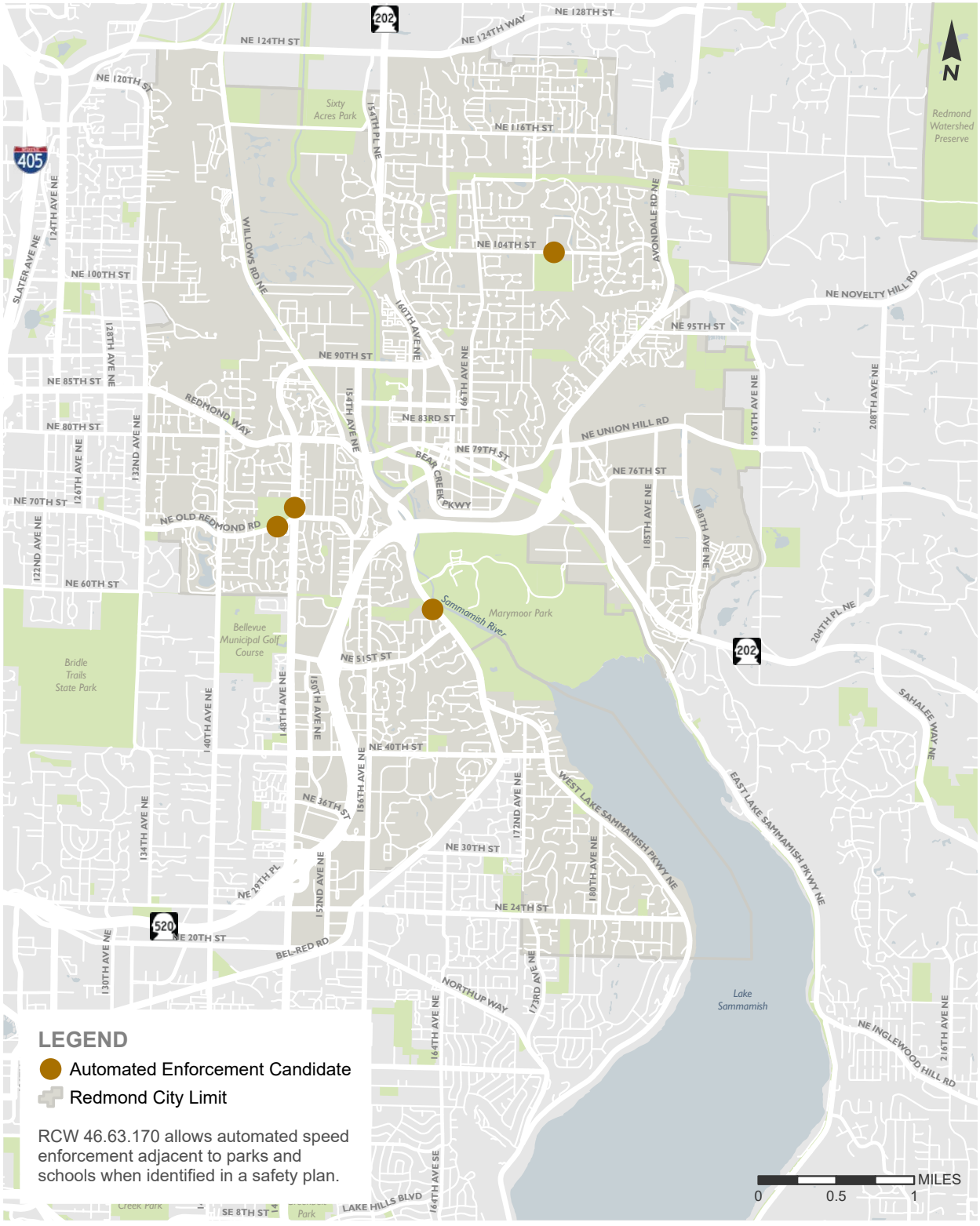


Figure A8. Location of Potential Automated Enforcement Projects

7

Appendix B: LRSP Detailed Crash Maps

7 Appendix

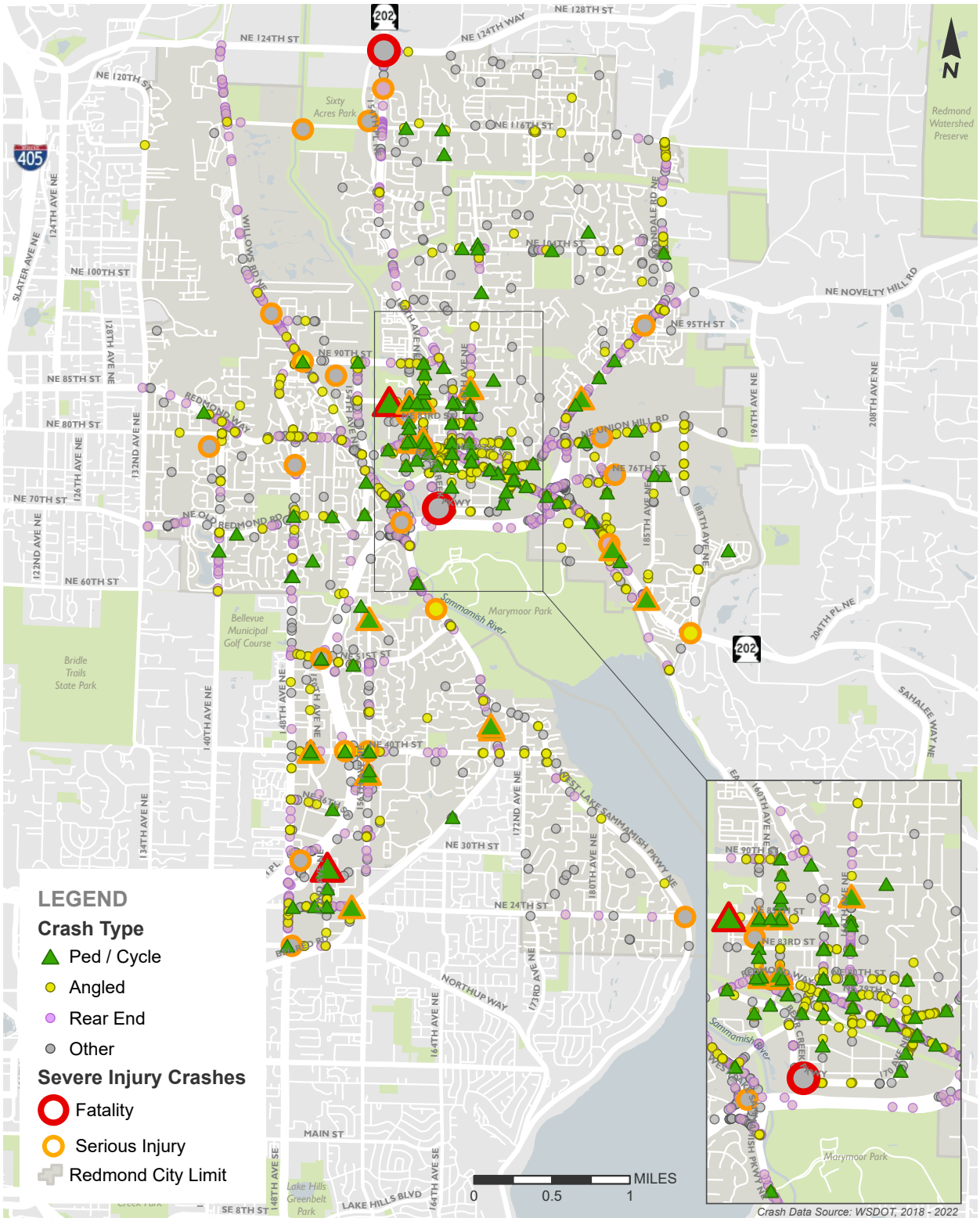


Figure A9. All Crashes

7 Appendix

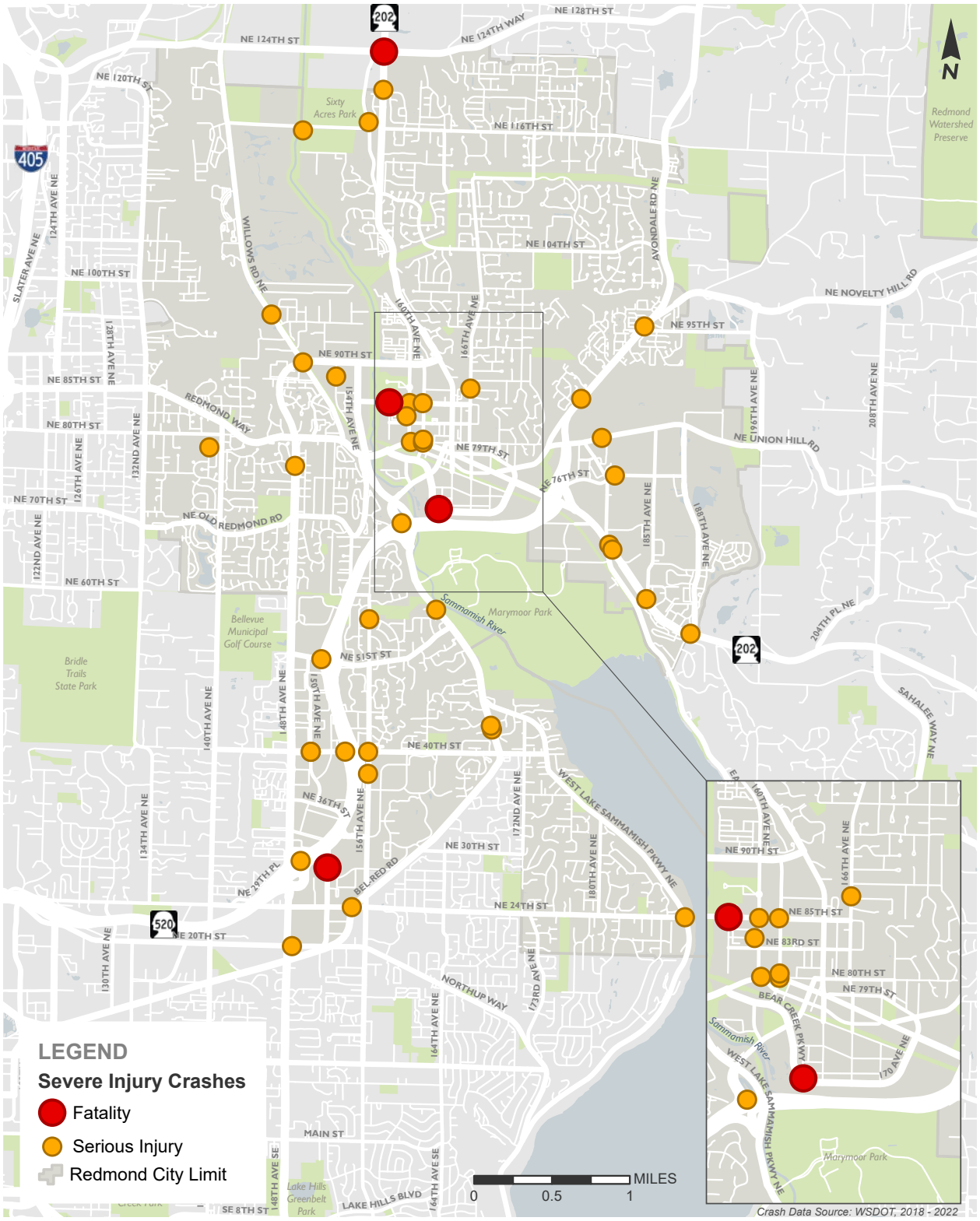


Figure A10. Severe Injury Crashes

7 Appendix

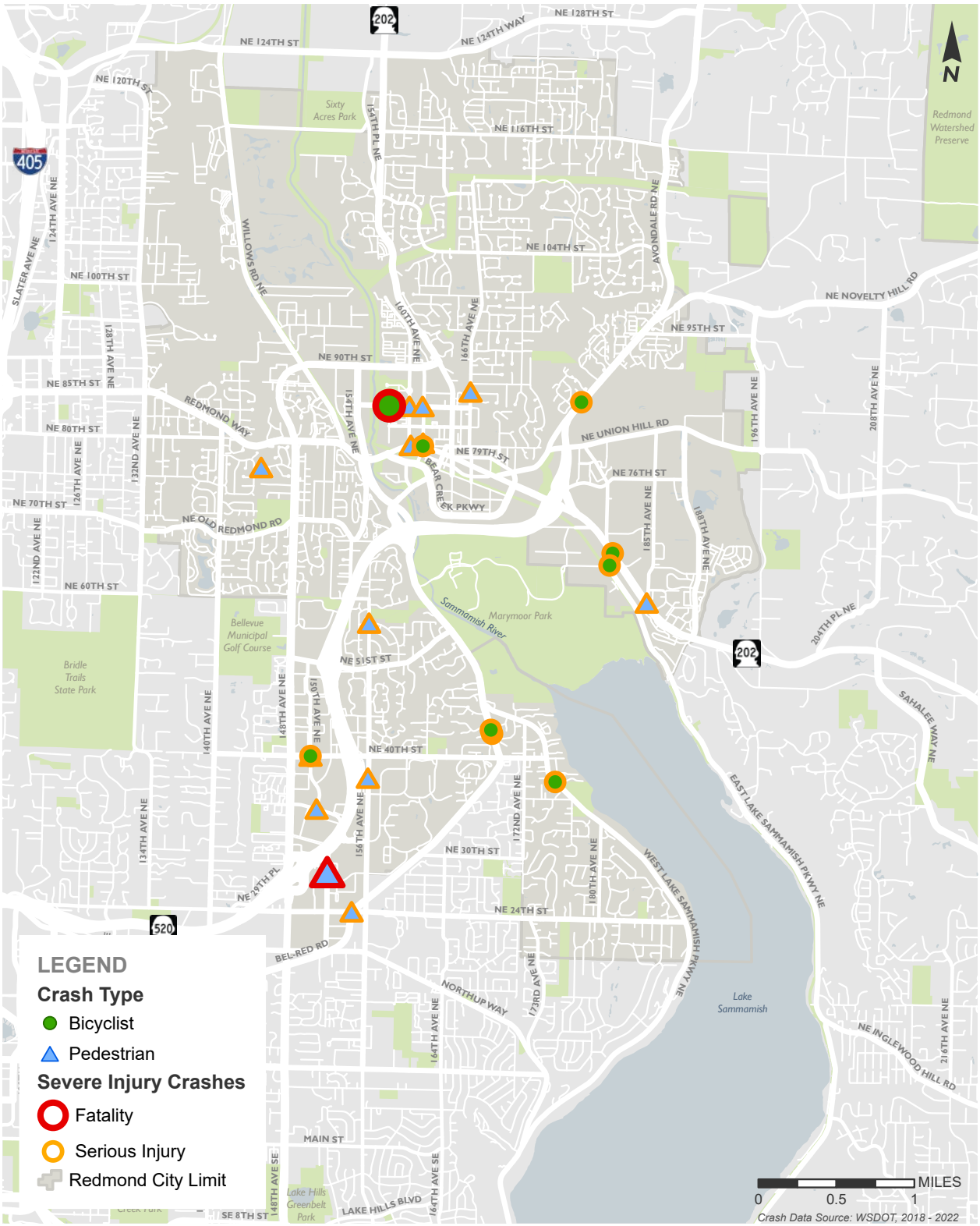


Figure A11. Severe Ped/Cycle Crashes

7 Appendix

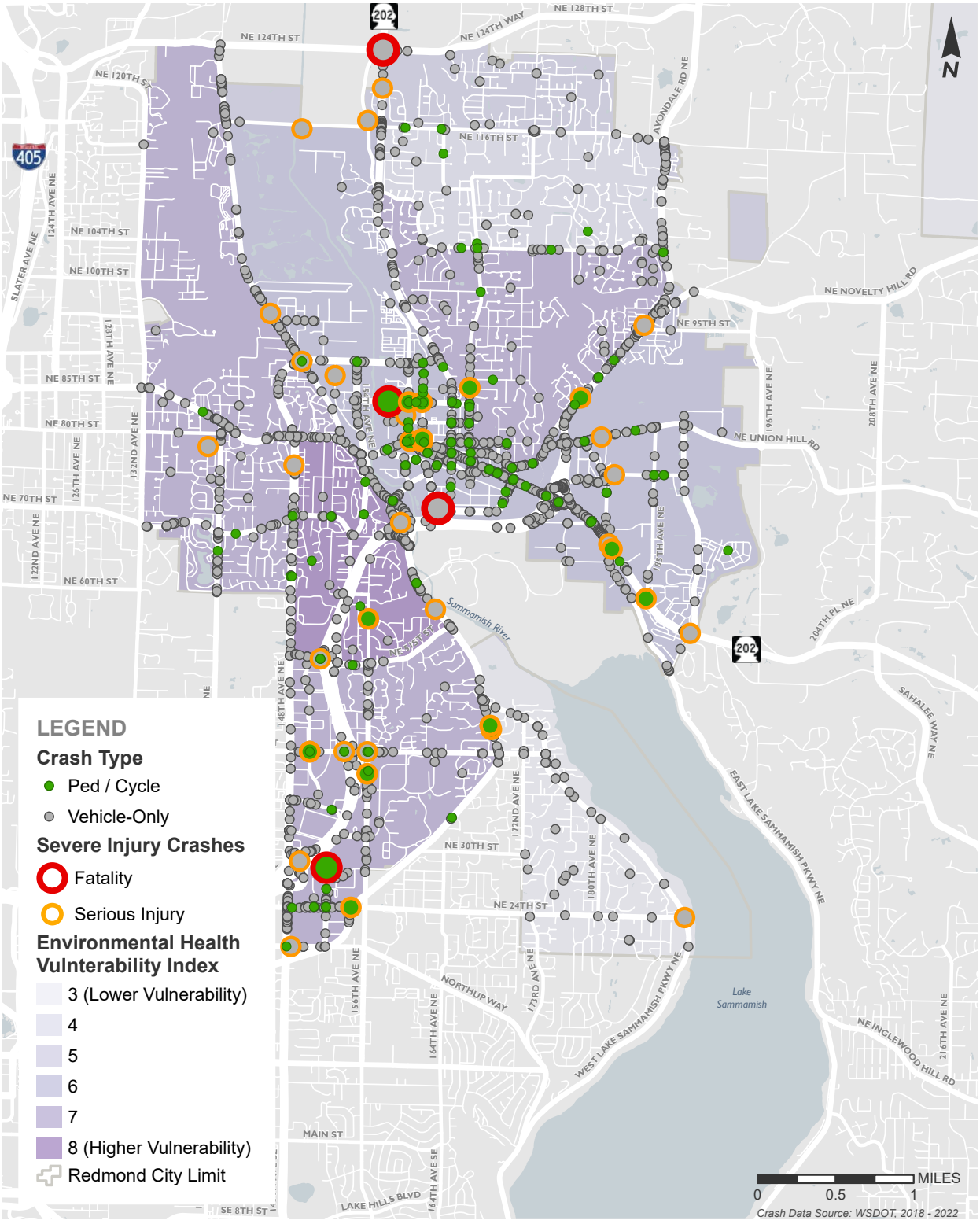


Figure A12. All Crashes with DOH Environmental Vulnerability

7 Appendix

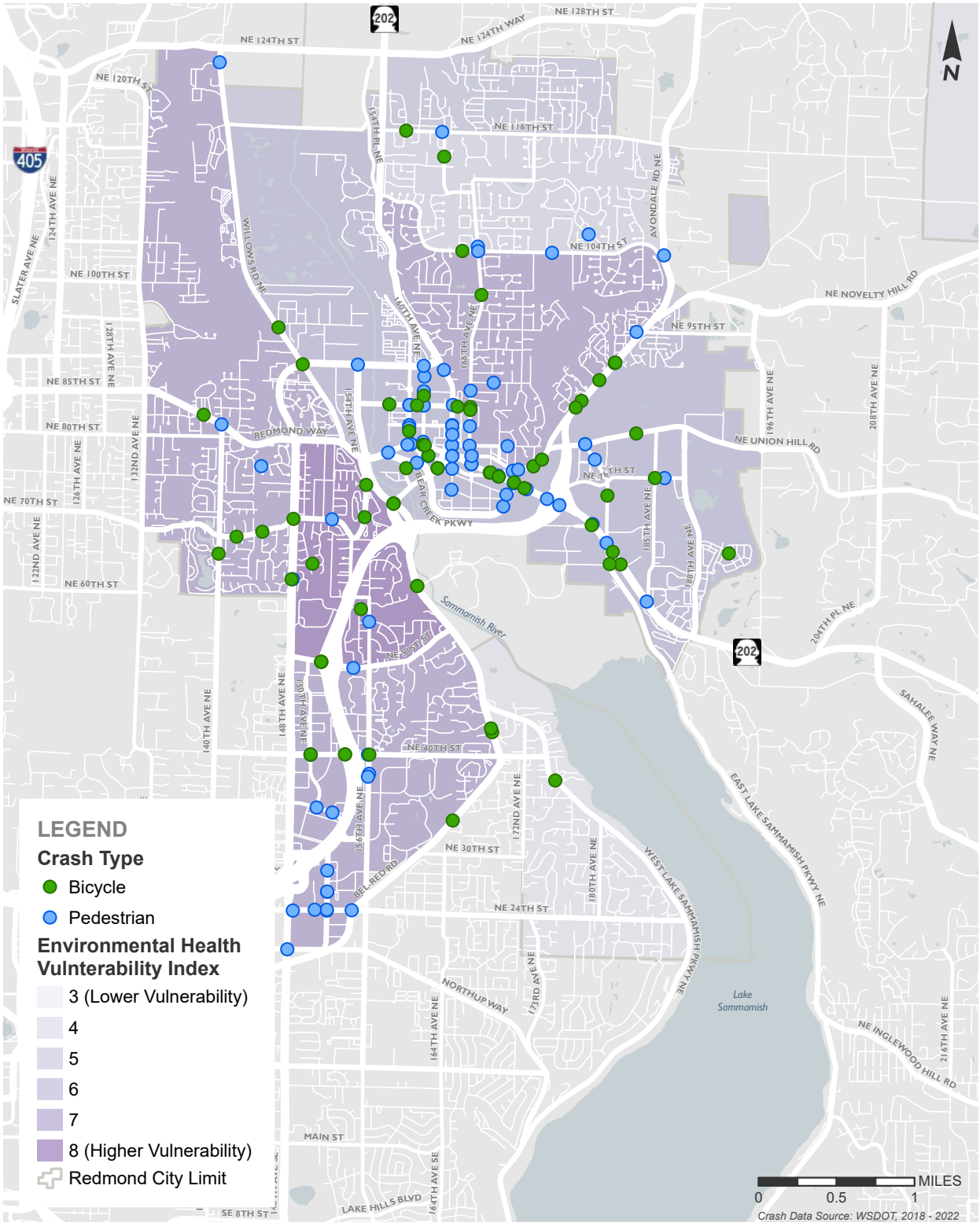


Figure A13. Ped/CycleCrashes with DOH Environmental Vulnerability

7 Appendix

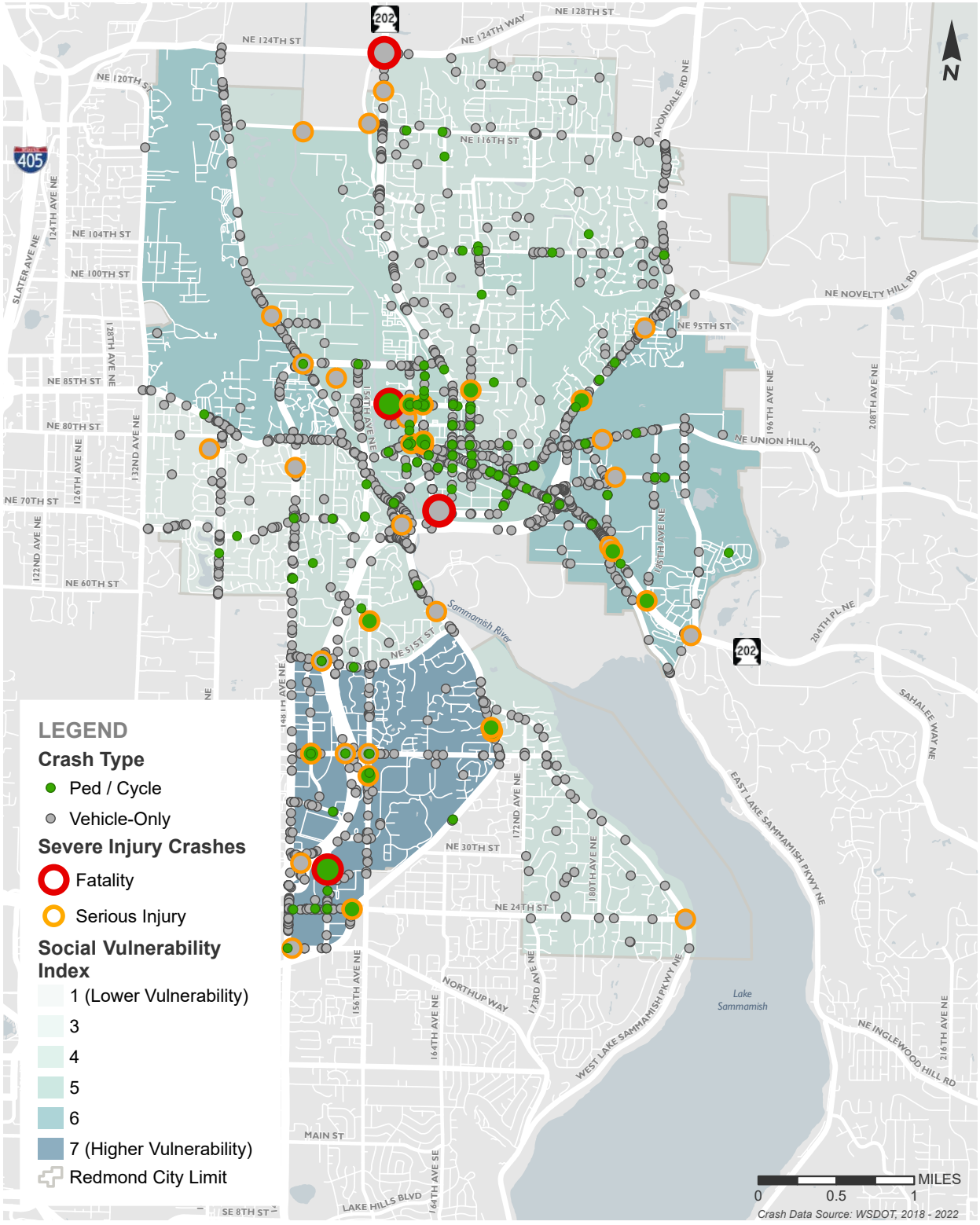


Figure A14. All Crashes with DOH Social Vulnerability

7 Appendix

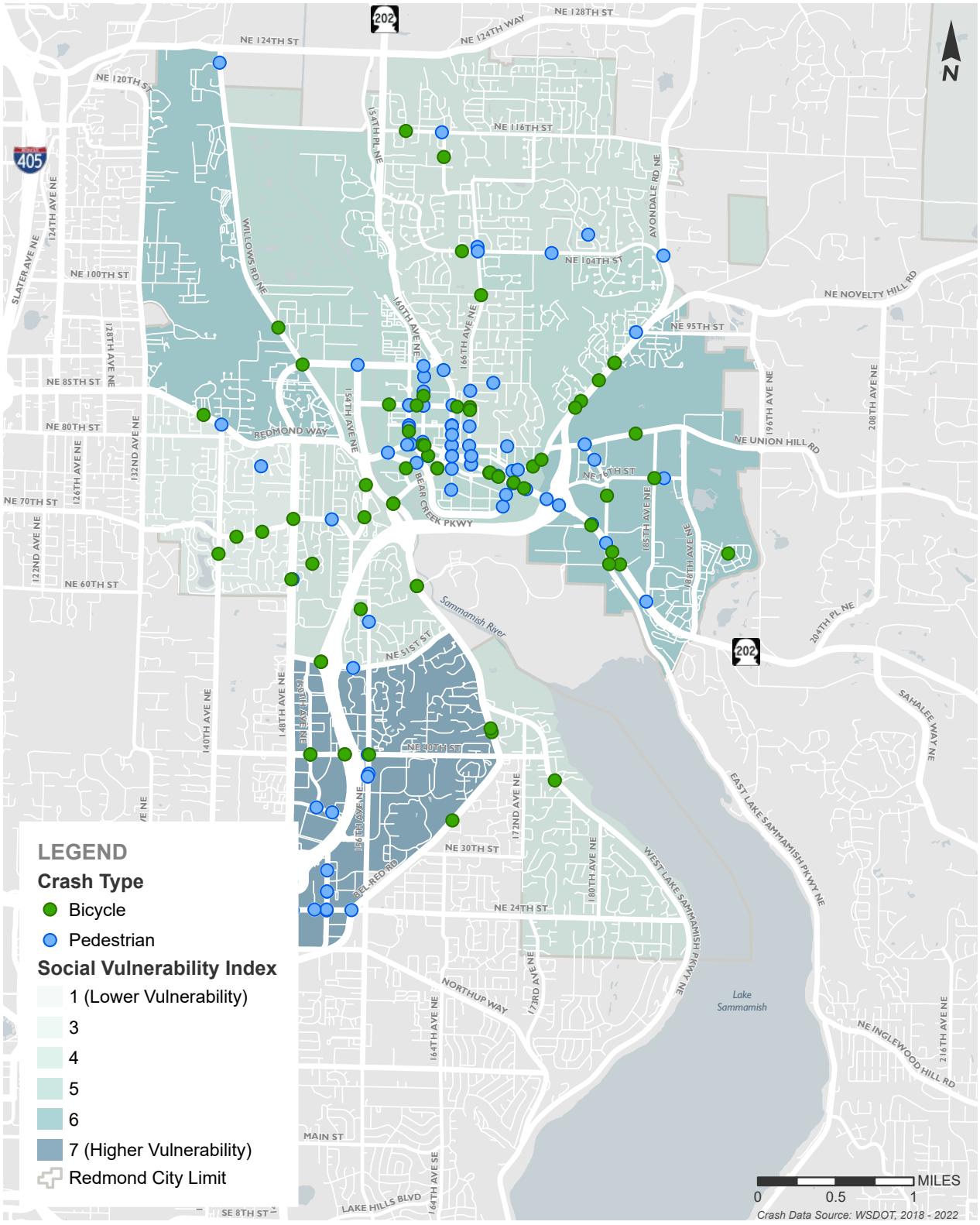


Figure A15. Ped/Cycle Crashes with DOH Social Vulnerability

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Figure A16. Ped/Cycle Crashes in Downtown Core

7 Appendix

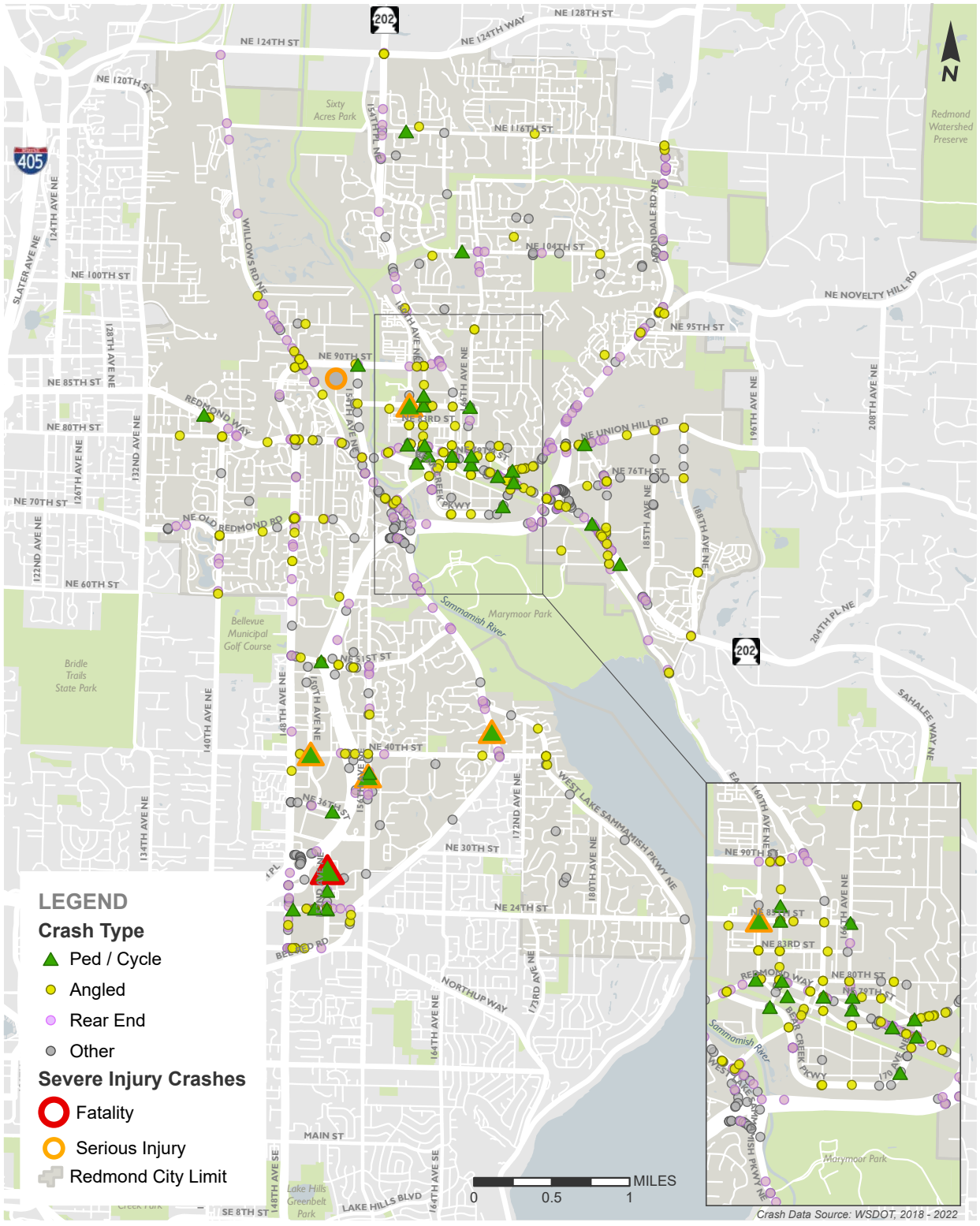

Figure A17. Wet Roadway Condition–All Crashes

7 Appendix

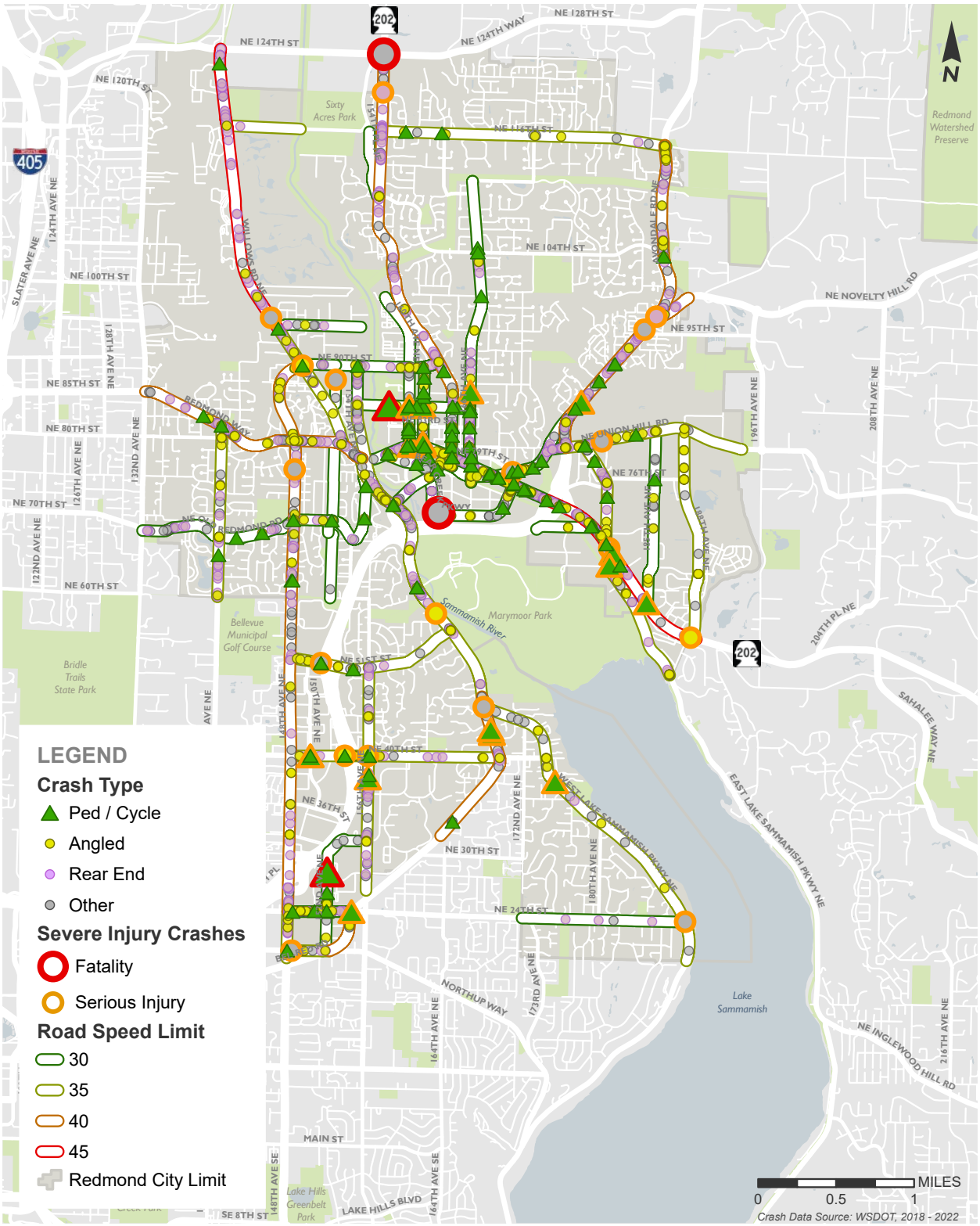

Figure A18. All Crashes on 30–45 mph Roadways

7 Appendix

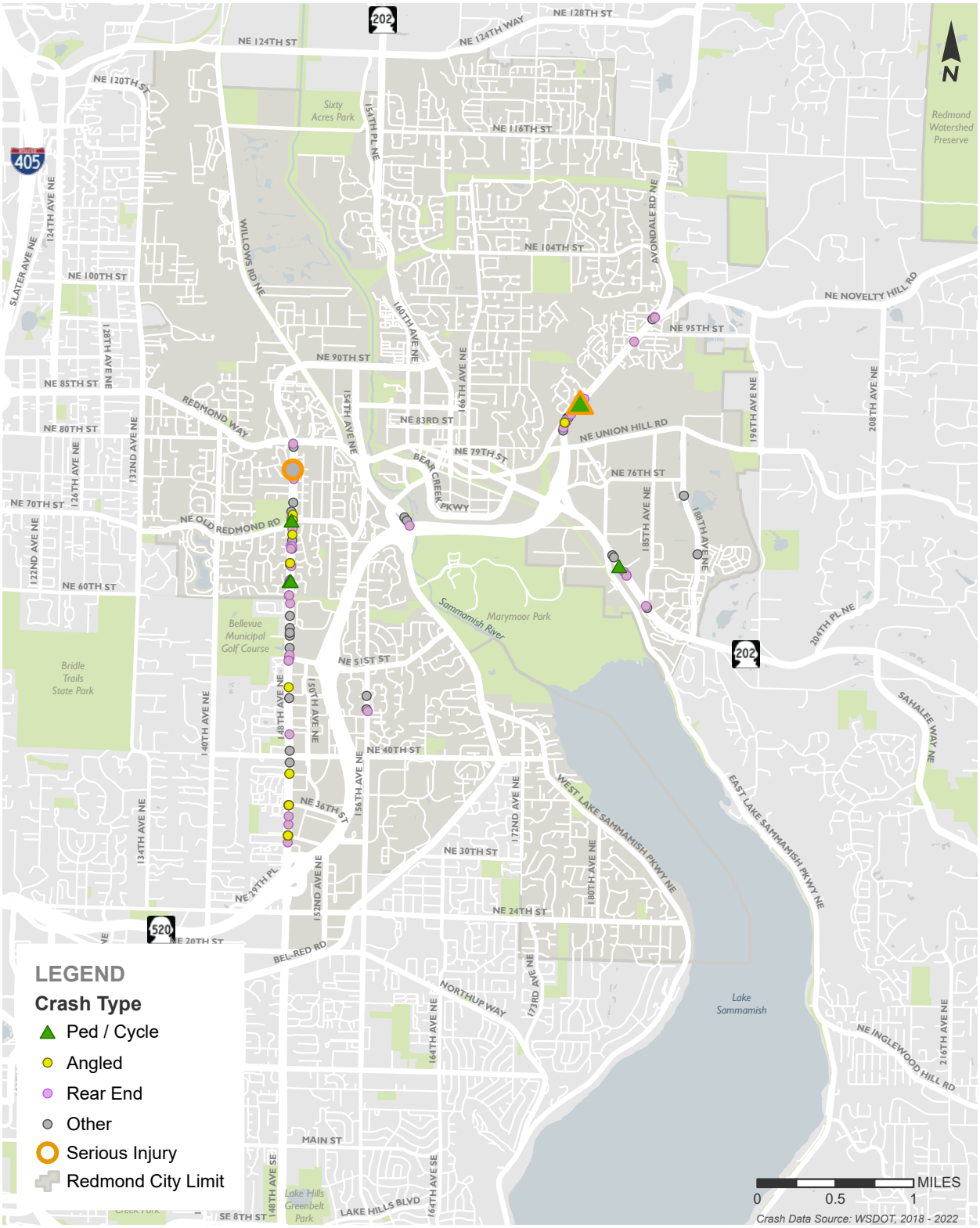

Figure A19. All Crashes on Roadways with Center Median

7 Appendix

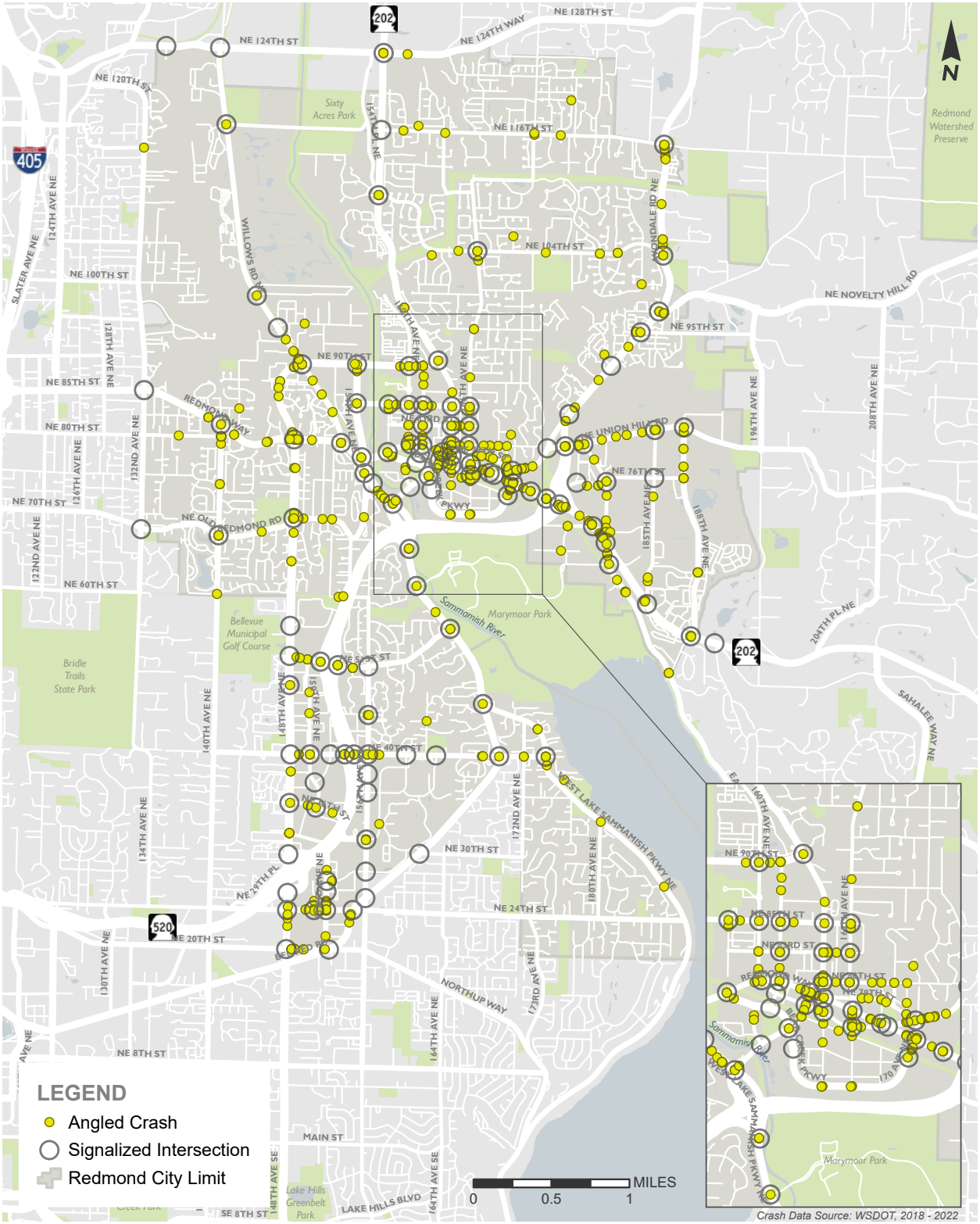

Figure A20. Angled Crashes with Signalized Intersections

7 Appendix

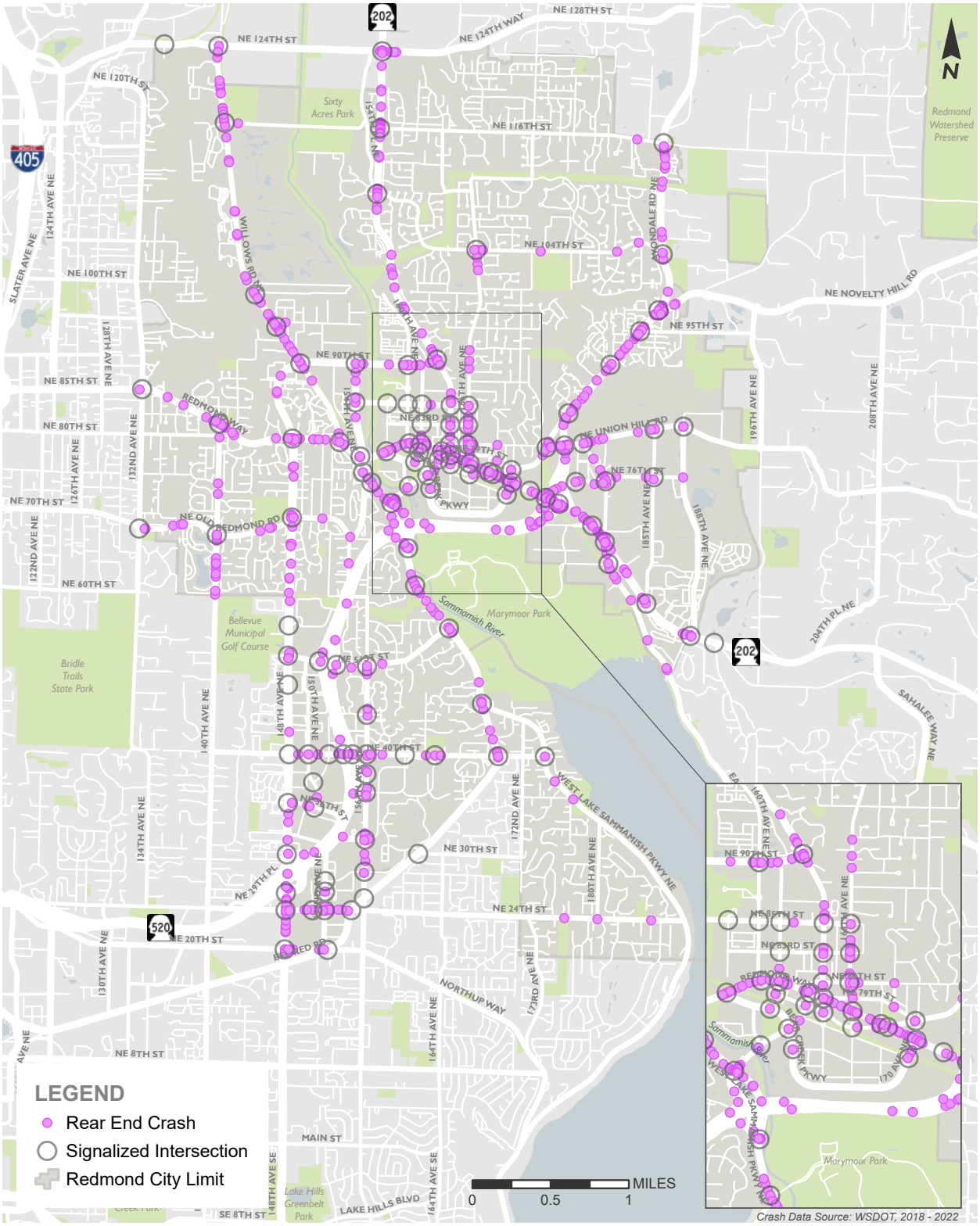

Figure A21. Rear End Crashes with Signalized Intersections

7 Appendix

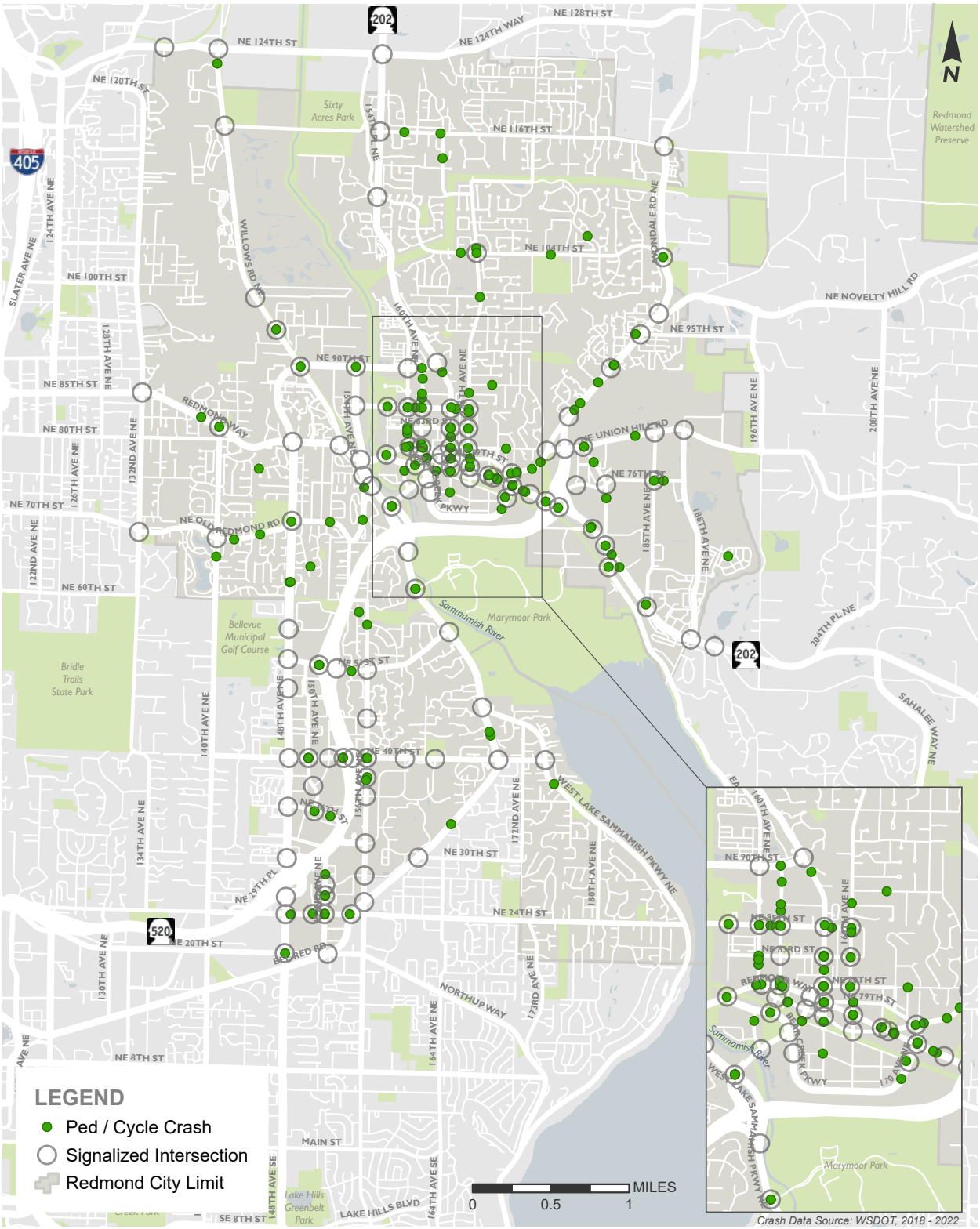

Figure A22. Ped/Cycle Crashes with Signalized Intersections

7 Appendix

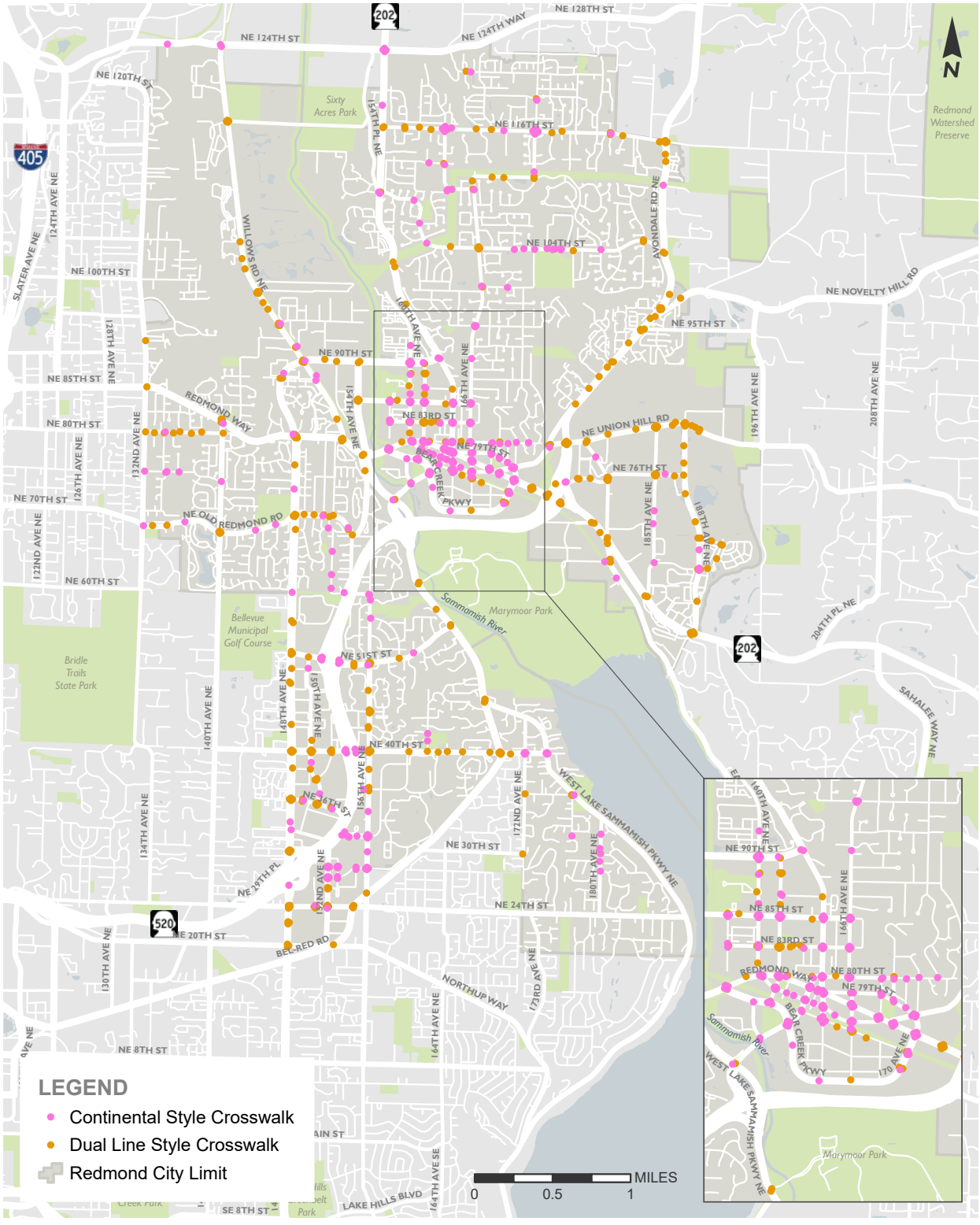

Figure A23. Existing Crosswalk by Type

7 Appendix

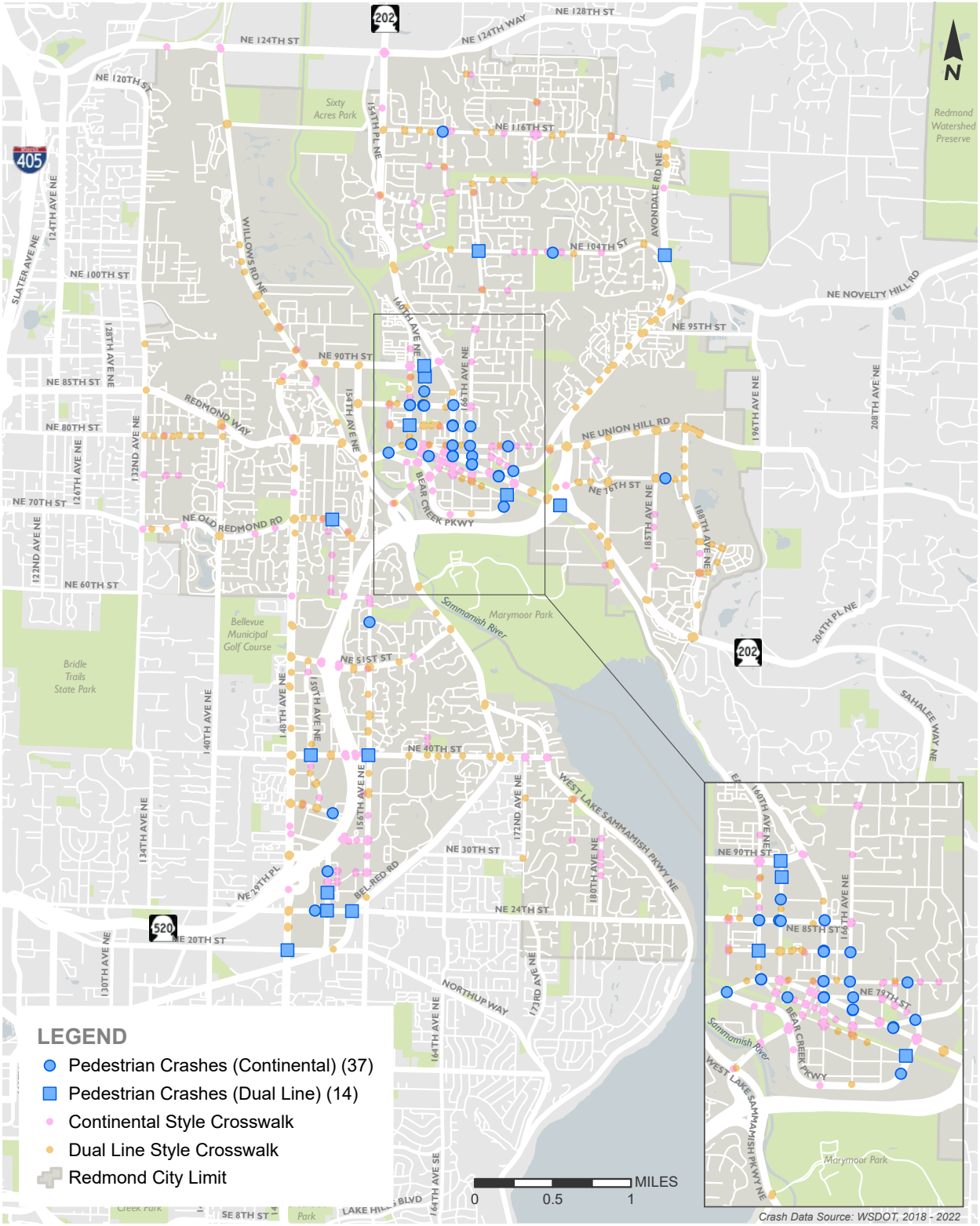

Figure A24. Pedestrian Crash by Crosswalk Type

7 Appendix

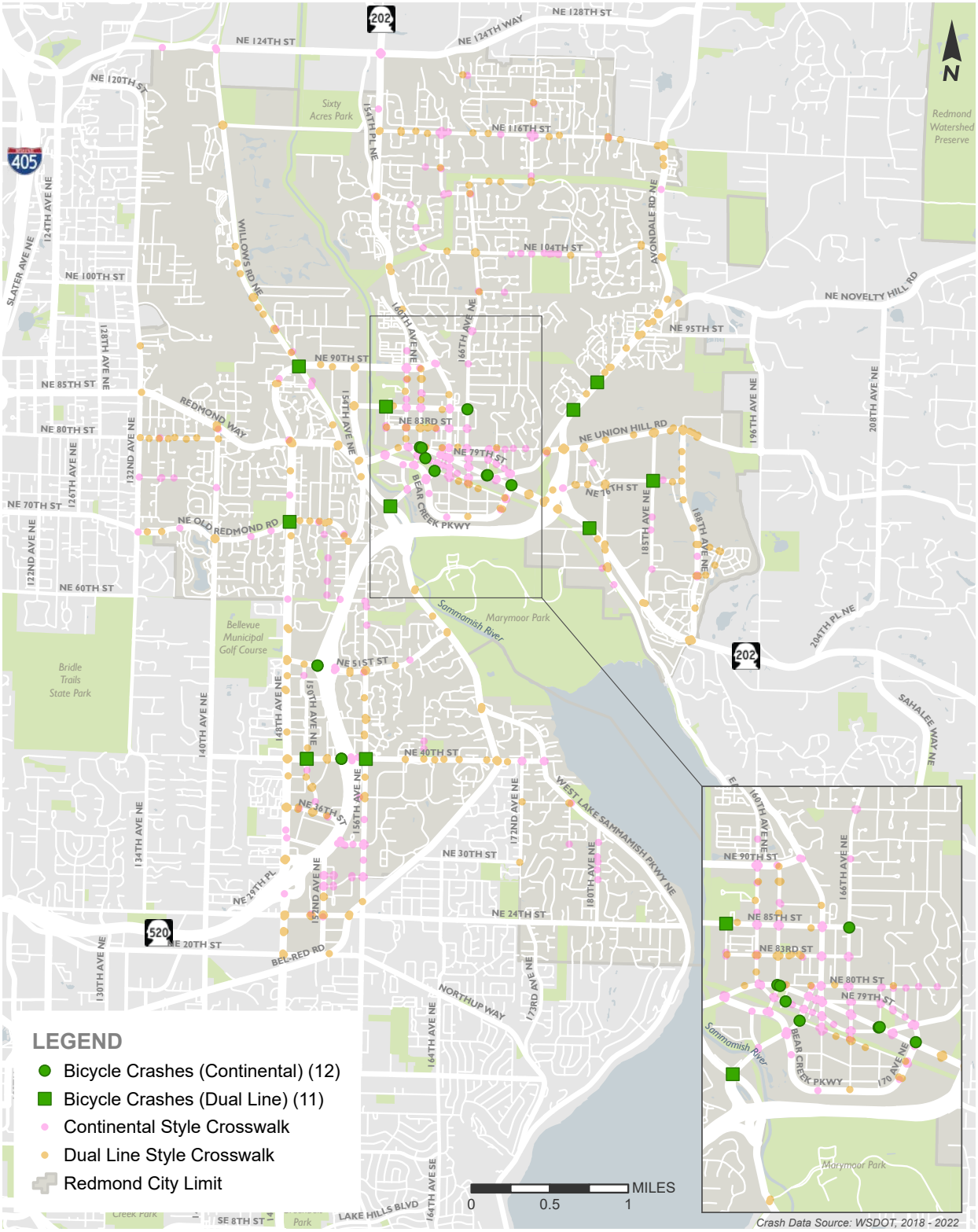

Figure A25. Bicycle Crash by Crosswalk Type

7 Appendix

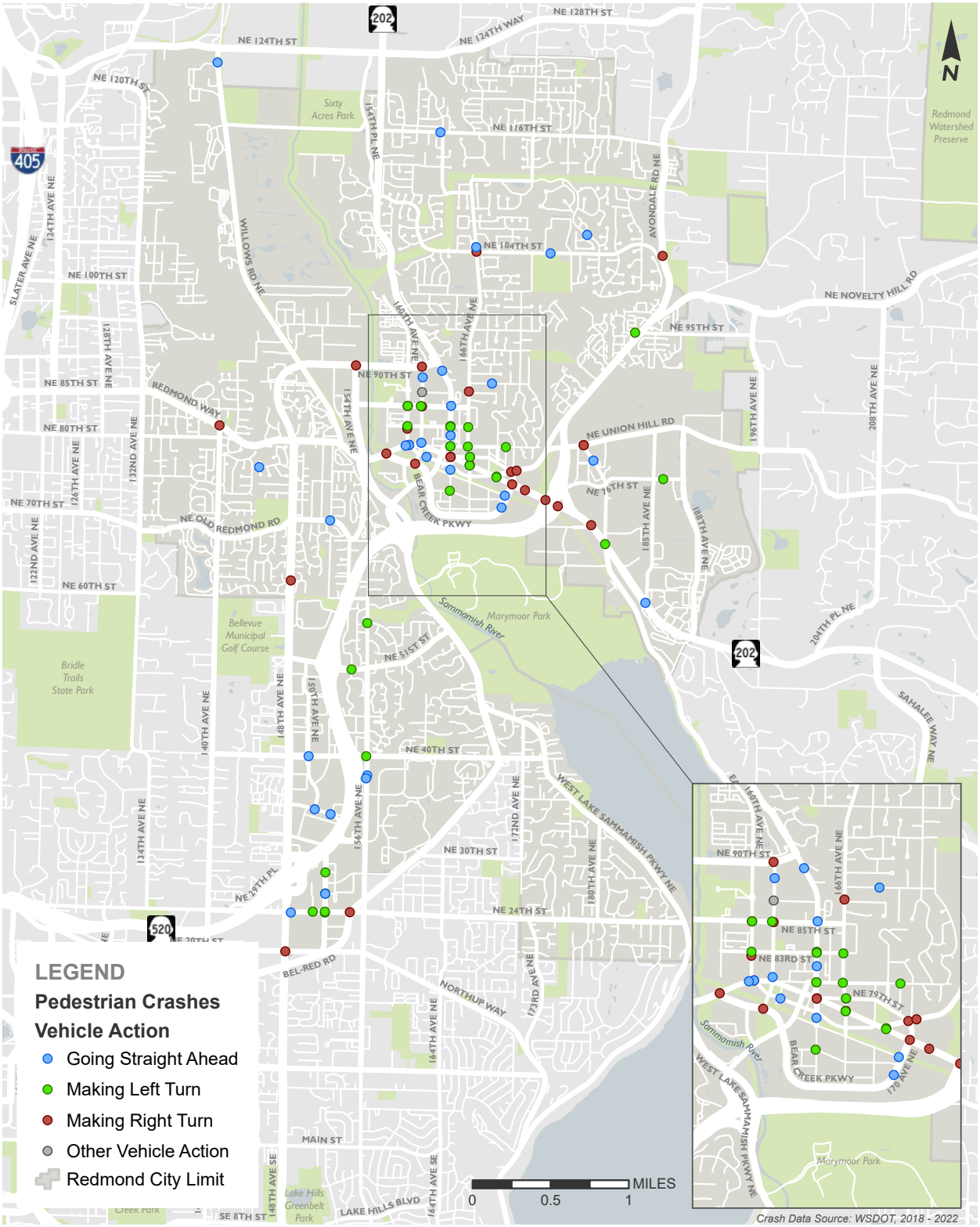

Figure A26. Pedestrian Crashes by Vehicle Turn Type

7 Appendix

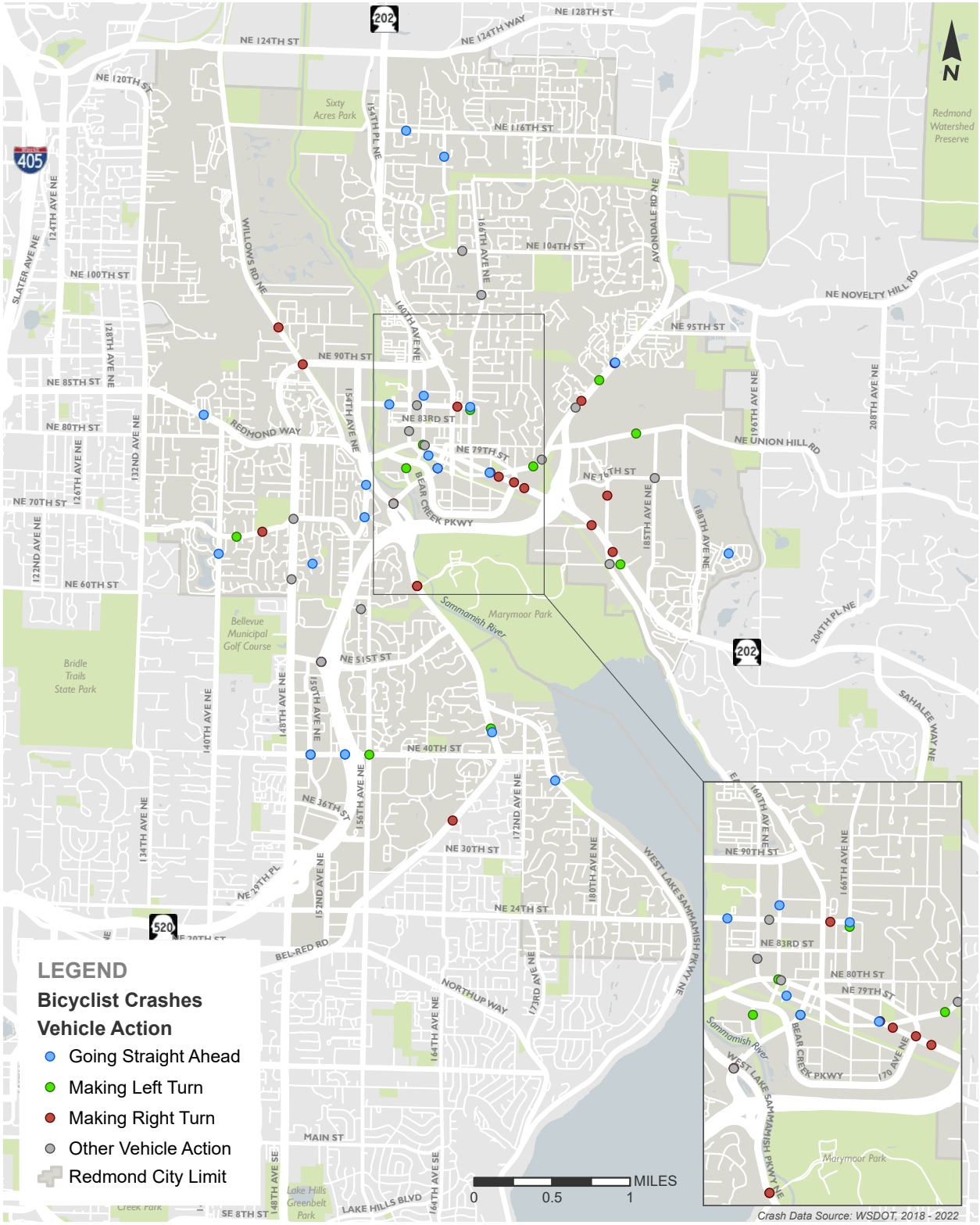

Figure A27. Bicycle Crashes by Vehicle Turn Type

7 Appendix

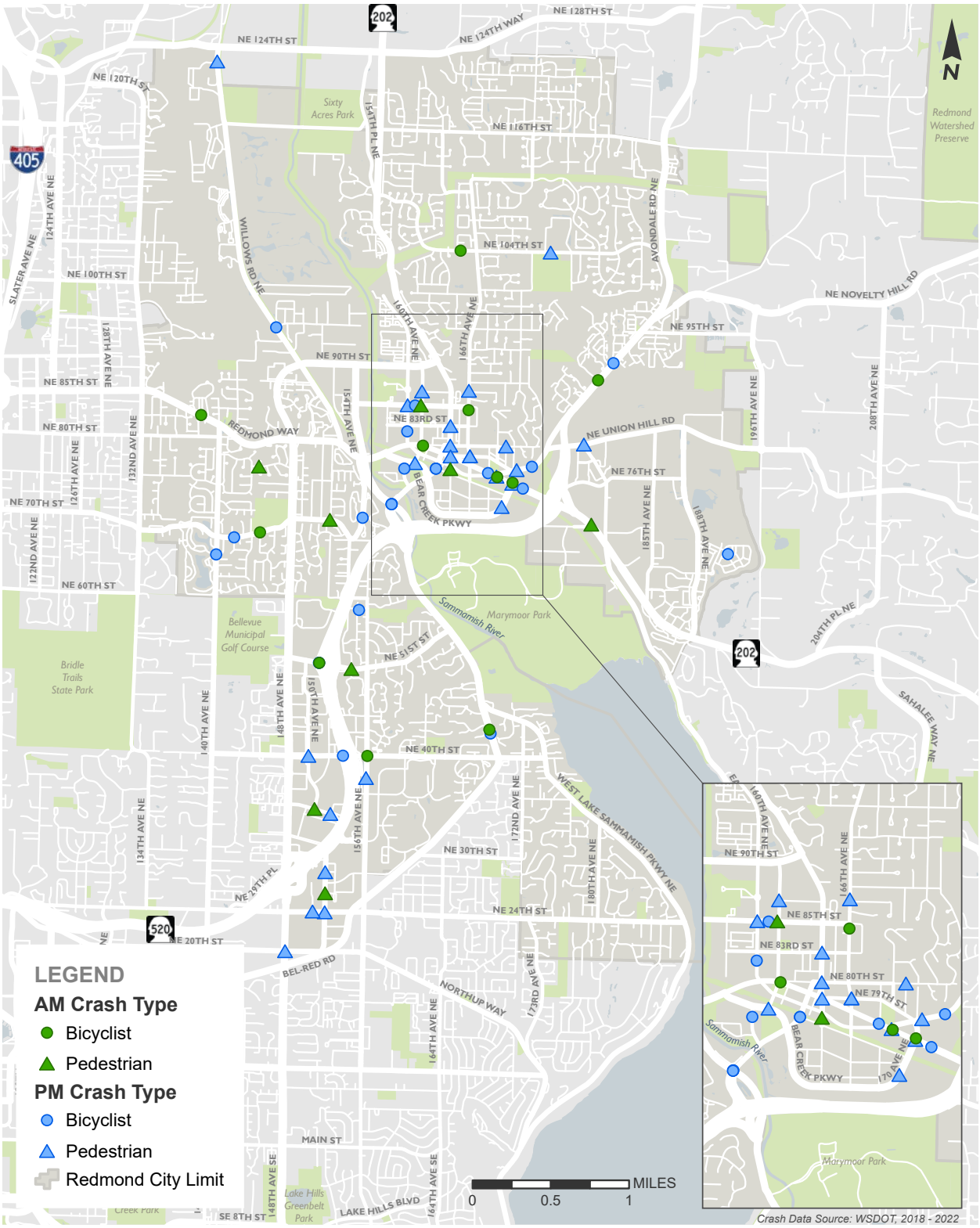

Figure A28. AM (7–9am) and PM (4–7pm) Ped/Cycle Crashes

7 Appendix

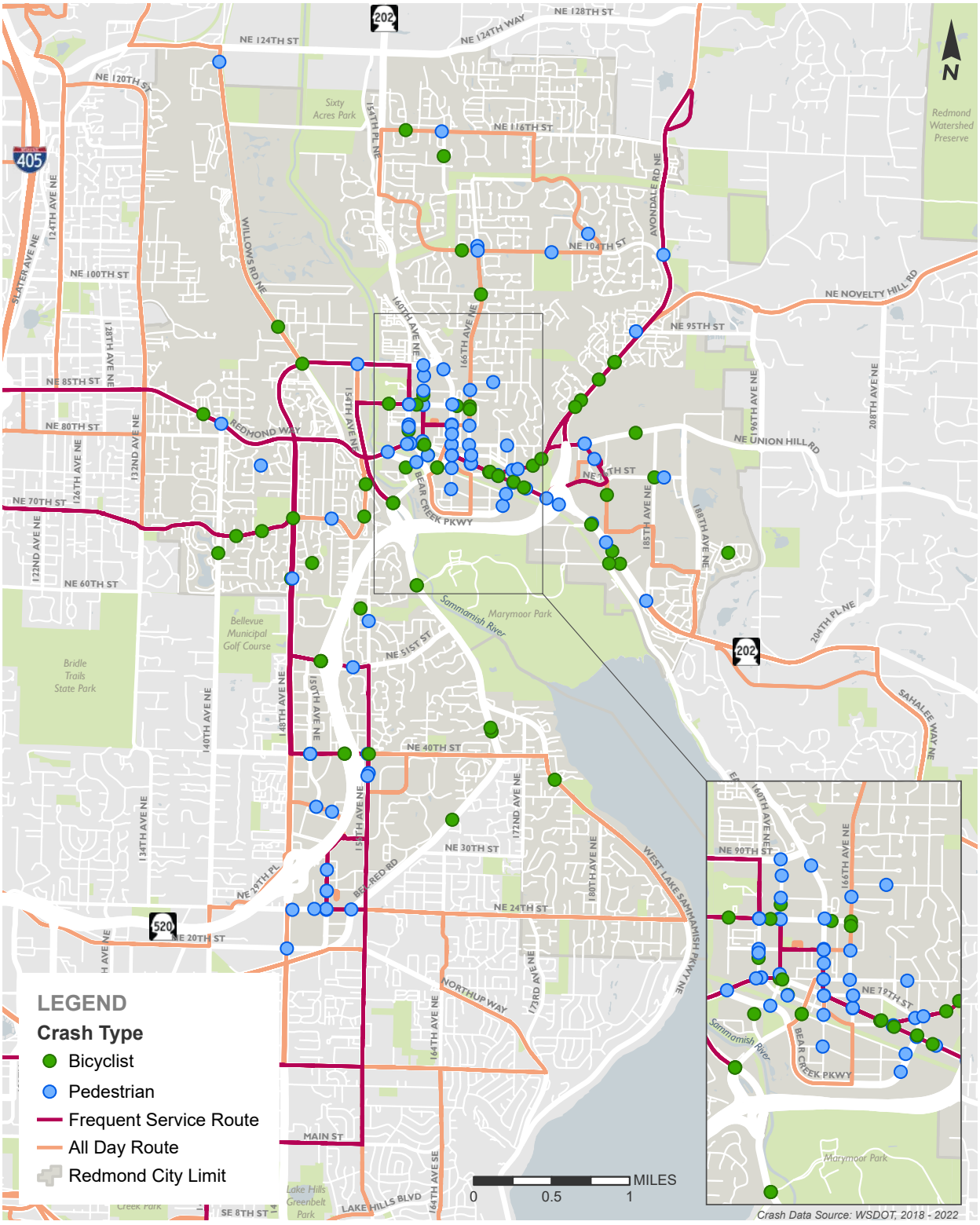

Figure A29. Ped/Cycle Crashes and Transit Routes

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Appendix C: High Risk and High Injury Networks

7 Appendix

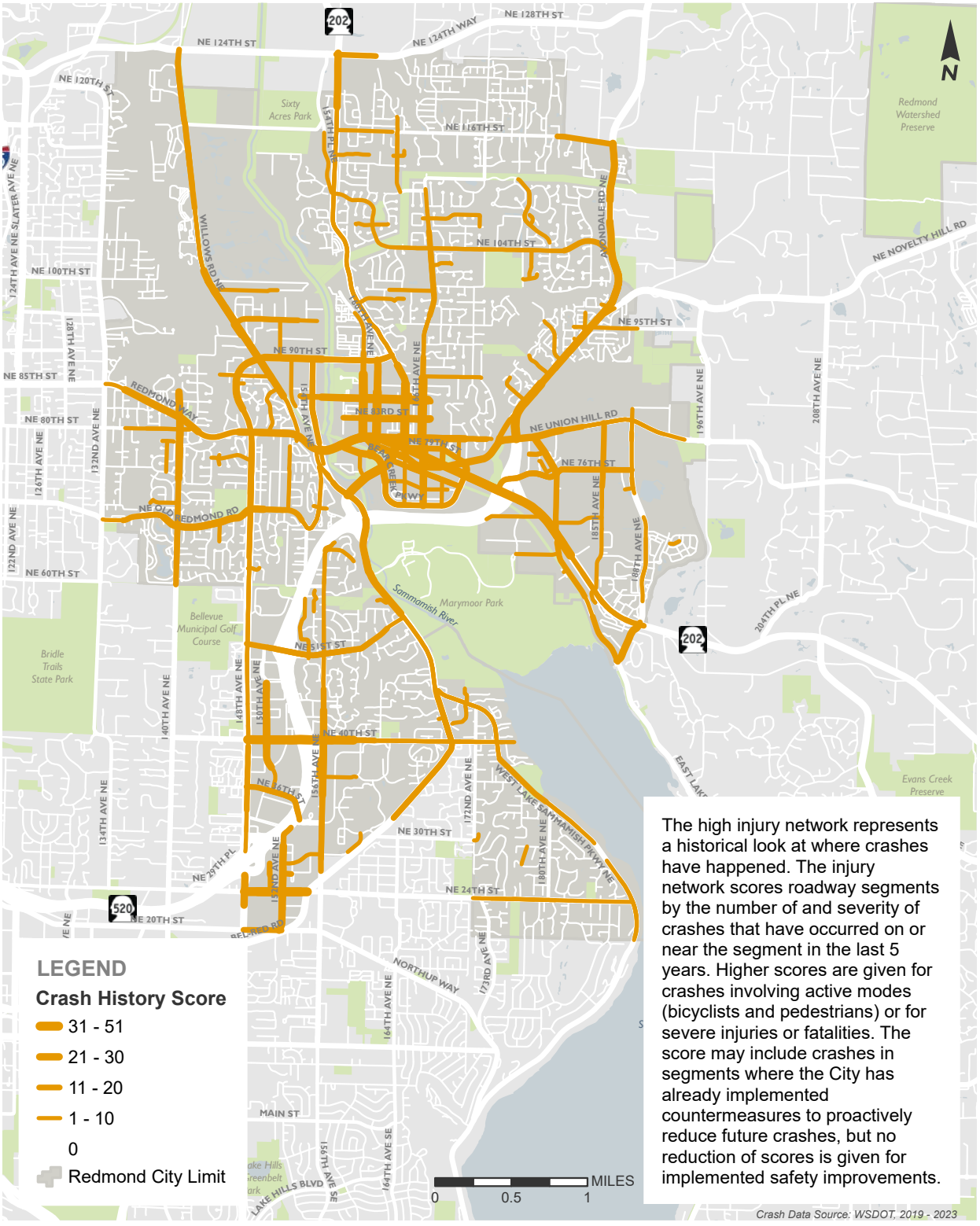

Figure A30. High Injury Network - Full Network

7 Appendix

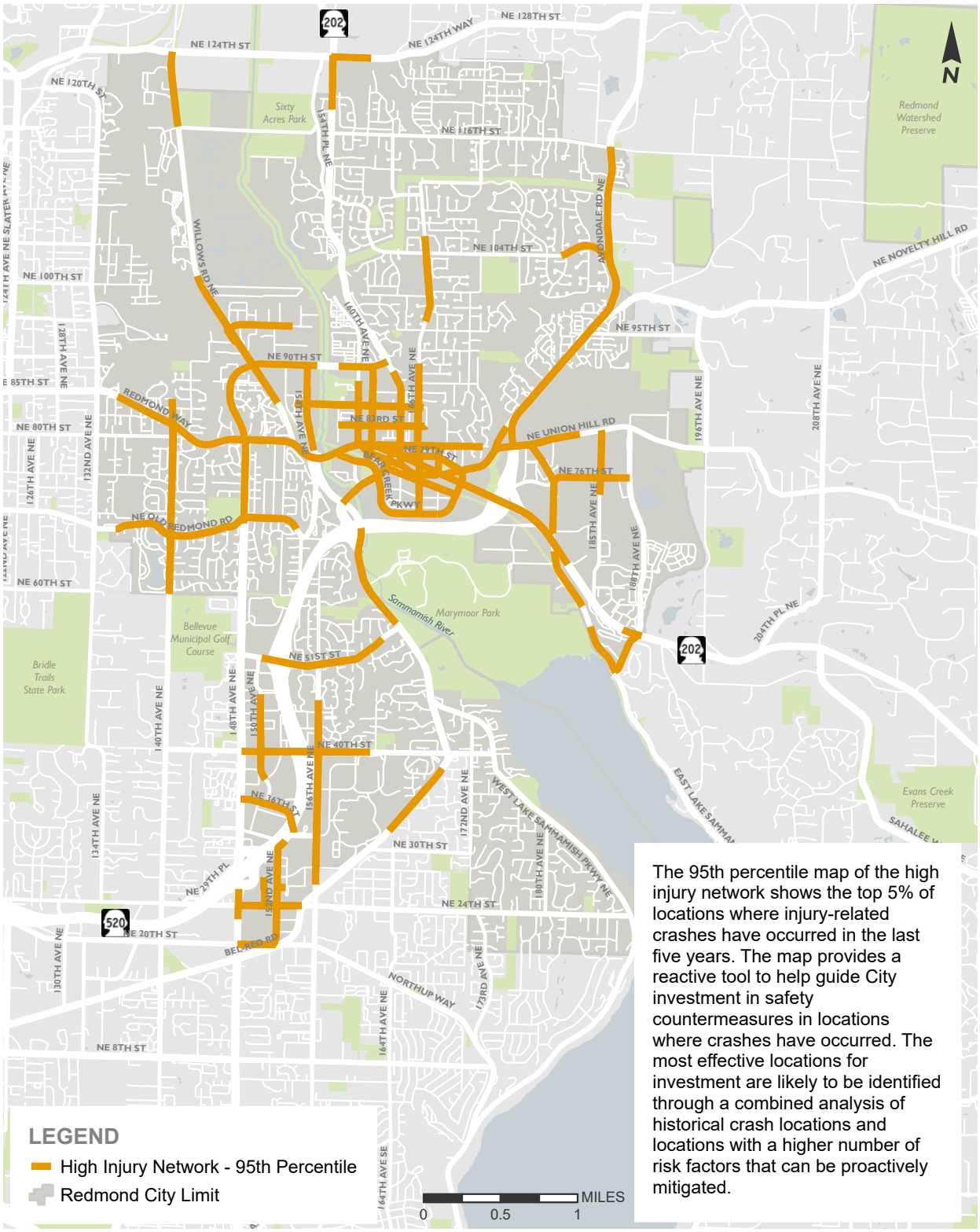

Figure A31. High Injury Network - 95th Percentile

7 Appendix

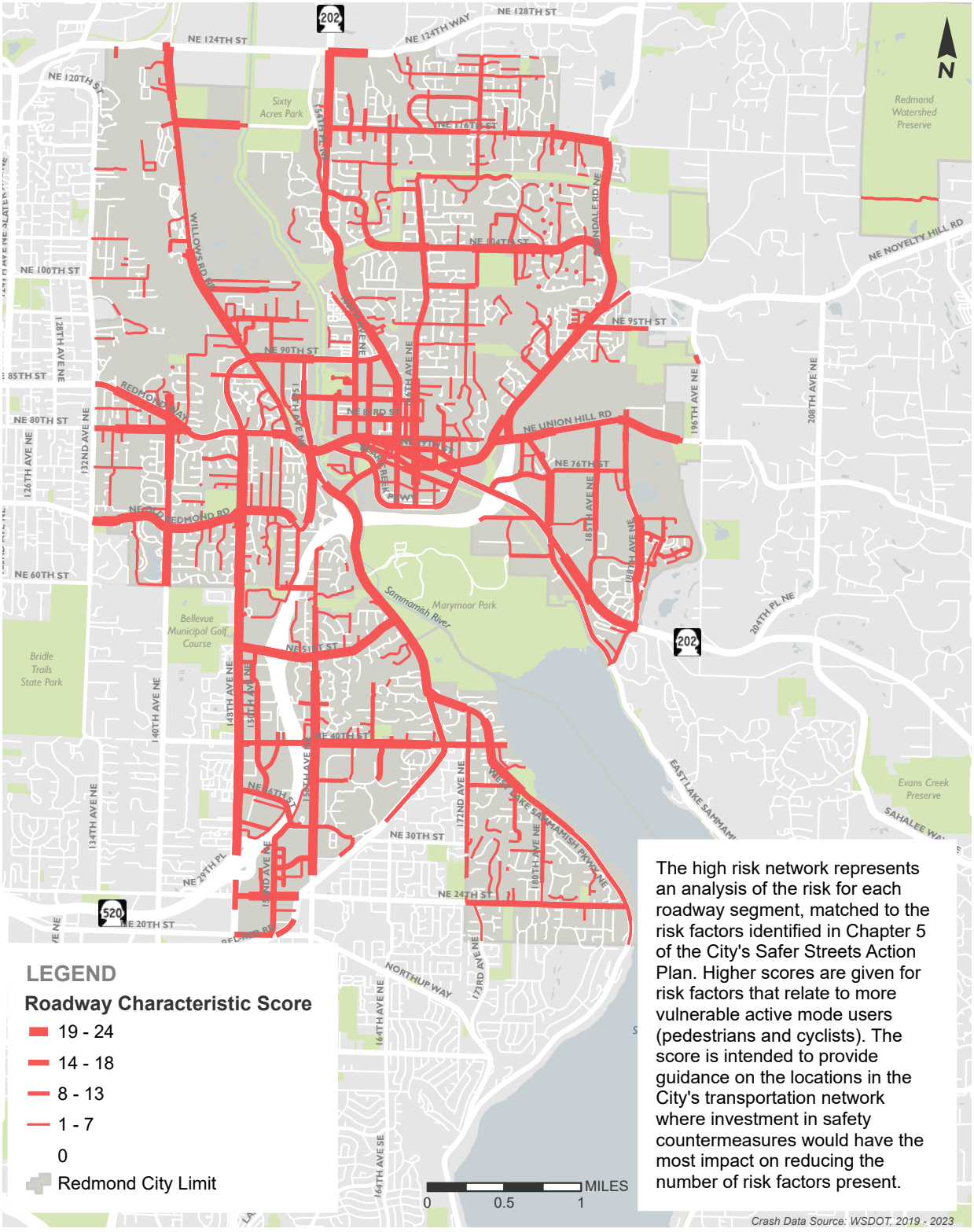

Figure A32. High Risk Network - Full Network

7 Appendix

Figure A33. High Risk Network - 95th Percentile

7 Appendix

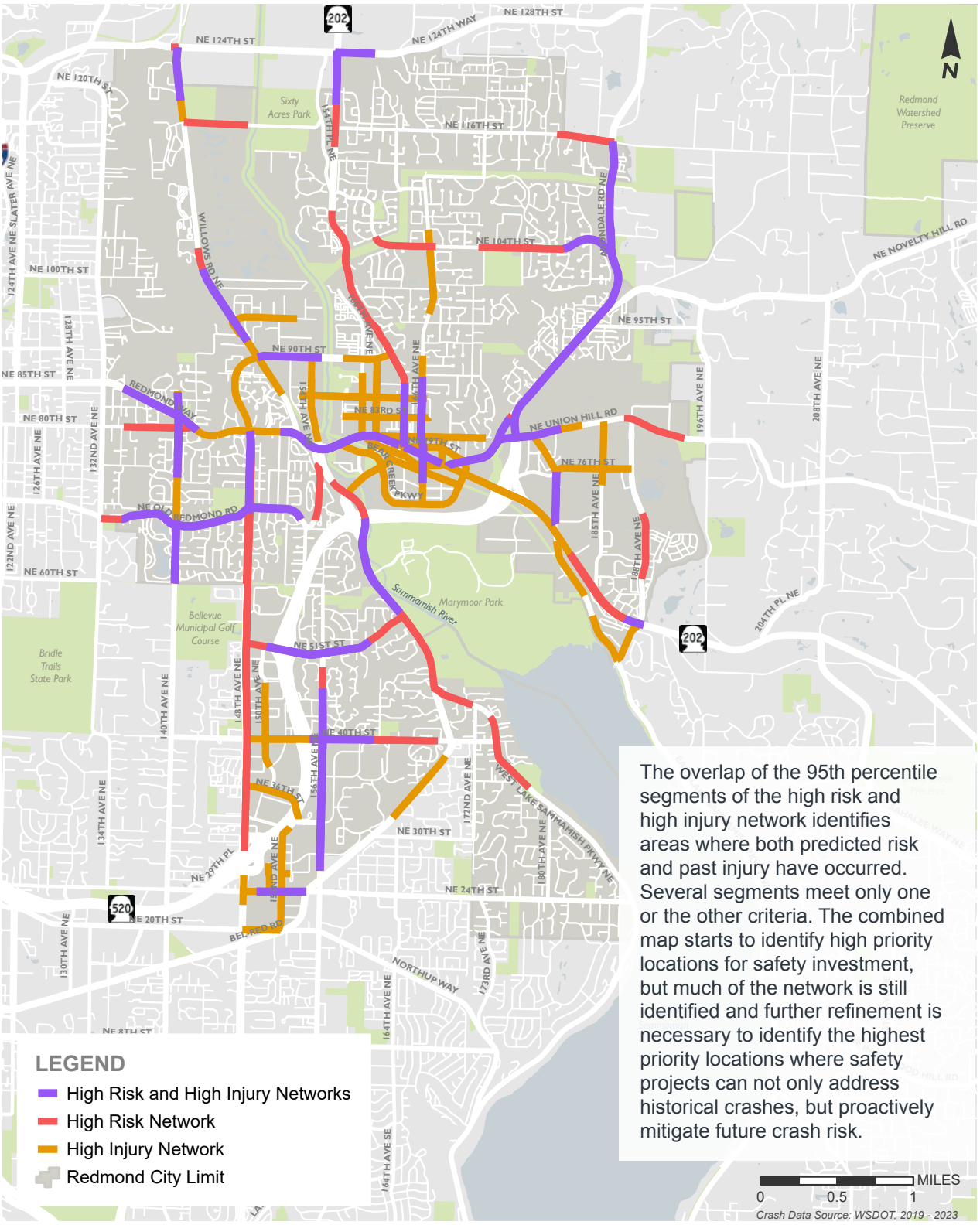

Figure A34. Combined Networks with High Risk and High Injury Networks

7 Appendix

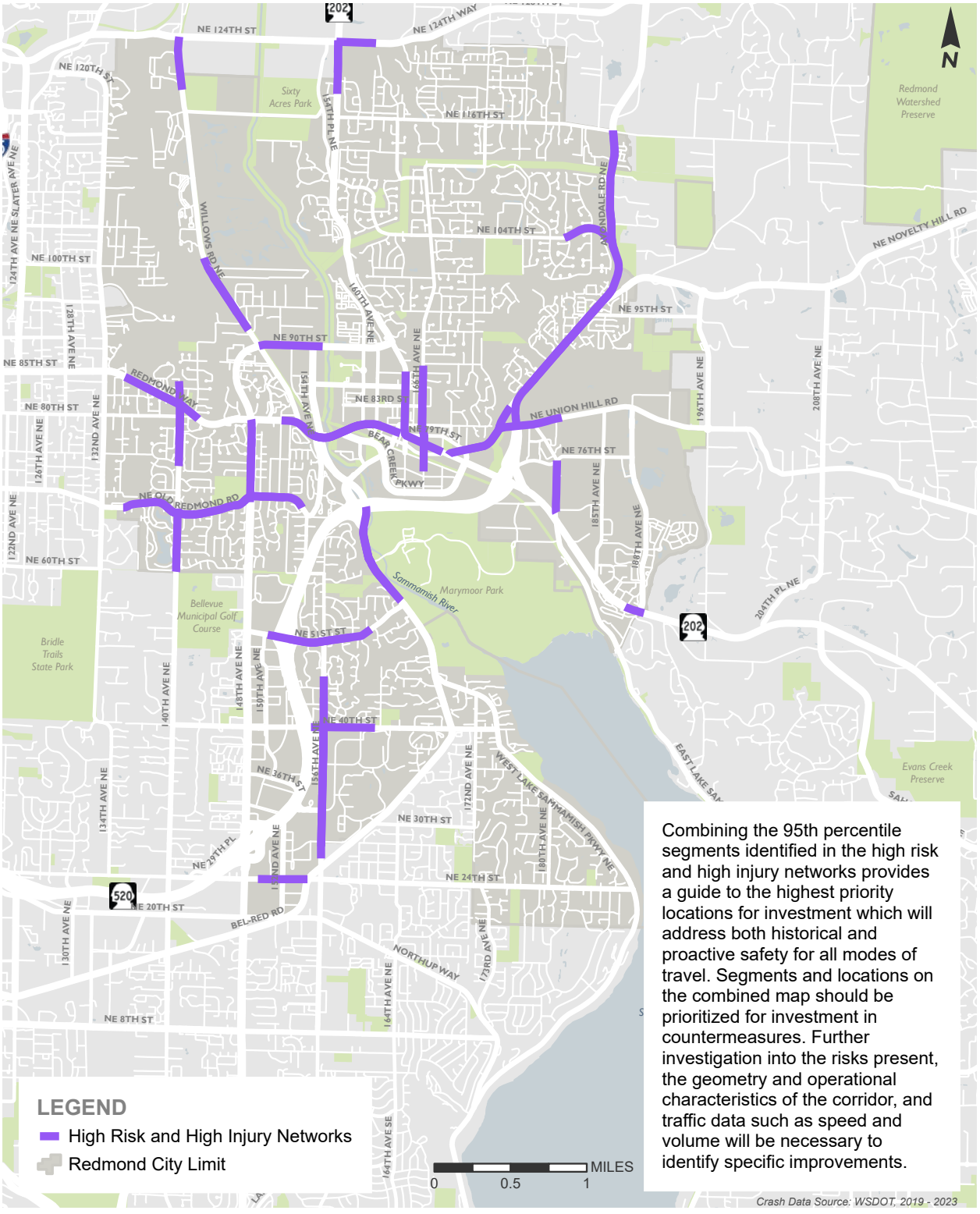

Figure A35. Combined Risk and Injury Networks

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Appendix D: Equity

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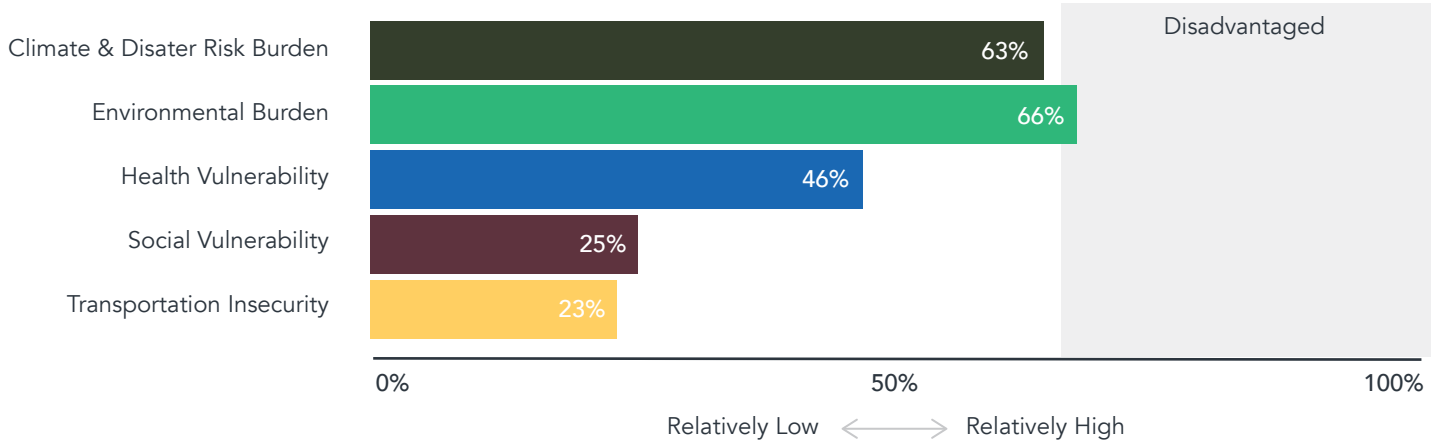
Appendix D: Equity

Within the ETC, Overall Disadvantage Component Scores are created by normalizing and then summing indicators within each component. The Explorer then displays the percentile ranking of these normalized sums at either a national or state level. The tool considers a census tract to be experiencing disadvantage if the overall index score places it in the 65 percent (or higher) of either all state or all US census tracts.

The City of Redmond's total population is 80,040. Of the city's 12 census tracts, only one (8% of all tracts) is ranked as "Disadvantaged" and has a population of just under 3,000 people (3.7% of the City's population). The disadvantaged tract, primarily based on environmental burden, is located in the City's downtown area.

Overall Disadvantage Component Scores—Percentile Ranked



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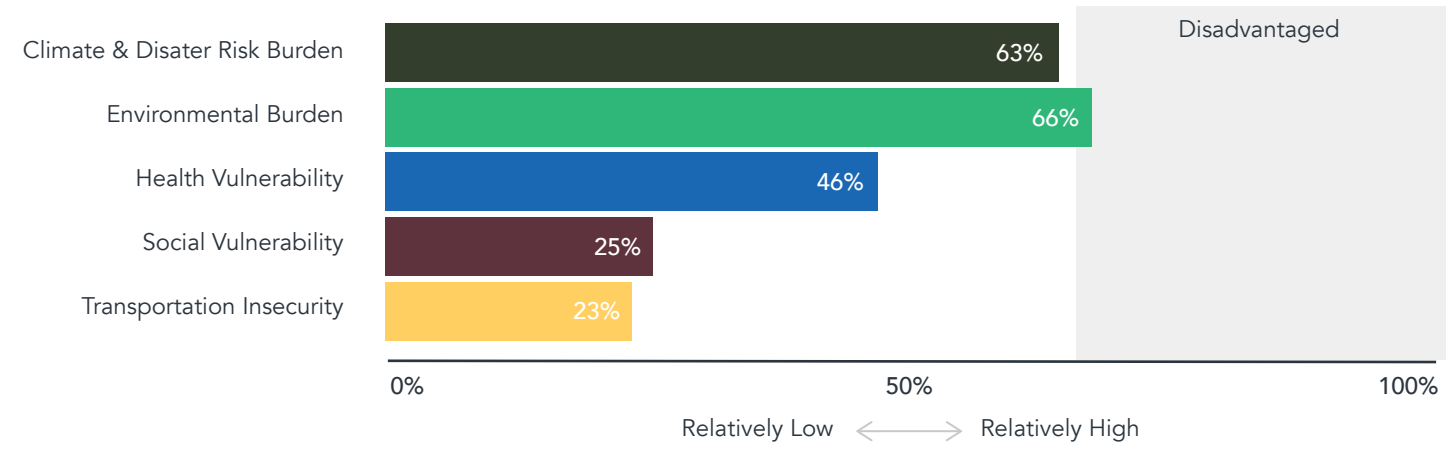
Appendix D: Equity

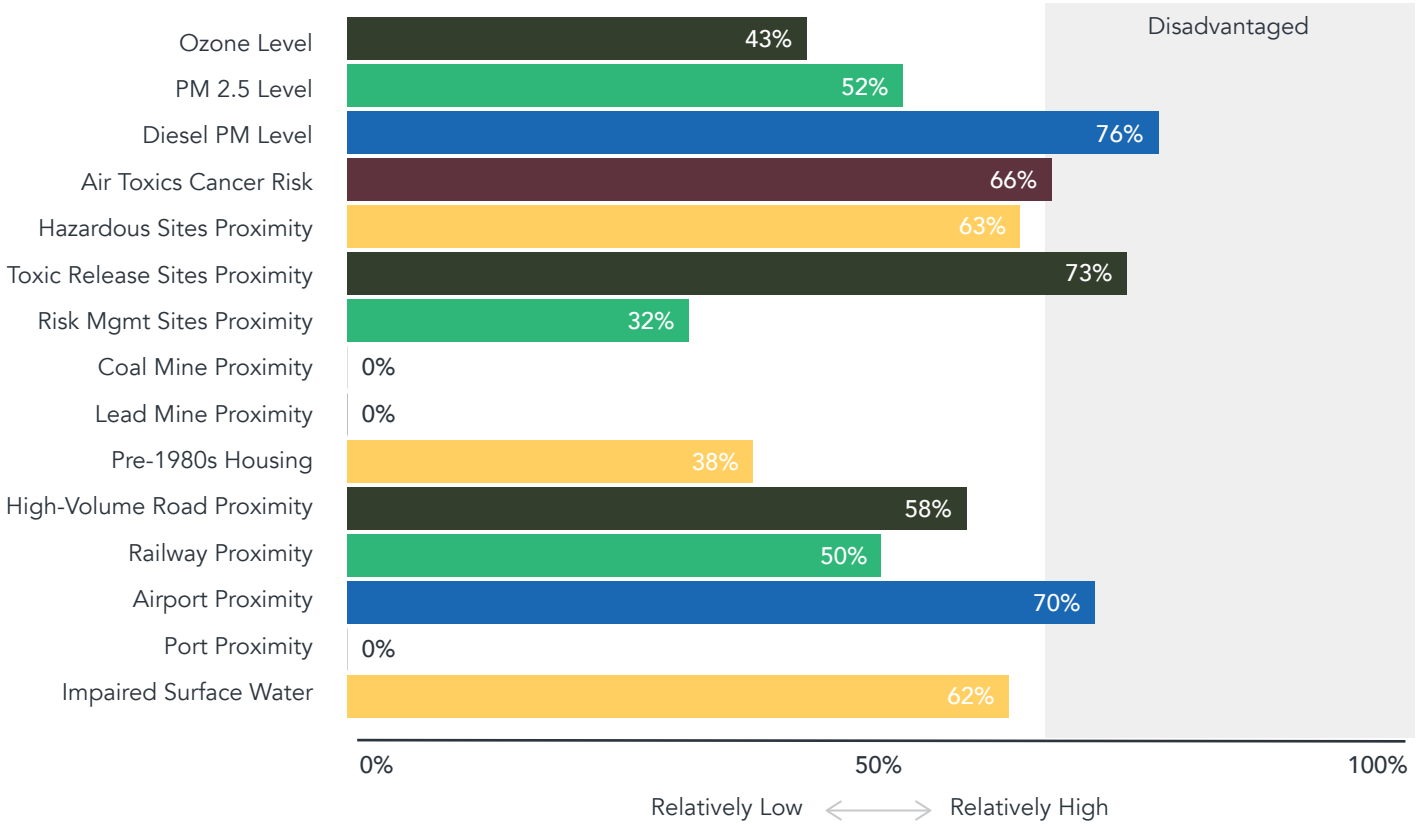
Environmental Burden

For the City of Redmond, the Environmental Burden compared to the State of Washington is 66 percent. The Environmental Burden component of the ETC index includes variables measuring factors such as air pollution, hazardous facility exposure, water pollution, and the built environment. For the City of Redmond as a whole, as well as the City's one disadvantaged census tract, diesel PM, proximity to toxic release sites, proximity to airports, and carcinogenic air pollutant ranked high, as shown in Figure 2. The high rankings for these elements can be related to the City's multimodal and regional transportation network, which is an essential element of the City's economic advantages.

Overall Disadvantage Component Scores—Percentile Ranked



Environmental Burden—Percentile Rank



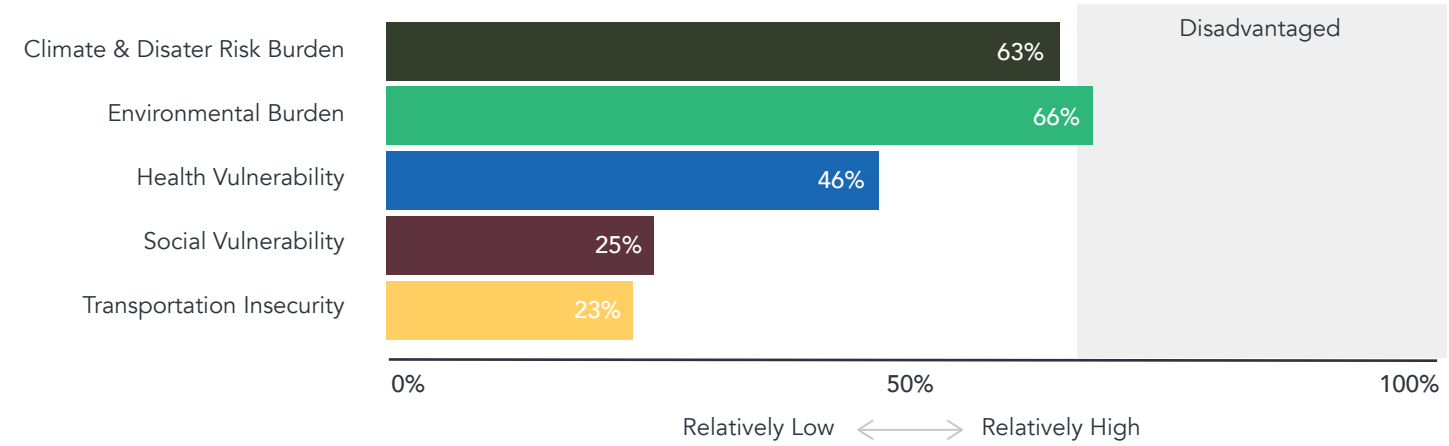
7

Appendix D: Equity

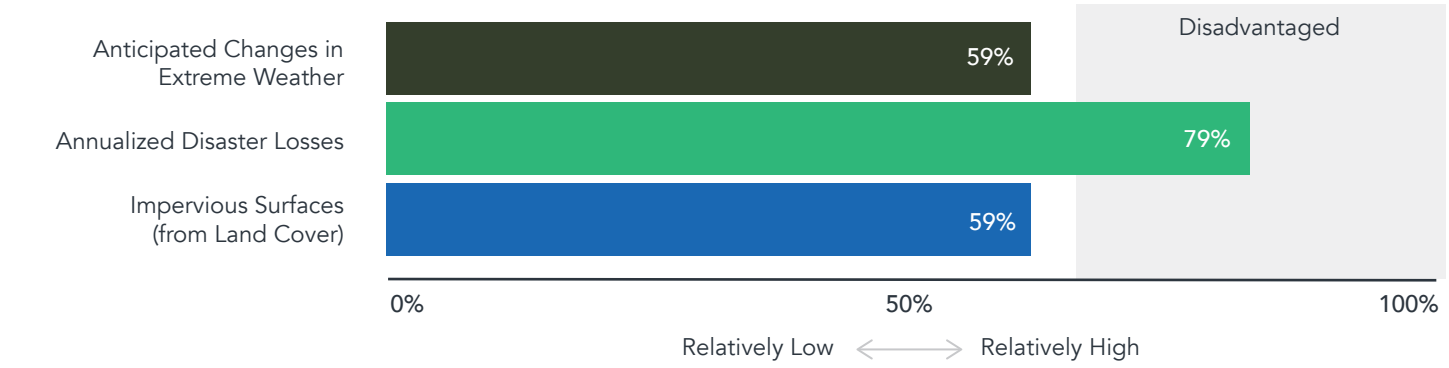
Climate and Disaster Burden

The second highest disadvantage score for the City as a whole, is the Climate and Disaster Risk Burden category. The score did not meet the threshold for disadvantaged, but is close at 63 percent, as seen in Figure 3. The category reflects climate change related risks such as changes in precipitation, extreme weather, and wildfire. Climate hazards may affect system performance, safety, and reliability, which is a particular risk during a situation where evacuation routes would become necessary. While the overall Climate and Disaster Risk Burden score only nears the "disadvantaged" range, one variable within the category, annualized disaster losses, falls above the 65 percent threshold (Figure 3). There could be a strong correlation between the high cost of disaster loss risk and the high median home price in the City of Redmond.

Overall Disadvantage Component Scores—Percentile Ranked



Climate & Disaster Risk Burden—Percentile Ranked



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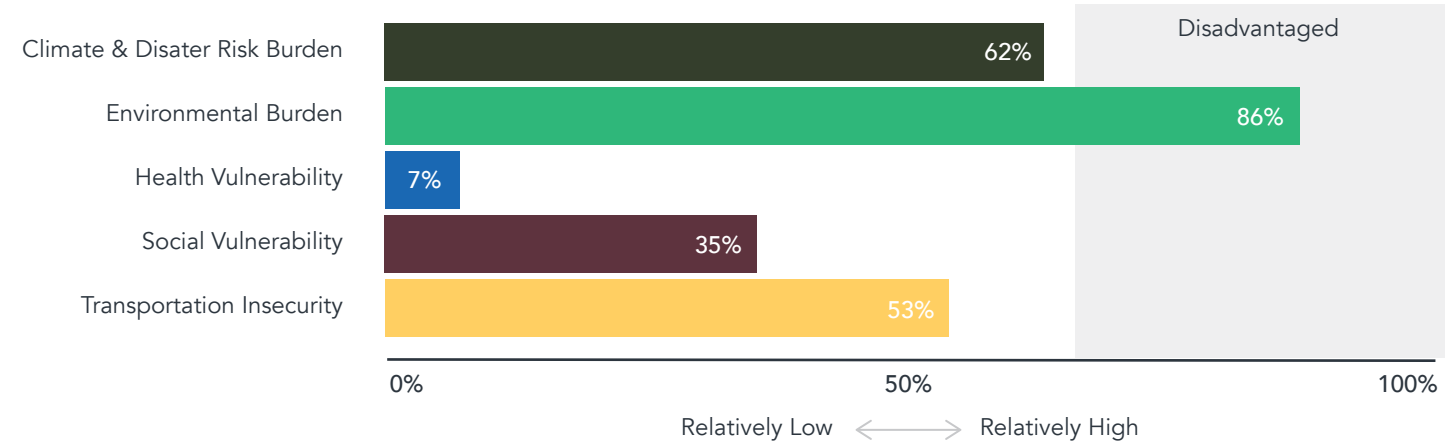
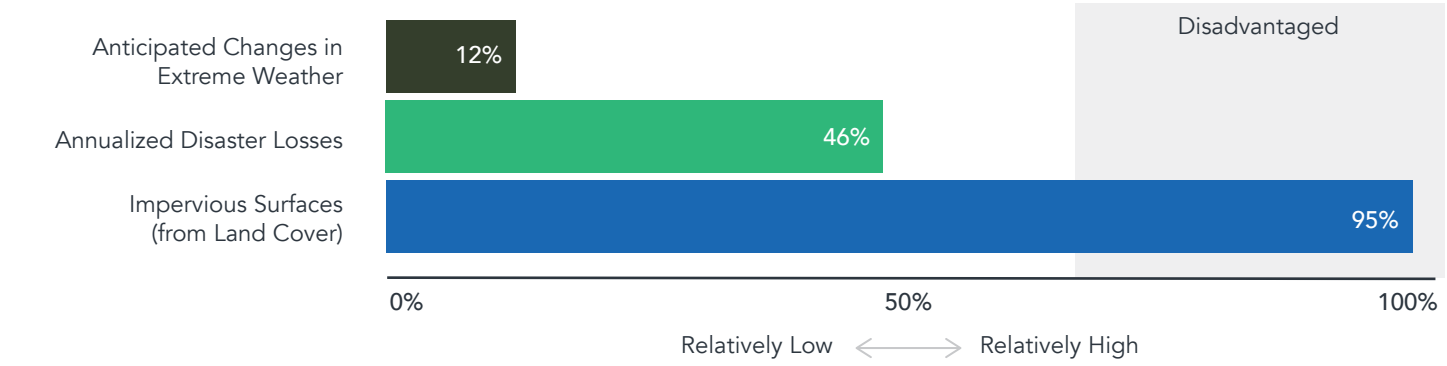
Appendix D: Equity

The Climate and Disaster Risk Burdens within Redmond's one disadvantaged census tract, in the downtown area, are shown in Figure 4. The downtown received a slightly lower overall Climate and Disaster Risk Burdens score, but high risks from impervious surfaces. The high risk makes sense in the context of the land use in the downtown area, and demonstrates the need to consider the ETC Explorer rankings in the context of land use and intentional decisions by the city. The Redmond Stormwater Technical Notebook adopts and modifies the Washington State Department of Ecology 2019 Stormwater Management Manual for Western Washington and outlines several "best practices" to reduce the City's impact on stormwater flows. In-place practices related to stormwater management address the identified equity risk and fall outside the scope of a Safer Streets Action Plan.

Overall Disadvantage Component Scores—Percentile Ranked



Climate & Disaster Risk Burden—Percentile Ranked



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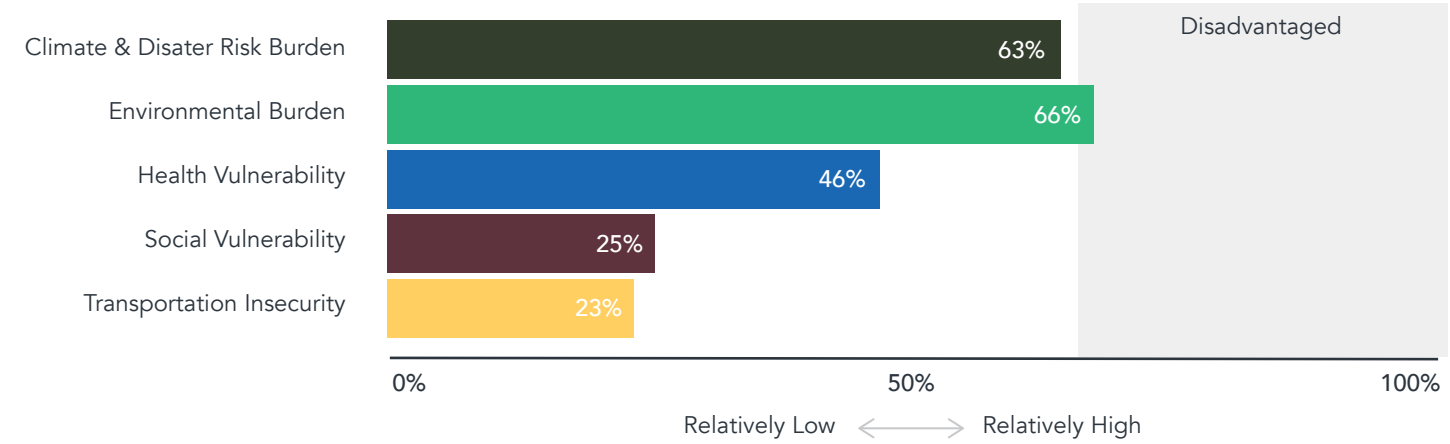
Appendix D: Equity

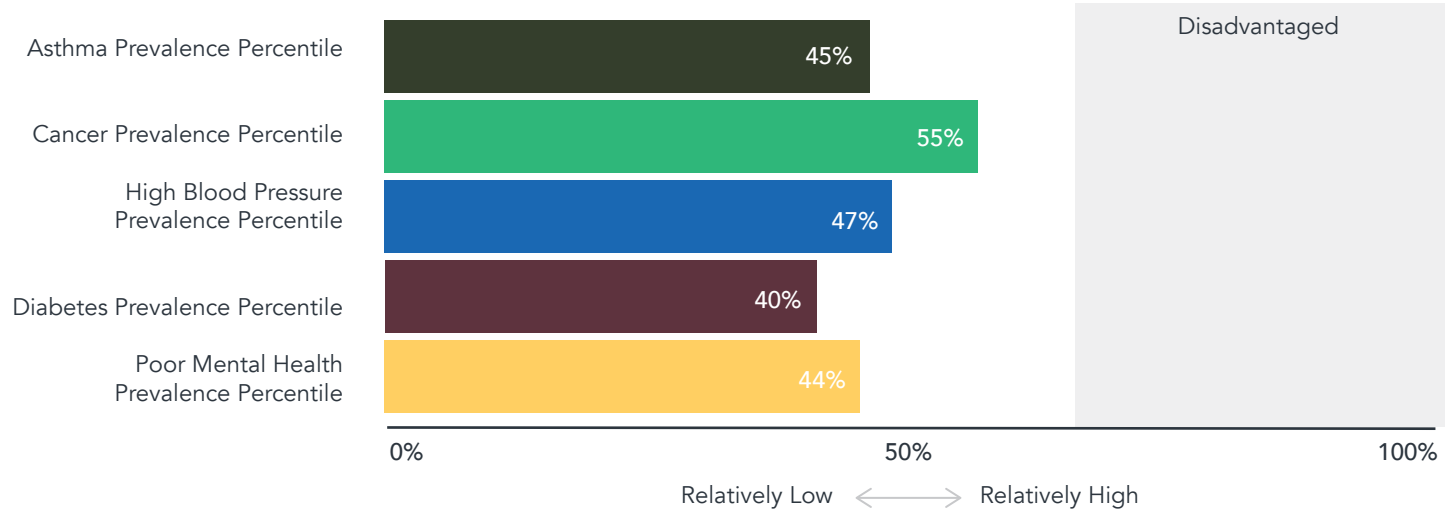
Health Vulnerability Burden

Compared to other Census tracts in Washington state, Redmond ranked moderately in terms of Health Vulnerability Burden, and below the disadvantaged threshold. The Health Vulnerability Burden category assesses the increased frequency of health conditions that may result from exposure to air, noise, and water pollution, as well as lifestyle factors such as poor walkability, car dependency, and long commute times.

Overall Disadvantage Component Scores—Percentile Ranked



Health Vulnerability—Percentile Ranked



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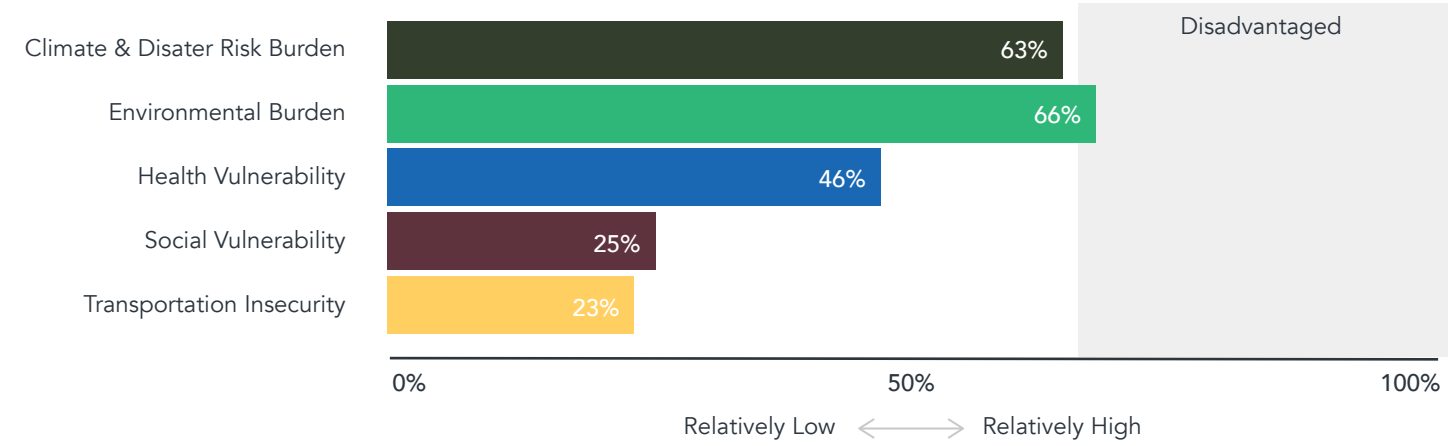
Appendix D: Equity

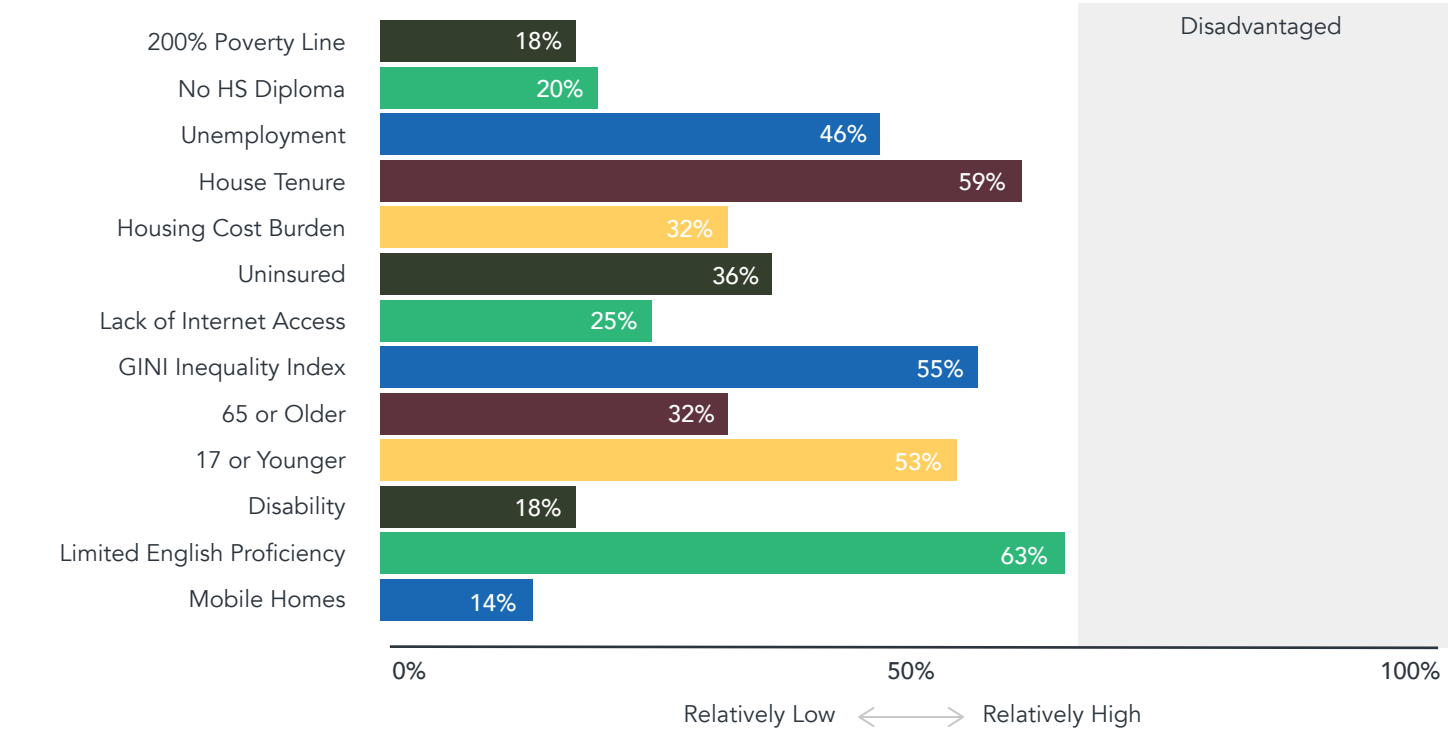
Social Vulnerability Burden

Compared to other Census tracts in Washington state, Redmond ranked low in Social Vulnerability Burden. The Social Vulnerability index measures lack of employment, educational attainment, poverty, housing tenure, access to broadband, and housing cost burden as well as identifying household characteristics such as age, disability status and English proficiency. Within the City of Redmond, social vulnerability falls below disadvantaged thresholds. The highest percentage ranks are for residents with limited English language proficiency, a higher turnover in housing, and an inequality in incomes, shown in Figure 6. The potential for vulnerabilities is considered in the described need for multilingual and repeated communications about safety-related initiatives and projects as identified in the Policies and Procedures chapter.

Overall Disadvantage Component Scores—Percentile Ranked



Social Vulnerability—Percentile Rank



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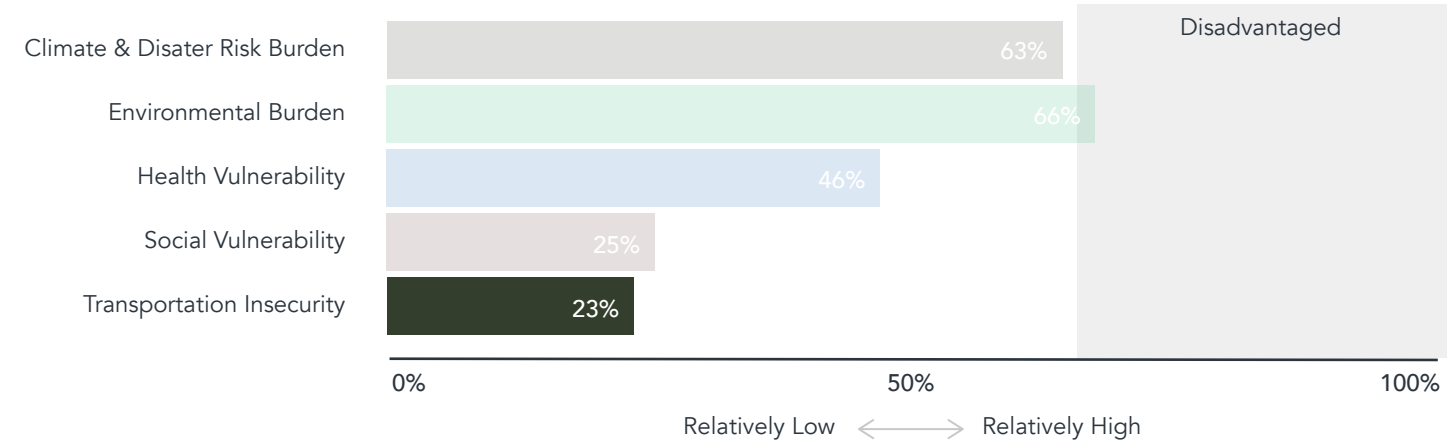
Appendix D: Equity

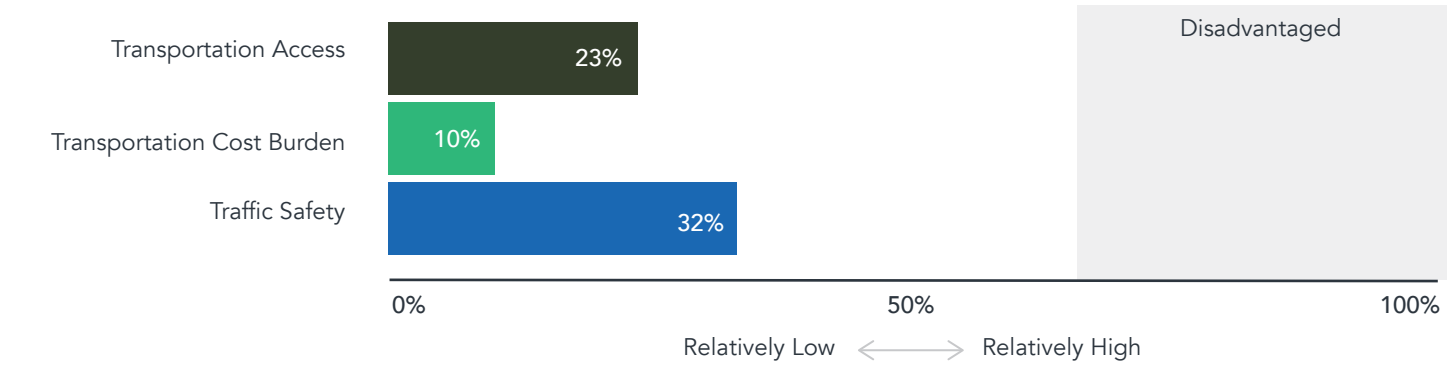
Transportation Insecurity Burden

Compared to other Census tracts in Washington state, Redmond ranked low in Transportation Insecurity Burden (Figure 7). The index measures lack of access to personal vehicles, proximity via short drives and walks to critical land uses, and a relative transportation safety factor based on serious crashes per population. Within the City of Redmond, transportation insecurity falls below disadvantaged thresholds, except in the downtown census tract. The higher score in the downtown census tract (Figure 8), especially for transportation safety, is a factor of the low population and high multimodal traffic volumes from outside of the downtown census tract. The high score in the downtown tract for safety reinforces the need to consider safety in the downtown, especially for active modes which represent all the serious injury and fatal crashes in the downtown census tract.

Overall Disadvantage Component Scores—Percentile Ranked



Transportation Insecurity—Percentile Ranked



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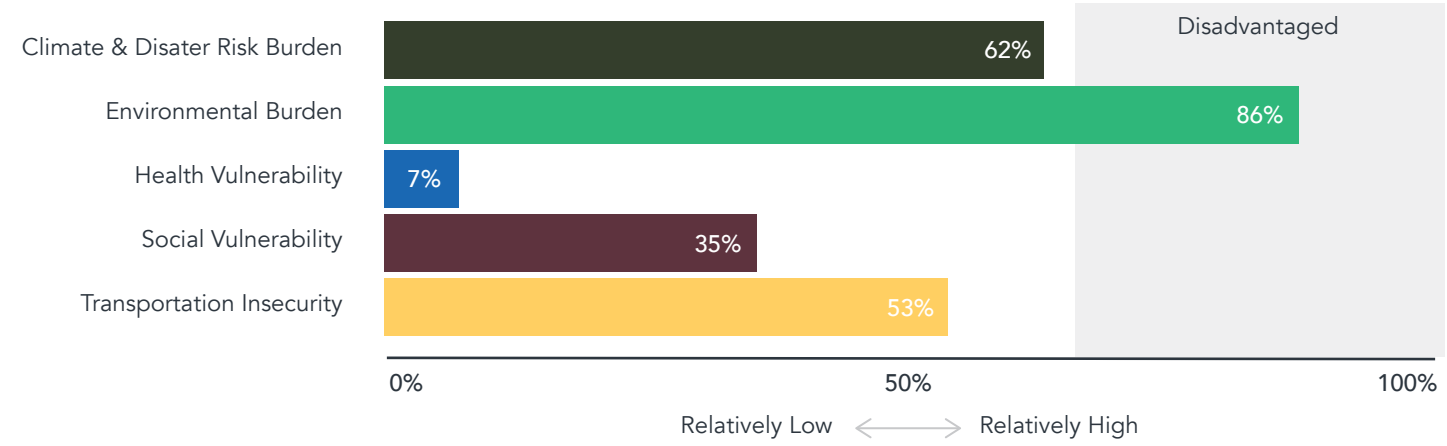
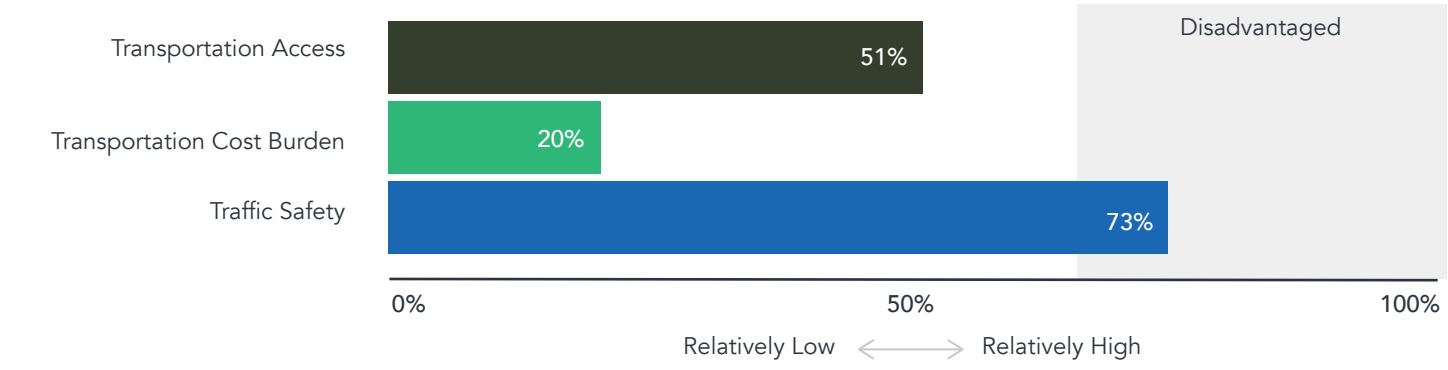
Appendix D: Equity

Overall Disadvantage Component Scores—Percentile Ranked



Transportation Insecurity—Percentile Ranked



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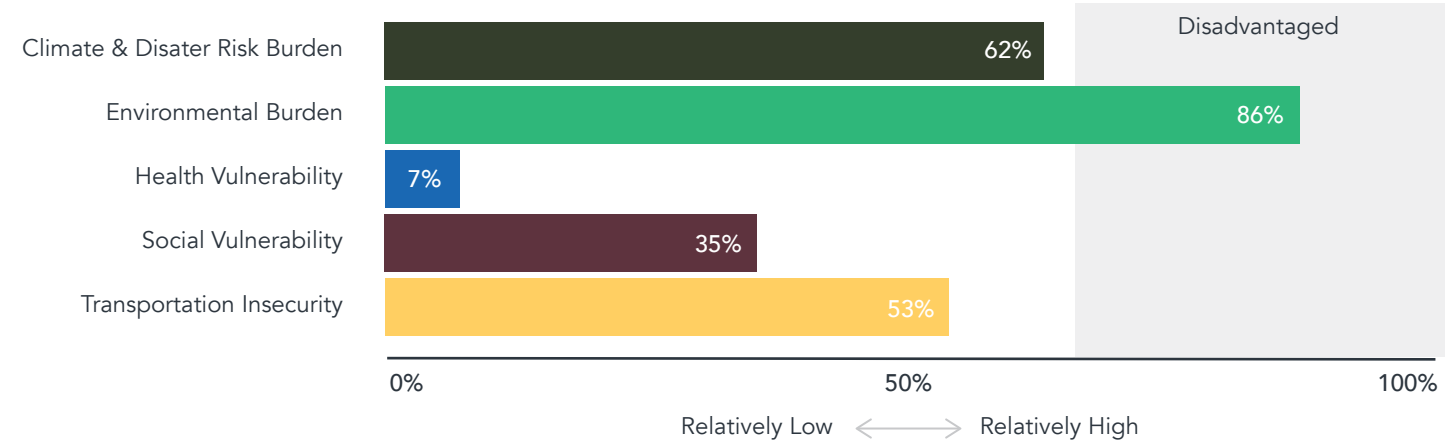
Appendix D: Equity

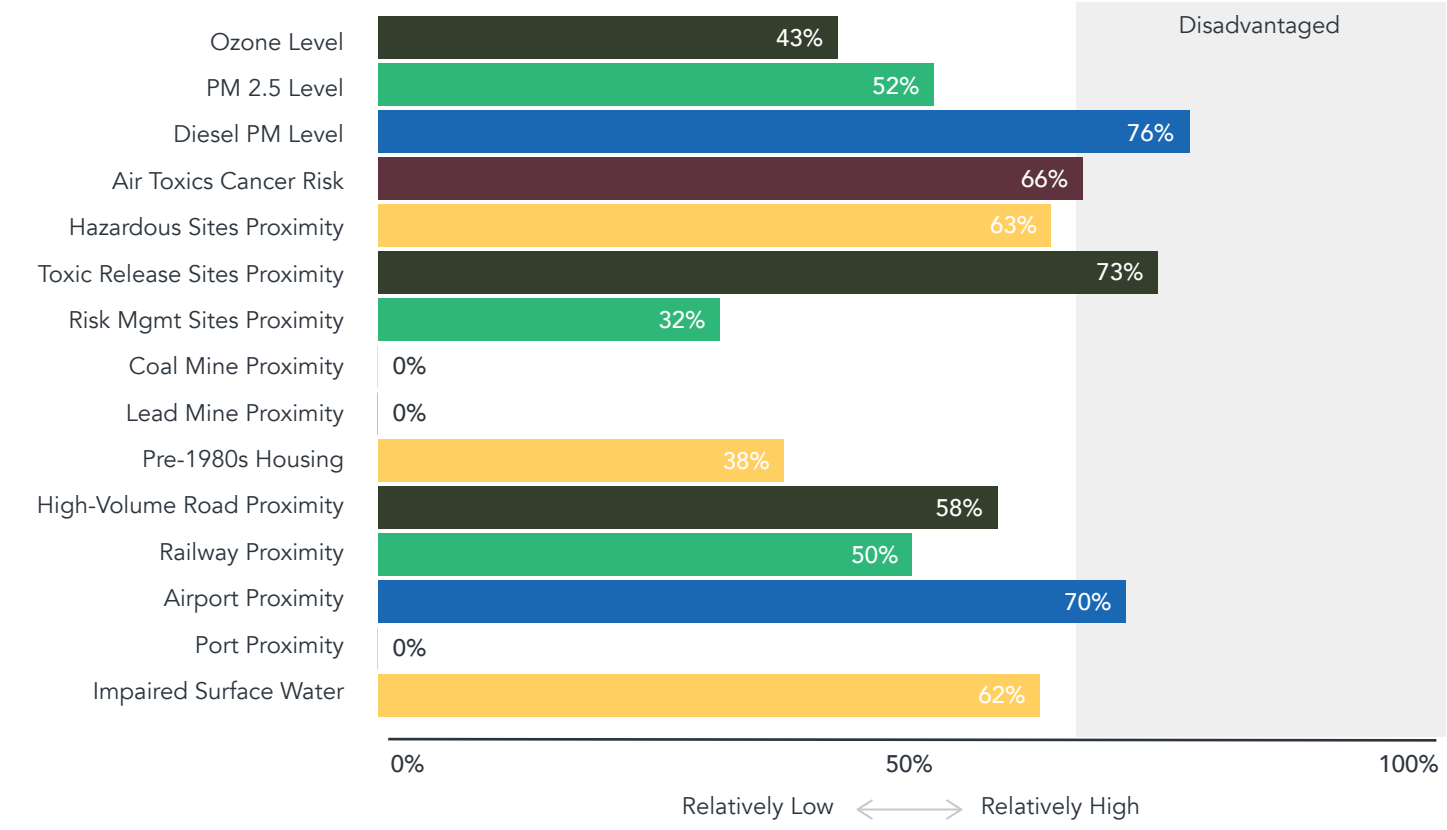
The Environmental Burdens within Disadvantaged Census Tract 53033032331 (herein after referred to as "the Tract" or "Redmond's Disadvantaged Census Tract") are shown in Figure 3. This area of the City received a significantly higher Environmental Burdens score of 86 percent, meaning that only 14 percent of other tracts in the state scored worse. Variables with high scores in this category included:

- Proximity to railway (98 percent)
- Proximity to risk management sites (88 percent)
- Proximity to high-volume roadways (86 percent)
- Proximity to toxic release sites (85 percent)
- Hazardous site proximity (80 percent)
- Diesel PM (79 percent)
- Airport proximity (74 percent), and;
- Carcinogenic air pollutants (66 percent).

Overall Disadvantage Component Scores—Percentile Ranked



Environmental Burden—Percentile Rank



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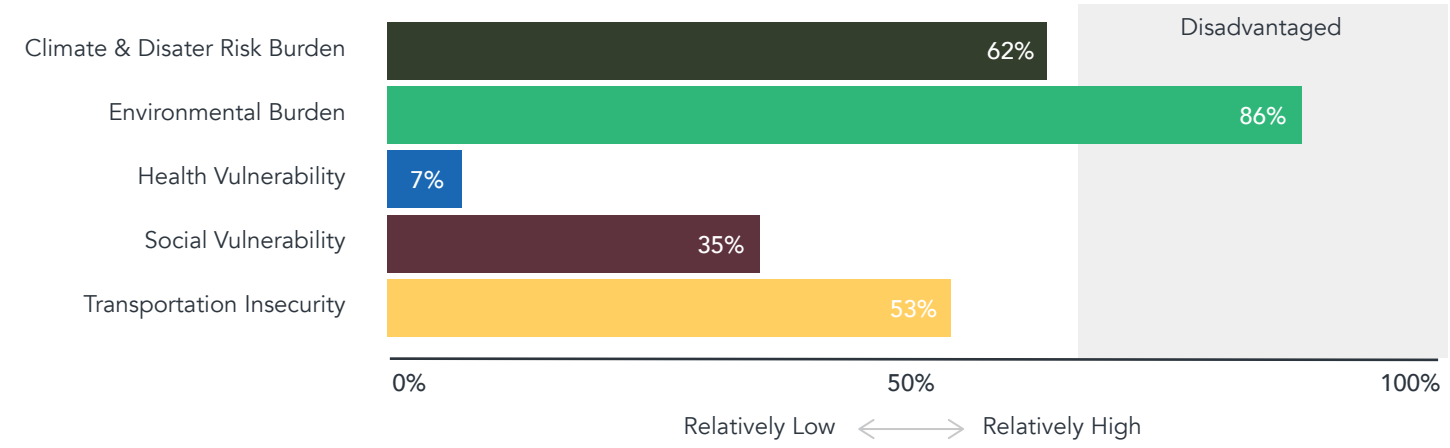
Appendix D: Equity

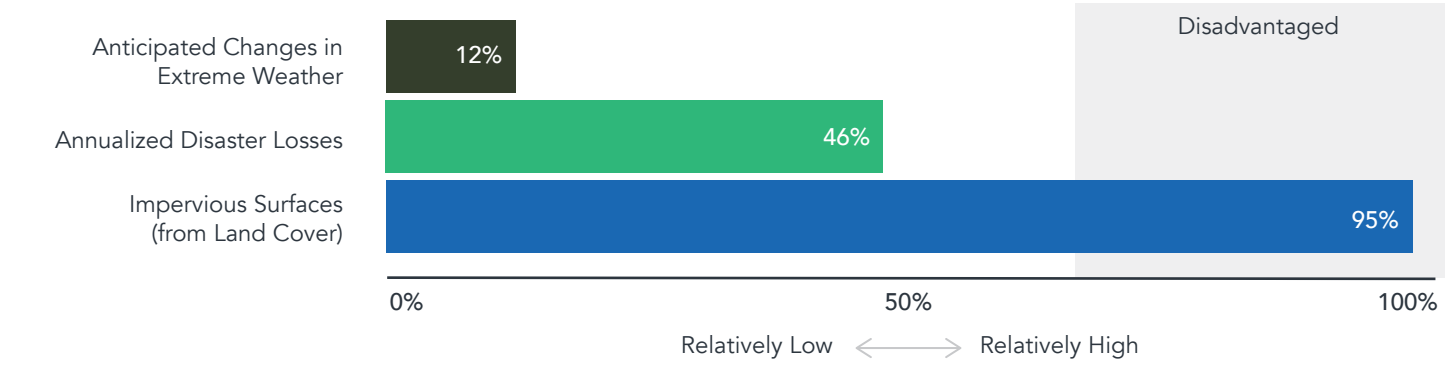
The Climate and Disaster Risk Burdens within Redmond's Disadvantaged Census Tract are shown in Figure 5. This area of the City received a slightly lower overall Climate and Disaster Risk Burdens score of 62 percent compared to the City as a whole. However, within the variables measured in this category, risks from Impervious Surfaces associated with paved roadways, parking lots, and driveways, and other developments fell into the "disadvantaged" range with a significant score of 95 percent.

Impervious surfaces are common to all urbanized, heavily paved, areas. The Washington Stormwater Manual requires certain improvements to handle increased stormwater flow generated by paved areas, including the preservation of natural drainage systems and outfalls, and retention of native vegetation and tree canopy to reduce impervious surfaces. The Redmond Stormwater Technical Notebook adopts and modifies the Washington State Department of Ecology 2019 Stormwater Management Manual for Western Washington and outlines several "best practices" to reduce the City's impact on stormwater flows.

Overall Disadvantage Component Scores—Percentile Ranked



Climate & Disaster Risk Burden—Percentile Ranked



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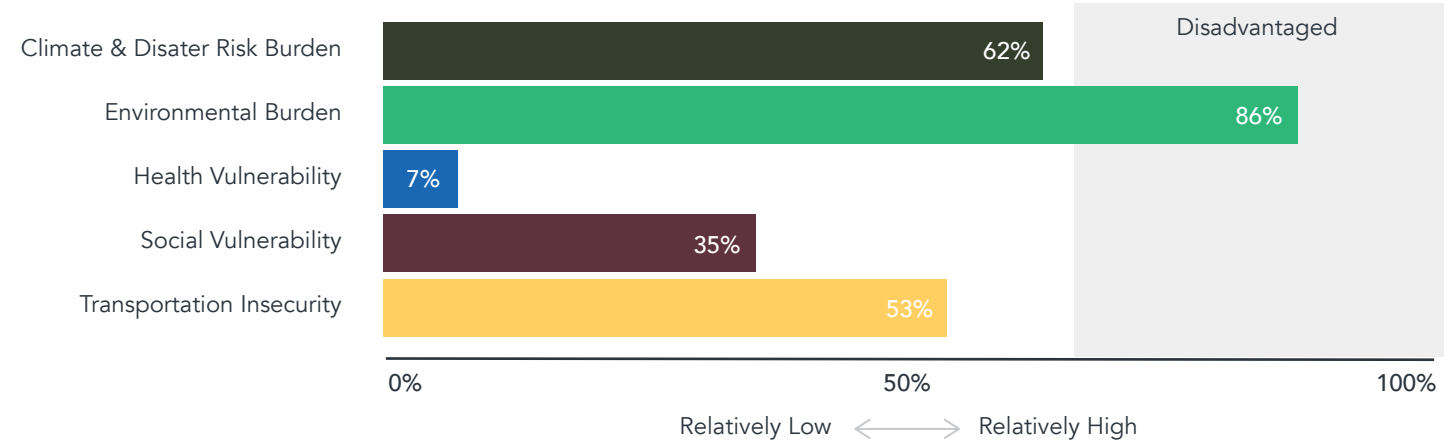
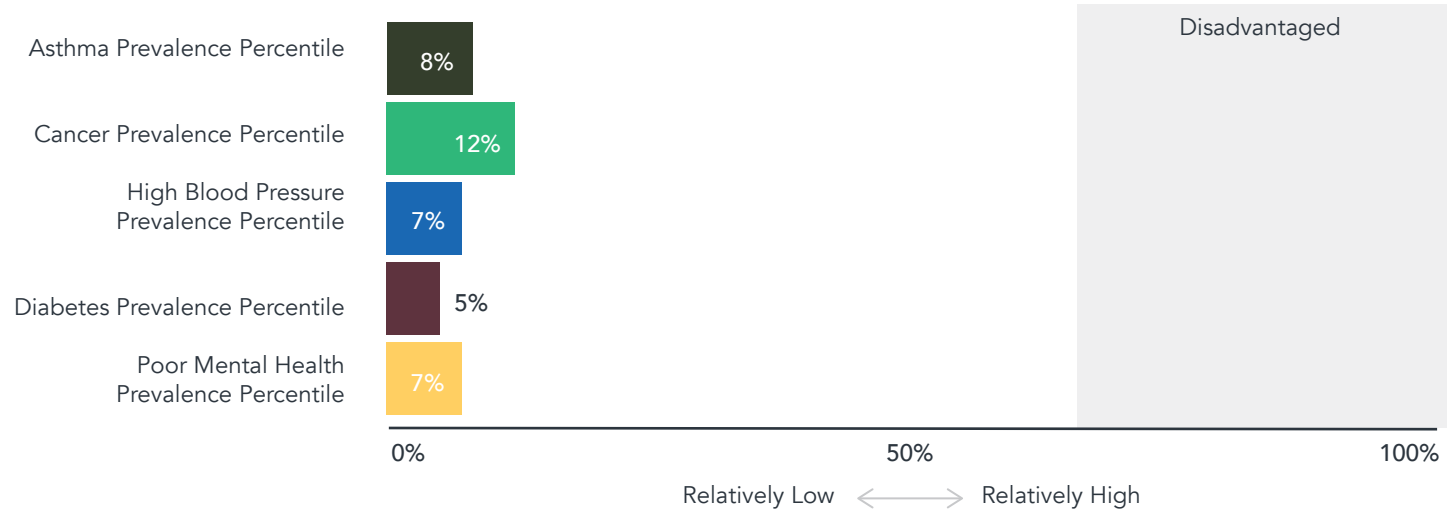
Appendix D: Equity

The Health Vulnerability Burdens within Redmond's Disadvantaged Census Tract are shown in Figure 7. This area of the City received a significantly lower Health Vulnerability Burden score of 7 percent. Additionally, within the variables measured in this category, no other variables fell into the "disadvantaged" range with the highest score of 12 percent falling into the cancer prevalence percentile.

Overall Disadvantage Component Scores—Percentile Ranked



Health Vulnerability—Percentile Ranked



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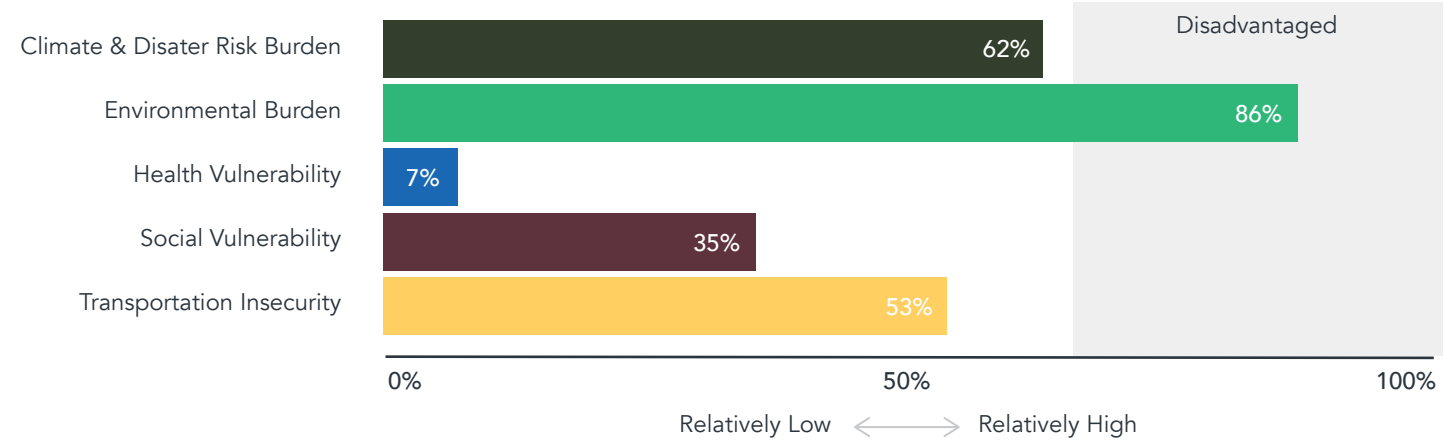
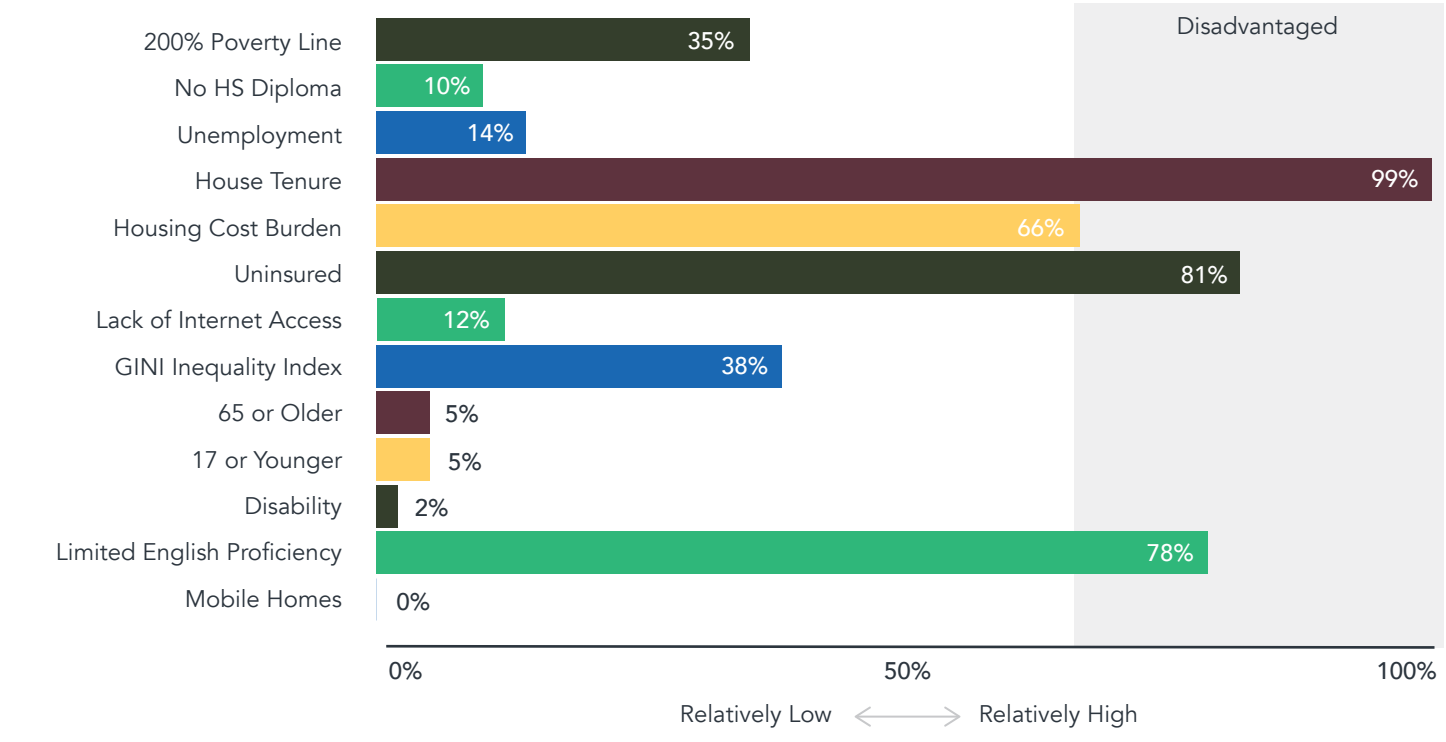
Appendix D: Equity

Within the City of Redmond, social vulnerability falls below disadvantaged thresholds. The highest percentages are for residents with limited English language proficiency, a higher turnover in housing, and an inequality in incomes.

Overall Disadvantage Component Scores—Percentile Ranked



Social Vulnerability—Percentile Rank



Glossary of Acronyms

ADA	Americans with Disabilities Act
APS	Accessible Pedestrian Signals
BFC	Bicycle Friendly Community
CEJST	Climate and Economic Justice Screening Tool
CMF	Crash Modification Factor
ETC	Equitable Transportation Community
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
HFST	High friction surface treatments
HSIP	Highway Safety Improvement Program
LPI	Leading pedestrian intervals
LRSP	Local Road Safety Plan
LWSD	Lake Washington School District
MUTCD	Manual on Uniform Traffic Control Devices
NACTO	National Association of City Transportation Officials
NHTSA	National Highway Traffic Safety Administration
NOFO	Notice of Funding Opportunity
NROR	No right on red
PDO	Property damage only
PROWAG	Public Right-of-Way Accessibility Guidelines
RCW	Revised Code of Washington
RMC	Redmond Municipal Code
RRFB	Rectangular Rapid Flashing Beacons
RSA	Road Safety Assessments
SECTOR	Statewide Electronic Collision & Ticket Online Records
SIF	Serious Injury or Fatal
SS4A	Safe Streets and Roads for All
SSAP	Safer Streets Action Plan
TSIP	Targeted Safety Improvement Program
TWLTL	two-way left turn lane
USDOT	United States Department of Transportation
WSDOT	Washington State Department of Transportation

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