Carson City

Safe Routes to School Action Plan

December 2025

Acknowledgments

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Executive Summary

The Carson City Safe Routes to School (SRTS) Action Plan is an update to the City's SRTS Master Plan, focused on improving student safety and promoting walking and biking as viable modes of transportation to and from school. Building upon the foundation of the previous plan—which included six elementary schools and two middle schools—this update expands the scope to include Stewart Headstart Washoe Tribe, Carson High School, and Carson High – Silver Campus (formerly Pioneer High School).

To inform the development of this plan, in-person site assessments were conducted at the newly added schools to better understand travel behaviors, identify safety challenges, and document infrastructure and programmatic needs. Additional data sources—including crash reports, student mode share statistics, and feedback from school staff—were used to shape the recommendations.

To focus improvements in areas with the greatest need and those that benefit multiple schools, the project team applied a weighted prioritization process based on previous data analysis findings. This approach enables the City to identify the most critical projects and phase implementation over time. Prioritization criteria included the following:

- Socioeconomics
- School proximity
- Community facility proximity
- Safety
- Active transportation barriers
- Cost per mile

Using the six E's of Safe Routes to School planning—Engineering, Education, Encouragement, Engagement, Equity, and Evaluation—the plan includes multidisciplinary recommendations that build upon existing efforts by the school district (including teachers and parents) and Carson City Public Works staff. These strategies provide a comprehensive road map for improving safety, accessibility, and confidence for students traveling to and from school.

Engineering Recommendations

Recommendations were developed through a collaborative and data-informed process that included input from the Vulnerable Road User Task Force committee meetings, site observations, and analysis of existing crash data. Feedback from school staff, parents, students, community members, and Carson City Public Works staff was also incorporated for a holistic and community-driven approach. Engineering projects were categorized into three tiers based on planning level cost estimates, available funding, and anticipated implementation timelines. Recommended projects in Tiers 1 and 2 are shown in **Figure ES-1**. Tier 3 projects are shown in **Figure ES-2**. **Table ES 1** presents the total estimated costs for all projects by tier.

Tier 1 – Quick Win Projects: This tier includes 28 low-cost projects designed to deliver immediate safety benefits and that can be implemented quickly. Tier 1 projects are intended to be carried out as soon as possible, ideally in coordination with other ongoing City projects and programs. The total estimated cost for all Tier 1 projects is $729,060. These quick wins focus on high-impact improvements such as installing pedestrian refuge islands, adding marked crosswalks, upgrading intersections to all-way stops, and implementing curb extensions (**Table ES-2**). These types of enhancements are listed in the Quick Wins table below and represent practical steps toward creating safer routes for students walking and biking to school.

Tier 2 – SRTS Core Projects: This tier includes 72 projects categorized into four key focus areas: Bicycle Network Enhancements, Corridor Enhancements, Crossing Safety Enhancements, and Walk Zone Connectivity Enhancements. These projects are planned for medium- to long-term implementation, depending on available funding, coordination, and design complexity.

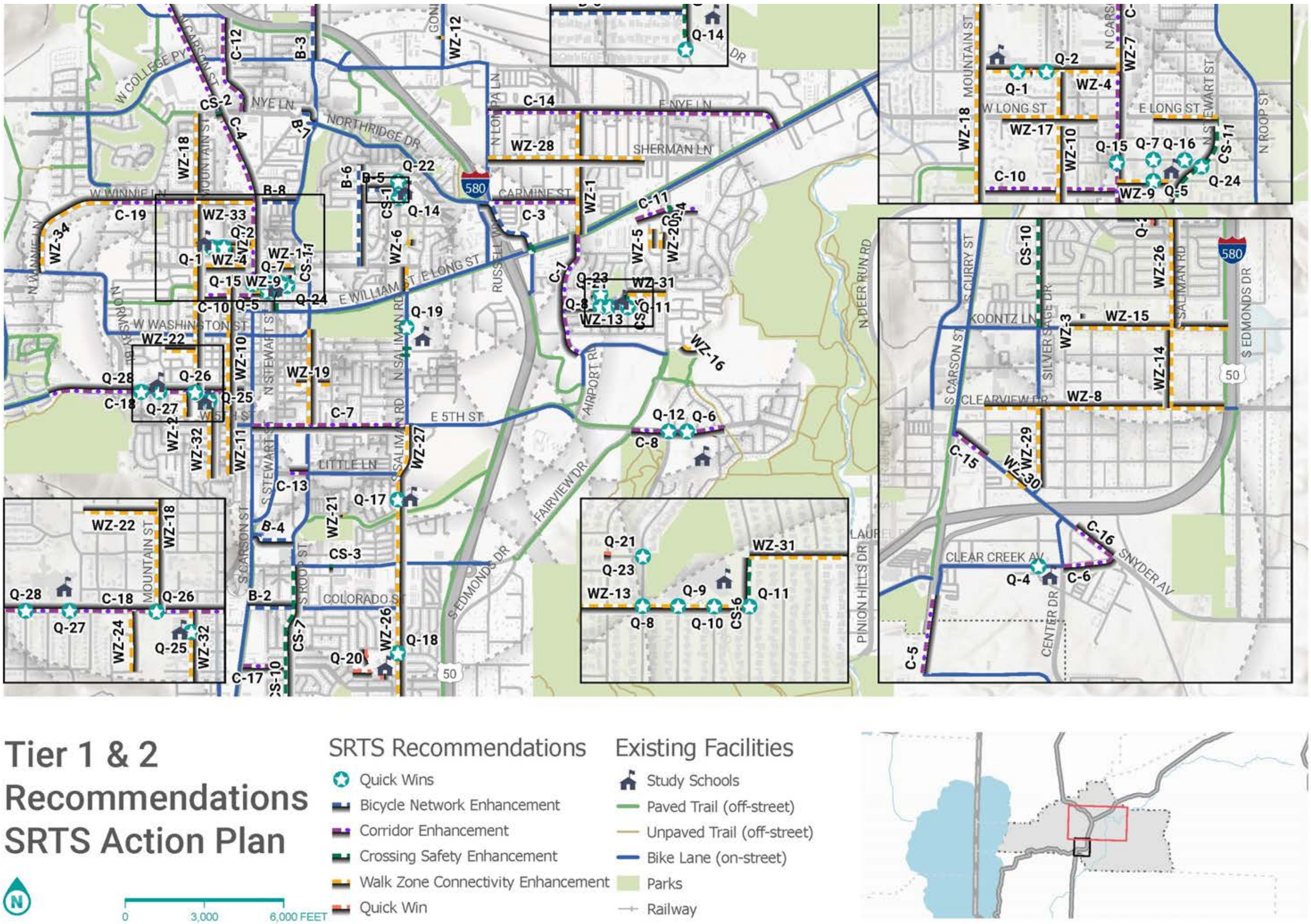
Tier 2 recommendations include a variety of impactful improvements such as connecting pathways, constructing buffered bike lanes, creating neighborhood byways, and closing sidewalk gaps. These projects aim to strengthen the active transportation network and improve safety and accessibility for students across Carson City. A detailed list of these projects can be found in **Table ES-3** through **Table ES-6**. The total estimated cost for all Tier 2 projects is $50,515,156. This includes over $400,000 in short-term improvements, $17 million in medium-term improvements, and $21 million in long-term improvements.

Tier 3 – Aspirational Projects: This tier includes 22 projects that are considered long-range or visionary improvements. These projects currently do not have an associated timeline for implementation, but represent important opportunities to further enhance safety, connectivity, and access for students walking and biking to school (**Table ES-7**). Tier 3 recommendations may require substantial planning, funding, or coordination with regional partners, and are intended to guide future investments as Carson City continues to expand its Safe Routes to School efforts. These aspirational projects reflect the community's long-term commitment to creating a safer and more inclusive transportation network. The total estimated cost for all Tier 3 projects is $21,711,970.

Table ES 1: Engineering Recommendations Cost by Project Tier

Engineering Recommendation Tier	Total Estimated Costs (2025)
Tier 1 – Quick Win Projects	**$729,060**
Tier 2 – SRTS Core Projects	**$50,515,156**
Short Term	*$409,329*
Medium Term	*$17,068,121*
Long Term	*$23,623,138*
Tier 3 – Aspirational Projects	**$21,711,970**
Total	**$72,956,186**

Figure ES-1: Tier 1 & 2 SRTS Recommendations



SRTS Quick Wins Recommendations

Table ES-2: Tier 1: Quick Wins

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
Q-1	Bath St.	Midblock crossing	Install curb extensions	Quick Win	$
Q-2	Bath St.	Division St.	Install curb extensions	Quick Win	$
Q-3	Bath St.	At FrES ES parent exit	Extend existing red curb by 20 feet to the east	Quick Win	$
Q-4	Clear Creek Ave.	Silver Sage Dr.	Upgrade to all-way stop control, or curb extensions	Quick Win	$
Q-5	Corbett St.	Fall St.	Upgrade to all-way stop control	Quick Win	$
Q-6	E. 5th St.	Regent Ct.	Install S1-1 signs for both directions	Quick Win	$
Q-7	Fall St.	Park St.	Upgrade to all-way stop control	Quick Win	$
Q-8	Gordonia Dr.	La Loma Dr.	Upgrade to all-way stop control	Quick Win	$
Q-9	Gordonia Dr.	Cascade Dr.	Install curb extensions	Quick Win	$
Q-10	Gordonia Dr.	Glacier Dr.	Install curb extensions	Quick Win	$
Q-11	Gordonia Dr.	Monte Rosa Dr.	Upgrade to all-way stop control	Quick Win	$
Q-12	Hells Bells Rd.	E. 5th St.	Install S1-1 for westbound traffic	Quick Win	$
Q-13	Hidden Meadows Dr.	Eagle Valley bus entrance	Install marked crosswalk	Quick Win	$
Q-14	Mountain Park Dr.	Carriage Crest Dr.	Add S1-1, add curb extensions	Quick Win	$
Q-15	N Carson St.	Park St.	Restrict northbound left, add pedestrian refuge island, add S1-1s, R1-5s at yield teeth	Quick Win	$
Q-16	Park St.	Peters St.	Upgrade to side-street stop control	Quick Win	$
Q-17	Saliman Rd.	Midblock crossing (south lot exit)	Add pedestrian refuge and R1-5 signs at yield teeth	Quick Win	$
Q-18	Saliman Rd.	Damon Rd.	Restrict southbound left, install pedestrian refuge, add R1-5 signs at yield teeth	Quick Win	$
Q-19	Saliman Rd.	Seely Loop (Mills Park crosswalk)	Add R1-5 signs at yield teeth	Quick Win	$
Q-20	Seeliger Paths	Footpaths to Al Seeliger from: Cortez St., Schell Ave., and off Shady Oak Dr.	Repave paths and extend pavement to school grounds	Quick Win	$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
Q-21	Siskiyou Dr.	Stanton Dr.	Install marked crosswalk	Quick Win	$
Q-21	Siskiyou Dr.	Stanton Dr.	Install marked crosswalk	Quick Win	$
Q-22	Slide Mountain Dr.	Carriage Crest Dr.	Add S1-1s for northbound and southbound, add curb extensions	Quick Win	$
Q-23	Stanton Dr.	La Loma Dr.	Upgrade to all-way stop control	Quick Win	$
Q-24	Stewart St.	Park St.	Upgrade to S1-1 signs	Quick Win	$
Q-25	Thompson St.	W 2nd St.	Install curb extensions	Quick Win	$
Q-26	W King St.	Mountain St.	Install curb extensions	Quick Win	$
Q-27	W King St.	S Richmond Ave.	Install curb extensions	Quick Win	$
Q-28	W King St.	Tacoma Ave.	Install curb extensions	Quick Win	$

SRTS Bicycle Network Enhancement Recommendations

Table ES-3: Tier 2: Bicycle Network Enhancements

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
B-1	Carmine St. and Lompa Ln.	US 50 to Russel Wy.	Add shared-use path	Bicycle Network Enhancement	Short	$$$
B-2	Colorado St.	Carson St. to Roop St.	Construct buffered bike lanes from Carson St. to existing bike lanes or similar multimodal improvement	Bicycle Network Enhancement	Short	$
B-3	Emerson Dr.	College Pkwy. to Mark Wy.	Add bike lanes with bulb-outs at key intersections	Bicycle Network Enhancement	Short	$
B-4	Green Belt Multi-Use Path	Roop St. to Carson St.	Add a multi-use path connecting Linear Ditch Trail with Carson St. Multi-Use Path, Americans with Disabilities Act sidewalks	Bicycle Network Enhancement	Medium	$$$
B-5	Lindsay Ln.	Carriage Crest Dr. to Marian Ave.	Neighborhood byway — corner bulb-outs, wayfinding, hardened centerlines	Bicycle Network Enhancement	Short	$$
B-6	Marian Ave.	Long St. to Rolling Hills Dr.	Neighborhood byway — add traffic calming, hardened centerlines, speed humps, corner bulb-outs	Bicycle Network Enhancement	Short	$$
B-7	Roop St. to Hot Springs Rd. (new path)	Roop St./Northridge Dr. and Hot Springs Rd./Valley Springs driveway	Path connection to link with Nye Ln.	Bicycle Network Enhancement	Long	$$
B-8	Winnie Ln.	Carson St. to Roop St.	Construct buffered bike lanes from Carson St. to Roop St. or similar multimodal improvement	Bicycle Network Enhancement	Short	$$

SRTS Corridor Enhancement Recommendations

Table ES-4: Tier 2: Corridor Enhancements

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
C-1	Airport Rd.	Hwy. 50 to E. 5th St.	A. Construct bike lane Butti Wy. to Hwy. 50 or similar multimodal improvement B. Add intersection crossing enhancements at Airport Rd./Douglas Dr. and Airport Rd./Menlo Dr.	Corridor Enhancement	Medium	$$
C-2	Arrowhead Dr.	Between roundabouts	Add sidewalk/path on north side, add shared lane markings in the roundabout	Corridor Enhancement	Medium	$
C-3	Carmine St.	Airport Rd. to Lompa Ln.	A. Close sidewalk gaps between Airport Rd. & Dori Wy. B. Intersection crossing enhancements at Dori Wy., Lompa Ln., and Airport Rd. to reduce crossing distances and visibility issues	Corridor Enhancement	Medium	$$$$
C-4	Carson St.	Medical Pkwy. to Williams St.	Add multi-use path, enhance crosswalks with activated flashers, include landscaped buffer	Corridor Enhancement	Medium	$$$$$
C-5	Carson St.	Topsy Ln. to 500 ft. south of Clear Creek Ave.	A) Add sidewalk on one side B) extend multi-use path	Corridor Enhancement	Medium	$$
C-6	Clear Creek Ave.	Snyder Ave. to Center Dr.	Close sidewalk gaps, enhance bus stop	Corridor Enhancement	Short	$$
C-7	E. 5th St.	Saliman Rd. to I-580	A. Enhance existing sidewalks B. Widen existing bike lane to 5 ft.	Corridor Enhancement	Short	$$$$
C-8	E. 5th St.	Fairview Dr. to Mexican Ditch Trail	A. Bike lanes Fairview Dr to Carson River Rd. or similar B. Marked Crosswalk with Ped Refuge at Parkhill Dr D. Ped Refuge at Regent Ct	Corridor Enhancement	Medium	$$$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
C-9	Emerson Dr.	Mark Wy. to Arrowhead Dr.	Build sidewalks, add bike lanes, add curb ramps at Mark Wy.	Corridor Enhancement	Short	$$
C-10	Fleischmann Wy.	Carson St. to Mountain St.	Bulb-outs and daylighting at intersections, address sidewalks gaps, traffic calming	Corridor Enhancement	Short	$$
C-11	Gordon St.	Full extent	Address sidewalk gaps, consider curb bulb-outs, update crosswalk to high visibility, increase corner daylighting	Corridor Enhancement	Medium	$$
C-12	Imperial Wy.	Nye Ln. to Silver Oak Dr.	Add bulb-outs and traffic calming	Corridor Enhancement	Medium	$$
C-13	Little Ln.	Roop St. to 90 ft. west of Oregon St.	Add sidewalk on north side	Corridor Enhancement	Medium	$
C-14	Nye Ln.	Lompa Ln. to Hwy. 50	Construct bike lanes and close sidewalk gaps	Corridor Enhancement	Long	$$$$$
C-15	Snyder Ave.	Carson St. to Appion Wy.	Bike lanes, close sidewalk gaps, curb ramps, stripe in crosswalks	Corridor Enhancement	Short	$$
C-16	Snyder Ave.	Dat So La Lee Wy. to Clear Creek Ave.	Add sidewalk, add high-visibility crosswalk with ped activated flasher	Corridor Enhancement	Medium	$$
C-17	Sonoma St.	Carson St. to Silver Sage	A. Construct bike lanes or similar multimodal improvement B. Add intersection crossing enhancement at Silver Sage Dr.	Corridor Enhancement	Short	$
C-18	W. King St.	Thames Ln. to Curry St.	A. Multi-Use Path Thames Ln. to Canyon Park Ct., or similar multimodal improvement B. Add physical buffer for bike lane at Carson Middle School & Bordewich-Bray Elementary School. Close sidewalk gaps between Curry St. and Ormsby Blvd. D. Install intersection crossing enhancements at Tacoma	Corridor Enhancement	Long	$$$$
C-19	Winnie Ln.	Ormsby Blvd. to Mountain St.	A. Add bike lanes Mountain St. to Ormsby Blvd.	Corridor Enhancement	Medium	$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
			B. Add wayfinding signage at Victoria Ave.			

SRTS Crossing Safety Enhancement Recommendations

Table ES-5: Tier 2: Crossing Safety Enhancements

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
CS-1	Carriage Crest Dr.	Slide Mountain Dr. to Mountain Park Dr.	A. Add intersection crossing enhancements at Mountain Park Dr. and Slide Mountain Dr. intersections B. Add center median from 70 ft. south of Slide Mountain Dr. to drop-off loop entrance C. Consider parking restrictions or removal on east side	Crossing Safety Enhancement	Medium	$$
CS-2	Carson St.	Nye Ln.	Construct rectangular rapid flashing beacon (RRFB) add associated crossing enhancements or alternatively a traffic signal	Crossing Safety Enhancement	Long	$$
CS-3	Fairview Dr.	Kansas St. to Kansas St.	Consider installing pedestrian activated flasher to increase pedestrian crossing opportunities	Crossing Safety Enhancement	Long	$
CS-4	Fairview Dr.	Fairview Dr. at Gordon St.	Consider right in/right out and pedestrian activated flasher	Crossing Safety Enhancement	Long	$$
CS-5	Hwy. 50	Hwy. 50 at Lompa Ln.	Add median pedestrian refuge island, add leading pedestrian interval (LPI), add bicycle signal detection	Crossing Safety Enhancement	Short	$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
CS-6	Monte Rosa Dr.	Stanton Ave. to Gordonia Ave.	Add intersection crossing enhancements to Stanton Dr. and Gordonia Ave. intersections, including striping to prohibit parking close to existing crosswalks	Crossing Safety Enhancement	Short	$
CS-7	Roop St.	Fairview Dr. to Sonoma Ave.	Add intersection crossing enhancements at minor side-street approaches south of Fairview Dr.	Crossing Safety Enhancement	Medium	$$
CS-8	Saliman Rd.	Robinson St. and Saliman Rd.	Add crossing guards during peak hours, future traffic signal will help intersection operations	Crossing Safety Enhancement	Short	$
CS-9	Saliman Rd.	Saliman Rd. at Mills Park	Add crossing guards during peak hours	Crossing Safety Enhancement	Short	$
CS-10	Silver Sage Dr.	Sonoma Ave. to Koontz Ln.	A. Add crosswalk at Pioche St. B. Add intersection crossing enhancements at Koontz Ln. intersection and minor side-street approaches	Crossing Safety Enhancement	Long	$$$$
CS-11	Stewart St.	Williams St. to Long St.	Add RRFB at Park St.	Crossing Safety Enhancement	Short	$

SRTS Walk Zone Connectivity Enhancement Recommendations

Table ES-6: Tier 2: Walk Zone Connectivity Enhancements

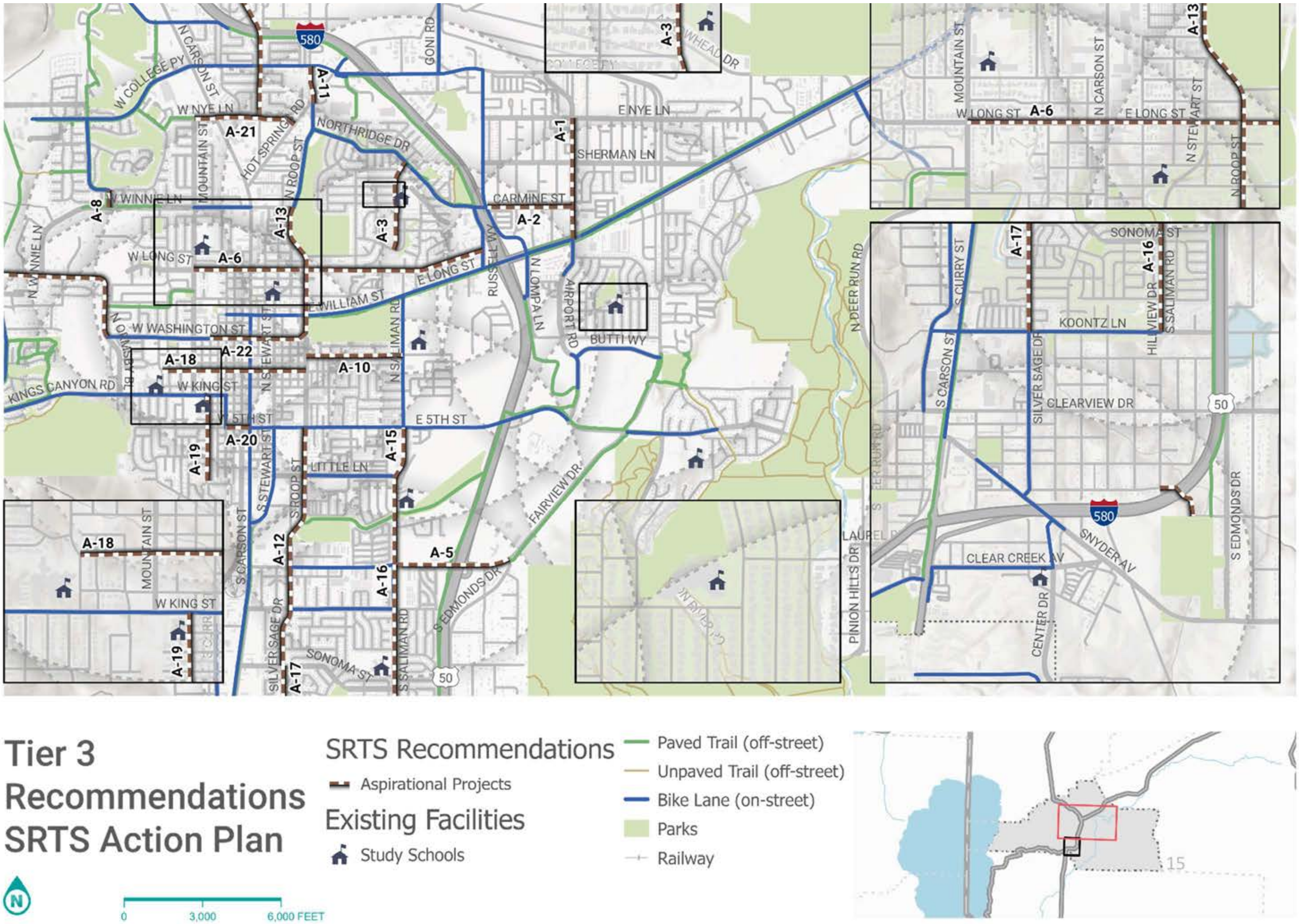
Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-1	Airport Rd.	Nye Ln. to Hwy. 50	A. Close sidewalk gaps B. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-2	Arrowhead Dr.	Imus Rd. to Goni Rd.	Add sidewalks	Walk Zone Connectivity Enhancement	Medium	$$$
WZ-3	Baker Dr.	Koontz Ln. to 175 ft. S. of Kerinne Cir.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$
WZ-4	Bath St.	Mountain St. to Carson St.	A. Close sidewalk gap between Curry and Mountain St. B. Add intersection crossing enhancement at midblock crosswalk and Division St. crosswalks C. Add missing and damaged ADA Ramps D. Repair and enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$
WZ-5	Brown St.	420 ft. N. of Reeves St. to 170 ft. S. of Reeves St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Medium	$$
WZ-6	Camille Dr.	Sunland Dr.	Install staircase/ramp for multi-use connectivity	Walk Zone Connectivity Enhancement	Long	$$
WZ-7	Carson St.	Bath St. to 420 ft. N. of Bath St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$
WZ-8	Clearview Dr.	Oak St. to I-580	Construct paved shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Short	$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-9	Corbett St.	Carson St. to school	Close sidewalk gaps	Walk Zone Connectivity Enhancement	Short	$
WZ-10	Division St.	Bath St. to W. 5th St.	A. Add intersection crossing enhancements at minor side streets B. Enhance and upgrade existing crosswalks including Musser St., Telegraph St., and Long St. C. Close sidewalk gaps with wide sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$$$
WZ-11	Division St.	5th St. to southern terminus	Close sidewalk gaps	Walk Zone Connectivity Enhancement	Long	$$
WZ-12	Goni Rd.	Hot Springs Rd. intersection	Consider pedestrian hybrid beacon (PHB) or RRFB	Walk Zone Connectivity Enhancement	Medium	$$
WZ-13	Gordonia Ave.	Airport Rd. to Monte Rosa Dr.	A. Widen existing sidewalks on northside of roadway B. Add center median from Monte Rosa Dr. to La Loma Dr.	Walk Zone Connectivity Enhancement	Long	$$
WZ-14	Hillview Dr.	Kingsley Ln. to Clearview Dr.	Construct paved shoulder or multi-use path to connect with existing multi-use path on Saliman at Kingsley	Walk Zone Connectivity Enhancement	Long	$$
WZ-15	Koontz Ln.	Center Dr. to I-580	Construct paved shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Long	$$$
WZ-16	Lepire Dr.	Snake Mountain MUP to Cassidy Ct.	Construct sidewalk from Snake Mountain MUP to the existing sidewalk on the north side of Lepire Dr.	Walk Zone Connectivity Enhancement	Long	$$
WZ-17	Long St.	Curry St. to Sierra Cir. and Fall St. to Stewart St.	A. Close sidewalk gaps (Curry St. to Sierra Cir. and Fall St. to Stewart St.) B. Crosswalks and intersection enhancements at Division St., Curry St., and Marian Ave.	Walk Zone Connectivity Enhancement	Short	$$$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-18	Mountain St.	Nye Ln. to King St.	A. Close sidewalk gaps and enhance existing sidewalk where possible B. Add intersection crossing enhancements at Long St., Washington St., Telegraph St., Musser St.	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-19	Musser St.	Harbin Ave. to Anderson St.	A. Close sidewalk gaps B. Enhance sidewalk where possible	Walk Zone Connectivity Enhancement	Long	$$
WZ-20	N. Edmonds Dr.	320 ft. N. of Reeves to 100 ft. N. Brown St.	Construct sidewalk on west side of roadway	Walk Zone Connectivity Enhancement	Medium	$$
WZ-21	Reavis Ln. to Evalyn Dr (new path)	Create pedestrian connection to multi-use path	Construct multi-use bridge between existing multi-use trail and sidewalk on south side of Reavis Ln.	Walk Zone Connectivity Enhancement	Medium	$$
WZ-22	Robinson St.	Richmond Ave. to Mountain St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-24	S. Iris St.	4th St. to King St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-25	Saliman Rd.	US 50 to Long St.	Add buffers to bike lane, consolidate southbound lanes, add curb extensions at Long St. and US 50	Walk Zone Connectivity Enhancement	Short	$
WZ-26	Roop St.	Washington St. to E. 5th St.	A. Close sidewalk gap (Telegraph St. to E. 5th St.) B. Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-26	Saliman Rd.	Fairview Dr. to Koontz Ln.	A. Intersection crossing enhancements at Sonoma St. B. RRFB at Damon Rd. crosswalk C. Sidewalk eastside Colorado to Fairview Dr. D. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Short	$$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-27	Saliman Rd.	E. 5th St. to Fairview Dr.	Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-28	Sherman Ln.	Lompa Ln. to Chanel Ln.	Construct sidewalk	Walk Zone Connectivity Enhancement	Medium	$$$$$
WZ-29	Silver Sage Dr.	Roland St. to Clearview Dr.	Add sidewalk to one side of the street	Walk Zone Connectivity Enhancement	Medium	$$
WZ-30	Snyder Ave.	Isabell Dr. to Roland St.	Close sidewalk gap	Walk Zone Connectivity Enhancement	Medium	$
WZ-31	Stanton Ave.	Monte Rosa Dr. to Fairview Dr.	Widen existing sidewalk on south side	Walk Zone Connectivity Enhancement	Medium	$$
WZ-32	Thompson St.	King St. to 550 ft. S. of San Marcus Dr.	A. Close sidewalk gaps on east side (King St. to 5th St.) B. Close sidewalk gaps on west side (5th St. to San Marcus Dr.) C. Create intersection crossing enhancements at existing W. 2nd St., 3rd St., and 4th St. crosswalks	Walk Zone Connectivity Enhancement	Long	$$$
WZ-33	Winnie Ln.	Mountain St. to Ormsby Blvd.	Enhance existing sidewalks where possible	Walk Zone Connectivity Enhancement	Long	$$
WZ-34	Winnie Ln.	Ash Canyon to Ormsby Blvd.	Extend multi-use path on north side to Ash Canyon	Walk Zone Connectivity Enhancement	Medium	$$

Figure ES-2: Tier 3 SRTS Recommendations



SRTS Aspirational Project Recommendations

Table ES-7: Tier 3: Aspirational Projects

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
A-1	Airport Rd.	Nye Ln. to Hwy. 50	A. Construct buffered bike lanes or similar multimodal improvement B. Protected intersection at Airport Rd./Hwy. 50 or similar multimodal improvement	Aspirational Project	$$$$$
A-2	Carmine St.	Airport Rd. to Lompa Ln.	Construct bike boulevard or similar multimodal improvement	Aspirational Project	$$
A-3	Carriage Crest Dr.	Northridge Dr. to Sunland Ave.	Construct bike boulevard or similar multimodal improvement	Aspirational Project	$
A-4	Edmonds Sports Complex	Hillview Dr. to Edmonds Sports Complex	Construct multi-use bridge over I-580 from the southeastern corner of Appion Wy./Hillview Dr. intersection to the Edmonds Sports Complex	Aspirational Project	$$$$$
A-5	Fairview Dr.	Edmonds Dr. to Saliman Rd.	Construct protected cycle track/multi-use path or similar multimodal improvement	Aspirational Project	$$$
A-6	Long St.	Mountain St. to Russell Wy.	A. Buffered bike lane from Mountain St. to Saliman Rd. or similar multimodal improvement B. Bike Lane from Saliman Rd. to Russell Wy. or similar multimodal improvement	Aspirational Project	$$$
A-7	Northgate Ln.	Arrowhead Dr. to Nye Ln.	Construct protected cycle track or similar multimodal improvement	Aspirational Project	$$
A-8	Ormsby Blvd.	Oak Ridge Dr. to Winnie Ln.	Construct bike lanes or similar multimodal improvement	Aspirational Project	$
A-9	Ormsby Blvd./Ash Canyon Rd.	Longview Wy. to Washington St.	Construct multi-use path from Washington St. to Longview Wy. or similar multimodal improvement	Aspirational Project	$$$
A-10	Robinson St.	Roop St. to Saliman Rd.	Construct bike lanes or similar multimodal improvement	Aspirational Project	$
A-11	Roop St.	College Parkway to Bernhard Wy.	Construct protected cycle track or similar multimodal improvement	Aspirational Project	$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
A-12	Roop St.	5th St. to Fairview St.	Enhance existing facility to buffered bike lanes or similar multimodal improvement	Aspirational Project	$$
A-13	Roop St.	Winnie Ln. to Washington St.	Construct protected cycle track or similar multimodal improvement	Aspirational Project	$$$$
A-14	Roop St./Silver Sage Dr.	5th St. to Sonoma Ave.	Enhance existing facility to buffered bike lanes or similar multimodal improvement	Aspirational Project	$$
A-15	Saliman Rd.	E. 5th St. to Fairview Dr.	Upgrade bike lane to cycle track with protected intersection at Fairview Dr. or similar multimodal improvement	Aspirational Project	$$$$
A-16	Saliman Rd.	Fairview Dr. to Koontz Ln.	Buffered bike lane with potential lane reduction or similar multimodal improvement	Aspirational Project	$$
A-17	Silver Sage Dr.	Sonoma Ave. to Koontz Ln.	Enhance existing facility to buffered bike lanes or similar multimodal improvement	Aspirational Project	$$
A-18	Telegraph St.	Richmond Ave. to Roop St.	Bike boulevard consider diverters at Mountain St., Division St., Stewart St., and Roop St, or similar multimodal improvement	Aspirational Project	$$$$
A-19	Thompson St.	King St. to 550 ft. S. of San Marcus Dr.	Bike boulevard or similar multimodal improvement	Aspirational Project	$$$
A-20	W. 5th St.	Division St. to Carson St.	A. Bike lanes Richmond Ave. to Minnesota St. or similar multimodal improvement B. Buffered bike lane Minnesota St. to Carson St. or similar multimodal improvement, C. Curb extension at Telegraph St.	Aspirational Project	$$$
A-21	W. Nye Ln.	Hot Springs Rd. to Mountain St.	A. Construct bike boulevard or similar multimodal improvement B. Intersection bulb-outs C. Median islands D. Speed cushions	Aspirational Project	$$
A-22	Washington St.	Phillips St. to Roop St.	A. Construct bike lane Minnesota St. to terminus or similar multimodal improvement B. Buffered bike lane Philips St. to Minnesota St. or similar multimodal improvement	Aspirational Project	$

SRTS Programmatic Recommendations

Engineering

Designing safer school travel routes through infrastructure planning helps reduce risk and improve accessibility for students walking and biking. Tools like route maps and designated drop-off zones support safer navigation and reduce traffic conflicts near school campuses.

Table ES-8: Engineering Programmatic Recommendations

Name	Description	Resource
Safe Routes to School Maps (New)	Developing school-specific route maps would give families clear guidance on the safest ways to walk or bike to school. Maps could highlight recommended crossings, signalized intersections, stop signs, estimated travel times, and visibility tips. These maps not only reduce uncertainty for families but also encourage students to choose safer, designated routes, and empower new students to try walking or biking who may not previously have done so.	SRTS Safe Route Maps and How to Create Them
Park + Walk & Walking School Bus Zones (New)	To reduce traffic congestion directly at school entrances, Carson City could designate Park + Walk zones—off-site drop-off locations where students join supervised walking groups for the final few blocks to school. These zones decrease chaos at the curb, reduce vehicle-pedestrian conflicts, and give students an easy way to add daily physical activity to their routine.	SRTS Walking School Bus Guide
School Zone Signing (New)	Ensure consistent signing across school zones in Carson City and clearly post beacons or times indicating when school zones are in effect. Work to update the Carson City Code and the Speed Limit Policy to ensure consistency with the Nevada Revised Statutes.	NRS 484B, AB 6 (2025 Special Session)

Education

Bicycle and pedestrian education help those who are interested in active transportation feel more comfortable, safe, and confident navigating streets and shared-use paths.

Table ES-9: Education Programmatic Recommendations

Name	Description	Resource
Back-to-School Safety Assemblies (Expanded)	The start of each school year offers a powerful opportunity to set norms for safe travel and empower students to choose walking or biking to school. Back-to-school safety assemblies deliver age-appropriate guidance on walking and biking rules, route planning, and visibility. By presenting this information early—when travel routines are first forming—assembly safety messages can reach nearly all students, including those who may not be enrolled in formal bike education classes. With assistance from schools, the SRTS program could expand the number of these assemblies across more schools and grade levels to amplify their reach, ensuring consistent, repeated exposure to safety guidance. With wider implementation, assemblies become an even more efficient and effective tool for instilling safe habits across the district.	Music Notes SRTS
Bicycle Safety Education (Expanded)	Carson City has an opportunity to strengthen its bicycle safety education by expanding programming for 3rd–5th grade students. By providing each class at least two dedicated sessions per year, students will have more time to practice core skills such as braking, signaling, and scanning for cars at intersections. Updated curriculum, combined with the provision of bicycles and helmets, will help students whose families may not have access to safe equipment at home. Extending the program to Stewart Community Schools and pairing it with a community bicycle equipment initiative will further broaden access, making sure more children and families can build lasting, hands-on skills for safe travel.	Sonoma SRTS Bicycle Safety / Skills Curriculum
School Bus Stop Awareness (Expanded)	Many school bus stops are dispersed throughout neighborhoods, where drivers may not expect children to be waiting or crossing. A School Bus Stop Awareness campaign would deploy temporary warning signs at high-risk stops, supported by outreach and driver education campaigns. Partnering with University of Northern Nevada to collect near-miss and speed data using LiDAR would provide valuable insights to guide adjustments. By increasing visibility and driver awareness, the program would reduce close calls and improve safety for students boarding or exiting buses.	School Zone Speed Study from the Nevada Department of Public Safety

Encouragement

Events and activities such as Walk and Roll to School Days, incentive programs, and school-wide challenges help build enthusiasm and normalize walking and biking as fun and healthy ways to get to school.

Table ES-10: Encouragement Programmatic Recommendations

Name	Description	Resource
Walk/Ride Punch Card Program (New)	Introducing a punch card system would gamify walking and biking, making it fun for younger students while tracking progress over time. Each time a student walks or rides to school, a teacher marks their punch card, working toward milestones that are celebrated with recognition or small prizes. This program not only motivates individual students but also gives schools a tangible way to measure and display participation. Over time, the punch card system could help turn occasional participation into a consistent habit.	Walk Bike & Roll to School Punch Cards and Certificates
Student Poster Contest (New)	A student poster contest would invite children to use their creativity to promote safe walking and biking. Contest themes could include helmet use, visibility, or sharing the road. Winning posters would be displayed in schools, libraries, and other community spaces, giving students ownership of the message while spreading peer-to-peer reminders about safe behavior. This approach harnesses student voice, reinforces learning through creative expression, and contributes to a broader culture of safety.	Vision Zero Truckee Meadows SRTS Poster Contest
Walking Wednesday & Annual Campaigns (Expanded)	Expanding Walking Wednesday into a citywide tradition would help normalize walking and biking to school as part of the weekly routine. With branded yard signs along key routes, small incentives for participating students, and links to national events like Walk to School Day in October and Bike to School Month in May, the program would send a visible signal to both students and drivers. These regular campaigns keep safe travel top-of-mind, encourage families to try active modes, and create predictable days when drivers expect to see more children walking and biking.	"Move a Little, Live a Lot" High School Campaign | Massachusetts SRTS Program

Engagement

Engaging families, school staff, and community partners means SRTS efforts will reflect local needs and values. Outreach activities like surveys, workshops, and student-led projects foster shared ownership and support.

Table ES-11: Engagement Programmatic Recommendations

Name	Description	Resource
School Safety Champions (Expanded)	Grow the School Safety Champions program to include one or two middle schools in Carson City during May is Bike Month. Continue organizing parent and community volunteers to supervise Walking School Buses and Bike Trains at elementary schools, providing younger students with safe, reliable group travel options. Use available funding to provide training, resources, and modest compensation for volunteers, sustaining participation and expanding the program's reach.	Walking School Bus Guide from the National Center for SRTS
Vision Zero SRTS Subcommittee (Expanded)	Formalizing a Vision Zero Safe Routes to School Subcommittee would bring parents, teachers, and City staff together to coordinate audits, speed checks, and other safety activities quarterly. By creating a standing group within the larger Vision Zero framework, Carson City would consistently address school-area issues alongside citywide safety goals. This governance model reduces duplication of effort, accelerates decision-making, and keeps school-specific concerns aligned with broader traffic safety strategies.	Vision Zero and SRTS Partners in Safety- SRTS National Partnership
School Speed Zone Engagement (Expanded)	Conduct targeted, high-visibility enforcement campaigns at elementary, middle, and high schools during arrival and dismissal times to reinforce compliance with school zone speed limits. Coordinate closely with law enforcement to focus on specific problem areas and times when risks are highest. Pair enforcement with "Slow Down in School Zones" flyers, signs, public service announcements, and Safe Driver Pledges directed at parents and teen drivers. This combined approach creates immediate visibility while also fostering long-term habit change, so that safer driving behaviors continue even after enforcement presence decreases.	School Speed Zone Safety Program from the Sarasota Police Department

Equity

Safe Routes to School initiatives benefit all demographic groups, with particular attention to providing safe, healthy, and fair outcomes for low-income neighborhoods, communities of color, and others.

Table ES-12: Equity Programmatic Recommendations

Name	Description	Resource
Crossing Guard Support (New)	Crossing guards are often the first line of defense for students navigating busy intersections. A crossing guard support program would include standardized training for all guards—whether staff, contractors, or volunteers—alongside a public awareness campaign to build respect for their role. By strengthening coordination with the district's existing training program and promoting consistent best practices, Carson City can enhance the visibility and effectiveness of crossing guards, improving compliance at key crossings and protecting students at high-risk locations.	Crossing Guards Save Lives - Traffic Safety Resource Center

Evaluation

Tracking participation, travel behavior, and safety outcomes helps measure the impact of SRTS programs and guide future improvements. Tools like student tallies and parent surveys provide valuable feedback for ongoing planning.

Table ES-13: Evaluation Programmatic Recommendations

Name	Description	Resource
SRTS Report Card (Expanded)	An annual Safe Routes to School Report Card would compile survey and tally data alongside program highlights, campaign outcomes, and next steps. This clear, public-facing document would provide accountability, build trust with families, and demonstrate progress to potential funders. A consistent reporting framework also helps align partners and keeps the program moving toward long-term goals. The SRTS team will work in conjunction with the school principal and District Crossing Guard Coordinator to compile the annual report card.	Safe Routes Partnership - Making Strides 2024 State Report Card
Annual Parent Surveys (Expanded)	Collecting annual parent surveys on travel mode, safety concerns, and demographics provides critical insight into family experiences year over year. Tracking these trends helps identify what interventions are working, and guide future messaging. Survey data can also be used to strengthen grant applications by showing community need and progress over time. Surveys will be in both English and Spanish.	Joseph L. Bowler Sr. Elementary School SRTS Annual Parent Survey

Long-Term Recommendations

Table ES-14: Long-Term Programmatic Recommendations

Type	Name	Long-Term Recommendation Description
Engineering	Sidewalk Gap Closures (Long Term)	Prioritizing the closure of sidewalk gaps within 1/4 mile of schools would create continuous, connected routes for students. Even short missing segments can force children into the street, greatly increasing risk. By focusing on high-priority corridors first, Carson City can build a safer walking environment that encourages more families to consider active travel.
Education	E-Bike Training & Licensing Program (Long Term)	The rising popularity of e-bikes among youth brings both benefits and challenges. To address safety concerns, Carson City could establish an e-bike training program based on Nevada Department of Transportation (NDOT) and Nevada State e-bike rules. Students would complete a short safety course covering speed control, safe passing, and responsible riding behavior, followed by a quiz to demonstrate their knowledge. Upon completion, they would receive a certificate of completion. This approach not only promotes safe habits but also provides schools with a clear and consistent policy for managing e-bike use.
Education	Community Mapping Projects (Long Term)	Community mapping projects would invite students and their families to chart their daily school routes and identify barriers such as missing sidewalks, unsafe crossings, or speeding traffic. This activity not only engages families in problem-solving but also produces detailed, ground-level data that can inform engineering fixes and enforcement priorities. By directly involving students in documenting their experiences, the project builds ownership and trust while ensuring future improvements reflect real community needs.
Encouragement	Walking and Biking Clubs (Long Term)	After-school walking and biking clubs, offered in partnership with local nonprofits, would provide students with more time to build confidence in their skills outside of the classroom. These clubs could combine group rides with basic bike maintenance workshops, giving students both the knowledge and the independence to travel safely on their own. Regular

Type	Name	Long-Term Recommendation Description
		practice builds lasting confidence, while the group setting fosters friendships and community around active travel.
Engagement	Parent Barrier Reporting System (Long Term)	Establishing a Parent Barrier Reporting System to create a simple, consistent way for families to raise safety concerns. Integrated into the district's online parent portal, with paper forms available in school offices, the system would make it easy to report issues such as broken sidewalks, unsafe crossings, or aggressive driving. Reports could be tracked and shared with equity and engineering teams, ensuring concerns are addressed in a timely and transparent manner. This district channel for feedback strengthens accountability while improving on-the-ground safety, and increases parents' comfort level when allowing students to walk or ride to school.
Engagement	Mobile Speed Feedback Trailers (Long Term)	Mobile speed feedback trailers remain a highly effective short-term tool for influencing driver behavior. Placing them in school zones during the first month of the school year—when families are setting travel routines— positions them to be most effective in shaping safe travel habits. When combined with enforcement campaigns, these trailers not only alert drivers in the moment but also reinforce expectations about safe travel near schools.
Evaluation	Student Hand Tallies (Long Term)	Expanding hand tally data collection to middle and high schools would provide a more complete picture of how student travel changes with age. Capturing shifts from family drop-off to self-transport offers valuable information about when and where interventions are most needed. With this data, programs can be better tailored to meet the needs of students at different stages of independence.

1

Introduction

1 Introduction

What Is Safe Routes to School?

Safe Routes to School (SRTS) is a strategy that makes it safer, easier and more appealing for students of all ages and abilities to walk, bike, or roll to school. In Carson City, SRTS is led by the Western Nevada Safe Routes to School (WNSRTS) program that aims to foster healthier, more connected communities through active school travel. WNSRTS collaborates with K–12 schools in Carson City, Douglas, Lyon, and Storey Counties to enhance safety, eliminate obstacles to walking and biking, and promote a culture of active transportation.

Engineering

Design, implement, and maintain infrastructure that improves safety along school commute routes.

Education

Equip students and families with the skills they need to travel safely whether walking, rolling, or biking.

Encouragement

Host events and programs that make walking and biking fun and inviting.

Engagement

Meaningfully involve students, families, teachers, school leaders, and community organizations.

Equity

Make sure every student, regardless of background and ability, can benefit from safe, healthy travel options.

Evaluation

Measure what is working, learn what is not, and adjust to better serve the community.

Why Is Safe Routes to School Important?

Many students in the US live within walking or biking distance of school, yet safety concerns and limited infrastructure often prevent them from traveling actively. Safe Routes to School (SRTS) programs address these challenges by combining infrastructure improvements with education, encouragement, and engagement, creating safer and more accessible options for children and families.

Benefits to Safe Routes to School

Safer Travel for Kids

- Improves safety near schools with better crossings, sidewalks, and traffic calming.
- Reduces motor vehicle congestion and air pollution at drop-off and pick-up zones.

Community Connections

- Walking, biking, carpooling, and bus-riding build stronger social bonds.
- Families and law enforcement strengthen relationships, improving public safety.

Health and Independence

- Active travel = healthier lifestyles and lifelong habits.
- Children gain independence through walking, biking, or rolling to school.
- Childhood obesity has tripled since the 1970s—SRTS helps reverse the trend.

Benefits Beyond Students

- Safer school routes also benefit older adults, people with disabilities, and the general public.
- Designing for children creates accessible streets for all ages and abilities.

Safe Routes to School Planning in Carson City

The Safe Routes to School (SRTS) Action Plan is a clear, community-informed road map for improving how students and families safely walk, bike, and roll to school. Developed through robust public engagement, data analysis, and a review of previous planning efforts, this updated document builds upon the foundation of the original Master Plan—expanding its scope to include additional schools and comprehensive strategies. Replacing the previous Master Plan, the Carson Safe Routes to School Action Plan highlights priority next steps for Carson City to enhance safe, healthy, and accessible school commutes.

While the primary focus of this plan is improving walking and biking within one mile of Carson Silver Campus and Carson High School, many recommendations also extend benefits to the larger community—particularly seniors, people with disabilities, and the general public.

Action Plan Development

The Carson Safe Routes to School Action Plan was created in close collaboration with the Carson City Vulnerable Road User Task Force, which included representatives from the Carson City School District, principals, school resource officers, crossing guards, volunteers, parents, the School District Risk Manager, and Carson City Public Works staff. The project team conducted in-person site assessments at each of the study schools to better understand travel behavior, identify safety challenges, and document infrastructure and programmatic needs.

Project team conducting site assessments at Carson High Silver Campus (above) and Carson High (left)

Action Plan Development

Since the City's SRTS Master Plan, significant progress has been made in both programmatic and infrastructure initiatives. The City has completed or begun all programmatic recommendations from the Master Plan with 13 programmatic recommendations being fully implemented and six more partially completed. These activities span across the six E's of SRTS implementing a school speed zone standard to increase driver awareness, providing bicycle safety education for elementary schools, and conducting a regular Walking Wednesday program at participating schools to encourage parents and students to walk and bike with the help of Safety Sally, the SRTS mascot.

Safety Sally engaging with students

On the infrastructure side, the City has implemented a variety of projects across the city and has numerous more programmed to be completed in the coming years. The eight completed projects from the Master Plan included curb extensions to reduce crossing distances, high-visibility crosswalks, pedestrian-scale lighting, rectangular rapid flashing beacons (RRFBs) to enhance crossing safety, and the filling of critical sidewalk gaps to create continuous pedestrian pathways.

These SRTS improvements complement other public works projects such as the Colorado Street Complete Streets Project, which added buffered bike lanes and enhanced crossings with pedestrian refuge islands (shown to the right). Further, the City is currently working on implementing three additional projects from the Master Plan with 12 more programmed for implementation in the next few years. The completed SRTS Master Plan projects reflect a total investment of $1,365,750, underscoring the City's ongoing commitment to creating safer, more accessible routes for students traveling to and from school.

Colorado Street Complete Street project

Together, these completed, active, and planned efforts demonstrate steady and strategic progress toward realizing the community's long-term vision for a safer and more connected network for students walking and biking to school.

2

Community Engagement

2 Community Engagement

A central component of the Carson Safe Routes to School Action Plan was a robust community engagement process designed to gather meaningful input from students, families, and community members. Outreach combined both digital and in-person strategies to solicit broad participation. The school district distributed surveys and an interactive online map through parent/caregiver emails, while pop-up events across the community provided additional opportunities for input. There were four pop-up events throughout the month of May including:

- Cinco De Mayo Festival (May 4, 2025)
- Walk Us Home (Fun & Family Fair) (May 10, 2025)
- Carson City Public Works Open House (May 17, 2025)
- Cops and Kids (May 31, 2025)

More than 290 parents, children, and community members engaged with project staff across these events. At these events, residents could scan QR codes to access the online survey or complete printed versions on site. This blended approach allowed for both convenience and inclusivity and captured a wide range of perspectives.

Families asking questions about SRTS Action Plan

Child enjoying the basketball hoops

Pop-up at the Cop and Kids event

Key Findings

Schools Mentioned Most: Carson High, Eagle Valley Middle, Empire Elementary, and Seeliger Elementary.

Distance to School: Most students live **more than two miles away**, limiting walking and biking options.

Main Travel Modes:

- Family vehicle (most common)
- School bus (second)
- Walking and biking (smaller share)

Travel Times: Most trips to and from school take **5 to 20 minutes**.

Child enjoying the basketball hoops

Interactive Map Feedback

Feedback from the interactive map revealed key concerns from community members, including **speeding vehicles**, **inattentive drivers at intersections**, and **poor compliance at four-way stops and crosswalks**. These issues underscore strong community support for implementing **traffic calming measures**, **enhancing pedestrian crossings**, and **increasing driver awareness** to better protect students on their routes to school.

Family learning about the SRTS Action Plan

Walk Us Home (Fun & Family Fair) event

3 Existing Conditions

3 Existing Conditions

The existing conditions analysis provides a foundational understanding of safety trends and transportation conditions for students walking and biking throughout Carson City. At the citywide level, the approach integrated field observations, crash data analysis, policy and plan review, and input gathered through community engagement and school walk audits. This included in-person walking audits at the high school campuses, which enriched the team's understanding of site-specific issues and aligned with similar audits conducted at elementary and middle schools during the Master Plan process. Collectively, these methods offer a comprehensive view of both the physical environment, and the challenges students encounter when traveling to and from school. Additional details on the methodologies and findings are available in **Appendix B**.

Socioeconomic Analysis

The Carson Safe Routes to School Action Plan presents an opportunity to focus transportation safety investments in areas with the greatest safety needs while also targeting areas with high proportions of people with low incomes or those without a vehicle. The project team conducted a targeted analysis of socioeconomic data to quantify the levels of disparity across areas and the larger Carson City area to best inform the development of recommendations. To best position projects from this plan to be competitive within current federal funding guidelines, the project team leveraged the US Department of Transportation (USDOT) Areas of Persistent Poverty dataset.[1] This dataset was developed by the USDOT to identify areas that have historically been underinvested in and include a large proportion of residents with low income. By focusing on these areas, the Carson Safe Routes to School Action Plan will help target investments in active transportation in areas where they are needed most, helping students who are more likely to rely on walking and biking due to limited transportation options.

Analysis Findings

The disadvantaged areas within Carson City have a significant level of disparity compared to Carson City as a whole (**Figure 3-1**). These areas generally have residents with lower incomes and higher proportions of zero vehicle households, which highlight the increased reliance on public transportation and active transportation in these areas. Furthermore, active transportation can provide additional health benefits in disadvantaged areas, which include large proportions of physically inactive adults. Targeted active transportation investments in these areas are likely to have a larger benefit due to the increased level of reliance on modes other than a private vehicle.

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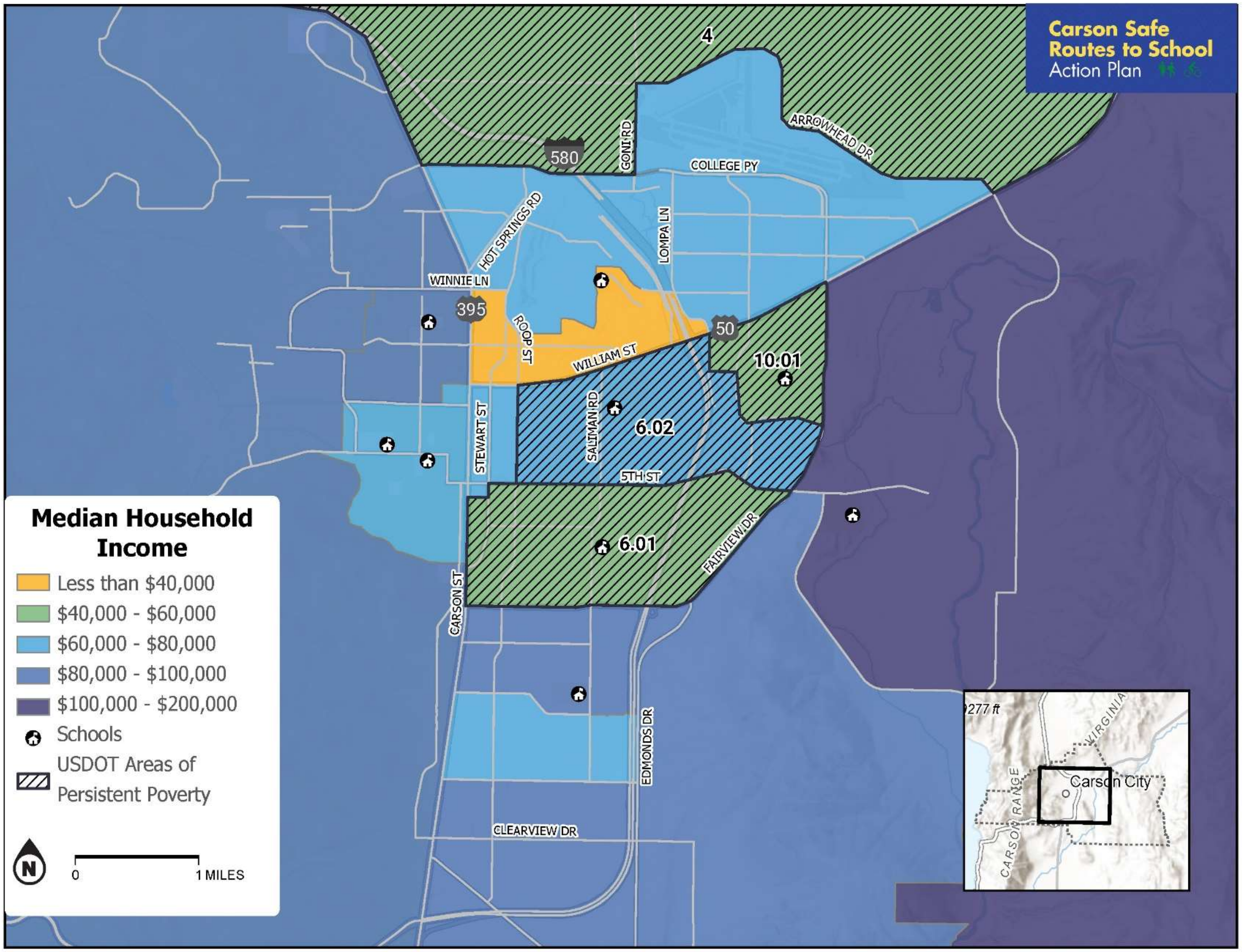
[1] *Persistent Poverty in Counties and Census Tracts (May 9, 2023)*.

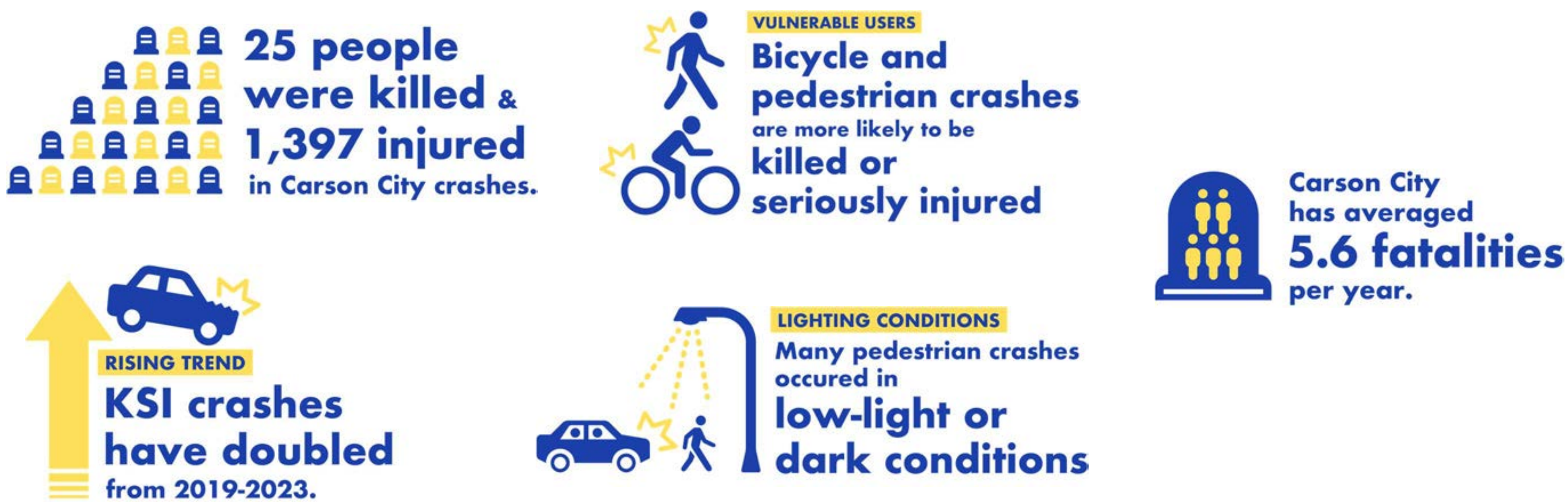
Figure 3-1: Median Household Income in Carson City, NV (Census Tracts)



Safety Analysis

The project team conducted an analysis of crashes from the past five years to identify safety trends for pedestrians and bicyclists within a mile of each school and performed a High Injury Network (HIN) analysis to identify the roadway sections within the city that have the highest crash rates. Crashes where someone was killed or seriously injured (also known as KSI crashes) were the focus of the analysis. This section summarizes the citywide trends and showcases the citywide HIN (**Figure 3-2**). Each school map below highlights the number of miles of HIN roads within one mile of the school. School-specific crash findings, school zones and HIN segments are highlighted in the school profiles located in the **Appendix D**.

Key Findings



*** This crash data is from 2019 to 2023.***

Citywide Crash Trends for Bicyclists and Pedestrians

Recent crash data reveals that pedestrians and bicyclists face significantly higher risks of severe injury or death compared to motorists. Nearly half **(45.5%)** of pedestrian-involved crashes results in a fatal or serious injury, making these incidents over **nine times** more likely to cause life altering harm than crashes involving only motorists. Bicyclists involved crashes also show elevated risks, with **22%** resulting in serious injury **4.6 higher** than motorists only crashes. These figures highlight the urgent need for targeted safety measures to protect vulnerable road users.

Lighting conditions play a critical role in crash outcomes, especially for pedestrians. Over a quarter **(27.27%)** of pedestrian crashes occur in dark conditions with only partial roadway lighting, a rate more than three times higher than for motorists. While daylight remains the most common setting for crashes across all modes, the disproportionate number of pedestrian incidents in poorly lit environments underscore the importance of infrastructure improvements such as enhanced lighting, visibility treatments, and traffic calming strategies to reduce risk and improve safety. Crashes surrounding each school are further analyzed in the school profiles later in this section with additional details on analysis methodology and sources available in **Appendix B**.

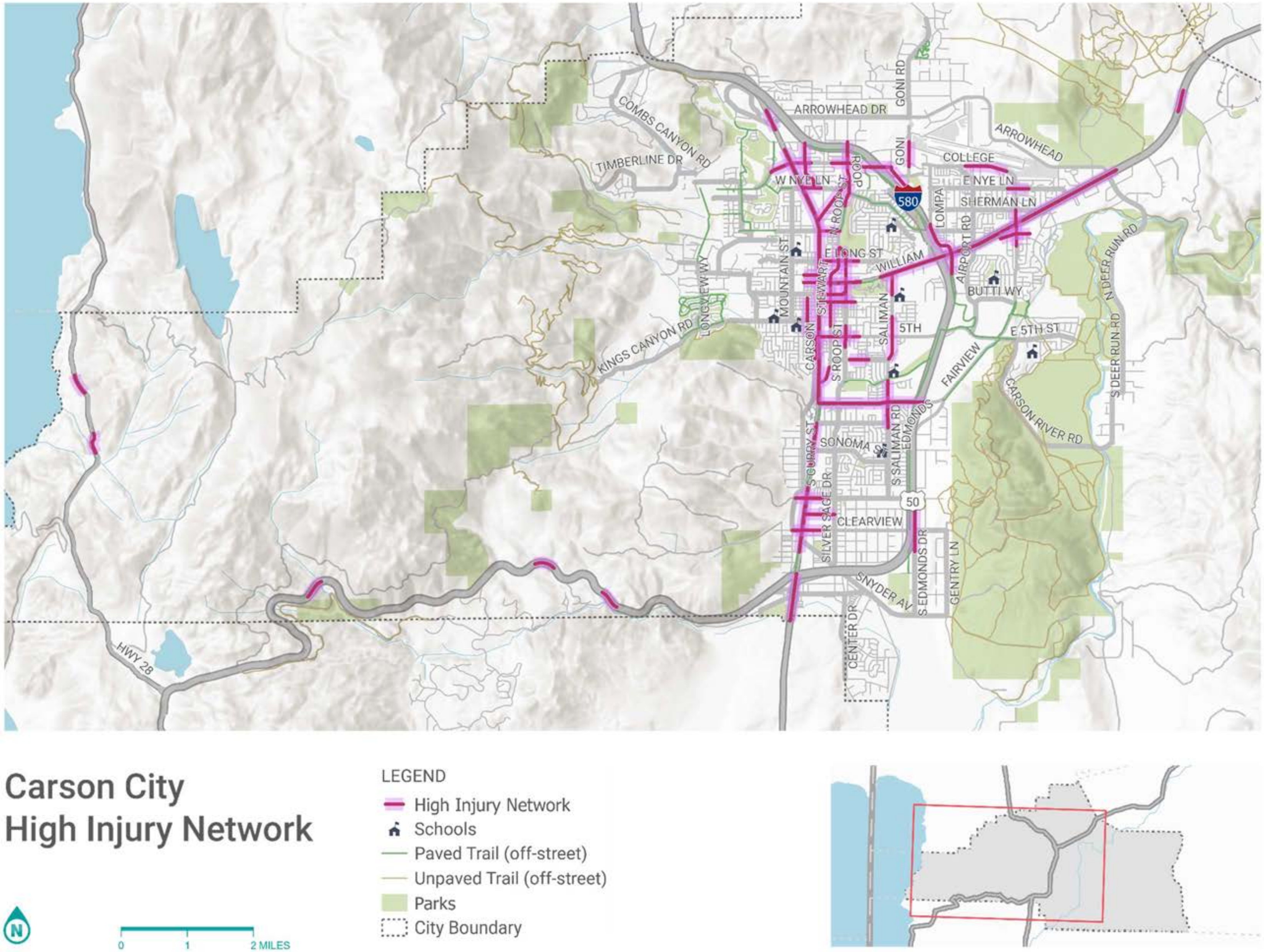
High Injury Network

The project team developed a HIN for Carson City to identify roadways where the most severe crashes occur. The resulting HIN highlights high-crash areas to direct resources where safety improvements can have the greatest impacts. The HIN was based on crash data weighted by crash severity and associated with the roadway centerline. Segments were added to the HIN network based on the crash severity per mile, to capture a high proportion of KSI crashes on a small overall percentage of the road network. **The HIN represents 70% of KSI crashes on just 5% of the road network.** The full methodology can be found in **Appendix C**. There are 26 miles of HIN in Carson City. Of these, 80% (20 miles) are within the one-mile school zones (**Table 1**). The maps included in this section show the HIN locations citywide and within each school study area (one mile). HIN maps for each school also highlight the HIN corridors and their extents that fall within the study area. In the case where no HIN corridors are present within the study area (i.e., Eagle Valley Middle School), this summary table is intentionally omitted as part of the map.

Table 3-1: HIN Mileage by School

School	HIN mileage (within 1 mi.)
Carson High School	7.4
Carson High – Silver Campus	9.1
Carson Middle School	6.4
Eagle Valley Middle School	0.0
Al Seeliger Elementary School	3.0
Bordewich-Bray Elementary School	7.5
Empire Elementary School	3.2
Fremont Elementary School	5.1
Edith Fritch Elementary School	8.0
Mark Twain Elementary School	7.7
Stewart Headstart Washoe Tribe	1.5

Figure 3-2: Carson City High Injury Network



Carson High School

School Information:

Carson High School is located on N. Saliman Road between E. Robinson Street and E. William Street on the east side of Carson City. The school campus is surrounded by commercial areas, Mills Park, residential neighborhoods and open space. The median household income in the area ranges from $60,000 to $80,000, which is similar to the regional average. Additionally, around 5% to 10% of households in the area do not have access to a vehicle, indicating a moderate level of vehicle access. At this time, mode share data specific to students from this school is not available.

School Crash Summary:

Within a one-mile radius of Carson High School, there were a total of 968 reported crashes making it the second highest crash count among the schools of focus. Of these, 110 crashes occurred during the morning peak (7 to 9 AM) and 125 during the afternoon peak (1 to 3 PM), meaning that 25% of all crashes happened during school commute hours. This concentration of incidents during key travel times highlights the elevated risk students face while commuting. Zooming in on the Carson High School zone itself, there were 25 crashes recorded, also the second highest among the schools analyzed. Of these, five occurred during the morning peak and two during the afternoon peak, indicating that 28% of crashes in the immediate school zone happened during peak school commute hours (**Figure 3-3**). Due to the high level of crashes in the area, there are a total of 7.5 miles of HIN roads within a one-mile radius (**Figure 3-4**).

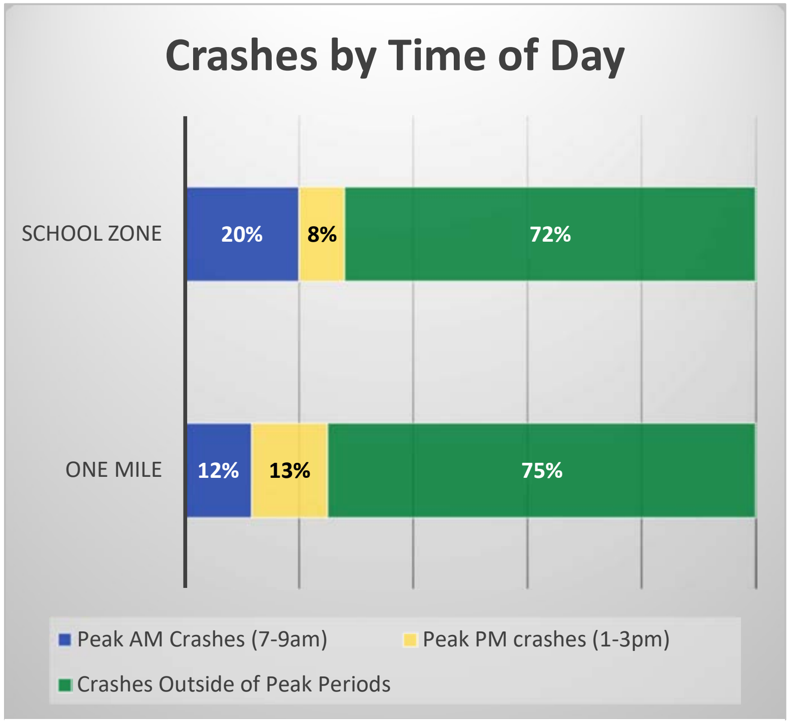


Figure 3-3: Carson High School – Crashes by Time of Day

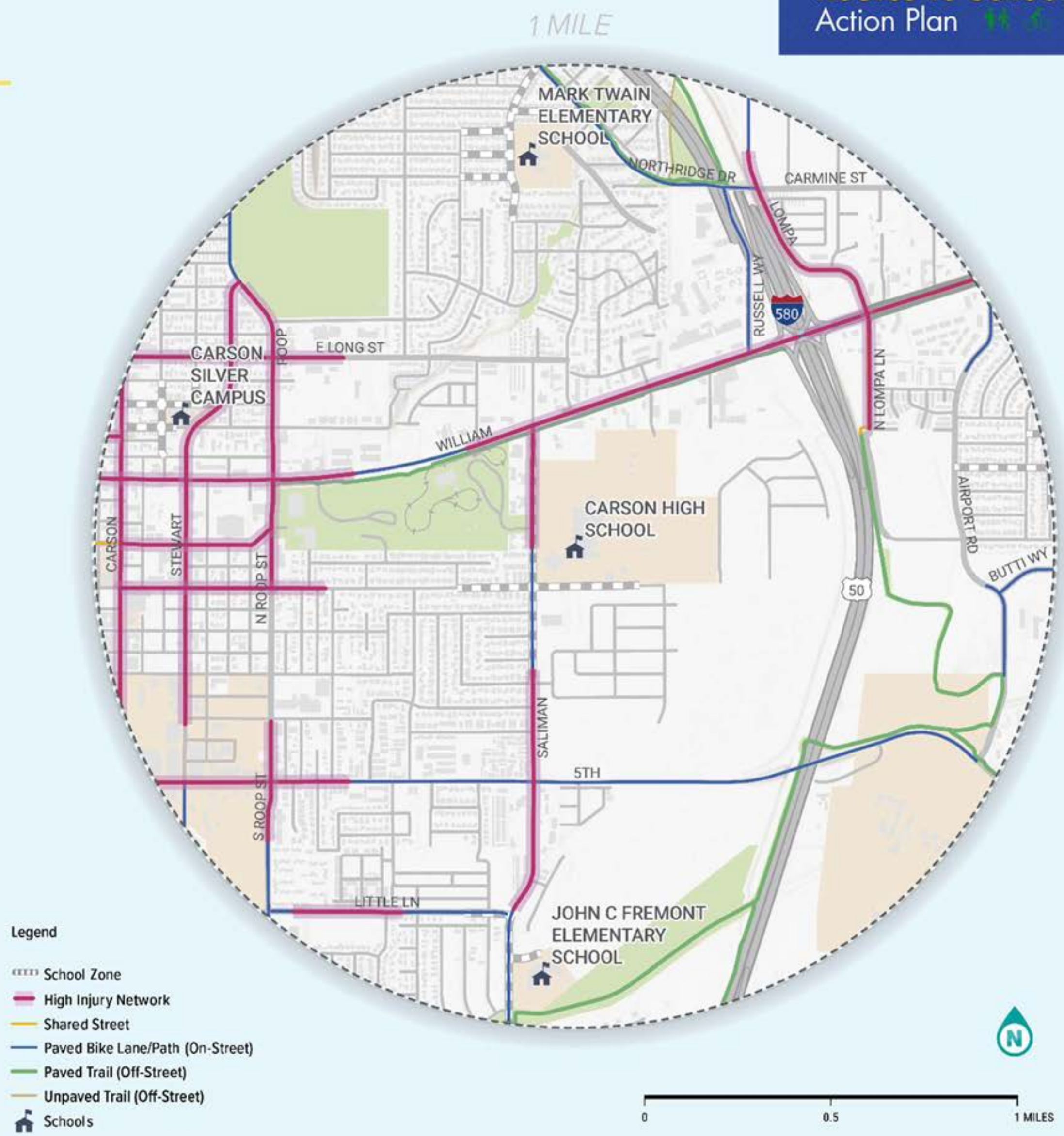
Figure 3-4: Carson High School High Injury Network Map

Carson High School

Within a 1-mile radius, there are **7.4** High Injury Network miles.

Name	Fromstreet	Tostreet
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
E William St	Rand Ave	State St
Fleishmann St	N Carson St	N Division St
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Nichols Ln	East Of Airport Rd
Little Ln	Parkland Ave	S Roop St
Long St	N Carson St	N Stewart St
N Carson St	Corbett St	Bath St
N Carson St	W 5th St	E Musser St
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
N Roop St	E Adams St	N Stewart St
Saliman Rd	Little Ln	E 5th Street
Saliman Rd	North Of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St

Carson Safe Routes to School
Action Plan



Carson High – Silver Campus (formally Pioneer High School)

School Information:

Carson High Silver Campus is located on Corbett Street between N. Fall Street and N. Stewart Street on the west side of Carson City. The school campus is surrounded by residential neighborhoods and open space. The area has a median household income of less than $40,000, which is below the regional average. Additionally, vehicle access is limited, with the Carson High Silver Campus community having more than 10% of households lacking access to a vehicle, which is higher than the regional average. At this time, mode share data specific to students from this school is not available.

School Crash Summary:

Carson High Silver Campus has a total of 892 reported crashes within its one-mile radius, with 121 occurring during the afternoon peak period (1 to 3 PM), see **Figure 3-5**. Notably, Carson High Silver Campus has the highest number of crashes during the morning peak (7 to 9 AM), with 115 incidents—indicating a significant concentration of crashes during school commute hours. The area also contains 9.1 miles of HIN roads, the most among the schools studied (**Figure 3-6**). These roads are typically characterized by higher speeds, heavier traffic volumes, and fewer pedestrian safety features, posing elevated risks for students who walk, bike, or are dropped off near school.

Within the immediate school zone, Carson High Silver Campus has a moderate crash volume, with only one crash occurring during the morning peak and none during the afternoon peak. It is one of four study schools with zero crashes recorded during the afternoon commute period in the school zone itself. While the zone shows relatively low crash activity during peak hours, the surrounding HIN road network and high crash counts during commute times suggest a need for targeted safety improvements on larger roadways surrounding the school area to better protect students traveling to and from school.

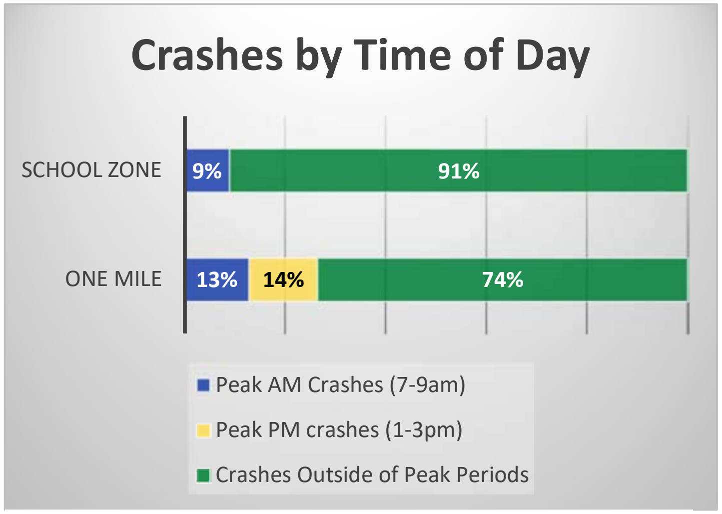


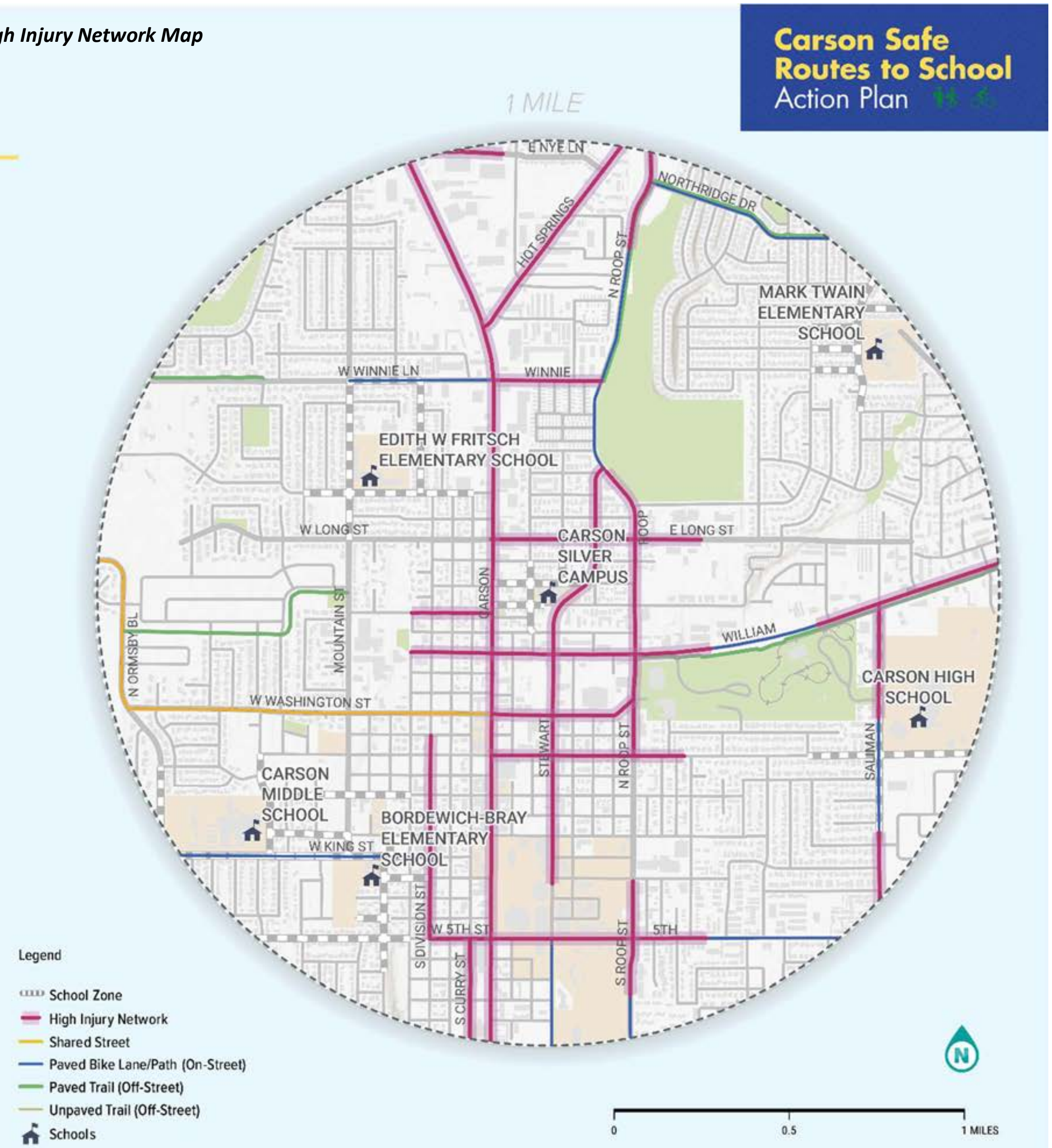
Figure 3-5: Carson High Silver Campus – Crashes by Time of Day

Figure 3-6: Carson High School (Silver Campus) High Injury Network Map

Carson High Silver Campus

Within a 1-mile radius, there are ***9.1*** High Injury Network miles.

Street Name	From	To
N Carson St	E Proctor St	E Washington St
N Carson St	E Washington St	Corbett St
N Carson St	N Of Hot Spring Rd	W Nye Ln
Division	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Rand Ave	State St
Fleischmann	N Carson St	N Division St
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Imperial	E Nye Ln	W Gardengate Wy
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
Roop	Northridge Dr	Hot Springs Rd
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Saliman	N of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W 5th St	S Carison St	S Division St
W Nye Ln	Northgate Ln	N Carson St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St
Winnie	N Roop St	N Carson St



Carson Middle School

School Information:

Carson Middle School is located on W. King Street between Richmond Drive and Ormsby Boulevard on the west side of Carson City. The school campus is surrounded by residential uses on all sides. The median household income in the area ranges from $60,000 to $80,000, which is similar to the regional average. Vehicle access is limited, with more than 10% of households lacking access to a vehicle, which is higher than the regional average. At Carson Middle, 10% of students use walking or rolling to get to school, 25% are driven by car, and 65% take the bus (**Figure 3-7**).

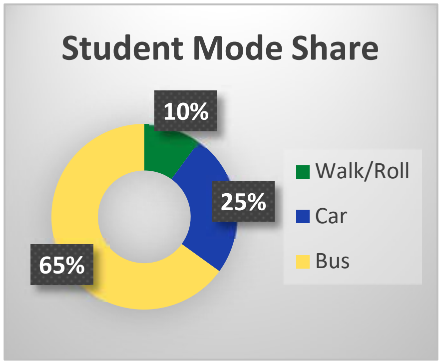


Figure 3-7: Carson Middle – Student Mode Share Data

School Crash Summary:

Carson Middle School has a total of 634 crashes within a one-mile radius, with 173 (27%) occurring during school commute hours—83 in the morning and 90 in the afternoon (**Figure 3-8**). The area includes 6.4 miles of HIN roads, which are typically associated with higher speeds, heavier traffic, and limited pedestrian safety features (**Figure 3-9**). These conditions pose increased risks for students who walk, bike, or are dropped off near school. Within the school zone, 13 crashes were recorded, including 4 during the morning peak and 2 during the afternoon. This represents a higher proportion of crashes occurring in the school zone than within a one-mile radius, which highlights the need for focused safety improvements in the immediate school area.

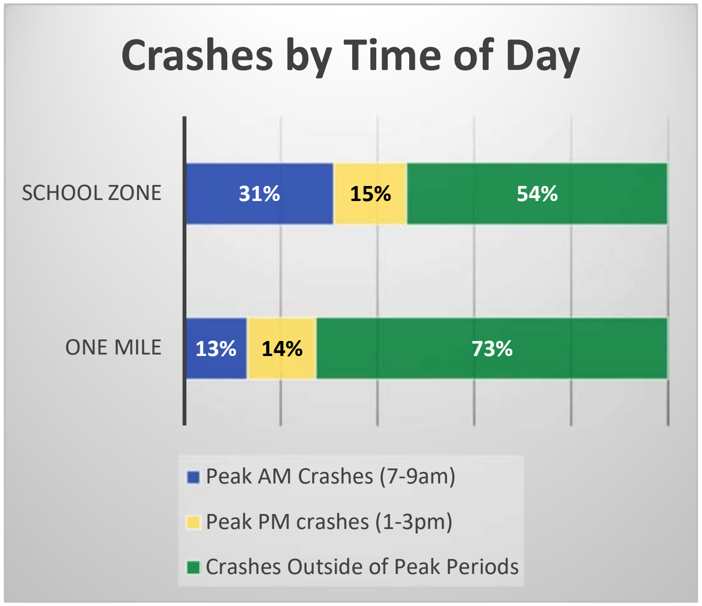


Figure 3-8: Carson Middle – Crashes by Time of Day

Figure 3-9: Carson Middle School High Injury Network Map

Carson Middle School

Within a 1-mile radius, there are ***6.4*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	S Stewart St	10 10th Street
S Division St	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fleishmann St	N Carson St	N Division St
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Stewart St	E 2nd St	E Spear St
Stewart St	E Park St	N Roop St
Stewart St	E William St	E Park St
Stewart St	S Spear Street	E William St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St

Carson Safe Routes to School
Action Plan

Eagle Valley Middle School

School Information:

Eagle Valley Middle School is located on E. 5th Street between Regent Court and Hidden Meadow Drive on the east side of Carson City. The school campus is surrounded by residential neighborhoods and open space. The area has a median household income ranging from $100,000 to $200,000 and is above the regional average. Additionally, less than 5% of households in the area do not have access to a vehicle, which is lower than the regional average. At Eagle Valley Middle, 14% of students use walking or rolling to get to school, 37% are driven by car, and 49% ride the bus (**Figure 3-10**).

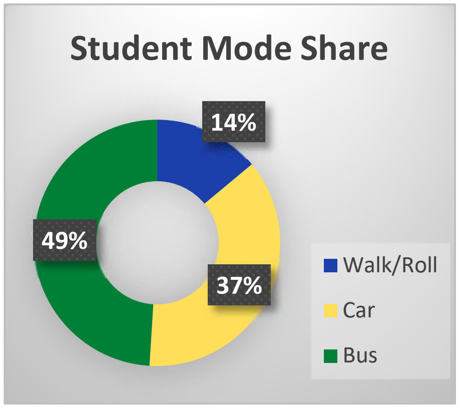


Figure 3-10: Eagle Valley Middle – Student Mode Share Data

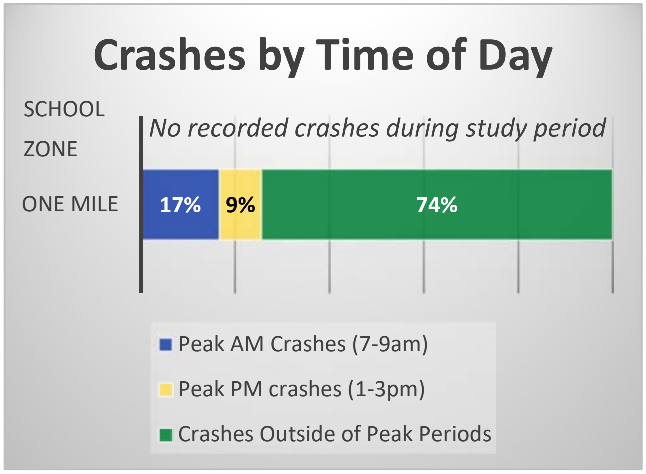


Figure 3-11: Eagle Valley Middle – Crashes by Time of Day

School Crash Summary:

Eagle Valley Middle School has the lowest crash volume among the schools studied, with 90 crashes within a one-mile radius. Of these, 23 occurred during school commute hours—15 in the morning peak (7 to 9 AM) and 8 in the afternoon peak (1 to 3 PM), see **Figure 3-11**. Notably, there are zero miles of HIN roads surrounding the school, likely due to a less complex roadway layout and fewer nearby destinations, which contribute to lower traffic volumes and reduced conflict points (**Figure 3-12**).

Within the school zone itself, there were zero crashes during the morning peak and zero during the afternoon (**Figure 3-11**). The absence of crashes within the school zone suggests that localized safety measures may be effectively protecting students in the immediate vicinity of the school during arrival and dismissal times.

Figure 3-12: Eagle Valley Middle School High Injury Network Map

Eagle Valley Middle School

Within a 1-mile radius, there are ***no*** High Injury Network miles.

Al Seeliger Elementary

School Information:

Al Seeliger Elementary School is located on Saliman Road between Shady Oak Drive and Sonoma Street on the south side of Carson City. The school campus is surrounded by residential uses on all sides. The area has a median household income ranging from $80,000 to $100,000 and is above the regional average. Additionally, less than 5% of households in the area do not have access to a vehicle, which is lower than the regional average. At Al Seeliger, 30% of students use walking or rolling to get to school, 44% are driven by car—which is the highest car drop-off rate among project schools—and 26% ride the bus (**Figure 3-13**).

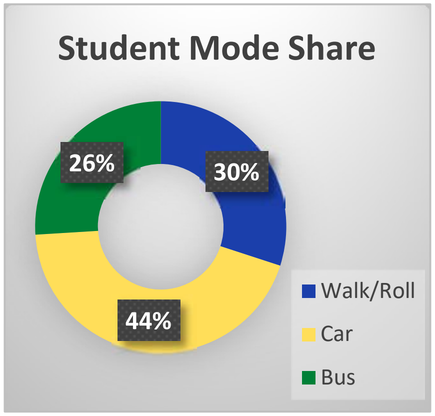


Figure 3-13: Al Seeliger Elementary – Student Mode Share Data

School Crash Summary:

Al Seeliger Elementary School has a total of 291 reported crashes within a one-mile radius, with 22 occurring during the morning peak (7 to 9 AM) and 45 during the afternoon peak (1 to 3 PM), see **Figure 3-14**. This means that 23% of all crashes happened during school commute hours—more than one in every five crashes. The area includes three miles of HIN roads, which are typically characterized by higher speeds, greater traffic volumes, and limited pedestrian safety features (**Figure 3-15**). These conditions can pose significant risks for students who walk, bike, or are dropped off near school. Within the school zone itself, there were zero recorded crashes over the previous five years. Al Seeliger Elementary is one of only two study schools with no crashes reported in the immediate school zone. While the surrounding area presents some safety concerns due to the presence of HIN roads (**Figure 3-15**), the absence of crashes within the school zone suggests that localized safety measures may be effectively protecting students in the immediate vicinity of the school during arrival and dismissal times.

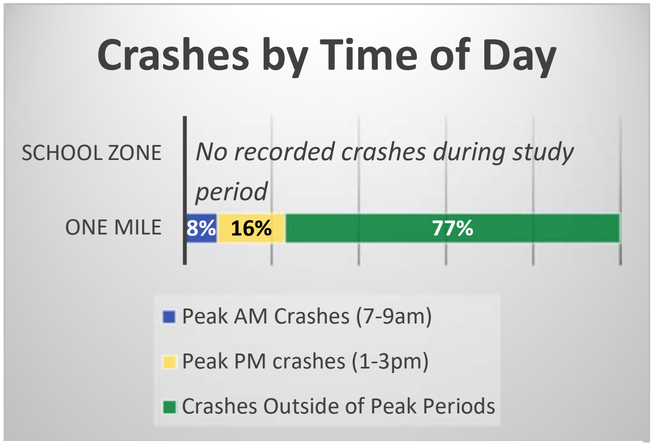


Figure 3-14: Al Seeliger Elementary – Crashes by Time of Day

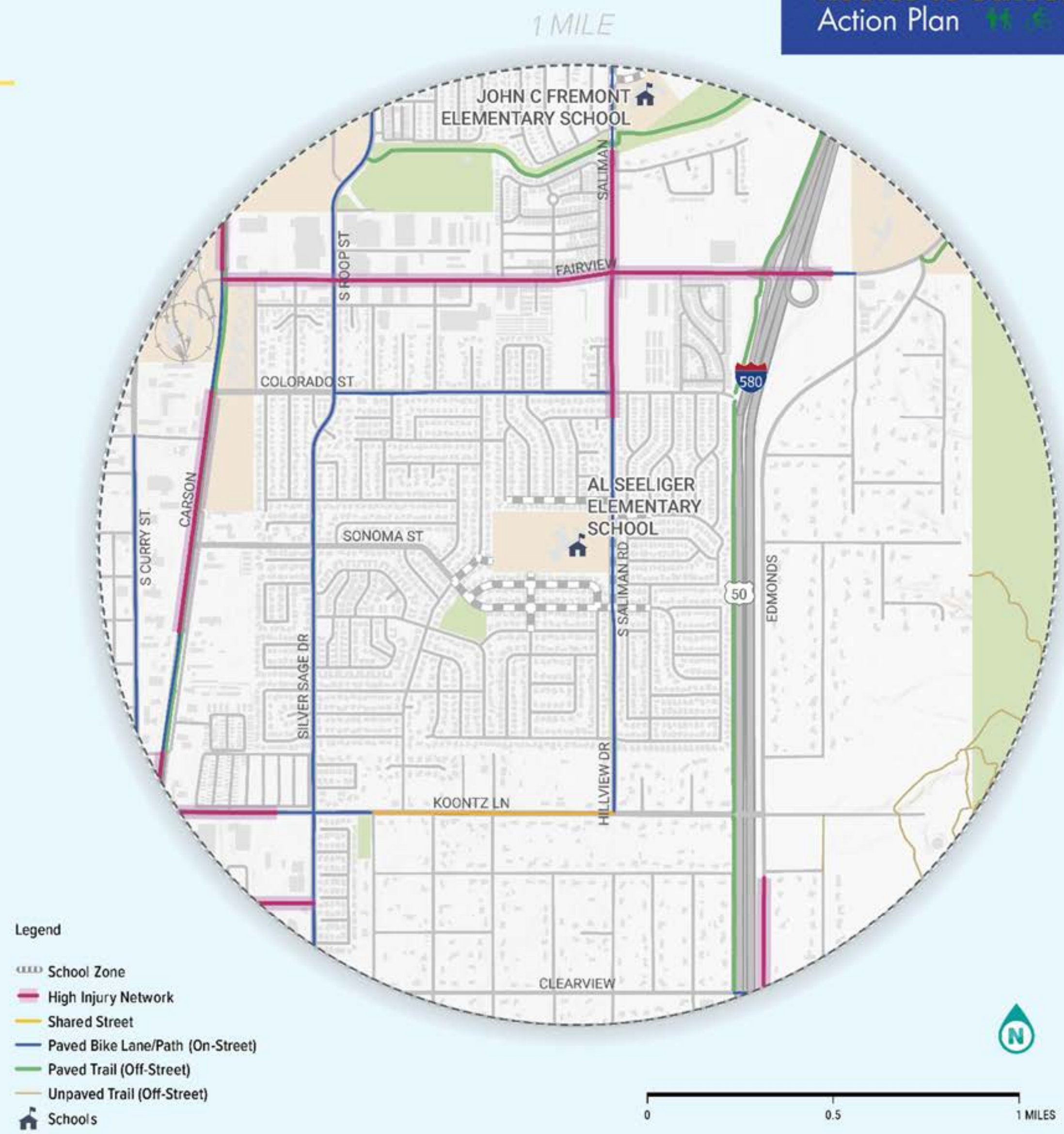
Figure 3-15: Al Seeliger Elementary School High Injury Network Map

Al Seeliger Elementary School

Within a 1-mile radius, there are ***3.0*** High Injury Network miles.

Street Name	From	To
Carson St	Sonoma St	Colorado St
Carson St	N Of Koontz Ln	Sonoma St
Eagle Station Ln	Silver Sage Dr	S Carson St
Edmonds Dr	Clearview Dr	Valley View Dr
Fairview Dr	Industrial Park Dr	S Roop St
Fairview Dr	S Roop St	S Carson St
Fairview Dr	S Saliman Rd	Industrial Park Dr
Fairview Dr	580 On-Ramp	Saliman Rd
Fairview Dr	S Saliman Rd	S Lompa Ln
Koontz Ln	Silver Sage Dr	S Carson St
S Carson St	Fairview Dr	S Stewart St
S Carson St	Moses St	Eagle Station Ln
S Saliman Rd	Fairview Dr	Railroad Dr
Saliman Rd	Heather Way	Fairview Dr

Carson Safe Routes to School Action Plan



Bordewich-Bray Elementary School

School Information:

Bordewich-Bray Elementary School is located at the intersection of Thompson Street and W. King Street in a well-established residential neighborhood on Carson City's west side. The campus is primarily surrounded by residential land uses. The median household income in the area ranges from $60,000 to $80,000, which is close to the regional average. However, vehicle access is relatively low, with over 10% of households lacking access to a vehicle. At Bordewich-Bray Elementary, 9% of students use walking or rolling to get to school, 17% are driven by car, and 74% ride the bus, which is the highest bus ridership among all the schools (**Figure 3-16**).

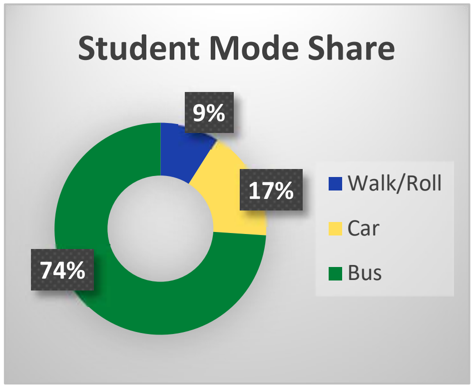


Figure 3-16: Bordewich-Bray Elementary – Student Mode Share Data

School Crash Summary:

Bordewich-Bray Elementary has a total of 715 reported crashes within a one-mile radius, with 90 occurring during the morning peak (7 to 9 AM) and 104 during the afternoon peak (1 to 3 PM), see **Figure 3-17**. This means that 27.1% of all crashes happened during school commute hours, indicating a high level of student exposure to crash-prone conditions. Within the school zone itself, 20 crashes were recorded, including 4 during the morning peak and 2 during the afternoon (**Figure 3-17**). The area also includes 7.5 miles of HIN roads, which are typically associated with higher speeds, greater traffic volumes, and limited pedestrian safety features—conditions that pose elevated risks for children walking, biking, or being dropped off near school (**Figure 3-18**).

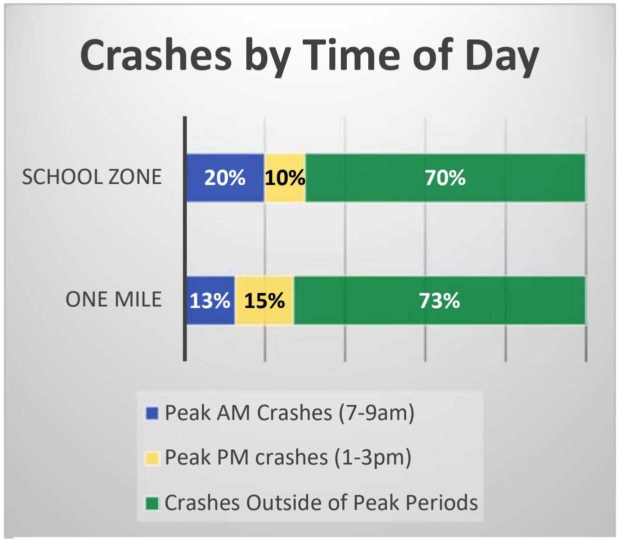


Figure 3-17: Bordewich-Bray Elementary – Crashes by Time of Day

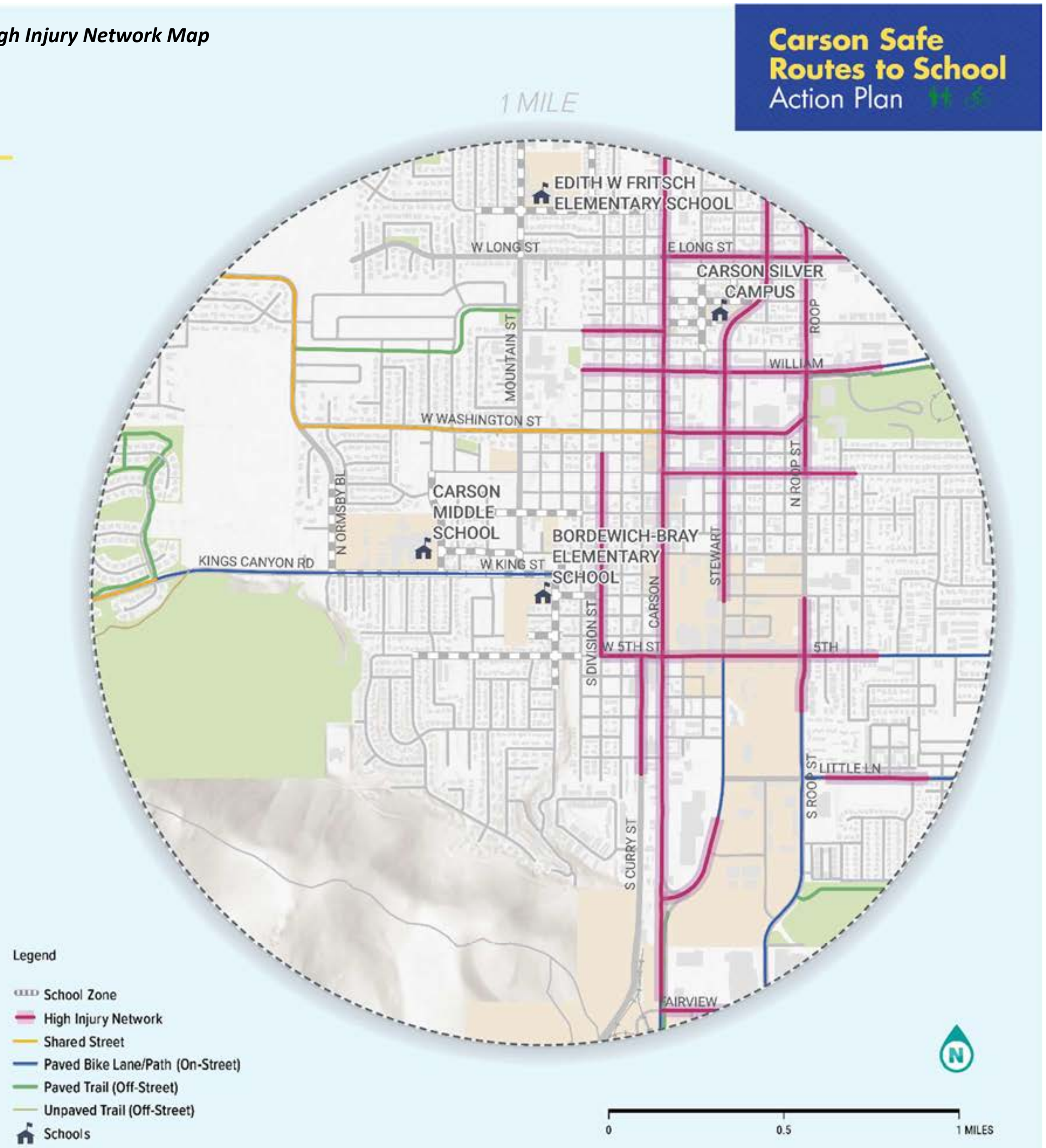
While the crash volume in the immediate zone is lower than the surrounding area, the presence of HIN roads and the high proportion of crashes during commute times suggest a need for targeted safety interventions that could help reduce risks and better protect students during arrival and dismissal periods.

Figure 3-18: Bordewich-Bray Elementary School High Injury Network Map

Bordewich-Bray Elementary School

Within a 1-mile radius, there are **7.5** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	S Stewart St	10 10th Street
Division	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fairview St	S Roop St	S Carson St
Fleishmann St	N Carson St	N Division St
Little Ln	Parkland Ave	S Roop St
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Stewart St	E 2nd St	E Spear St
Stewart St	E Park St	N Roop St
Stewart St	E William St	E Park St
Stewart St	S Spear Street	E William St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St



Empire Elementary

School Information:

Empire Elementary School is situated between Gordonia Avenue, Stanton Drive, Monte Rosa Drive, and La Loma Drive in an established residential neighborhood on Carson City's east side. The campus is surrounded by residential housing and borders a local park to the north. Empire Elementary is located within a USDOT-designated area of persistent poverty. The median household income in this area ranges from $40,000 to $60,000, which is below the regional average. Despite this, vehicle access is high, with fewer than 5% of households lacking access to a vehicle. At Empire Elementary, 50% of students use walking or rolling to get to school—the highest percentage of active transportation among the project schools. Only 11% are driven by car and 39% ride the bus (**Figure 3-19**).

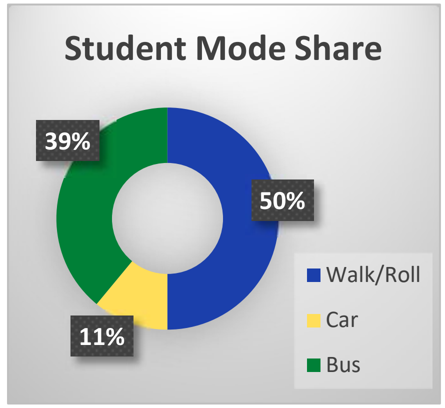


Figure 3-19: Empire Elementary – Student Mode Share Data

School Crash Summary:

Empire Elementary School has a total of 729 reported crashes within a 1 mile radius, with 80 occurring during the morning peak (7 to 9 AM) and 74 during the afternoon peak (1 to 3 PM), see **Figure 3-20**. This means that 21.1% of all crashes happened during school commute hours—more than one in every five crashes. The area includes 3.2 miles of HIN roads, which are typically associated with higher speeds, greater traffic volumes, and limited pedestrian safety features (**Figure 3-21**). These conditions pose increased risks for students who walk, bike, or are dropped off near school. Within the school zone at Empire Elementary, 36 crashes were recorded, including 6 during the morning peak and 1 during the afternoon. This level of crash activity in the immediate vicinity of the school reflects a pattern of elevated risk during student commute hours. The presence of incidents during these key travel times may indicate underlying safety challenges in the school zone environment that warrant closer attention.

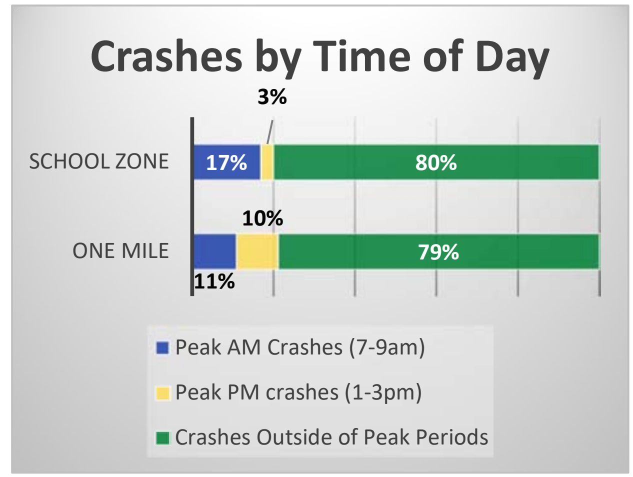


Figure 3-20: Empire Elementary – Crashes by Time of Day

Figure 3-21: Empire Elementary School High Injury Network Map

Empire Elementary School

Within a 1-mile radius, there are ***3.2*** High Injury Network miles.

Street Name	From	To
College Pkwy	Hwy 50	Sherman Ln
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
Fairview	Sweetwater Dr	Hwy 50
Gordon St	Walker Dr	Brown St
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Brown St	College Pkwy
Hwy 50	Carter Ave	Merrimac Way
Hwy 50	Nichols Ln	East Of Airport Rd
Hwy 50	Sherman Ln	College Pkwy
Hwy 50	West Of Brown St	West Of Silver State St
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50

Fremont Elementary School

School Information:

Fremont Elementary School is located on Saliman Road, between Firebox Road and Railroad Drive. The school is bordered by residential areas to the north, south, and west, with open space to the east. Fremont Elementary is also situated within a USDOT-designated area of persistent poverty. The median household income in the area ranges from $40,000 to $60,000, which is below the regional average. Vehicle access is limited, with more than 10% of households lacking access to a vehicle which is higher than the regional average. At Fremont Elementary, just 4% of students use walking or rolling to get to school, 42% are driven by car, and 54% take the bus (**Figure 3-22**).

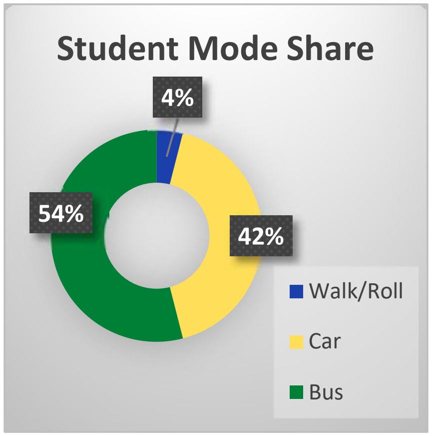


Figure 3-22: Fremont Elementary – Student Mode Share Data

School Crash Summary:

Fremont Elementary School has a total of 443 reported crashes within a one-mile radius, with 55 occurring during the morning peak (7 to 9 AM) and 62 during the afternoon peak (1 to 3 PM), see **Figure 3-23**. This means that 26.4% of all crashes happened during school commute hours—more than one in every four crashes. The area is surrounded by 5.1 miles of HIN roads, which are typically associated with higher speeds, greater traffic volumes, and limited pedestrian safety features (**Figure 3-24**). These conditions can increase the risk for students traveling to and from school, particularly those who walk, bike, or are dropped off nearby. Within the school zone at Fremont Elementary, 10 crashes were recorded, including 1 during the morning peak and 2 during the afternoon. While the number of incidents in the immediate school zone is relatively low, the presence of HIN roads and the concentration of crashes during afternoon commute times suggest broader safety concerns in the surrounding area. These patterns may point to environmental and traffic-related factors that warrant further attention to support safe travel for students.

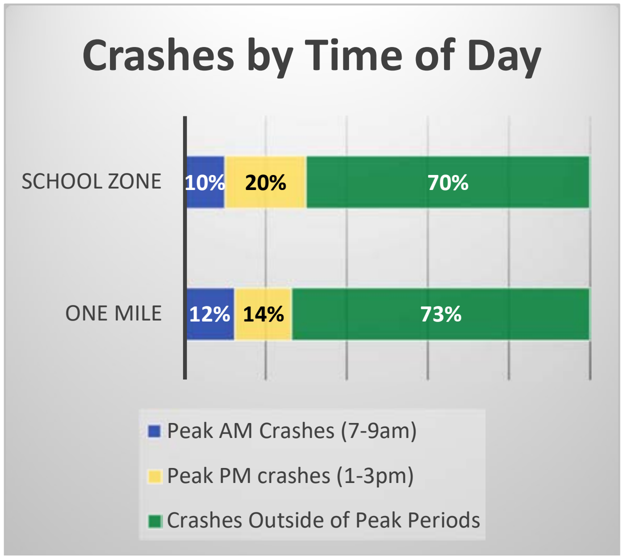


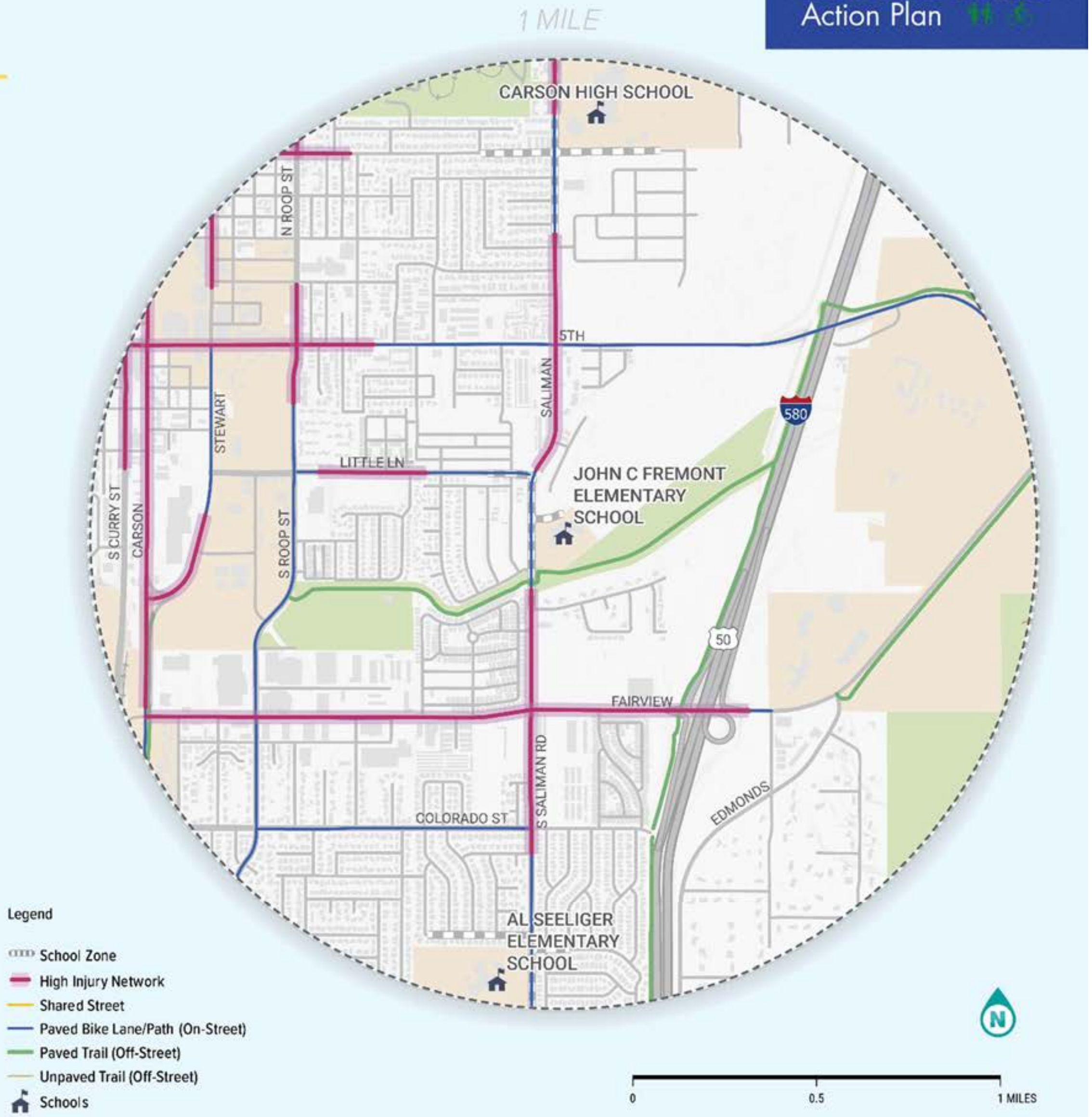
Figure 3-23: Fremont Elementary – Crashes by Time of Day

Figure 3-24: John C Fremont Elementary School High Injury Network Map

John C Fremont Elementary School

Within a 1-mile radius, there are ***5.1*** High Injury Network miles.

Street Name	From	To
Carson St	S Stewart St	10 10th Street
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Robinson St	N Harbin Ave	N Valley St
Fairview	Industrial Park Dr	S Roop St
Fairview	S Roop St	S Carson St
Fairview	S Saliman Rd	Industrial Park Dr
Fairview Dr	580 On-Ramp	Saliman Rd
Fairview Dr	S Saliman Rd	S Lompa Ln
Little Ln	Parkland Ave	S Roop St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	Little Ln	E 2nd St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Saliman Rd	Fairview Dr	Railroad Dr
Saliman Rd	Little Ln	E 5th Street
Saliman Rd	North Of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Saliman Rd	Heather Way	Fairview Dr
Stewart St	E 2nd St	E Spear St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St



Edith Fritsch Elementary School

School Information:

Edith Fritsch Elementary School is located on Bath Street between Mountain Street and Division Street. The school campus is surrounded by residential neighborhoods with Carson Street, a major commercial corridor, approximately 1,000 feet to the east. The area has a median household income ranging from $80,000 to $100,000 and is above the regional average. Additionally, around 5% to 10% of households in the area do not have access to a vehicle, indicating a moderate level of vehicle access. At Edith Fritsch Elementary, 26% of students use walking or rolling to get to school, 40% are driven by car, and 34% ride the bus (**Figure 3-25**).

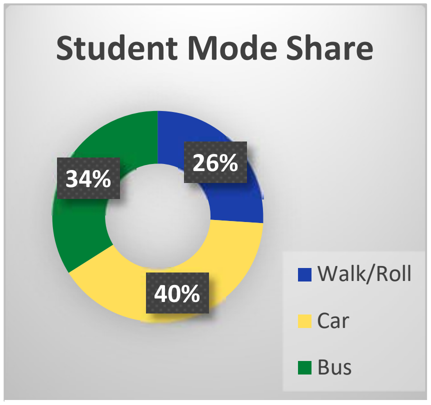


Figure 3-25: Fritsch Elementary – Student Mode Share Data

School Crash Summary:

Edith Fritsch Elementary School has a total of 686 reported crashes within a one-mile radius, with 77 occurring during the morning peak (7 to 9 AM) and 93 during the afternoon peak (1 to 3 PM), see **Figure 3-26**. This means that 24.8% of all crashes happened during school commute hours—nearly one in every four crashes. The area includes eight miles of HIN roads, the second highest among the schools studied. While the overall crash volume is moderate, the presence of extensive HIN roadways indicates that students may encounter segments of roadway with comparatively high safety concerns (**Figure 3-27**). Within the school zone at Edith Fritsch Elementary, 11 crashes were recorded, including 1 during the morning peak and 1 during the afternoon. Although the number of incidents in the immediate school zone is relatively low, the surrounding roadway environment presents conditions that may contribute to increased safety concerns. These patterns suggest a need for continued attention to the broader traffic context in which students travel to and from school.

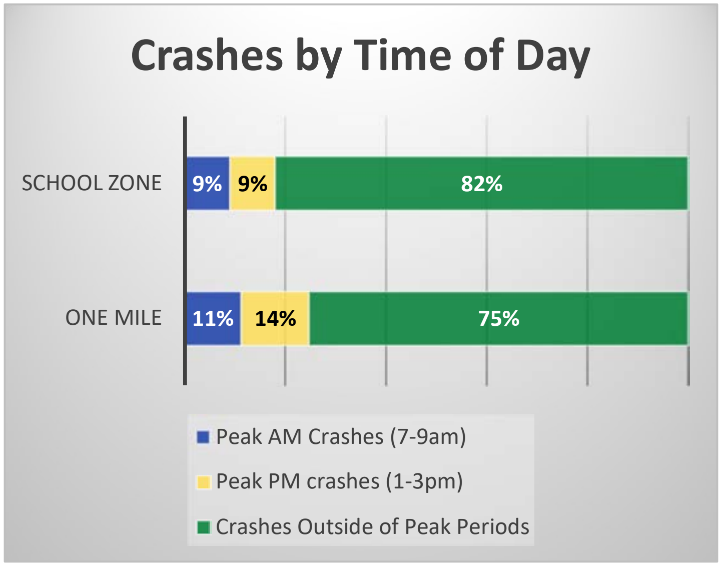


Figure 3-26: Fritsch Elementary – Crashes by Time of Day

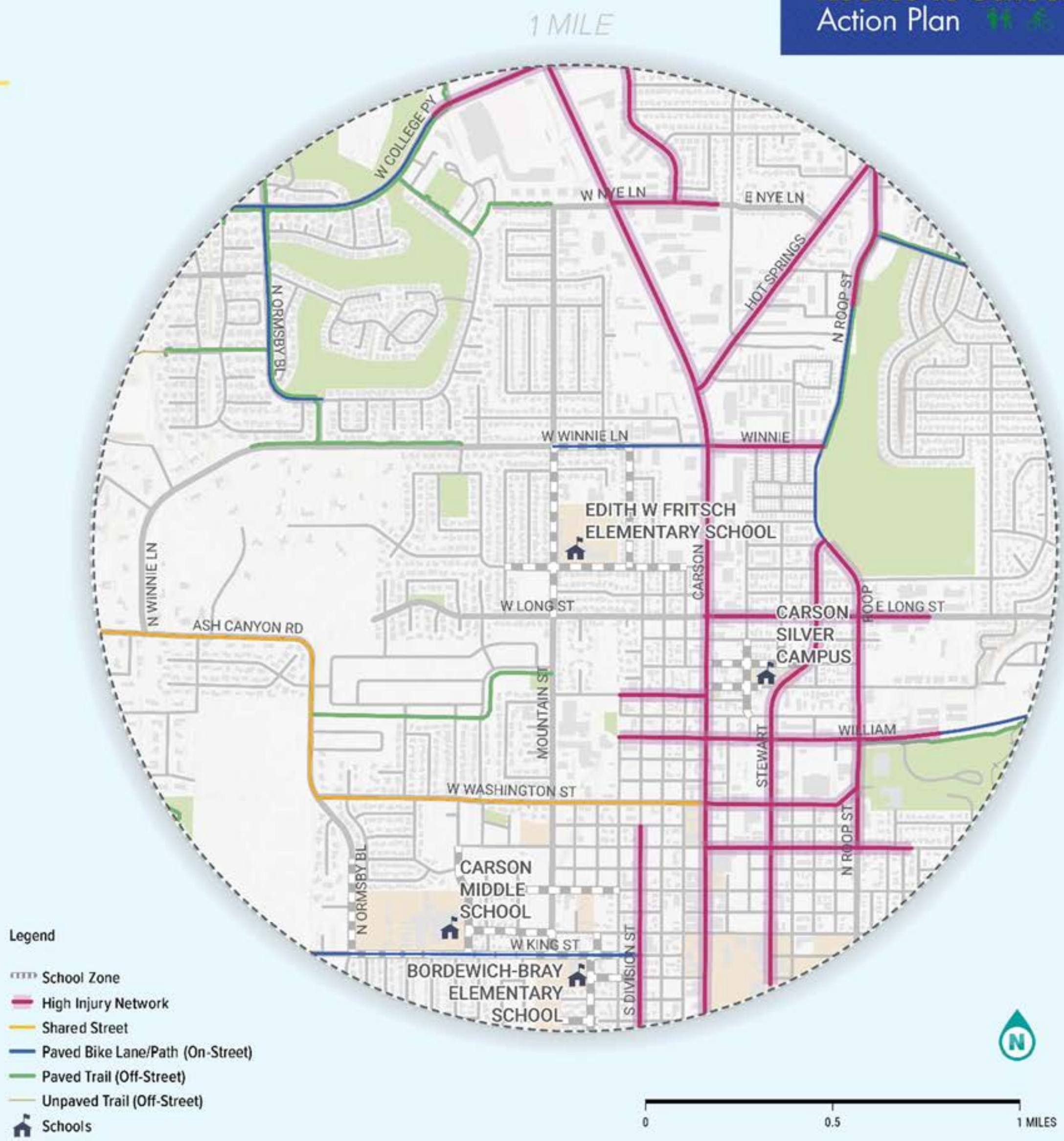
Figure 3-27: Edith W Fritsch Elementary School High Injury Network Map

Edith W Fritsch Elementary School

Within a 1-mile radius, there are ***8*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	N Of Hot Spring Rd	W Nye Ln
Division	W King St	W Caroline St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fleishmann St	N Carson St	N Division St
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Imperial	E Nye Ln	W Gardengate Way
Imperial	W Gardengate Way	Alexa Way
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Carson St	W 5th St	E Musser St
N Carson St	W College Parkway	Silver Oak Dr
N Carson St	W Nye Ln	W College Pkwy
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
Roop	Northridge Dr	Hot Springs Rd
S Division St	W 5th St	W King St
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W College Pkwy	Imperial Way	N Carson St
W College Pkwy	N Clarkson St	Cs Richards Blvd
W Nye Ln	Northgate Ln	N Carson St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St
W Winnie Ln	N Roop St	N Carson St

Carson Safe Routes to School Action Plan



Mark Twain Elementary

School Information:

Mark Twain Elementary School is located on Carriage Crest Drive between Spooner Drive and Hamilton Avenue. The school campus is surrounded by a residential neighborhood with a commercial corridor along William Street to the south. The area has a median household income of less than $40,000, which is below the regional average. Additionally, vehicle access is limited, with more than 10% of households lacking access to a vehicle, which is higher than the regional average. At Mark Twain Elementary, 31% of students use walking or rolling to get to school, 35% are driven by car, and 34% ride the bus (**Figure 3-28**).

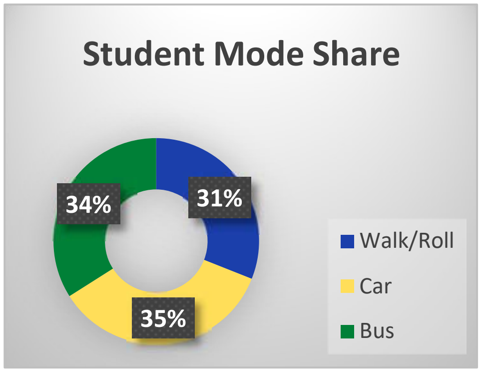


Figure 3-28: Fritsch Elementary – Student Mode Share Data

School Crash Summary:

Mark Twain Elementary School has the highest total number of crashes among all schools studied, with 1,064 reported incidents within a one-mile radius. Of these, 114 occurred during the morning peak (7 to 9 AM) and 119 during the afternoon peak (1 to 3 PM), meaning that 20% of all crashes happened during school commute hours, see **Figure 3-29**. The area includes 5.1 miles of HIN roads (**Figure 3-30**), which are often associated with higher speeds, greater traffic volumes, and fewer pedestrian safety features—conditions that can increase risk for students traveling near the school.

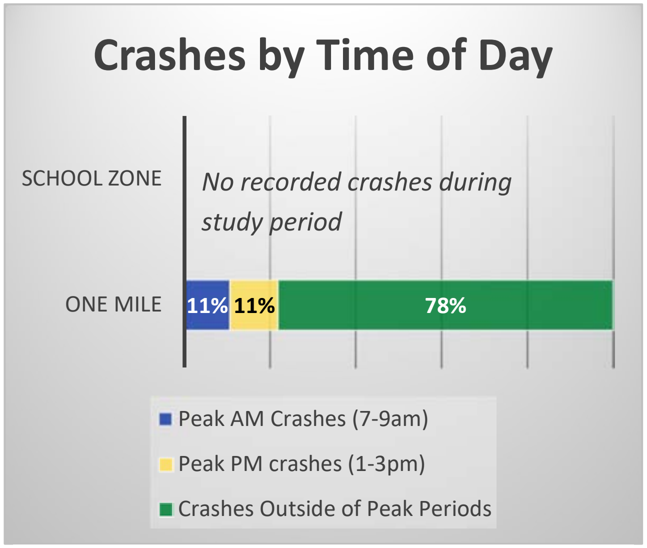


Figure 3-29: Mark Twain Elementary – Crashes by Time of Day

Within the school zone at Mark Twain Elementary, no crashes were recorded during either the morning or afternoon peak periods. Mark Twain is one of the few schools with zero reported crashes in the immediate school zone. While this suggests a relatively safe zone for students during arrival and dismissal, the surrounding crash volume and roadway characteristics point to broader environmental factors that may warrant further monitoring and evaluation.

Figure 3-30: Mark Twain Elementary School High Injury Network Map

Mark Twain Elementary School

Within a 1-mile radius, there are **7.7** High Injury Network miles.

Street Name	From	To
N Carson St	E Washington St	Corbett St
N Carson St	N Of Hot Spring Rd	W Nye Ln
College Pkwy	580 Ramp	Emerson Dr
College Pkwy	Emerson Dr	Cinnabar Ave
College Pkwy	Research Way	Market St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
E William St	Rand Ave	State St
Emerson Dr	College Pkwy	Mark Way
Goni Rd	College Pkwy	Old Hot Spring Rd
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Nichols Ln	E of Airport Rd
Imperial	E Nye Ln	W Gardengate Wy
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Hot Spring Rd	College Pkwy
Research Way	College Pkwy	College Pkwy
Research Way	Goni Drive	College Pkwy
N Roop St	E Adams St	N Stewart St
N Roop St	Northridge Dr	Hot Springs Rd
Saliman	N of E Robinson St	E William St
Stewart	E Park St	N Roop St
N Stewart St	E William St	E Park St
N Stewart St	S Spear Street	E William St
W Nye Ln	Northgate Ln	N Carson St
E Williams St	N Anderson St	N Carson St
E Williams St	Oxoby Loop	N Anderson St
W Winnie Ln	N Roop St	N Carson St

Stewart Headstart Washoe Tribe

School Information:

Stewart Headstart Washoe Tribe is located on De Lah E Deh between Gibson Avenue and Havasupi Drive. The school campus is surrounded by a residential neighborhood. The area has a median household income of $80,000 to $100,000, which is above the regional average. Additionally, vehicle access is high, with less than 5% of households lacking access to a vehicle which is lower than the regional average. At this time, mode share data specific to students from this school is not available.

School Crash Summary:

Stewart Headstart has a total of 482 reported crashes within a one-mile radius, with 22 occurring during the morning peak (7 to 9 AM) and 55 during the afternoon peak (1 to 3 PM). This means that 16% of all crashes happened during school commute hours. The school is surrounded by 1.5 miles of HIN roads, which are typically associated with higher speeds, greater traffic volumes, and fewer pedestrian safety features (**Figure 3-31**). Despite the presence of HIN roads (**Figure 3-32**), the overall crash volume is relatively low, likely due to the school's location within a residential neighborhood characterized by slower streets and reduced traffic complexity.

Within the school zone itself, no crashes were recorded during either the morning or afternoon peak periods. Stewart Headstart is among the few schools with zero reported crashes in the immediate school zone. While this suggests a relatively safe environment for students during arrival and dismissal, the surrounding roadway conditions and commute-hour crash patterns may still warrant ongoing monitoring to ensure continued safety for young travelers.

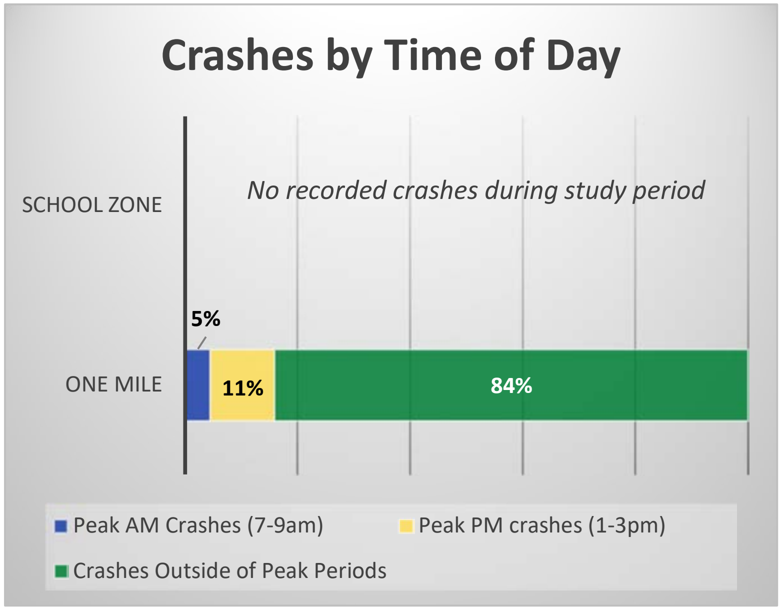


Figure 3-31: Stewart Headstart Washoe Tribe– Crashes by Time of Day

Figure 3-32: Stewart Headstart Washoe Tribe- High Injury Network Map

Stewart Headstart Washoe Tribe

Carson Safe Routes to School Action Plan

Within a 1-mile radius, there are ***1.5*** High Injury Network miles.

Street Name	From	To
W Clearview Dr	Silver Sage Dr	S Carson St
Eagle Station Ln	Silver Sage Dr	S Carson St
S Carson St	Clearview Dr	Eagle Station Ln
S Carson St	W Appion Way	W Clearview Dr
S Carson Street	Old Clear Creek Road	Warehouse Way
S Carson Street	Route 50	Old Clear Creek Road
W Clearview Dr	S Carson St	Cochise St

Walking and Biking Barrier Analysis

As part of Carson City's SRTS initiative, a detailed barrier analysis was conducted to better understand where the city's active transportation network—such as sidewalks, bike lanes, and trails—may be falling short for students. The goal was to identify areas where walking and biking to school is difficult or not as safe, and to highlight opportunities for future improvements.

Analysis Factors

This analysis focused on the areas surrounding six elementary schools, two middle schools, two high schools, and one Head Start program located in the Stewart community. These schools represent a wide range of student populations and neighborhoods across the city.

To evaluate the network, a scoring system was developed using several key factors (further described in **Table 3-2**):

- Safety
- Socioeconomic Need
- SRTS Master Plan Project Status[2]
- School Proximity
- Public Comments

Table 3-2: Barrier Analysis Factors

Factors	Rationale	Points
Safety	Focusing on roadways where serious injuries are most likely to occur	On a HIN roadway: 40 points
Socioeconomic Need	Prioritizing communities with greater need	Within USDOT Area of Persistent Poverty: 10 points
SRTS Master Plan Project Status	Leverage prior planning efforts and existing projects	• Completed: -10 points • Partially Completed: -5 points • No existing project: 0 points • Unprogrammed: 5 points • Programmed: 10 points
School Proximity	Providing benefits to multiple schools and near school campuses	Distance to each study school: • <0.1 mi = 4 points • 0.1–0.25 mi = 3 points • 0.25–0.5 mi = 2 points • 0.5–1 mi = 1 point • >1 mi = 0 points
Public Comments	Addressing public concerns	Within 250 ft of comment: 5 points

More information about socioeconomics, safety, and the HIN analyses are included in Appendix A, B, and C.

It's important to understand that the roadways identified as barriers in this analysis are not limited to locations lacking sidewalks, trails, or bike facilities. Instead, they represent areas where safety concerns or gaps in connectivity make it more difficult for students to walk

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[2] *Refer to the Carson City Safe Routes to School Master Plan for more information.*

or bike to school safely and comfortably. Many of these roadways serve as important corridors that could benefit students attending multiple schools, making them especially impactful targets for future improvements.

Each roadway segment was scored using the criteria above. Segments with the highest scores were categorized as either Primary or Secondary barriers. This classification helps distinguish between the most critical needs and those that are still important but may be less urgent.

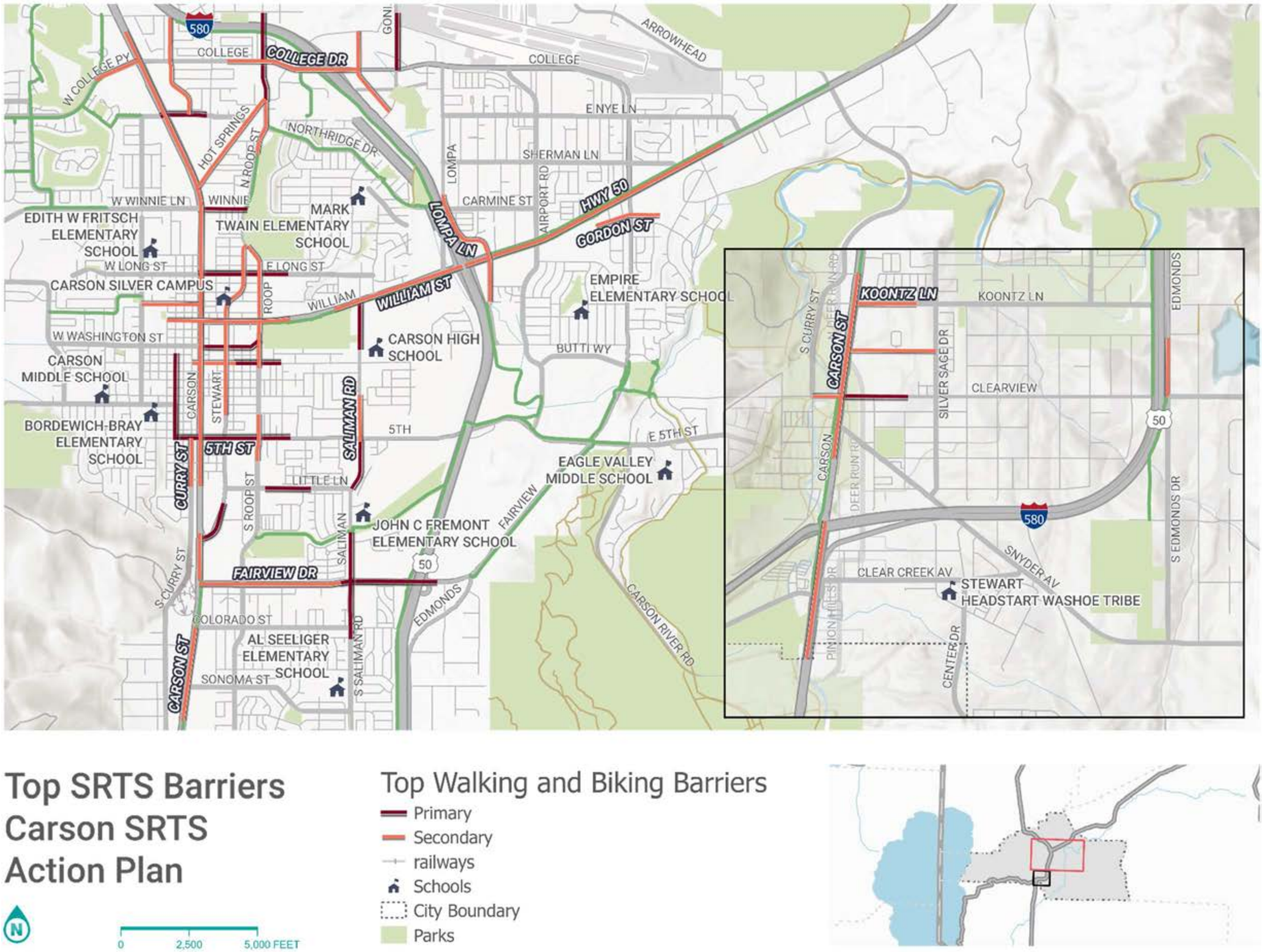
Analysis Results

To keep the analysis focused on areas most relevant to students, only roadways within a one-mile radius of each school were included. Roadways beyond this distance were not evaluated in detail and were automatically assigned the lowest possible barrier score, since they fall outside the typical walking and biking range for school-aged children.

The results of the barrier analysis were presented in two ways:

- All identified barriers (primary and secondary) across Carson City (**Figure 3-33**).
- Individual maps for each school that highlight the primary and secondary barriers within a one-mile radius. These maps provide a clear visual summary of where improvements may be most beneficial and how they relate to school access across the city. The individual school maps are included in the **Appendix D**.

Figure 3-33: Top SRTS Barriers



4

SRTS Engineering Recommendations

4 SRTS Engineering Recommendations

The project team conducted engineering and programmatic reviews of each study school to identify improvements to enhance the walking and biking networks connecting each school. The engineering review included an evaluation of relevant data including recent crash history, crash severity, time of day, and the location of bicycle and pedestrian facilities. The findings from this review and the analysis results informed the development of specific recommendations for each school. Recommended Engineering projects are divided into three tiers:

Tier 1 – Quick Wins

Quick win projects involve minimal capital costs such as changes to signage or adding a painted curb extension. These improvements are anticipated to be implemented as soon as possible to provide immediate benefits for students walking and biking to school.

Tier 2 – SRTS Core Projects

Tier 2 projects are intended to be implemented over the next 20 years. These projects are prioritized based on their proximity to schools and community destinations, crash history on the corridor, and implementation feasibility (see **Table 4-1** for more details). Tier 2 projects are further divided into four categories based on the primary safety issues addressed:

- Bicycle Network Enhancements – Focused on enhancing and expanding the bicycle network.
- Crossing Safety Enhancements – Focused on improving roadway crossings.
- Walk Zone Connectivity Enhancements – Focused on improving pedestrian connectivity within school walk zones (one mile surrounding each school).
- Corridor Enhancements – Focused on improvements to multiple aspects of a specific corridor.

Tier 3 – Aspirational Projects

These projects represent an ideal conceptual network of low-stress bicycle facilities across Carson City. The projects focus on providing students with a safe and comfortable route based on design best practices from around the Country. Designing for "all ages and abilities" would provide students and the large senior population with a safe and comfortable way to travel without a vehicle based on guidance from the Federal Highway Administration (FHWA) and the National City and Transportation Officials (NACTO).[3,4] These projects are conceptual and require further analysis before being programmed.

Tier 1 and Tier 2 projects are shown spatially in **Figure 4-1**. Tier 1 projects are shown in **Table 4-3**, Tier 2 projects are shown in **Table 4-4** through **Table 4-7** and divided by their project category. Tier 3 projects are shown in **Figure 4-2** and included in **Table 4-8**. Project IDs (example: WZ-2) included in **Table 4-3** through **Table 4-8** are also shown on the corresponding figures to highlight the project locations.

School Profiles

Recommendations specific to each school are highlighted within the school profiles (included in **Appendix E**) later in this section. Each School Profile includes a map and table noting all recommended improvements (Tiers 1, 2, 3) within a mile of the school that will provide a direct benefit to students walking or biking to that school.

[3] FHWA, Bikeway Selection Guide (2019), FHWA, Separated Bike Lanes on Higher Speed Roadways: A Toolkit and Guide (2024).

[4] NACTO, Urban Bikeway Design Guide (2025); NACTO, Designing Streets for Kids (2020).

Prioritization Process

To focus improvements in areas with the greatest needs and those that provide benefits to multiple schools, the project team applied a weighted prioritization process based on previous data analysis findings. This enables the City to identify the most critical projects and phase implementation over time.

Tier 2 projects, which involve more significant capital and infrastructure improvements than Tier 1 projects, were evaluated using the prioritization criteria in **Table 4-1**. Projects received an individual score for each criterion as well as a combined score based on all six metrics. Projects are divided into short-term, medium-term, and long-term implementation timeframes based on the combined total score.

Short-term projects reflect the proposed improvements that scored in the highest third of prioritization process scores. Implementing these high-priority projects first will help the City most directly improve safety and connectivity for students walking and biking to school. These projects are recommended for dedicated resources for design and construction along with additional analysis and community engagement as needed.

Table 4-1: Prioritization Metrics

Prioritization		
Metric	**Point Rankings**	
Socioeconomics	Within disadvantaged tract(s)	5 pts
	Not within disadvantaged tract(s)	0 pts
School Proximity	Within 1/8 mile	10 pts
	Within 1/4 mile	5 pts
	Within 1/2 mile	2 pts
Community Facility Proximity	Within 1/8 mile	6 pts
	Within 1/4 mile	4 pts
	Within 1/2 mile	2 pts
Safety	Reduces vehicle speeds	4 pts
	Improves intersection	4 pts
	Improves/adds new sidewalk or pathway	4 pts
Active Transportation Barrier	Primary barrier	15 pts
	Secondary barrier	10 pts
	Not on barrier roadway	0 pts
Cost Per Mile	< $100,000	10 pts
	$100,001 - $500,000	8 pts
	$500,001 - $1,000,000	4 pts
	$1,000,001+	0 pts

Medium-term projects scored in the middle third and long-term projects in the last third based on the prioritization process. These are recommended to be implemented following the short-term projects; however, implementation opportunities may arise that may include elements of medium- or long-term projects.

Cost Estimates

Planning level cost estimates were developed for each recommended engineering project based on planning level project concepts. These cost estimates include curb ramps and minor modifications to drainage but do not include costs for rights-of-way or major stormwater enhancements. Cost estimates for Tier 1 projects focus on quick build materials where Tier 2 and Tier 3 projects represent permanent installations such as sidewalks and concrete medians. It is important to note that using quick build materials for bicycle facility and intersection improvements in Tier 2 and Tier 3 projects would reduce the overall costs and may help speed implementation of improvements. The City will consider a variety of materials from quick build to permanent during the design phase of funded projects.

Table 4-2: Cost Estimate Ranges

Cost Estimate Symbol	Cost Estimate Range
$	Less than $99,000
$$	$100,000 - $499,999
$$$	$500,000 - $999,999
$$$$	$1,000,000 - $1,999,999
$$$$$	$2,000,000+

Planning level order of magnitude cost estimates for each engineering project are symbolized in **Table 4-3** through **Table 4-8** based on the categories shown in **Table 4-2**.

Safe Routes to School Design Toolbox

The Carson City Safe Routes to School Design Toolbox (**Appendix F**) includes a wide variety of improvement and facility types that may be appropriate at different locations based on roadway conditions, activity levels, and area context. The concepts included in this toolbox will inform the design process for Tier 2 and Tier 3 projects.

Figure 4-1: Tier 1 & 2 SRTS Recommendations

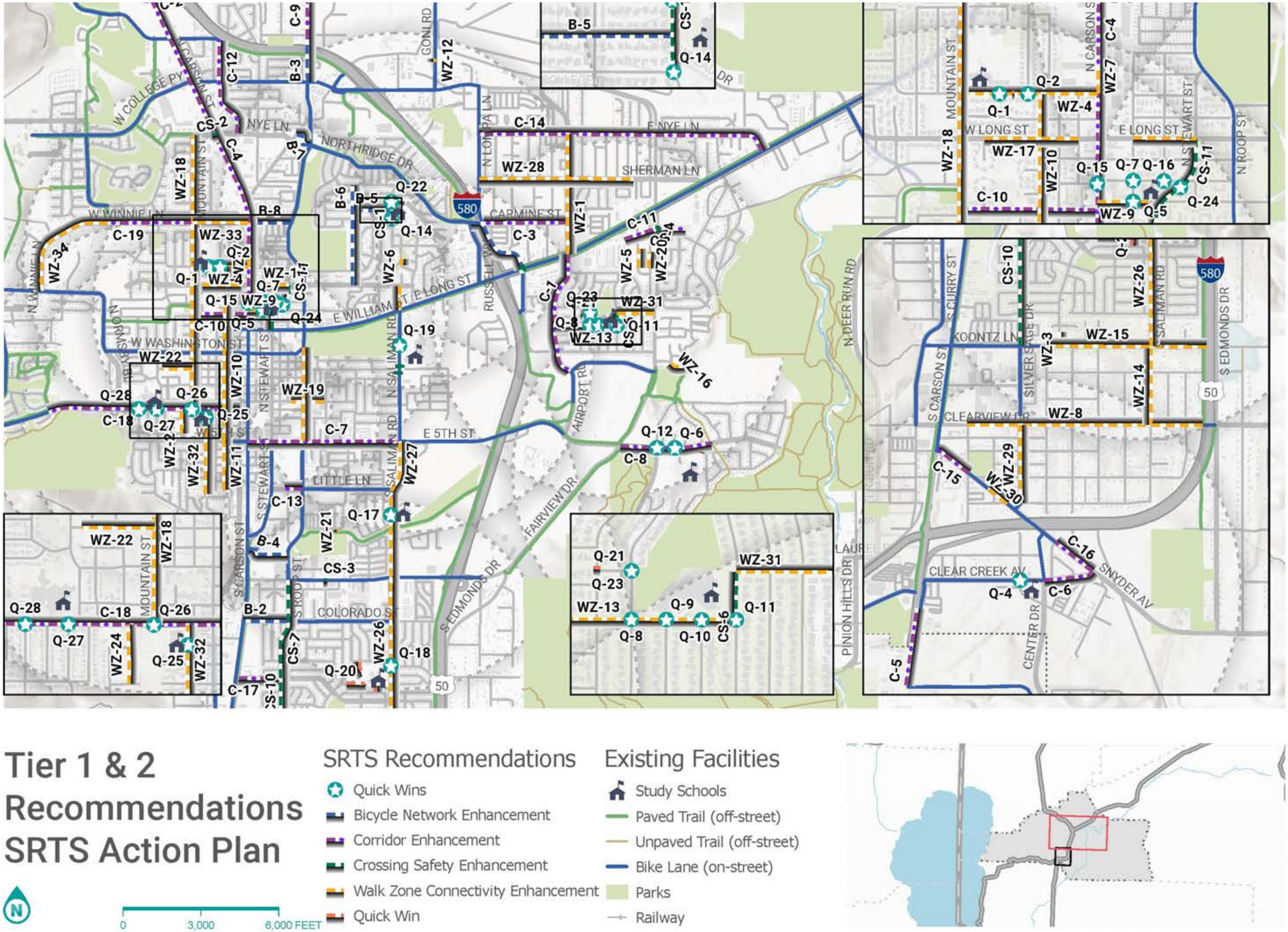


Table 4-3: Tier 1: Quick Wins

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
Q-1	Bath St.	Midblock crossing	Install curb extensions	Quick Win	$
Q-2	Bath St.	Division St.	Install curb extensions	Quick Win	$
Q-3	Bath St.	At FrES ES parent exit	Extend existing red curb by 20 feet to the east	Quick Win	$
Q-4	Clear Creek Ave.	Silver Sage Dr.	Upgrade to all-way stop control, or curb extensions	Quick Win	$
Q-5	Corbett St.	Fall St.	Upgrade to all-way stop control	Quick Win	$
Q-6	E. 5th St.	Regent Ct.	Install S1-1 signs for both directions	Quick Win	$
Q-7	Fall St.	Park St.	Upgrade to all-way stop control	Quick Win	$
Q-8	Gordonia Dr.	La Loma Dr.	Upgrade to all-way stop control	Quick Win	$
Q-9	Gordonia Dr.	Cascade Dr.	Install curb extensions	Quick Win	$
Q-10	Gordonia Dr.	Glacier Dr.	Install curb extensions	Quick Win	$
Q-11	Gordonia Dr.	Monte Rosa Dr.	Upgrade to all-way stop control	Quick Win	$
Q-12	Hells Bells Rd.	E. 5th St.	Install S1-1 for westbound traffic	Quick Win	$
Q-13	Hidden Meadows Dr.	Eagle Valley bus entrance	Install marked crosswalk	Quick Win	$
Q-14	Mountain Park Dr.	Carriage Crest Dr.	Add S1-1, add curb extensions	Quick Win	$
Q-15	N Carson St.	Park St.	Restrict northbound left, add pedestrian refuge island, add S1-1s, R1-5s at yield teeth	Quick Win	$
Q-16	Park St.	Peters St.	Upgrade to side-street stop control	Quick Win	$
Q-17	Saliman Rd.	Midblock crossing (south lot exit)	Add pedestrian refuge and R1-5 signs at yield teeth	Quick Win	$
Q-18	Saliman Rd.	Damon Rd.	Restrict southbound left, install pedestrian refuge, add R1-5 signs at yield teeth	Quick Win	$
Q-19	Saliman Rd.	Seely Loop (Mills Park crosswalk)	Add R1-5 signs at yield teeth	Quick Win	$
Q-20	Seeliger Paths	Footpaths to Al Seeliger from: Cortez St., Schell Ave., and off Shady Oak Dr.	Repave paths and extend pavement to school grounds	Quick Win	$
Q-21	Siskiyou Dr.	Stanton Dr.	Install marked crosswalk	Quick Win	$
Q-21	Siskiyou Dr.	Stanton Dr.	Install marked crosswalk	Quick Win	$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
Q-22	Slide Mountain Dr.	Carriage Crest Dr.	Add S1-1s for northbound and southbound, add curb extensions	Quick Win	$
Q-23	Stanton Dr.	La Loma Dr.	Upgrade to all-way stop control	Quick Win	$
Q-24	Stewart St.	Park St.	Upgrade to S1-1 signs	Quick Win	$
Q-25	Thompson St.	W 2nd St.	Install curb extensions	Quick Win	$
Q-26	W King St.	Mountain St.	Install curb extensions	Quick Win	$
Q-27	W King St.	S Richmond Ave.	Install curb extensions	Quick Win	$
Q-28	W King St.	Tacoma Ave.	Install curb extensions	Quick Win	$

Table 4-4: Tier 2: Bicycle Network Enhancements

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
B-1	Carmine St. and Lompa Ln.	US 50 to Russel Wy.	Add shared-use path	Bicycle Network Enhancement	Short	$$$
B-2	Colorado St.	Carson St. to Roop St.	Construct buffered bike lanes from Carson St. to existing bike lanes or similar multimodal improvement	Bicycle Network Enhancement	Short	$
B-3	Emerson Dr.	College Pkwy. to Mark Wy.	Add bike lanes with bulb-outs at key intersections	Bicycle Network Enhancement	Short	$
B-4	Green Belt Multi-Use Path	Roop St. to Carson St.	Add a multi-use path connecting Linear Ditch Trail with Carson St. Multi-Use Path, Americans with Disabilities Act sidewalks	Bicycle Network Enhancement	Medium	$$$
B-5	Lindsay Ln.	Carriage Crest Dr. to Marian Ave.	Neighborhood byway — corner bulb-outs, wayfinding, hardened centerlines	Bicycle Network Enhancement	Short	$$
B-6	Marian Ave.	Long St. to Rolling Hills Dr.	Neighborhood byway — add traffic calming, hardened centerlines, speed humps, corner bulb-outs	Bicycle Network Enhancement	Short	$$
B-7	Roop St. to Hot Springs Rd. (new path)	Roop St./Northridge Dr. and Hot Springs Rd./Valley Springs driveway	Path connection to link with Nye Ln.	Bicycle Network Enhancement	Long	$$
B-8	Winnie Ln.	Carson St. to Roop St.	Construct buffered bike lanes from Carson St. to Roop St. or similar multimodal improvement	Bicycle Network Enhancement	Short	$$

Table 4-5: Tier 2: Corridor Enhancements

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
C-1	Airport Rd.	Hwy. 50 to E. 5th St.	A. Construct bike lane Butti Wy. to Hwy. 50 or similar multimodal improvement B. Add intersection crossing enhancements at Airport Rd./Douglas Dr. and Airport Rd./Menlo Dr.	Corridor Enhancement	Medium	$$
C-2	Arrowhead Dr.	Between roundabouts	Add sidewalk/path on north side, add shared lane markings in the roundabout	Corridor Enhancement	Medium	$
C-3	Carmine St.	Airport Rd. to Lompa Ln.	A. Close sidewalk gaps between Airport Rd. & Dori Wy. B. Intersection crossing enhancements at Dori Wy., Lompa Ln., and Airport Rd. to reduce crossing distances and visibility issues	Corridor Enhancement	Medium	$$$$
C-4	Carson St.	Medical Pkwy. to Williams St.	Add multi-use path, enhance crosswalks with activated flashers, include landscaped buffer	Corridor Enhancement	Medium	$$$$$
C-5	Carson St.	Topsy Ln. to 500 ft. south of Clear Creek Ave.	A) Add sidewalk on one side B) extend multi-use path	Corridor Enhancement	Medium	$$
C-6	Clear Creek Ave.	Snyder Ave. to Center Dr.	Close sidewalk gaps, enhance bus stop	Corridor Enhancement	Short	$$
C-7	E. 5th St.	Saliman Rd. to I-580	A. Enhance existing sidewalks B. Widen existing bike lane to 5 ft.	Corridor Enhancement	Short	$$$$
C-8	E. 5th St.	Fairview Dr. to Mexican Ditch Trail	A. Bike lanes Fairview Dr to Carson River Rd. or similar B. Marked Crosswalk with Ped Refuge at Parkhill Dr D. Ped Refuge at Regent Ct	Corridor Enhancement	Medium	$$$$
C-9	Emerson Dr.	Mark Wy. to Arrowhead Dr.	Build sidewalks, add bike lanes, add curb ramps at Mark Wy.	Corridor Enhancement	Short	$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
C-10	Fleischmann Wy.	Carson St. to Mountain St.	Bulb-outs and daylighting at intersections, address sidewalks gaps, traffic calming	Corridor Enhancement	Short	$$
C-11	Gordon St.	Full extent	Address sidewalk gaps, consider curb bulb-outs, update crosswalk to high visibility, increase corner daylighting	Corridor Enhancement	Medium	$$
C-12	Imperial Wy.	Nye Ln. to Silver Oak Dr.	Add bulb-outs and traffic calming	Corridor Enhancement	Medium	$$
C-13	Little Ln.	Roop St. to 90 ft. west of Oregon St.	Add sidewalk on north side	Corridor Enhancement	Medium	$
C-14	Nye Ln.	Lompa Ln. to Hwy. 50	Construct bike lanes and close sidewalk gaps	Corridor Enhancement	Long	$$$$$
C-15	Snyder Ave.	Carson St. to Appion Wy.	Bike lanes, close sidewalk gaps, curb ramps, stripe in crosswalks	Corridor Enhancement	Short	$$
C-16	Snyder Ave.	Dat So La Lee Wy. to Clear Creek Ave.	Add sidewalk, add high-visibility crosswalk with ped activated flasher	Corridor Enhancement	Medium	$$
C-17	Sonoma St.	Carson St. to Silver Sage	A. Construct bike lanes or similar multimodal improvement B. Add intersection crossing enhancement at Silver Sage Dr.	Corridor Enhancement	Short	$
C-18	W. King St.	Thames Ln. to Curry St.	A. Multi-Use Path Thames Ln. to Canyon Park Ct., or similar multimodal improvement B. Add physical buffer for bike lane at Carson Middle School & Bordewich-Bray Elementary School C. Close sidewalk gaps between Curry St. and Ormsby Blvd. D. Install intersection crossing enhancements at Tacoma	Corridor Enhancement	Long	$$$$
C-19	Winnie Ln.	Ormsby Blvd. to Mountain St.	A. Add bike lanes Mountain St. to Ormsby Blvd. B. Add wayfinding signage at Victoria Ave.	Corridor Enhancement	Medium	$$

Table 4-6: Tier 2: Crossing Safety Enhancements

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
CS-1	Carriage Crest Dr.	Slide Mountain Dr. to Mountain Park Dr.	A. Add intersection crossing enhancements at Mountain Park Dr. and Slide Mountain Dr. intersections B. Add center median from 70 ft. south of Slide Mountain Dr. to drop-off loop entrance C. Consider parking restrictions or removal on east side	Crossing Safety Enhancement	Medium	$$
CS-2	Carson St.	Nye Ln.	Construct rectangular rapid flashing beacon (RRFB) add associated crossing enhancements or alternatively a traffic signal	Crossing Safety Enhancement	Long	$$
CS-3	Fairview Dr.	Kansas St. to Kansas St.	Consider installing pedestrian activated flasher to increase pedestrian crossing opportunities	Crossing Safety Enhancement	Long	$
CS-4	Fairview Dr.	Fairview Dr. at Gordon St.	Consider right in/right out and pedestrian activated flasher	Crossing Safety Enhancement	Long	$$
CS-5	Hwy. 50	Hwy. 50 at Lompa Ln.	Add median pedestrian refuge island, add leading pedestrian interval (LPI), add bicycle signal detection	Crossing Safety Enhancement	Short	$
CS-6	Monte Rosa Dr.	Stanton Ave. to Gordonia Ave.	Add intersection crossing enhancements to Stanton Dr. and Gordonia Ave. intersections, including striping to prohibit parking close to existing crosswalks	Crossing Safety Enhancement	Short	$
CS-7	Roop St.	Fairview Dr. to Sonoma Ave.	Add intersection crossing enhancements at minor side-street approaches south of Fairview Dr.	Crossing Safety Enhancement	Medium	$$
CS-8	Saliman Rd.	Robinson St. and Saliman Rd.	Add crossing guards during peak hours, future traffic signal will help intersection operations	Crossing Safety Enhancement	Short	$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
CS-9	Saliman Rd.	Saliman Rd. at Mills Park	Add crossing guards during peak hours	Crossing Safety Enhancement	Short	$
CS-10	Silver Sage Dr.	Sonoma Ave. to Koontz Ln.	A. Add crosswalk at Pioche St. B. Add intersection crossing enhancements at Koontz Ln. intersection and minor side-street approaches	Crossing Safety Enhancement	Long	$$$$
CS-11	Stewart St.	Williams St. to Long St.	Add RRFB at Park St.	Crossing Safety Enhancement	Short	$

Table 4-7: Tier 2: Walk Zone Connectivity Enhancements

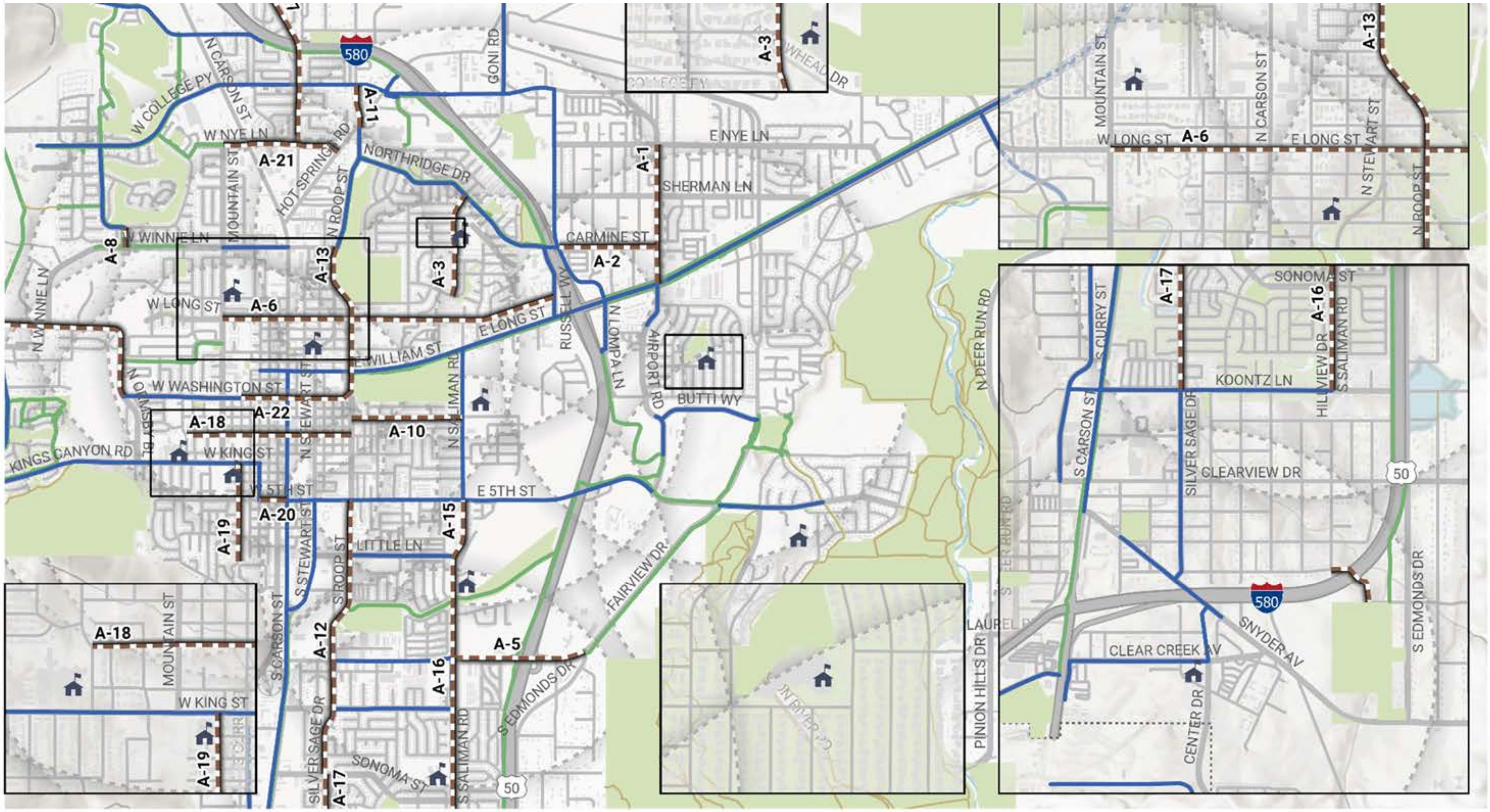
Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-1	Airport Rd.	Nye Ln. to Hwy. 50	A. Close sidewalk gaps B. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-2	Arrowhead Dr.	Imus Rd. to Goni Rd.	Add sidewalks	Walk Zone Connectivity Enhancement	Medium	$$$
WZ-3	Baker Dr.	Koontz Ln. to 175 ft. S. of Kerinne Cir.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$
WZ-4	Bath St.	Mountain St. to Carson St.	A. Close sidewalk gap between Curry and Mountain St. B. Add intersection crossing enhancement at midblock crosswalk and Division St. crosswalks C. Add missing and damaged ADA Ramps D. Repair and enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$
WZ-5	Brown St.	420 ft. N. of Reeves St. to 170 ft. S. of Reeves St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Medium	$$
WZ-6	Camille Dr.	Sunland Dr.	Install staircase/ramp for multi-use connectivity	Walk Zone Connectivity Enhancement	Long	$$
WZ-7	Carson St.	Bath St. to 420 ft. N. of Bath St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$
WZ-8	Clearview Dr.	Oak St. to I-580	Construct paved shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Short	$$
WZ-9	Corbett St.	Carson St. to school	Close sidewalk gaps	Walk Zone Connectivity Enhancement	Short	$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-10	Division St.	Bath St. to W. 5th St.	A. Add intersection crossing enhancements at minor side streets B. Enhance and upgrade existing crosswalks including Musser St., Telegraph St., and Long St. C. Close sidewalk gaps with wide sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$$$
WZ-11	Division St.	5th St. to southern terminus	Close sidewalk gaps	Walk Zone Connectivity Enhancement	Long	$$
WZ-12	Goni Rd.	Hot Springs Rd. intersection	Consider pedestrian hybrid beacon (PHB) or RRFB	Walk Zone Connectivity Enhancement	Medium	$$
WZ-13	Gordonia Ave.	Airport Rd. to Monte Rosa Dr.	A. Widen existing sidewalks on northside of roadway B. Add center median from Monte Rosa Dr. to La Loma Dr.	Walk Zone Connectivity Enhancement	Long	$$
WZ-14	Hillview Dr.	Kingsley Ln. to Clearview Dr.	Construct paved shoulder or multi-use path to connect with existing multi-use path on Saliman at Kingsley	Walk Zone Connectivity Enhancement	Long	$$
WZ-15	Koontz Ln.	Center Dr. to I-580	Construct paved shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Long	$$$
WZ-16	Lepire Dr.	Snake Mountain MUP to Cassidy Ct.	Construct sidewalk from Snake Mountain MUP to the existing sidewalk on the north side of Lepire Dr.	Walk Zone Connectivity Enhancement	Long	$$
WZ-17	Long St.	Curry St. to Sierra Cir. and Fall St. to Stewart St.	A. Close sidewalk gaps (Curry St. to Sierra Cir. and Fall St. to Stewart St.) B. Crosswalks and intersection enhancements at Division St., Curry St., and Marian Ave.	Walk Zone Connectivity Enhancement	Short	$$$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-18	Mountain St.	Nye Ln. to King St.	A. Close sidewalk gaps and enhance existing sidewalk where possible B. Add intersection crossing enhancements at Long St., Washington St., Telegraph St., Musser St.	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-19	Musser St.	Harbin Ave. to Anderson St.	A. Close sidewalk gaps B. Enhance sidewalk where possible	Walk Zone Connectivity Enhancement	Long	$$
WZ-20	N. Edmonds Dr.	320 ft. N. of Reeves to 100 ft. N. Brown St.	Construct sidewalk on west side of roadway	Walk Zone Connectivity Enhancement	Medium	$$
WZ-21	Reavis Ln. to Evalyn Dr (new path)	Create pedestrian connection to multi-use path	Construct multi-use bridge between existing multi-use trail and sidewalk on south side of Reavis Ln.	Walk Zone Connectivity Enhancement	Medium	$$
WZ-22	Robinson St.	Richmond Ave. to Mountain St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-24	S. Iris St.	4th St. to King St.	Construct sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-25	Saliman Rd.	US 50 to Long St.	Add buffers to bike lane, consolidate southbound lanes, add curb extensions at Long St. and US 50	Walk Zone Connectivity Enhancement	Short	$
WZ-26	Roop St.	Washington St. to E. 5th St.	A. Close sidewalk gap (Telegraph St. to E. 5th St.) B. Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-26	Saliman Rd.	Fairview Dr. to Koontz Ln.	A. Intersection crossing enhancements at Sonoma St. B. RRFB at Damon Rd. crosswalk C. Sidewalk eastside Colorado to Fairview Dr. D. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Short	$$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-27	Saliman Rd.	E. 5th St. to Fairview Dr.	Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-28	Sherman Ln.	Lompa Ln. to Chanel Ln.	Construct sidewalk	Walk Zone Connectivity Enhancement	Medium	$$$$$
WZ-29	Silver Sage Dr.	Roland St. to Clearview Dr.	Add sidewalk to one side of the street	Walk Zone Connectivity Enhancement	Medium	$$
WZ-30	Snyder Ave.	Isabell Dr. to Roland St.	Close sidewalk gap	Walk Zone Connectivity Enhancement	Medium	$
WZ-31	Stanton Ave.	Monte Rosa Dr. to Fairview Dr.	Widen existing sidewalk on south side	Walk Zone Connectivity Enhancement	Medium	$$
WZ-32	Thompson St.	King St. to 550 ft. S. of San Marcus Dr.	A. Close sidewalk gaps on east side (King St. to 5th St.) B. Close sidewalk gaps on west side (5th St. to San Marcus Dr.) C. Create intersection crossing enhancements at existing W. 2nd St., 3rd St., and 4th St. crosswalks	Walk Zone Connectivity Enhancement	Long	$$$
WZ-33	Winnie Ln.	Mountain St. to Ormsby Blvd.	Enhance existing sidewalks where possible	Walk Zone Connectivity Enhancement	Long	$$
WZ-34	Winnie Ln.	Ash Canyon to Ormsby Blvd.	Extend multi-use path on north side to Ash Canyon	Walk Zone Connectivity Enhancement	Medium	$$

Figure 4-2: Tier 3 SRTS Recommendations



Tier 3 Recommendations SRTS Action Plan

SRTS Recommendations

- Aspirational Projects

Existing Facilities

- Study Schools
- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Parks
- Railway

0 3,000 6,000 FEET

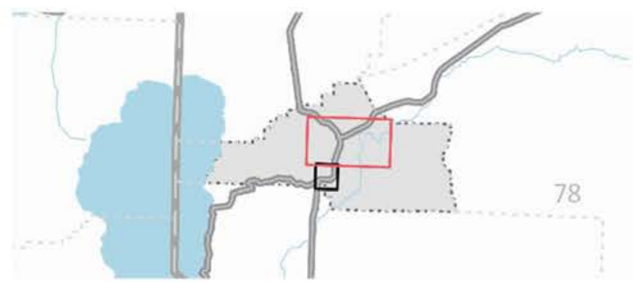


Table 4-8: Tier 3: Aspirational Projects

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
A-1	Airport Rd.	Nye Ln. to Hwy. 50	A. Construct buffered bike lanes or similar multimodal improvement B. Protected intersection at Airport Rd./Hwy. 50 or similar multimodal improvement	Aspirational Project	$$$$$
A-2	Carmine St.	Airport Rd. to Lompa Ln.	Construct bike boulevard or similar multimodal improvement	Aspirational Project	$$
A-3	Carriage Crest Dr.	Northridge Dr. to Sunland Ave.	Construct bike boulevard or similar multimodal improvement	Aspirational Project	$
A-4	Edmonds Sports Complex	Hillview Dr. to Edmonds Sports Complex	Construct multi-use bridge over I-580 from the southeastern corner of Appion Wy./Hillview Dr. intersection to the Edmonds Sports Complex	Aspirational Project	$$$$$
A-5	Fairview Dr.	Edmonds Dr. to Saliman Rd.	Construct protected cycle track/multi-use path or similar multimodal improvement	Aspirational Project	$$$
A-6	Long St.	Mountain St. to Russell Wy.	A. Buffered bike lane from Mountain St. to Saliman Rd. or similar multimodal improvement B. Bike Lane from Saliman Rd. to Russell Wy. or similar multimodal improvement	Aspirational Project	$$$
A-7	Northgate Ln.	Arrowhead Dr. to Nye Ln.	Construct protected cycle track or similar multimodal improvement	Aspirational Project	$$
A-8	Ormsby Blvd.	Oak Ridge Dr. to Winnie Ln.	Construct bike lanes or similar multimodal improvement	Aspirational Project	$
A-9	Ormsby Blvd./Ash Canyon Rd.	Longview Wy. to Washington St.	Construct multi-use path from Washington St. to Longview Wy. or similar multimodal improvement	Aspirational Project	$$$
A-10	Robinson St.	Roop St. to Saliman Rd.	Construct bike lanes or similar multimodal improvement	Aspirational Project	$
A-11	Roop St.	College Parkway to Bernhard Wy.	Construct protected cycle track or similar multimodal improvement	Aspirational Project	$$
A-12	Roop St.	5th St. to Fairview St.	Enhance existing facility to buffered bike lanes or similar multimodal improvement	Aspirational Project	$$
A-13	Roop St.	Winnie Ln. to Washington St.	Construct protected cycle track or similar multimodal improvement	Aspirational Project	$$$$

Project ID	Street Name	Extent/Intersecting Street	Description	Project Type	Cost
A-14	Roop St./Silver Sage Dr.	5th St. to Sonoma Ave.	Enhance existing facility to buffered bike lanes or similar multimodal improvement	Aspirational Project	$$
A-15	Saliman Rd.	E. 5th St. to Fairview Dr.	Upgrade bike lane to cycle track with protected intersection at Fairview Dr. or similar multimodal improvement	Aspirational Project	$$$$
A-16	Saliman Rd.	Fairview Dr. to Koontz Ln.	Buffered bike lane with potential lane reduction or similar multimodal improvement	Aspirational Project	$$
A-17	Silver Sage Dr.	Sonoma Ave. to Koontz Ln.	Enhance existing facility to buffered bike lanes or similar multimodal improvement	Aspirational Project	$$
A-18	Telegraph St.	Richmond Ave. to Roop St.	Bike boulevard consider diverters at Mountain St., Division St., Stewart St., and Roop St, or similar multimodal improvement	Aspirational Project	$$$$
A-19	Thompson St.	King St. to 550 ft. S. of San Marcus Dr.	Bike boulevard or similar multimodal improvement	Aspirational Project	$$$
A-20	W. 5th St.	Division St. to Carson St.	A. Bike lanes Richmond Ave. to Minnesota St. or similar multimodal improvement B. Buffered bike lane Minnesota St. to Carson St. or similar multimodal improvement, C. Curb extension at Telegraph St.	Aspirational Project	$$$
A-21	W. Nye Ln.	Hot Springs Rd. to Mountain St.	A. Construct bike boulevard or similar multimodal improvement B. Intersection bulb-outs C. Median islands D. Speed cushions	Aspirational Project	$$
A-22	Washington St.	Phillips St. to Roop St.	A. Construct bike lane Minnesota St. to terminus or similar multimodal improvement B. Buffered bike lane Philips St. to Minnesota St. or similar multimodal improvement	Aspirational Project	$

5 SRTS Programmatic Recommendations

5 SRTS Programmatic Recommendations

As Carson City continues to advance its SRTS initiatives, there are opportunities to build on existing efforts while introducing new strategies that respond to evolving community needs. The recommended actions reflect a holistic approach to improving safety, accessibility, and confidence for students traveling to and from school. Grounded in the six E's framework – **Engineering, Education, Encouragement, Equity, and Evaluation** - these strategies aim to foster a safer and more supportive environment for students. Each element of the six E's plays a vital role in shaping a comprehensive SRTS program that meets the needs of students, families, and the broader community. Long-term strategies are included in Table 5-7. These are intended to support continued implementation in the event that additional staff and funding resources are available in the future.

Engineering

Designing safer school travel routes through infrastructure planning helps reduce risk and improve accessibility for students walking and biking. Tools like route maps and designated drop-off zones support safer navigation and reduce traffic conflicts near school campuses.

Table 5-1: Engineering Programmatic Recommendations

Name	Description	Resource
Safe Routes to School Maps (New)	Developing school-specific route maps would give families clear guidance on the safest ways to walk or bike to school. Maps could highlight recommended crossings, signalized intersections, stop signs, estimated travel times, and visibility tips. These maps not only reduce uncertainty for families but also encourage students to choose safer, designated routes, and empower new students to try walking or biking who may not previously have done so.	SRTS Safe Route Maps and How to Create Them
Park + Walk & Walking School Bus Zones (New)	To reduce traffic congestion directly at school entrances, Carson City could designate Park + Walk zones—off-site drop-off locations where students join supervised walking groups for the final few blocks to school. These zones decrease chaos at the curb, reduce vehicle-pedestrian conflicts, and give students an easy way to add daily physical activity to their routine.	SRTS Walking School Bus Guide

Name	Description	Resource
School Zone Signing (New)	Ensure consistent signing across school zones in Carson City and clearly post beacons or times indicating when school zones are in effect. Work to update the Carson City Code and the Speed Limit Policy to ensure consistency with the Nevada Revised Statutes.	NRS 484B, AB 6 (2025 Special Session)

Education

Bicycle and pedestrian education help those who are interested in active transportation feel more comfortable, safe, and confident navigating streets and shared-use paths.

Table 5-2: Education Programmatic Recommendations

Name	Description	Resource
Back-to-School Safety Assemblies (Expanded)	The start of each school year offers a powerful opportunity to set norms for safe travel and empower students to choose walking or biking to school. Back-to-school safety assemblies deliver age-appropriate guidance on walking and biking rules, route planning, and visibility. By presenting this information early—when travel routines are first forming—assembly safety messages can reach nearly all students, including those who may not be enrolled in formal bike education classes. With assistance from schools, the SRTS program could expand the number of these assemblies across more schools and grade levels to amplify their reach, ensuring consistent, repeated exposure to safety guidance. With wider implementation, assemblies become an even more efficient and effective tool for instilling safe habits across the district.	Music Notes SRTS
Bicycle Safety Education (Expanded)	Carson City has an opportunity to strengthen its bicycle safety education by expanding programming for 3rd–5th grade students. By providing each class at least two dedicated sessions per year, students will have more time to practice core skills such as braking, signaling, and scanning for cars at intersections. Updated curriculum, combined with the provision of bicycles and helmets, will help students whose families may not have access to safe equipment at home. Extending the program to Stewart Community Schools and pairing it with a community bicycle equipment initiative will further broaden access, making sure more children and families can build lasting, hands-on skills for safe travel.	Sonoma SRTS Bicycle Safety / Skills Curriculum

Name	Description	Resource
School Bus Stop Awareness (Expanded)	Many school bus stops are dispersed throughout neighborhoods, where drivers may not expect children to be waiting or crossing. A School Bus Stop Awareness campaign would deploy temporary warning signs at high-risk stops, supported by outreach and driver education campaigns. Partnering with University of Northern Nevada to collect near-miss and speed data using LiDAR would provide valuable insights to guide adjustments. By increasing visibility and driver awareness, the program would reduce close calls and improve safety for students boarding or exiting buses.	School Zone Speed Study from the Nevada Department of Public Safety

Encouragement

Events and activities such as Walk and Roll to School Days, incentive programs, and school-wide challenges help build enthusiasm and normalize walking and biking as fun and healthy ways to get to school.

Table 5-3: Encouragement Programmatic Recommendations

Name	Description	Resource
Walk/Ride Punch Card Program (New)	Introducing a punch card system would gamify walking and biking, making it fun for younger students while tracking progress over time. Each time a student walks or rides to school, a teacher marks their punch card, working toward milestones that are celebrated with recognition or small prizes. This program not only motivates individual students but also gives schools a tangible way to measure and display participation. Over time, the punch card system could help turn occasional participation into a consistent habit.	Walk Bike & Roll to School Punch Cards and Certificates
Student Poster Contest (New)	A student poster contest would invite children to use their creativity to promote safe walking and biking. Contest themes could include helmet use, visibility, or sharing the road. Winning posters would be displayed in schools, libraries, and other community spaces, giving students ownership of the message while spreading peer-to-peer reminders about safe behavior. This approach harnesses student voice, reinforces learning through creative expression, and contributes to a broader culture of safety.	Vision Zero Truckee Meadows SRTS Poster Contest
Walking Wednesday & Annual	Expanding Walking Wednesday into a citywide tradition would help normalize walking and biking to school as part of the weekly routine. With branded yard signs along key routes, small incentives for participating students, and links to national events like Walk to School	"Move a Little, Live a Lot" High School Campaign |

Name	Description	Resource
Campaigns (Expanded)	Day in October and Bike to School Month in May, the program would send a visible signal to both students and drivers. These regular campaigns keep safe travel top-of-mind, encourage families to try active modes, and create predictable days when drivers expect to see more children walking and biking.	Massachusetts SRTS Program

Engagement

Engaging families, school staff, and community partners ensures that SRTS efforts reflect local needs and values. Outreach activities like surveys, workshops, and student-led projects foster shared ownership and support.

Table 5-4: Engagement Programmatic Recommendations

Name	Description	Resource
School Safety Champions (Expanded)	Grow the School Safety Champions program to include one or two middle schools in Carson City during May is Bike Month. Continue organizing parent and community volunteers to supervise Walking School Buses and Bike Trains at elementary schools, providing younger students with safe, reliable group travel options. Use available funding to provide training, resources, and modest compensation for volunteers, sustaining participation and expanding the program's reach.	Walking School Bus Guide from the National Center for SRTS
Vision Zero SRTS Subcommittee (Expanded)	Formalizing a Vision Zero Safe Routes to School Subcommittee would bring parents, teachers, and City staff together to coordinate audits, speed checks, and other safety activities quarterly. By creating a standing group within the larger Vision Zero framework, Carson City would consistently address school-area issues alongside citywide safety goals. This governance model reduces duplication of effort, accelerates decision-making, and keeps school-specific concerns aligned with broader traffic safety strategies.	Vision Zero and SRTS Partners in Safety- SRTS National Partnership

School Speed Zone Engagement (Expanded)	Conduct targeted, high-visibility enforcement campaigns at elementary, middle, and high schools during arrival and dismissal times to reinforce compliance with school zone speed limits. Coordinate closely with law enforcement to focus on specific problem areas and times when risks are highest. Pair enforcement with "Slow Down in School Zones" flyers, signs, public service announcements, and Safe Driver Pledges directed at parents and teen drivers. This combined approach creates immediate visibility while also fostering long-term habit change, so that safer driving behaviors continue even after enforcement presence decreases.	School Speed Zone Safety Program from the Sarasota Police Department

Equity

Ensuring that Safe Routes to School initiatives benefit all demographic groups, with particular attention to ensuring safe, healthy, and fair outcomes for low-income neighborhoods, communities of color, and others.

Table 5-5: Equity Programmatic Recommendations

Name	Description	Resource
Crossing Guard Support (New)	Crossing guards are often the first line of defense for students navigating busy intersections. A crossing guard support program would include standardized training for all guards—whether staff, contractors, or volunteers—alongside a public awareness campaign to build respect for their role. By strengthening coordination with the district's existing training program and promoting consistent best practices, Carson City can enhance the visibility and effectiveness of crossing guards, improving compliance at key crossings and protecting students at high-risk locations.	Crossing Guards Save Lives - Traffic Safety Resource Center

Evaluation

Tracking participation, travel behavior, and safety outcomes helps measure the impact of SRTS programs and guide future improvements. Tools like student tallies and parent surveys provide valuable feedback for ongoing planning.

Table 5-6: Evaluation Programmatic Recommendations

Name	Description	Resource
SRTS Report Card (Expanded)	An annual Safe Routes to School Report Card would compile survey and tally data alongside program highlights, campaign outcomes, and next steps. This clear, public-facing document would provide accountability, build trust with families, and demonstrate progress to potential funders. A consistent reporting framework also helps align partners and keeps the program moving toward long-term goals. The SRTS team will work in conjunction with the school principal and District Crossing Guard Coordinator to compile the annual report card.	Safe Routes Partnership - Making Strides 2024 State Report Card
Annual Parent Surveys (Expanded)	Collecting annual parent surveys on travel mode, safety concerns, and demographics provides critical insight into family experiences year over year. Tracking these trends helps identify what interventions are working, and guide future messaging. Survey data can also be used to strengthen grant applications by showing community need and progress over time. Surveys will be in both English and Spanish.	Joseph L. Bowler Sr. Elementary School SRTS Annual Parent Survey

Long-Term Recommendations

Table 5-7: Long-Term Programmatic Recommendations

Type	Name	Long-Term Recommendation Description
Engineering	Sidewalk Gap Closures (Long Term)	Prioritizing the closure of sidewalk gaps within 1/4 mile of schools would create continuous, connected routes for students. Even short missing segments can force children into the street, greatly increasing risk. By focusing on high-priority corridors first, Carson City can build a safer walking environment that encourages more families to consider active travel.
Education	E-Bike Training & Licensing Program (Long Term)	The rising popularity of e-bikes among youth brings both benefits and challenges. To address safety concerns, Carson City could establish an e-bike training program based on Nevada Department of Transportation (NDOT) and Nevada State e-bike rules. Students would complete a short safety course covering speed control, safe passing, and responsible riding behavior, followed by a quiz to demonstrate their knowledge. Upon completion, they would receive a certificate of completion. This approach not only promotes safe habits but also provides schools with a clear and consistent policy for managing e-bike use.
Education	Community Mapping Projects (Long Term)	Community mapping projects would invite students and their families to chart their daily school routes and identify barriers such as missing sidewalks, unsafe crossings, or speeding traffic. This activity not only engages families in problem-solving but also produces detailed, ground-level data that can inform engineering fixes and equity priorities. By directly involving students in documenting their experiences, the project builds ownership and trust while ensuring future improvements reflect real community needs.
Encouragement	Walking and Biking Clubs (Long Term)	After-school walking and biking clubs, offered in partnership with local nonprofits, would provide students with more time to build confidence in their skills outside of the classroom. These clubs could combine group rides with basic bike maintenance workshops, giving students both the knowledge and the independence to travel safely on their own. Regular

Type	Name	Long-Term Recommendation Description
		practice builds lasting confidence, while the group setting fosters friendships and community around active travel.
Engagement	Parent Barrier Reporting System (Long Term)	Establishing a Parent Barrier Reporting System to create a simple, consistent way for families to raise safety. Integrated into the district's online parent portal, with paper forms available in school offices, the system would make it easy to report issues such as broken sidewalks, unsafe crossings, or aggressive driving. Reports could be tracked and shared with equity and engineering teams, ensuring concerns are addressed in a timely and transparent manner. This district channel for feedback strengthens accountability while improving on-the-ground safety, and increases parents' comfort level when allowing students to walk or ride to school.
Engagement	Mobile Speed Feedback Trailers (Long Term)	Mobile speed feedback trailers remain a highly effective short-term tool for influencing driver behavior. Placing them in school zones during the first month of the school year—when families are setting travel routines— positions them to be most effective in shaping safe travel habits. When combined with enforcement campaigns, these trailers not only alert drivers in the moment but also reinforce expectations about safe travel near schools.
Evaluation	Student Hand Tallies (Long Term)	Expanding hand tally data collection to middle and high schools would provide a more complete picture of how student travel changes with age. Capturing shifts from family drop-off to self-transport offers valuable information about when and where interventions are most needed. With this data, programs can be better tailored to meet the needs of students at different stages of independence.

A

Appendix A: Socioeconomic Analysis

MEMORANDUM

To: Carson City Safe Routes to Schools (SRTS)

From: Cole Peiffer, Sierra Rodriguez-Torres, Alta Planning + Design

Date: May 9, 2025

Re: Carson SRTS Action Plan - Socio-Economic Analysis Memo

Introduction

The Carson Safe Routes to School Action Plan (Action Plan) presents an opportunity to focus transportation safety investments in areas with the greatest safety needs while also targeting areas with high proportions of disadvantaged populations such as people with low-incomes or those without a vehicle. Alta Planning + Design (Alta) conducted a targeted analysis of socio-economic data to quantify the levels of disparity between disadvantaged areas and the larger Carson City area in order to best inform the development of recommendations. This memo outlines the analysis approach, summarizes the data sources, and highlights key findings across a selection of individual data metrics.

Analysis Approach

To best position projects from this plan to be competitive within current federal funding guidelines, Alta leveraged the USDOT Areas of Persistent Poverty[1] (USDOT APP) dataset. This dataset was developed by the USDOT to identify areas that have historically been underinvested in and include a large proportion of disadvantaged residents. By focusing on these areas, the Action Plan will help target investments in active transportation in areas where they are needed most, helping students who are more likely to rely on walking and biking due to limited transportation options.

Using this dataset, Alta identified a sub-set of four census tracts within the Carson City area as 'Disadvantaged Areas', which are highlighted in Table 1 and Figure 1. Alta then compared the Disadvantaged Areas with the greater Carson City area using individual datasets from the Census Bureau and Center for Disease Control (CDC), shown in Table 2.

Table 1. Disadvantaged Census Tracts in Carson City (Per USDOT APP)

Disadvantaged Census Tracts (Tract Number)	
10.01	6.01
4.00	6.02

[1] Persistent Poverty in Counties and Census Tracts (May 9, 2023)

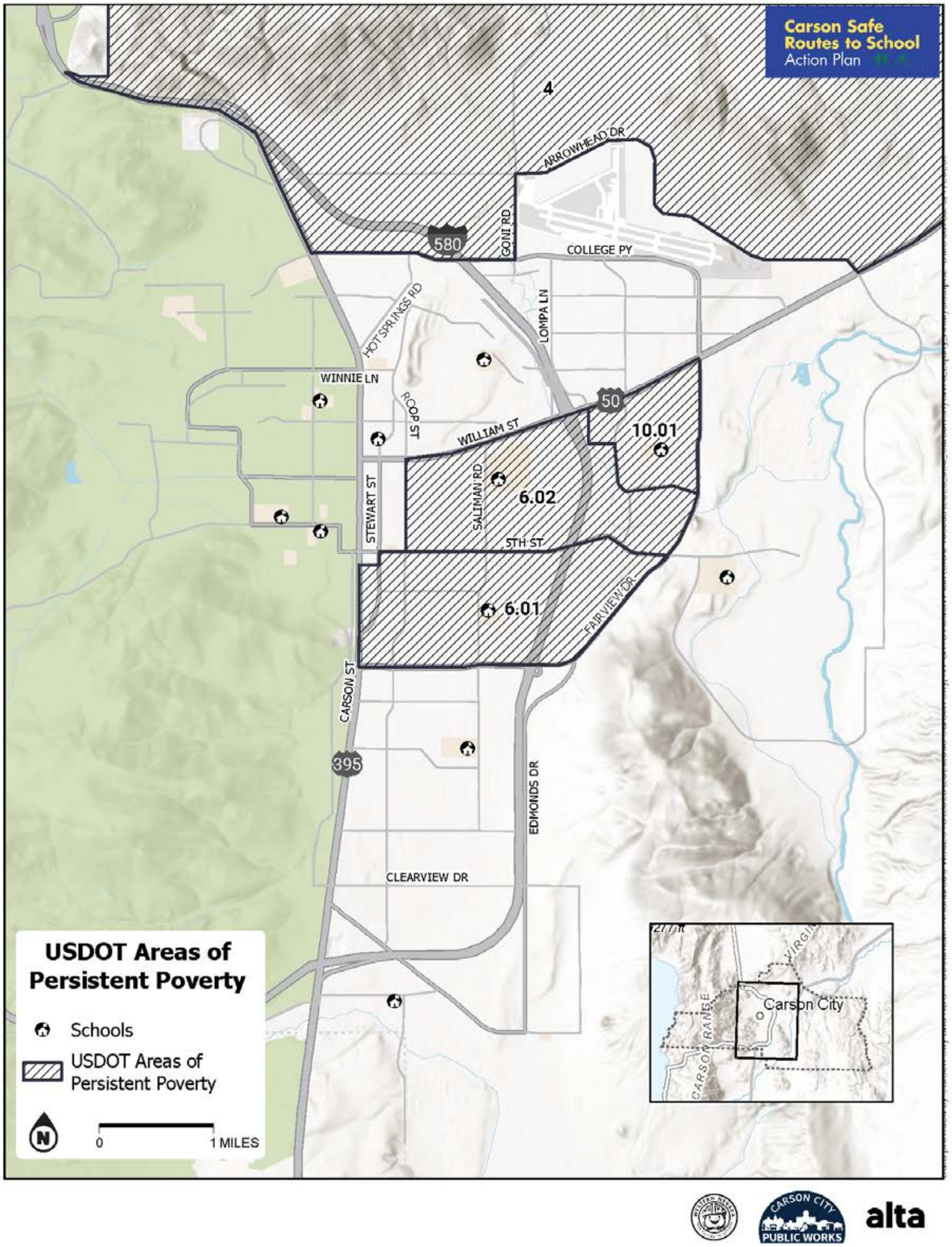


Figure 1. USDOT Areas of Persistent Poverty (Disadvantaged Areas) in Carson City, NV (Census Tracts)

Table 2. Data Sources for Analysis

Data Source	Name of Data	Year	Description
Census Bureau	Median Household Income	2018-2023	ACS data based on the median household income.
	Commute Mode	2018-2023	ACS data based on individuals travel mode to work.
	Zero Vehicle Households	2018-2023	ACS data based on how many vehicles are registered to households.
	Age and Population	2018-2023	ACS data based on the age and population of census tracts.
Center for Disease Control	Physical Inactivity	2024	CDC data estimated the percentage of individuals that do not participate in physical activity during their leisure time. Among adults and older adults, physical activity can lower the risk of early death, coronary heart disease, stroke, high blood pressure, type 2 diabetes, breast and colon cancer, falls, and depression.[2]
	Mobility Disability	2024	CDC data based on seven disability measures. Assessing disability helps identify opportunities to remove barriers and improve inclusion, ensuring people with disabilities can fully participate in daily life, access timely services, and contribute to their communities.[3]

[2] U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. U.S. Department of Health and Human Services; 2018. https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

[3] National Center for Health Statistics. Chapter 9: Disability and Health. Healthy People 2020 Midcourse Review; 2016. https://www.cdc.gov/nchs/data/hpdata2020/HP2020MCR-C09-DH.pdf

Analysis Findings

This section summarizes the findings of each socio-economic data metric to highlight the level of disparity between Disadvantaged Areas and the entire Carson City area. These metrics help to understand the levels of disparity in different areas of Carson across various socio-economic factors including economic, transportation, and health. The key findings from each data metric are summarized below in a table and displayed in a corresponding map.

Median Household Income

Median Household Income is a standard metric for assessing the general economic state of residents within a specific geography and between geographies. Based on data from the US Census, the 2018-2023 median household income varies significantly across the Carson City area (Figure 2).

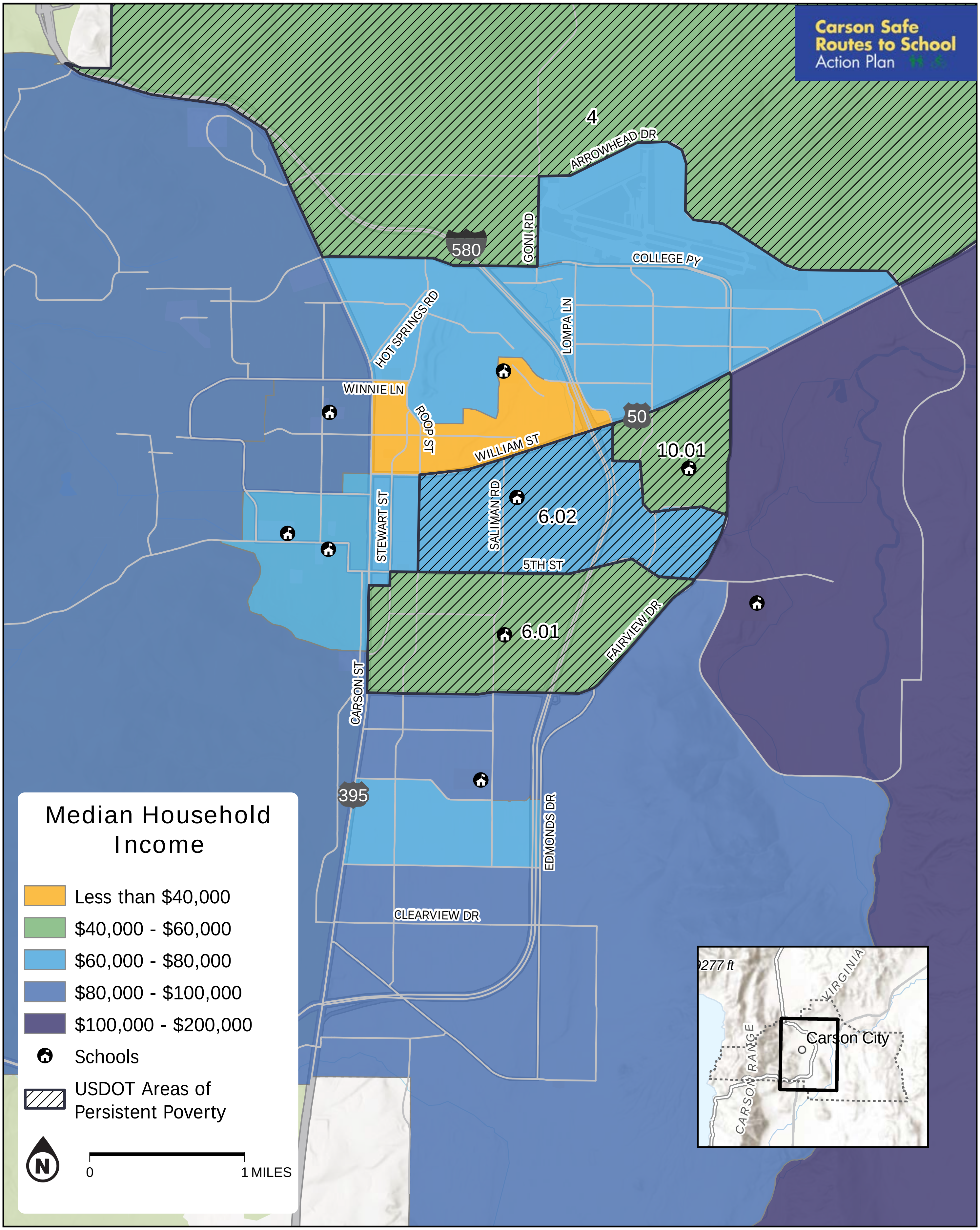


Figure 2. Median Household Income in Carson City, NV (Census Tracts)

As shown in Table 3, each of the four disadvantaged census tracts have median household incomes that fall below the Carson City average ($71,809). The most significant difference in median household incomes is seen in census tract 10.01, which covers the area between Hwy 50, N Lompa Ln, Airport Rd, Butti Wy, and Fairview Dr. This census tract has a median household income of $55,211, which is $16,598 below the area average.

Table 3. Median Household Income Data for the Disadvantaged Census Tracts

Area	Median Household Income
Census Tract 10.01	$55,211.00
Census Tract 4	$56,578.00
Census Tract 6.01	$59,870.00
Census Tract 6.02	$69,954.00
Carson City	$71,809.00

Zero Vehicle Households

Households which lack access to a vehicle (zero vehicle households) are dependent on active transportation, public transportation, and carpooling. Areas with a high proportion of zero vehicle households (Figure 3) have a greater reliance on active transportation and public transportation and therefore typically have a greater overall need for biking and walking improvements.

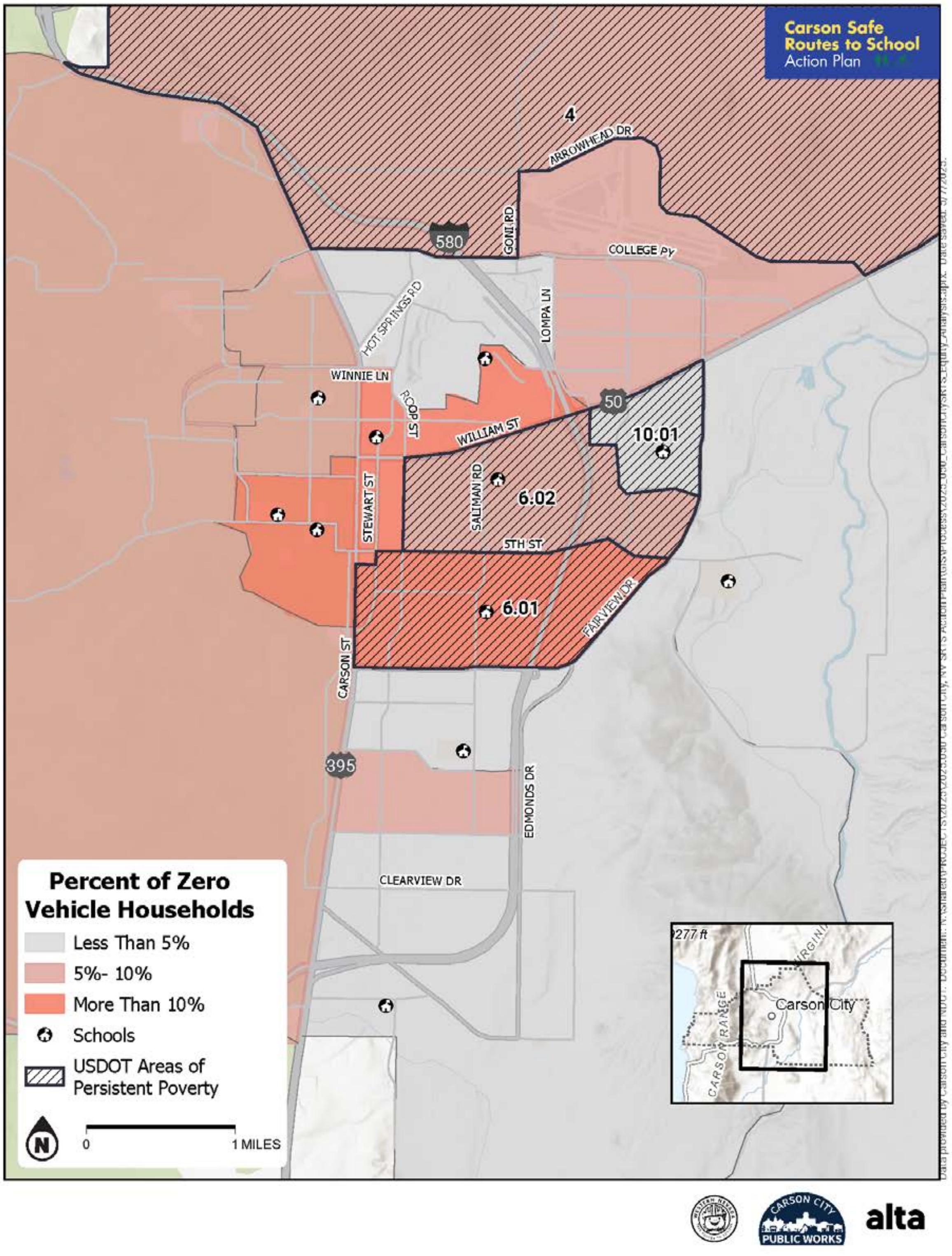


Figure 3. Zero Vehicle Households in Carson City, NV (Census Tracts)

As shown in Table 4, the Disadvantaged Areas generally align with the Carson City average of Zero Vehicle Households at 6.2%. However, census tract 6.01 bound by S Carson St, Fairview Dr, and E 5th St is nearly twice the area average with a total of 11% of households lacking access to a vehicle. Based on this, improvements for walking and biking in this area could have more significant benefits than those in areas with a lower level of zero vehicle households.

Table 4. Access to Vehicle Data

Area	Zero Vehicle Households (%)
Census Tract 10.01	4.7%
Census Tract 4	6.9%
Census Tract 6.01	11.0%
Census Tract 6.02	6.9%
Carson City	6.2%

Commute Mode to Work

Census tract 6.01 has the highest proportion of individuals who walk to work (5%), which is twice the area average rate (2%). This aligns with data from Table 4, which shows that census tract 6.01 has the highest percentage of households without access to a vehicle. Census tract 4 ranks second in walking commutes, as shown in Table 5, and has more than triple the area average for transit use. Census tract 6.02 stands out as having a carpooling rate that is 7% higher than the regional percentage. Additionally, across multiple tracts, a portion of individuals work from home and therefore do not participate in daily commuting. Overall, driving alone remains the dominant commute mode across the broader Carson City region.

Table 5. Commute Mode by Percentage

Area	Drove alone	Walk	Bike	Carpooled	Bus	Work from home
Census Tract 10.01	82%	0.3%	0.0%	16%	0%	1%
Census Tract 4	72%	3.0%	0.0%	11%	7%	7%
Census Tract 6.01	79%	5.0%	0.0%	4%	0%	13%
Census Tract 6.02	71%	0.0%	0.0%	21%	0%	5%
Carson City	73%	2.0%	0.2%	14%	2%	9%

Physical Inactivity

Regular physical activity can improve the health and quality of life of Americans of all ages, regardless of the presence of a chronic disease or disability.[4] The second edition of the Physical Activity Guidelines for Americans states that adults should move more and sit less throughout the day. One way to get more physical activity is by choosing more active forms of transportation, such as walking or biking, which allows individuals to be active while getting where they need to go. As seen in Table 6 and displayed in Figure 4, Census tract 10.01 (area surrounding Empire Elementary School) has the highest percentage of individuals who are physically inactive with a third of all individuals lacking physical activity of a regular basis; this exceeds the Carson City average (24%) by nine percent. This census tract also has the highest percentage of individuals that commute to work by car and a low percentage of individuals that commute to work by an active transportation mode (walking/biking). Census tracts 4 and 6.02 also have a slightly higher percentage of individuals who are physically inactive than the regional average. Census tract 6.01 has the lowest percentage of individuals that are physically inactive, which is four percent lower than the regional average.

Table 6. Physical Activity Data

Area	Physical Inactivity (%)
Census Tract 10.01	33%
Census Tract 4	26%
Census Tract 6.01	20%
Census Tract 6.02	25%
Carson City	24%

[4] U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. U.S. Department of Health and Human Services; 2018. https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

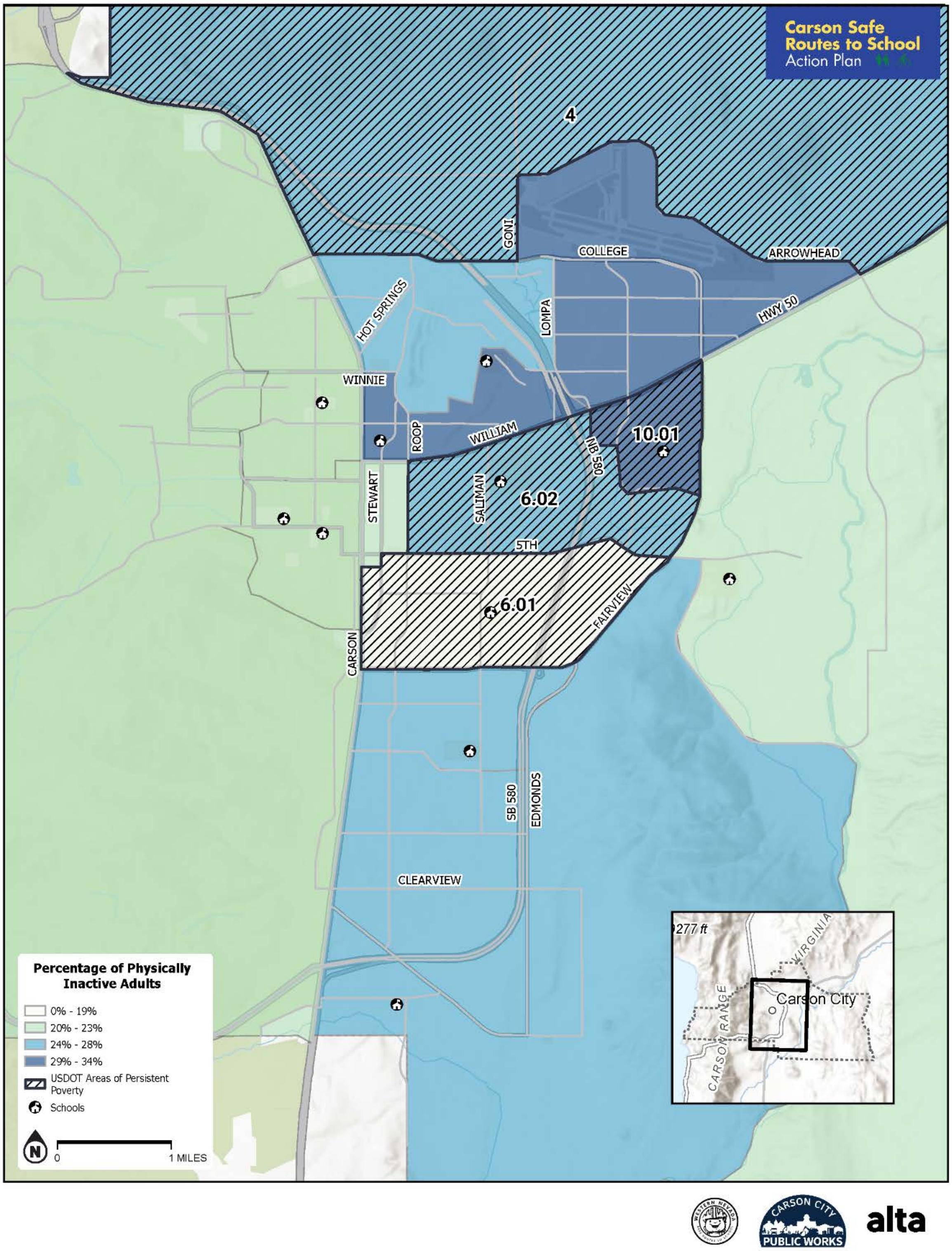


Figure 4. Physical Inactivity in Carson City, NV (Census Tracts)

Mobility Disability Among Adults

To be healthy, all people with or without disabilities must have opportunities to take part in meaningful daily activities that add to their growth, development, fulfillment, and community contribution. Assessing disability provides valuable insight into both opportunities and gaps in accessibility, helping to identify where improvements can be made. This includes ensuring that individuals with disabilities can fully engage in public health initiatives, receive timely services and interventions, navigate their environments without physical or systemic barriers, and participate fully in everyday life.[5] As shown in Table 7 and displayed in Figure 5, census tract 10.01 and census tract 4 have the highest percentage of individuals with mobility disabilities at 18%. Census tract 6.01 has the lowest percentage of individuals with mobility disabilities, which is five percent lower than the area average.

Table 7. Mobility Disability Data Among Adults

Area	Mobility Disability (%)
Census Tract 10.01	18%
Census Tract 4	18%
Census Tract 6.01	11%
Census Tract 6.02	14%
Carson City	16%

[5] National Center for Health Statistics. Chapter 9: Disability and Health. Healthy People 2020 Midcourse Review; 2016. https://www.cdc.gov/nchs/data/hpdata2020/HP2020MCR-C09-DH.pdf

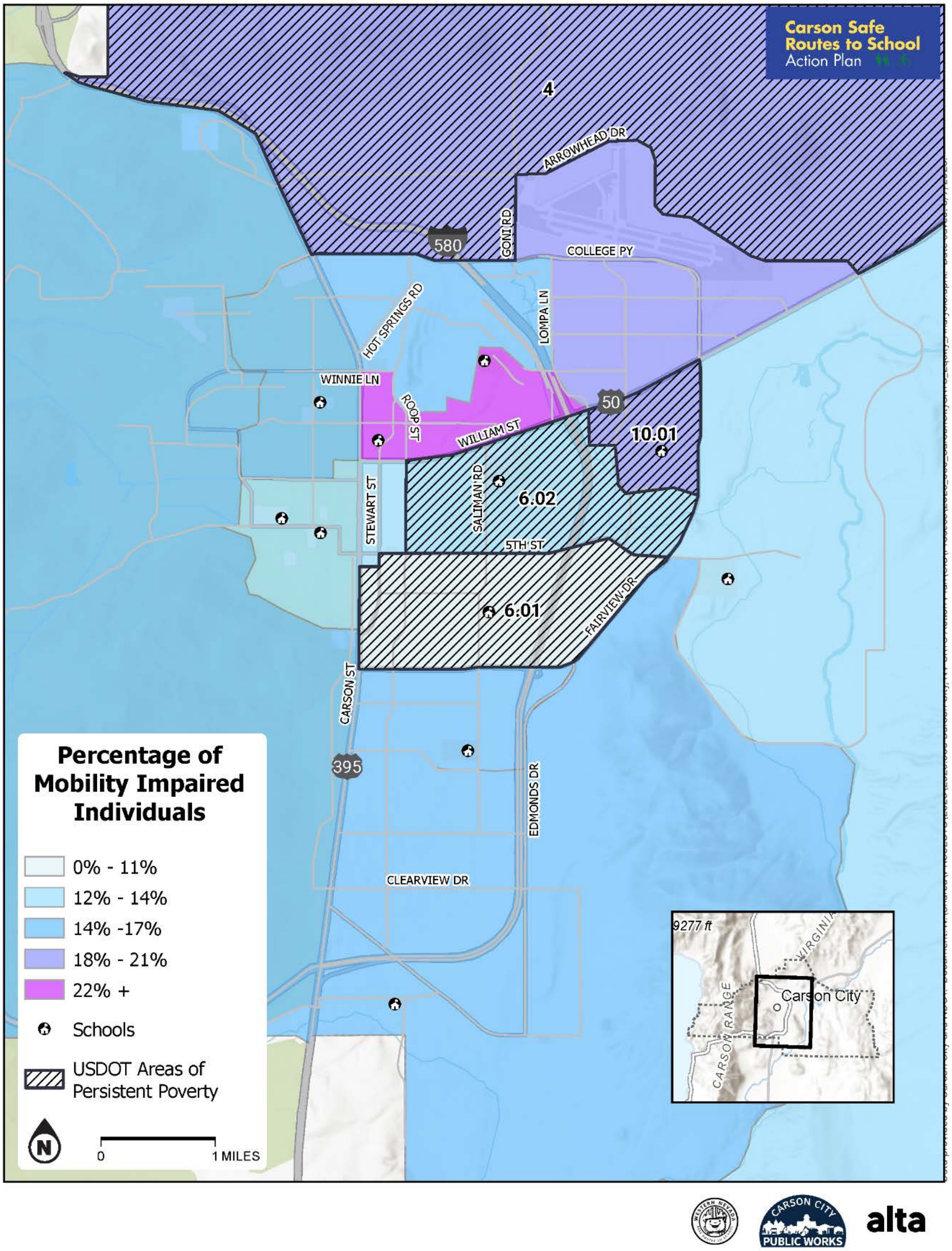


Figure 5. Mobility Impaired Individuals in Carson City, NV (Census Tracts)

Summary

The Disadvantaged Areas within Carson City have a significant level of disparity compared to Carson City as a whole. These areas generally have lower incomes and higher proportions of zero vehicle households which highlight the increased reliance on public transportation and active transportation in these areas. Furthermore, the active transportation can provide additional health benefits in disadvantaged areas, which include large proportions of physically inactive adults. Targeted active transportation investments in these areas are likely to have a larger benefit due to the increased level of reliance on modes other than a private vehicle.

B

Appendix B: Existing Conditions

To: Scott Bohemier, Project Manager, Western Nevada Safe Routes to School

From: Cole Peiffer, Sierra Rodriguez-Torres, Alta Planning + Design

Date: 8/22/2025

Re: Carson City SRTS Action Plan - Existing Conditions Memo

Carson Safe Routes to School Action Plan - Existing Conditions

Introduction

This memo provides an overview of the current safety trends and transportation infrastructure needs to improve walking and biking conditions for all students. This memo presents the results of a barriers analysis which combines outputs from previous analyses and findings from the public engagement phase. The purpose of this memo is to establish a baseline understanding of the physical environment and identify key barriers to walking and biking for students. Combining these findings with community input and school walk audits will form the basis for identifying new project recommendations or modifying planned projects with additional safety improvements. This analysis is based on field observations, crash data and a review of relevant plans and policies.

Citywide Safety Analysis

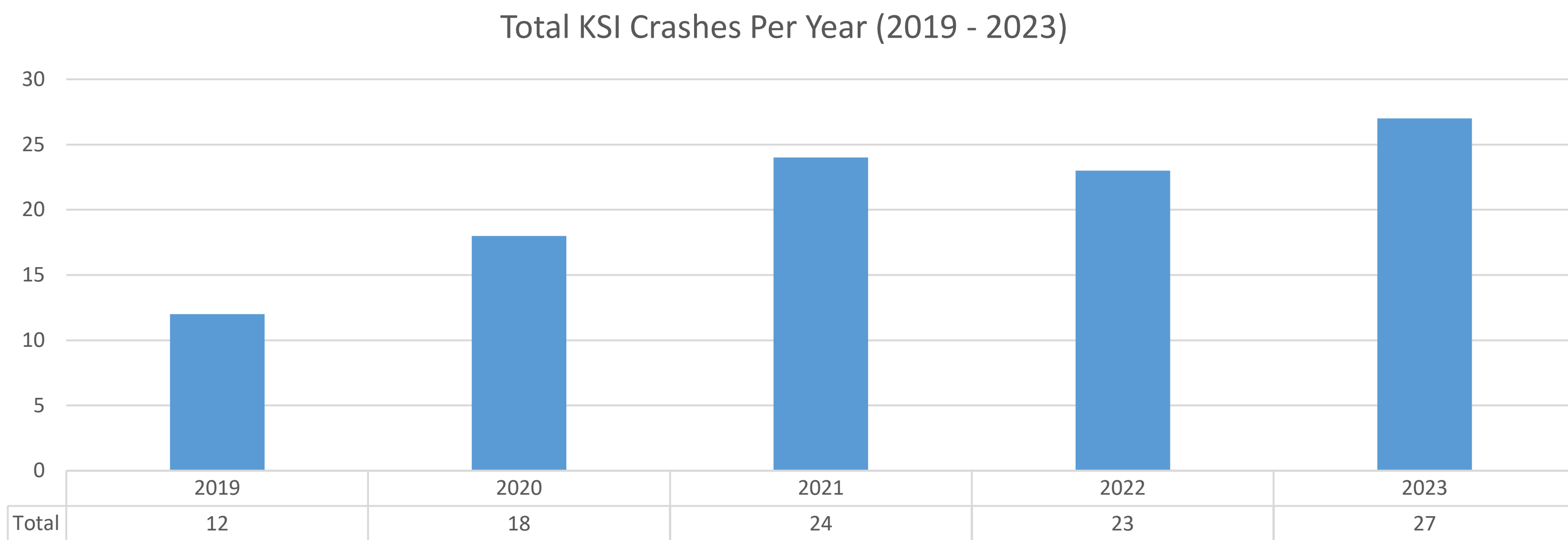
Alta examined the five most recent years of available crash data (2019 – 2023) that occurred on all public roadways in Carson City. Crashes where someone was killed or seriously injured (also known as KSI crashes) were the focus of this analysis. Crashes outside of Carson City were excluded for analysis but are shown for context. Crashes that occurred on the Interstate Highway System (I-580) were excluded from this analysis, unless stated otherwise. Property Damage Crashes, except for bicycle and pedestrian property damage crashes, were generally excluded from this analysis. Motorcycles were included with vehicles for the purposes of this analysis.

Key Overall Findings

- Between 2019 and 2023 25 people were killed and 1,397 people were injured in crashes in Carson City.
- Crashes have been increasing since 2019 (**Figure 1**). There were more than twice as many KSI crashes in 2023 than in 2019.
- Inclusive of interstates, there was an average of 5.6 fatalities per year. Based on 2020 census population data for Carson City (55,639), this is a fatality rate of 9.5 per 100,000 people. This is lower than the state average for Nevada (11.9 per 100,000) and less than the 2023 national average of 12.21.[1]

[1] *For more information, refer to the Traffic Safety Facts Annual Report, May 2025: https://cdan.dot.gov/tsftables/National%20Statistics.pdf*

Figure 1: Crashes that resulted in a serious or fatal injury (KSI) per year



City-wide crash trends for bicyclists and pedestrians

As shown in **Table 1**, when pedestrians or bicyclists were involved in a crash, they were more likely to be fatal or seriously injured. 45.5% of pedestrian crashes resulted in a fatal or life-altering injury (KSI). Pedestrian-involved crashes were more than 9 times more likely to result in a KSI. Bicyclist-involved crashes were 4.6 times more likely to result in a KSI.

Table 1: Injury crashes, by mode and severity

Crash Severity	Pedestrian Involved	Bicyclist Involved	Motorist-only
Fatal or Serious Injury (K,A)	45.45%	22.00%	4.77%
Minor, Possible or Unknown Injury (B,C,U)	54.55%	78.00%	95.23%
Grand Total	100.00%	100.00%	100.00%

Compared with crashes only involving motorists, crashes involving pedestrians were more likely to occur in dark lighting conditions, with 27% of pedestrian-involved crashes occurring in dark conditions on roads with only partial lighting (**Table 2**). Pedestrian-involved crashes were also more likely to involve somebody under the influence of alcohol (**Table 3**).

Table 2: Lighting conditions at the time of the crash

Lighting Condition	Pedestrian Involved	Bicyclist Involved	Motorist-only
Dark – Continuous Roadway Lighting	6.06%	2.99%	3.77%
Dark - No Roadway Lighting	7.58%	4.48%	7.28%
Dark - Spot Roadway Lighting	27.27%	8.96%	8.45%
Dark - Unknown Roadway Lighting	1.52%	1.49%	0.42%
Dawn	3.03%	1.49%	1.74%
Daylight	48.48%	71.64%	71.94%
Dusk	4.55%	4.48%	3.32%
Other / Unknown / Blank	1.52%	4.48%	3.09%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Table 3: Alcohol involvement, by mode

Alcohol Involved	Pedestrian Involved Crashes	Bicycle Involved Crashes	Motorist-only
No	83.33%	98.51%	93.50%
Yes	16.67%	1.49%	6.50%
Grand Total	100.00%	100.00%	100.00%

School-area Crashes

Crashes within 1 mile of the 11 study-area schools in Carson City were specifically analyzed to determine trends and patterns specific to each school. Overall, crashes near schools account for 73% of all crashes in Carson City (**Figure 2**). Crashes near schools were more likely to involve a person walking (85% of all pedestrian crashes) or biking (94% of all bicyclist crashes) as shown in **Table 4**.

Figure 2: KSI crashes near study-area schools

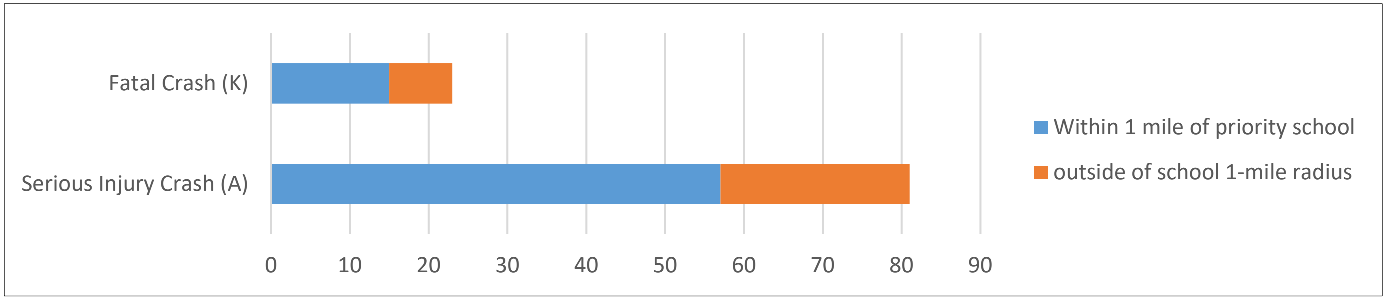


Table 4: Crashes by mode, near study area schools

	Total Crashes	Pedestrian Involved	Bicyclist Involved	Motorist-only
Within a school zone	3.6%	4.5%	13.0%	3.4%
Within 1 mile of priority school	76.70%	84.85%	94.03%	76.19%
Outside of school 1-mile radius	23.30%	15.15%	5.97%	23.81%
Grand Total	100.00%	100.00%	100.00%	100.00%

The portion of crashes that occurred during peak school hours (7-9am, 1-3pm) is key to helping understand which school areas have a higher level of crash risks while students are coming to and from school. As shown in **Table 5**, Mark Twain and Carson High School have the highest total crashes within 1 mile of the school. Carson High-Silver Campus had lower overall crashes, but a higher proportion of crashes during peak hours.

Table 5: Crashes by peak AM/PM school hours within a 1-mile buffer

Study School	Peak AM Crashes (7-9am)	Peak PM crashes (1-3pm)	Crashes Outside of Peak Periods	Total Crashes
Carson High	110	125	703	938
Carson High – Silver Campus	115	121	656	892
Carson Middle	83	90	461	634
Eagle Valley Middle	15	8	67	90
Seeliger Elementary	22	45	224	291
Bordewich-Bray Elementary	90	104	521	715
Fremont Elementary	55	62	326	443
Fritsch Elementary	77	93	516	686
Empire Elementary	80	74	575	729
Mark Twain Elementary	114	119	831	1064
Washoe Headstart	22	55	405	482
Some 1-mile buffers overlap. Crashes are counted for each boundary they fall within. Crash totals include property damage only crashes. Crashes in 1-mile buffer around Washoe Headstart also include crashes outside of Carson City.				

Table 6 - Crashes by peak AM/PM school hours within School Zones

Study School	Peak AM Crashes (7-9am)	Peak PM crashes (1-3pm)	Crashes Outside of Peak Periods	Total Crashes
Carson High	5	2	18	25
Carson High – Silver Campus	1	0	10	11
Carson Middle	4	2	7	13
Eagle Valley Middle	0	0	0	0
Seeliger Elementary	0	0	6	6
Bordewich-Bray Elementary	4	2	14	20
Fremont Elementary	1	2	7	10
Fritsch Elementary	1	1	9	11
Empire Elementary	6	1	29	36
Mark Twain Elementary	0	0	6	6
Washoe Headstart	0	0	0	0
Some school zones overlap. Crash totals include property damage only crashes.				

High Injury Network

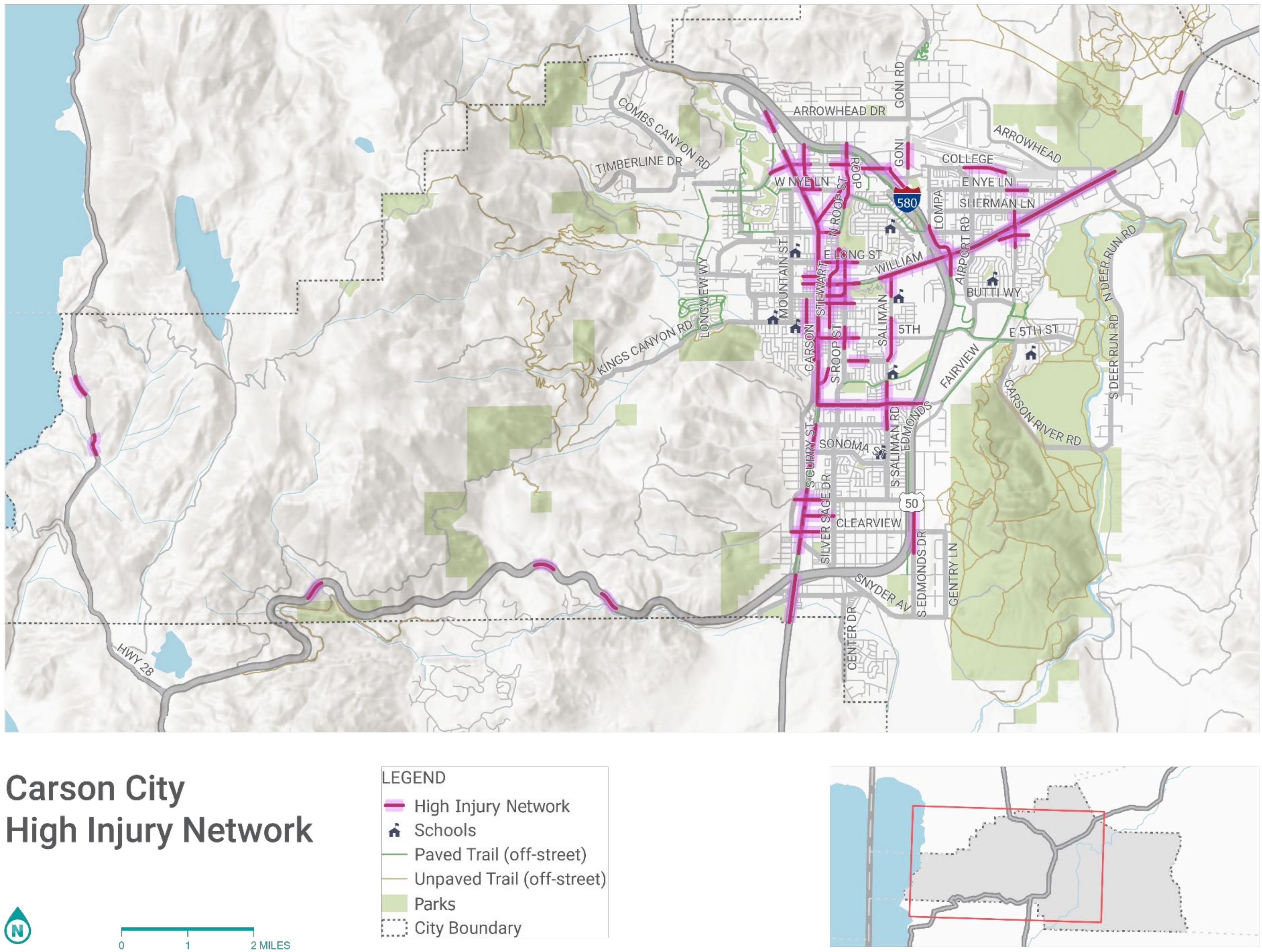
Alta developed a High Injury Network (HIN) for Carson City to identify roadways where the most severe crashes occur. The resulting HIN highlights high-crash areas to focus safety improvements, to direct resources where safety improvements can have the greatest impacts. The high injury network was based on crash data weighted by crash severity and associated with the roadway centerline, using a rolling window analysis. Segments were added to the HIN network based on the crash severity per mile, to capture a high proportion of KSI crashes on a small overall percentage of the road network. **The HIN represents 70% of KIS crashes on just 5% of the road network.** The full methodology can be found in Appendix A. There are 26 miles of HIN in Carson City. Of these, 80% (20 miles) are within the 1-mile school zones.

Table 7: HIN mileage by school

School	HIN mileage (within 1 mi)
Bordewich-Bray Elementary School	7.5
Empire Elementary School	3.2
John C Fremont Elementary School	5.1
Edith W Fritsch Elementary School	8.0
Mark Twain Elementary School	7.7
Al Seeliger Elementary School	3.0
Carson High School	7.4
Carson High School – Silver Campus	9.1
Carson Middle School	6.4
Eagle Valley Middle School	0.0
Stewart Headstart Washoe Tribe	1.5

The maps included in this section show the HIN locations citywide and within each school study-area (1-mile). HIN maps for each school also highlight the HIN corridors and their extents which fall within the study area; in the case where no HIN corridors are present within the study area (i.e. Eagle Valley Middle School), this summary table is intentionally omitted as part of the map.

Figure 3: Carson City High Injury Network



Carson High

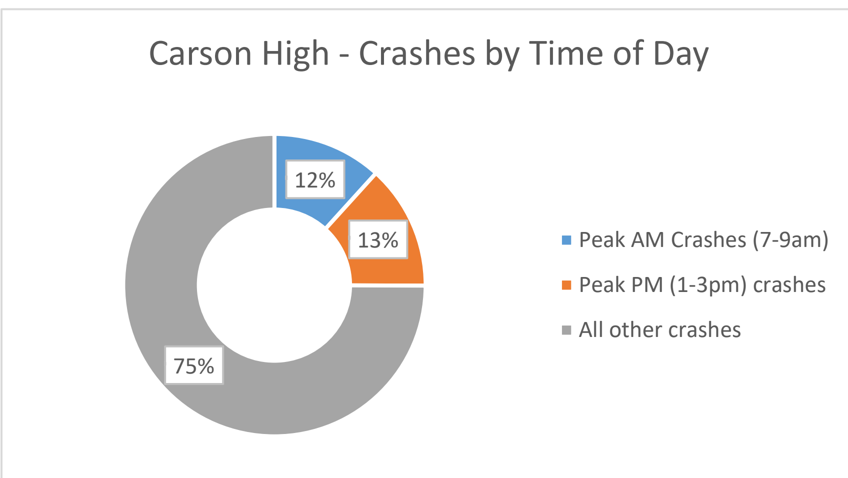
School Information:

Carson High School (CHS) is located on N. Saliman Road between E. Robinson Street and E. William Street on the east side of Carson City. The school campus is surrounded by commercial areas, Mills Park, residential neighborhoods and open space. The median household income in the area ranges from $60,000 to $80,000, which is similar to the regional average. Additionally, around 5–10% of households in the area do not have access to a vehicle, indicating a moderate level of vehicle access.

School Crash Summary:

Carson High has a total of 938 crashes within a 1-mile radius, the second highest among the schools of focus. Of these, 90 crashes occurred during the morning peak period (7–9 AM) and 104 during the afternoon peak (1–3 PM), meaning 20% or 1 in every 5 crashes happened during school commute hours. There are 7.5 miles of high injury network (HIN) roads within the 1-mile school radius.

Figure 4: Carson High School – Crashes by Time of Day



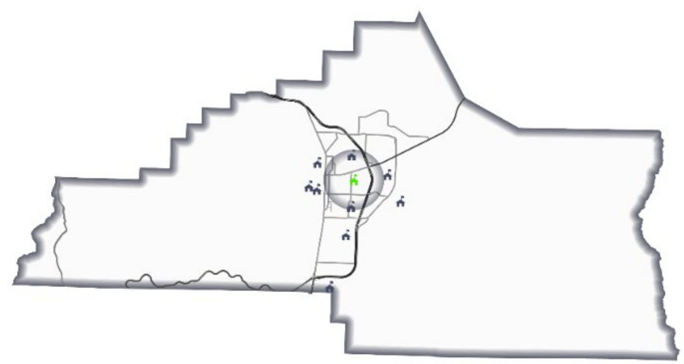


Figure 5: Carson High School High Injury Network Map

Carson High School

Within a 1-mile radius, there are *7.4* High Injury Network miles.

Name	Fromstreet	Tostreet
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
E William St	Rand Ave	State St
Fleishmann St	N Carson St	N Division St
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Nichols Ln	East Of Airport Rd
Little Ln	Parkland Ave	S Roop St
Long St	N Carson St	N Stewart St
N Carson St	Corbett St	Bath St
N Carson St	W 5th St	E Musser St
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
N Roop St	E Adams St	N Stewart St
Saliman Rd	Little Ln	E 5th Street
Saliman Rd	North Of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St

Carson High – Silver Campus (formerly Pioneer High School)

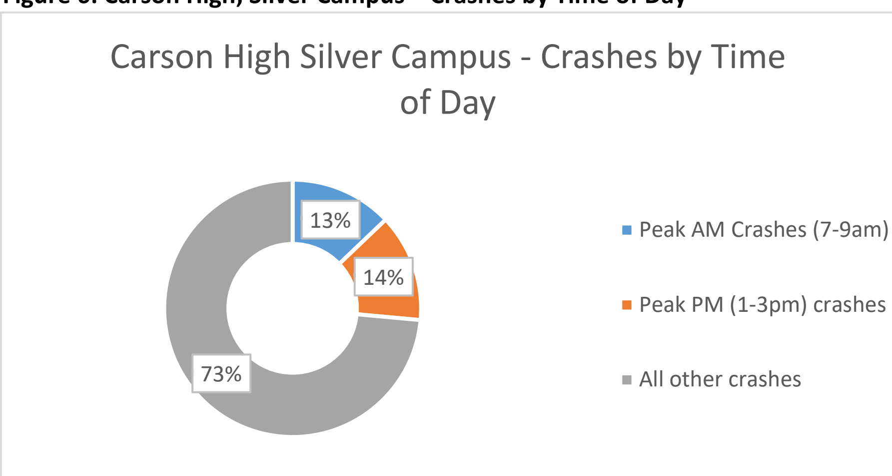
School Information:

Carson High Silver Campus (CHSC) is located on Corbett Street between N. Fall Street and N. Stewart Street on the west side of Carson City. The school campus is surrounded by residential neighborhoods and open space. The area has the lowest median household income at $30,000 or more below the regional average. Additionally, vehicle access is limited, with Carson High Silver Campus more than 10% of households lacking access to a vehicle which is higher than the regional average.

School Crash Summary:

Carson High Silver Campus has a total of 892 crashes, with 121 of those occurring during the peak PM period (1-3pm). CHSC has the highest number of crashes that occurred during the peak AM period (7-9am) at 115 crashes. There are 9.1 high injury network miles within the 1-mile school radius. Carson High Silver Campus has a moderate crash volume and has the highest number of HIN roads surrounding the school. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 6: Carson High, Silver Campus – Crashes by Time of Day



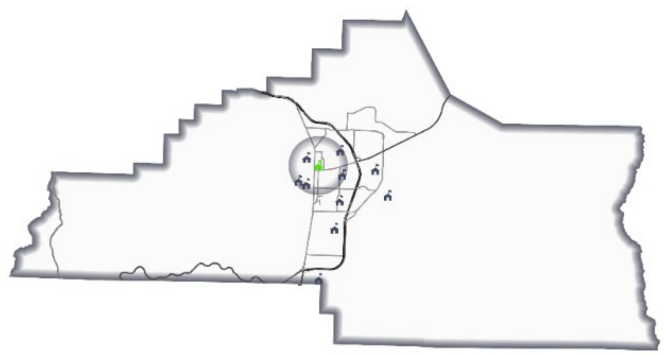


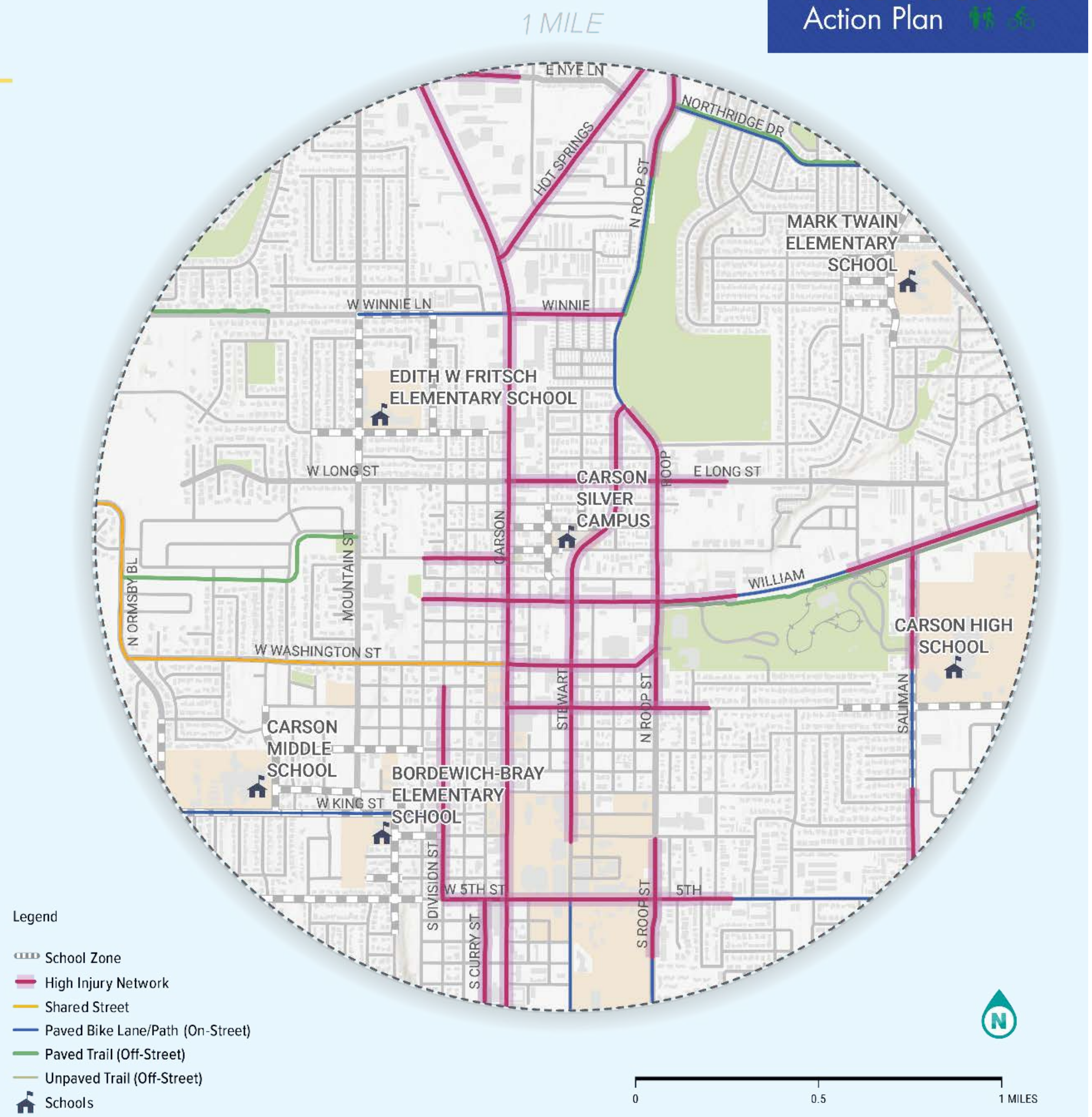
Figure 7: Carson High School, Silver Campus High Injury Network Map

Carson Safe Routes to School Action Plan

Carson High Silver Campus

Within a 1-mile radius, there are ***9.1*** High Injury Network miles.

Street Name	From	To
N Carson St	E Proctor St	E Washington St
N Carson St	E Washington St	Corbett St
N Carson St	N Of Hot Spring Rd	W Nye Ln
Division	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Rand Ave	State St
Fleischmann	N Carson St	N Division St
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Imperial	E Nye Ln	W Gardengate Wy
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
Roop	Northridge Dr	Hot Springs Rd
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Saliman	N of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W 5th St	S Carison St	S Division St
W Nye Ln	Northgate Ln	N Carson St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St
Winnie	N Roop St	N Carson St



Carson Middle

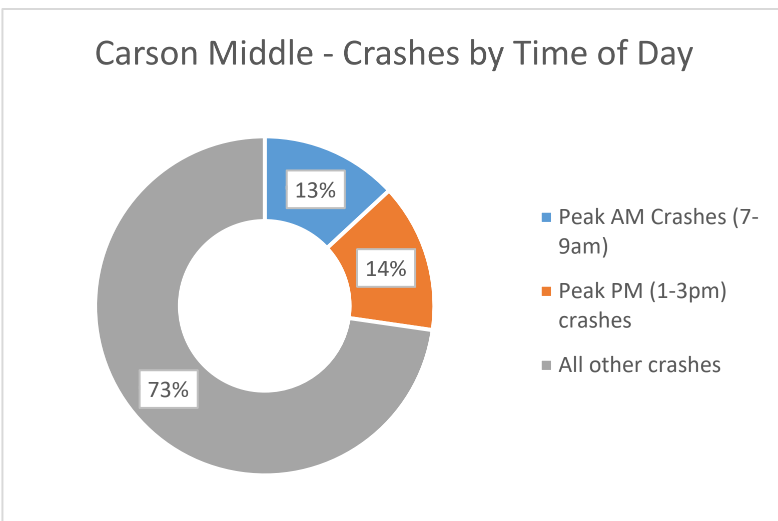
School Information:

Carson Middle School (CMS) is located on W. King Street between Richmond Drive and Ormsby Boulevard on the west side of Carson City. The school campus is surrounded by residential uses on all sides. Vehicle access is limited, with more than 10% of households lacking access to a vehicle which is higher than the regional average.

School Crash Summary:

Carson Middle has a total of 634 crashes within a one-mile radius, including 83 during the peak AM period (7-9am) and 90 crashes during the peak PM period (1-3pm) totaling 173 (27%) during student commute hours. There are 6.4 high injury network miles within the 1-mile school radius. Carson Middle has a moderate crash volume and is surrounded by a notable number of HIN roads. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 8: Carson Middle – Crashes by Time of Day



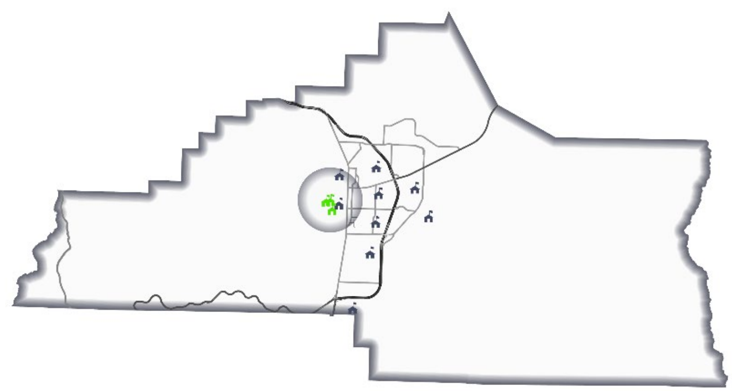
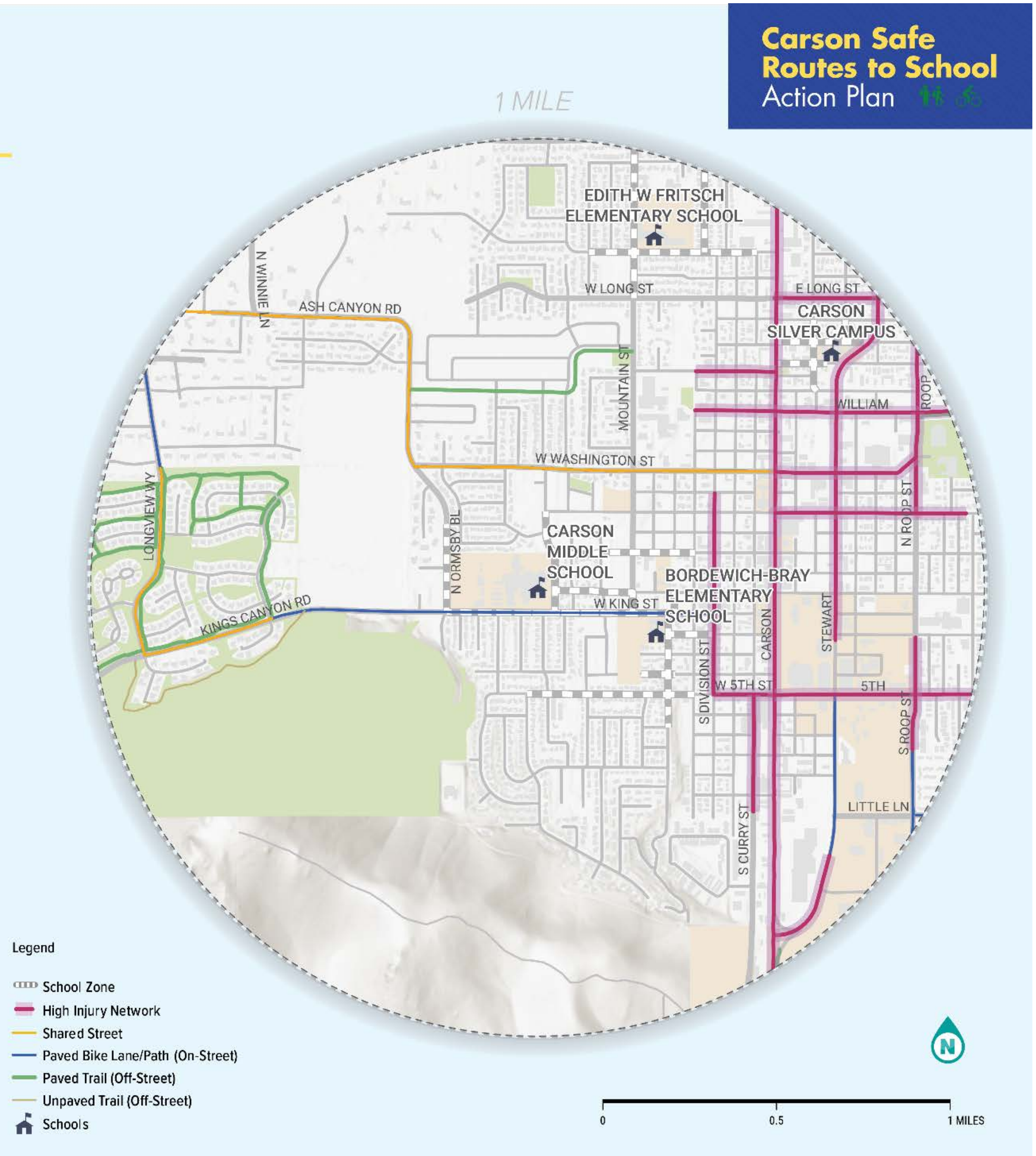


Figure 9: Carson Middle School High Injury Network Map

Carson Middle School

Within a 1-mile radius, there are ***6.4*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	S Stewart St	10 10th Street
S Division St	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fleishmann St	N Carson St	N Division St
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Stewart St	E 2nd St	E Spear St
Stewart St	E Park St	N Roop St
Stewart St	E William St	E Park St
Stewart St	S Spear Street	E William St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St



Eagle Valley Middle

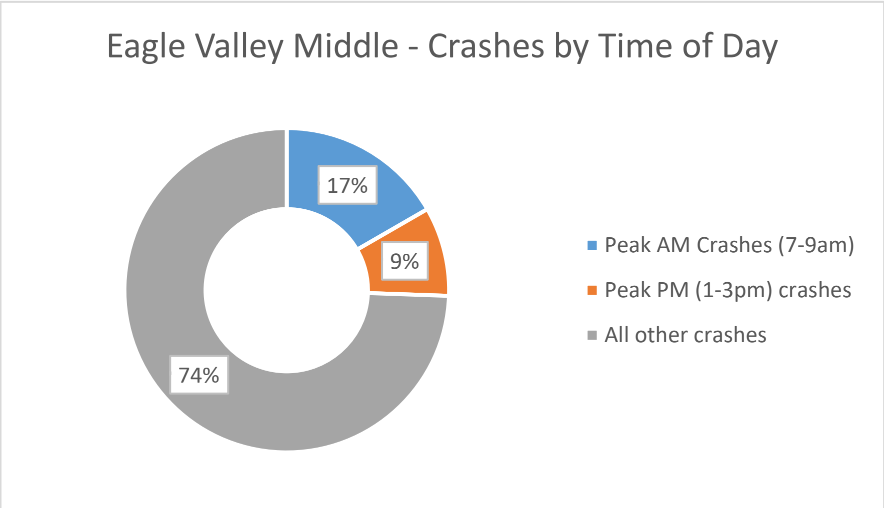
School Information:

Eagle Valley Middle School (EVMS) is located on E. 5th Street between Regent Court and Hidden Meadow Drive on the east side of Carson City. The school campus is surrounded by residential neighborhoods and open space. The area has a high median household income, ranging from $30,000 to $130,000 above the regional average. Additionally, less than 5% of households in the area do not have access to a vehicle, which is lower than the regional average.

School Crash Summary:

Eagle Valley Middle stands out with the lowest number of crashes within a one-mile radius totaling 90 crashes. Only 15 occurred during the peak AM period (7-9am) and 8 crashes occurred during the peak PM period (1-3pm), totaling just 23 crashes during school commute hours. Notably, there are zero miles of High Injury Network roads in the surrounding area. This is likely due to a less complex roadway network and an overall lack of surrounding destinations besides the school itself, resulting in lower vehicle volumes and fewer conflict points.

Figure 10: Eagle Valley Middle – Crashes by Time of Day



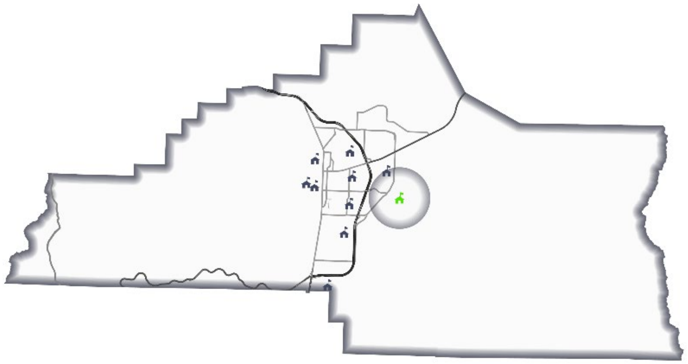
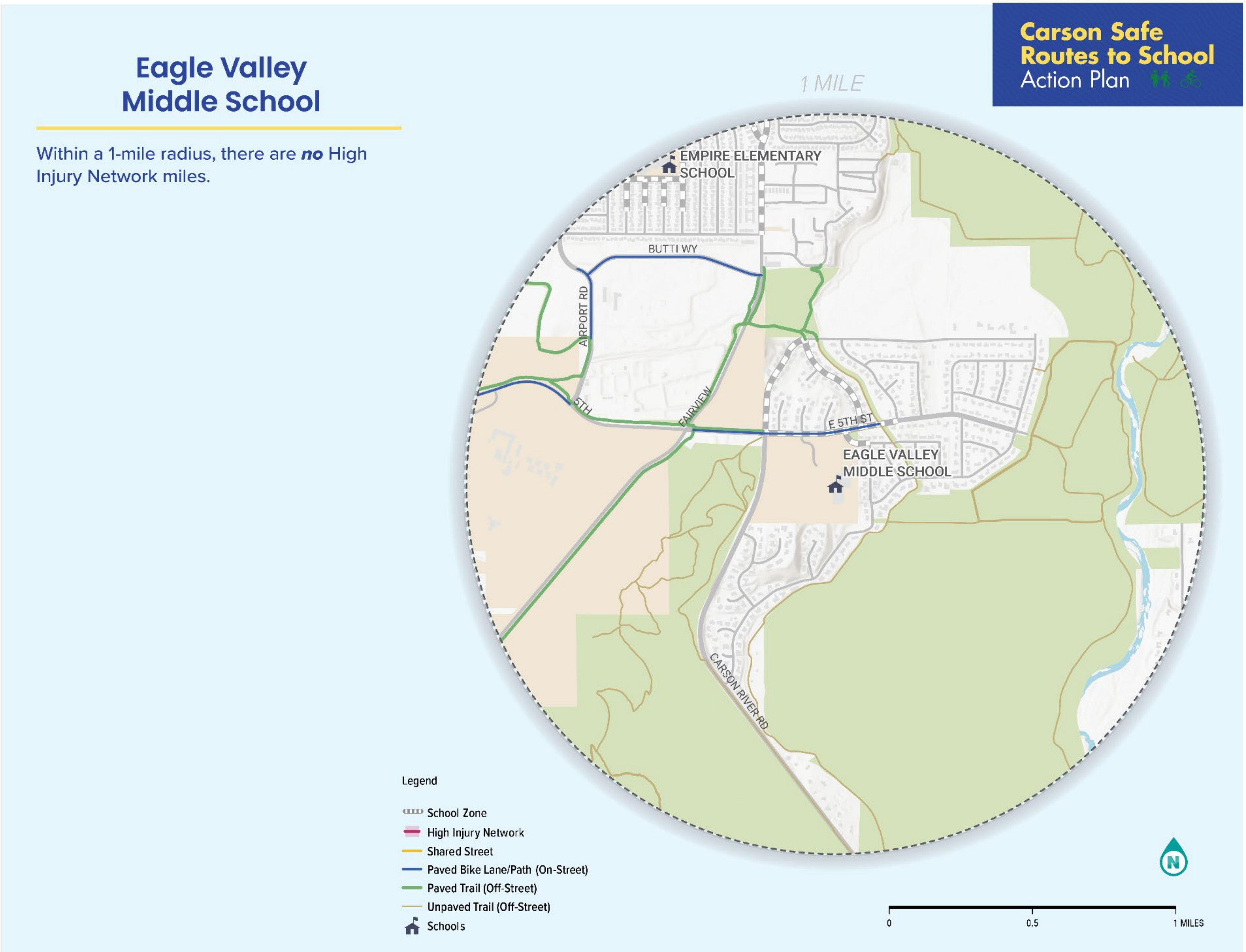


Figure 11: Eagle Valley Middle School High Injury Network Map



Al Seeliger Elementary

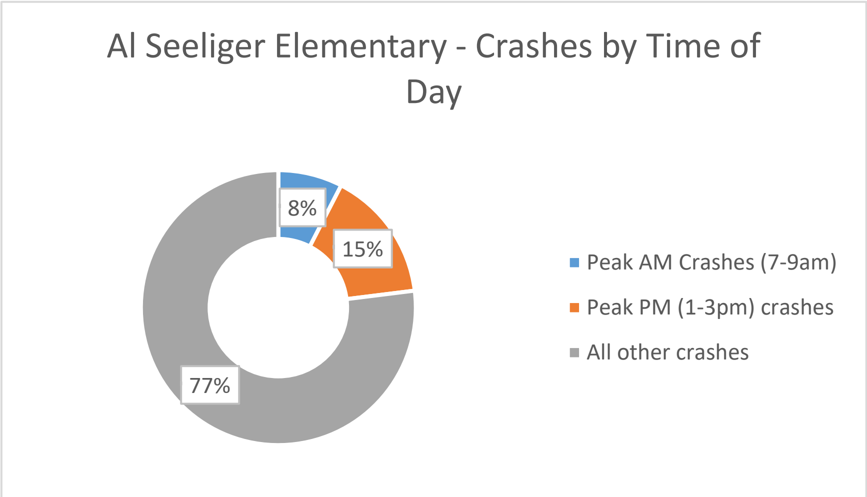
School Information:

Seeliger Elementary School (SES) is located on Saliman Road between Shady Oak Drive and Sonoma Street on the south side of Carson City. The school campus is surrounded by residential uses on all sides. The area has a relatively high median household income, ranging from $10,000 to $30,000 above the regional average. Additionally, less than 5% of households in the area do not have access to a vehicle, which is lower than the regional average.

School Crash Summary:

Al Seeliger has a total of 291 crashes, including 22 during the peak AM period (7-9am) and 45 during the peak PM period (1-3pm). Over 1 and every 5 crashes or 23% occurred during peak student travel hours. There are 3 high injury network miles within the 1-mile school radius. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure: 12: Al Seeliger Elementary – Crashes by Time of Day



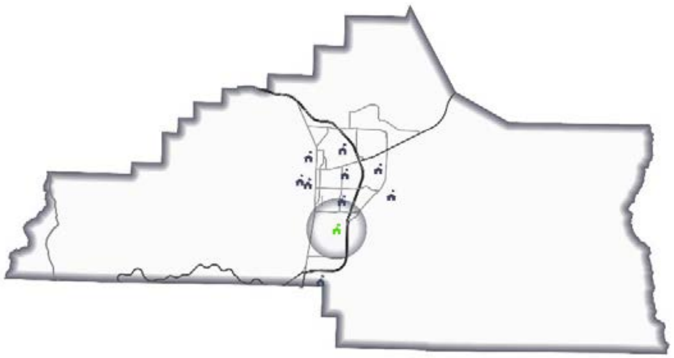


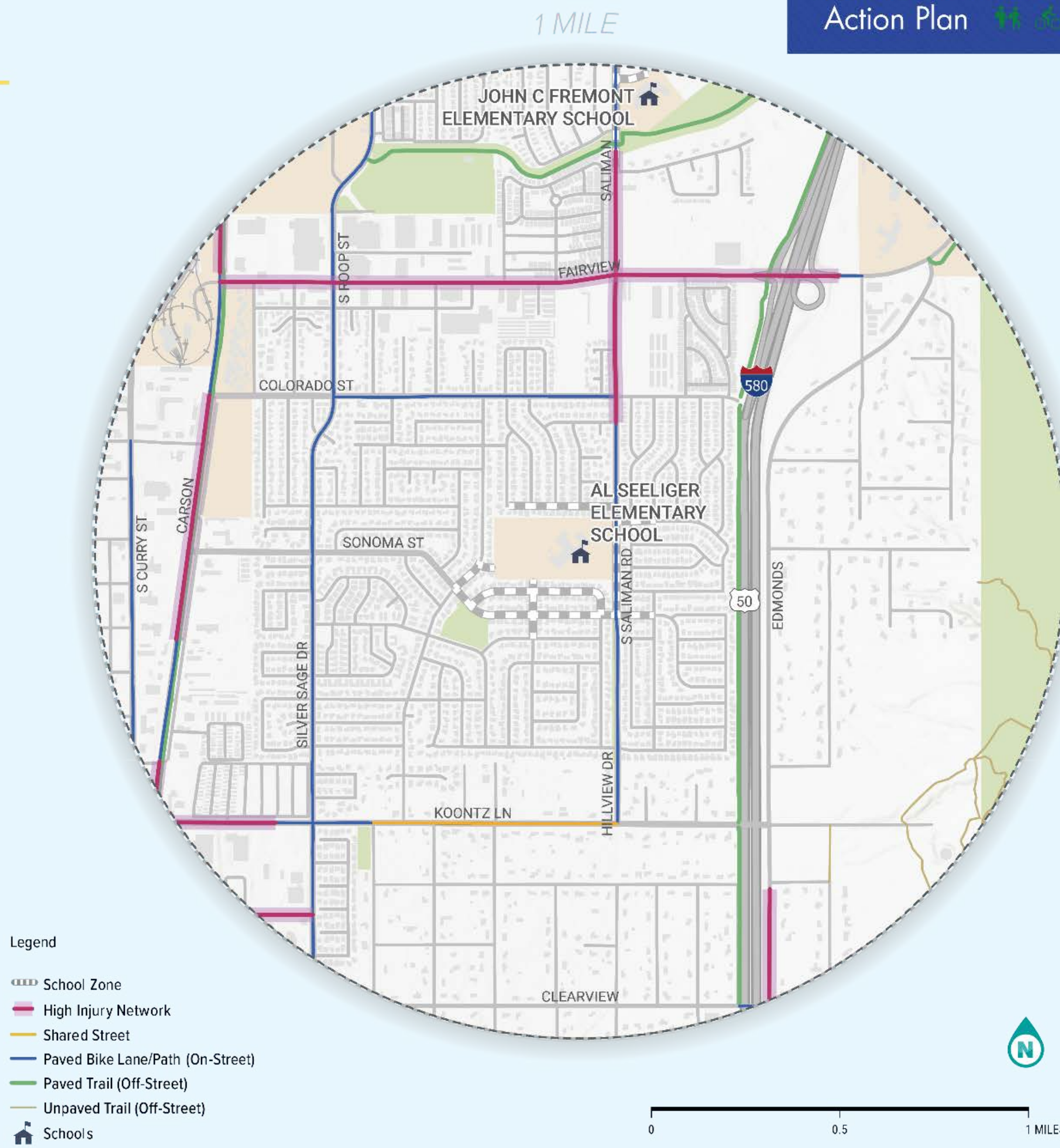
Figure 13: Al Seeliger Elementary School High Injury Network Map

Al Seeliger Elementary School

Within a 1-mile radius, there are ***3.0*** High Injury Network miles.

Carson Safe Routes to School Action Plan

Street Name	From	To
Carson St	Sonoma St	Colorado St
Carson St	N Of Koontz Ln	Sonoma St
Eagle Station Ln	Silver Sage Dr	S Carson St
Edmonds Dr	Clearview Dr	Valley View Dr
Fairview Dr	Industrial Park Dr	S Roop St
Fairview Dr	S Roop St	S Carson St
Fairview Dr	S Saliman Rd	Industrial Park Dr
Fairview Dr	580 On-Ramp	Saliman Rd
Fairview Dr	S Saliman Rd	S Lompa Ln
Koontz Ln	Silver Sage Dr	S Carson St
S Carson St	Fairview Dr	S Stewart St
S Carson St	Moses St	Eagle Station Ln
S Saliman Rd	Fairview Dr	Railroad Dr
Saliman Rd	Heather Way	Fairview Dr



Bordewich-Bray Elementary School

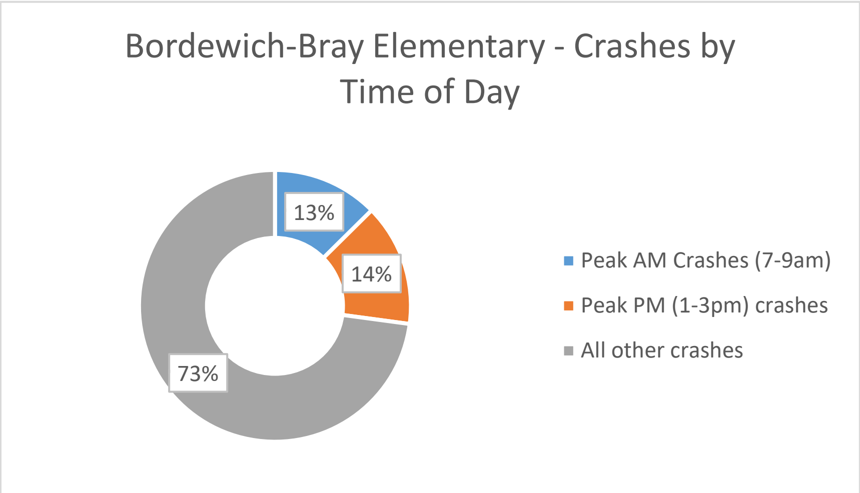
School Information:

Bordewich-Bray Elementary School (BBES) is located at the intersection of Thompson Street and W. King Street in a well-established residential neighborhood on Carson City's west side. The campus is primarily surrounded by residential land uses. The median household income in the area ranges from $60,000 to $80,000, which is close to the regional average. However, vehicle access is relatively low, with over 10% of households lacking access to a vehicle.

School Crash Summary:

Bordewich-Bray Elementary School has a total of 715 crashes. Of these, 90 occurred during the peak AM period (7-9am) and 104 crashes occurred during the peak PM period (1-3pm). This means 194 crashes (27.1%) of crashes happened during peak school travel time, indicating a high degree of student exposure to crash prone conditions. There are also 7.5 high injury network miles within the 1-mile school radius. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 14: Bordewich-Bray Elementary – Crashes by Time of Day



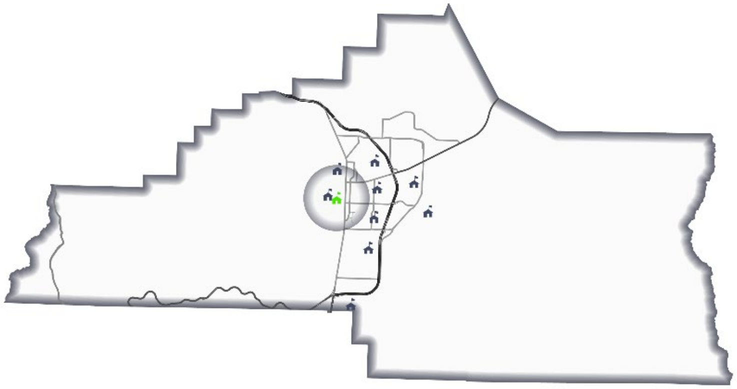
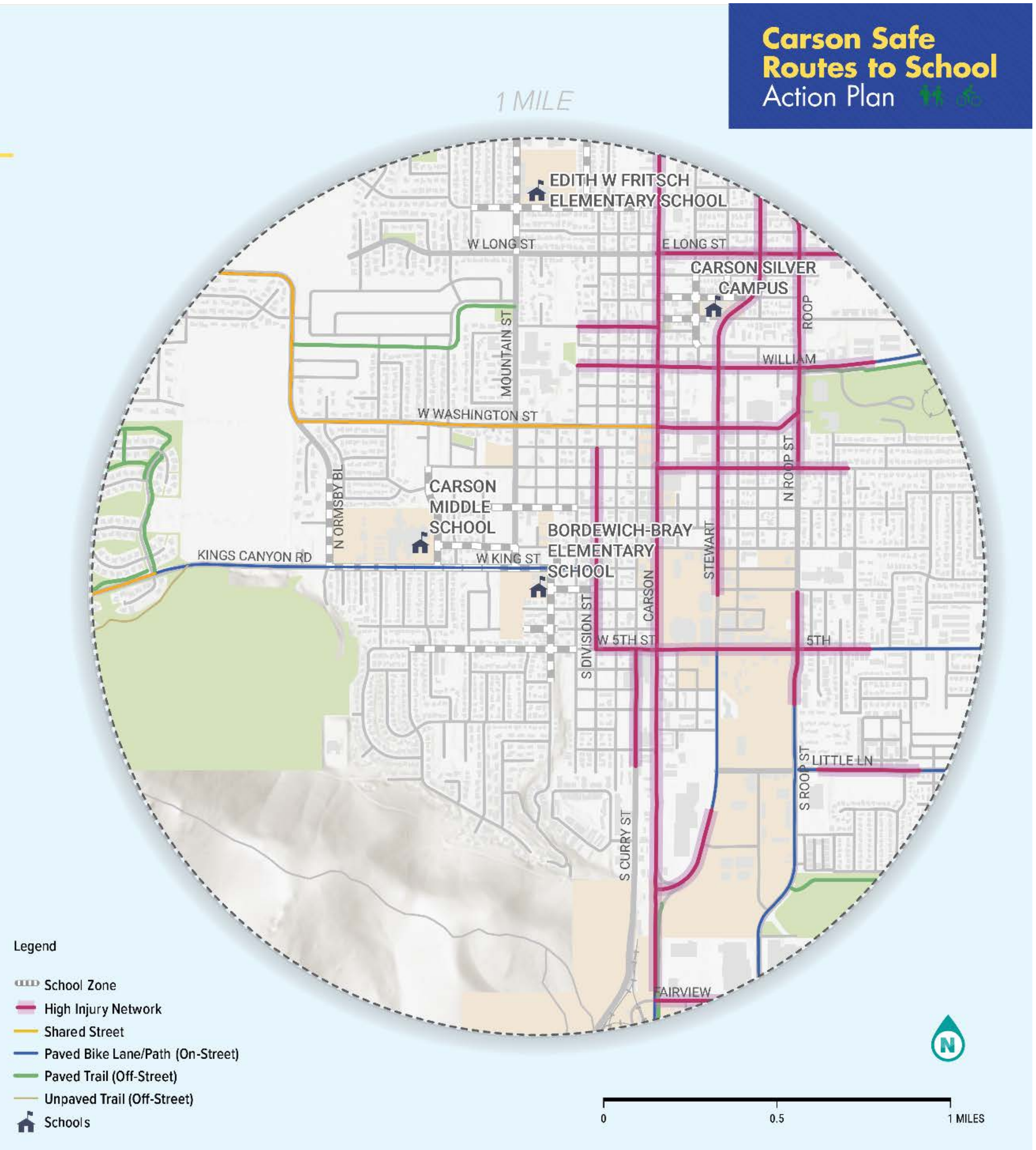


Figure 15: Bordewich-Bray Elementary School High Injury Network Map

Bordewich-Bray Elementary School

Within a 1-mile radius, there are ***7.5*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	S Stewart St	10 10th Street
Division	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fairview St	S Roop St	S Carson St
Fleishmann St	N Carson St	N Division St
Little Ln	Parkland Ave	S Roop St
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Stewart St	E 2nd St	E Spear St
Stewart St	E Park St	N Roop St
Stewart St	E William St	E Park St
Stewart St	S Spear Street	E William St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St



Empire Elementary

School Information:

Empire Elementary School (EES) is situated between Gordonia Avenue, Stanton Drive, Monte Rosa Drive, and La Loma Drive in an established residential neighborhood on Carson City's east side. The campus is surrounded by residential housing and borders a local park to the north. Empire Elementary is located within a USDOT-designated area of persistent poverty. The median household income in this area is $10,000 to $30,000 below the regional average. Despite this, vehicle access is high, with fewer than 5% of households lacking access to a vehicle.

School Crash Summary:

Empire Elementary has a total of 729 crashes within a one-mile radius. Of these, 80 occurred during the peak AM period (7-9am) and 74 crashes occurred during the peak PM period (1-3pm). Over 1 and every 5 crashes or 21.1% occurred during peak student travel hours. There are 3.2 high injury network miles within the one-mile school radius. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 16: Empire Elementary – Crashes by Time of Day

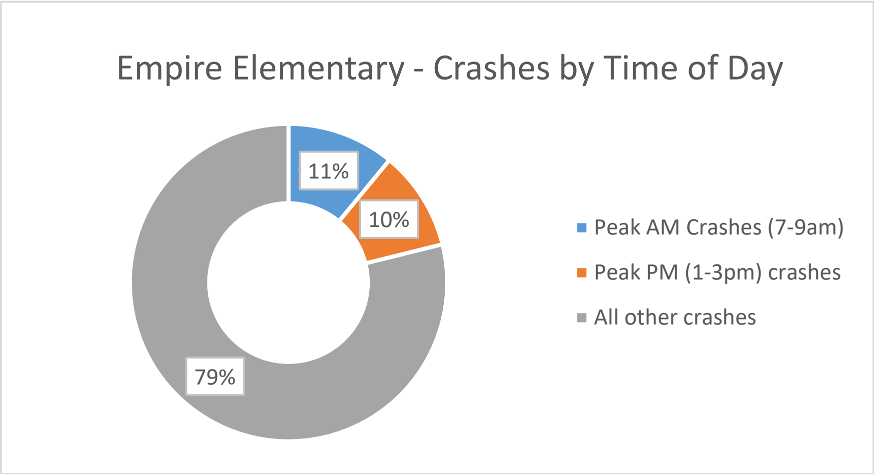
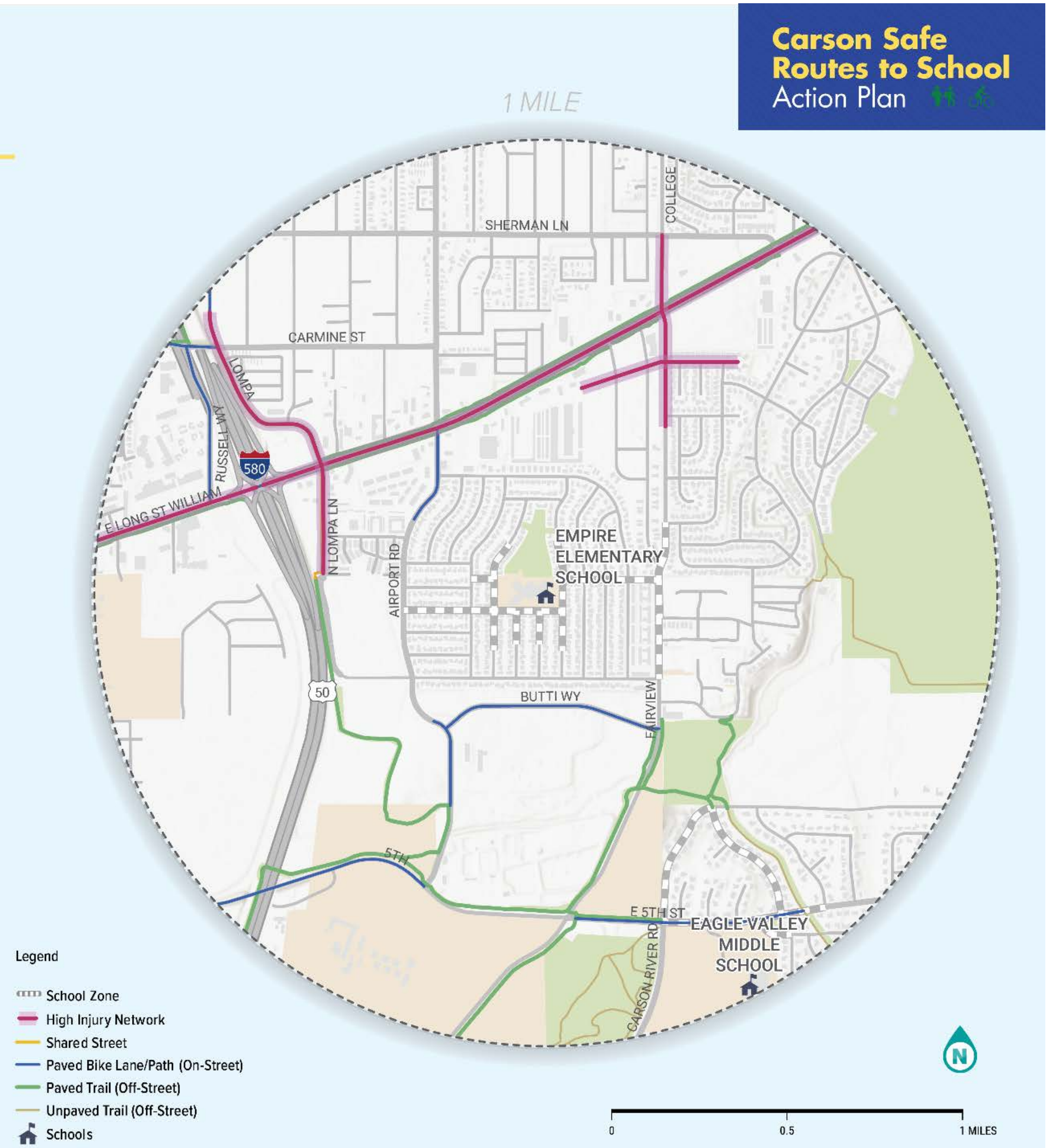


Figure 17: Empire Elementary School High Injury Network Map

Empire Elementary School

Within a 1-mile radius, there are ***3.2*** High Injury Network miles.

Street Name	From	To
College Pkwy	Hwy 50	Sherman Ln
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
Fairview	Sweetwater Dr	Hwy 50
Gordon St	Walker Dr	Brown St
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Brown St	College Pkwy
Hwy 50	Carter Ave	Merrimac Way
Hwy 50	Nichols Ln	East Of Airport Rd
Hwy 50	Sherman Ln	College Pkwy
Hwy 50	West Of Brown St	West Of Silver State St
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50



Fremont Elementary School

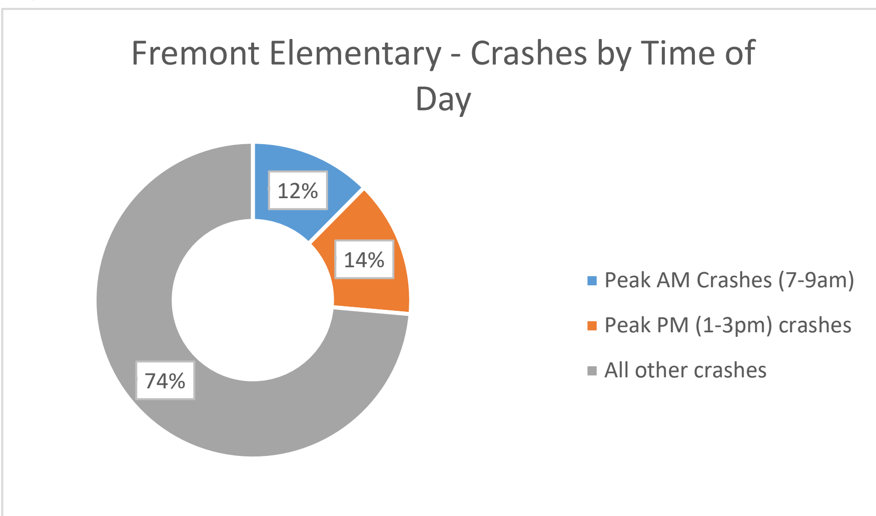
School Information:

Fremont Elementary School (FES) is located on Saliman Road, between Firebox Road and Railroad Drive. The school is bordered by residential areas to the north, south, and west, with open space to the east. Fremont Elementary is also situated within a USDOT-designated area of persistent poverty. The median household income here is $10,000 to $30,000 below the regional average. Vehicle access is limited, with more than 10% of households lacking access to a vehicle which is higher than the regional average.

School Crash Summary:

Fremont has a total of 443 crashes in the area, including 55 in the peak AM period (7-9am) and 62 in the peak PM period (1-3pm). Over 1 and every 5 crashes or 26.4% occurred during peak student travel hours. The school is surrounded by 5.1 miles of high injury network (HIN) roads. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 18: Fremont Elementary – Crashes by Time of Day



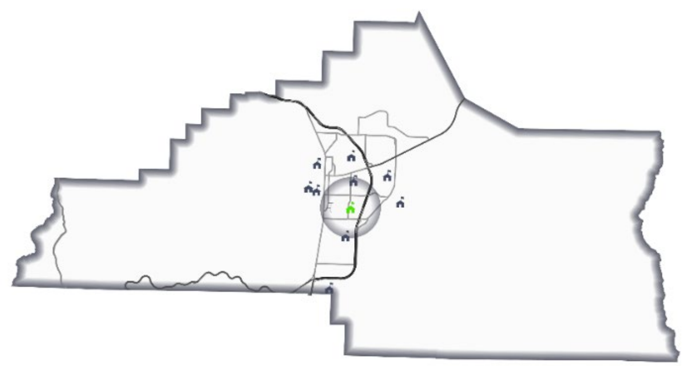
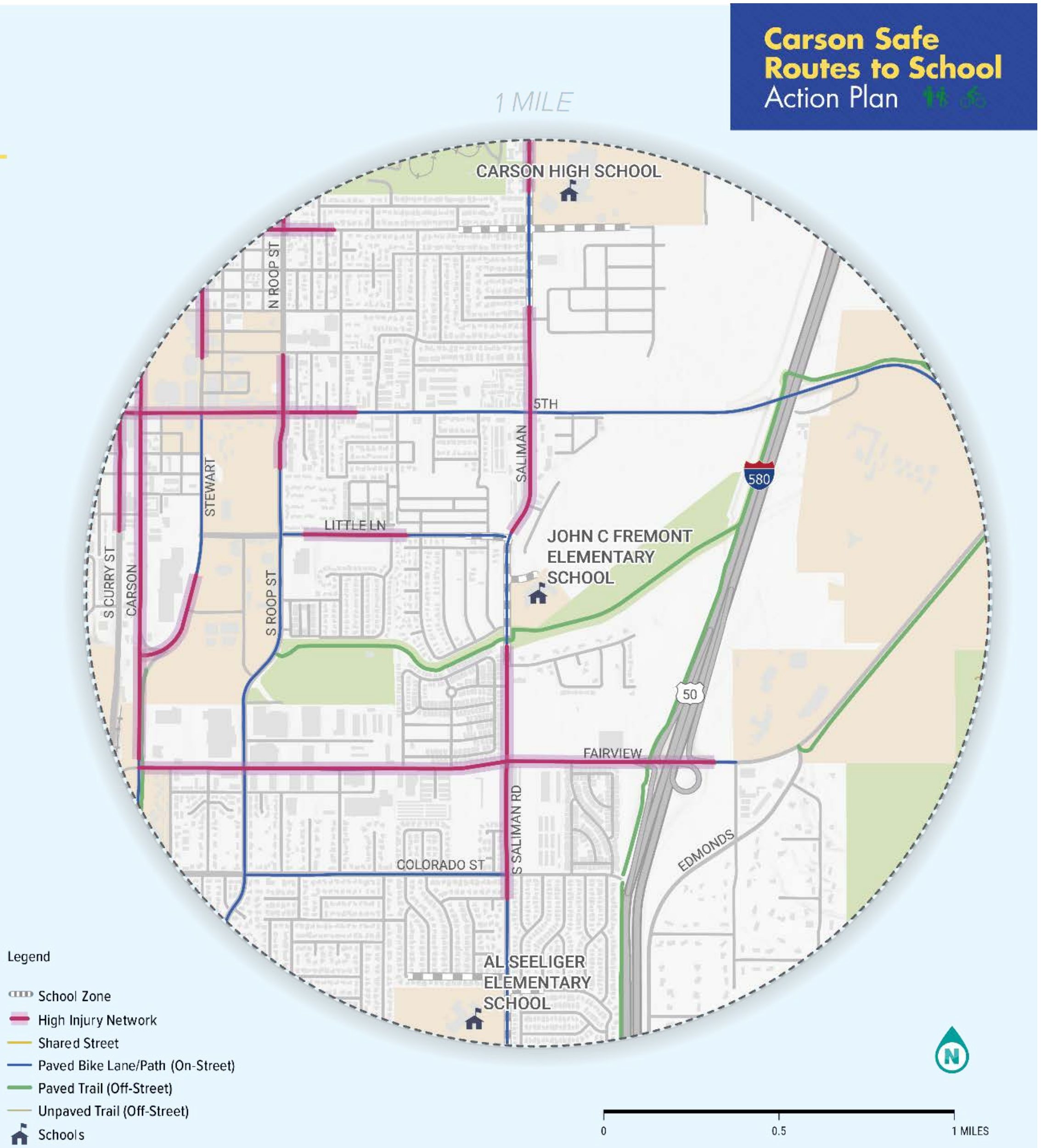


Figure 19: John C Fremont Elementary School High Injury Network Map

John C Fremont Elementary School

Within a 1-mile radius, there are ***5.1*** High Injury Network miles.

Street Name	From	To
Carson St	S Stewart St	10 10th Street
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Robinson St	N Harbin Ave	N Valley St
Fairview	Industrial Park Dr	S Roop St
Fairview	S Roop St	S Carson St
Fairview	S Saliman Rd	Industrial Park Dr
Fairview Dr	580 On-Ramp	Saliman Rd
Fairview Dr	S Saliman Rd	S Lompa Ln
Little Ln	Parkland Ave	S Roop St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	Little Ln	E 2nd St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Saliman Rd	Fairview Dr	Railroad Dr
Saliman Rd	Little Ln	E 5th Street
Saliman Rd	North Of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Saliman Rd	Heather Way	Fairview Dr
Stewart St	E 2nd St	E Spear St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St



Fritsch Elementary

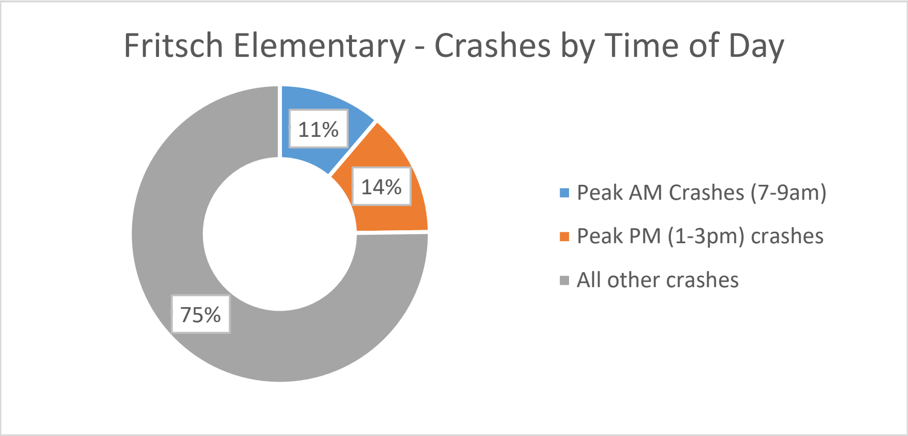
School Information:

Edith Fritsch Elementary School (EFES) is located on Bath Street between Mountain Street and Division Street. The school campus is surrounded by residential neighborhoods with Carson Street, a major commercial corridor, approximately 1,000 feet to the east. The area has a relatively high median household income, ranging from $10,000 to $30,000 above the regional average. Additionally, around 5–10% of households in the area do not have access to a vehicle, indicating a moderate level of vehicle access.

School Crash Summary:

Edith Fritsch Elementary has a total of 686 crashes within a one-mile radius, with 77 occurring during the peak AM period (7-9am) and 93 of crashes occurring during the peak PM period (1-3pm). Over 1 and every 5 crashes or 24.8% occurred during peak student travel hours. There are 8 high injury network miles within the 1-mile school radius, indicating that while the overall crash volume is relatively low, students are still exposed to segments of roadway with elevated injury risk. Edith Fritsch has the second highest number of HIN roads surrounding the school. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 20: Fritsch Elementary – Crashes by Time of Day



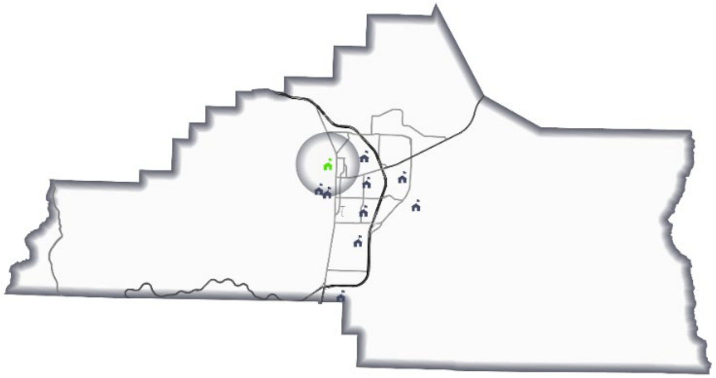


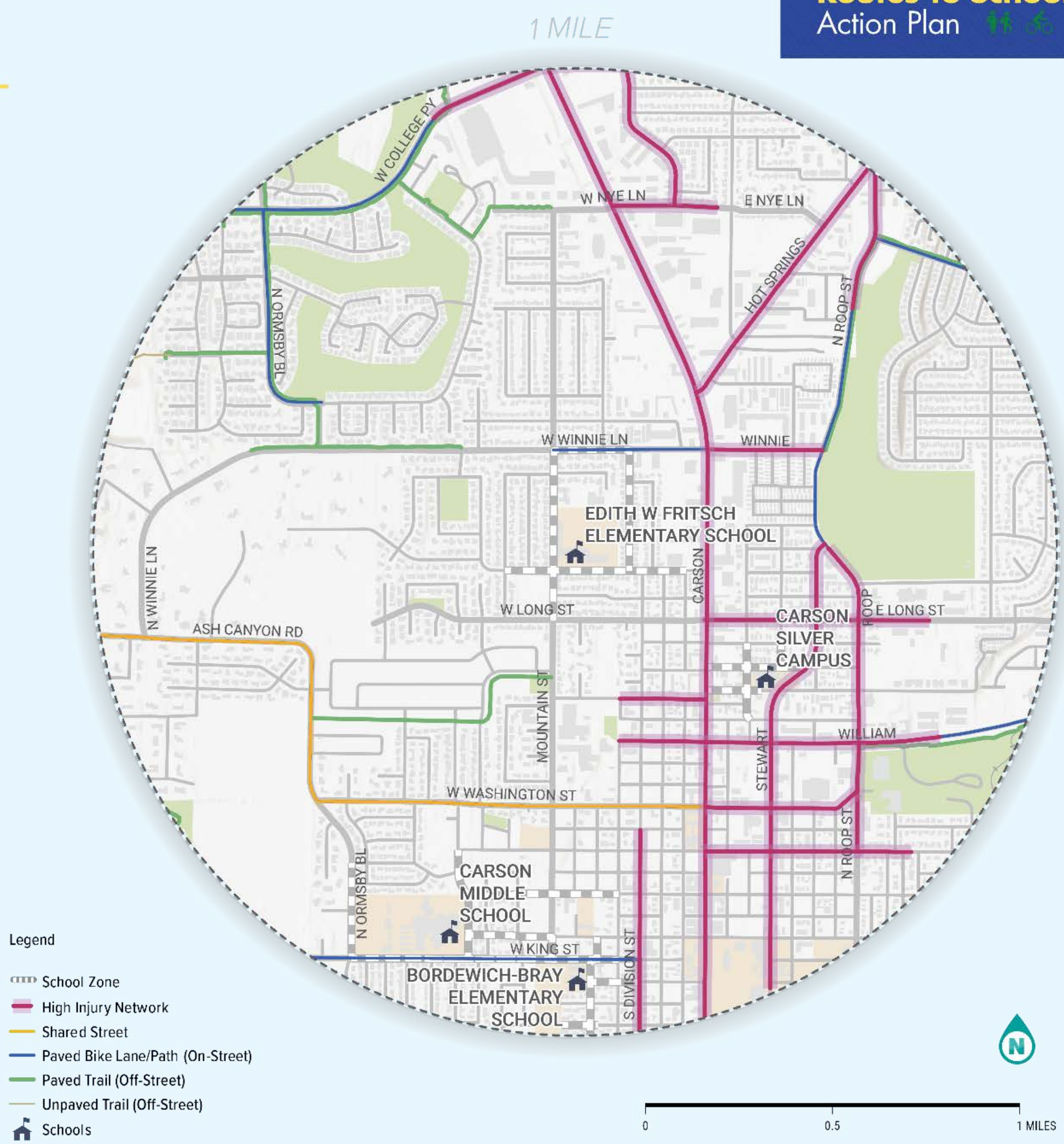
Figure 21: Edith W Fritsch Elementary School High Injury Network Map

Carson Safe Routes to School Action Plan

Edith W Fritsch Elementary School

Within a 1-mile radius, there are ***8*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	N Of Hot Spring Rd	W Nye Ln
Division	W King St	W Caroline St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fleishmann St	N Carson St	N Division St
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Imperial	E Nye Ln	W Gardengate Way
Imperial	W Gardengate Way	Alexa Way
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Carson St	W 5th St	E Musser St
N Carson St	W College Parkway	Silver Oak Dr
N Carson St	W Nye Ln	W College Pkwy
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
Roop	Northridge Dr	Hot Springs Rd
S Division St	W 5th St	W King St
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W College Pkwy	Imperial Way	N Carson St
W College Pkwy	N Clarkson St	Cs Richards Blvd
W Nye Ln	Northgate Ln	N Carson St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St
W Winnie Ln	N Roop St	N Carson St



Mark Twain Elementary

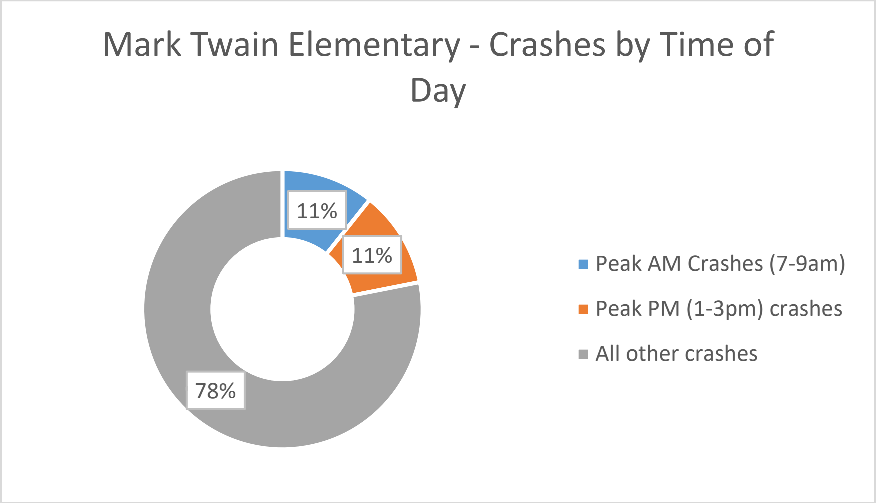
School Information:

Mark Twain Elementary School (MTES) is located on Carriage Crest Drive between Spooner Drive and Hamilton Avenue. The school campus is surrounded by a residential neighborhood with a commercial corridor along William Street to the south. The area has the lowest median household income at $30,000 or more below the regional average. Additionally, vehicle access is limited, with more than 10% of households lacking access to a vehicle which is higher than the regional average.

School Crash Summary:

Mark Twain Elementary has the highest total number of crashes among all schools, with 1064 crashes within a one-mile radius. Of these, 114 occurred during the peak AM period (7-9am) and 119 crashes occurred during the peak PM period (1-3pm). This means 1 and every 5 crashes or 20% of all crashes occur during peak commutes hours. There are 5.1 high injury network (HIN) miles within the 1-mile school radius. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 22: Mark Twain Elementary – Crashes by Time of Day



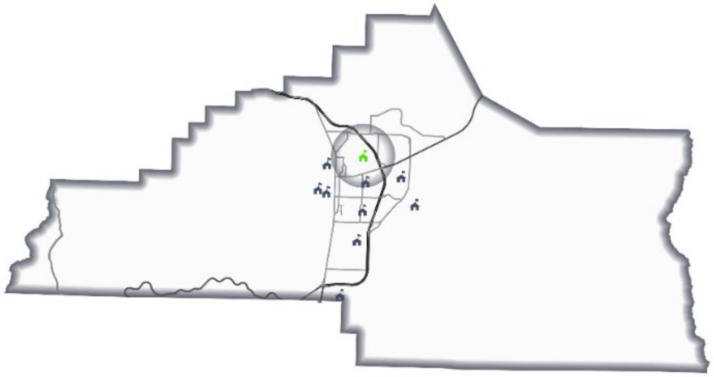


Figure 23: Mark Twain Elementary School High Injury Network Map

Mark Twain Elementary School

Within a 1-mile radius, there are ***7.7*** High Injury Network miles.

Street Name	From	To
N Carson St	E Washington St	Corbett St
N Carson St	N Of Hot Spring Rd	W Nye Ln
College Pkwy	580 Ramp	Emerson Dr
College Pkwy	Emerson Dr	Cinnabar Ave
College Pkwy	Research Way	Market St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
E William St	Rand Ave	State St
Emerson Dr	College Pkwy	Mark Way
Goni Rd	College Pkwy	Old Hot Spring Rd
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Nichols Ln	E of Airport Rd
Imperial	E Nye Ln	W Gardengate Wy
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Hot Spring Rd	College Pkwy
Research Way	College Pkwy	College Pkwy
Research Way	Goni Drive	College Pkwy
N Roop St	E Adams St	N Stewart St
N Roop St	Northridge Dr	Hot Springs Rd
Saliman	N of E Robinson St	E William St
Stewart	E Park St	N Roop St
N Stewart St	E William St	E Park St
N Stewart St	S Spear Street	E William St
W Nye Ln	Northgate Ln	N Carson St
E Williams St	N Anderson St	N Carson St
E Williams St	Oxoby Loop	N Anderson St
W Winnie Ln	N Roop St	N Carson St

Washoe Stewart Headstart

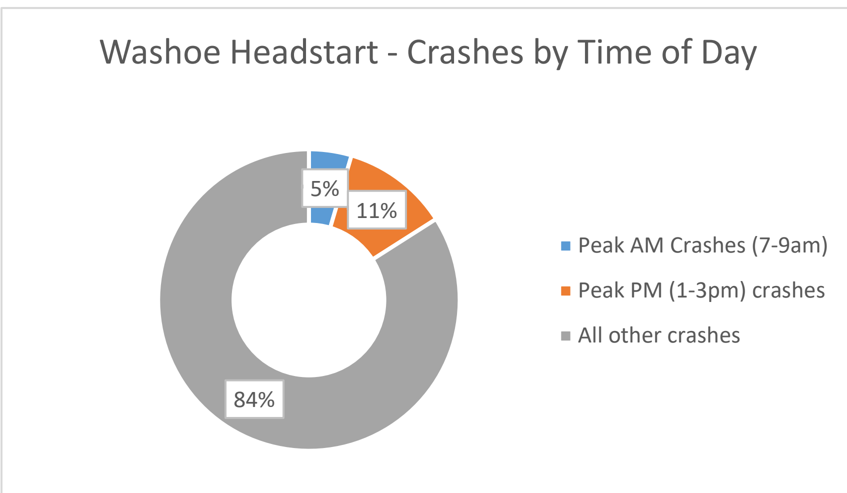
School Information:

Washoe Stewart Headstart is located on De Lah E Deh between Gibson Avenue and Havasupi Drive. The school campus is surrounded by a residential neighborhood. The area has a median household income of $80,000 to $100,000 which is above the regional average. Additionally, vehicle access is high, with less than 5% of households lacking access to a vehicle which is lower than the regional average.

School Crash Summary:

Washoe Headstart has a total of 482 crashes within a one-mile radius, with 22 occurring during the peak AM period (7-9am) and 55 crashes occurring during the peak PM period (1-3pm). This means 16% of crashes occurred during peak commute hours. The low number of crashes is most likely due to the school being surrounded by a residential neighborhood with slower streets. The school is surrounded by 1.5 miles of high injury network (HIN) roads. HIN roads often have higher speeds, more vehicle traffic, and fewer pedestrian safety features, making them especially dangerous for young people who walk, bike, or are dropped off near school.

Figure 24: Washoe Headstart – Crashes by Time of Day



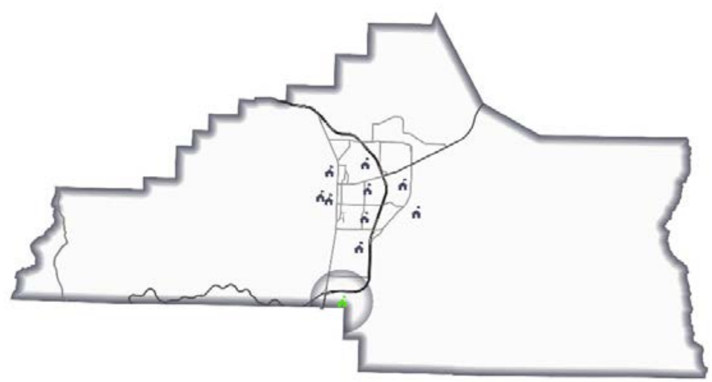


Figure 25: Stewart Headstart Washoe Tribe – High Injury Network Map

Carson Safe Routes to School Action Plan

Stewart Headstart Washoe Tribe

Within a 1-mile radius, there are ***1.5*** High Injury Network miles.

Street Name	From	To
W Clearview Dr	Silver Sage Dr	S Carson St
Eagle Station Ln	Silver Sage Dr	S Carson St
S Carson St	Clearview Dr	Eagle Station Ln
S Carson St	W Appion Way	W Clearview Dr
S Carson Street	Old Clear Creek Road	Warehouse Way
S Carson Street	Route 50	Old Clear Creek Road
W Clearview Dr	S Carson St	Cochise St

School Field Reviews

Carson Public Works staff collaborated with school administrators to schedule on-site school reviews at Carson High School and Carson High Silver Campus[2]. The intent of these reviews was to understand travel behaviors, identify infrastructure gaps, and consider potential improvements. The review team included staff from Carson City Public Works, NDOT, and Alta. Prior to each field review, the team met with school administrators to identify focus areas near each school. Each team member received maps of a ¼-mile vicinity around the school, highlighting areas with the highest volume of student travel. The team evaluated crosswalk visibility and location, sidewalk continuity and condition, traffic control measures (e.g., stop signs, school zone signs, crossing guards), curb ramps and ADA compliance, pick-up/drop-off congestion, and speeding. Observations were conducted during both morning arrival and afternoon dismissal periods (Table 7), followed by team discussions to identify traffic circulation issues and infrastructure gaps.

Figure 26: Project team walking in the road due to gaps in sidewalks along N Fall St.

Table 8. Field Review Dates

Location	Arrival Review	Dismissal Review
Carson High School	May 22nd, 2025	May 14th, 2025
Carson High School - Silver Campus	May 7th, 2025	May 6th, 2025

[2] *School reviews were conducted for each elementary school and middle school during the Master Plan process.*

Carson High Field Review Findings

Observation locations at Carson High Silver High campus were selected based on crash data analysis and discussions with school administrators. The intersection of E William St and N. Saliman Rd was observed to assess interactions between students and drivers at this frequently congested location. Traffic flow during drop-off and pick-up times was studied within the school's designated drop-off areas. The intersection of E Robinson St and N Saliman Rd was monitored due to high volumes of both pedestrian and vehicle traffic. This section presents the findings from these field observations.

Figure 27: Students crossing N Saliman Rd as cars are entering and leaving the intersection.

Figure 28: Students walking and riding bike along N Saliman Rd.

E Robinson St and N Saliman Rd

- Four marked crosswalks with stop bars and ADA-compliant curb ramps are present.
- As the intersection becomes more active and delays increase for drivers due to the increased number of pedestrians, yield compliance was observed to decrease with some drivers traveling through the intersection while students were still crossing.
- Drivers often enter the intersection before students have completed crossing, blocking traffic and creating conflict points as seen in **Figure 27**.
- Right-turning vehicles frequently conflict with crossing students.
- Parents dropping off students on the corner of E Robinson St block traffic turning onto the street. This causes back-ups into the intersection, causing delays in vehicular and pedestrian movements.
- Sidewalk cracks on Saliman Rd in the northeast corner of the intersection can be hazardous to scooters and skateboards and may cause injury from falls.
- Double parking by students blocks residential driveways on E Robinson St.
- Many students who park off-campus along E Robinson and E Telegraph St, use this intersection to access the school.
- Most students wait to cross in groups.
- Students ride bikes and skateboards on sidewalks to access the intersection due to potential concerns about safety and blocked bike lanes due to parents dropping off or parking in bike lane as seen in **Figure 28.**
- During peak travel times, no vehicles enter the intersection for 30 seconds to 1 minute due to high pedestrian traffic using multiple crosswalks.
- Most students were alert and making eye contact with drivers while crossings; a small portion were observed crossing while distracted and not making eye contact with drivers.

N Saliman Rd and Mills Park

- A marked crosswalk with a pedestrian refuge island exists for students to cross each direction independently.
- Driver proceeding through crosswalk before students have fully crossed.
- Parents often drop students off in the park, leading to heavy traffic that backs up into the Mills Park parking lot.
- The left-turn lane exiting the school parking lot onto N Saliman Rd also experiences significant backup, especially due to left-turns.
- Vehicles turning into the school campus back-up in northbound and southbound directions. During dismissal periods, vehicles were observed waiting in the bike lane on Saliman Rd for an extended period of time.

N Saliman Rd and William St

- Curb ramps, marked crosswalks, and pedestrian push buttons are used by students.
- Conflicts are common between pedestrians, bicyclists, and right-turning vehicles.
- Due to inconsistent driver yielding, some students pause at the curb to assess whether it is safe to cross, often seeking visual confirmation from drivers.
- The intersection is congested during school dismissal and arrival times. This results in vehicles turning onto Saliman Rd blocking the intersection as they are unable to clear through the intersection with the high volume of traffic during peak periods. This can create conflicts and operational delays.
- Some parents drop off students or allow them to park at the nearby Walgreens, from which students walk to school. There is no marked crosswalk at the Walgreens driveway, but students were observed crossing there.

Carson High Silver Campus Field Review Findings

Observation locations at Carson High Silver High campus were selected based on crash data analysis and discussions with school administrators. The intersection of E John St and N Stewart St was observed to understand the travel patterns of students who park along E John St and those walking to the library using the crosswalk. The intersection at N Fall St and E Park St, the busiest during pick-up and drop-off times, was observed to study students who take the bus, walk home toward N Carson St, or are picked up by parents along E Park St. Observations at E Park St and N Stewart St focused on students walking home toward N Roop St. At E Park St and N Peter's St, the team examined the behavior of students who use the crosswalk and then walk in the street due to the absence of sidewalks on the north side of E Park St. This section outlines the findings from these field observations.

Corbett St and N Fall St

- There are two marked crosswalks with faded paint across N Fall St.
- Three curb ramps are present at the intersection, none of which are ADA compliant.
- The crosswalk on the south side ends in a landscaping strip on the east side of Corbett St as seen in **Figure 29**.
- Sidewalks are missing on both the south side of Corbett St and the southeast side of N Fall St.
- The corner of the intersection lacking a curb ramp is also the one with missing sidewalks.

N Fall St and E Park St

- Two curb ramps are present but are not ADA compliant.
- Two marked crosswalks with faded paint are located across N Fall St.
- The crosswalk on the south side ends in a landscaping strip with no sidewalk. Students who use this crossing are forced to walk in the street. As seen in **Figure 30** and **Figure 31**.
- There is one marked crosswalk and one stop bar with faded paint located on the east side of E Park St.
- This busy intersection creates safety and circulation issues, as school buses on N Fall St and parent pick-up activity on E Park St lead to congestion, reduced visibility, and increased conflict between vehicles and pedestrians.

Figure 29: Missing curb ramps and sidewalks across N Fall St at the intersection of Corbett St.

Figure 30: Missing curb ramps and sidewalks across N Fall St at the intersection of E Park St.

E Park St and Peters St

- A midblock crosswalk across E Park St connects the school to the neighborhood. The paint is faded, and there is no curb ramp or sidewalk on Peters St north of Park St.
- A marked crosswalk with faded paint exists across Peters St. Neither end has curb ramps or sidewalks as seen in **Figure 32.**
- Students frequently use these crossings to walk home or meet their parents who park on Peters St.
- There were two near misses involving vehicles and pedestrians observed during the field review, as cars often do not stop due to the absence of stop signs on Peters St.

Figure 31: Students walking along E Park St in the road due to gaps in sidewalks.

E Park St and N Stewart St

- A marked crosswalk across N Stewart St is used by students as seen in **Figure 33**. Some had to stop mid-crossing because cars failed to yield.
- On the north side of E Park St, the sidewalk ends at Peters St and resumes before N Stewart St.
- Across E Park St, there are marked crosswalks with concrete protection in the middle and stop bars at each crosswalk.
- Curb ramps and sidewalks are present at and around this intersection.
- There are no bike facilities on N Stewart St; many cyclists ride in the vehicle lanes or on sidewalks as seen in **Figure 34**.
- The sidewalk on E Park St is inconsistent on both the north and south sides between N Stewart St and N Roop St.

Figure 32: Crosswalk across E Park St that leads to N Peter's St that has no curb ramps or sidewalks.

N Stewart St and Corbett St

- A wide sidewalk exists on the west side of N Stewart St between E Park St and Corbett St. Many students use this sidewalk and cross at unmarked locations on Corbett S**t**.
- Elementary students and their parents frequently cross at gaps in the median on N Stewart St where no marked crossings exist as seen in **Figure 35**.

N Stewart St and E John St

- Each approach has a marked crosswalk with curb ramps and connecting sidewalks.
- Concrete islands on E John St (east and west of N Stewart St) add a traffic calming element which slows vehicles but can contribute to back-ups or difficult turning movements (**Figure 36**).
- Due to limited on-campus parking, students often park on the south side of E John St and cross mid-block rather than using the designated crosswalk.
- E John St is a wide street that has angled parking that is underutilized. When cars are not parked on this street it makes the roadway appear even wider, which can encourage higher vehicle speeds.

Figure 33: Students using the crosswalk across N Stewart St.

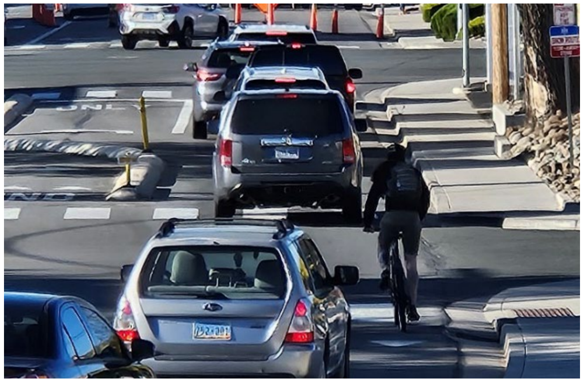


Figure 34: Bicyclist riding with traffic due to lack of bike facilities on N Stewart St.

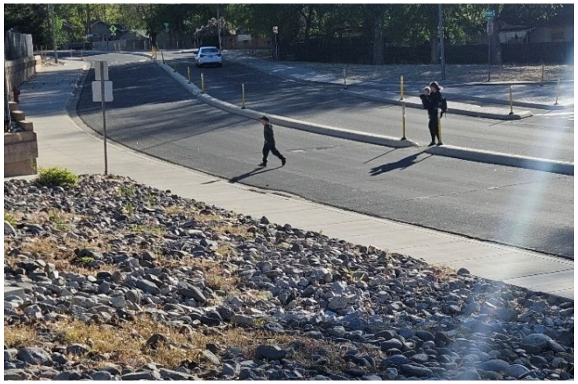


Figure 35: Elementary school student crossing N Stewart St with parent and sibling.

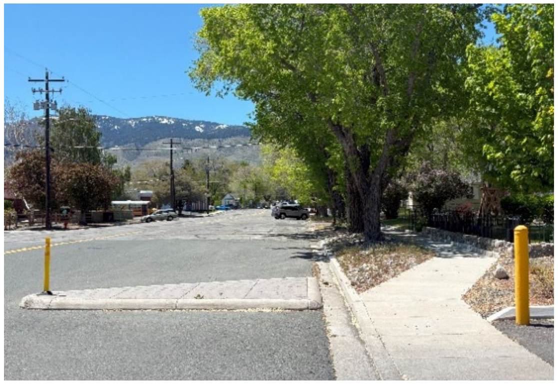


Figure 36: Concrete islands on E John St.

Safe Routes To School (SRTS) Master Plan Projects

As part of the development of the Safe Routes to School (SRTS) Action Plan, we reviewed and categorized projects from the 2020 Carson City SRTS Master Plan to help inform future priorities. This process allowed us to focus funding and planning efforts on projects that had not yet been built, while also recognizing the value of those that had already been reviewed through previous public planning processes. By building on this foundation, the Action Plan was able to advance improvements that were both needed and supported by the community.

Each project from the 2020 Master Plan was assigned to one of three categories based on its status at the time of the analysis:

- **Completed Projects**: These were projects that had been fully constructed and were already in use. They represented successful implementation of the improvements identified in the 2020 plan and were actively benefiting students and the broader community.
- **Partially Completed Projects**: These projects had some components built, but additional work was still needed to complete the full scope. They often included segments of sidewalk, crossings, or other infrastructure that remained unfinished.
- **Programmed Projects**: These projects had secured funding and were either in the design phase or scheduled for construction. While not yet built, they were actively moving forward and expected to be completed in the near future.

These projects are displayed in **Table 9** based on their category. Additionally, the City has implemented many programs from the Master Plan illustrated in **Table 10**. These tables help illustrate where progress has been made and where future improvements are still needed across Carson City.

This classification system provided a clear framework for evaluating progress, setting priorities, and communicating with the public about the status of SRTS improvements across the city.

Table 9. Completed Projects

Corridor	Project Type	Extent	Description	Status
Fairview Drive	Aspirational Project	Nye Lane to Butti Way	Construct Protected Cycle Track with Protected Intersection at Highway 50 or similar multimodal improvement	Programmed possible multi-use improvements the D3 Fairview Project
Little Lane	Aspirational Project	Saliman Road to Roop Street	Construct Buffered Bike Lanes or similar multimodal improvement	Programmed - Providing continuous wide bike lanes
Colorado Street	Bicycle Network Enhancement	Carson Street to Roop Street	Construct Buffered Bike Lanes from Carson Street to Existing Bike Lanes or similar multi-modal improvement	Partially completed. Added buffered lanes from Roop St to Saliman.
Carmine Street	Corridor Enhancement	Airport Road to Lompa Lane	A. Traffic Circle at Dori Way B. Close Sidewalk Gaps between Airport Road & Dori Way C. Intersection crossing enhancements at Dori Way, Lompa Lane, and Airport Road to reduce crossing distances and visibility issues	Programmed

Table 9. Completed Projects

Corridor	Project Type	Extent	Description	Status
E. 5th Street	Corridor Enhancement	Fairview Dr to Mexican Ditch Trail	A. Bike Lanes Fairview Dr to Carson River Rd or similar B. Buffered Bike Lane Carson River Rd to Mexican Ditch or similar C. Marked Crosswalk w Ped Refuge at Parkhill Dr D. Ped Refuge at Regent Ct E. Relocate crosswalk Hells Bells / Carson River Rd	Complete
Winnie Lane	Corridor Enhancement	Carson Street to Mountain Street	A. Enhance existing sidewalks as possible B. Add bike lanes Mountain St to Ormsby Blvd C. Add wayfinding signage at Victoria Ave	Partially Complete - Added sidewalks Carson to Mountain
Carson Street	Crossing Safety Enhancement	Nye Lane	Construct RRFB add associated crossing enhancements or alternatively a traffic signal or lighting	Complete - Added Street lighting

Table 9. Completed Projects

Corridor	Project Type	Extent	Description	Status
Fairview Drive	Crossing Safety Enhancement	Desatoya Drive to Walker Drive	A. Install RRFB at Desatoya Drive B. Install RRFB with Pedestrian Refuge between Walker and Stanton Drive C. Construct Sidewalk on the Westside of Fairview from Walker Drive to Edmonds Drive D. Enhanced existing sidewalk on east side from Lepire Dr *	Programmed
FES Drop-Off Loop	Quick Win	At Existing Sign	Install permanent sign	Complete
Firebox Road	Quick Win	At Saliman Rd	Install in-road message sign stating No Left-Out	Complete
Firebox Road	Quick Win	At Saliman Rd	Update Existing Red Curb along Firebox Road to be more visible	Complete
Hidden Meadows Drive	Quick Win	Eagle Valley Bus Entrance	Install Marked Crosswalk	Programmed
Saliman Road	Quick Win	At Cardinal Way	Install RRFB at existing crosswalk south of Cardinal Way	Complete

Table 9. Completed Projects

Corridor	Project Type	Extent	Description	Status
Telegraph Street	Quick Win	3 Intersections: Telegraph St & Mountain St Telegraph St & Division St Telegraph St & Richmond Ave	Install Marked Crosswalks	Programmed crosswalks at Mountain and Richmond.
Bath Street	Quick Win	At FrES ES Parent Exit	Extend existing red curb by 20 feet to the east	Programmed
Carriage Crest Drive	Quick Win	At MTES Parent Drop Off Exit	Relocate existing No Left-Out signage to more visible location	Complete
Mountain Street	Walk Zone Connectivity Enhancement	Nye Lane to King Street	A. Close Sidewalk Gaps & Enhance existing sidewalk where possible B. Add intersection crossing enhancements at Winnie Ln, Bath St, Long St, Washington St, Telegraph St, Musser St	Partially Complete. Some intersection enhancements made.
Musser Street	Walk Zone Connectivity Enhancement	Richmond Avenue to Winters Drive	Construct Sidewalk	Programmed

Table 9. Completed Projects

Corridor	Project Type	Extent	Description	Status
Roop Street	Walk Zone Connectivity Enhancement	Winnie Lane to E. 5th Street	A. Close Sidewalk Gap (Telegraph St to E. 5th St) B. Enhance existing sidewalks as possible	Programmed
Saliman Road	Walk Zone Connectivity Enhancement	Fairview Drive to Koontz Lane	A. Intersection Crossing Enhancements at Sonoma St B. RRFB at Damon Rd crosswalk C. Sidewalk Eastside Colorado to Fairview Dr D. Enhance existing sidewalk as possible	Programmed A and B
Telegraph Street	Walk Zone Connectivity Enhancement	Richmond Avenue to Mountain Street	Construct sidewalk on south side of roadway to eliminate sidewalk gaps and enhance existing sidewalks, as possible	Programmed
W. 5th Street	Walk Zone Connectivity Enhancement	Richmond Avenue to Carson Street	A. Close Sidewalk Gaps and enhance existing sidewalk where possible B. Add intersection crossing enhancements at Thompson St & Division St	Programmed from Richmond to Thompson.

Table 9. Completed Projects

Corridor	Project Type	Extent	Description	Status
Colorado Street	Walk Zone Connectivity Enhancement	Northside Birch Street to 125 ft W. of Utah Street	Construct Sidewalk on north side of roadway	Complete

Table 10. SRTS Programs

Theme	Type	Description	Schools	Implemented
Engineering School Safety	School Speed Zone Standard	Develop standard for School Speed Zone signage, lane markings, and controls which will create a standard look and feel for School Speed Zones across Carson City. This may include installing flashers at all existing "School Zone When Flashing" signs (S5-1) and replacing existing School Zone Time Specific sign combinations (S4-3P, R2-1, S4-1P) with S5- 1 signs. Additionally, a standard may include traffic calming strategies such as in-road message signs (R1-6), intersection bulb-outs, and speed feedback signs.	All	Completed
Engineering School Safety	School Speed Zone Standard	Implement School Speed Zone standard at all eight study schools as funding is available.	All	Completed
Engineering School Safety	School Speed Zone Standard	Ensure that Speed Feedback Signs within a School Zone are programmed to reflect the school zone speed limits during the appropriate hours of the day.	All	Completed

Table 10. SRTS Programs

Theme	Type	Description	Schools	Implemented
Education	Bicycle Safety Education	Develop TA-Set Aside grant application to bolster and expand upon the existing Bicycle Safety Education program at all six elementary schools. Items to include in grant application are new bicycles, easy to use bicycle helmets, funding for on-going maintenance and repairs, and updated curriculum materials.	Elementary	Completed
Education	Bicycle Safety Education	Work with CCSD to expand the total number of days of bicycle education instruction to provide 3rd, 4th, and 5th grade students with at least 2 class periods of experience on a bike each school year.	Elementary	Completed
Education	Student Pedestrian Education	Develop / obtain pedestrian safety education curriculum for elementary school students and incorporate these lessons into an expanded Bicycle Safety Education program.	Elementary	Completed
Education	Student Pedestrian Education	Develop / obtain pedestrian safety education curriculum for middle school students. Disseminate this information to students during the school year or as part of a Bicycle/Pedestrian Safety Program.	Middle	In Process

Table 10. SRTS Programs

Theme	Type	Description	Schools	Implemented
Education	Parent / Caregiver Safety Education	Develop and implement a public messaging campaign to make drivers aware of School Zone laws. This campaign can be reused at the beginning of each school year and following long breaks.	All	Completed
Education	Parent / Caregiver Safety Education	Develop and implement public messaging campaign focused on parents and the importance of teaching safe pedestrian habits to their children.	All	Completed
Encouragement	Walking/Biking Encouragement	Start a Walking Wednesday program at each elementary school focused on encouraging students (and parents) to walk or bike to school every Wednesday in order to receive daily prizes and to compete for a bicycle or scooter at the end of the school year.	Elementary	Completed in most schools
Encouragement	Bicycle Equipment Program	Work with local non-profits and local businesses to create local bicycle donation and rehabilitation program. Program would obtain and repair older bicycles from the community and fix them up to provide them to Carson City students without a bicycle.	All	Completed

Table 10. SRTS Programs

Theme	Type	Description	Schools	Implemented
Encouragement	Walking/Biking Encouragement	Increase number of School Safety Champions to one at each school.	All	In Process
Encouragement	Walking/Biking Encouragement	Work with School Safety Champions and School administrations to create a network of parents who are willing and able to supervise Walking School Buses and/or Bike Trains at each of the six elementary schools. Leverage available funding for compensating volunteers.	All	Completed
Encouragement	Active Transportation Challenges / Competitions	Work with schools to develop a Golden Sneaker Challenge between classrooms at each school during Walk to School Day. Expand the challenge to be community wide (between each school) within three years.	All	Completed
School Zone	School Speed Zone Engagement	Increase SRO or police presence in school zones (as possible) during morning and afternoon peak periods to increase enforcement of School Zone laws. Key areas of focus are MTES (prohibiting left-out turns), FES (prohibiting left-out turns & speeding), and ASES (Speeding).	All	Completed

Table 10. SRTS Programs

Theme	Type	Description	Schools	Implemented
School Zone	School Speed Zone Task Force	Collaborate with local law enforcement and CCSD to develop a School Speed Zone task force. The task force would conduct intermittent and Nearly visible School Speed Zone engagement programs at each study school throughout the school year.	All	Completed
School Zone	Mobile Speed Feedback Trailers	Work with Carson City Sheriff's Office to place mobile speed feedback trailers on school routes at the beginning of the school year and following extended holiday breaks.	All	In Process
Equity	Equitable Program of Projects	All engineering projects were evaluated through the prioritization process based on the benefit provided to economically disadvantaged areas. Projects providing direct benefits to these locations were assigned additional points during prioritization. It is recommended that projects be implemented based on priority ranking, as possible, in order to deliver an equitable program of projects.	All	In Process
Program	Student Hand Tallies	Conduct hand tallies of how students arrived and departed from school during a two to three day period at each school once per year.	All	Completed

Table 10. SRTS Programs

Theme	Type	Description	Schools	Implemented
Program	Parent Surveys	Conduct surveys of parents regarding how their child got to and from school and basic demographic information. It is recommended that this be conducted periodically, potentially every three years.	All	Completed

Walking and Biking Barrier Analysis

As part of Carson City's Safe Routes to School (SRTS) initiative, a detailed barrier analysis was conducted to better understand where the city's active transportation network—such as sidewalks, bike lanes, and trails—may be falling short for students. The goal was to identify areas where walking and biking to school is difficult or unsafe, and to highlight opportunities for future improvements.

Analysis Factors

This analysis focused on the areas surrounding six elementary schools, two middle schools, two high schools, and one Head Start program located in the Stewart community. These schools represent a wide range of student populations and neighborhoods across the city.

To evaluate the network, a scoring system was developed using several key factors (further described in Table 8):

- **Safety**
- **Socio-Economic Need**
- **SRTS Master Plan Project Status**[3]
- **School Proximity**
- **Public Comments**

Table 11. Barrier Analysis Factors

Factors	Rationale	Points
Safety	Focusing on roadways where serious injuries are most likely to occur	On a High Injury Network roadway: 40 points
Socio-Economic Need	Prioritizing communities with greater need	Within USDOT Area of Persistent Poverty: 10 points
SRTS Master Plan Project Status	Leverage prior planning efforts and existing projects	• Completed: -10 points • Partially Completed: -5 points • No existing project: 0 points • Unprogrammed: 5 points • Programmed: 10 points
School Proximity	Providing benefits to multiple schools and near school campuses	Distance to each study school: • <0.1 mi = 4 points • 0.1–0.25 mi = 3 points • 0.25–0.5 mi = 2 points • 0.5–1 mi = 1 point • >1 mi = 0 points
Public Comments	Addressing public concerns	Within 250 ft of comment: 5 points

More information about the methodologies and findings from the safety analysis and socio-economic are included in Appendix A and B.

It's important to understand that the roadways identified as barriers in this analysis are not limited to locations lacking sidewalks, trails, or bike facilities. Instead, they represent areas where safety concerns or gaps in connectivity make it more difficult for students to walk or bike to school safely

[3] *Refer to the Carson City Safe Routes to School Master Plan for more information.*

and comfortably. Many of these roadways serve as important corridors that could benefit students attending multiple schools, making them especially impactful targets for future improvements.

Each roadway segment was scored using the criteria above. Segments with the highest scores were categorized as either Primary or Secondary barriers. This classification helps distinguish between the most critical needs and those that are still important but may be less urgent.

Analysis Results

To keep the analysis focused on areas most relevant to students, only roadways within a one-mile radius of each school were included. Roadways beyond this distance were not evaluated in detail and were automatically assigned the lowest possible barrier score, since they fall outside the typical walking and biking range for school-aged children.

The results of the barrier analysis are presented in the following section in two ways:

- All identified barriers (primary and secondary) across Carson City are listed in **Table 11**.
- Individual maps for each school, highlighting the primary and secondary barriers within a one-mile radius in included in Figures 38 to 48 below. These maps provide a clear visual summary of where improvements may be most beneficial and how they relate to school access across the city.

Table 12. Primary and Secondary Walking and Biking Barriers

Primary and Secondary Walking and Biking Barriers					
#	Corridor	Type	From	To	Miles
1	5TH ST	Primary	Division St	Harbin Ave	0.61
2	CLEARVIEW DR	Primary	Carson St	California St	0.26
3	DIVISION ST	Primary	5th St	Caroline St	0.45
4	EMERSON DR	Primary	College Pkwy	Mark Way	0.25
5	FAIRVIEW DR	Primary	350 ft W of Saliman Rd	I580 Ramps	0.51
6	GONI RD	Primary	380 ft S of Old Hot Spring Rd	1675 ft N of Old Hot Springs Rd	0.29
7	LITTLE LN	Primary	230 ft E of Janas Way	350 ft E of Roop St	0.23
8	LONG ST	Primary	Carson St	1000 ft E of Roop St	0.47
9	NYE LN	Primary	100 ft W of Carson St	200 ft W of Northgate Ln	0.23
10	ROBINSON ST	Primary	105 ft W of Harbin Ave	80 ft E of Valley St	0.24
11	ROOP ST	Primary	Hot Springs Rd	College Dr	0.21

Primary and Secondary Walking and Biking Barriers					
#	**Corridor**	**Type**	**From**	**To**	**Miles**
12	SALIMAN RD	Primary	100 ft N of Little Ln	150 ft S of 5th St	0.25
13	SALIMAN RD	Primary	William St	275 ft S of Seely Loop	0.25
14	SALIMAN RD	Primary	Heather Way	Bike Route 6	0.56
15	STEWART ST	Primary	Carson St	605 ft S of Little Ln	0.24
16	WASHINGTON ST	Primary	Carson St	Roop St	0.33
17	WINNIE LN	Primary	Roop St	Carson St	0.24
18	CARSON ST	Secondary	Stewart St	Fairview Dr	0.25
19	CARSON ST	Secondary	Appion Way	Moses St	0.76
20	CARSON ST	Secondary	Colorado St	Chrysler Dodge Ram	0.51
21	CARSON ST	Secondary	10th St	1200 ft N of College Dr	2.53
22	CARSON ST	Secondary	US 50	Douglas County Border	0.56
23	CLEARVIEW DR	Secondary	Carson St	Curry St	0.12
24	COLLEGE DR	Secondary	Carson St	260 ft W of GS Richards BL	0.26
25	COLLEGE DR	Secondary	Research Way	200 ft E of Cinnabar Ave	0.71
26	CURRY ST	Secondary	5th St	200 ft S of 10th St	0.26
27	EAGLE STATION LN	Secondary	Carson St	Silver Sage Dr	0.36
28	EDMONDS DR	Secondary	Clearview Dr	Valley View Dr	0.24
29	FAIRVIEW DR	Secondary	350 ft W of Saliman Rd	Carson St	0.77
30	FLEISCHMANN WAY	Secondary	Mountain St	Carson St	0.32
31	GORDON ST	Secondary	Full Extent	Full Extent	0.36
32	HOT SPRINGS RD	Secondary	Carson St	Roop St	0.60
33	HWY 50	Secondary	I580	750 ft W of Nye Ln	1.54
34	IMPERIAL WAY	Secondary	Nye Ln	Silver Oak Dr	0.56
35	KOONTZ LN	Secondary	Carson St	Sevenstar St	0.25
36	LOMPA LN	Secondary	Modoc Ct	550 ft N of Carmine St	0.70
37	RESEARCH WAY	Secondary	Old Hot Springs Rd	Goni Rd	0.50
38	ROBINSON ST	Secondary	80 ft E of Valley St	Curry St	0.24

Primary and Secondary Walking and Biking Barriers					
#	Corridor	Type	From	To	Miles
39	ROOP ST	Secondary	Hot Springs Rd	1045 ft S of Northgate	0.30
40	ROOP ST	Secondary	2nd St	850 ft S of 5th St	0.25
41	ROOP ST	Secondary	Stewart St	180 ft S of Robinson St	0.67
42	SALIMAN RD	Secondary	150 ft S of 5th St	150 ft S of Appaloosa Ct	0.25
43	STEWART ST	Secondary	2nd St	Roop St	0.96
44	WILLIAM ST	Secondary	Minnesota St	500 ft E of Oxoby Loop	0.67
45	WILLIAM ST	Secondary	190 ft W of State St	I580	0.73

Figure 37: Carson High School Walking and Biking Barrier Ranking Map

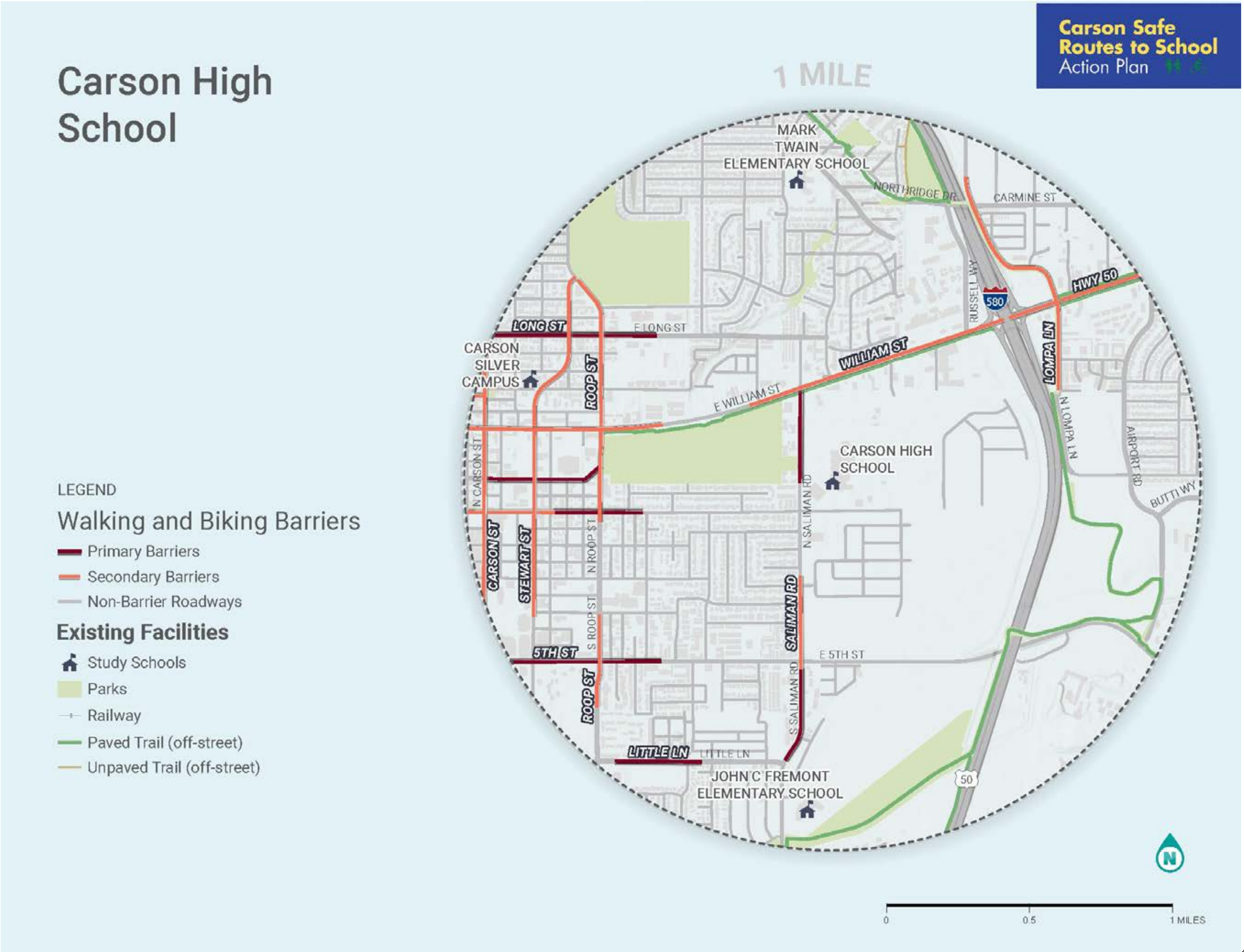


Figure 38: Carson High Silver Campus School Walking and Biking Barrier Ranking Map

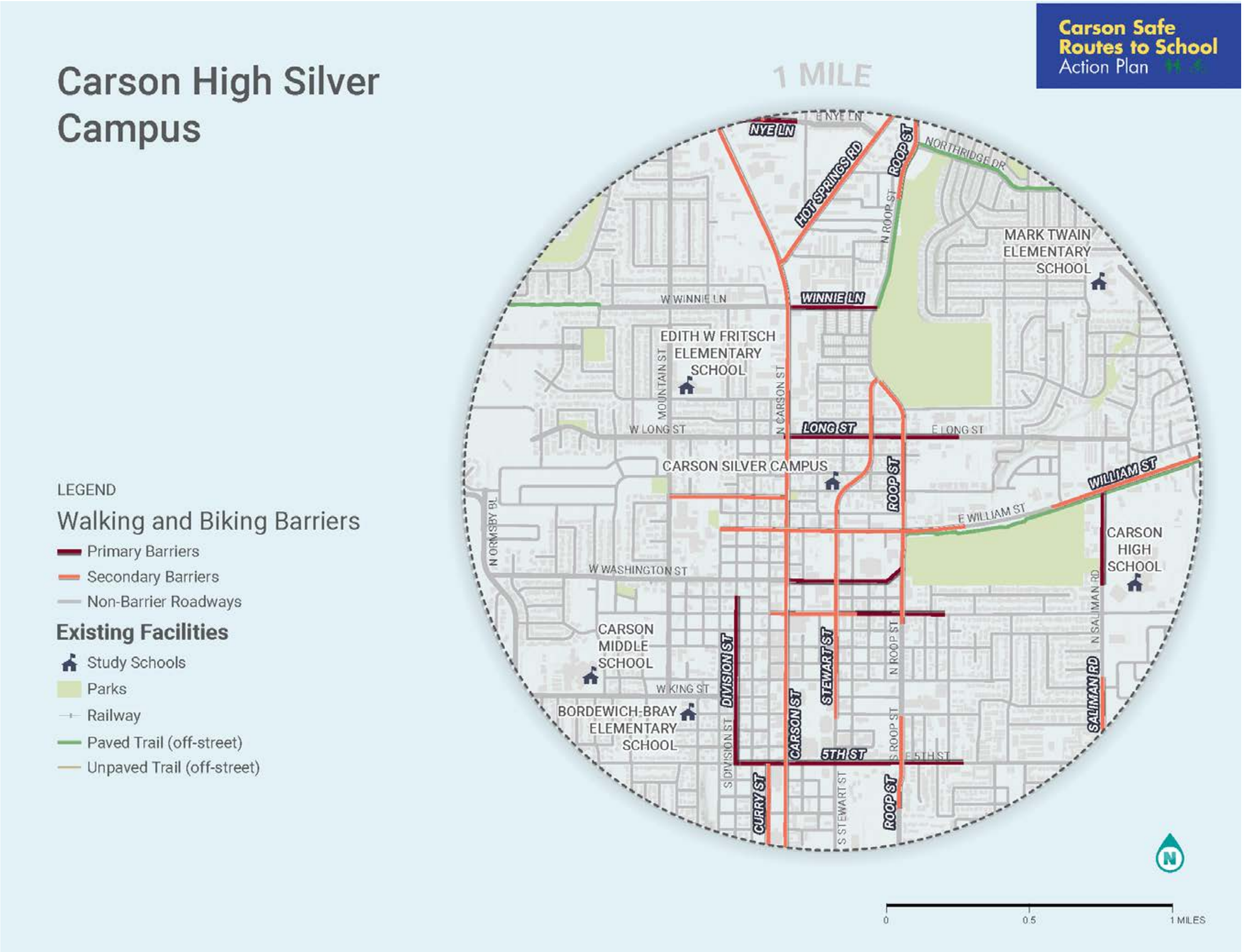


Figure 39: Carson Middle School Walking and Biking Barrier Ranking Map

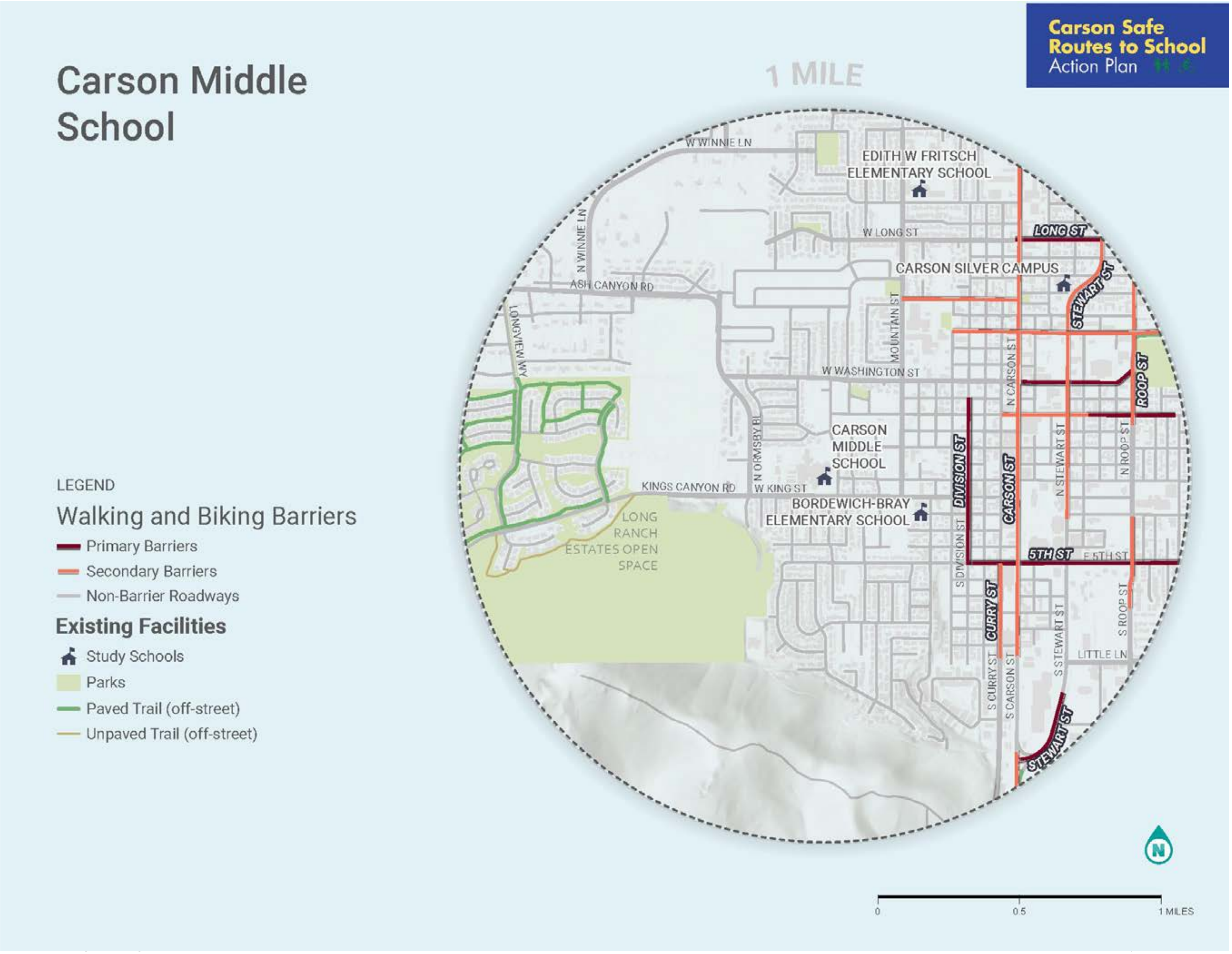


Figure 40: Eagle Valley Middle School Walking and Biking Barrier Ranking Map

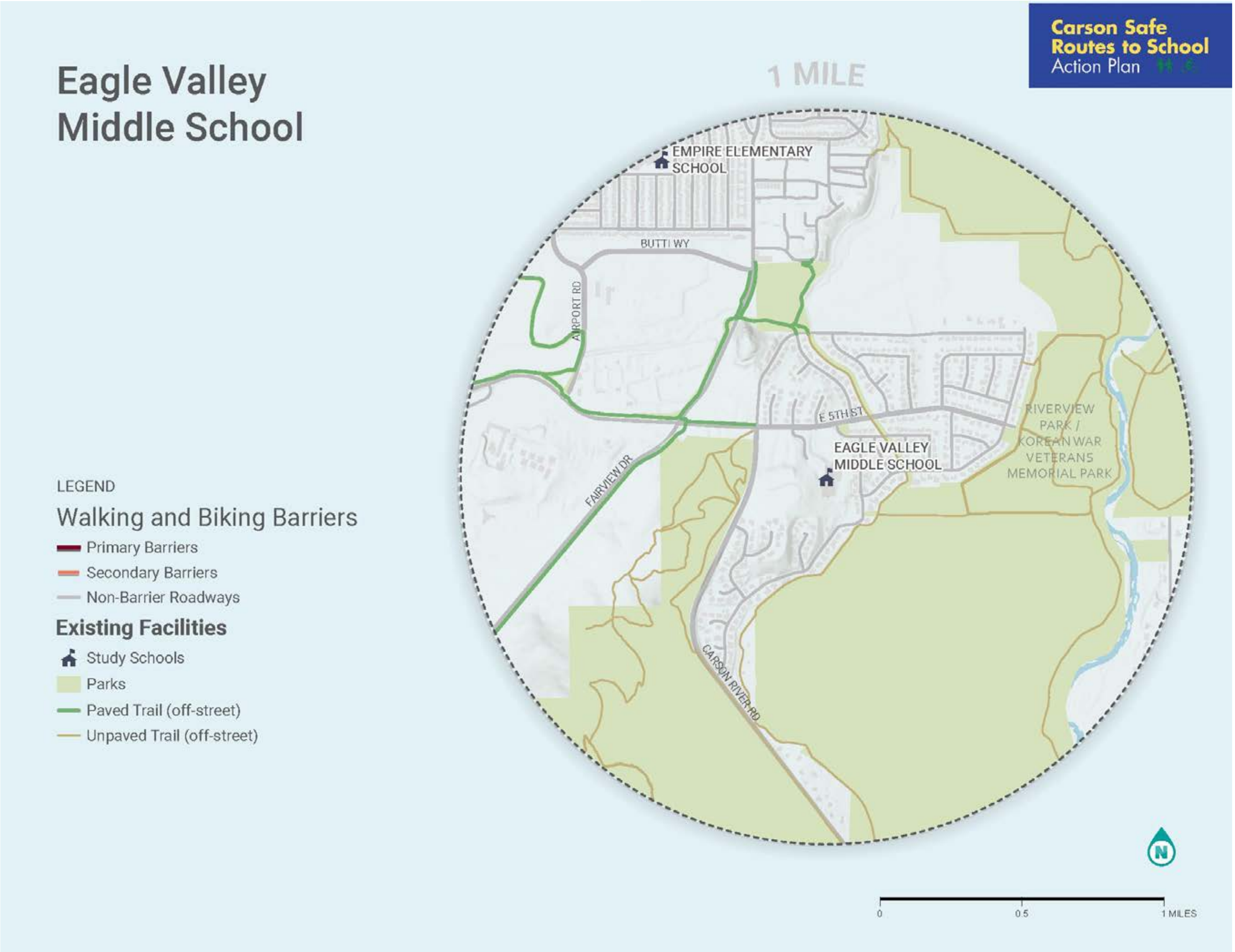


Figure 41: Al Seeliger Elementary School Walking and Biking Barrier Ranking Map

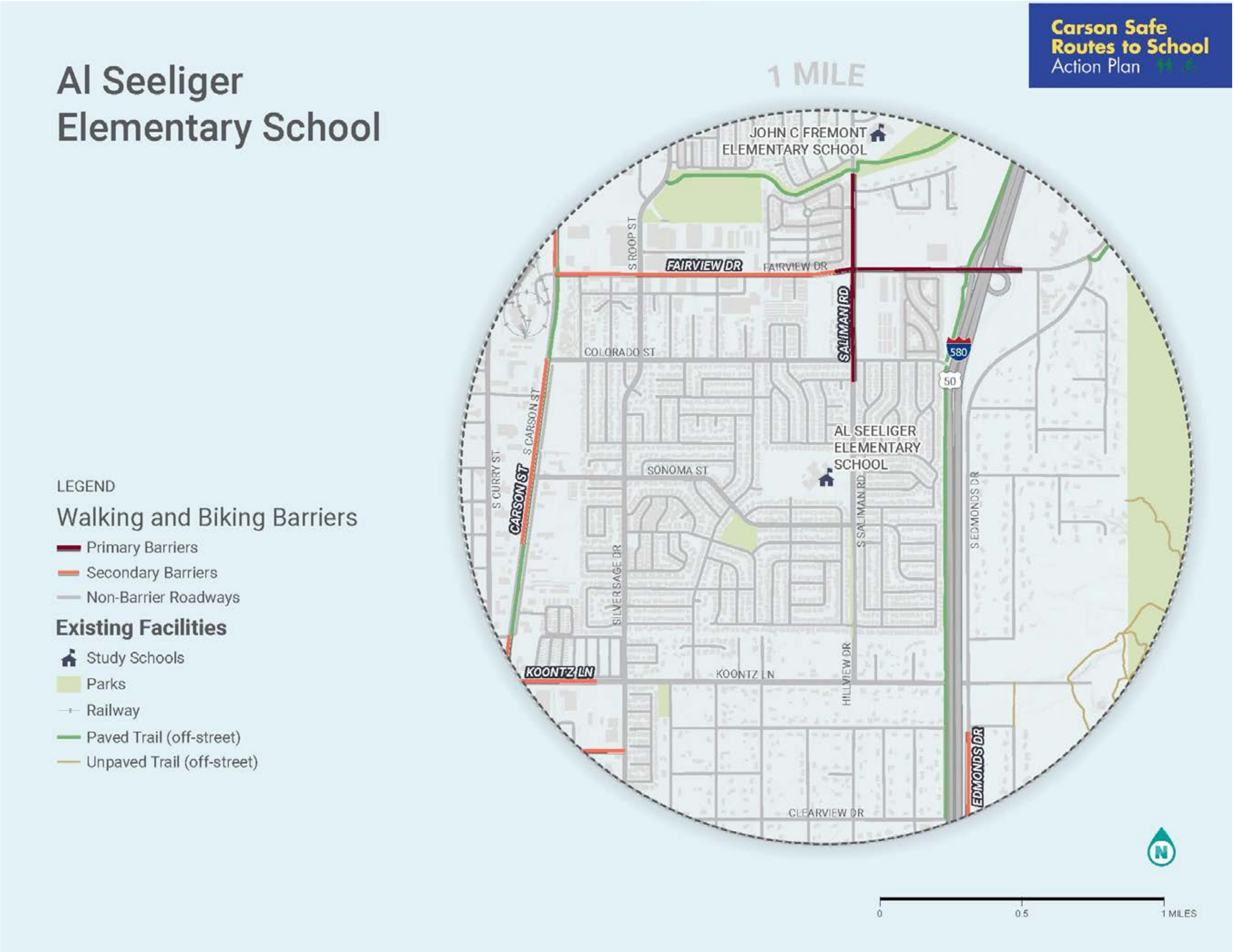


Figure 42: Bordewich-Bray Elementary School Walking and Biking Barrier Ranking Map

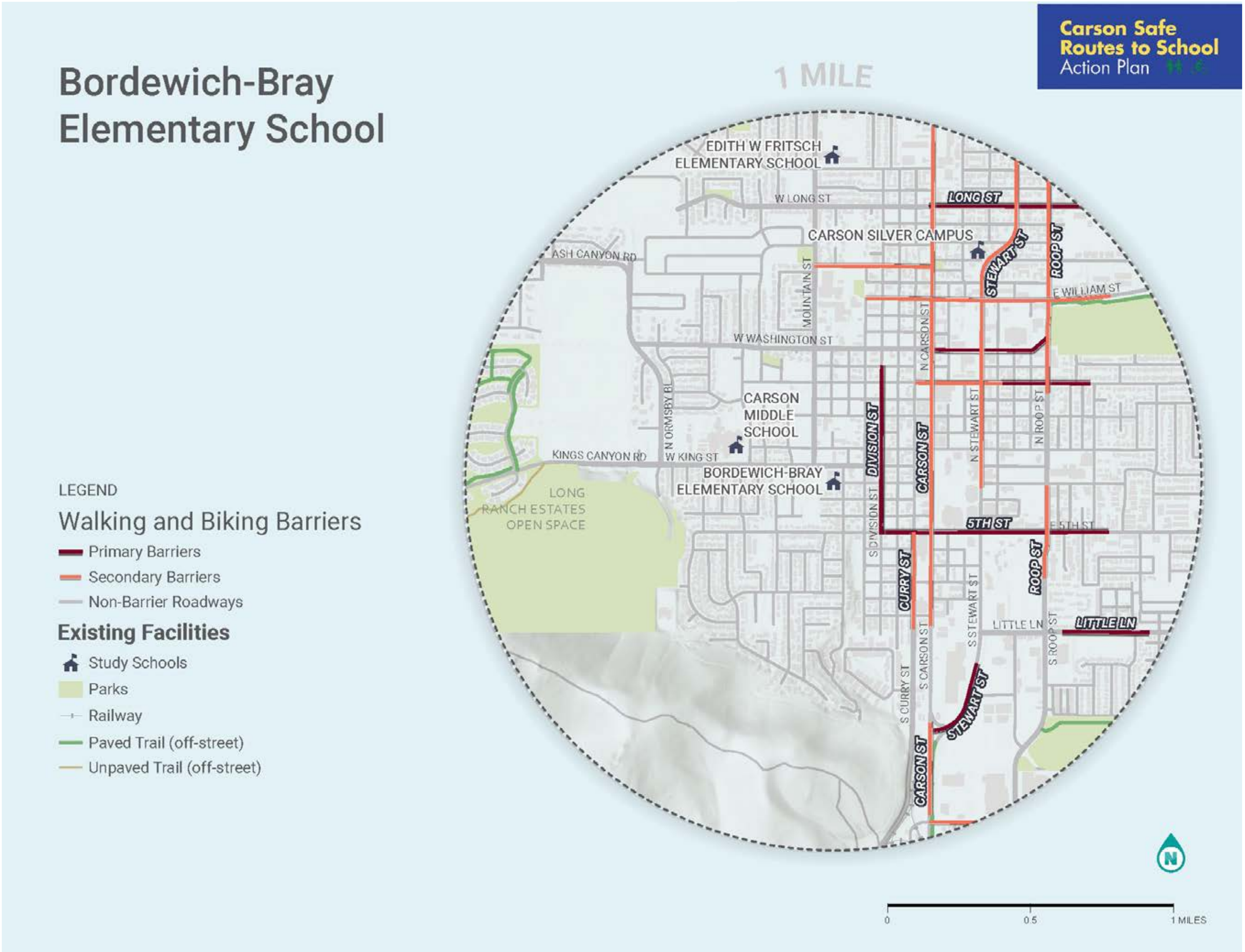


Figure 43: Empire Elementary School Walking and Biking Barrier Ranking Map

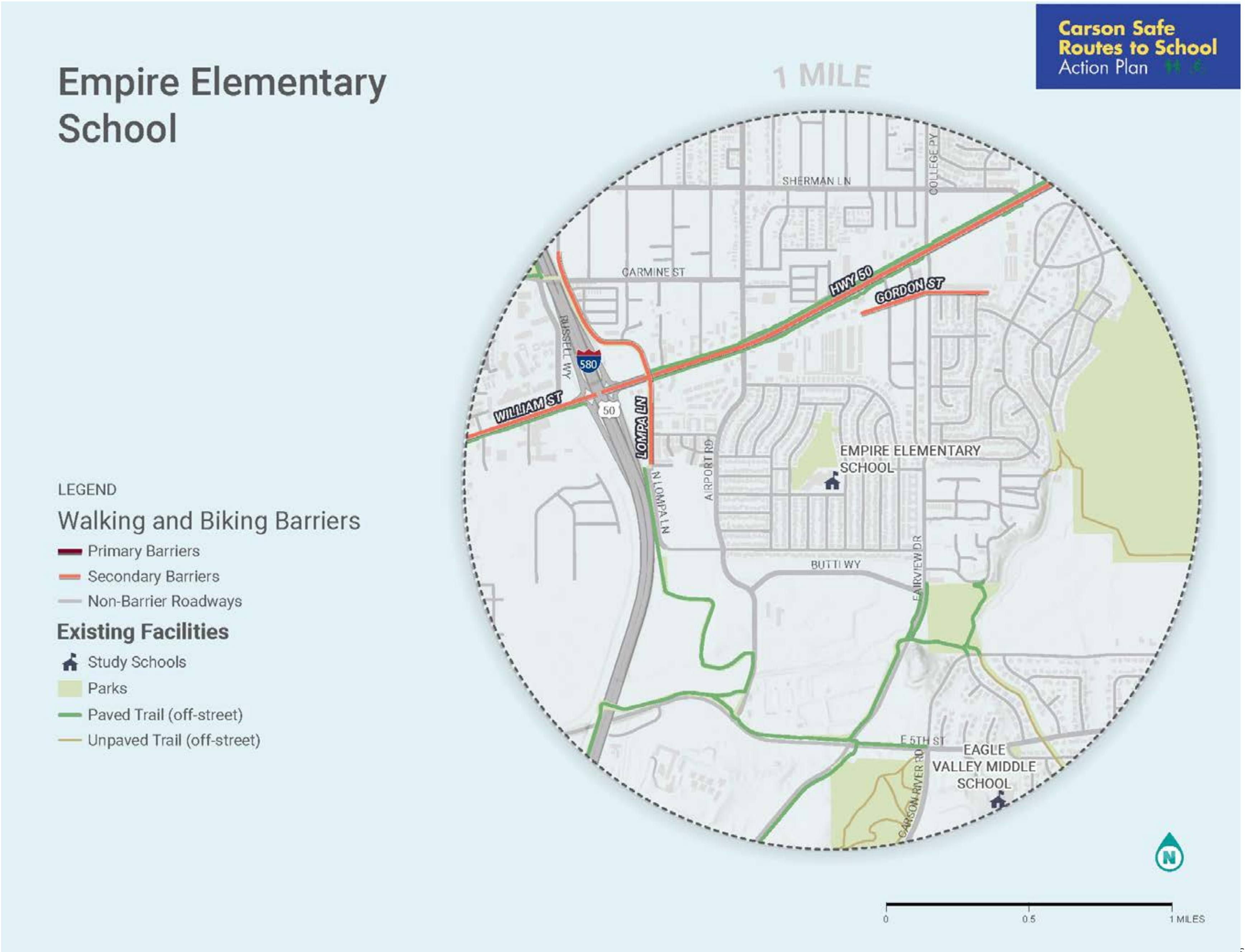


Figure 44: John C Fremont Elementary School Walking and Biking Barrier Ranking Map

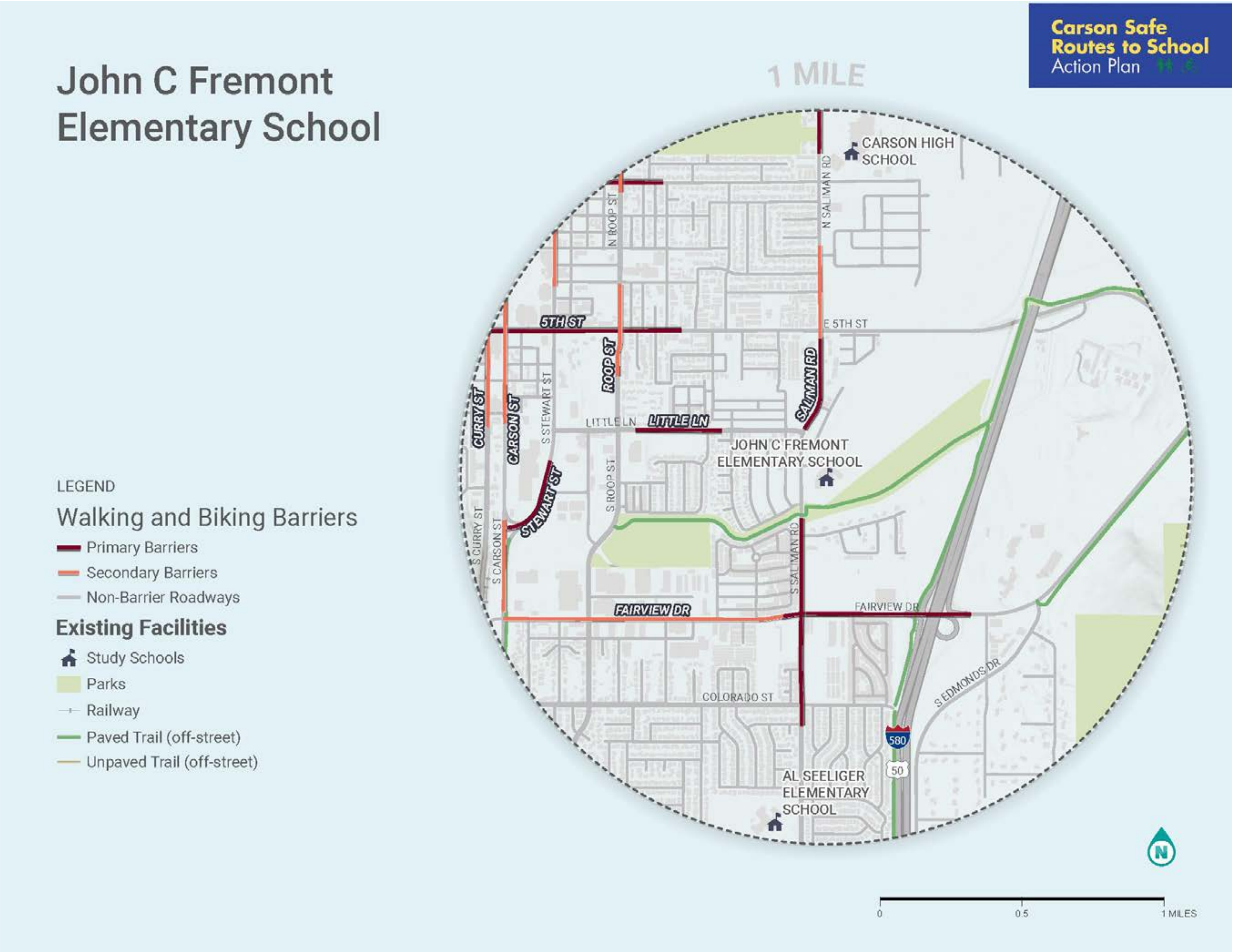


Figure 45: Edith W Fritsch Elementary School Walking and Biking Barrier Ranking Map

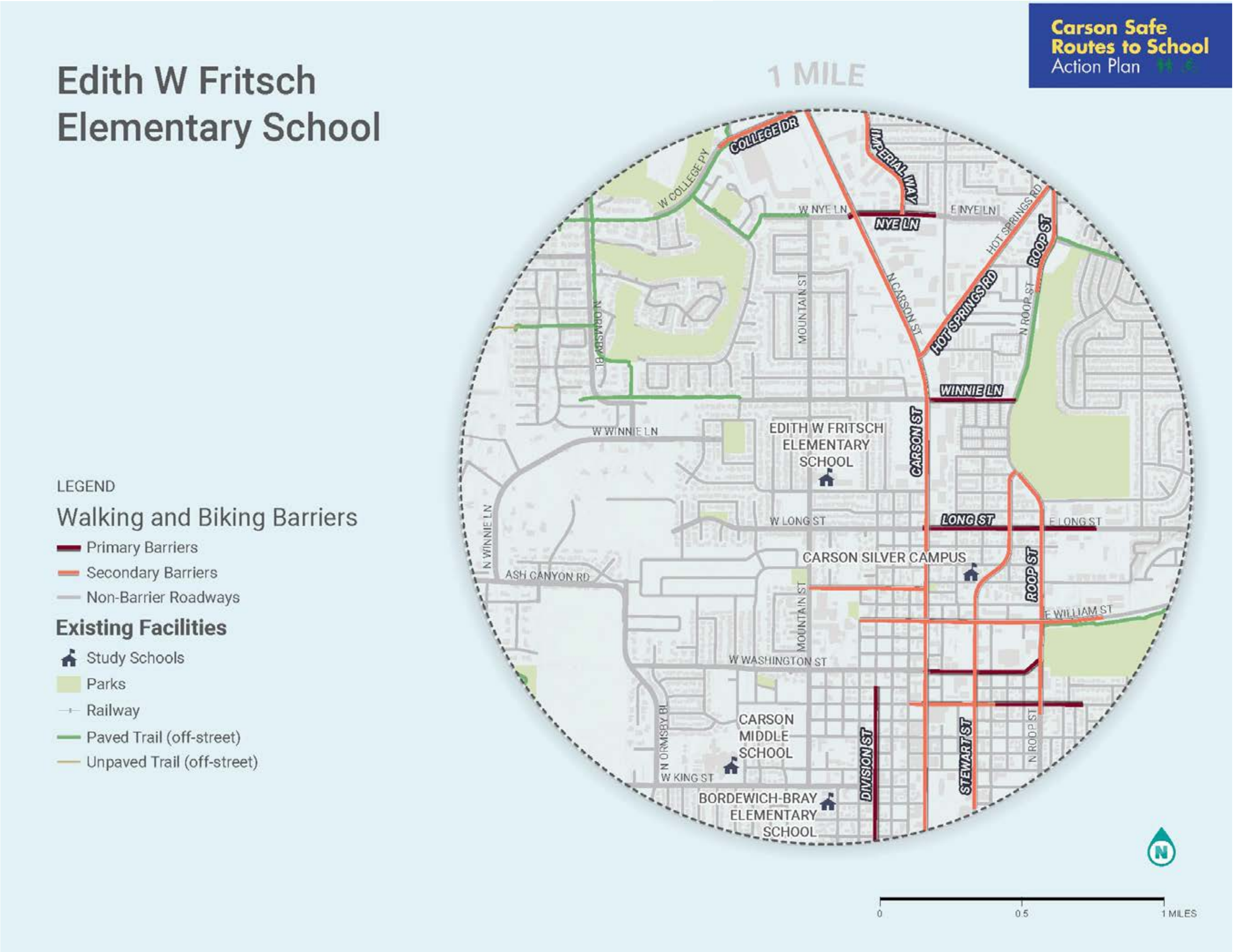


Figure 46: Empire Elementary School Walking and Biking Barrier Ranking Map

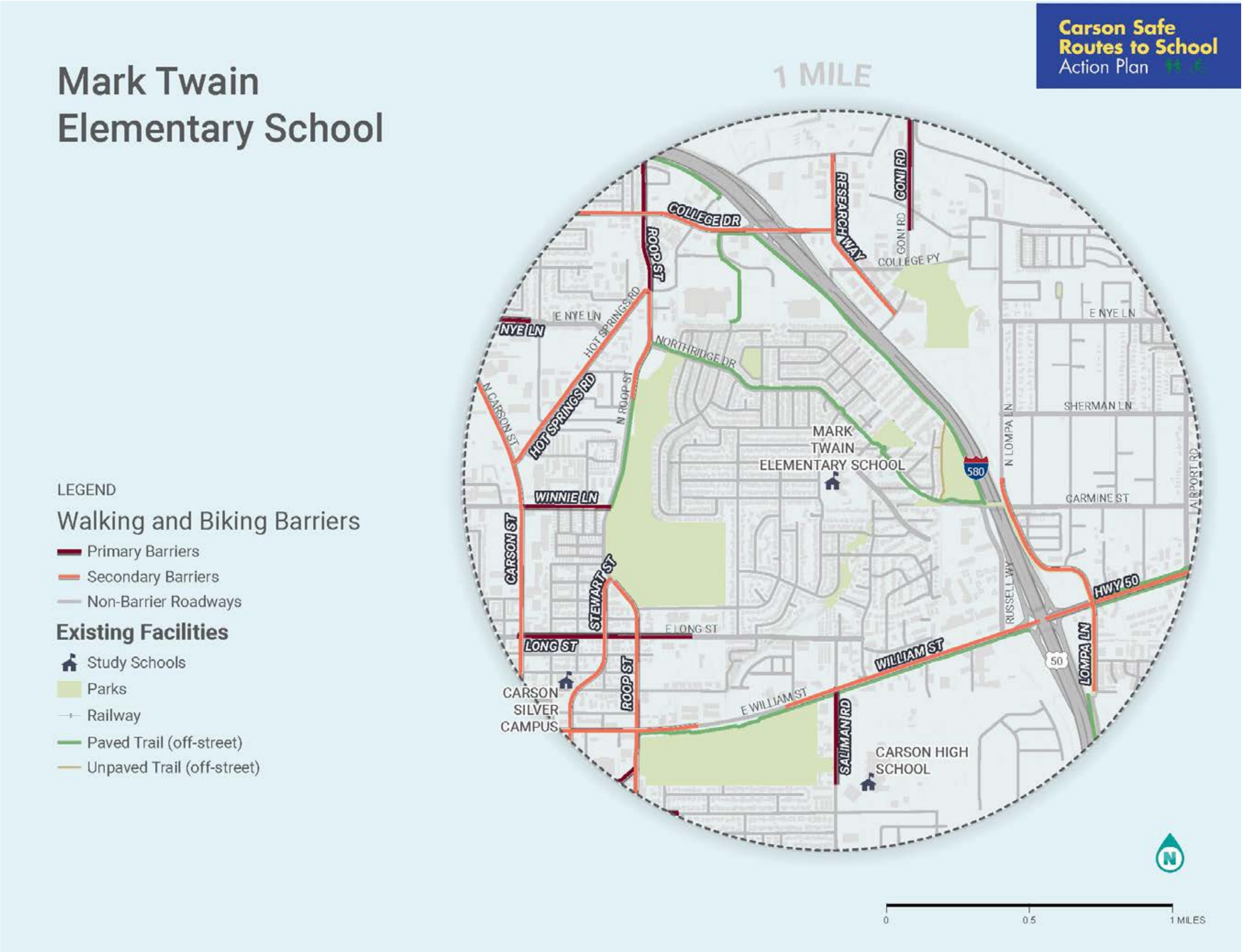
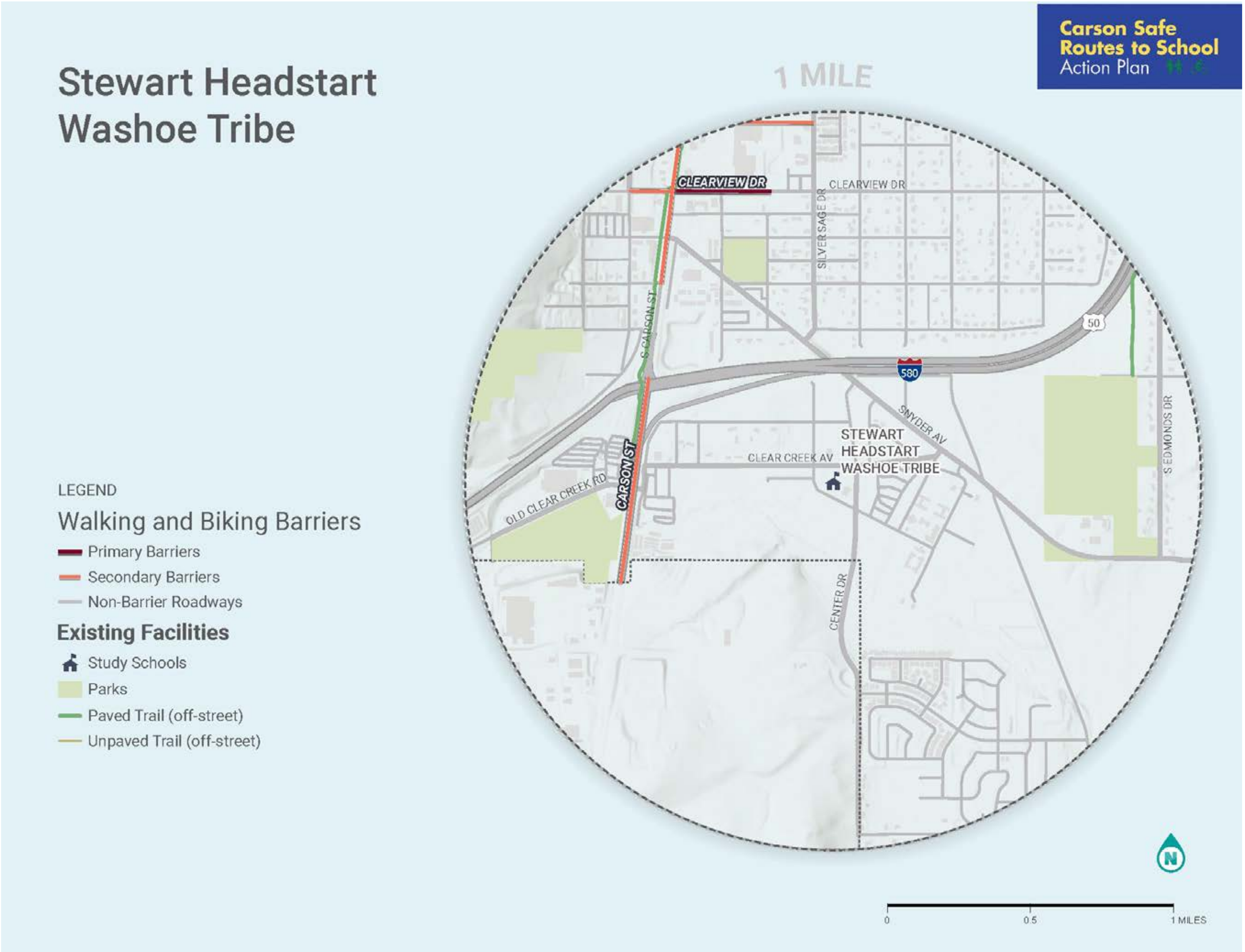
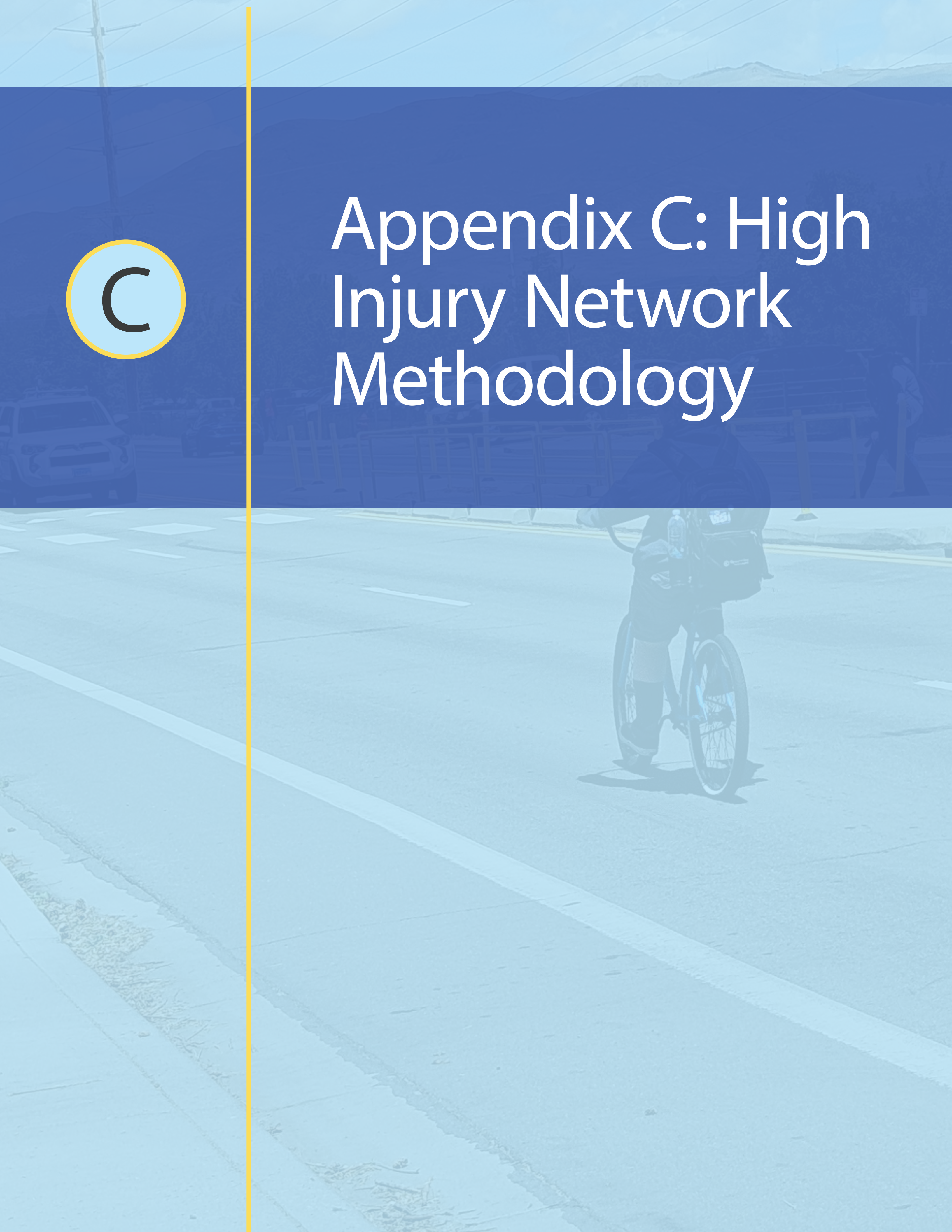


Figure 47: Stewart Headstart Washoe Tribe Walking and Biking Barrier Ranking Map





C

Appendix C: High Injury Network Methodology

MEMORANDUM

To: Scott Bohemier, Project Manager, Carson City

From: Cole Peiffer, Project Manager, Alta Planning + Design

Date: May 1, 2025

Re: Carson City SRTS Action Plan - High Injury Network Methodology

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High Injury Network Development

Introduction

A High Injury Network (HIN) is a data-driven tool used to identify the small percentage of roadways where a disproportionate number of fatal and serious injury crashes occur. These networks are critical in understanding where countermeasures can have the greatest impact on reducing crashes that lead to life-altering injuries or deaths. By focusing resources on these high-risk roadways, counties and municipalities can address systemic safety challenges and make meaningful progress toward goals like Vision Zero, which aims to eliminate traffic-related fatalities and serious injuries.

The development of an HIN moves beyond simply analyzing crash histories; it provides critical insights into the patterns, characteristics, and systemic factors that contribute to crash risks. This method emphasizes prioritizing safety improvements on corridors where the potential for reducing serious crashes is highest, ensuring that investments in safety improvements are both effective and equitable. While the SRTS Action Plan is focused primarily within one mile from a priority school, the HIN will cover all of Carson City.

This memorandum outlines Alta's methodology for analyzing crash data and developing the HIN for Carson City. It details the inputs, data preparation, and analytical processes required to identify high-injury corridors, offering a roadmap for addressing the most pressing safety issues in the city's transportation network.

Inputs

Alta will use the following data sets to develop a High Injury Network for Carson City:

1) **Crash layer:** Five-year crash data (2019 – 2023), from NDOT - provided by CAMPO.

- Inclusive of motor vehicle, bicyclist, pedestrian, and motorcycle crashes.
- Removed crashes outside of city limits.
- Removed crashes on limited-access interstates from this analysis using ArcGIS Pro.
- Filtered crashes to remove Property Damage Only (PDO) severity crashes involving a vehicle or motorcycle. Property Damage Crashes
- Checked crash points for unique crash identification numbers to confirm no duplicate records were included.
- Tagged crashes that were within 1-mile of one of the 11 priority schools.

2) **Street Centerlines:** GIS Streets, obtained from the Carson City open data portal

- Removed limited-access interstates and ramps. (I-580)
- Removed streets outside of city boundaries
- Consolidated divided roads so each roadway is represented by a single line.

- Used “unsplit lines tool” to merge road segments based on road name and functional classification. This eliminates any arbitrary splits in the centerline shapefile.
- Divided centerlines into segments of approximately 0.25 miles (1,320 ft.) each so that crashes can be summarized for segments of equal length.
- Created unique IDs for roadway segments.

Methodology

Alta used the following methodology to develop a High Injury Network for Carson City:

1. Prepare the Crash Data:

a. Weight each crash based on the most serious injury sustained by any individual involved in the crash. This effectively prioritizes areas where more serious crashes are occurring to identify areas where the most serious injuries can be reduced. These proportions are based on the ratio of the average cost to society from fatal and serious crashes compared to minor injury crashes. While some analyses may weight serious crashes higher in proportion to minor crashes, that can lead to every segment with a fatal crash being represented on the HIN. Using this ratio avoids overweighting fatal crashes that occur as isolated events so that the HIN can represent roadways with patterns of serious crashes. [1]

   - Fatal injury (K) or serious injury (A): 4
   - Minor (B), Possible (C), or Unknown injury: 1
   - Bike or Pedestrian involved PDO crash (O): 1

b. Snap all analysis crashes within 250 feet of the street centerline network to a prepared network segment. This distance generally accounts for collisions on divided highways that occur far from the now-consolidated centerline (such as wide highways) but is not long enough to capture collisions that occurred in parking lots adjacent to roadways. Crashes that were within 50 feet of a major road were snapped to the prepared network segments. This accounts for crashes at intersections between local roads and major roads. Crashes are joined to the higher speed and higher volume roadways rather than smaller side streets.

[1] There are many calculations of average cost of serious and fatal crashes. The ratio shown here is based on FHWA’s *Crash Costs for Safety Analysis* (Harmon et al, 2018), table 17. The weights shown here are proportional to the average of the square root of costs to society of serious crashes (fatal and serious injury) compared to the baseline of minor-injury crashes. Source: https://safety.fhwa.dot.gov/hsip/docs/fhwasa17071.pdf.

2. **Prepare the Street Network:**
   c. Create a Rolling Window / Sliding Window feature class where the lines are extended over each road segment approximately 1,320 feet, or 0.25 miles, with a 25% overlap in each direction (330 feet), for a total rolling segment length of approximately 1,980 feet. Alta will use custom splitting tools that have an overlap percentage (Wasserman, 2023). Lines will overlap with adjacent lines by the 25% set percentage. This process allows rolling window statistics to be calculated on each road segment. The benefits of rolling window analyses are that they reduce the impact that dead-end streets, the boundary effect (where boundaries from the centerline file are imposed on unbounded crash data), or anomalous crashes have on the final HIN. Fundamentally, it better captures the linear corridor crash patterns where they exist (Fitzpatrick, 2018)[2]. The rolling window concept is illustrated in **Figure 1**.

3. **Applied Rolling Window Analysis:**
   d. Spatially joined the crash layer to the rolling window road network.

   e. Calculated the summed rolling crash weight for each rolling road segment. This sums the weight of crashes on each rolling segment to reflect total crash severity on each segment.

   f. Rejoined the rolling crash weight from the rolling window layer to the original centerline network to calculate the rolling crash weight per mile for each segment. This step normalizes the crash weight based on road length. For segments shorter than 0.25 miles, a minimum length of 0.25 miles was applied to prevent overrepresenting crashes on small road segments, as dividing by very small numbers can produce disproportionately large values.

[2] These patterns would take into account collisions sometimes not directly on a particular segment in other to smooth out analysis results. Examples of this type of analysis are provided by FHWA in their Guide Book on High Pedestrian Crash Locations.

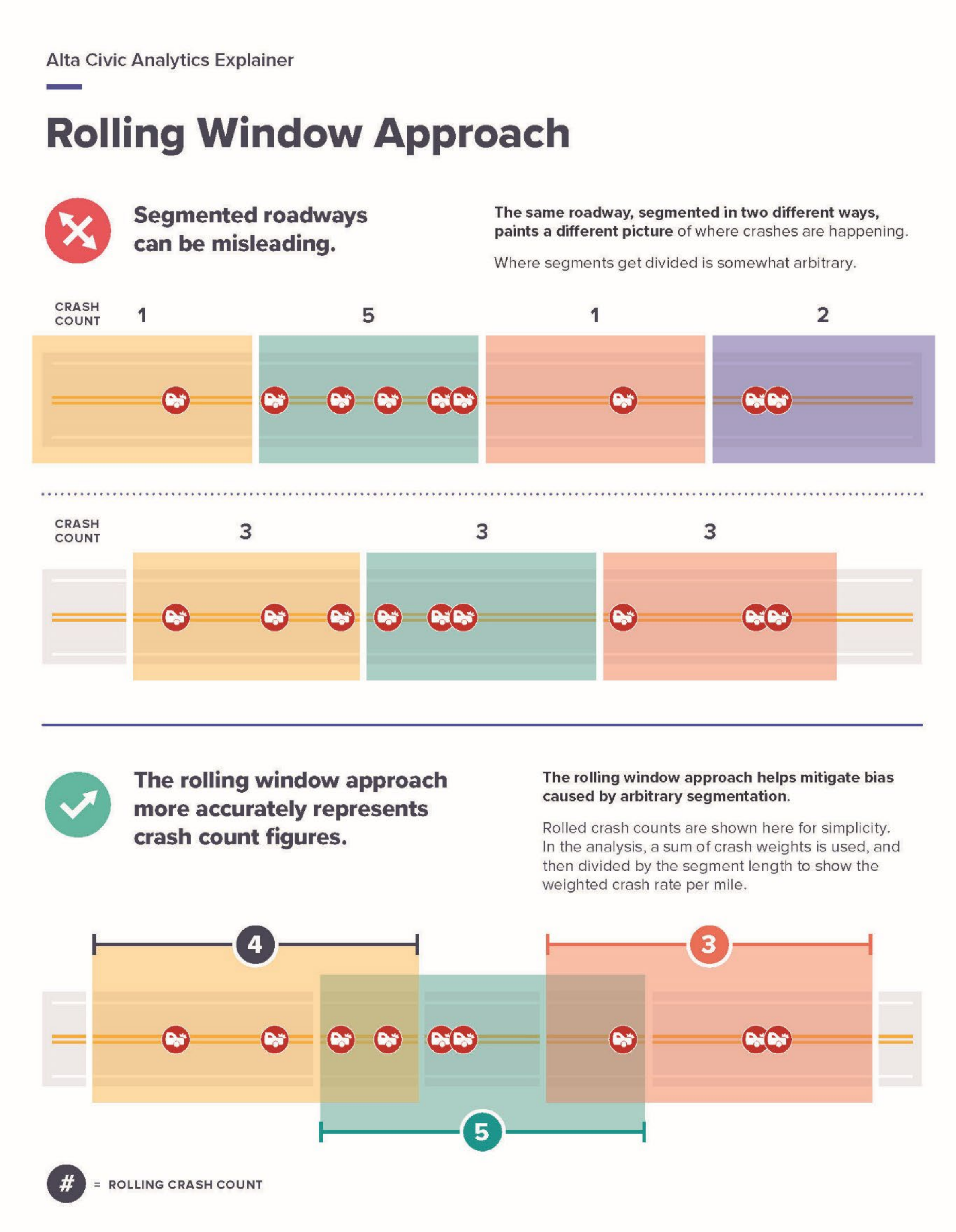


Figure 1: Rolling window approach.

4. **Accumulate Crashes:**

    a. Beginning with segments with the highest crash weight per mile, use Alta's custom-build *HIN Generation Tool* to progressively add segments to the HIN. This tool calculates the length in miles for each segment as it is added and keeps track of the cumulative miles in the HIN and the number of crashes occurring on those segments. It stops when the designated threshold of KSI collisions have been accumulated. The tool also generates a table that shows the number of crashes, and the number of roadway miles accounted for with each HIN segment.

    b. Decide the threshold for the percentage of crashes included in the HIN by examining a graph of accumulated collisions and accumulated centerline miles and identifying the natural inflection point in the data. This represents the point at which adding more roadways to the HIN has diminishing returns in terms of identifying more crashes. An example graph is shown in **Figure 2.**

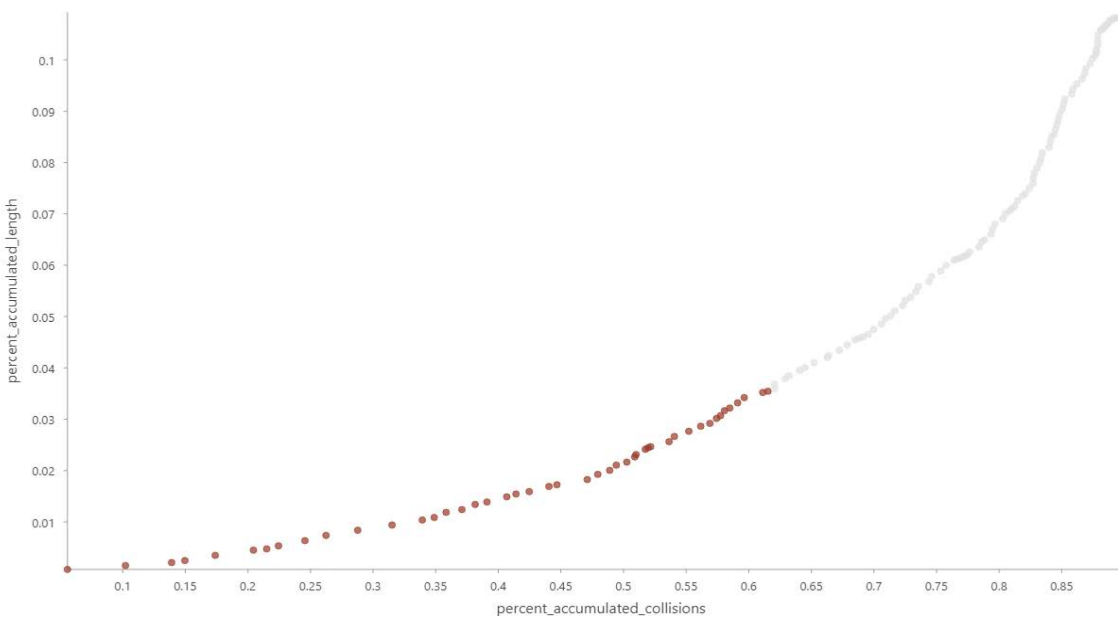


Figure 2: Example of a graph of accumulated collisions and accumulated centerline length. Collisions selected for the HIN are represented in brown.

5. **Final Refinement:**

    a. Examine the map of qualifying HIN segments and perform manual cleaning output from the tool. This step eliminates segments that the tool may have selected where no crashes have occurred. It also fills small gaps in otherwise contiguous networks on major roadways.

    b. Calculate the percent of roadway miles and the percent of KSI crashes accounted for in the final HIN.

References

Fitzpatrick, K. A. (2018). *Guidebook on Identification of High Pedestrian Crash Locations. FHWA-HRT-17-106. Supplemental Material.* McLean, VA: Federal Highway Administration Office of Safety Research and Development.

Harmon, T. G. (2018). *Crash Costs for Highway Safety Analysis. Report No. FHWA-SA-17-071.* Washington, D.C.: Federal Highway Administration.

Wasserman, D. (2023, March 30). Study-Line-Editor. Portland, OR, USA. Retrieved from https://github.com/d-wasserman/study-line-editor/tree/dev

D

Appendix D: School Map Packets

Table of Contents

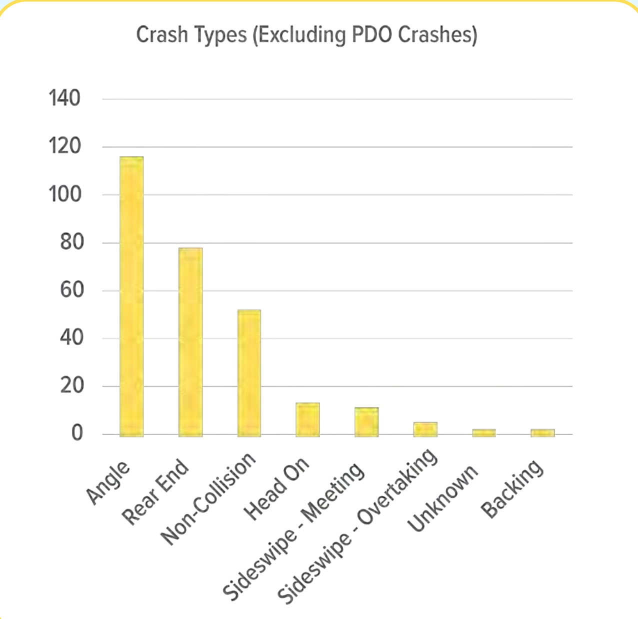
Carson High School

Carson High School

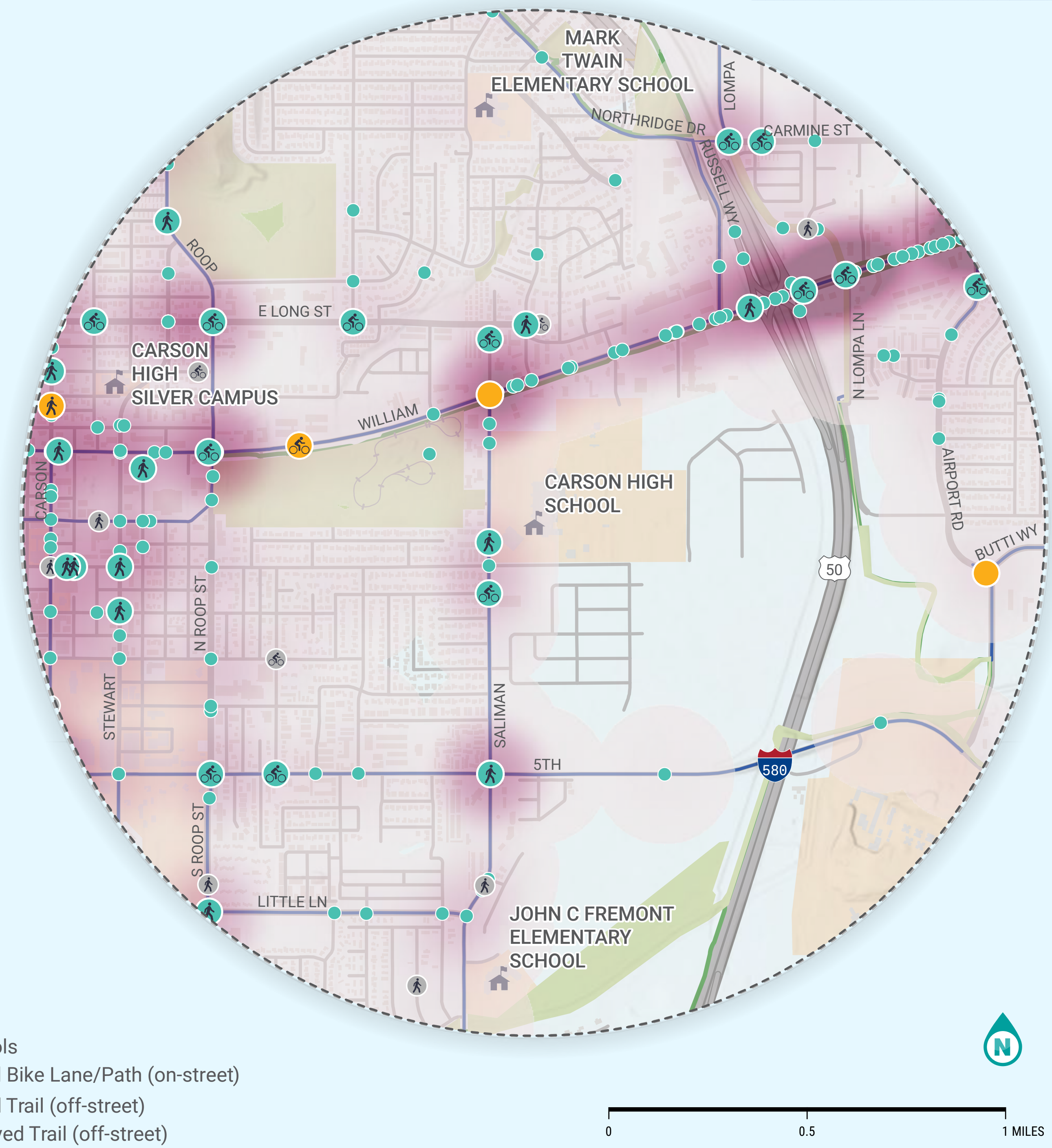
Between 2019 and 2023, there were ***4*** fatal crashes and ***267*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	1	1	2	4
Injury	15	16	236	267
Property Damage	7	6	651	664
Total	23	23	892*	938*

*includes 3 unknown crashes



1 MILE



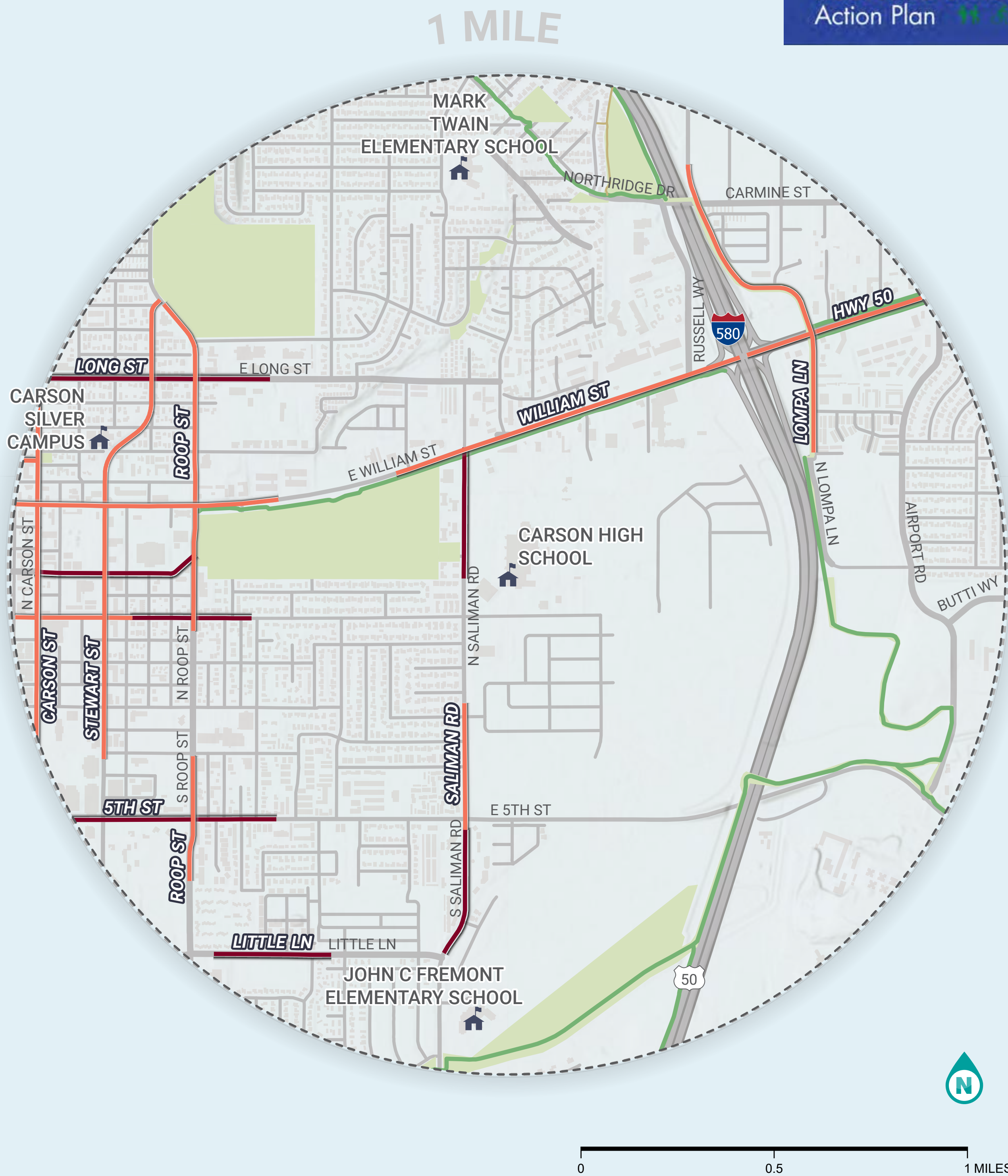
LEGEND

CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Carson High School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

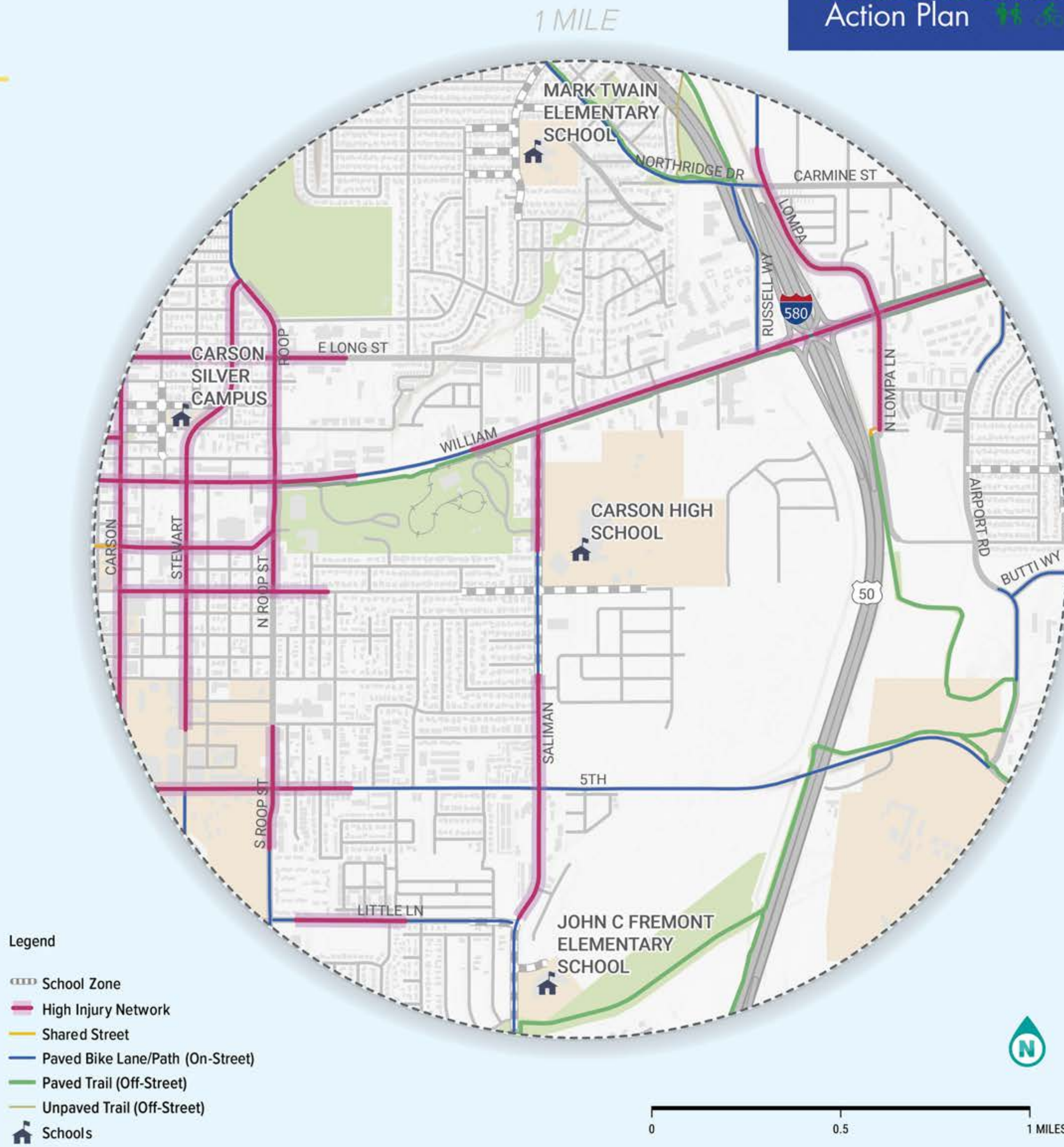
Existing Facilities

- Study Schools
- Parks
- Railway
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Carson High School

Within a 1-mile radius, there are ***7.4*** High Injury Network miles.

Name	Fromstreet	Tostreet
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
E William St	Rand Ave	State St
Fleishmann St	N Carson St	N Division St
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Nichols Ln	East Of Airport Rd
Little Ln	Parkland Ave	S Roop St
Long St	N Carson St	N Stewart St
N Carson St	Corbett St	Bath St
N Carson St	W 5th St	E Musser St
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
N Roop St	E Adams St	N Stewart St
Saliman Rd	Little Ln	E 5th Street
Saliman Rd	North Of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St



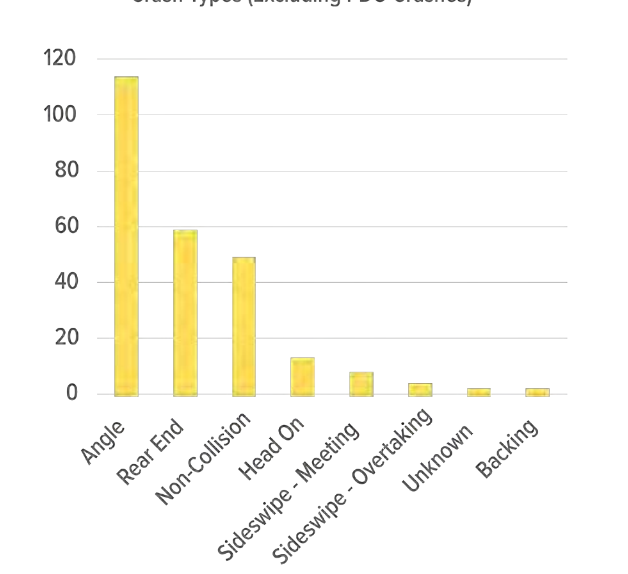
Carson High Silver Campus

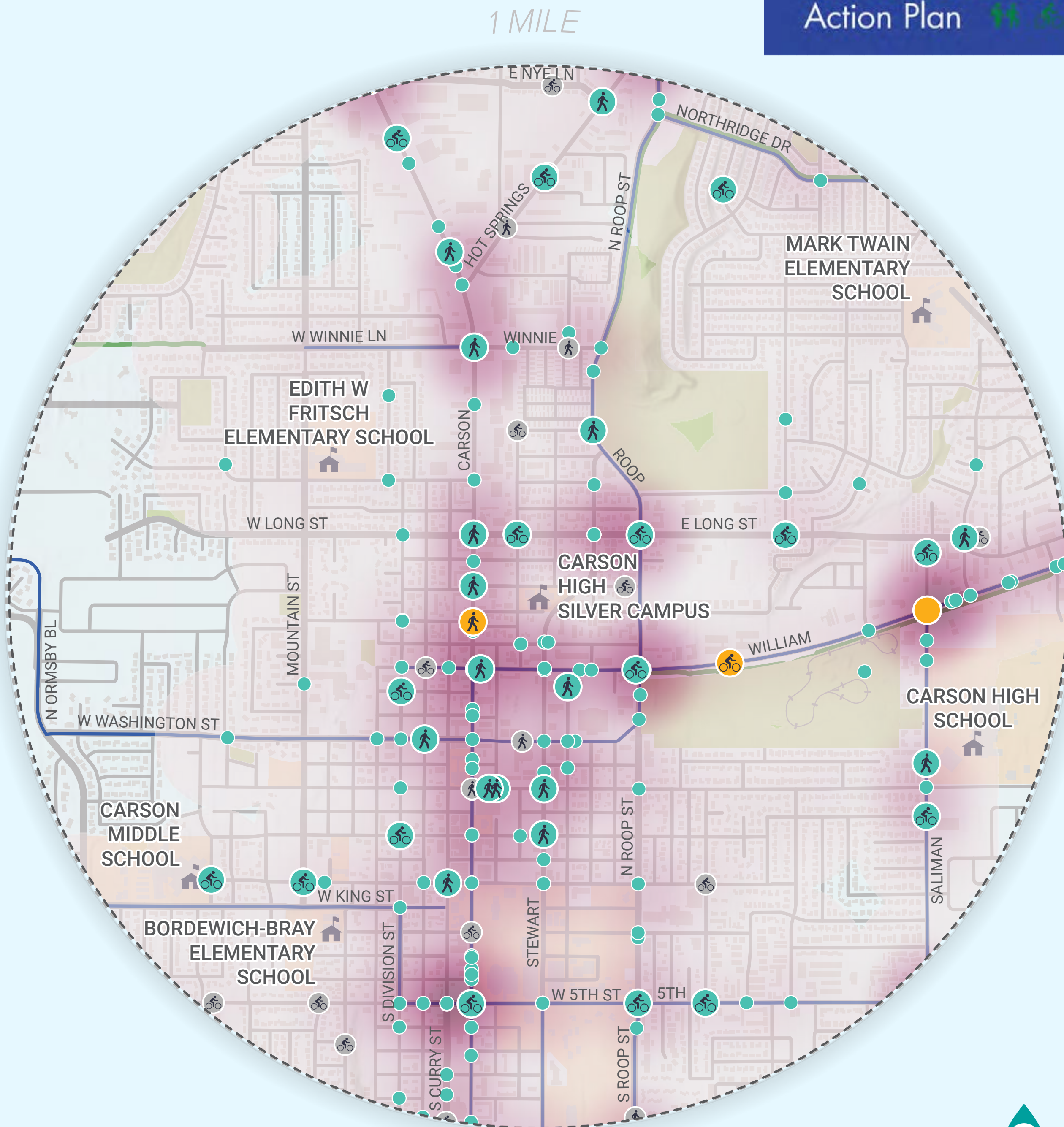
Carson High Silver Campus

Between 2019 and 2023, there were ***3*** fatal crashes and ***240*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	1	1	1	3
Injury	17	18	205	240
Property Damage	6	13	626	645
Total	24	32	836*	892*

*includes 4 unknown crashes





LEGEND

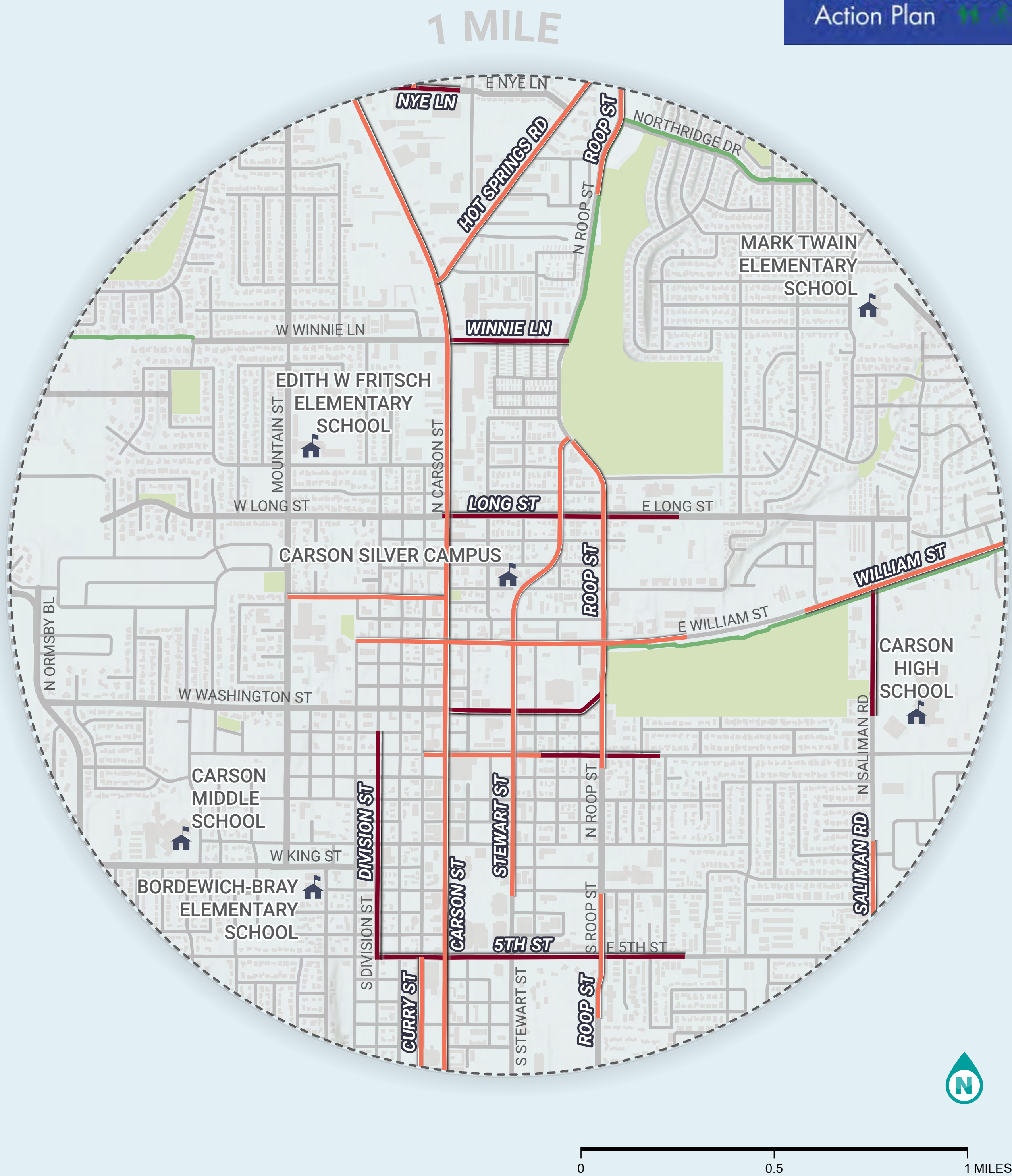
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

0 0.5 1 MILES

Carson High Silver Campus



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

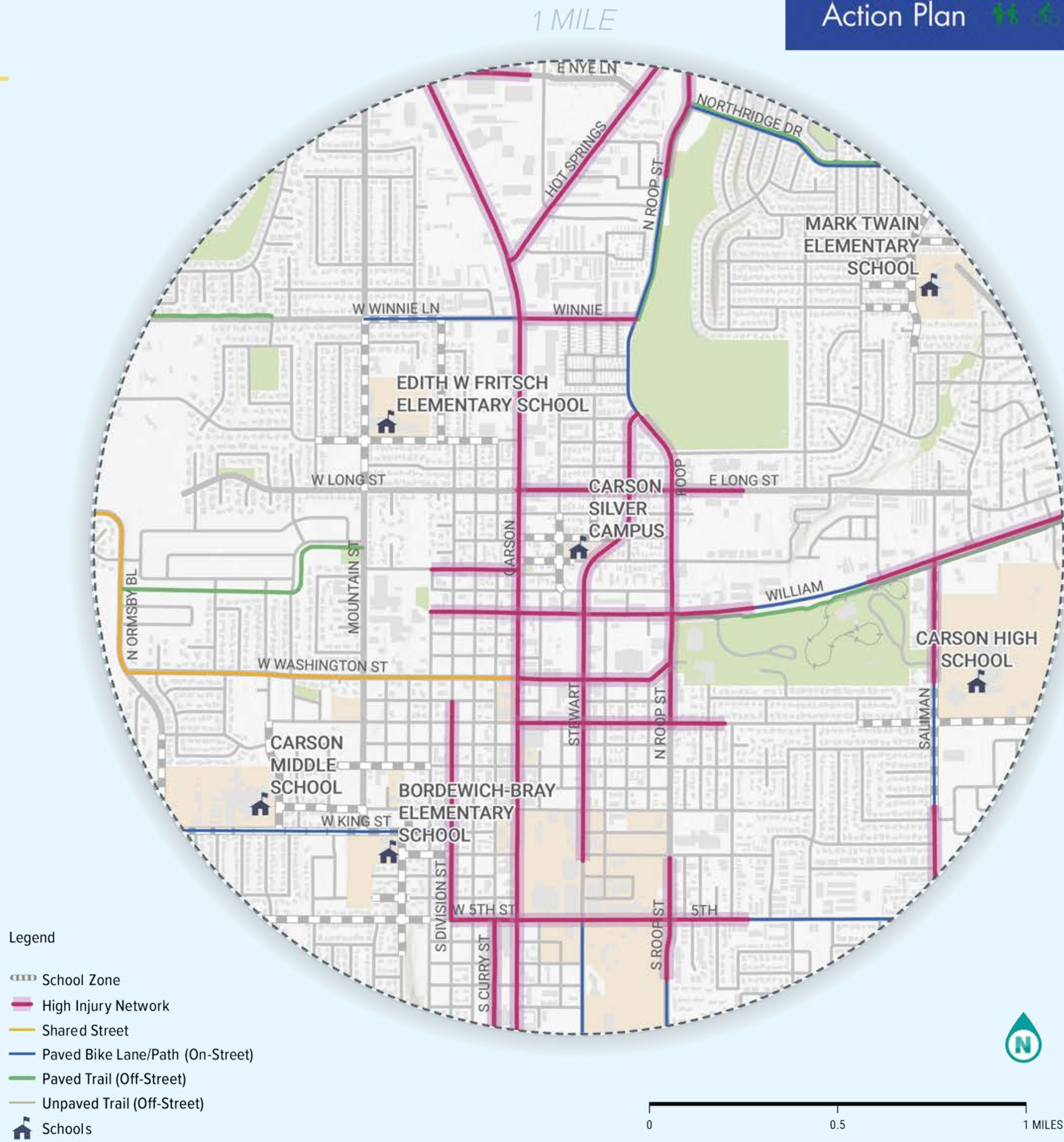
Existing Facilities

- Study Schools
- Parks
- Railway
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Carson High Silver Campus

Within a 1-mile radius, there are ***9.1*** High Injury Network miles.

Street Name	From	To
N Carson St	E Proctor St	E Washington St
N Carson St	E Washington St	Corbett St
N Carson St	N Of Hot Spring Rd	W Nye Ln
Division	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Rand Ave	State St
Fleischmann	N Carson St	N Division St
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Imperial	E Nye Ln	W Gardengate Wy
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
Roop	Northridge Dr	Hot Springs Rd
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Saliman	N of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W 5th St	S Carison St	S Division St
W Nye Ln	Northgate Ln	N Carson St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St
Winnie	N Roop St	N Carson St



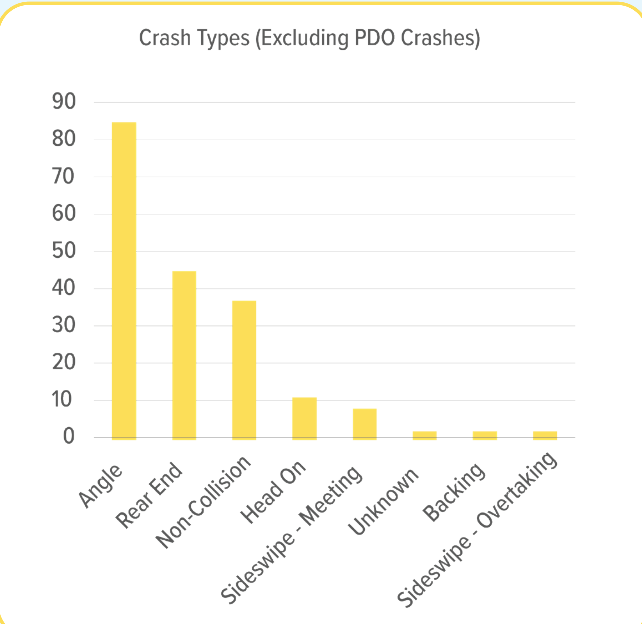
Carson Middle School

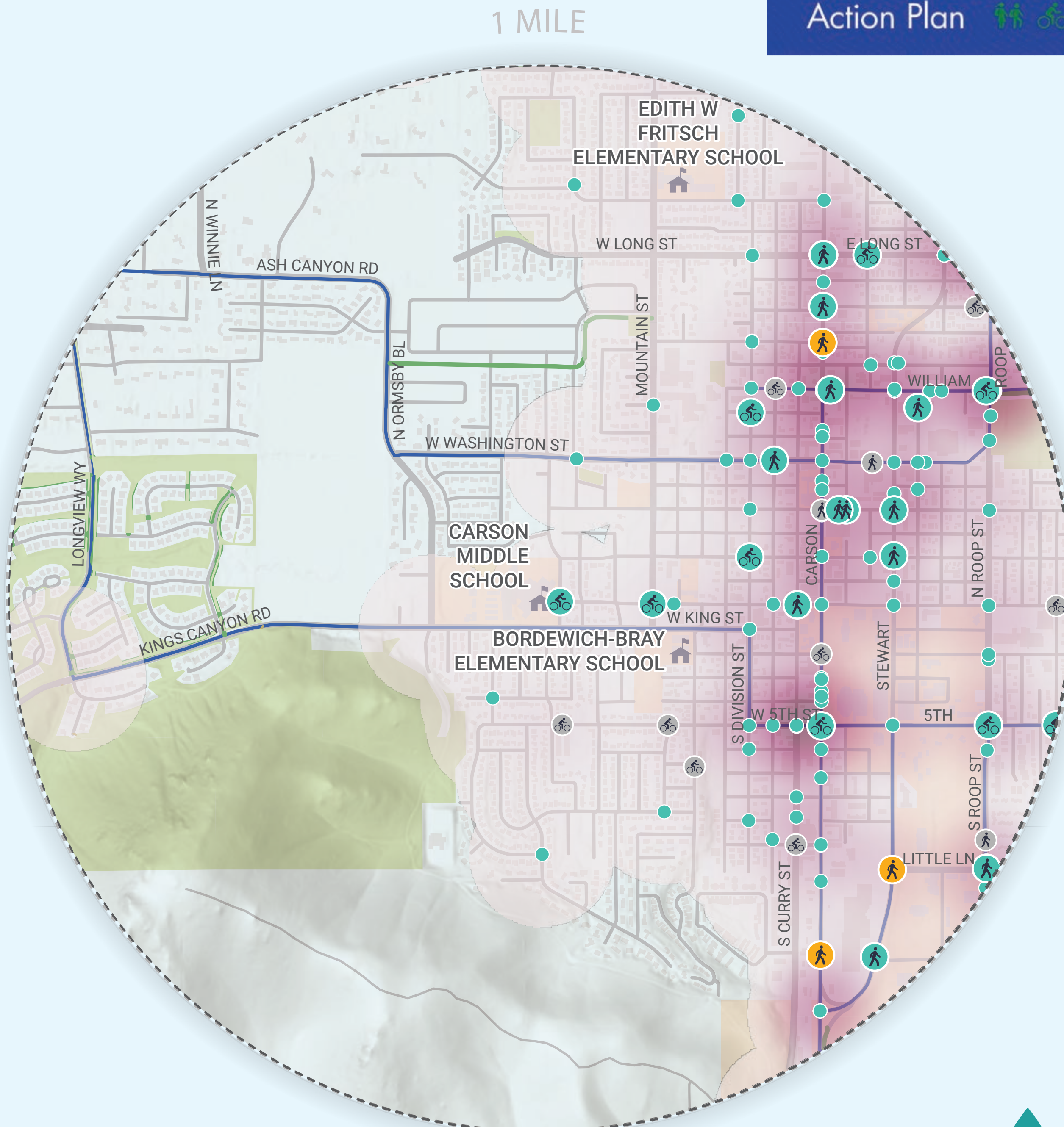
Carson Middle School

Between 2019 and 2023, there were 3 fatal crashes and 181 injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	3			3
Injury	15	10	156	181
Property Damage	3	9	435	447
Total	21	19	594*	634*

*includes 3 unknown crashes





LEGEND

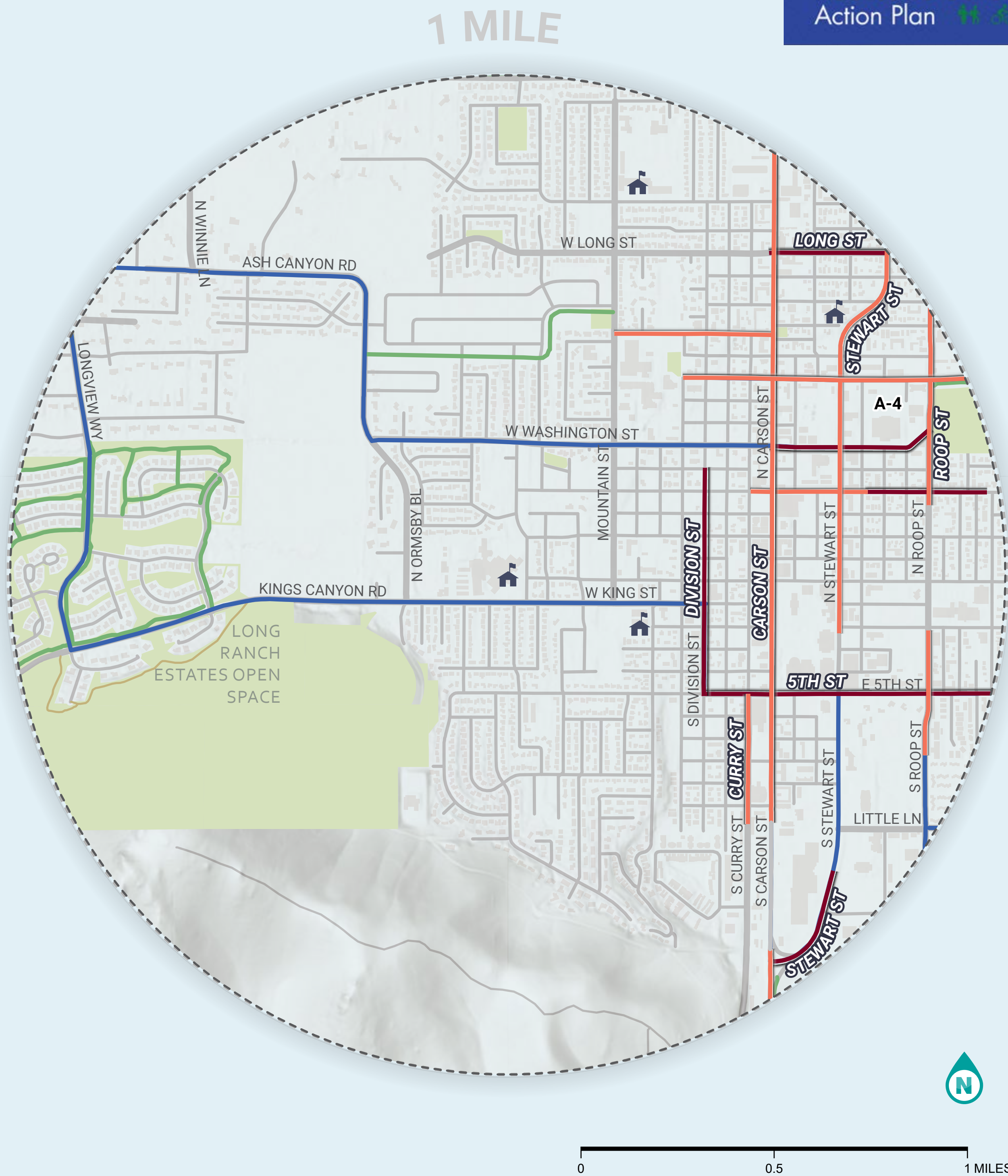
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

0 0.5 1 MILES

Carson Middle School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

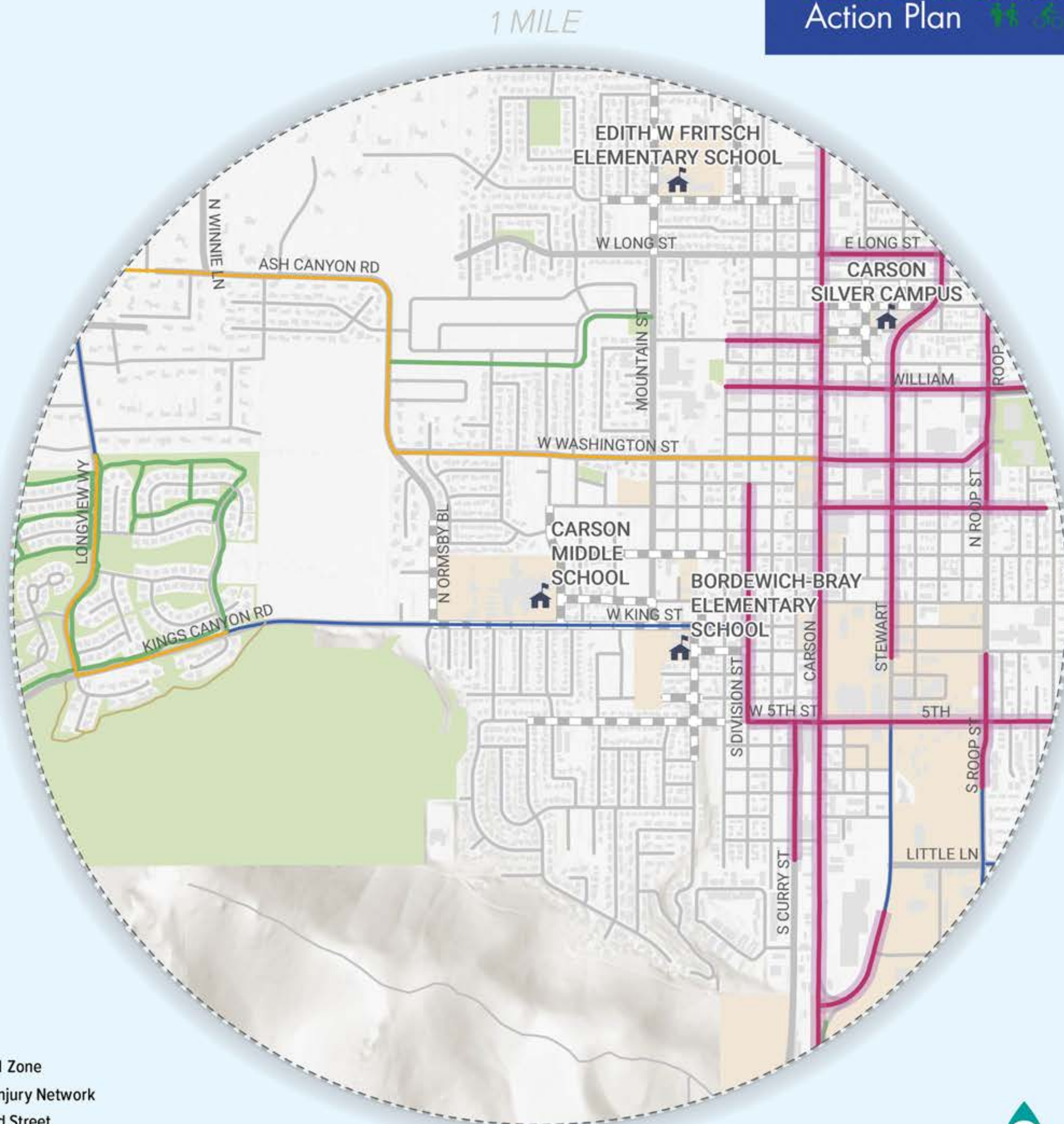
Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks

Carson Middle School

Within a 1-mile radius, there are ***6.4*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	S Stewart St	10 10th Street
S Division St	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fleishmann St	N Carson St	N Division St
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Stewart St	E 2nd St	E Spear St
Stewart St	E Park St	N Roop St
Stewart St	E William St	E Park St
Stewart St	S Spear Street	E William St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St



Legend

- School Zone
- High Injury Network
- Shared Street
- Paved Bike Lane/Path (On-Street)
- Paved Trail (Off-Street)
- Unpaved Trail (Off-Street)
- Schools

0 0.5 1 MILES

Eagle Valley Middle School

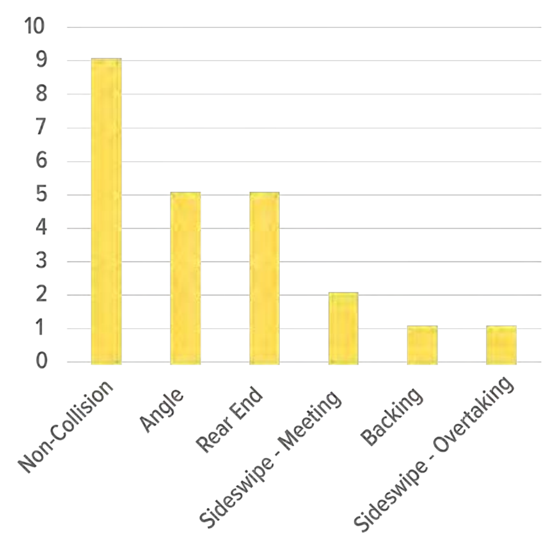
Carson Safe Routes to School Action Plan

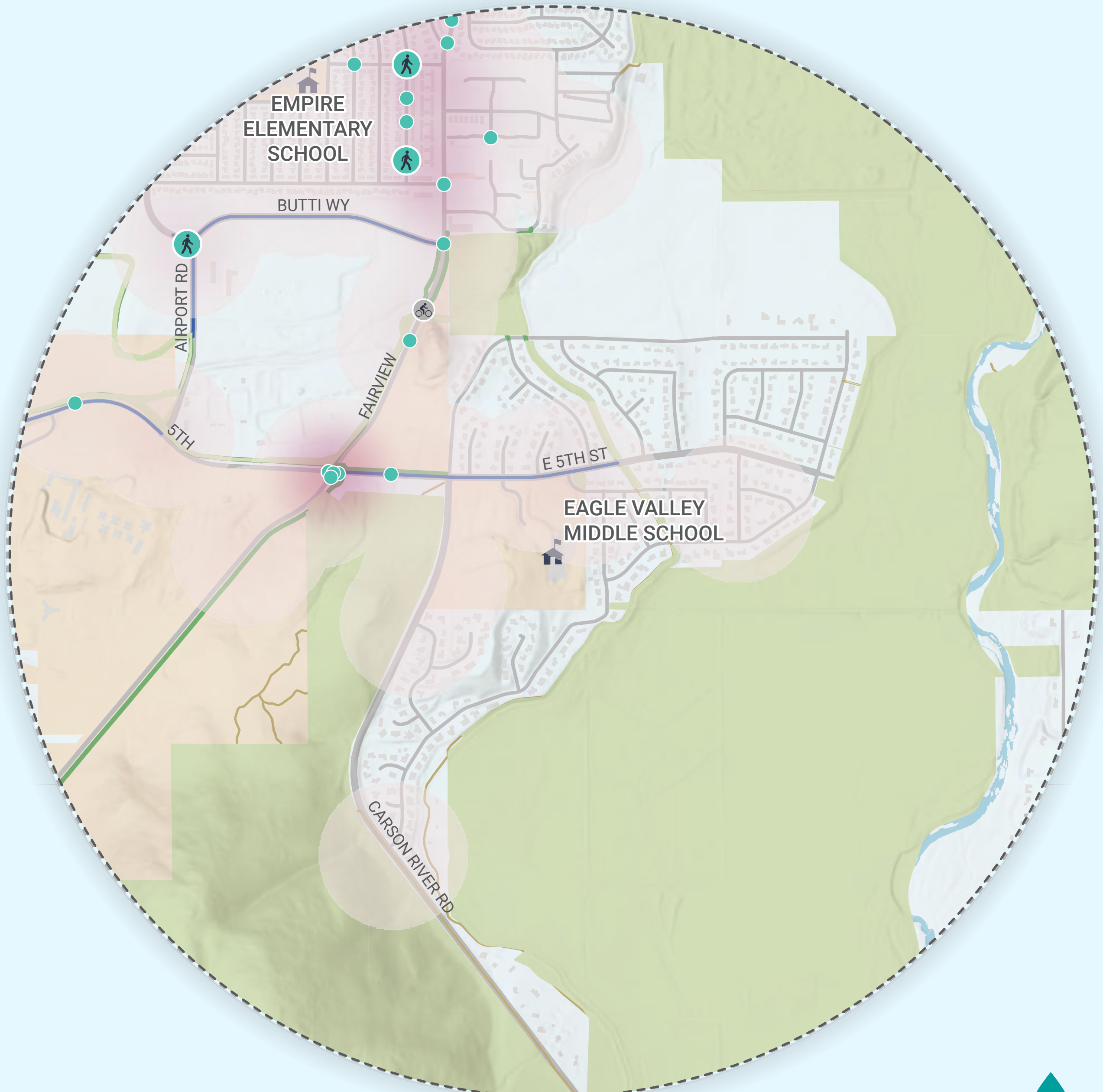
Eagle Valley Middle School

Between 2019 and 2023, there was ***1*** fatal crash and ***22*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal			1	1
Injury	3		19	22
Property Damage		1	66	67
Total	3	1	86	90

Crash Types (Excluding PDO Crashes)





LEGEND

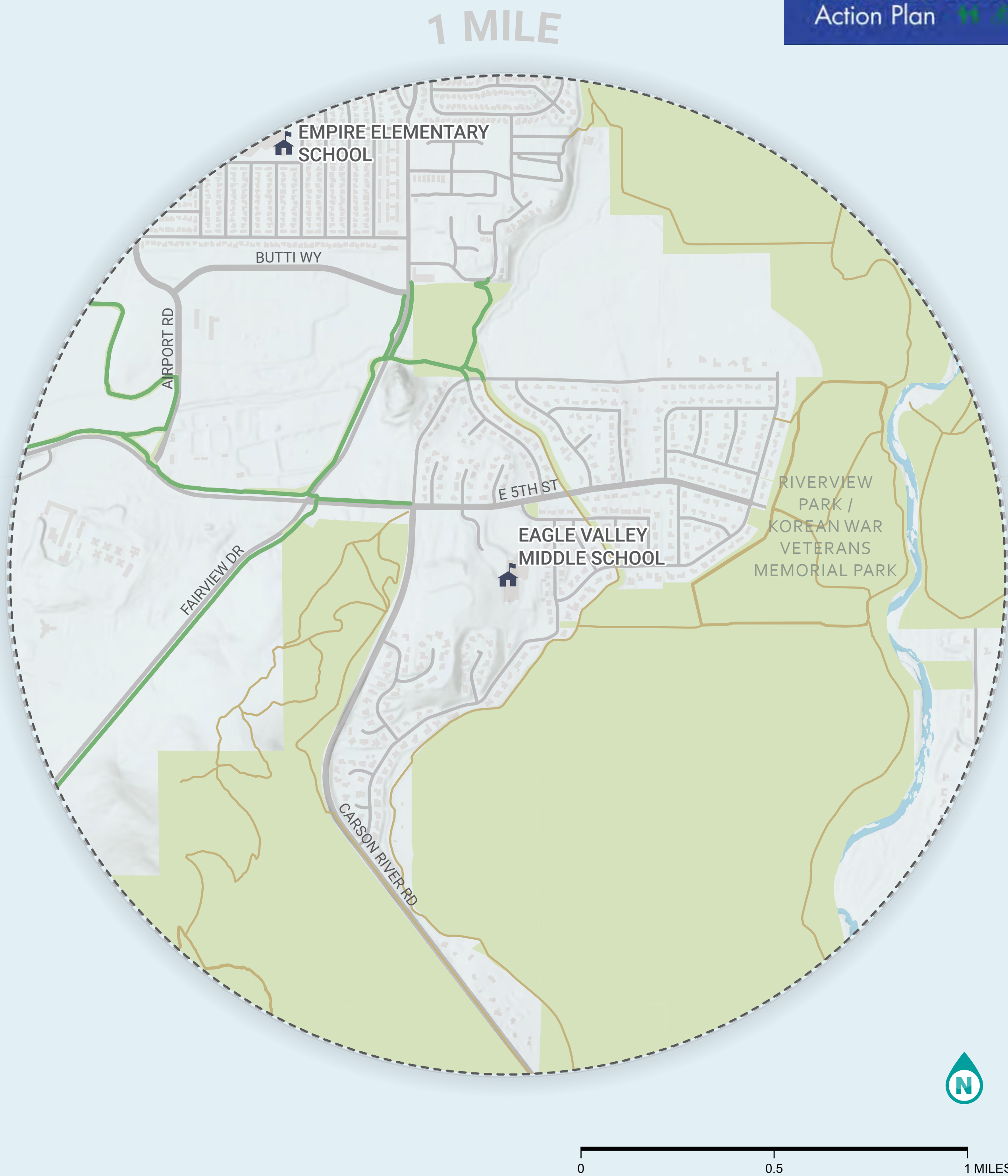
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

0 0.5 1 MILES

Eagle Valley Middle School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

Existing Facilities

- Study Schools
- Parks
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Eagle Valley Middle School

Within a 1-mile radius, there are ***no*** High Injury Network miles.

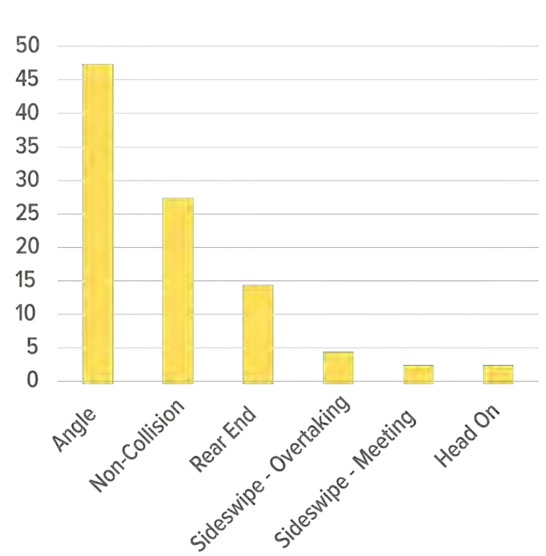
Al Seeliger Elementary School

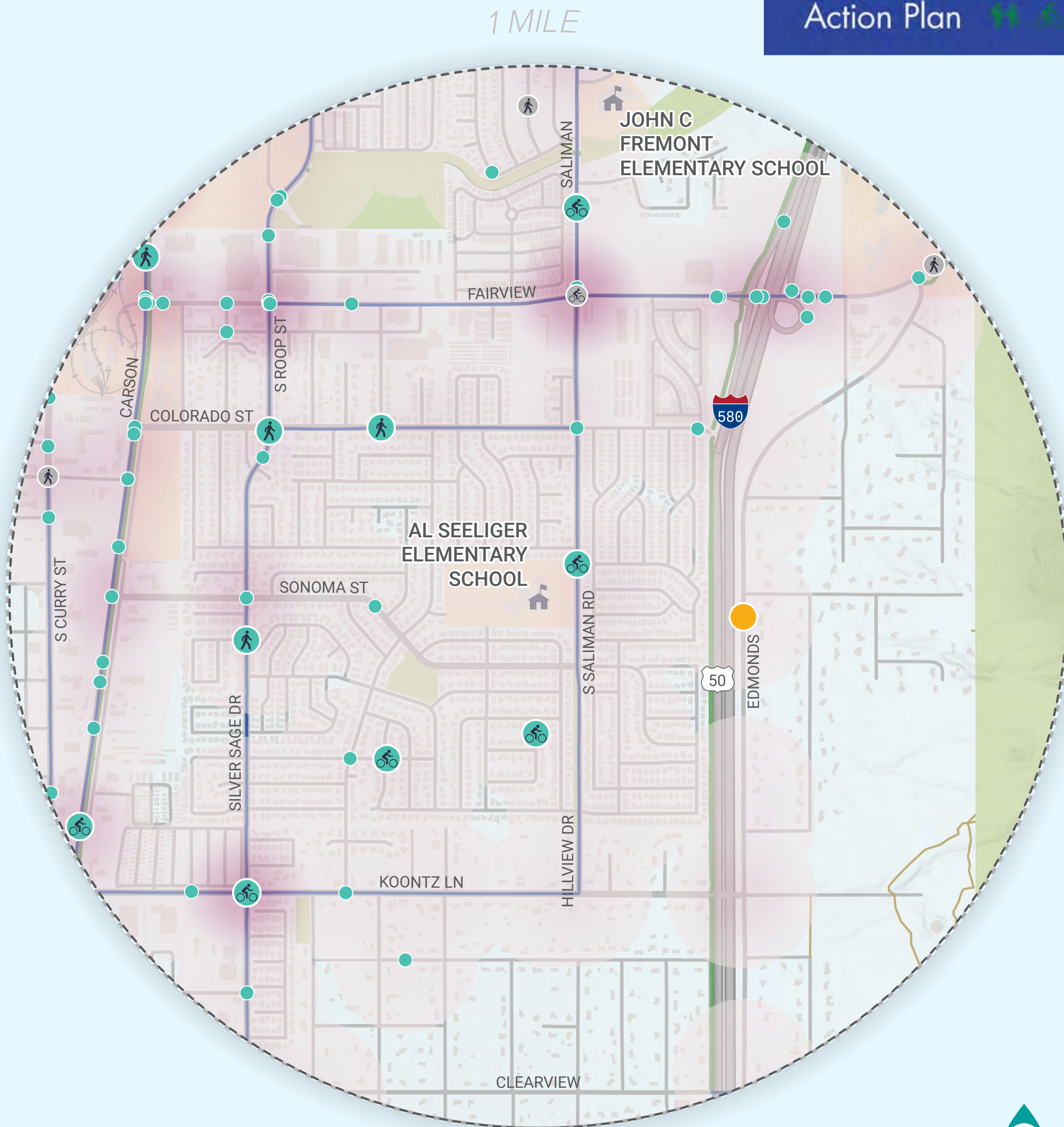
Al Seeliger Elementary School

Between 2019 and 2023, there was ***1*** fatal crash and ***95*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal			1	1
Injury	4	6	85	95
Property Damage	3	2	189	194
Total	7	8	276*	291*

*includes 1 unknown crash





LEGEND

CRASH DENSITY
Sparse
Dense

CRASH POINTS
Fatal
Injury
Property Damage Only

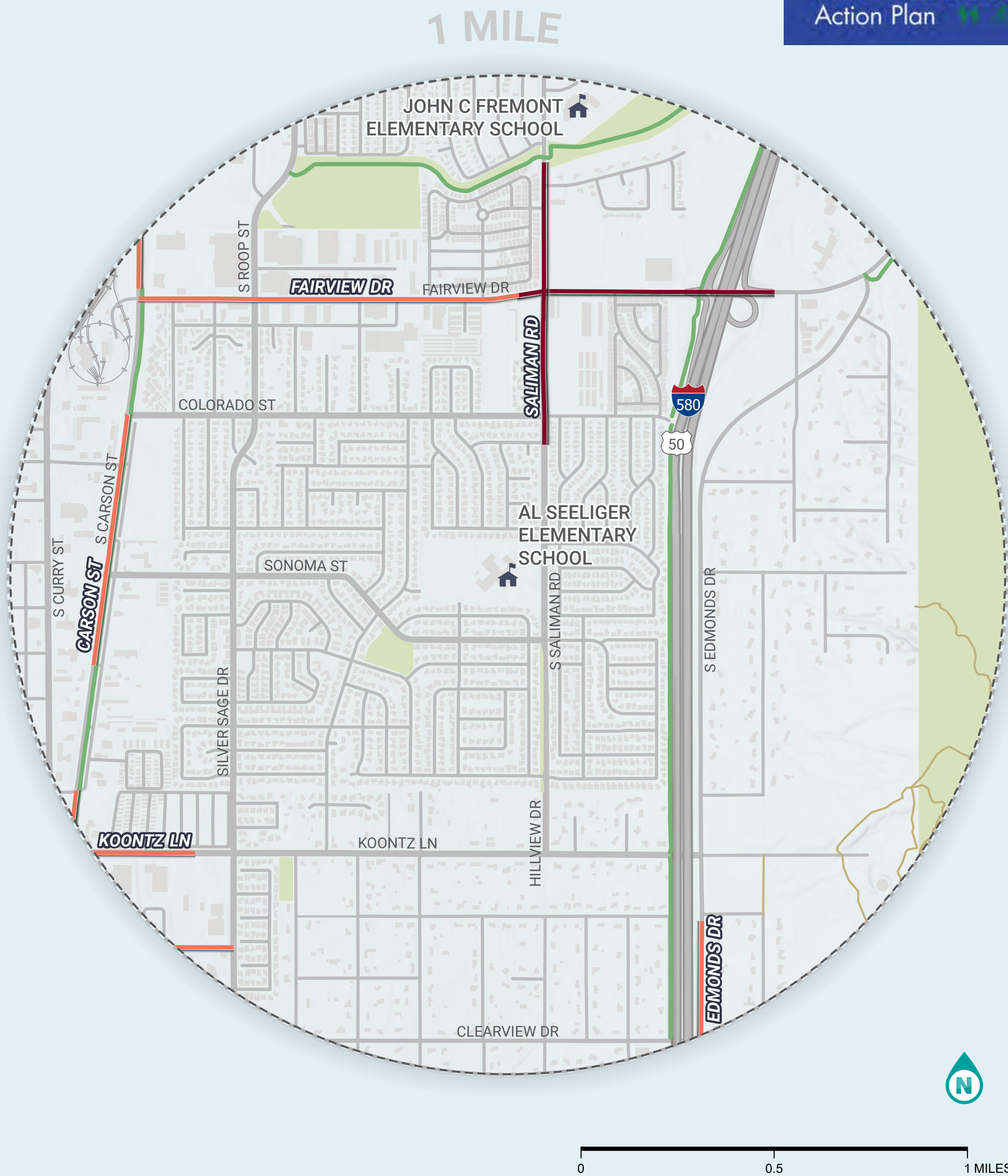
Schools
Paved Bike Lane/Path (on-street)
Paved Trail (off-street)
Unpaved Trail (off-street)

N

0 0.5 1 MILES

Carson Safe Routes to School Action Plan

Al Seeliger Elementary School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

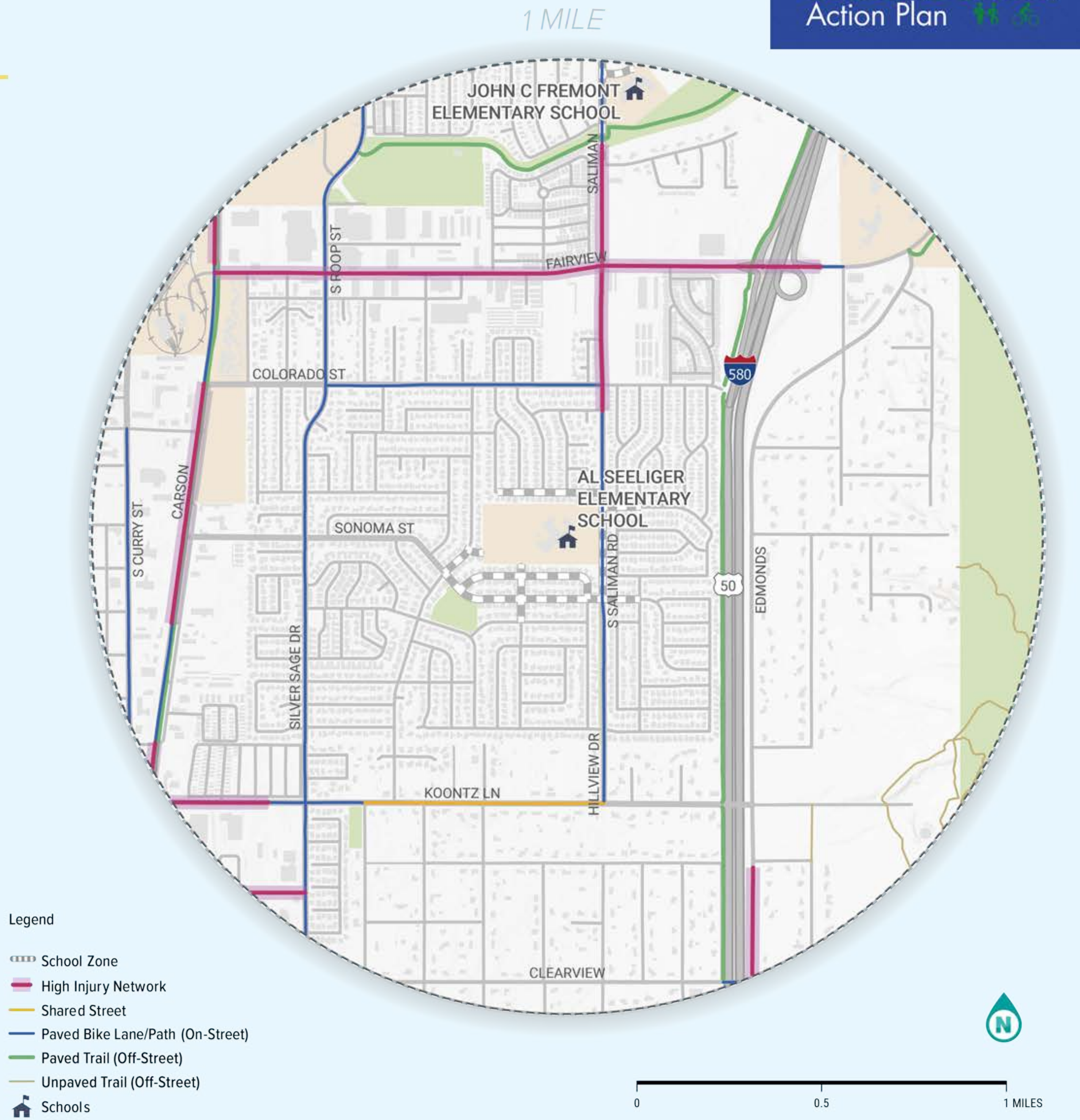
Existing Facilities

- Study Schools
- Parks
- Railway
- Paved Trail (off-street)
- Unpaved Trail (off-street)

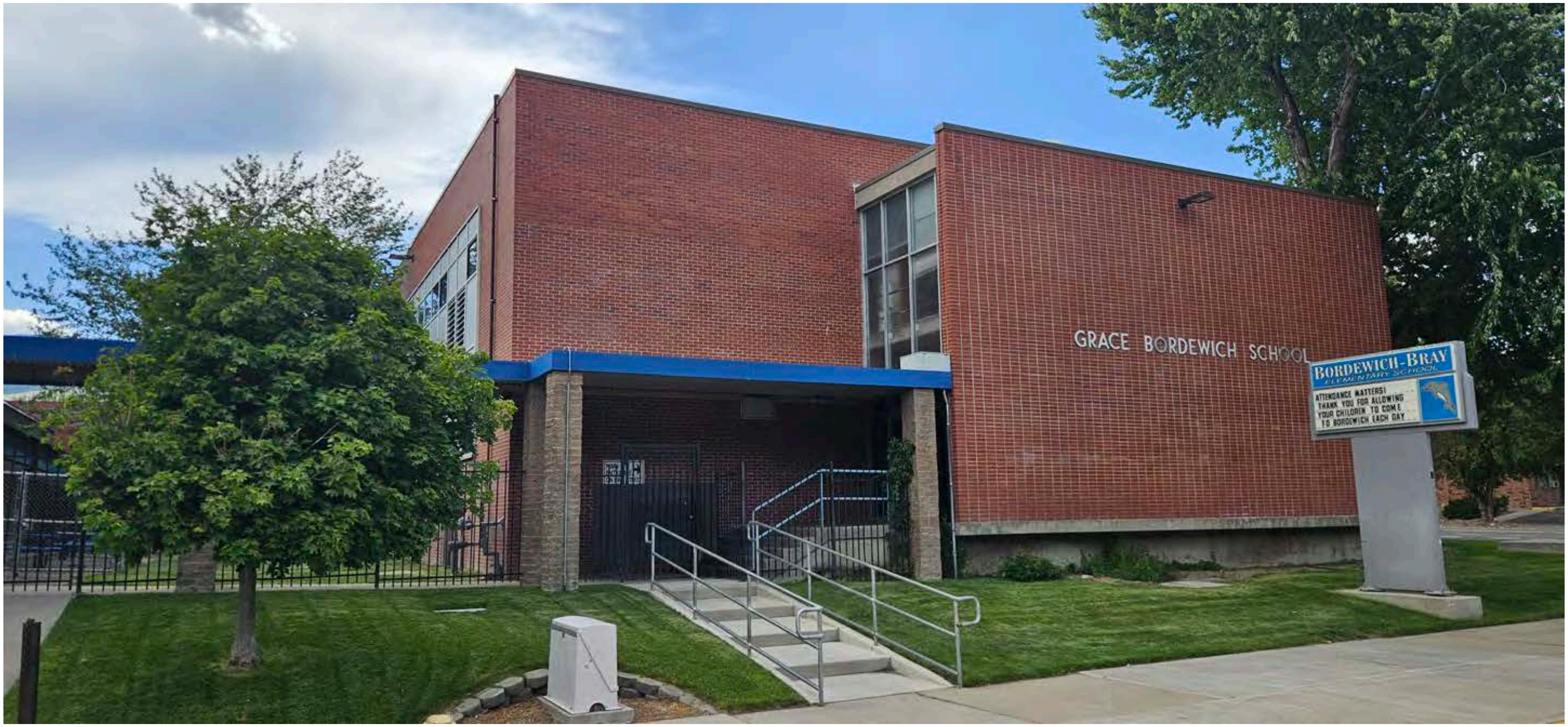
Al Seeliger Elementary School

Within a 1-mile radius, there are ***3.0*** High Injury Network miles.

Street Name	From	To
Carson St	Sonoma St	Colorado St
Carson St	N Of Koontz Ln	Sonoma St
Eagle Station Ln	Silver Sage Dr	S Carson St
Edmonds Dr	Clearview Dr	Valley View Dr
Fairview Dr	Industrial Park Dr	S Roop St
Fairview Dr	S Roop St	S Carson St
Fairview Dr	S Saliman Rd	Industrial Park Dr
Fairview Dr	580 On-Ramp	Saliman Rd
Fairview Dr	S Saliman Rd	S Lompa Ln
Koontz Ln	Silver Sage Dr	S Carson St
S Carson St	Fairview Dr	S Stewart St
S Carson St	Moses St	Eagle Station Ln
S Saliman Rd	Fairview Dr	Railroad Dr
Saliman Rd	Heather Way	Fairview Dr



Bordewich-Bray Elementary School



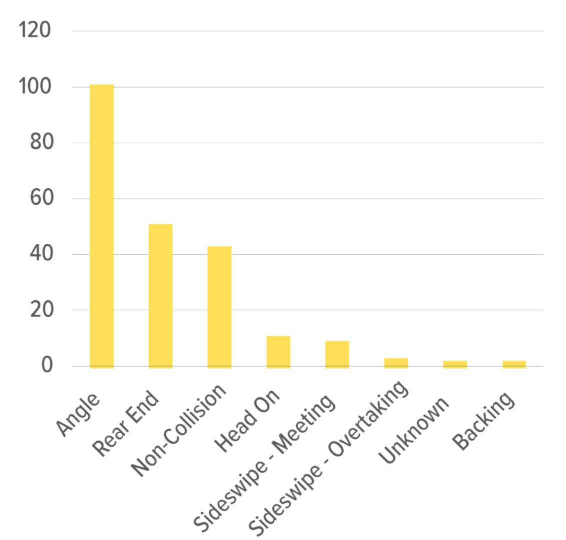
Bordewich-Bray Elementary School

Between 2019 and 2023, there were 4 fatal crashes and 210 injury crashes within a one-mile radius.

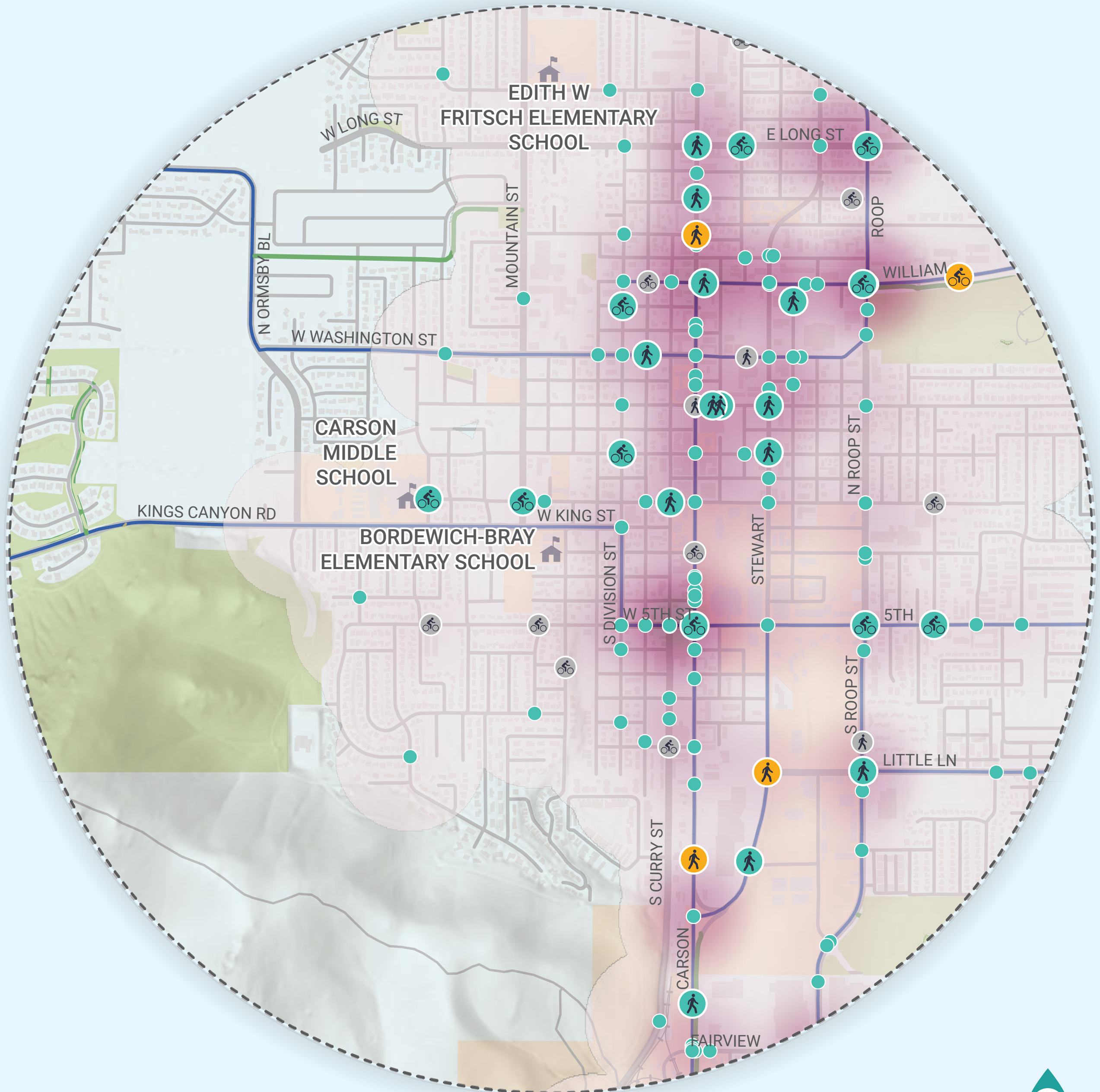
Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	3	1		4
Injury	16	12	182	210
Property Damage	3	9	486	498
Total	22	22	671*	715*

*includes 3 unknown crashes

Crash Types (Excluding PDO Crashes)



1 MILE



LEGEND

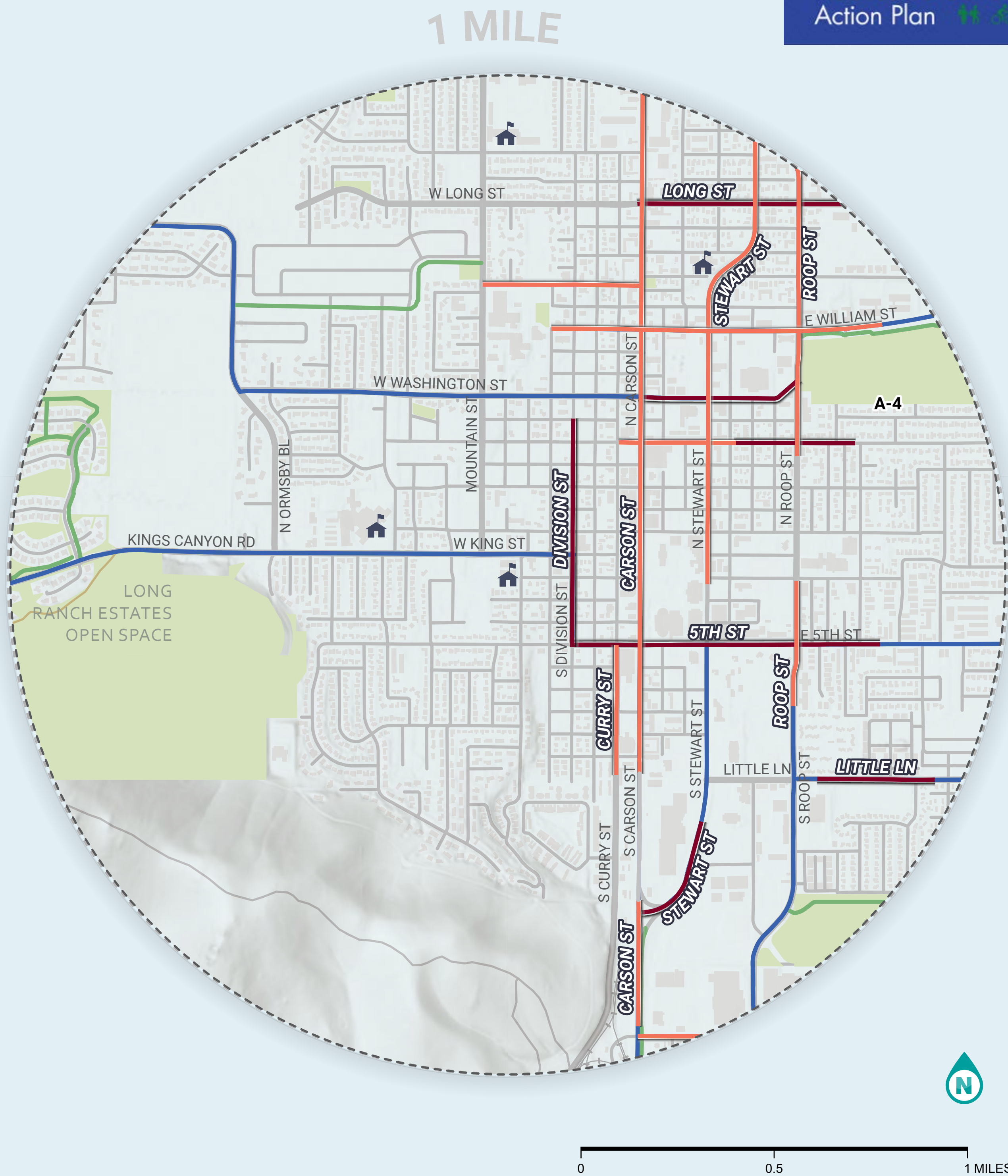
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Bordewich-Bray Elementary School

Carson Safe Routes to School Action Plan



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

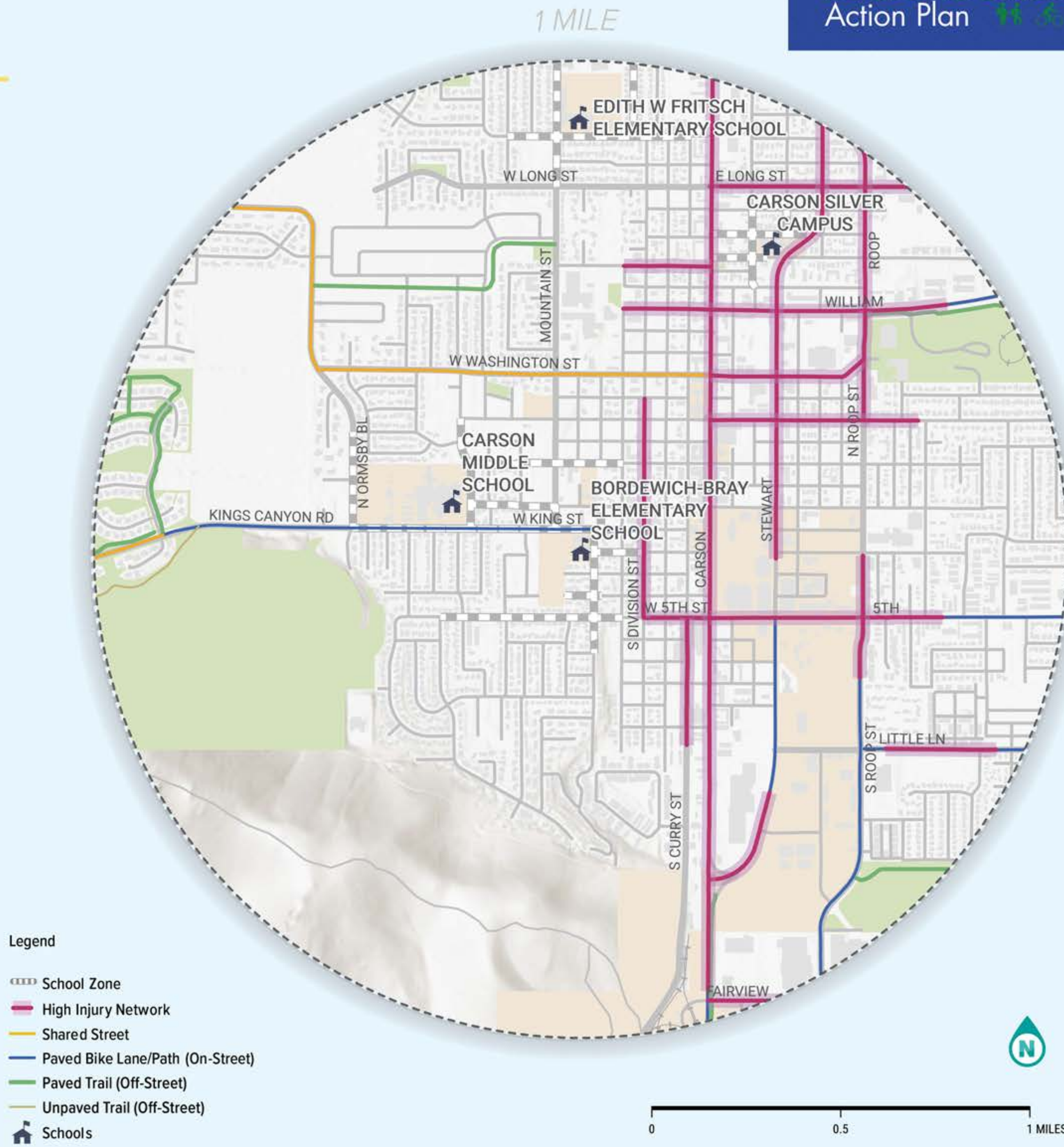
Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Bordewich-Bray Elementary School

Within a 1-mile radius, there are ***7.5*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	S Stewart St	10 10th Street
Division	W King St	W Caroline St
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fairview St	S Roop St	S Carson St
Fleishmann St	N Carson St	N Division St
Little Ln	Parkland Ave	S Roop St
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Little Ln	E 2nd St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Division St	W 5th St	W King St
Stewart St	E 2nd St	E Spear St
Stewart St	E Park St	N Roop St
Stewart St	E William St	E Park St
Stewart St	S Spear Street	E William St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St



Edith Fritsch Elementary School

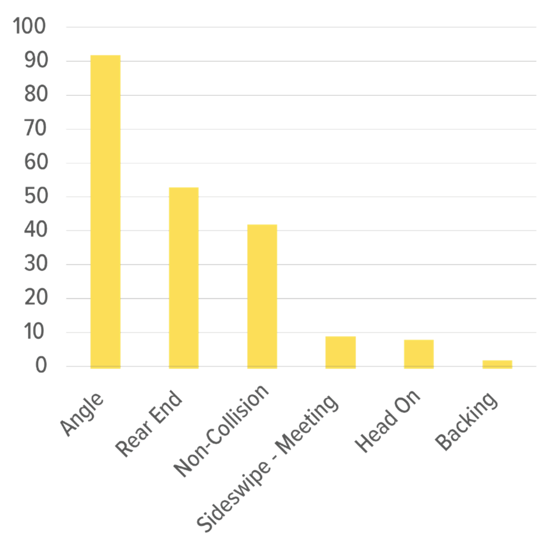
Edith W Fritsch Elementary School

Between 2019 and 2023, there were 3 fatal crashes and 197 injury crashes within a one-mile radius.

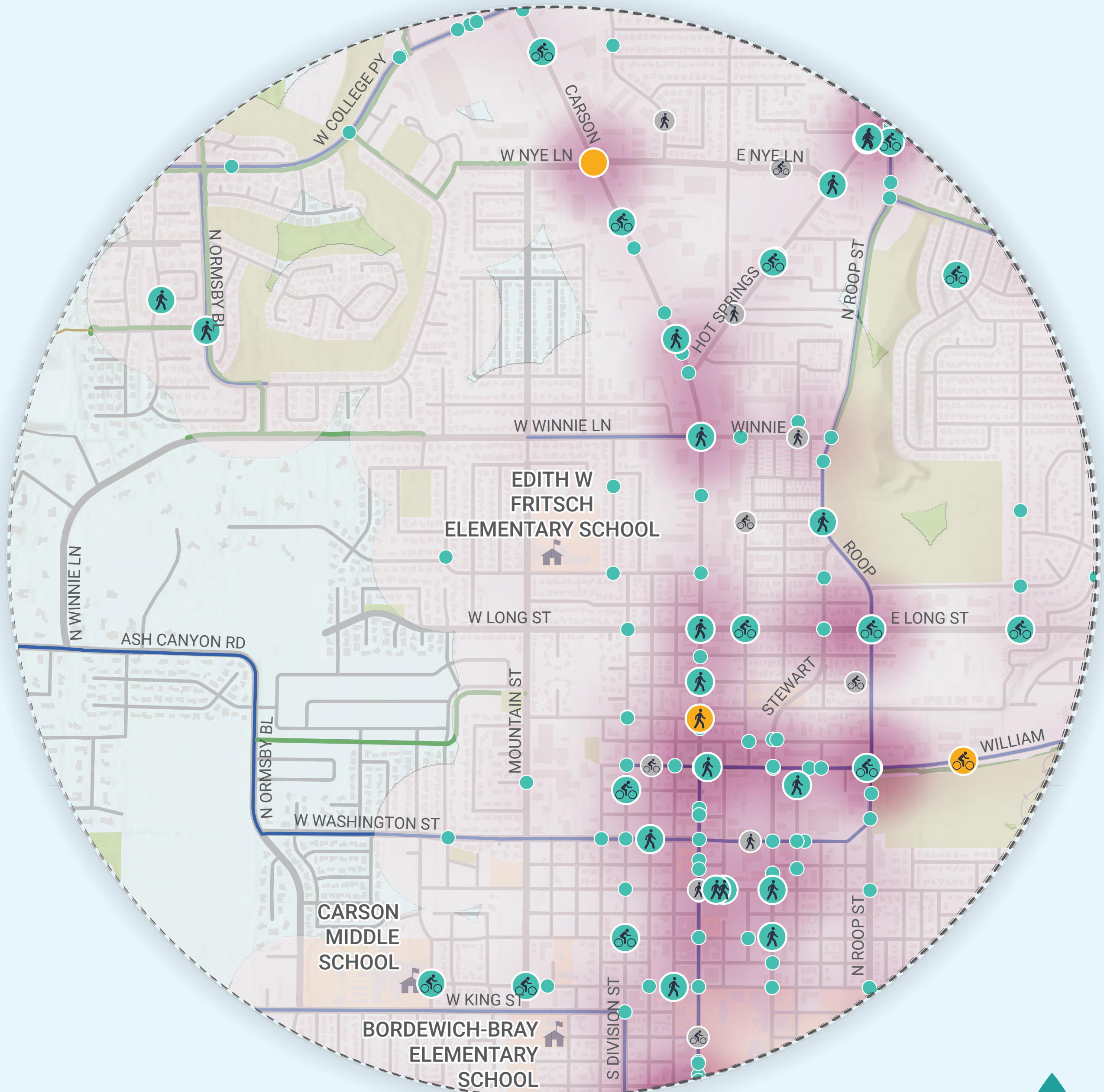
Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	1	1	1	3
Injury	19	15	163	197
Property Damage	5	8	469	482
Total	25	24	637*	686*

*includes 4 unknown crashes

Crash Types (Excluding PDO Crashes)



1 MILE



LEGEND

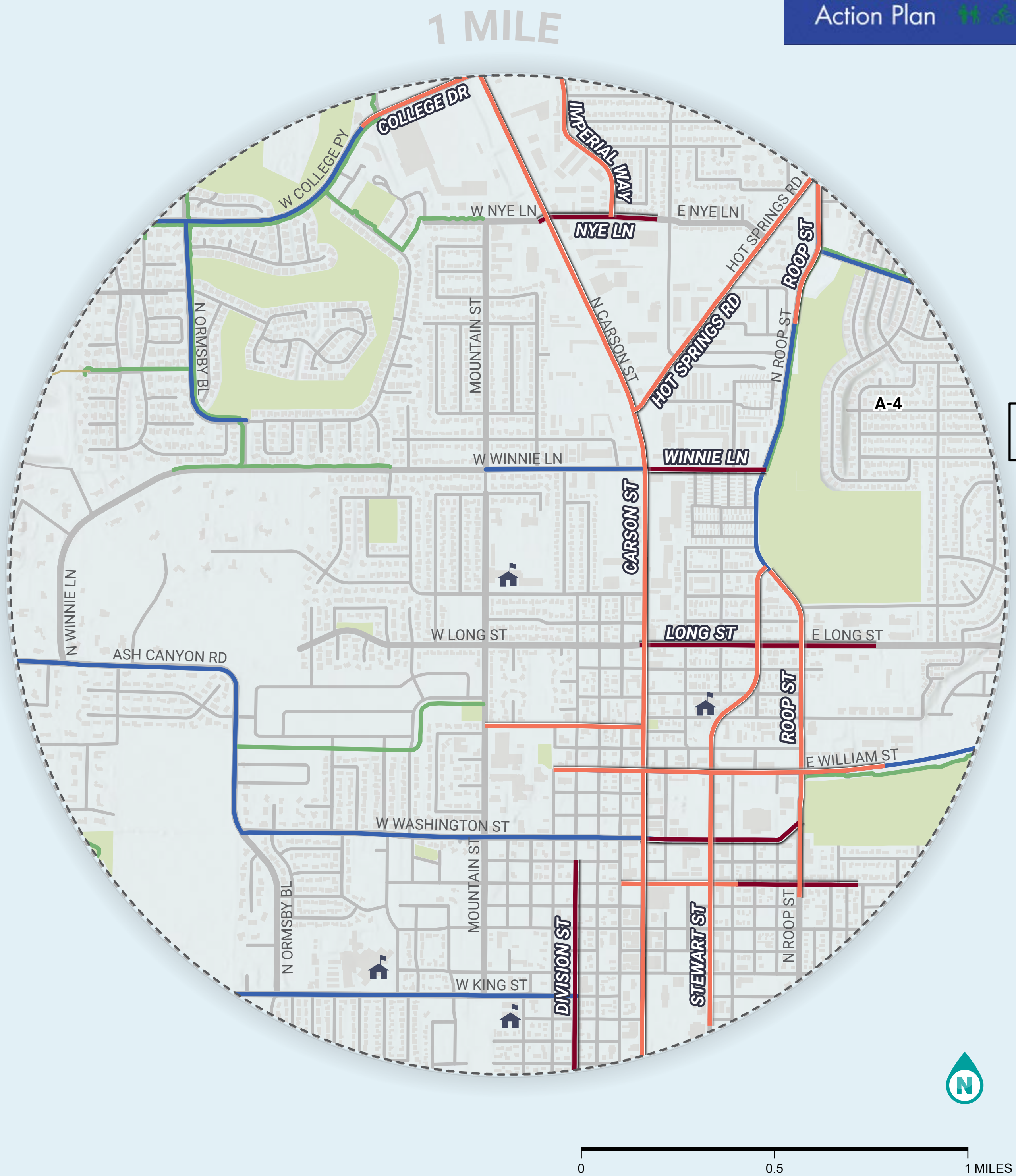
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

0 0.5 1 MILES

Edith W Fritsch Elementary School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

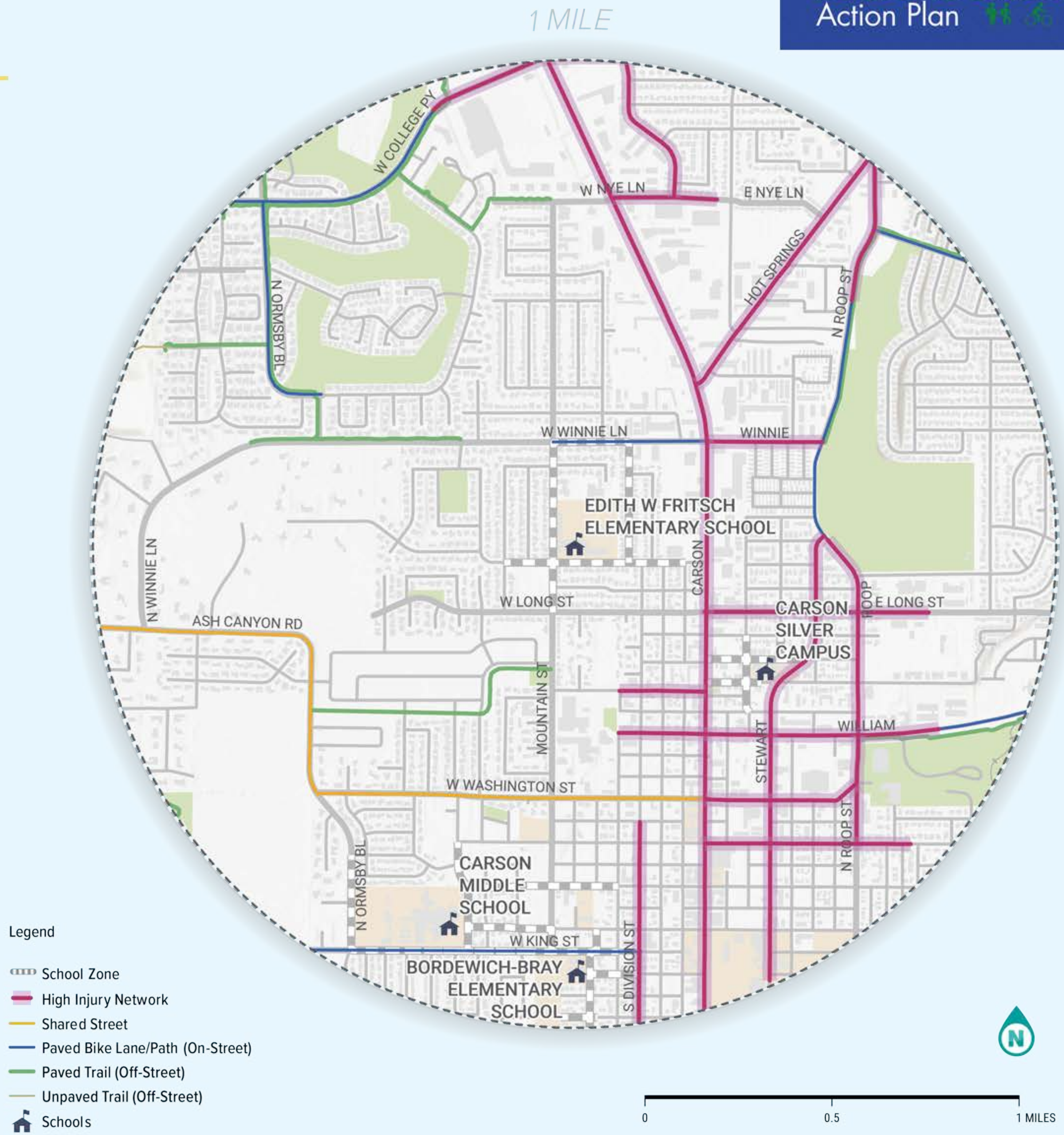
Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Edith W Fritsch Elementary School

Within a 1-mile radius, there are ***8*** High Injury Network miles.

Street Name	From	To
Carson St	E Proctor St	E Washington St
Carson St	E Washington St	Corbett St
Carson St	N Of Hot Spring Rd	W Nye Ln
Division	W King St	W Caroline St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
Fleishmann St	N Carson St	N Division St
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Imperial	E Nye Ln	W Gardengate Way
Imperial	W Gardengate Way	Alexa Way
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Carson St	W 5th St	E Musser St
N Carson St	W College Parkway	Silver Oak Dr
N Carson St	W Nye Ln	W College Pkwy
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
Robinson	N Valley St	N Carson St
Roop	E Adams St	N Stewart St
Roop	Northridge Dr	Hot Springs Rd
S Division St	W 5th St	W King St
Stewart	E 2nd St	E Spear St
Stewart	E Park St	N Roop St
Stewart	E William St	E Park St
Stewart	S Spear Street	E William St
W College Pkwy	Imperial Way	N Carson St
W College Pkwy	N Clarkson St	Cs Richards Blvd
W Nye Ln	Northgate Ln	N Carson St
W William St	Rt 395	N Minnesota St
W William St	N Anderson St	N Carson St
W William St	Oxoby Loop	N Anderson St
W Winnie Ln	N Roop St	N Carson St



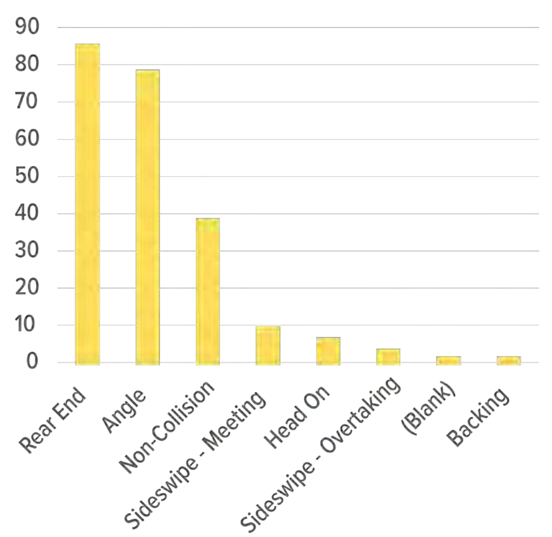
Empire Elementary School

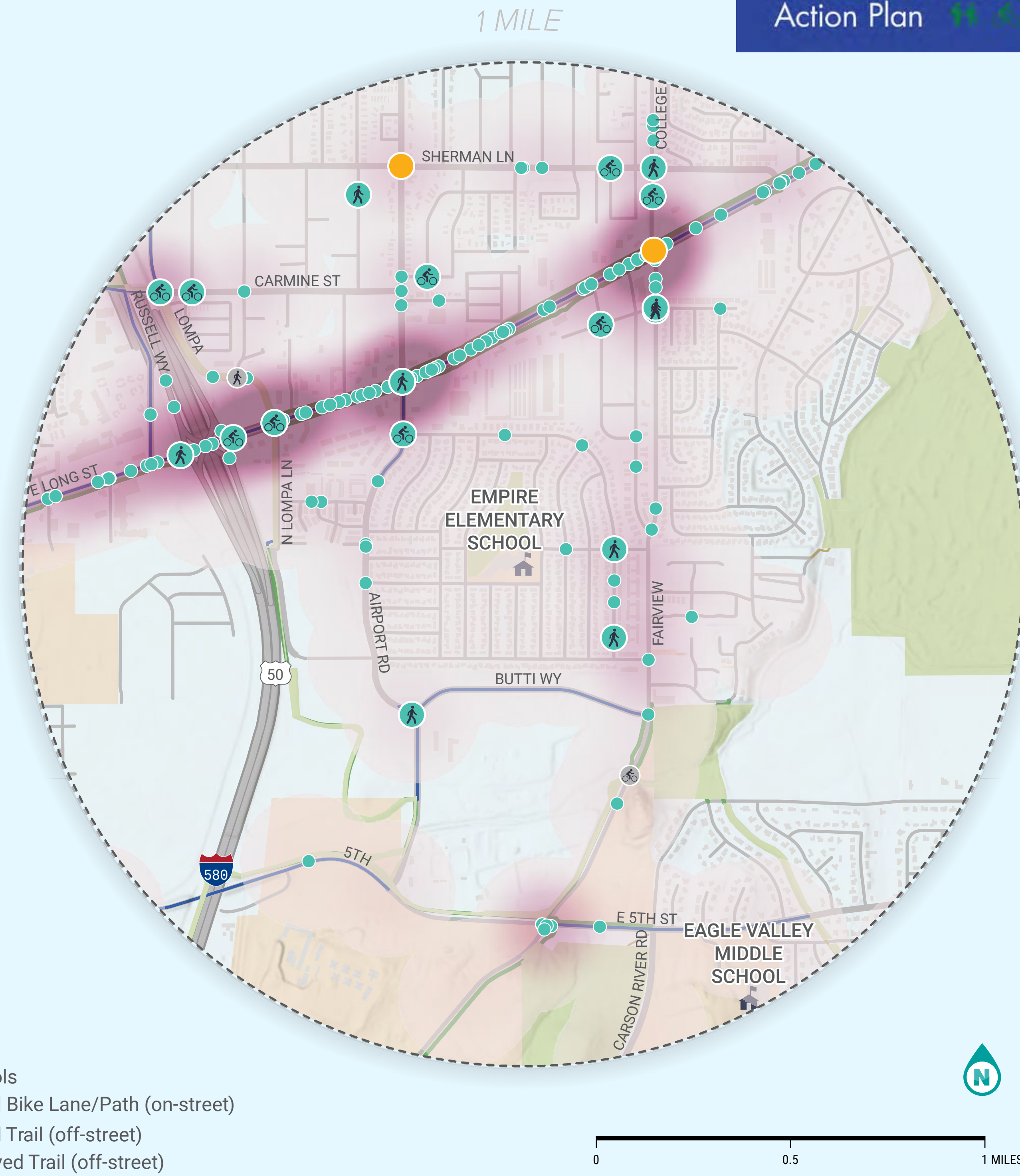
Empire Elementary School

Between 2019 and 2023, there were ***4*** fatal crashes and ***217*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal			4	4
Injury	9	10	198	217
Property Damage	1	3	504	508
Total	10	13	706	729

Crash Types (Excluding PDO Crashes)





LEGEND

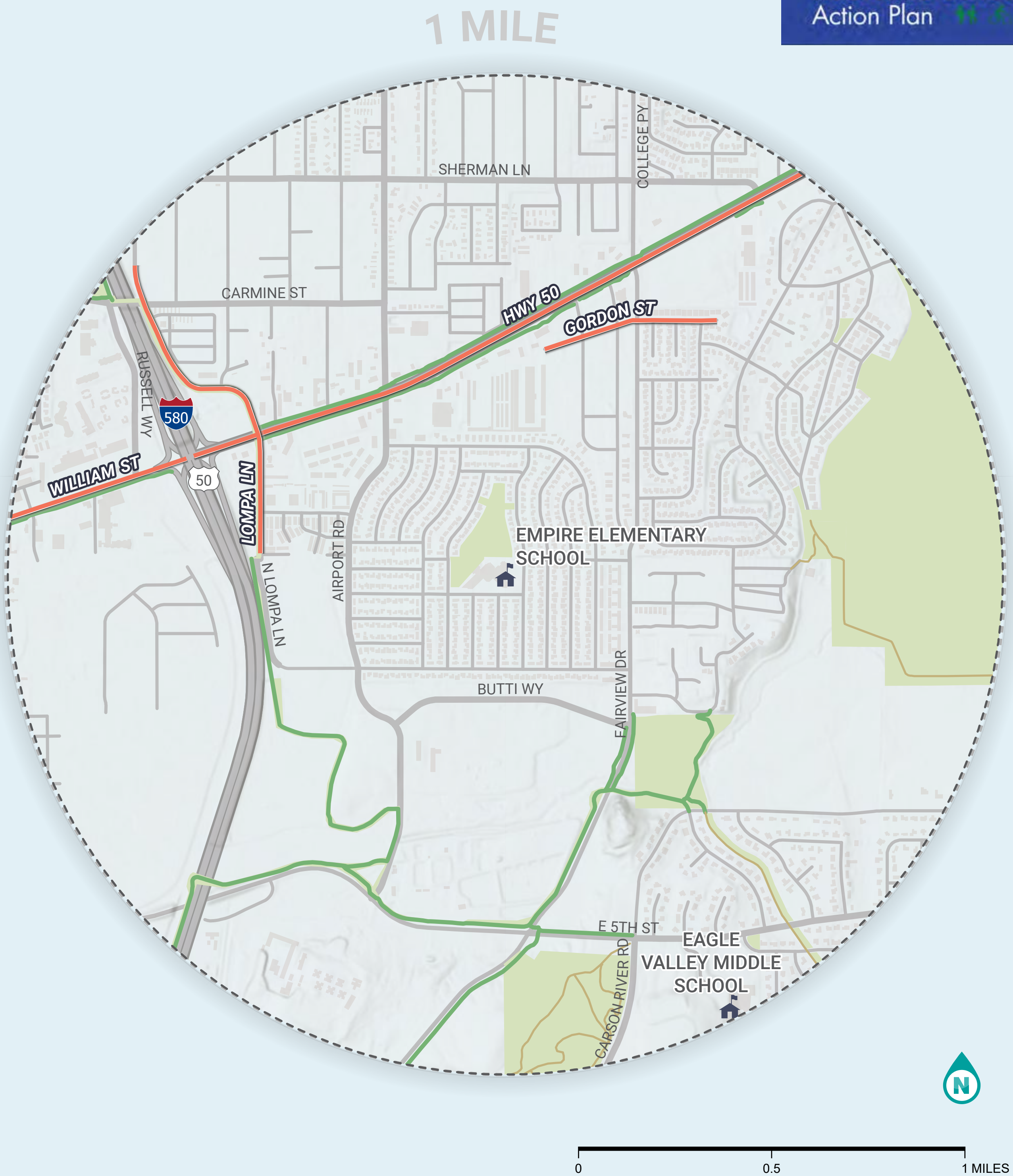
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Empire Elementary School

Carson Safe Routes to School Action Plan



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

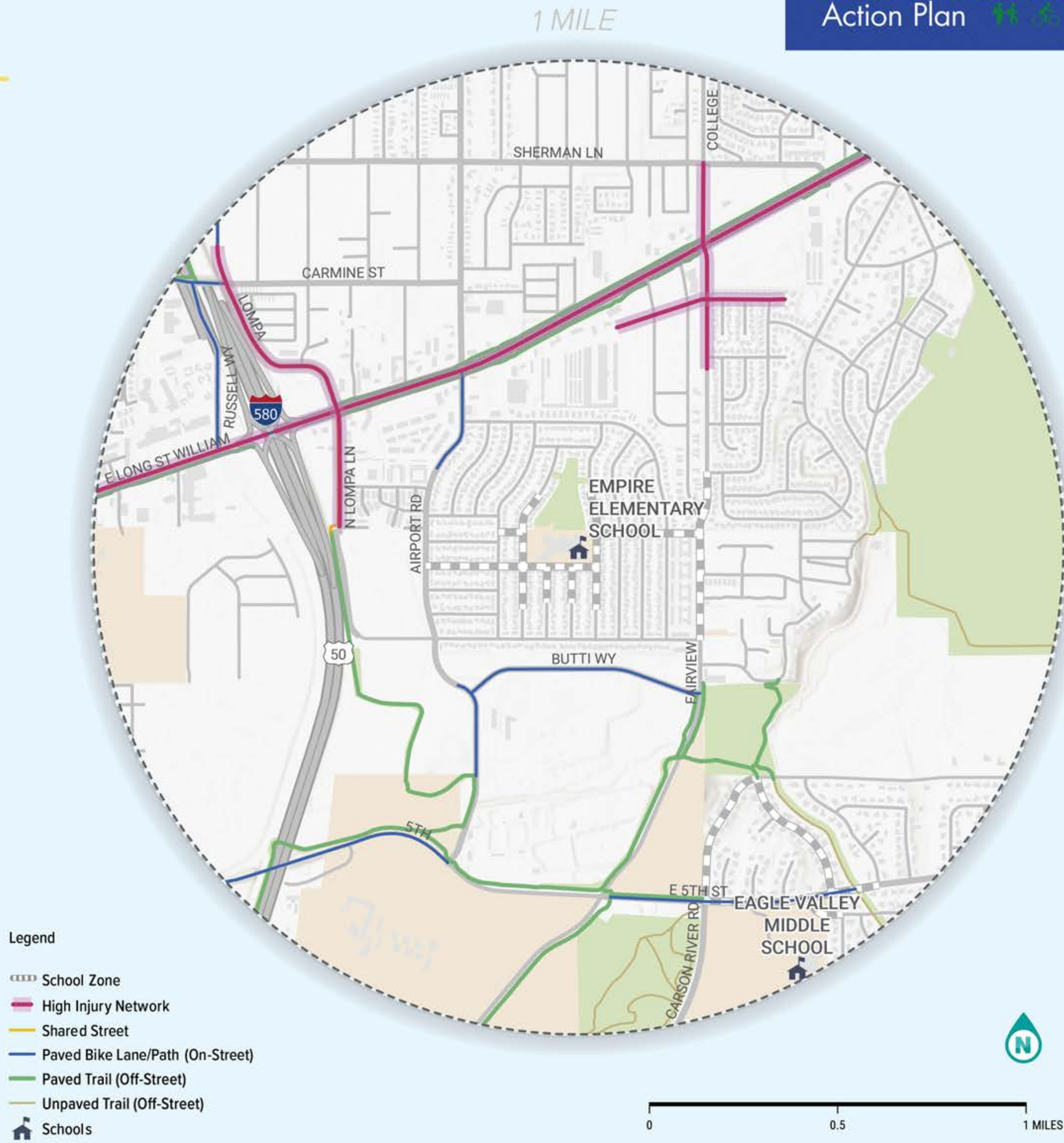
Existing Facilities

- Study Schools
- Parks
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Empire Elementary School

Within a 1-mile radius, there are ***3.2*** High Injury Network miles.

Street Name	From	To
College Pkwy	Hwy 50	Sherman Ln
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
Fairview	Sweetwater Dr	Hwy 50
Gordon St	Walker Dr	Brown St
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Brown St	College Pkwy
Hwy 50	Carter Ave	Merrimac Way
Hwy 50	Nichols Ln	East Of Airport Rd
Hwy 50	Sherman Ln	College Pkwy
Hwy 50	West Of Brown St	West Of Silver State St
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50



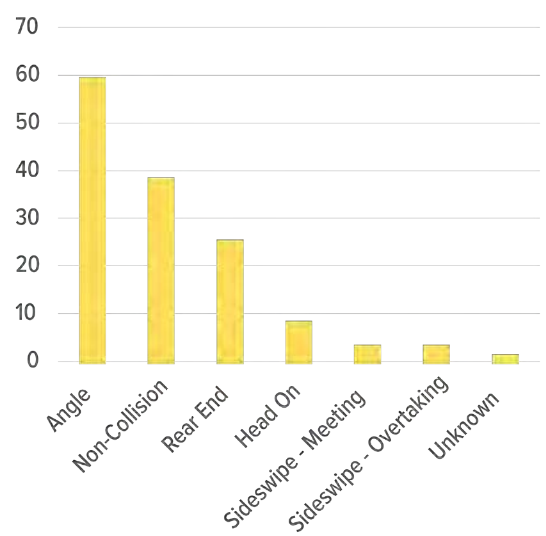
John Fremont Elementary School

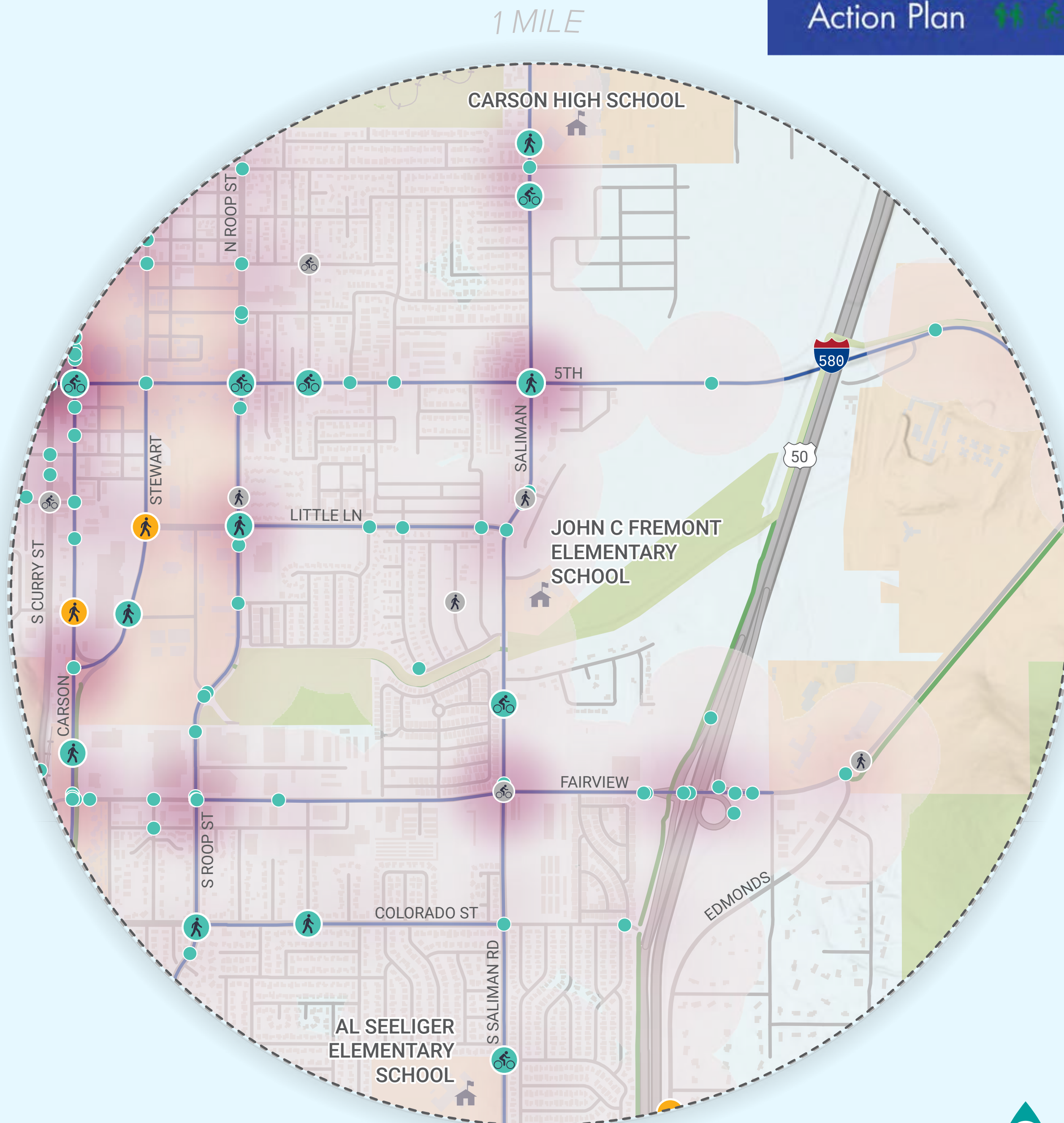
John C Fremont Elementary School

Between 2019 and 2023, there were ***2*** fatal crashes and ***135*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	2			2
Injury	9	8	118	135
Property Damage	4	3	299	306
Total	15	11	417	443

Crash Types (Excluding PDO Crashes)





LEGEND

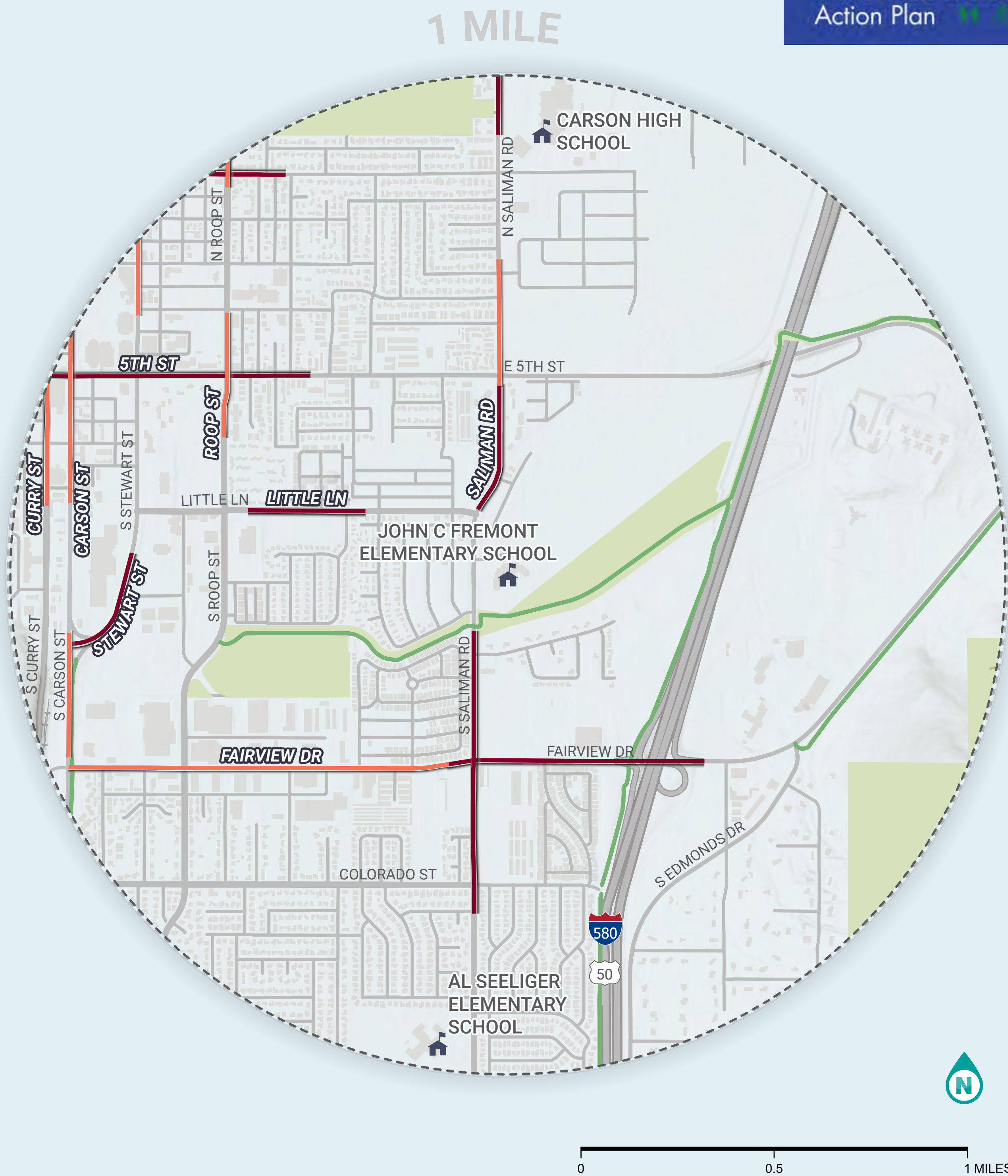
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

0 0.5 1 MILES

John C Fremont Elementary School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

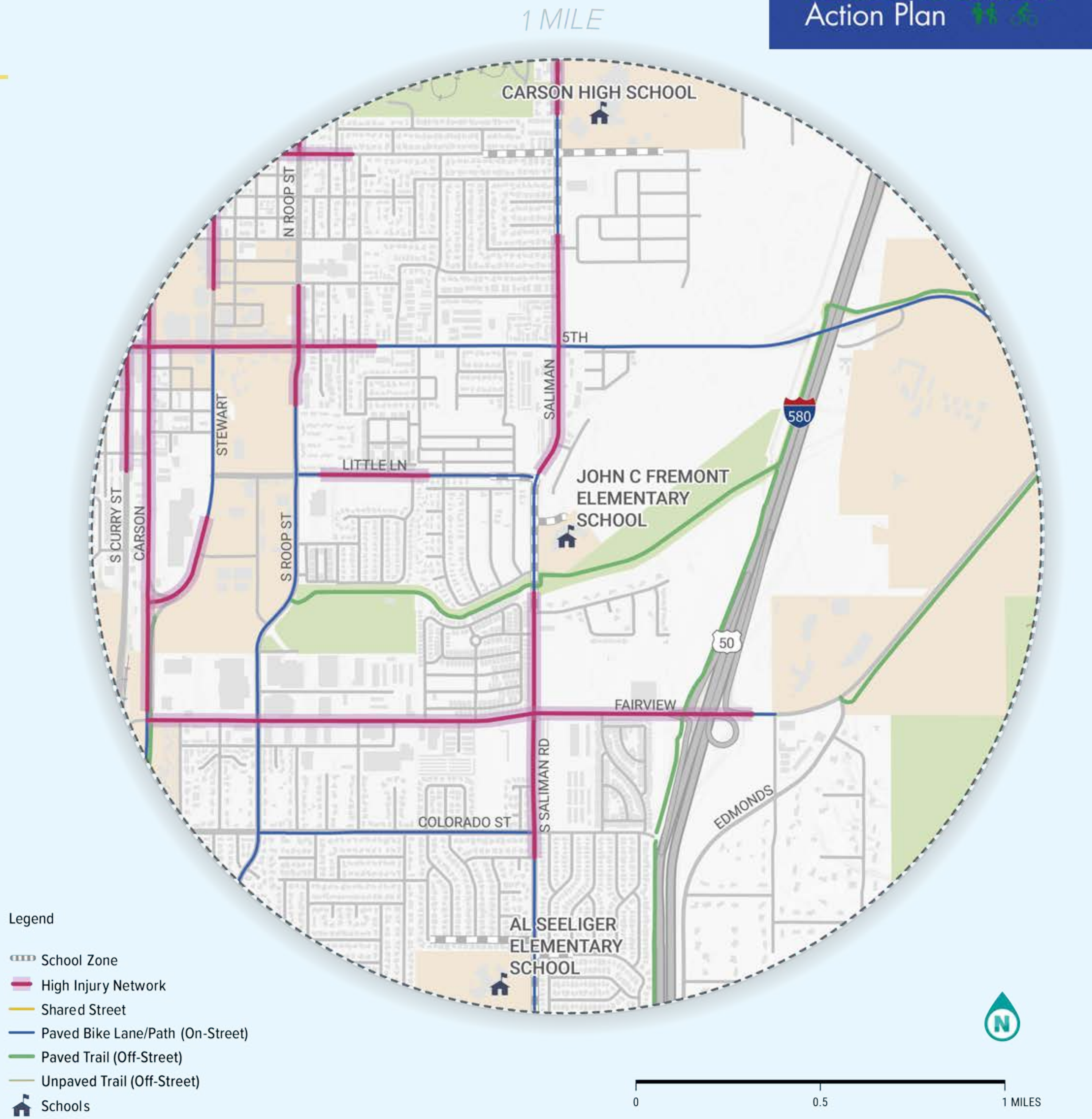
Existing Facilities

- Study Schools
- Parks
- Railway
- Paved Trail (off-street)
- Unpaved Trail (off-street)

John C Fremont Elementary School

Within a 1-mile radius, there are ***5.1*** High Injury Network miles.

Street Name	From	To
Carson St	S Stewart St	10 10th Street
E 5th St	S Roop St	S Carson St
E 5th St	S Roop St	S Stewart St
E Robinson St	N Harbin Ave	N Valley St
Fairview	Industrial Park Dr	S Roop St
Fairview	S Roop St	S Carson St
Fairview	S Saliman Rd	Industrial Park Dr
Fairview Dr	580 On-Ramp	Saliman Rd
Fairview Dr	S Saliman Rd	S Lompa Ln
Little Ln	Parkland Ave	S Roop St
N Carson St	W 10th St	W 5th St
N Carson St	W 5th St	E Musser St
N Roop St	E Robinson St	E William St
N Roop St	Little Ln	E 2nd St
S Carson St	Fairview Dr	S Stewart St
S Curry St	W 10th St	W 5th St
S Saliman Rd	Fairview Dr	Railroad Dr
Saliman Rd	Little Ln	E 5th Street
Saliman Rd	North Of E Robinson St	E William St
Saliman Rd	E 5th St	Appaloosa Ct
Saliman Rd	Heather Way	Fairview Dr
Stewart St	E 2nd St	E Spear St
Stewart St	Wright Way	S Carson St
W 5th St	S Carison St	S Division St



Mark Twain Elementary School

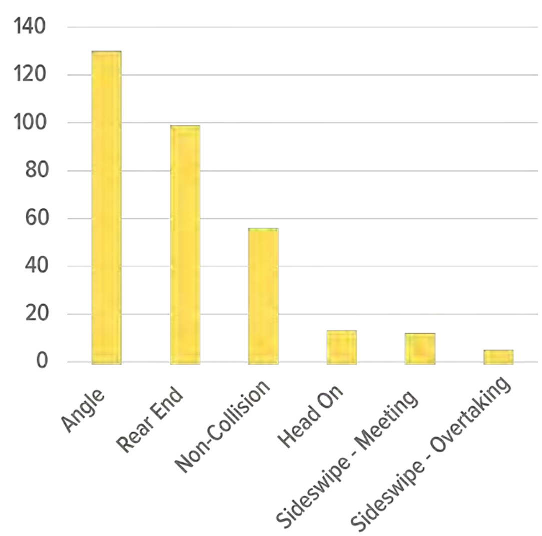
Mark Twain Elementary School

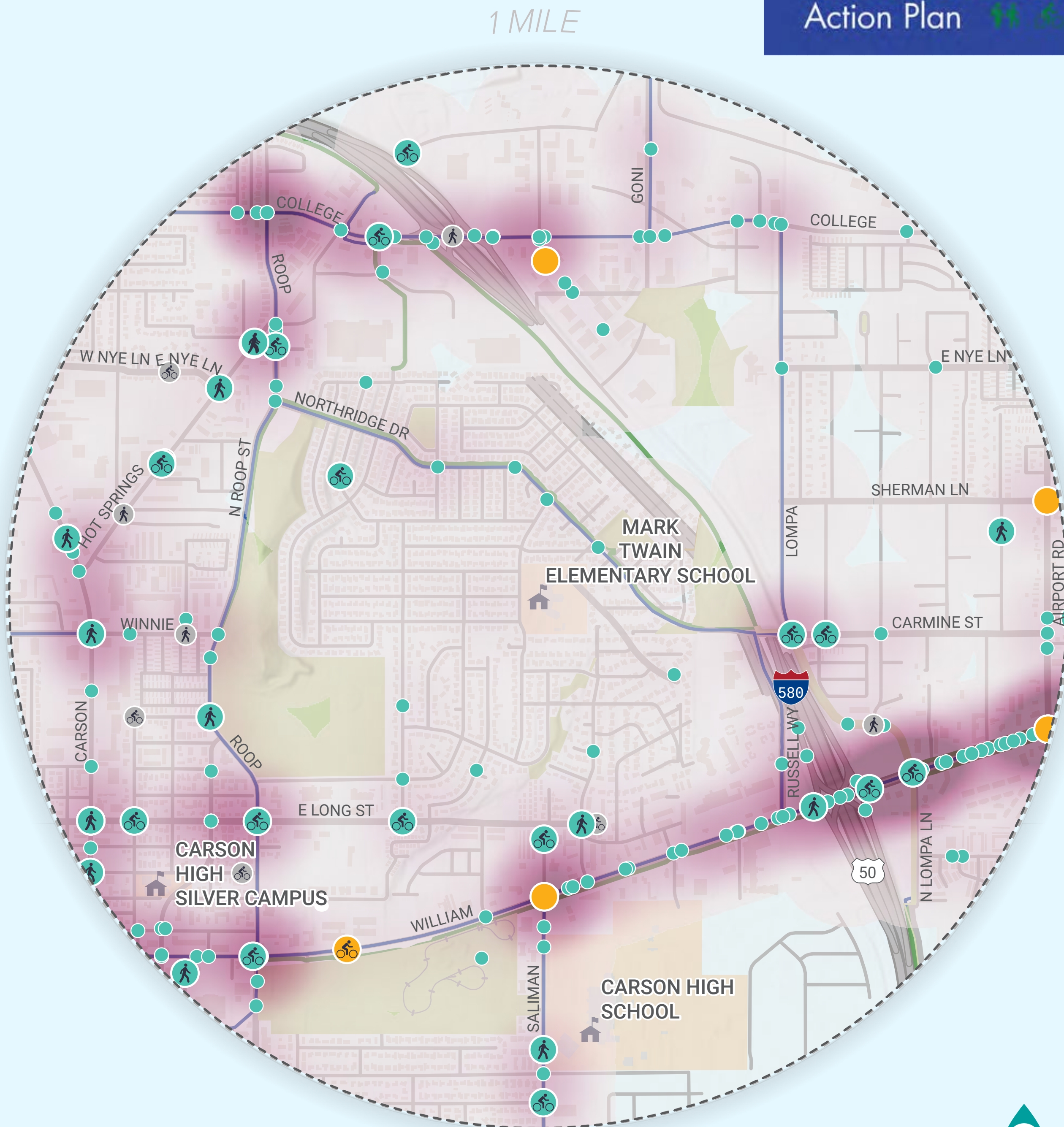
Between 2019 and 2023, there were ***5*** fatal crashes and ***304*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal		1	4	5
Injury	15	18	271	304
Property Damage	5	9	737	751
Total	20	28	1016*	1064*

*includes 4 unknown crashes

Crash Types (Excluding PDO Crashes)





LEGEND

CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

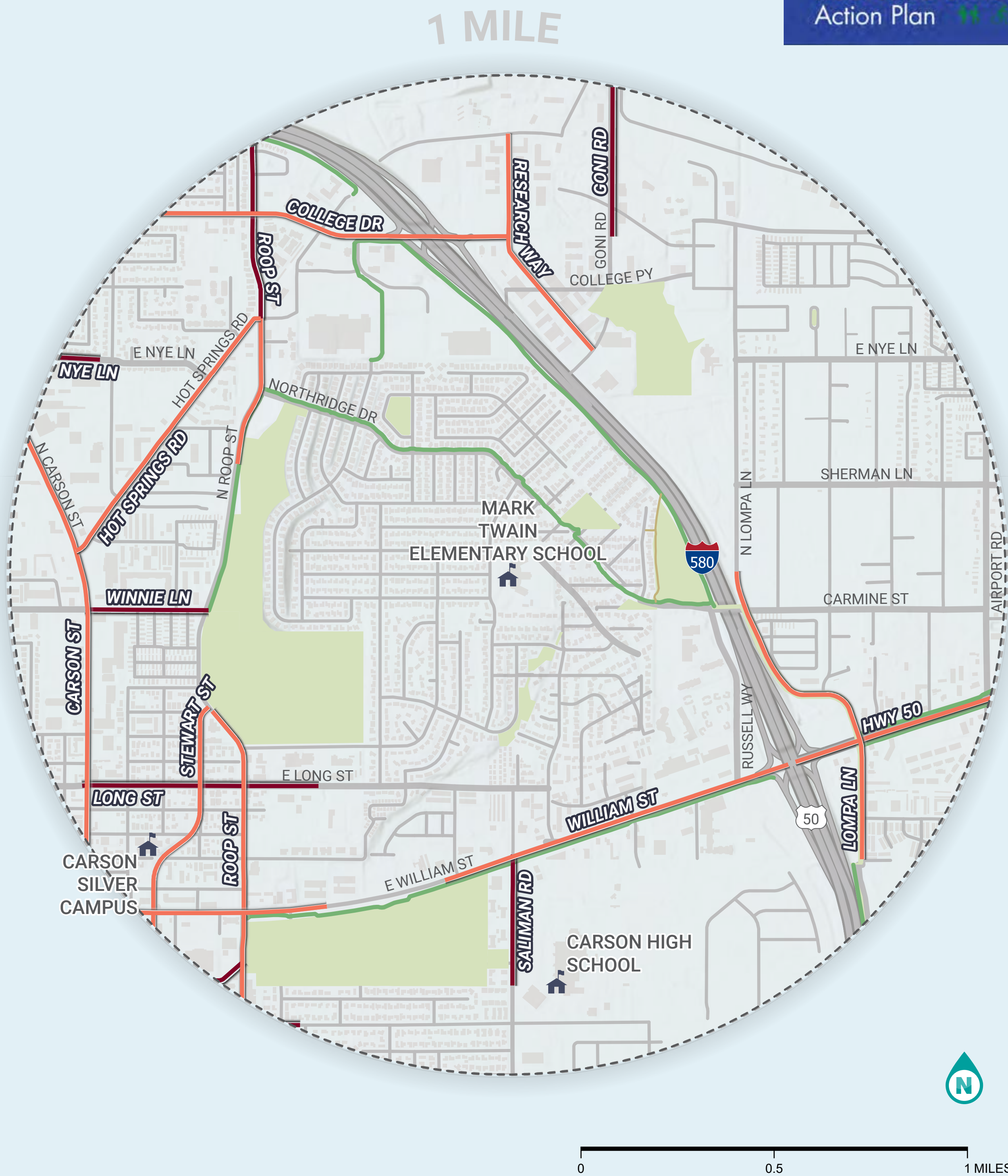
- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

0 0.5 1 MILES

N

Carson Safe Routes to School Action Plan

Mark Twain Elementary School



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

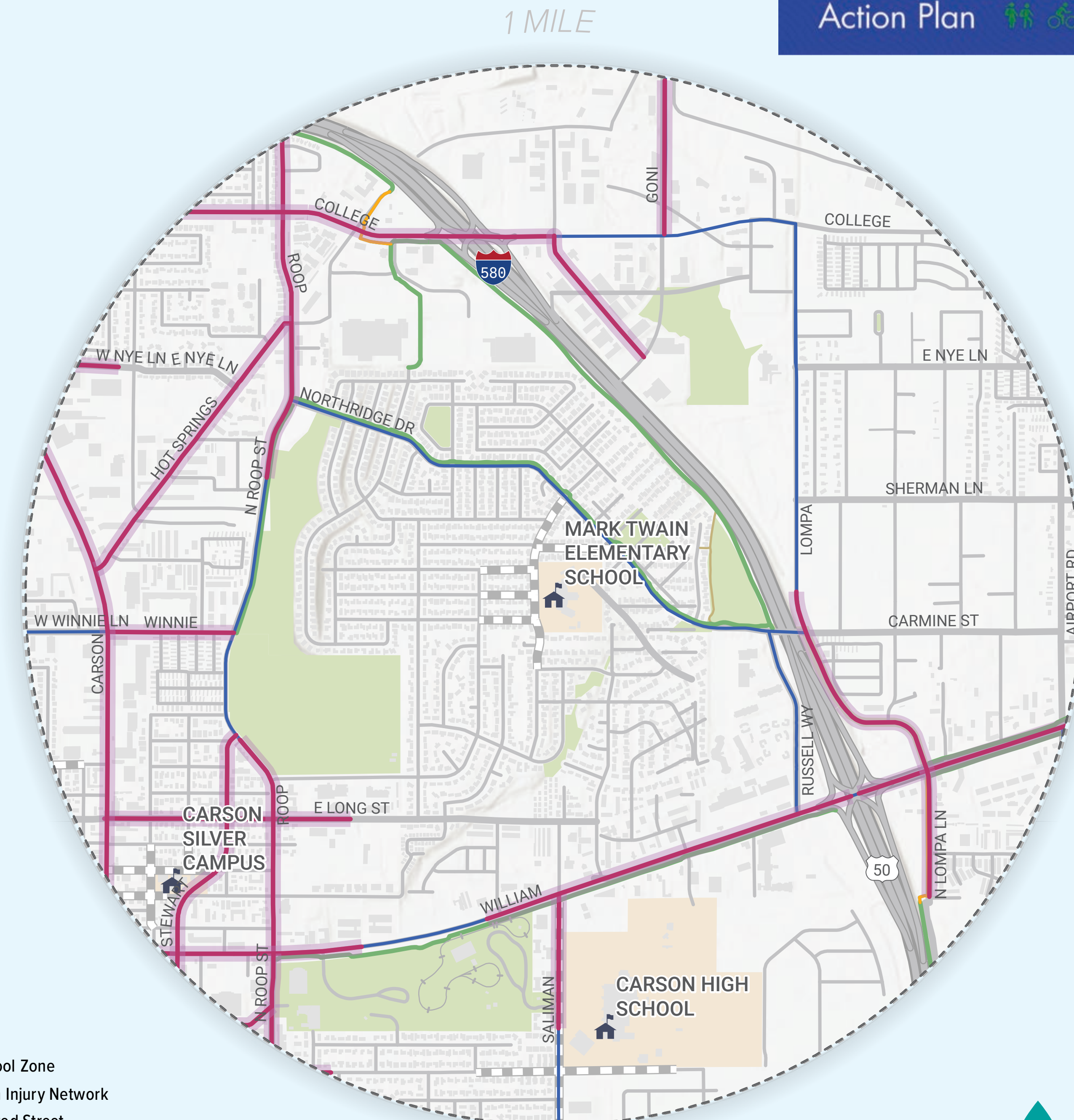
Existing Facilities

- Study Schools
- Parks
- Railway
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Mark Twain Elementary School

Within a 1-mile radius, there are ***7.7*** High Injury Network miles.

Street Name	From	To
N Carson St	E Washington St	Corbett St
N Carson St	N Of Hot Spring Rd	W Nye Ln
College Pkwy	580 Ramp	Emerson Dr
College Pkwy	Emerson Dr	Cinnabar Ave
College Pkwy	Research Way	Market St
E Long St	Marian Ave	N Stewart St
E Robinson St	N Harbin Ave	N Valley St
E Washington St	N Roop St	N Carson St
E William St	Humbolt Ln	Rand Ave
E William St	Hwy 50	Humbolt Ln
E William St	Rand Ave	State St
Emerson Dr	College Pkwy	Mark Way
Goni Rd	College Pkwy	Old Hot Spring Rd
Hot Springs Rd	E Nye Ln	N Carson St
Hot Springs Rd	N Roop St	N Of Tiger Dr
Hwy 50	580 Ramp	Nichols Ln
Hwy 50	Nichols Ln	E of Airport Rd
Imperial	E Nye Ln	W Gardengate Wy
Long St	N Carson St	N Stewart St
N Carson St	Bath St	W Winnie Ln
N Carson St	Corbett St	Bath St
N Carson St	E Winne Ln	S Of W Nye Ln
N Lompa Ln	Dori Way	S Of Sherman Ln
N Lompa Ln	Hwy 50	N Of Dori Way
N Lompa Ln	W Modoc Ct	Hwy 50
N Roop St	E Robinson St	E William St
N Roop St	E Williams St	E Adams St
N Roop St	Hot Spring Rd	College Pkwy
Research Way	College Pkwy	College Pkwy
Research Way	Goni Drive	College Pkwy
N Roop St	E Adams St	N Stewart St
N Roop St	Northridge Dr	Hot Springs Rd
Saliman	N of E Robinson St	E William St
Stewart	E Park St	N Roop St
N Stewart St	E William St	E Park St
N Stewart St	S Spear Street	E William St
W Nye Ln	Northgate Ln	N Carson St
E Williams St	N Anderson St	N Carson St
E Williams St	Oxoby Loop	N Anderson St
W Winnie Ln	N Roop St	N Carson St



Legend

- School Zone
- High Injury Network
- Shared Street
- Paved Bike Lane/Path (On-Street)
- Paved Trail (Off-Street)
- Unpaved Trail (Off-Street)
- Schools

0 0.5 1 MILES

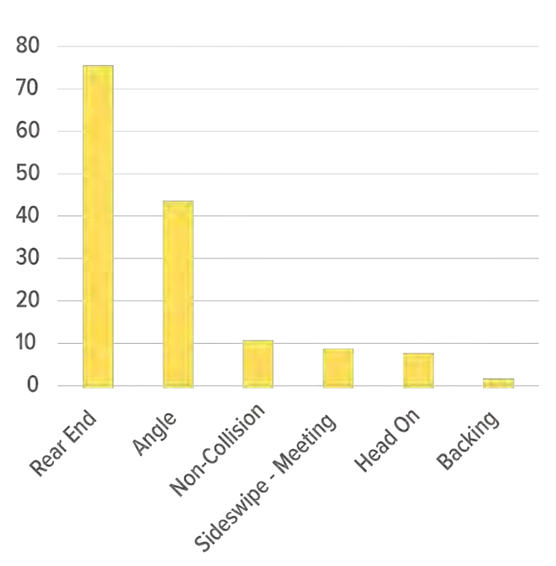
Stewart Headstart Washoe Tribe

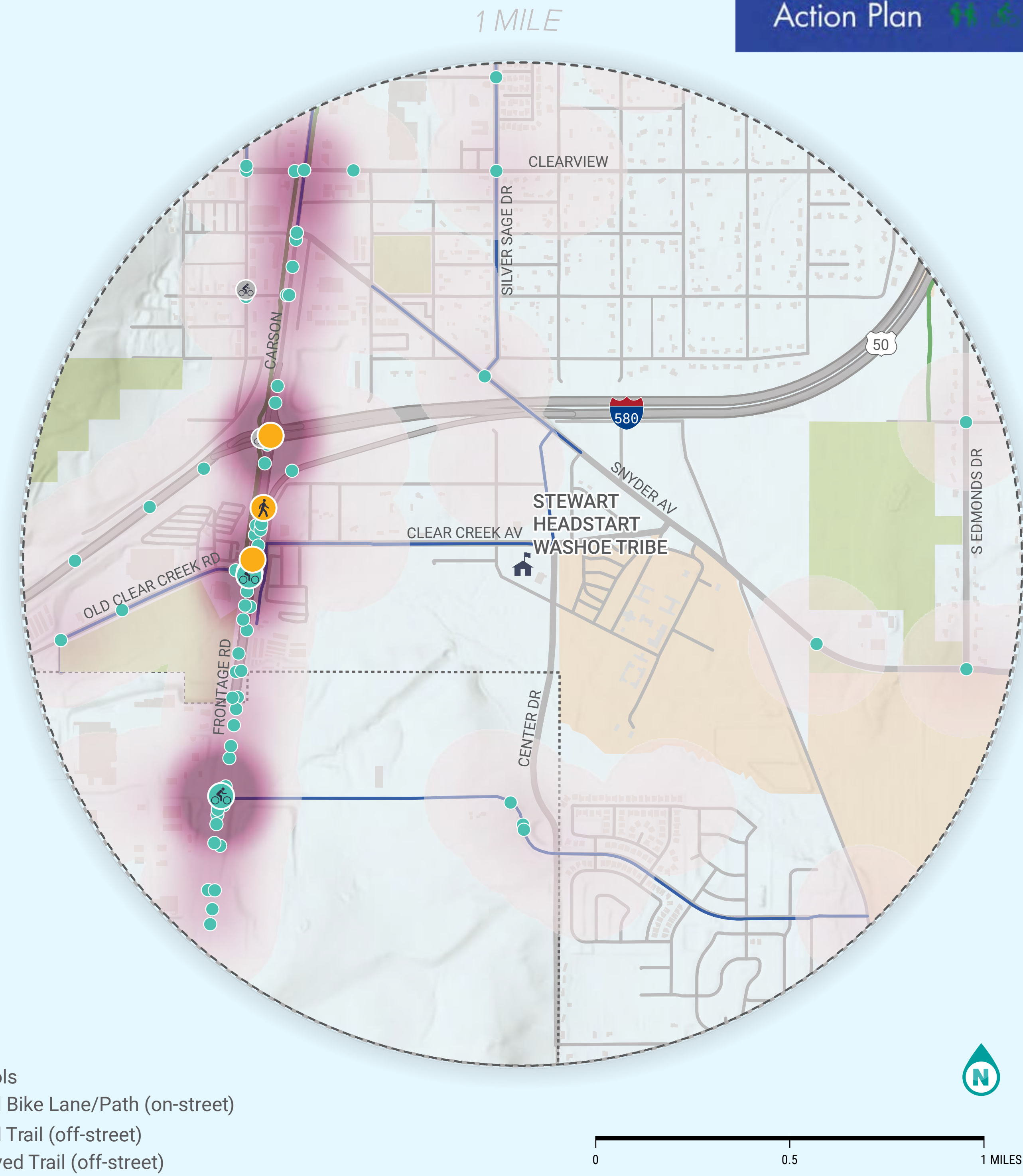
Stewart Headstart Washoe Tribe

Between 2019 and 2023, there were ***3*** fatal crashes and ***141*** injury crashes within a one-mile radius.

Severity	Pedestrians	Bicyclists	Vehicles	Total
Fatal	1		2	3
Injury		2	139	141
Property Damage		2	335	337
Total	1	4	477*	482*

*includes 1 unknown crash





LEGEND

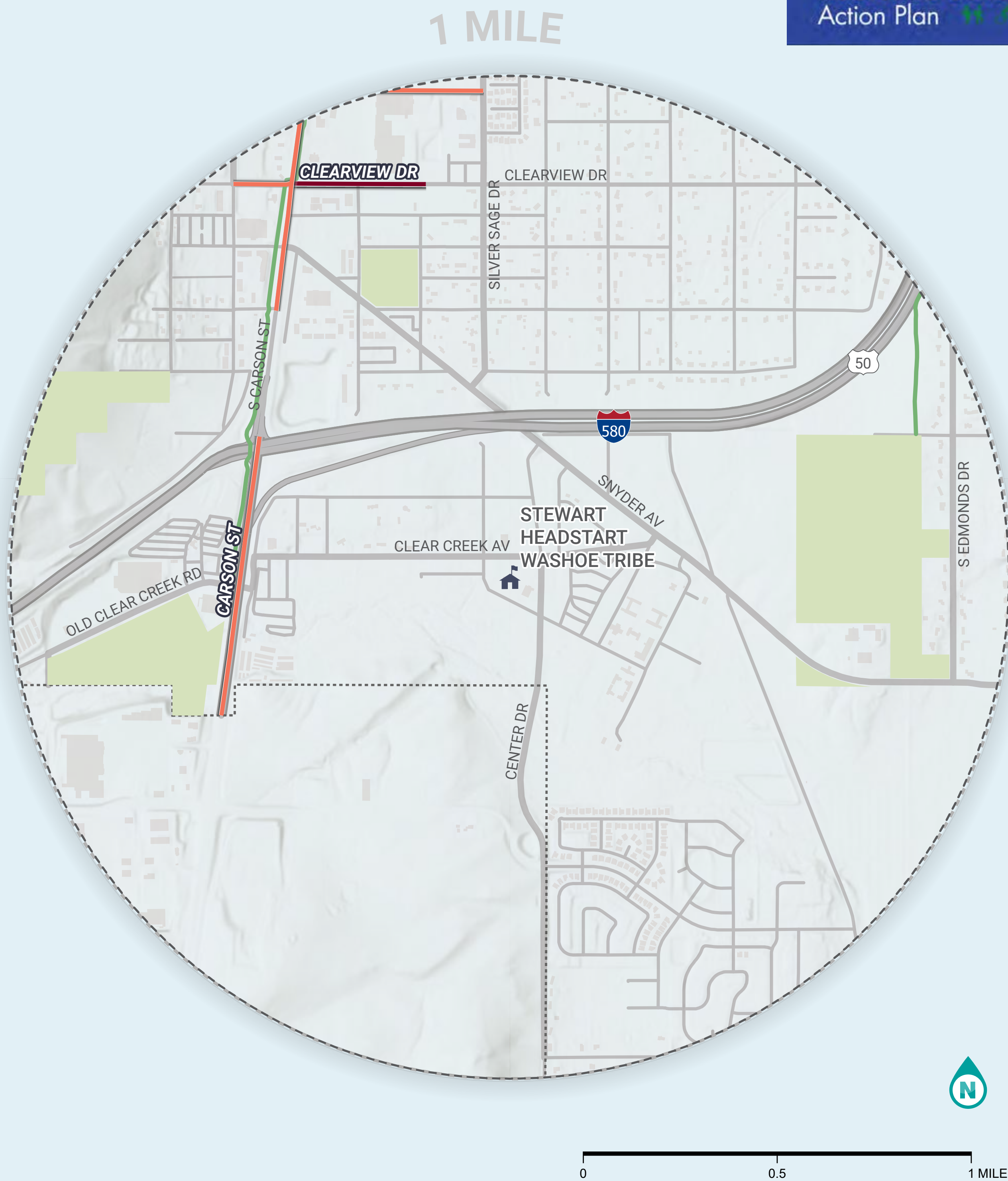
CRASH DENSITY
- Sparse
- Dense

CRASH POINTS
- Fatal
- Injury
- Property Damage Only

- Schools
- Paved Bike Lane/Path (on-street)
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Stewart Headstart Washoe Tribe

Carson Safe Routes to School Action Plan



LEGEND

Walking and Biking Barriers

- Primary Barriers
- Secondary Barriers
- Non-Barrier Roadways

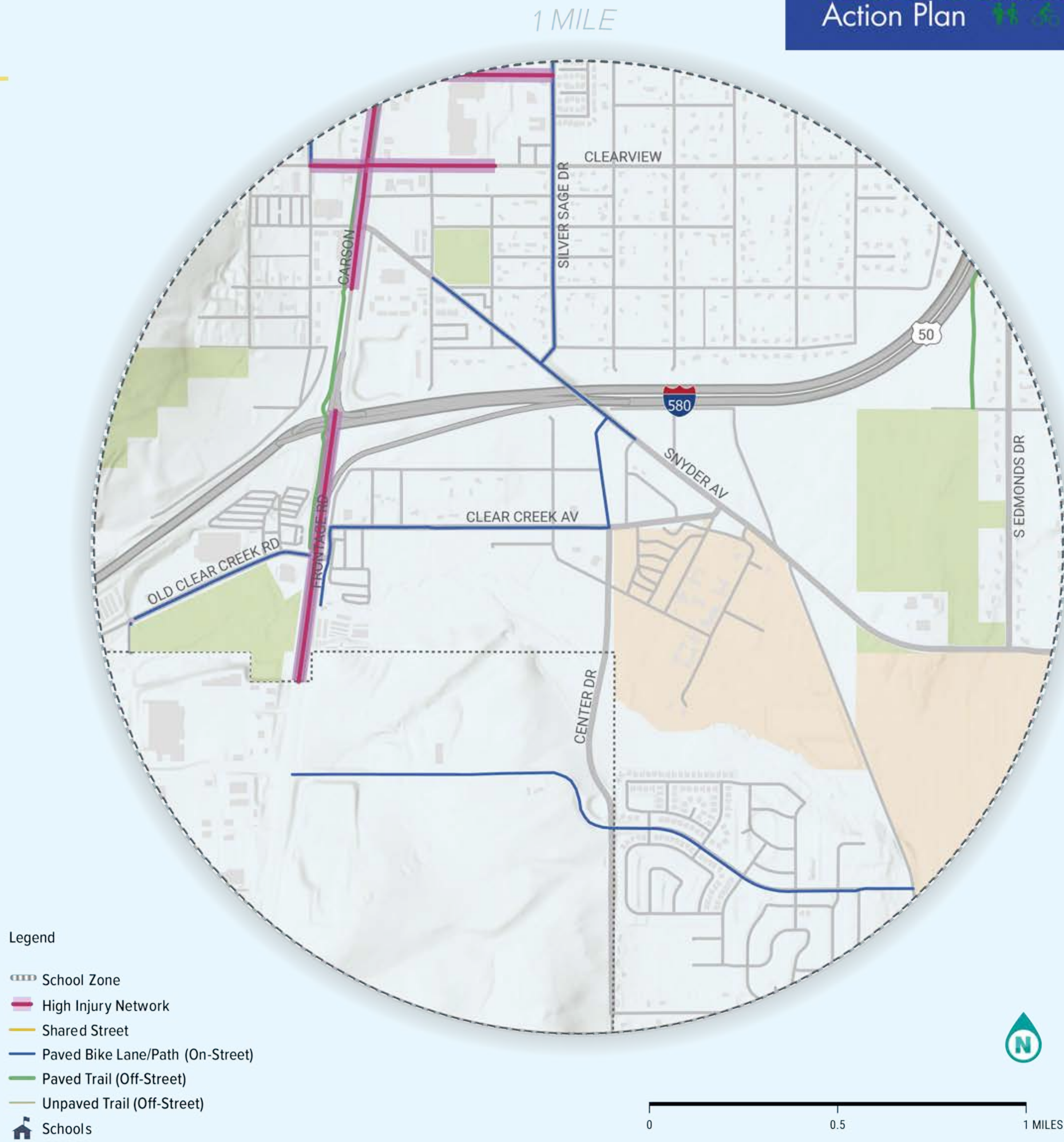
Existing Facilities

- Study Schools
- Parks
- Paved Trail (off-street)
- Unpaved Trail (off-street)

Stewart Headstart Washoe Tribe

Within a 1-mile radius, there are ***1.5*** High Injury Network miles.

Street Name	From	To
W Clearview Dr	Silver Sage Dr	S Carson St
Eagle Station Ln	Silver Sage Dr	S Carson St
S Carson St	Clearview Dr	Eagle Station Ln
S Carson St	W Appion Way	W Clearview Dr
S Carson Street	Old Clear Creek Road	Warehouse Way
S Carson Street	Route 50	Old Clear Creek Road
W Clearview Dr	S Carson St	Cochise St



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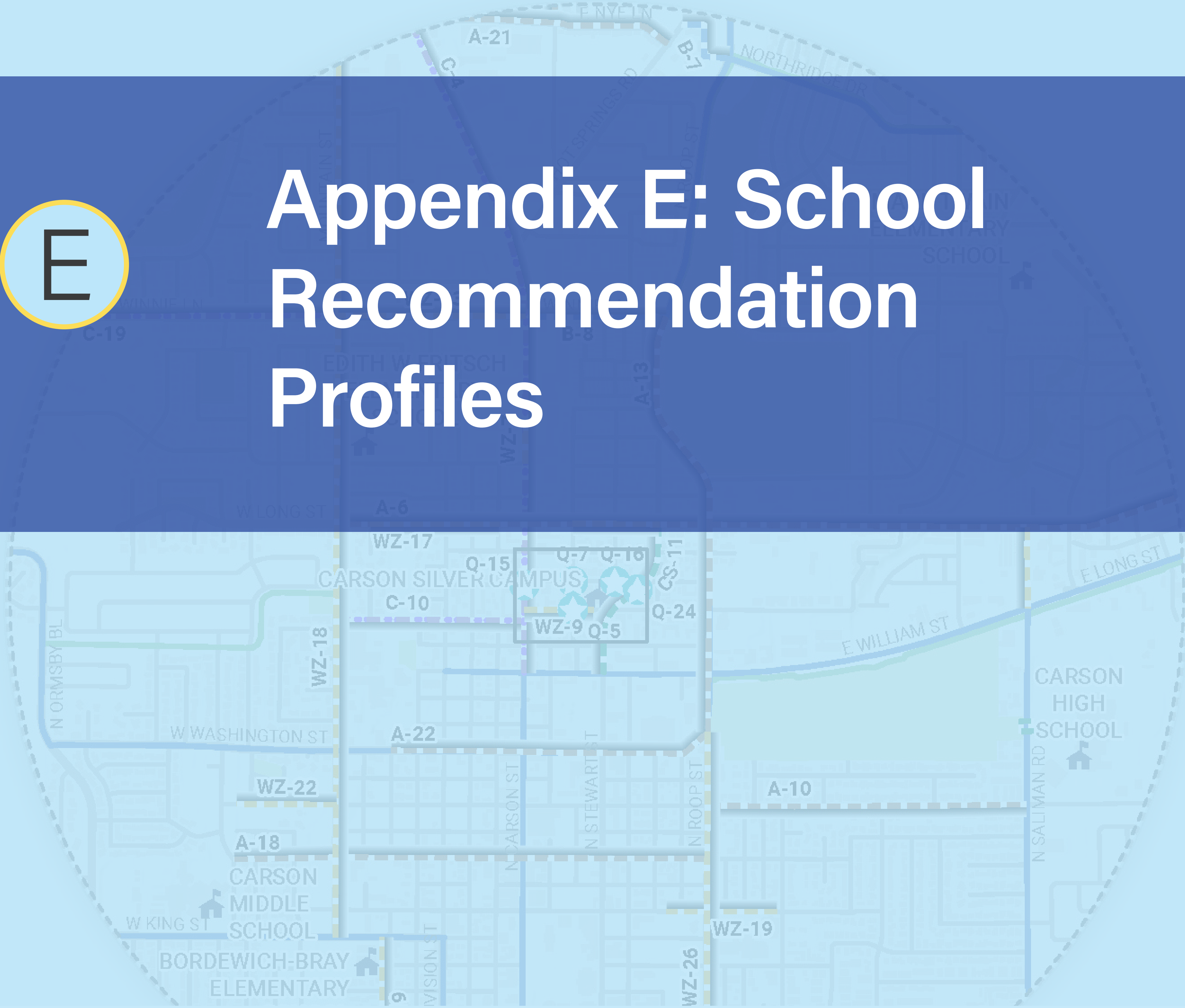
Appendix E: School Recommendation Profiles



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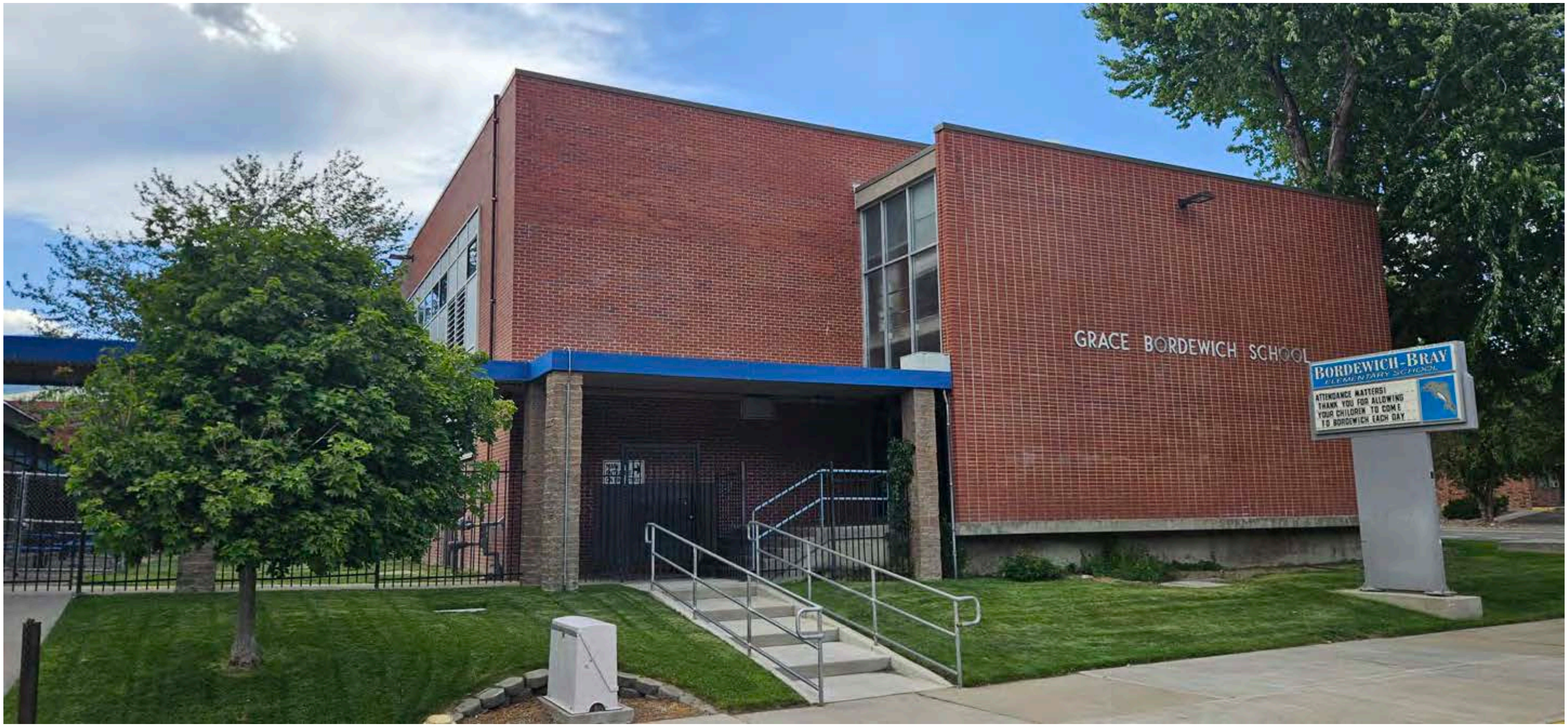
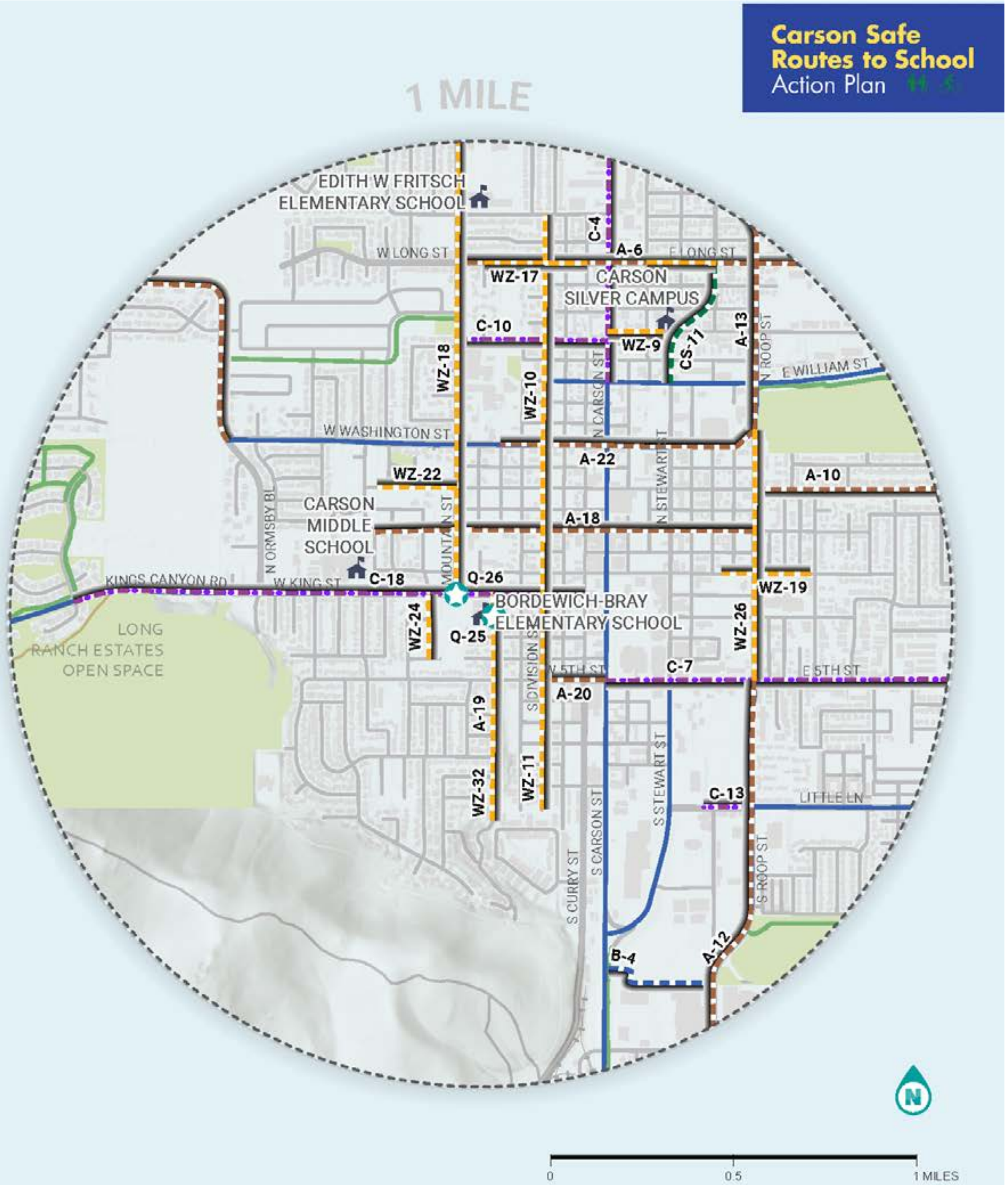
Bordewich-Bray Elementary School



Bordewich-Bray Elementary School



LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Tier 1: Quick Wins

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type
Q-25	Thompson St	W 2nd St	Install Curb Extensions	Quick Win
Q-26	W King St	Mountain St	Install Curb Extensions	Quick Win

Tier 2 Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
C-7	E. 5th Street	Saliman Road to I-580	Enhance existing sidewalks on north side	Corridor Enhancement	Short	$$
C-10	Fleischmann Way	Carson St to Mountain Street	Bulb-outs and daylighting at intersections, address sidewalks gaps, traffic calming	Corridor Enhancement	Short	$$
WZ-10	Division Street	Bath Street to W. 5th Street	A. Add Intersection crossing enhancements at minor side streets B. Enhance & upgrade existing crosswalks including Musser St, Telegraph St, and Long St C. Close Sidewalk Gaps with wide sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$$$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-17	Long Street	Curry Street to Sierra Circle & Fall Street to Stewart Street	A. Close Sidewalk Gaps (Curry St to Sierra Cir & Fall St to Stewart St) B. Crosswalks and Intersection Enhancements at Division St, Curry St, and Marian Ave	Walk Zone Connectivity Enhancement	Short	$$$$
WZ-26	Roop Street	Washington Street to E. 5th Street	A. Close Sidewalk Gap (Telegraph St to E. 5th St) B. Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
B-4	Evalyn Drive	Roop St to Carson St	Add a multi-use path connecting Linear Ditch Trail with Carson St MUP, ADA Sidewalks	Bicycle Network Enhancement	Medium	$$$
C-13	Little Lane	Roop St to 90 ft W of Oregon St	Add sidewalk on north side	Corridor Enhancement	Medium	$
C-18	W. King Street	Thames Lane to Curry Street	A. Multi-Use Path Thames Ln to Canyon Park Ct, or similar multi-modal improvement B. Add physical buffer for bike lane at CMS & BBES C. Close Sidewalk Gaps between Curry St and Ormsby Blvd D. Install intersection crossing enhancements at Tacoma	Corridor Enhancement	Long	$$$$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-11	Division Street	5th Street to southern terminus	Close Sidewalk Gaps	Walk Zone Connectivity Enhancement	Long	$$
WZ-18	Mountain Street	Nye Lane to King Street	A. Close Sidewalk Gaps & Enhance existing sidewalk where possible B. Add intersection crossing enhancements at Long St, Washington St, Telegraph St, Musser St	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-22	Robinson Street	Richmond Avenue to Mountain Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-24	S. Iris Street	4th Street to King Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-32	Thompson Street	King Street to 550 ft. S. of San Marcus Drive	A. Close sidewalk gaps on east side (King St to 5th St) B. Close sidewalk gaps on west side (5th St to San Marcus Dr) C. Create intersection crossing enhancements at existing W. 2nd St, 3rd St, and 4th St crosswalks	Walk Zone Connectivity Enhancement	Long	$$$

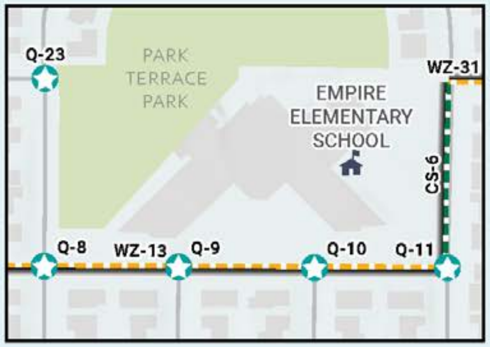
Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-6	Long Street	Mountain Street to Russell Way	A. Buffered Bike Lane from Mountain Street to Saliman Road or similar multimodal improvement B. Bike Lane from Saliman Road to Russell Way or similar multimodal improvement	Aspirational Project	$$$
A-12	Roop Street	5th Street to Fairview Street	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$
A-13	Roop Street	Winnie Lane to Washington Street	Construct protected cycle track or similar multi-modal improvement	Aspirational Project	$$$$
A-20	W. 5th Street	Division St to Carson Street	A. Bike lanes Richmond Avenue to Minnesota St or similar multimodal improvement B. Buffered Bike Lane Minnesota St to Carson St or similar multimodal improvement, C. Curb Extension at Telegraph St	Aspirational Project	$$$
A-22	Washington Street	Phillips Street to Roop Street	A. Construct Bike Lane Minnesota St to Terminus or similar multimodal improvement B. Buffered Bike Lane Philips St to Minnesota St or similar multimodal improvement	Aspirational Project	$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-9	Ormsby Boulevard / Ash Canyon Road	Longview Way to Washington Street	Construct Multi-Use Path from Washington Street to Longview Way or similar multimodal improvement	Aspirational Project	$$$
A-18	Telegraph Street	Richmond Avenue to Roop Street	Bike Boulevard consider Diverters at Mountain St, Division St, Stewart St & Roop St or similar multimodal improvement	Aspirational Project	$$$$
A-19	Thompson Street	King Street to 550 ft. S. of San Marcus Drive	Bike Boulevard or similar multimodal improvement	Aspirational Project	$$$

Empire Elementary School

Carson Safe Routes to School
Action Plan

Empire Elementary School



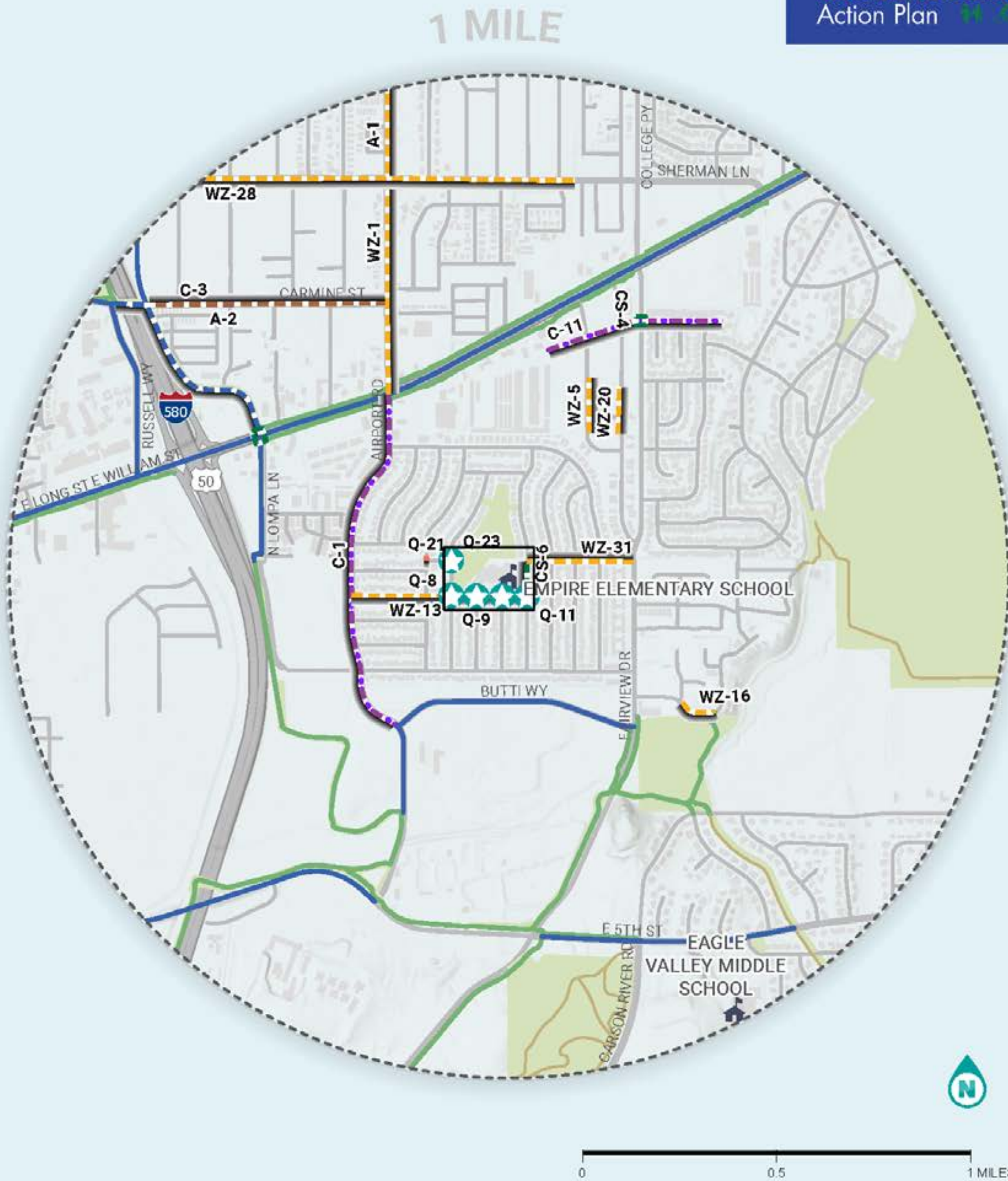
LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks



Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-8	Gordonia Dr	La Loma Dr	Upgrade to All-Way Stop Control	Quick Win
Q-9	Gordonia Dr	Cascade Dr	Install Curb Extensions	Quick Win
Q-10	Gordonia Dr	Glacier Dr	Install Curb Extensions	Quick Win
Q-11	Gordonia Dr	Monte Rosa Dr	Upgrade to All-Way Stop Control	Quick Win
Q-21	Siskiyou Drive	Stanton Drive	Install Marked Crosswalk	Quick Win
Q-23	Stanton Dr	La Loma Dr	Upgrade to All-Way Stop Control	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
B-1	Carmine St and Lompa Lane	US 50 to Russel Way	Add shared-use path	Bicycle Network Enhancement	Short	$$$
CS-5	Hwy 50	Hwy 50 at Lompa Lane	Add Median Pedestrian Refuge Island, add LPI, Add bicycle signal detection	Crossing Safety Enhancement	Short	$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
CS-6	Monte Rosa Drive	Stanton Avenue to Gordonia Avenue	Add intersection crossing enhancements to Stanton Dr & Gordonia Ave intersections, including striping to prohibit parking close to existing crosswalks	Crossing Safety Enhancement	Short	$
C-1	Airport Road	Highway 50 to E. 5th Street	A. Construct Bike Lane Butti Way to Highway 50 or similar multi-modal improvementB. Add intersection crossing enhancements at Airport Road / Douglas Drive and Airport Road / Menlo Dr	Corridor Enhancement	Medium	$$
C-3	Carmine Street	Airport Road to Lompa Lane	A. Close Sidewalk Gaps between Airport Road & Dori Way B. Intersection crossing enhancements at Dori Way, Lompa Lane, and Airport Road to reduce crossing distances and visibility issues	Corridor Enhancement	Medium	$$$$
C-11	Gordon Street	Full Extent	Address sidewalk gaps, consider curb bulb-outs, update crosswalk to high visibility, increase corner daylighting	Corridor Enhancement	Medium	$$
WZ-5	Brown Street	420 ft. N. of Reeves Street to 170 ft. S. of Reeves Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Medium	$$
WZ-20	N. Edmonds Drive	320 ft N. of Reeves to 100 ft N. Brown Street	Construct Sidewalk on west side of roadway	Walk Zone Connectivity Enhancement	Medium	$$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-28	Sherman Lane	Lompa Lane to Chanel Lane	Construct Sidewalk	Walk Zone Connectivity Enhancement	Medium	$$$$$
WZ-31	Stanton Avenue	Monte Rosa Dr to Fairview Dri	Widen existing sidewalk on south side to existing sidewalk	Walk Zone Connectivity Enhancement	Medium	$$
CS-4	Fairview Drive	Fairview Dr at Gordon St	Consider right in/right out and pedestrian activated flasher	Crossing Safety Enhancement	Long	$$
WZ-1	Airport Road	Nye Lane to Highway 50	A.Close Sidewalk Gaps B. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-13	Gordonia Avenue	Airport Road to Monte Rosa Drive	A. Widen existing sidewalks on northside of roadway B. Add center median from Monte Rosa Dr to La Loma Dr	Walk Zone Connectivity Enhancement	Long	$$
WZ-16	Lepire Drive	Snake Mountain MUP to Cassidy Court	Construct sidewalk from Snake mountain MUP to the existing sidewalk on the north side of Lepire Drive	Walk Zone Connectivity Enhancement	Long	$$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-2	Carmine Street	Airport Road to Lompa Lane	Construct Bike Boulevard or similar multimodal improvement	Aspirational Project	$$
A-1	Airport Road	Nye Lane to Highway 50	A. Construct Buffered Bike Lanes or similar multimodal improvement B. Protected intersection at Airport Road / Highway 50 or similar multimodal improvement	Aspirational Project	$$$$$

John Fremont Elementary School

John C Fremont Elementary School

LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Tier 1: Quick Wins

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type
Q-17	Saliman Rd	Mid-Block Crossing (South Lot Exit)	Add pedestrian refuge and R1-5 signs at yield teeth	Quick Win

Tier 2 Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
C-7	E. 5th Street	Saliman Road to I-580	Enhance existing sidewalks on north side	Corridor Enhancement	Short	$$$$
WZ-26	Saliman Road	Fairview Drive to Koontz Lane	A. Intersection Crossing Enhancements at Sonoma St B. RRFB at Damon Rd crosswalk C. Sidewalk Eastside Colorado to Fairview Dr D. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-27	Saliman Road	E. 5th Street to Fairview Drive	Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
B-4	Evalyn Drive	Roop St to Carson St	Add a multi-use path connecting Linear Ditch Trail with Carson St MUP, ADA Sidewalks	Bicycle Network Enhancement	Medium	$$$
C-13	Little Lane	Roop St to 90 ft W of Oregon St	Add sidewalk on north side	Corridor Enhancement	Medium	$

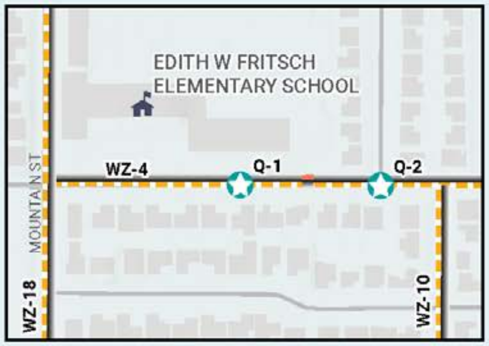
Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
CS-7	Roop Street	Fairview Drive to Sonoma Avenue	Add intersection crossing enhancements at minor side-street approaches south of Fairview Drive	Crossing Safety Enhancement	Medium	$$
WZ-21	Reavis Lane to Evalyn Dr (New Path)	Create Pedestrian Connection to Multi-Use Path	Construct Multi-Use Bridge between existing Multi-Use Trail and sidewalk on southside of Reavis Lane	Walk Zone Connectivity Enhancement	Medium	$$
CS-3	Fairview Drive	Kansas St to Kansas St	Consider installing pedestrian activated flasher to increase pedestrian crossing opportunities	Crossing Safety Enhancement	Long	$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-5	Fairview Drive	Edmonds Drive to Saliman Road	Construct Protected Cycle Track / Multi-Use Path or similar multimodal improvement	Aspirational Project	$$$
A-10	Robinson Street	Roop Street to Saliman Road	Construct Bike Lanes or similar multimodal improvement	Aspirational Project	$
A-12	Roop Street	5th Street to Fairview Street	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$
A-15	Saliman Road	E. 5th Street to Fairview Drive	Upgrade Bike Lane to Cycle Track with Protected Intersection at Fairview Drive or similar multimodal improvement	Aspirational Project	$$$$
A-14	Roop Street / Silver Sage Drive	5th Street to Sonoma Avenue	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-16	Saliman Road	Fairview Drive to Koontz Lane	Buffered Bike Lane with potential lane reduction or similar multimodal improvement	Aspirational Project	$$

Edith Fritsch Elementary School

Edith W Fritsch Elementary School



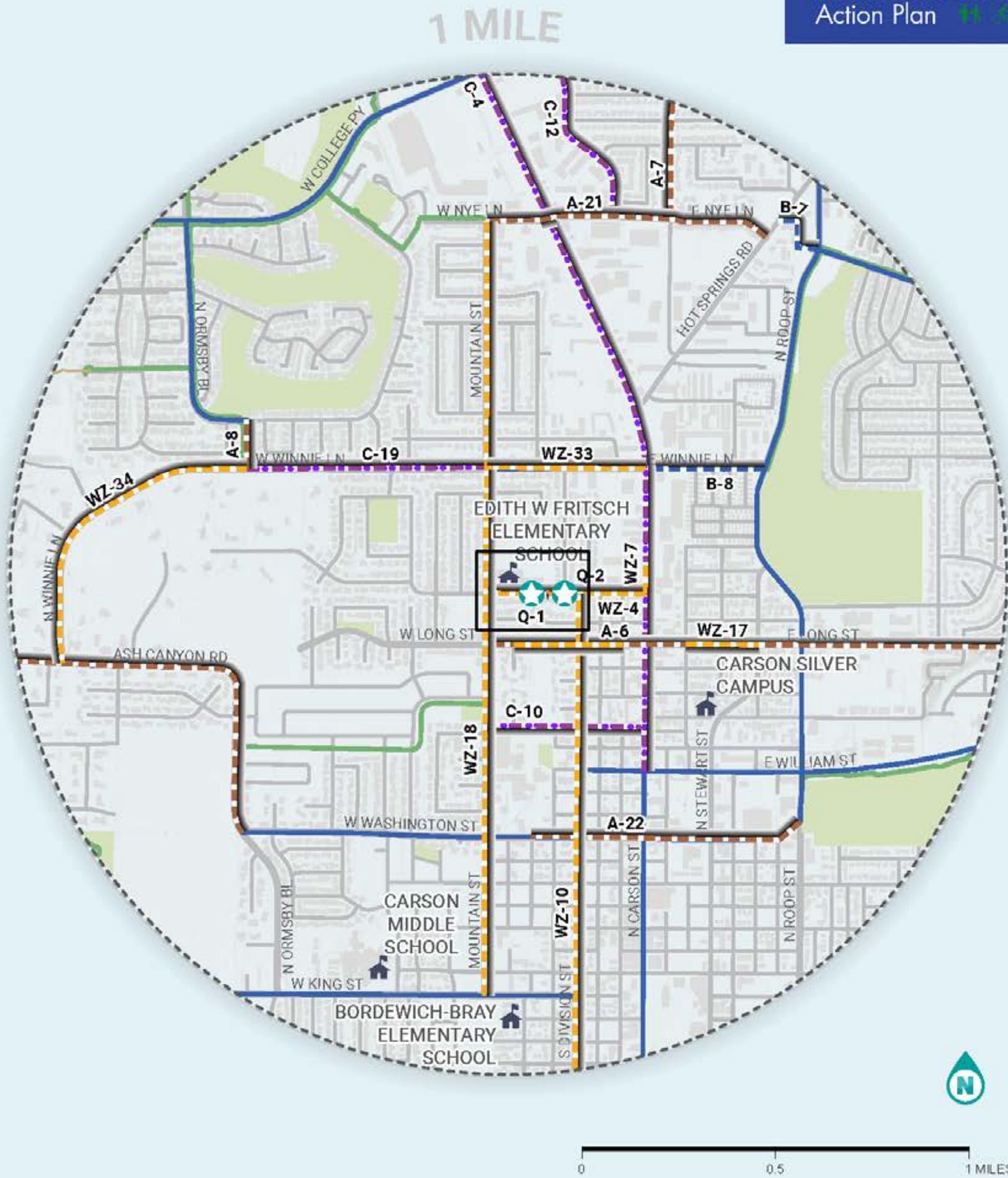
LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway



Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-1	Bath St	Mid-Block Crossing	Install Curb Extensions	Quick Win
Q-2	Bath St	Division St	Install Curb Extensions	Quick Win
Q-3	Bath St	At Fritsch ES Parent Exit	Extend existing red curb by 20 feet to the east	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
B-8	Winnie Lane	Carson Street to Roop Street	Construct Buffered Bike Lanes from Carson Street to Roop Street or similar multi-modal improvement	Bicycle Network Enhancement	Short	$$
C-10	Fleischmann Way	Carson St to Mountain Street	Bulb-outs and daylighting at intersections, address sidewalks gaps, traffic calming	Corridor Enhancement	Short	$$
WZ-10	Division Street	Bath Street to W. 5th Street	A. Add Intersection crossing enhancements at minor side streets B. Enhance & upgrade existing crosswalks including Musser St, Telegraph St, and Long St C. Close Sidewalk Gaps with wide sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$$$
WZ-17	Long Street	Curry Street to Sierra Circle & Fall Street to Stewart Street	A. Close Sidewalk Gaps (Curry St to Sierra Cir & Fall St to Stewart St) B. Crosswalks and Intersection Enhancements at Division St, Curry St, and Marian Ave	Walk Zone Connectivity Enhancement	Short	$$$$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
C-4	Carson Street	Medical Parkway to Williams Street	Add multi-use path, enhance crosswalks with activated flashers, include landscaped buffer	Corridor Enhancement	Medium	$$$$$
C-12	Imperial Way	Nye Ln to Silver Oak Dr	Add bulb-outs and traffic calming	Corridor Enhancement	Medium	$$
C-19	Winnie Lane	Ormsby Blvd to Mountain Street	A. Add bike lanes Mountain St to Ormsby Blvd B. Add wayfinding signage at Victoria Ave	Corridor Enhancement	Medium	$$
WZ-34	Winnie Lane	Ash Canyon to Ormsby Blvd	Extend Multi-Use path on north side to Ash Canyon	Walk Zone Connectivity Enhancement	Medium	$$
B-7	Roop St to Hot Springs Road (New Path)	Hot Springs Road to Roop Street	Path connection to link with Nye Ln	Bicycle Network Enhancement	Long	$$
CS-2	Carson Street	Nye Lane	Construct RRFB add associated crossing enhancements or alternatively a traffic signal	Crossing Safety Enhancement	Long	$$
WZ-4	Bath Street	Mountain Street to Carson Street	A. Close Sidewalk Gap between Curry & Mountain St B. Add intersection crossing enhancement at mid-block crosswalk & Division St crosswalks C. Add missing & damaged ADA Ramps D. Repair and enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$
WZ-7	Carson Street	Bath Street to 420 ft. N. of Bath Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-18	Mountain Street	Nye Lane to King Street	A. Close Sidewalk Gaps & Enhance existing sidewalk where possible B. Add intersection crossing enhancements at Long St, Washington St, Telegraph St, Musser St	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-33	Winnie Lane	Mountain Street to Ormsby Blvd	Enhance existing sidewalks where possible	Walk Zone Connectivity Enhancement	Long	$$

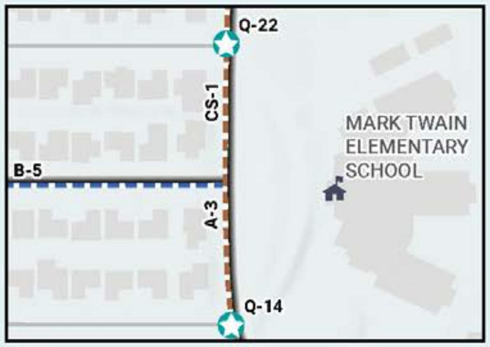
Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-6	Long Street	Mountain Street to Russell Way	A. Buffered Bike Lane from Mountain Street to Saliman Road or similar multimodal improvement B. Bike Lane from Saliman Road to Russell Way or similar multimodal improvement	Aspirational Project	$$$
A-21	W. Nye Lane	Hot Springs Road to Mountain Street	A. Construct Bike Boulevard or similar multimodal improvement B. Intersection Bulb-Outs C. Median Islands D. Speed Cushions	Aspirational Project	$$
A-22	Washington Street	Phillips Street to Roop Street	A. Construct Bike Lane Minnesota St to Terminus or similar multimodal improvement B. Buffered Bike Lane Philips St to Minnesota St or similar multimodal improvement	Aspirational Project	$

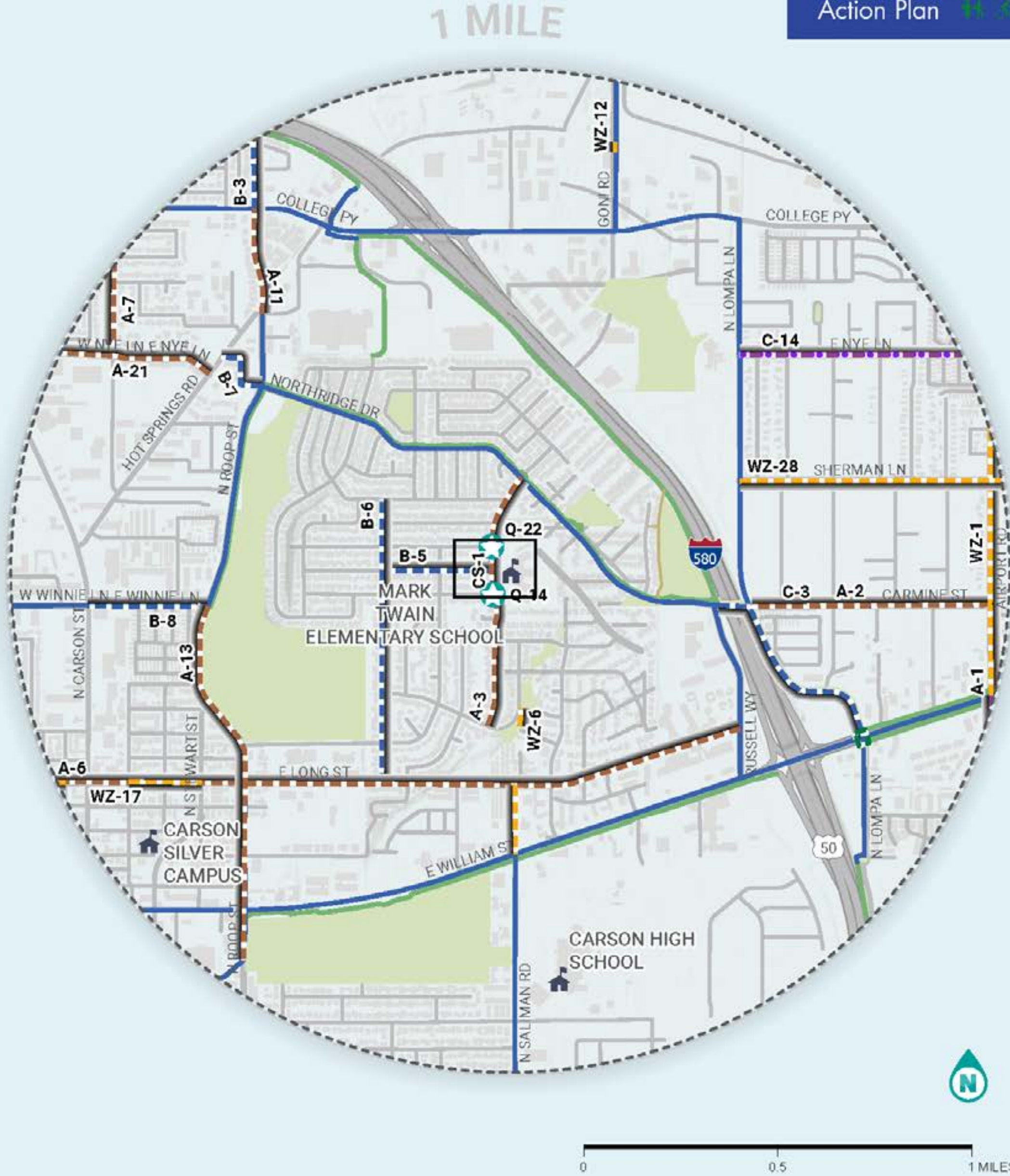
Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-7	Northgate Lane	Arrowhead Drive to Nye Lane	Construct Protected Cycle Track or similar multimodal improvement	Aspirational Project	$$
A-8	Ormsby Boulevard	Oak Ridge Drive to Winnie Lane	Construct Bike Lanes or similar multimodal improvement	Aspirational Project	$
A-9	Ormsby Boulevard / Ash Canyon Road	Longview Way to Washington Street	Construct Multi-Use Path from Washington Street to Longview Way or similar multimodal improvement	Aspirational Project	$$$

Mark Twain Elementary School

Carson Safe Routes to School
Action Plan

Mark Twain Elementary School





LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-14	Mountain Park Dr	Carriage Crest Dr	Add S1-1, Add Curb Extensions	Quick Win
Q-22	Slide Mountain Dr	Carriage Crest Drive	Add S1-1s for NB and SB, add Curb Extensions	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
B-1	Carmine St and Lompa Lane	US 50 to Russel Way	Add shared-use path	Bicycle Network Enhancement	Short	$$$
B-3	Emerson Drive	College Parkway to Mark Way	Add bike lanes with bulb-outs at key intersections	Bicycle Network Enhancement	Short	$
B-5	Lindsay Lane	Carriage Crest Dr to Marian Ave	Neighborhood Byway - corner bulb-outs, wayfinding, hardened centerlines	Bicycle Network Enhancement	Short	$$
B-6	Marian Ave	Long St to Rolling Hills Dr	Neighborhood Byway - Add traffic calming, hardened centerlines, speed humps, corner bulb-outs	Bicycle Network Enhancement	Short	$$
B-8	Winnie Lane	Carson Street to Roop Street	Construct Buffered Bike Lanes from Carson Street to Roop Street or similar multi-modal improvement	Bicycle Network Enhancement	Short	$$
CS-5	Hwy 50	Hwy 50 at Lompa Lane	Add Median Pedestrian Refuge Island, add LPI, Add bicycle signal detection	Crossing Safety Enhancement	Short	$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-17	Long Street	Curry Street to Sierra Circle & Fall Street to Stewart Street	A. Close Sidewalk Gaps (Curry St to Sierra Cir & Fall St to Stewart St) B. Crosswalks and Intersection Enhancements at Division St, Curry St, and Marian Ave	Walk Zone Connectivity Enhancement	Short	$$$$
WZ-25	Saliman Rd	US 50 to Long St	Add buffers to bike lane, Consolidate southbound lanes, add curb extensions at Long St and US 50	Walk Zone Connectivity Enhancement	Short	$
C-1	Airport Road	Highway 50 to E. 5th Street	A. Construct Bike Lane Butti Way to Highway 50 or similar multi-modal improvementB. Add intersection crossing enhancements at Airport Road / Douglas Drive and Airport Road / Menlo Dr	Corridor Enhancement	Medium	$$
C-3	Carmine Street	Airport Road to Lompa Lane	A. Close Sidewalk Gaps between Airport Road & Dori Way B. Intersection crossing enhancements at Dori Way, Lompa Lane, and Airport Road to reduce crossing distances and visibility issues	Corridor Enhancement	Medium	$$$$
CS-1	Carriage Crest Drive	Slide Mountain Drive to Mountain Park Drive	A. Add intersection crossing enhancements at Mountain Park Dr & Slide Mountain Dr intersections B. Add center median from 70' south of Slide Mountain Dr to Drop-Off Loop entrance C. Consider parking restrictions or removal on eastside	Crossing Safety Enhancement	Medium	$$

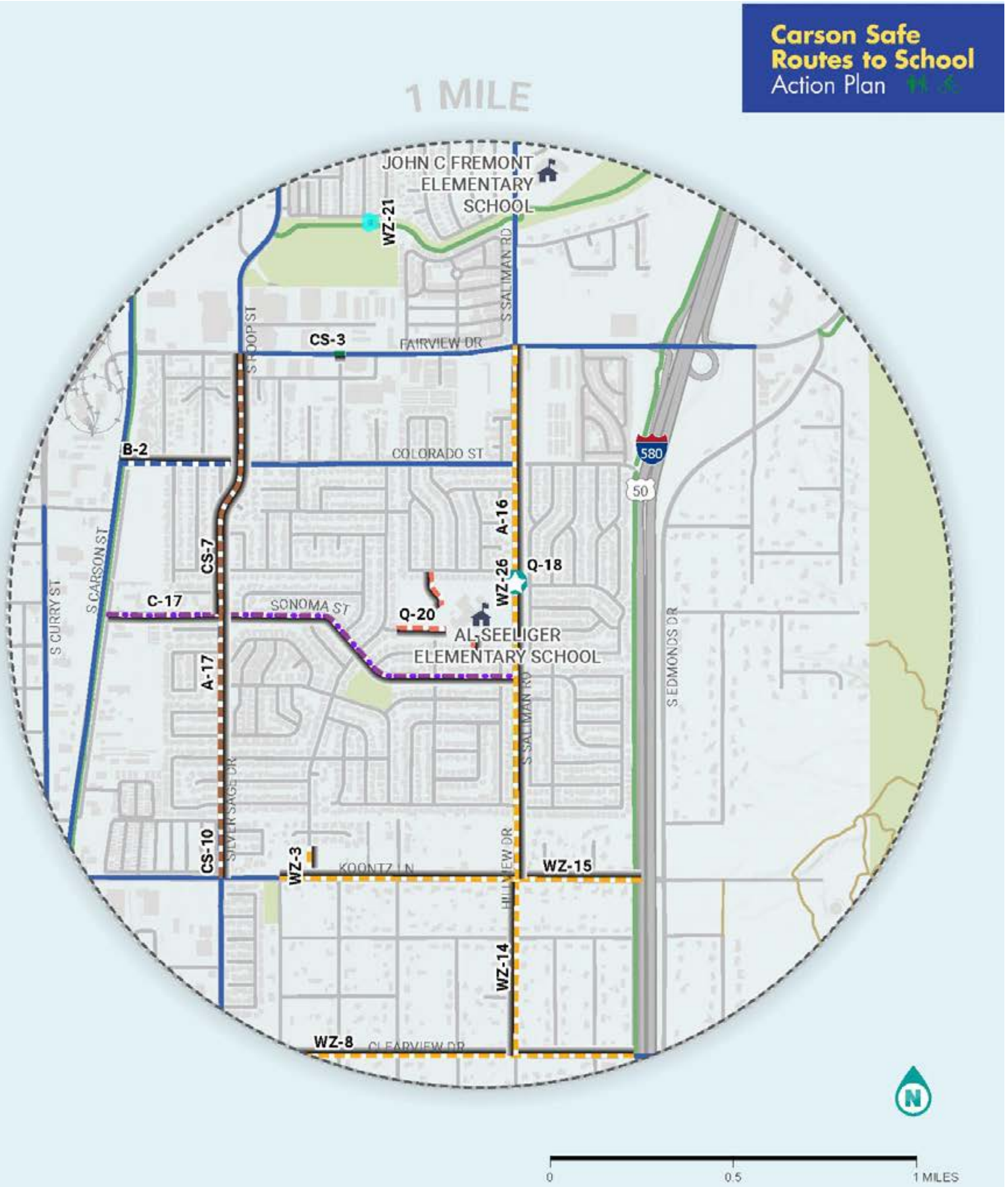
Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-12	Goni Rd	Hot Springs Rd Intersection	Consider PHB or RRFB	Walk Zone Connectivity Enhancement	Medium	$$
WZ-28	Sherman Lane	Lompa Lane to Chanel Lane	Construct Sidewalk	Walk Zone Connectivity Enhancement	Medium	$$$$$
B-7	Roop St to Hot Springs Road (New Path)	Hot Springs Road to Roop Street	Path connection to link with Nye Ln	Bicycle Network Enhancement	Long	$$
C-14	Nye Lane	Lompa Lane to Highway 50	Construct Bike Lanes & Close Sidewalk Gaps	Corridor Enhancement	Long	$$$$$
WZ-1	Airport Road	Nye Lane to Highway 50	A. Close Sidewalk Gaps B. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-6	Camille Drive	Sunland Drive	Install Staircase / Ramp for Multi-Use Connectivity	Walk Zone Connectivity Enhancement	Long	$$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-2	Carmine Street	Airport Road to Lompa Lane	Construct Bike Boulevard or similar multimodal improvement	Aspirational Project	$$
A-3	Carriage Crest Drive	Northridge Drive to Sunland Ave	Construct Bike Boulevard or similar multimodal improvement	Aspirational Project	$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-6	Long Street	Mountain Street to Russell Way	A. Buffered Bike Lane from Mountain Street to Saliman Road or similar multimodal improvement B. Bike Lane from Saliman Road to Russell Way or similar multimodal improvement	Aspirational Project	$$$
A-11	Roop Street	College Parkway to Bernhard Way	Construct Protected Cycle Track or similar multimodal improvement	Aspirational Project	$$
A-13	Roop Street	Winnie Lane to Washington Street	Construct protected cycle track or similar multi-modal improvement	Aspirational Project	$$$$
A-21	W. Nye Lane	Hot Springs Road to Mountain Street	A. Construct Bike Boulevard or similar multimodal improvement B. Intersection Bulb-Outs C. Median Islands D. Speed Cushions	Aspirational Project	$$
A-7	Northgate Lane	Arrowhead Drive to Nye Lane	Construct Protected Cycle Track or similar multimodal improvement	Aspirational Project	$$
A-1	Airport Road	Nye Lane to Highway 50	A. Construct Buffered Bike Lanes or similar multimodal improvement B. Protected intersection at Airport Road / Highway 50 or similar multimodal improvement	Aspirational Project	$$$$$

Al Seeliger Elementary School

Al Seeliger Elementary School



LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-18	Saliman Rd	Damon Rd	Restrict SB left, install pedestrian refuge, add R1-5 signs at yield teeth	Quick Win
Q-20	Seeliger Paths	Footpaths to Al Seeliger from: Cortez Street, Schell Avenue, and off Shady Oak Drive.	Repave paths and extend pavement to school grounds	Quick Win
Q-20	Seeliger Paths	Footpaths to Al Seeliger from: Cortez Street, Schell Avenue, and off Shady Oak Drive.	Repave paths and extend pavement to school grounds	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
B-2	Colorado Street	Carson Street to Roop Street	Construct Buffered Bike Lanes from Carson Street to Existing Bike Lanes or similar multi-modal improvement	Bicycle Network Enhancement	Short	$
C-17	Sonoma St	Carson Street to Saliman Road	A. Construct Bike Lanes or similar multi-modal improvement B. Add intersection crossing enhancement at Silver Sage Drive	Corridor Enhancement	Short	$
WZ-8	Clearview Drive	Oak Street to I580	Construct Paved Shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Short	$$

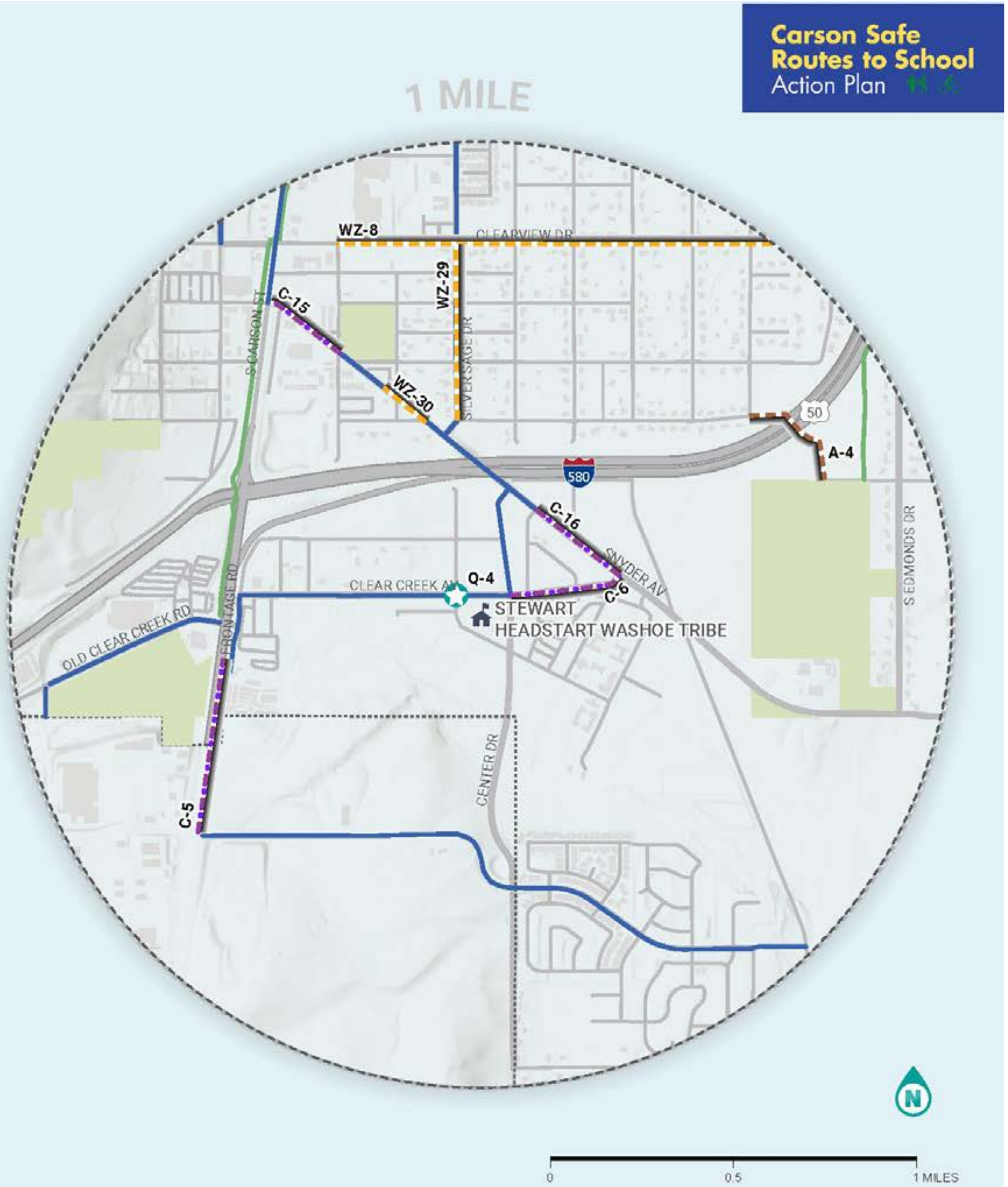
Tier 2 Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-26	Saliman Road	Fairview Drive to Koontz Lane	A. Intersection Crossing Enhancements at Sonoma St B. RRFB at Damon Rd crosswalk C. Sidewalk Eastside Colorado to Fairview Dr D. Enhance existing sidewalk as possible	Walk Zone Connectivity Enhancement	Short	$$$
CS-7	Roop Street	Fairview Drive to Sonoma Avenue	Add intersection crossing enhancements at minor side-street approaches south of Fairview Drive	Crossing Safety Enhancement	Medium	$$
CS-3	Fairview Drive	Kansas St to Kansas St	Consider installing pedestrian activated flasher to increase pedestrian crossing opportunities	Crossing Safety Enhancement	Long	$
CS-10	Silver Sage Drive	Sonoma Avenue to Koontz Lane	A. Add crosswalk at Pioche St B. Add intersection crossing enhancements at Koontz Lane intersection and minor side-street approaches	Crossing Safety Enhancement	Long	$$$$
WZ-3	Baker Drive	Koontz Lane to 175 ft. S. of Kerinne Circle	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$
WZ-14	Hillview Drive	Kingsley Ln to Clearview Drive	Construct Paved Shoulder or Multi-use path to connect with existing multi-use path on Saliman at Kingsley	Walk Zone Connectivity Enhancement	Long	$$
WZ-15	Koontz Lane	Center Drive to I580	Construct Paved Shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Long	$$$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-14	Roop Street / Silver Sage Drive	5th Street to Sonoma Avenue	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$
A-16	Saliman Road	Fairview Drive to Koontz Lane	Buffered Bike Lane with potential lane reduction or similar multimodal improvement	Aspirational Project	$$
A-17	Silver Sage Drive	Sonoma Avenue to Koontz Lane	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$

Stewart Headstart Washoe Tribe

Stewart Headstart Washoe Tribe



LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks

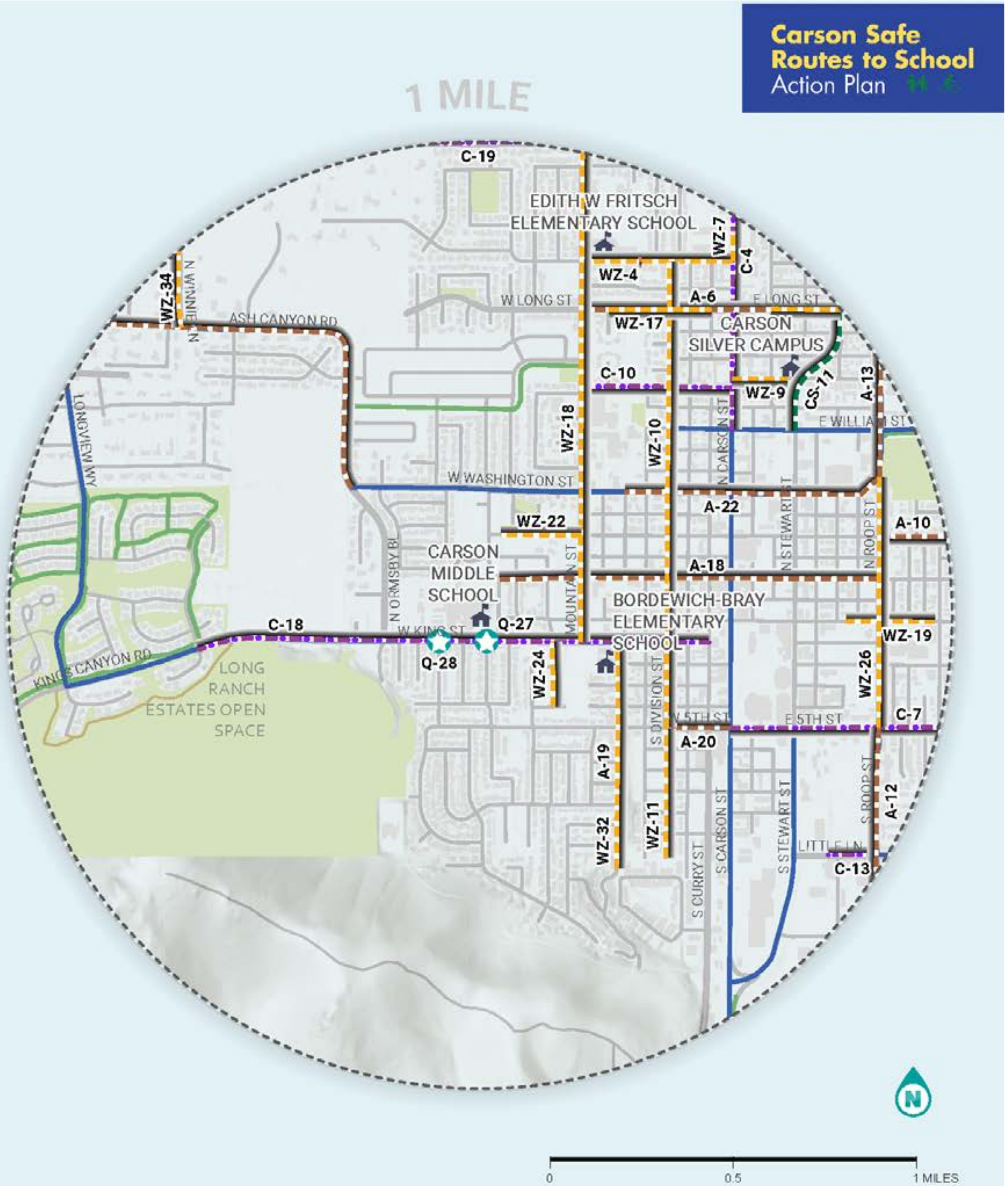
Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-4	Clear Creek Ave	Silver Sage Dr	Upgrade to All-Way Stop Control, or curb extensions	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
C-6	Clear Creek Ave	Snyder Avenue to Center Drive	Close sidewalk gaps, enhance bus stop	Corridor Enhancement	Short	$$
C-15	Snyder Ave	Carson Street to Appion Way	Bike Lanes, close sidewalk gaps, curb ramps, stripe in crosswalks	Corridor Enhancement	Short	$$
WZ-8	Clearview Drive	Oak Street to I580	Construct Paved Shoulder for bikes/pedestrians/bus stop accessibility	Walk Zone Connectivity Enhancement	Short	$$
C-5	Carson Street	Topsy Lane to 500 ft south of Clear Creek Ave	A) Add sidewalk on one side B) extend multi-use path	Corridor Enhancement	Medium	$$
C-16	Snyder Ave	Dat So La Lee Way to Clear Creek Ave	Add sidewalk, add high-visibility crosswalk with ped activated flasher, consider shared use path	Corridor Enhancement	Medium	$$
WZ-29	Silver Sage Dr	Roland St to Clearview Drive	Add sidewalk to one side of the street	Walk Zone Connectivity Enhancement	Medium	$$
WZ-30	Snyder Avenue	Isabell Dr to Roland St	Close sidewalk gap	Walk Zone Connectivity Enhancement	Medium	$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-4	Edmonds Sports Complex	Hillview Dr to Edmonds Sports Complex	Construct multi-use bridge over I-580 from the southeastern corner of Appion Way / Hillview Drive intersection to the Edmonds Sports Complex	Aspirational Project	$$$$$

Carson Middle School

Carson Middle School



LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks

Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-27	W King St	S Richmond Ave	Install Curb Extensions	Quick Win
Q-28	W King St	Tacoma Ave	Install Curb Extensions	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
C-7	E. 5th Street	Saliman Road to I-580	A. Enhance existing sidewalks B. Widen existing bike lane to 5'	Corridor Enhancement	Short	$$$$
C-10	Fleischmann Way	Carson St to Mountain Street	Bulb-outs and daylighting at intersections, address sidewalks gaps, traffic calming	Corridor Enhancement	Short	$$
WZ-10	Division Street	Bath Street to W. 5th Street	A. Add Intersection crossing enhancements at minor side streets B. Enhance & upgrade existing crosswalks including Musser St, Telegraph St, and Long St C. Close Sidewalk Gaps with wide sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$$$
WZ-17	Long Street	Curry Street to Sierra Circle & Fall Street to Stewart Street	A. Close Sidewalk Gaps (Curry St to Sierra Cir & Fall St to Stewart St) B. Crosswalks and Intersection Enhancements at Division St, Curry St, and Marian Ave	Walk Zone Connectivity Enhancement	Short	$$$$
WZ-26	Roop Street	Washington Street to E. 5th Street	A. Close Sidewalk Gap (Telegraph St to E. 5th St) B. Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
C-4	Carson Street	Medical Parkway to Williams Street	Add multi-use path, enhance crosswalks with activated flashers, include landscaped buffer	Corridor Enhancement	Medium	$$$$$
C-13	Little Lane	Roop St to 90 ft W of Oregon St	Add sidewalk on north side	Corridor Enhancement	Medium	$
C-19	Winnie Lane	Ormsby Blvd to Mountain Street	A. Add bike lanes Mountain St to Ormsby Blvd B. Add wayfinding signage at Victoria Ave	Corridor Enhancement	Medium	$$
WZ-34	Winnie Lane	Ash Canyon to Ormsby Blvd	Extend Multi-Use path on north side to Ash Canyon	Walk Zone Connectivity Enhancement	Medium	$$
C-18	W. King Street	Thames Lane to Curry Street	A. Multi-Use Path Thames Ln to Canyon Park Ct, or similar multi-modal improvement B. Add physical buffer for bike lane at CMS & BBES C. Close Sidewalk Gaps between Curry St and Ormsby Blvd D. Install intersection crossing enhancements at Taco*	Corridor Enhancement	Long	$$$$
WZ-7	Carson Street	Bath Street to 420 ft. N. of Bath Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$
WZ-11	Division Street	5th Street to southern terminus	Close Sidewalk Gaps	Walk Zone Connectivity Enhancement	Long	$$

Tier 2 Projects

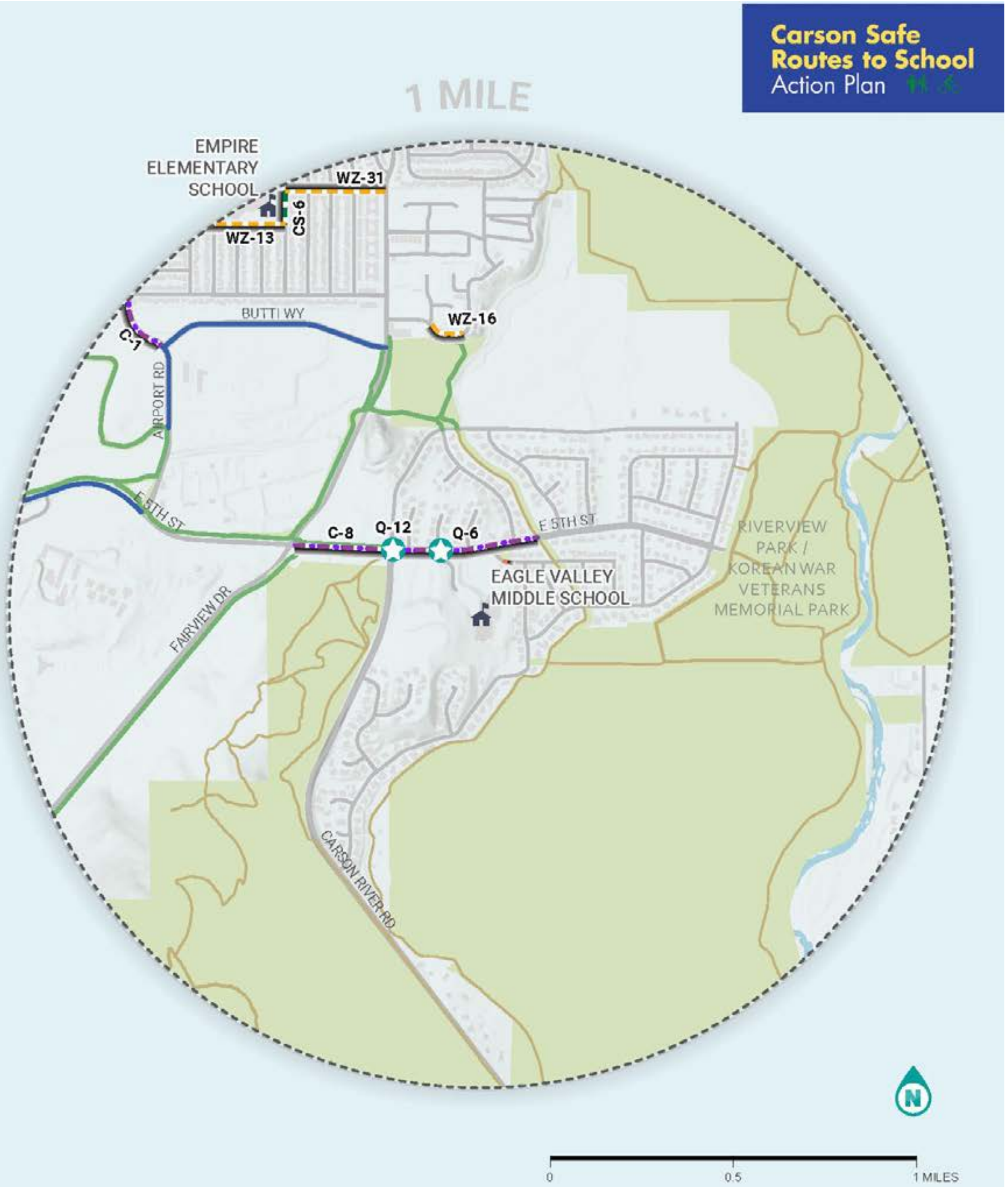
Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-18	Mountain Street	Nye Lane to King Street	A. Close Sidewalk Gaps & Enhance existing sidewalk where possible B. Add intersection crossing enhancements at Long St, Washington St, Telegraph St, Musser St	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-22	Robinson Street	Richmond Avenue to Mountain Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-24	S. Iris Street	4th Street to King Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-32	Thompson Street	King Street to 550 ft. S. of San Marcus Drive	A. Close sidewalk gaps on east side (King St to 5th St) B. Close sidewalk gaps on west side (5th St to San Marcus Dr) C. Create intersection crossing enhancements at existing W. 2nd St, 3rd St, and 4th St crosswalks	Walk Zone Connectivity Enhancement	Long	$$$

Tier 3: Aspirational Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Cost
A-6	Long Street	Mountain Street to Russell Way	A. Buffered Bike Lane from Mountain Street to Saliman Road or similar multimodal improvement B. Bike Lane from Saliman Road to Russell Way or similar multimodal improvement	Aspirational Project	$$$
A-12	Roop Street	5th Street to Fairview Street	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$
A-13	Roop Street	Winnie Lane to Washington Street	Construct protected cycle track or similar multi-modal improvement	Aspirational Project	$$$$
A-20	W. 5th Street	Division St to Carson Street	A. Bike lanes Richmond Avenue to Minnesota St or similar multimodal improvement B. Buffered Bike Lane Minnesota St to Carson St or similar multimodal improvement, C. Curb Extension at Telegraph St	Aspirational Project	$$$
A-22	Washington Street	Phillips Street to Roop Street	A. Construct Bike Lane Minnesota St to Terminus or similar multimodal improvement B. Buffered Bike Lane Philips St to Minnesota St or similar multimodal improvement	Aspirational Project	$
A-9	Ormsby Boulevard / Ash Canyon Road	Longview Way to Washington Street	Construct Multi-Use Path from Washington Street to Longview Way or similar multimodal improvement	Aspirational Project	$$$
A-18	Telegraph Street	Richmond Avenue to Roop Street	Bike Boulevard consider Diverters at Mountain St, Division St, Stewart St & Roop St or similar multimodal improvement	Aspirational Project	$$$$
A-19	Thompson Street	King Street to 550 ft. S. of San Marcus Drive	Bike Boulevard or similar multimodal improvement	Aspirational Project	$$$

Eagle Valley Middle School

Eagle Valley Middle School



LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

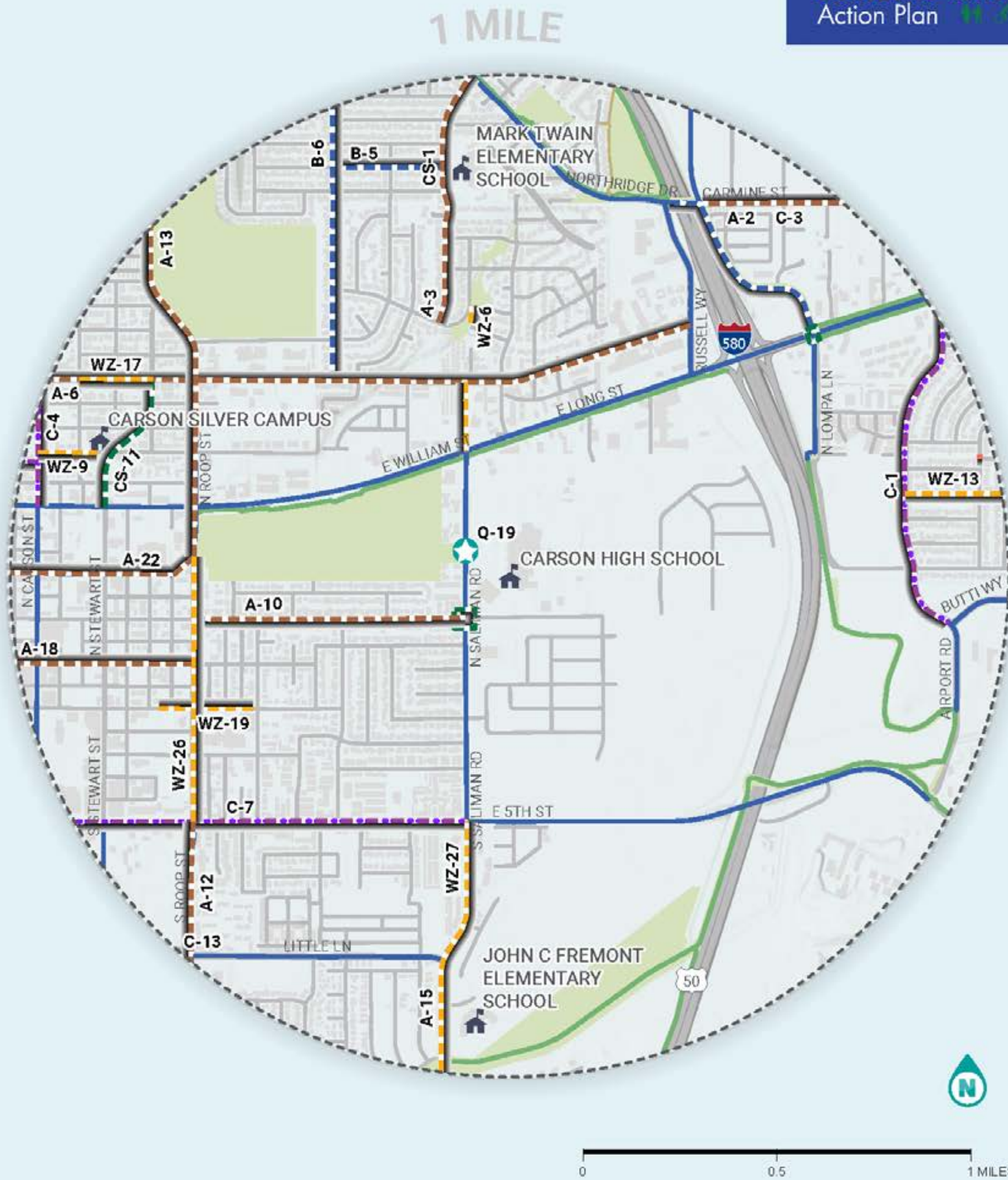
- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks

Tier 1: Quick Wins				
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**
Q-6	E 5th St	Regent Ct	Install S1-1 signs for both directions	Quick Win
Q-12	Hells Bells Rd	E 5th St	Install S1-1 for westbound traffic	Quick Win
Q-13	Hidden Meadows Drive	Eagle Valley Bus Entrance	Install Marked Crosswalk	Quick Win

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
C-1	Airport Road	Highway 50 to E. 5th Street	A. Construct Bike Lane Butti Way to Highway 50 or similar multi-modal improvement B. Add intersection crossing enhancements at Airport Road / Douglas Drive and Airport Road / Menlo Dr	Corridor Enhancement	Medium	$$
C-8	E. 5th Street	Fairview Dr to Mexican Ditch Trail	A. Bike Lanes Fairview Dr to Carson River Rd or similar B. Marked Crosswalk w Ped Refuge at Parkhill Dr D. Ped Refuge at Regent Ct	Corridor Enhancement	Long	$$$$
WZ-16	Lepire Drive	Snake Mountain MUP to Cassidy Court	Construct sidewalk from Snake mountain MUP to the existing sidewalk on the north side of Lepire Drive	Walk Zone Connectivity Enhancement	Long	$$

Carson High School

Carson High School



LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Tier 1: Quick Wins

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type
Q-19	Saliman Rd	Seely Loop (Mills Park Crosswalk)	Add R1-5 signs at yield teeth	Quick Win

Tier 2 Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
B-1	Carmine St and Lompa Ln	US 50 to Russel Way	Add shared-use path	Bicycle Network Enhancement	Short	$$$
C-7	E. 5th St	Saliman Road to I-580	A. Enhance existing sidewalks B. Widen existing bike lane to 5'	Corridor Enhancement	Short	$$$$
CS-5	Hwy 50	Hwy 50 at Lompa Lane	Add Median Pedestrian Refuge Island, add LPI, Add bicycle signal detection	Crossing Safety Enhancement	Short	$
CS-8	Saliman Rd	Robinson St and Saliman Rd	Add crossing guards during peak hours, future traffic signal will help intersection operations	Crossing Safety Enhancement	Short	$
CS-9	Saliman Rd	Saliman Rd at Mills Park	Add crossing guards during peak hours	Crossing Safety Enhancement	Short	$
WZ-26	Roop St	Washington Street to E. 5th Street	A. Close Sidewalk Gap (Telegraph St to E. 5th St) B. Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-25	Saliman Rd	US 50 to Long St	Add buffers to bike lane, Consolidate southbound lanes, add curb extensions at Long St and US 50	Walk Zone Connectivity Enhancement	Short	$

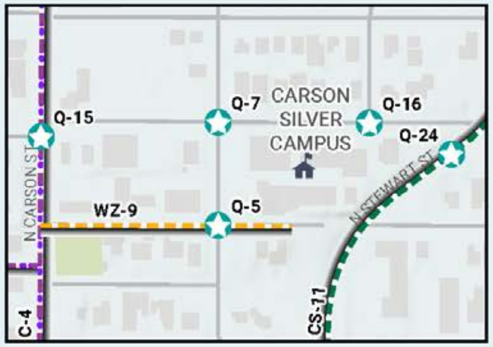
Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-27	Saliman Rd	E. 5th Street to Fairview Drive	Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
C-1	Airport Rd	Highway 50 to E. 5th Street	A. Construct Bike Lane Butti Way to Highway 50 or similar multi-modal improvementB. Add intersection crossing enhancements at Airport Road / Douglas Drive and Airport Road / Menlo Dr	Corridor Enhancement	Medium	$$
C-4	Carson St	Medical Parkway to Williams Street	Add multi-use path, enhance crosswalks with activated flashers, include landscaped buffer	Corridor Enhancement	Medium	$$$$$
C-13	Little Ln	Roop St to 90 ft W of Oregon St	Add sidewalk on north side	Corridor Enhancement	Medium	$
WZ-19	Musser St	Harbin Avenue to Anderson Street	A. Close sidewalk gaps B. Enhance sidewalk where possible	Walk Zone Connectivity Enhancement	Long	$$

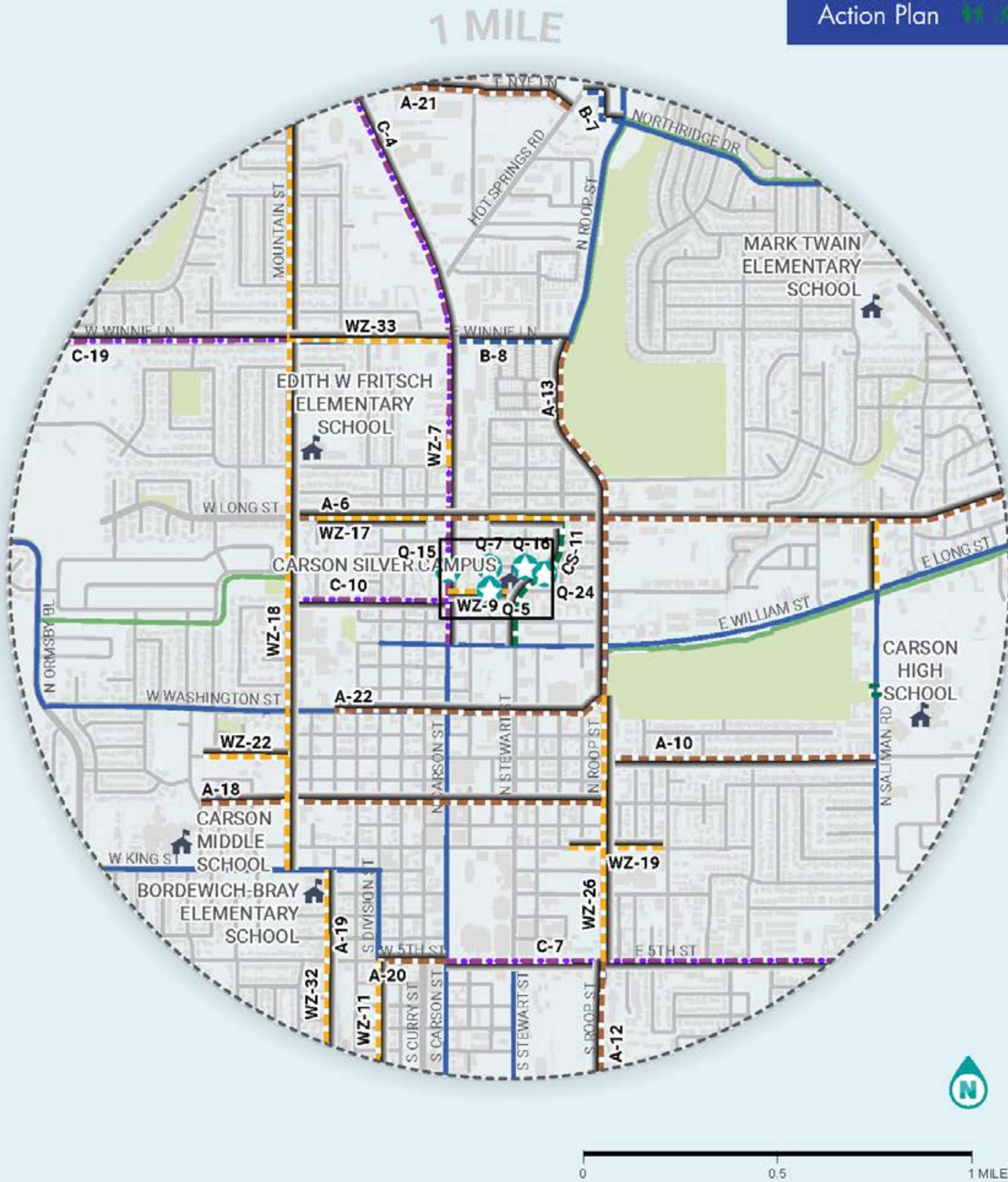
Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-6	Long St	Mountain Street to Russell Way	A. Buffered Bike Lane from Mountain Street to Saliman Road or similar multimodal improvement B. Bike Lane from Saliman Road to Russell Way or similar multimodal improvement	Aspirational Project	$$$
A-10	Robinson St	Roop Street to Saliman Road	Construct Bike Lanes or similar multimodal improvement	Aspirational Project	$
A-12	Roop St	5th Street to Fairview Street	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$
A-13	Roop St	Winnie Lane to Washington Street	Construct protected cycle track or similar multi-modal improvement	Aspirational Project	$$$$
A-15	Saliman Rd	E. 5th Street to Fairview Drive	Upgrade Bike Lane to Cycle Track with Protected Intersection at Fairview Drive or similar multimodal improvement	Aspirational Project	$$$$
A-22	Washington St	Phillips Street to Roop Street	A. Construct Bike Lane Minnesota St to Terminus or similar multimodal improvement B. Buffered Bike Lane Philips St to Minnesota St or similar multimodal improvement	Aspirational Project	$
A-18	Telegraph St	Richmond Avenue to Roop Street	Bike Boulevard consider Diverters at Mountain St, Division St, Stewart St & Roop St or similar multimodal improvement	Aspirational Project	$$$$

Carson High Silver Campus

Carson Safe Routes to School
Action Plan

Carson High Silver Campus





LEGEND

SRTS Recommendations

- Bicycle Network Enhancement
- Corridor Enhancement
- Crossing Safety Enhancement
- Aspirational Project
- Walk Zone Connectivity Enhancement
- Quick Win

Existing Facilities

- Paved Trail (off-street)
- Unpaved Trail (off-street)
- Bike Lane (on-street)
- Study Schools
- Parks
- Railway

Tier 1: Quick Wins

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type
Q-5	Corbett St	Fall St	Upgrade to All-Way Stop Control	Quick Win
Q-7	Fall St	Park St	Upgrade to All-Way Stop Control	Quick Win
Q-15	N Carson St	Park St	Restrict NB Left, Add Pedestrian Refuge Island, Add S1-1s, R1-5s at yield teeth	Quick Win
Q-16	Park St	Peters St	Upgrade to Side-street stop control	Quick Win
Q-24	Stewart St	Park St	Upgrade to S1-1 Signs	Quick Win

Tier 2 Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
B-8	Winnie Lane	Carson Street to Roop Street	Construct Buffered Bike Lanes from Carson Street to Roop Street or similar multi-modal improvement	Bicycle Network Enhancement	Short	$$
C-7	E. 5th Street	Saliman Road to I-580	A. Enhance existing sidewalks B. Widen existing bike lane to 5'	Corridor Enhancement	Short	$$$$
C-10	Fleischmann Way	Carson St to Mountain Street	Bulb-outs and daylighting at intersections, address sidewalks gaps, traffic calming	Corridor Enhancement	Short	$$
CS-9	Saliman Rd	Saliman Rd at Mills Park	Add crossing guards during peak hours	Crossing Safety Enhancement	Short	$
CS-11	Stewart Street	Williams Street to Long Street	Add RRFB at Park Street	Crossing Safety Enhancement	Short	$
WZ-9	Corbett St	Carson St to School	Close sidewalk gaps	Walk Zone Connectivity Enhancement	Short	$

Tier 2 Projects						
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Priority Timeframe**	**Cost**
WZ-17	Long Street	Curry Street to Sierra Circle & Fall Street to Stewart Street	A. Close Sidewalk Gaps (Curry St to Sierra Cir & Fall St to Stewart St) B. Crosswalks and Intersection Enhancements at Division St, Curry St, and Marian Ave	Walk Zone Connectivity Enhancement	Short	$$$$
WZ-26	Roop Street	Washington Street to E. 5th Street	A. Close Sidewalk Gap (Telegraph St to E. 5th St) B. Enhance existing sidewalks as possible	Walk Zone Connectivity Enhancement	Short	$$$
WZ-25	Saliman Rd	US 50 to Long St	Add buffers to bike lane, Consolidate southbound lanes, add curb extensions at Long St and US 50	Walk Zone Connectivity Enhancement	Short	$
C-4	Carson Street	Medical Parkway to Williams Street	Add multi-use path, enhance crosswalks with activated flashers, include landscaped buffer	Corridor Enhancement	Medium	$$$$$
C-12	Imperial Way	Nye Ln to Silver Oak Dr	Add bulb-outs and traffic calming	Corridor Enhancement	Medium	$$
C-19	Winnie Lane	Ormsby Blvd to Mountain Street	A. Add bike lanes Mountain St to Ormsby Blvd B. Add wayfinding signage at Victoria Ave	Corridor Enhancement	Medium	$$
B-7	Roop St to Hot Springs Road (New Path)	Hot Springs Road to Roop Street	Path connection to link with Nye Ln	Bicycle Network Enhancement	Long	$$
WZ-7	Carson Street	Bath Street to 420 ft. N. of Bath Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$

Tier 2 Projects

Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Priority Timeframe	Cost
WZ-11	Division Street	5th Street to southern terminus	Close Sidewalk Gaps	Walk Zone Connectivity Enhancement	Long	$$
WZ-18	Mountain Street	Nye Lane to King Street	A. Close Sidewalk Gaps & Enhance existing sidewalk where possible B. Add intersection crossing enhancements at Long St, Washington St, Telegraph St, Musser St	Walk Zone Connectivity Enhancement	Long	$$$$$
WZ-19	Musser Street	Harbin Avenue to Anderson Street	A. Close sidewalk gaps B. Enhance sidewalk where possible	Walk Zone Connectivity Enhancement	Long	$$
WZ-22	Robinson Street	Richmond Avenue to Mountain Street	Construct Sidewalk	Walk Zone Connectivity Enhancement	Long	$$$
WZ-32	Thompson Street	King Street to 550 ft. S. of San Marcus Drive	A. Close sidewalk gaps on east side (King St to 5th St) B. Close sidewalk gaps on west side (5th St to San Marcus Dr) C. Create intersection crossing enhancements at existing W. 2nd St, 3rd St, and 4th St crosswalks	Walk Zone Connectivity Enhancement	Long	$$$
WZ-33	Winnie Lane	Mountain Street to Ormsby Blvd	Enhance existing sidewalks where possible	Walk Zone Connectivity Enhancement	Long	$$

Tier 3: Aspirational Projects					
Project ID	Street Name	Extent / Intersecting Street	Description	Project Type	Cost
A-6	Long Street	Mountain Street to Russell Way	A. Buffered Bike Lane from Mountain Street to Saliman Road or similar multimodal improvement B. Bike Lane from Saliman Road to Russell Way or similar multimodal improvement	Aspirational Project	$$$
A-10	Robinson Street	Roop Street to Saliman Road	Construct Bike Lanes or similar multimodal improvement	Aspirational Project	$
A-12	Roop Street	5th Street to Fairview Street	Enhance Existing Facility to Buffered Bike Lanes or similar multimodal improvement	Aspirational Project	$$
A-13	Roop Street	Winnie Lane to Washington Street	Construct protected cycle track or similar multi-modal improvement	Aspirational Project	$$$$
A-20	W. 5th Street	Division St to Carson Street	A. Bike lanes Richmond Avenue to Minnesota St or similar multimodal improvement B. Buffered Bike Lane Minnesota St to Carson St or similar multimodal improvement, C. Curb Extension at Telegraph St	Aspirational Project	$$$
A-21	W. Nye Lane	Hot Springs Road to Mountain Street	A. Construct Bike Boulevard or similar multimodal improvement B. Intersection Bulb-Outs C. Median Islands D. Speed Cushions	Aspirational Project	$$
A-22	Washington Street	Phillips Street to Roop Street	A. Construct Bike Lane Minnesota St to Terminus or similar multimodal improvement B. Buffered Bike Lane Philips St to Minnesota St or similar multimodal improvement	Aspirational Project	$
A-7	Northgate Lane	Arrowhead Drive to Nye Lane	Construct Protected Cycle Track or similar multimodal improvement	Aspirational Project	$$

Tier 3: Aspirational Projects					
Project ID	**Street Name**	**Extent / Intersecting Street**	**Description**	**Project Type**	**Cost**
A-18	Telegraph Street	Richmond Avenue to Roop Street	Bike Boulevard consider Diverters at Mountain St, Division St, Stewart St & Roop St or similar multimodal improvement	Aspirational Project	$$$$
A-19	Thompson Street	King Street to 550 ft. S. of San Marcus Drive	Bike Boulevard or similar multimodal improvement	Aspirational Project	$$$

F

Appendix F: Carson SRTS Design Toolbox

Table of Contents

Section I

Context

Introduction

This Design Toolbox has been developed to complement Carson City's Safe Routes to School Master Plan and to assist the City in the selection and design of facilities. The designs featured in this Toolbox work to promote pedestrian and bicycle comfort, particularly among children. The chapter presents current engineering design resources and approaches to implement bicycle and pedestrian enhancements.

What, Why, Where, When and How?

Future roadway planning, engineering, design and construction will continue to strive for a balanced transportation system that includes a seamless, accessible bicycle and pedestrian network and encourages bicycle and pedestrian travel wherever possible.

There are many reasons to integrate bicycle and pedestrian facilities into typical roadway development policy. The goal of a transportation system is to better meet the needs of people - whether in vehicles, bicyclists or pedestrians - and to provide access to goods, services, and activities.

Supporting active modes gives users important transportation choices, whether it is to make trips entirely by walking or cycling, or to access public transit. Often in urban or suburban areas, walking and cycling are the fastest and most efficient ways to perform short trips.

Convenient non-motorized travel provides many benefits, including reduced traffic congestion, user savings, road and parking facility savings, economic development, and a healthier environment.

Compatible design does more than help those who already walk or bicycle. It encourages greater use of non-motorized transportation and makes the street safer for everyone.

The design recommendations in this document are for use on Carson City roadways. Projects must not only be planned for their physical aspects as facilities serving specific transportation objectives; they must also consider effects on the aesthetic, social, economic and environmental values, needs, constraints and opportunities in a larger community setting. This is commonly known as Context Sensitive Design, and should be employed when determining which standard is applicable in each scenario.

All walkway and bikeway design guidelines in this document meet or exceed the minimums set by the Americans with Disabilities Act.

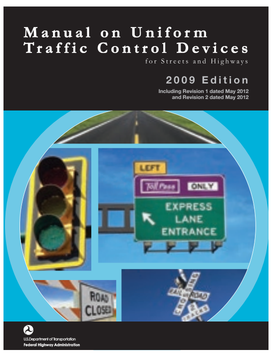
All traffic control devices, signs, pavement markings used and identified in this document must conform to the latest edition of the "Manual on Uniform Traffic Control Devices" (MUTCD).

Whenever possible and appropriate, the National Association of City Transportation Officials (NACTO)'s guidance is recommended where applicable.

Guidance Basis

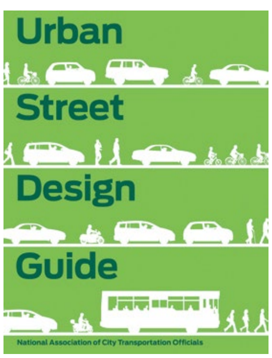
The sections that follow serve as an inventory of pedestrian and bicycle design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a pedestrian- and bicycle-friendly, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a professional engineer prior to implementation of facility improvements. The following guidelines are incorporated in this Design Guide.

National Guidance

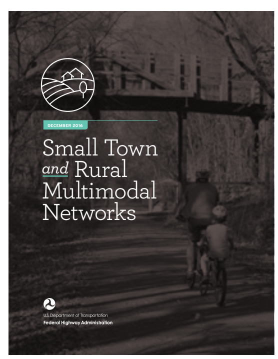


The Federal Highway Administration's **Manual on Uniform Traffic Control Devices (MUTCD)** *defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic.*

Separated Bike Lane Planning and Design Guide (2015) *is the latest national guidance on the planning and design of separated bike lane facilities released by the Federal Highway Administration (FHWA). The resource documents best practices as demonstrated around the U.S., and offers ideas on future areas of research, evaluation and design flexibility.*

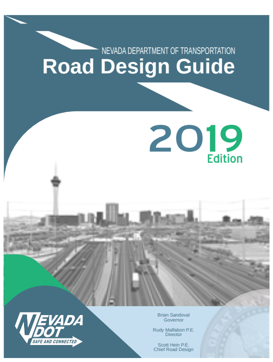


The National Association of City Transportation Officials' (NACTO) **Urban Bikeway Design Guide (2012)** *and* **Urban Street Design Guide (2013)** *are collections of nationally recognized street design standards, and offers guidance on the current state of the practice designs.*



The Federal Highway Administration's **Small Town and Rural Multimodal Networks Report (2016)** *offers resources and ideas to help small towns and rural communities support safe, accessible, comfortable, and active travel for people of all ages and abilities. It connects existing guidance to rural practice and includes examples of peer communities.*

Nevada Guidance



The Nevada Department of Transportations's **Road Design Guide (2019)** *establishes uniform design criteria for Nevada roadways to supplement AASHTO's "A Policy on Geometric Design of Highways and Streets."*

Design Needs of Pedestrians

The MUTCD recommends a normal walking speed of 3.5 ft per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to 3 ft per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.

Types of Pedestrians

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments.

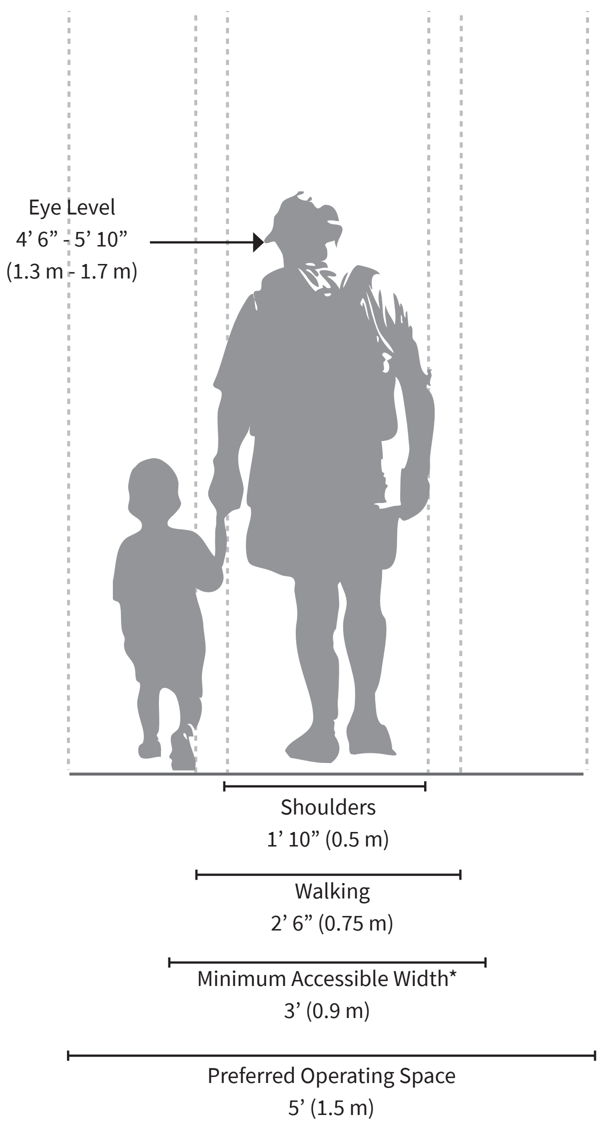
Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing.

Disabled Pedestrian Design Considerations

The table below summarizes common physical and cognitive impairments, how they affect personal mobility, and recommendations for improved pedestrian-friendly design.

Disabled Pedestrian Design Considerations

Impairment	Effect on Mobility	Design Solution
Physical Impairment Necessitating Wheelchair and Scooter Use	Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
	Cross-slopes cause wheelchairs to veer downhill or tip sideways.	Cross-slopes of less than two percent.
	Require wider path of travel.	Sufficient width and maneuvering space.
Physical Impairment Necessitating Walking Aid Use	Difficulty negotiating steep grades and cross slopes; decreased stability and tripping hazard.	Cross-slopes of less than two percent. Smooth, non-slippery travel surface.
	Slower walking speed and reduced endurance; reduced ability to react.	Longer pedestrian signal cycles, shorter crossing distances, median refuges, and street furniture.
Hearing Impairment	Less able to detect oncoming hazards at locations with limited sight lines (e.g. driveways, angled intersections, channelized right turn lanes) and complex intersections.	Longer pedestrian signal cycles, clear sight distances, highly visible pedestrian signals and markings.
Vision Impairment	Limited perception of path ahead and obstacles; reliance on memory; reliance on non-visual indicators (e.g. sound and texture).	Accessible text (larger print and raised text), accessible pedestrian signals (APS), guide strips and detectable warning surfaces, safety barriers, and lighting.
Cognitive Impairment	Varies greatly. Can affect ability to perceive, recognize, understand, interpret, and respond to information.	Signs with pictures, universal symbols, and colors, rather than text.



**At point of contact*

Pedestrian Characteristics by Age

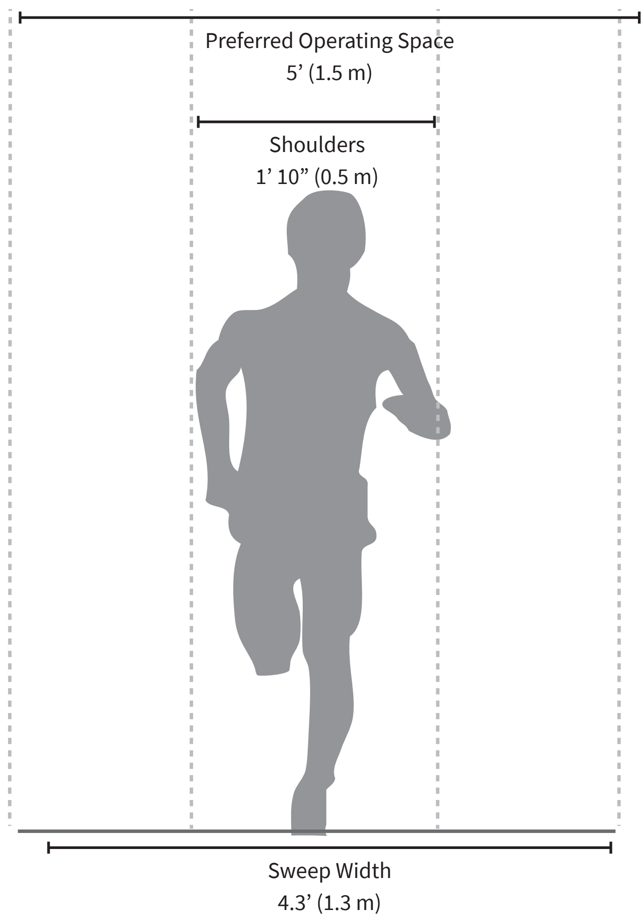
Age	Characteristics
0-4	Learning to walk
	Requires constant adult supervision
	Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision
	Poor depth perception
9-13	Susceptible to “darting out” in roadways
	Insufficient judgment
	Sense of invulnerability
14-18	Improved awareness of traffic environment
	Insufficient judgment
19-40	Active, aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street
	Vision loss
	Difficulty hearing vehicles approaching from behind

Source: AASHTO. Guide for the Planning, Design, and Operation of Pedestrian Facilities, Exhibit 2-1. 2004.

Design Needs of Runners

Running is an important recreation and fitness activity commonly performed on shared use paths. Many runners prefer softer surfaces (such as rubber, bare earth or crushed rock) to reduce impact. Runners can change their speed and direction frequently. If high volumes are expected, controlled interaction or separation of different types of users should be considered.

Runner Dimensions

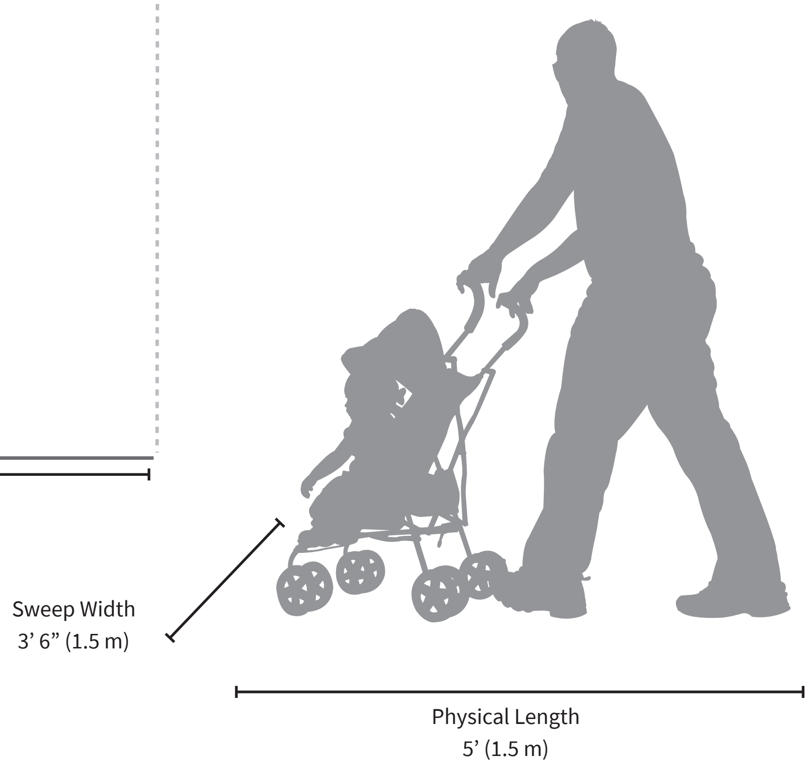


Design Needs of Strollers

Strollers are wheeled devices pushed by pedestrians to transport babies or small children. Stroller models vary greatly in their design and capacity. Some strollers are designed to accommodate a single child, others can carry 3 or more. Design needs of strollers depend on the wheel size, geometry and ability of the adult who is pushing the stroller.

Strollers commonly have small pivoting front wheels for easy maneuverability, but these wheels may limit their use on unpaved surfaces or rough pavement. Curb ramps are valuable to these users. Lateral overturning is one main safety concern for stroller users.

Stroller Dimensions



Design Needs of Wheelchair Users

As the American population ages, the age demographics in Carson City may also shift, and the number of people using mobility assistive devices (such as manual wheelchairs, powered wheelchairs) will increase.

Manual wheelchairs are self-propelled devices. Users propel themselves using push rims attached to the rear wheels. Braking is done through resisting wheel movement with the hands or arm. Alternatively, a second individual can control the wheelchair using handles attached to the back of the chair.

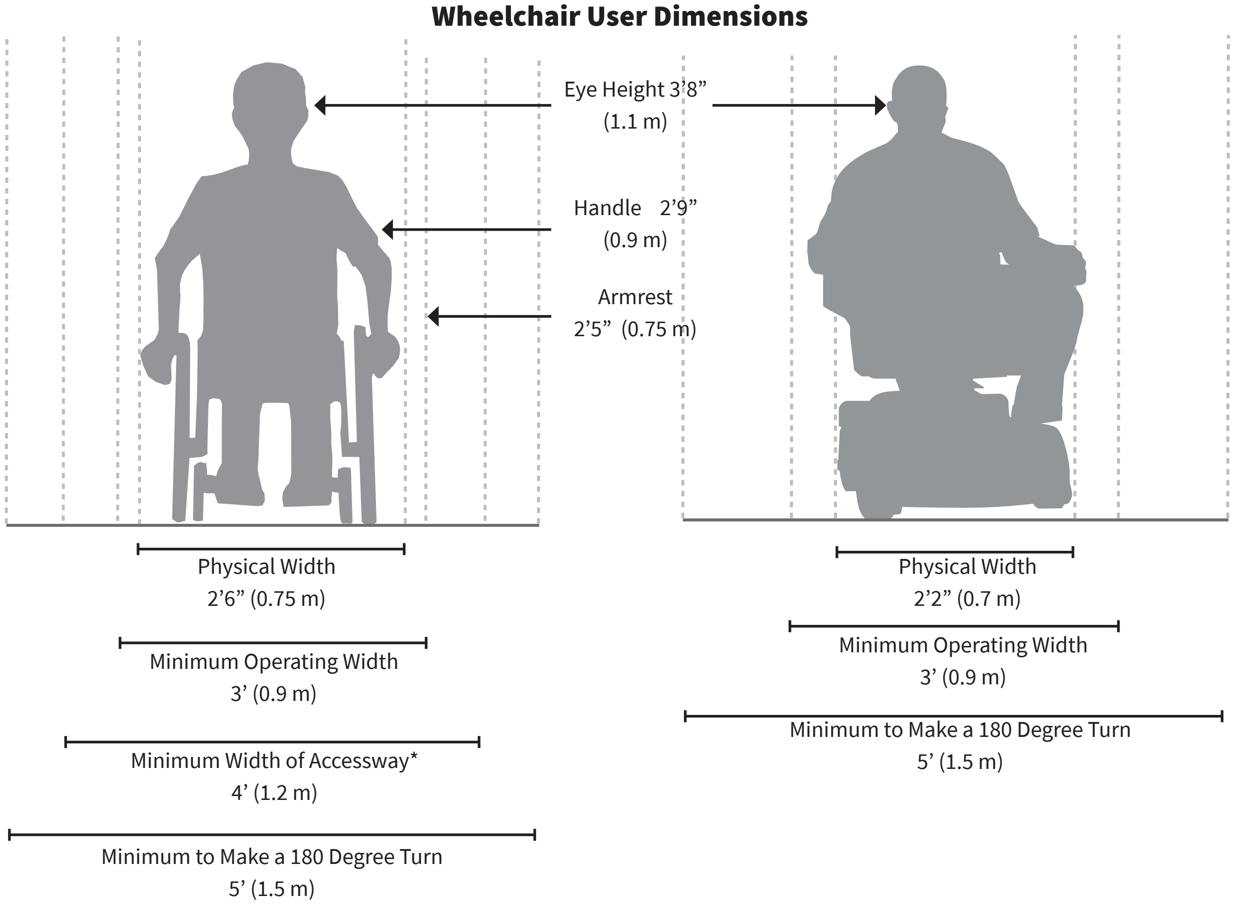
Power wheelchairs use battery power to move the wheelchair. The size and weight of power wheelchairs limit their ability to negotiate obstacles without a ramp. Various control units are available that enable users to control the wheelchair movement, based on their ability (e.g., joystick control, breath controlled, etc).

Maneuvering around a turn requires additional space for wheelchair devices. Providing adequate space for 180 degree turns at appropriate locations is an important element of accessible design.

Wheelchair User Design Considerations

Effect on Mobility	Design Solution
Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
Cross-slopes cause wheelchairs to veer downhill.	Cross-slopes of less than two percent.
Require wider path of travel.	Sufficient width and maneuvering space.

Wheelchair User Dimensions



**Provide 5' x 5' passing zone every 200' if travel way is at minimum width*

Design Needs of Bicyclists

The facility designer must have an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction and maintenance practices than motor vehicle drivers.

By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk

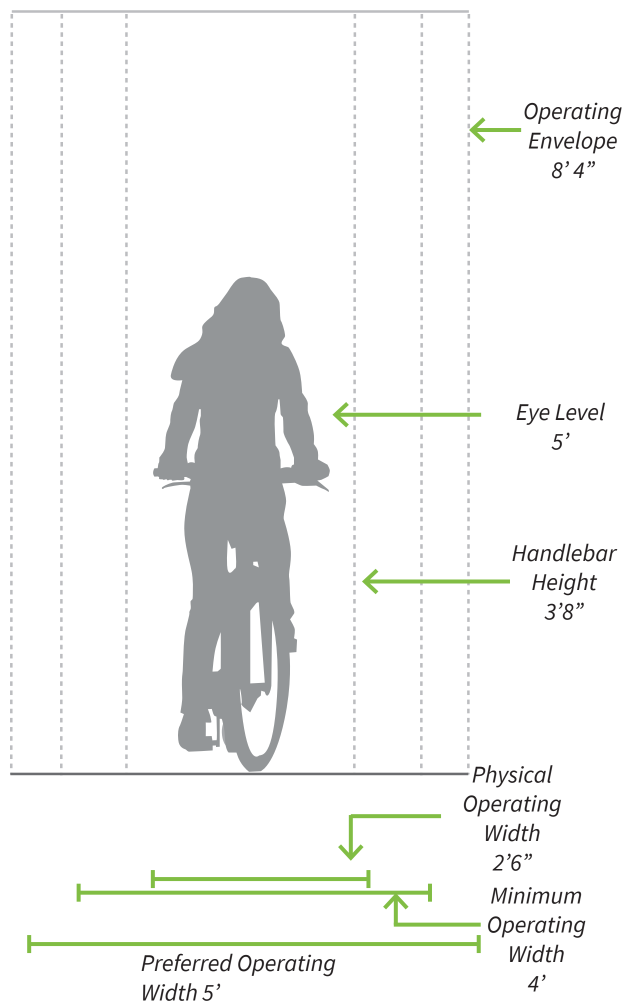
Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The Bicycle Rider figure illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories.

Bicycle Rider - Typical Dimensions



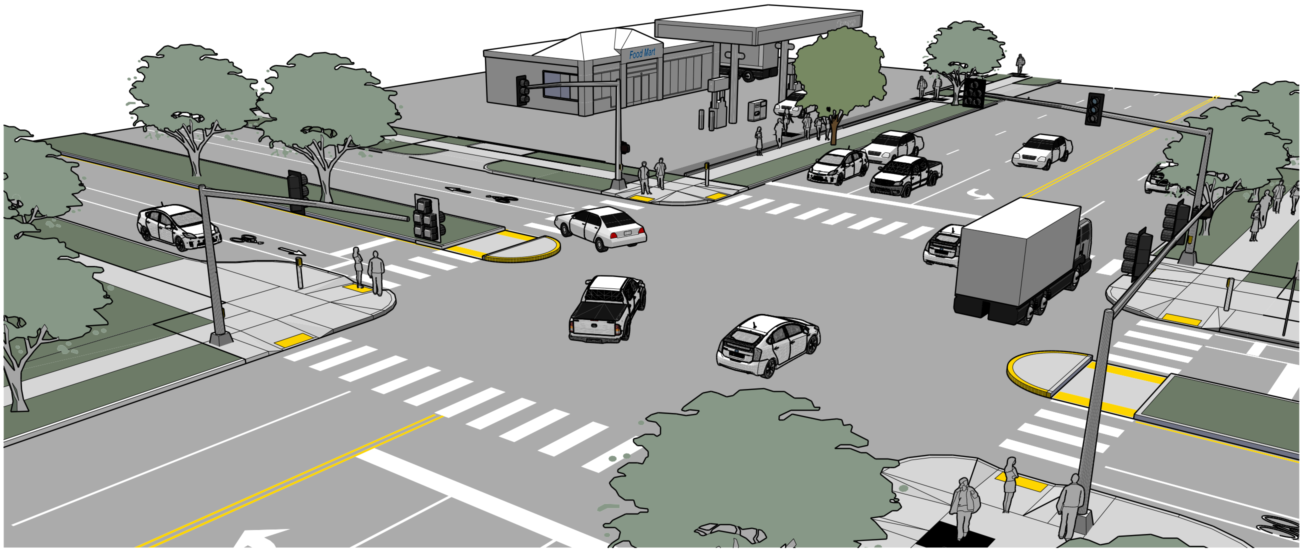
Bicycle as Design Vehicle - Design Speed Expectations

BICYCLE TYPE	FEATURE	TYPICAL SPEED
Upright Adult Bicyclist	Paved level surfacing	8-12 mph*
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5 -12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

** Typical speed for causal riders per AASHTO 2013.*

Section 2

Pedestrian Toolbox



Marked Crosswalks

A marked crosswalk signals to motorists that they must yield to pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily enhance the comfort level of crossings. At mid-block locations, crosswalks can be marked where there is a demand for crossing and there are no nearby marked crosswalks.

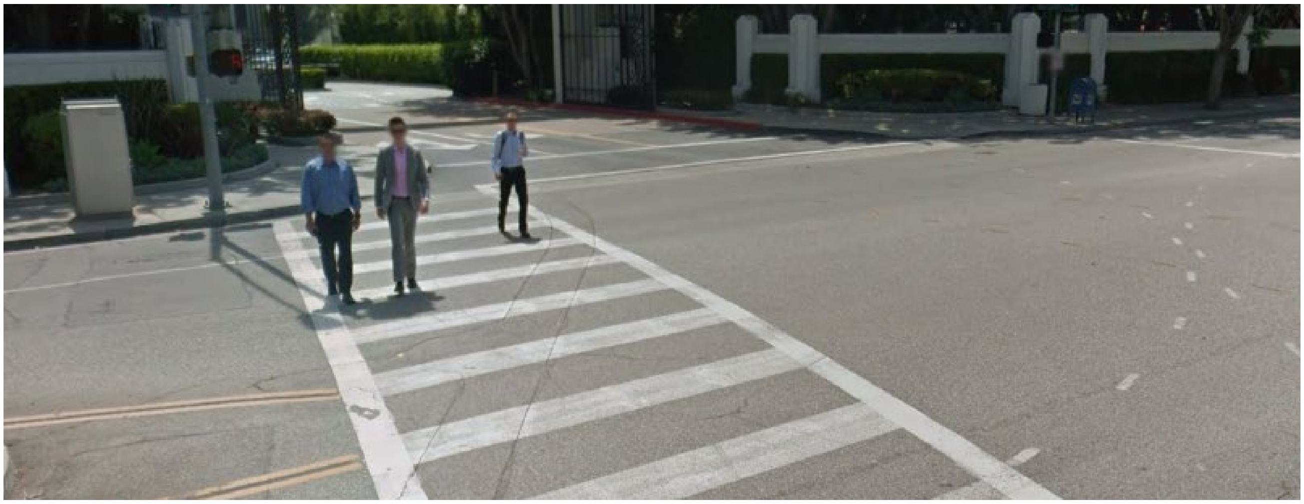
Typical Use

All crosswalks should be marked at signalized intersections. At unsignalized intersections, crosswalks may be marked under the following conditions:

- At a complex intersection, to orient pedestrians in finding their way across.
- At an offset intersection, to show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts.
- At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
- At an intersection within a school zone on a walking route.

Design Features

- The crosswalk should be located to align as closely as possible with the through pedestrian zone of the sidewalk corridor.
- Users should not have to leave the crosswalk or reorient themselves from the crosswalk when accessing the curb ramp onto the sidewalk.
- See page 18 for design guidelines for curb ramps.
- High- visibility ladder, zebra, and continental crosswalk markings are preferable to standard parallel or dashed pavement markings.
- To reinforce yielding to pedestrians and reduce vehicle incursion into the crosswalk, some crossings may include an advanced stop bar in advance of the crosswalk.



Marked crosswalks include standard parallel pavement markings as well as high-visibility ladder markings. Source: Google Streetview

Further Considerations

Pedestrians are sensitive to out-of-direction travel, and reasonable accommodations should be made to make crossings both convenient at locations with adequate visibility.

Continental crosswalk markings should be used at crossings with high pedestrian use or where vulnerable pedestrians are expected, including: school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and at intersections where there is expected high pedestrian use and the crossing is not controlled by signals or stop signs. High-visibility crosswalks are not appropriate for all locations. Other crosswalk marking patterns are provided for in the MUTCD.

Some cities prohibit omitting or removing a marked crosswalk at intersections in order to require a three-stage pedestrian crossing. Intersections with three-stage crossings lead to arduous and increased crossing distances, pedestrian frustration, encourages jaywalking, and exhibits modal bias favoring motor vehicle level-of-service over other modes. There are circumstances when only three crosswalks are utilized and typically occur at or near interchanges and freeway ramps.

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority. Thermoplastic markings offer increased durability than conventional paint.[1]

Approximate Cost

Depending on the type of material used, width of the crossing and width of the roadway, approximate installation costs are $500 for a regular striped crosswalk, $1,000 for a ladder crosswalk, and $8,000 for a patterned concrete crosswalk. In addition, the cost of a curb ramp is about $5,000-$10,000 per ramp.

Due to various number of crosswalk styles in use, signing standards, color and aesthetics, other factors will affect the final cost.

Maintenance of markings should also be considered.

1 The appropriate marking material(s) should be determined on a project basis.

Raised Pedestrian Crossings

A raised crosswalk or intersection can eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street. Raised crosswalks also functions as speed tables, and encourage motorists to slow down. As such, they should be used only in cases where a special emphasis on pedestrians is desired.

Raised crosswalks are typically implemented on low-speed streets, bike boulevards and other areas of very high pedestrian activity. They are often paired with other treatments such as curb extensions for greater traffic calming effect.

Typical Use

Like a speed hump/table, raised crosswalks have a traffic slowing effect which may be unsuitable on high-speed streets, roadways with sharp curves, designated transit or freight routes, and in locations that would reduce access for emergency responders. Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.

Approaches to the raised crosswalk may be designed to be similar to speed humps/tables.

Design Features

- Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.
- Approaches to the raised crosswalk may be designed to be similar to speed humps.
- Drainage improvements may be required depending on the grade of the roadway.
- Special paving materials can be used to increase conspicuity of the crossing, and alert drivers to the presence of pedestrians.

Raised pedestrian crossings help reduce vehicle speeds and give pedestrians greater prominence as they cross the street.

Further Considerations

- The noise of vehicles traveling over raised crosswalks may be of concern to nearby residents and businesses.
- Refer to Americans with Disabilities Act (ADA) and California Building Code (CBC) for additional requirements.

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority. Ensure drainage used to channel stormwater past the raised intersection is kept free of debris, to prevent stormwater from backing up and pooling.

Approximate Cost

Raised crosswalks are approximately $2,000 to $15,000, depending on drainage conditions and material used.

Sidewalk Zones & Widths

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel separated from vehicle traffic. Providing adequate and accessible facilities can lead to increased numbers of people walking, improved accessibility, and the creation of social space.

Curbside Lane

The curbside lane can act as a flexible space to further buffer the sidewalk from moving traffic., and may be used for a bike lane. Curb extensions and bike corrals may occupy this space where appropriate.

In the **edge zone** there should be a 6 inch wide curb.

Buffer Zone

The buffer zone, also called the furnishing or landscaping zone, buffers pedestrians from the adjacent roadway, and is also the area where elements such as street trees, signal poles, signs, and other street furniture are properly located.

Pedestrian Through Zone

The through zone is the area intended for pedestrian travel. This zone should be entirely free of permanent and temporary objects.

Wide through zones are needed in downtown areas or where pedestrian flows are high.

Frontage Zone

The frontage zone allows pedestrians a comfortable “shy” distance from the building fronts. It provides opportunities for window shopping, to place signs, planters, or chairs.

Street Classification	Parking Lane/ Enhancement Zone	Buffer Zone	Pedestrian Through Zone	Frontage Zone*
Local Streets	Varies	4 - 6 ft	6 ft	N/A
Downtown and Pedestrian Priority Areas	Varies	4 - 6 ft	12 ft	2.5 - 10 ft
Arterials and Collectors	Varies	4 - 6 ft	6 - 8 ft	2.5 - 5 ft

**Indicates ideal frontage zone space. Actual frontage zone is contingent upon the City's development code and required set backs*

Typical Uses

- Wider sidewalks should be installed near schools, at transit stops, in downtown areas, or anywhere high concentrations of pedestrians exist.
- At transit stops, an 8 ft by 5 ft clear space is required for accessible passenger boarding/ alighting at the front door location per ADA requirements.
- Sidewalks should be continuous on both sides of urban commercial streets, and should be required in areas of moderate residential density (1-4 dwelling units per acre).
- When retrofitting gaps in the sidewalk network, locations near transit stops, schools, parks, public buildings, and other areas with high concentrations of pedestrians should be the highest priority.

Materials and Maintenance

Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped boulevard. Less expensive walkways constructed of asphalt, crushed stone, or other stabilized surfaces may be appropriate. Ensure accessibility and properly maintain all surfaces regularly. Surfaces must be firm, stable, and slip resistant. Colored, patterned, or stamped concrete can add distinctive visual appeal.

Approximate Cost

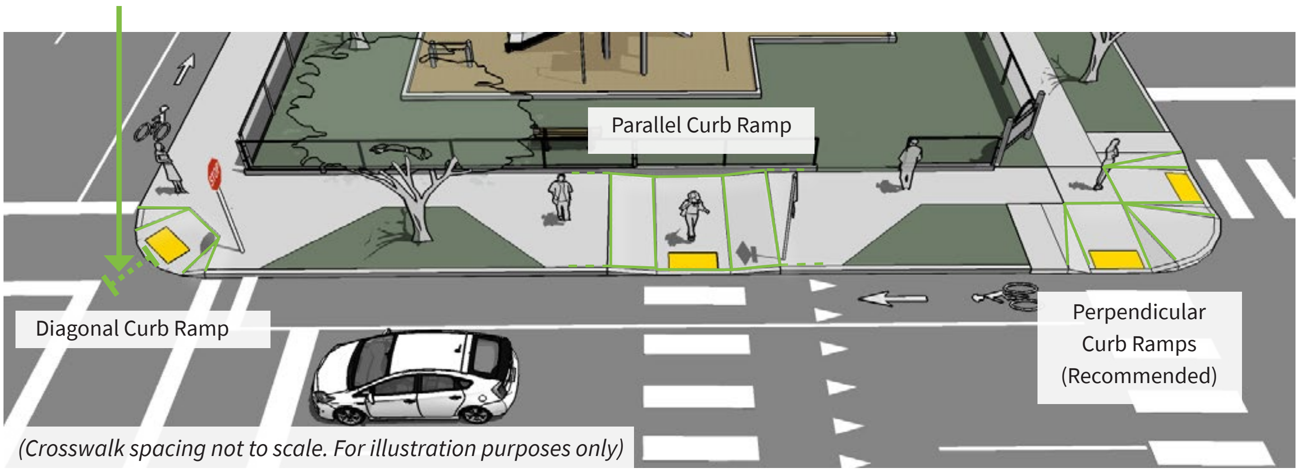
Cost of standard sidewalks range from about $25 per square foot for concrete sidewalk. This cost can increase with additional right-of-way acquisition or addition of landscaping, lighting or other aesthetic features. As an interim measure, an asphalt concrete path can be placed until such time that a standard sidewalk can be built. The cost of asphalt path can be less than half the cost of a standard sidewalk.

Curb Ramps

Curb ramps are the design elements that allow all users to make the transition from the street to the sidewalk. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access. There are a number of factors to be considered in the design and placement of curb ramps.

Diagonal ramps shall include a clear space of at least 48" within the crosswalk for user maneuverability

Curb ramps shall be located so that they do not project into vehicular traffic lanes, parking spaces, or parking access aisles. Three configurations are illustrated below.



(Crosswalk spacing not to scale. For illustration purposes only)

Typical Use

- Curb ramps must be installed at all intersections and midblock locations where pedestrian crossings exist, as mandated by federal legislation (1973 Rehabilitation Act and ADA 1990). All newly constructed and altered roadway projects must include curb ramps. In addition, existing facilities must be upgraded to current standards when appropriate.
- The edge of an ADA compliant curb ramp shall be marked with a tactile warning device (also known as truncated domes) to alert people with visual impairments to changes in the pedestrian environment. Contrast between the raised tactile device and the surrounding infrastructure is important so that the change is readily evident to partially sighted pedestrians. These devices are most effective when adjacent to smooth pavement so the difference is easily detected.

Design Features

- The level landing at the top of a ramp shall be at least 4 feet long and at least the same width as the ramp itself. The slope of the ramp shall be compliant to current standards.
- If the ramp runs directly into a crosswalk, the landing at the bottom will be in the roadway.
- If the top landing is within the sidewalk or corner area where someone in a wheelchair may have to change direction, the landing must be a minimum of 4'-0" long (in the direction of the ramp run) and at least as wide as the ramp, although a width of 5'-0" is preferred.

Not recommended: diagonal curb ramp configuration. Source: Google Streetview

Recommended: Bulb-Out with bidirectional curb ramps for crossing in both directions. Source: Google Streetview

Further Considerations

Where feasible, separate directional curb ramps for each crosswalk at an intersection should be provided rather than having a single ramp at a corner for both crosswalks. Although diagonal curb ramps might save money, they orient pedestrians directly into the traffic zone, which can be challenging for wheelchair users and pedestrians with visual impairment. Diagonal curb ramp configurations are not recommended.

Curb return radii need to be considered when designing directional ramps. While curb ramps are needed for use on all types of streets, the highest priority locations are in downtown areas and on streets near transit stops, schools, parks, medical facilities, shopping areas.

Materials and Maintenance

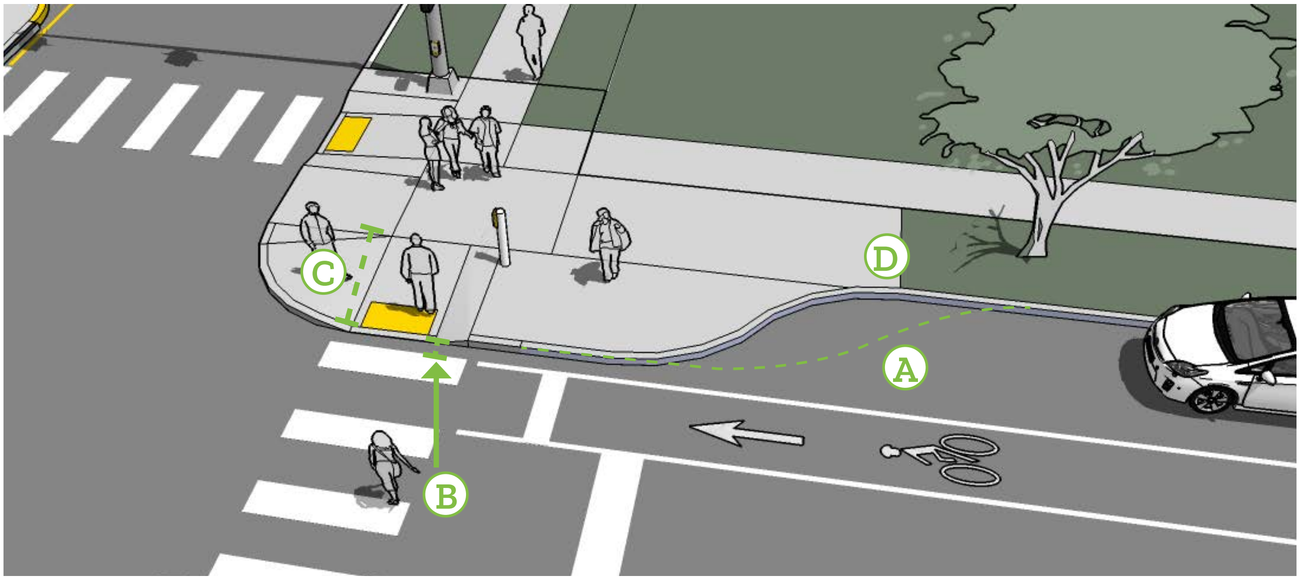
It is critical that the interface between a curb ramp and the street be maintained adequately. Asphalt street sections can develop potholes at the foot of the ramp, which can catch the front wheels of a wheelchair.

Approximate Cost

The cost is approximately $5,000-$10,000 per curb ramp depending on drainage and right-of-way.

Curb Extensions

Curb extensions minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing.



Typical Use

- Within parking lanes appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb.
- May be possible within non-travel areas on roadways with excess space.
- Particularly helpful at midblock crossing locations.
- Curb extensions should not impede bicycle travel in the absence of a bike lane.
- Curb extensions are often utilized as in-lane transit stops, allowing passengers to board and alight outside of the pedestrian through zone.

Materials and Maintenance

Planted curb extensions may be designed as a bioswale, a vegetated system for stormwater management. To maintain proper stormwater drainage, curb extensions can be constructed as refuge islands offset by a drainage channel or feature a covered trench drain.

Design Features

A For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft and the two radii should be balanced to be nearly equal.

B When a bike lane is present, the curb extensions should terminate one foot short of the parking lane to enhance bicyclist access.

C Reduces pedestrian crossing distance by 6-8 ft.

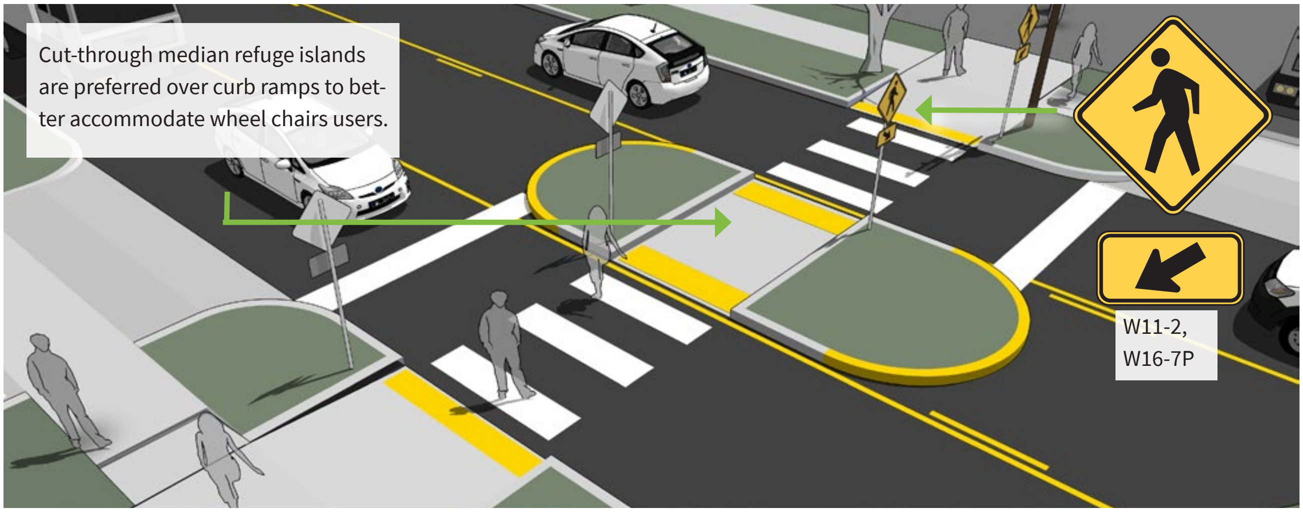
D Planted curb extensions may be designed as a bioswale for stormwater management.

Approximate Cost

The cost of a curb extension can range from $2,000 to $20,000 depending on the design and site condition, with the typical cost approximately $12,000. Green/vegetated curb extensions cost between $10,000 to $40,000.

Median Refuge Islands

Median refuge islands are located at the mid-point of a marked crossing and help improve pedestrian access by increasing pedestrian visibility and allowing pedestrians to cross one direction of traffic at a time. Refuge islands minimize pedestrian exposure at mid-block crossings by shortening the crossing distance and increasing the number of available gaps for crossing.



Typical Use

- Refuge islands an be applied on any roadway with a left turn center lane or median that is at least 6' wide. Islands are appropriate at signalized or unsignalized crosswalks.
- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- The island should be at least 6' wide between travel lanes (to accommodate wheelchair users) and at least 20' long (40' minimum preferred).
- Provide double centerline marking, reflectors, and "KEEP RIGHT" signage (MUTCD R4-7a) in the island on streets with posted speeds above 25 mph.

Materials and Maintenance

Refuge islands may require frequent maintenance of road debris. Trees and plantings in a landscaped median must be maintained so as not to impair visibility, and should be no higher than 1 foot 6 inches.

Design Features

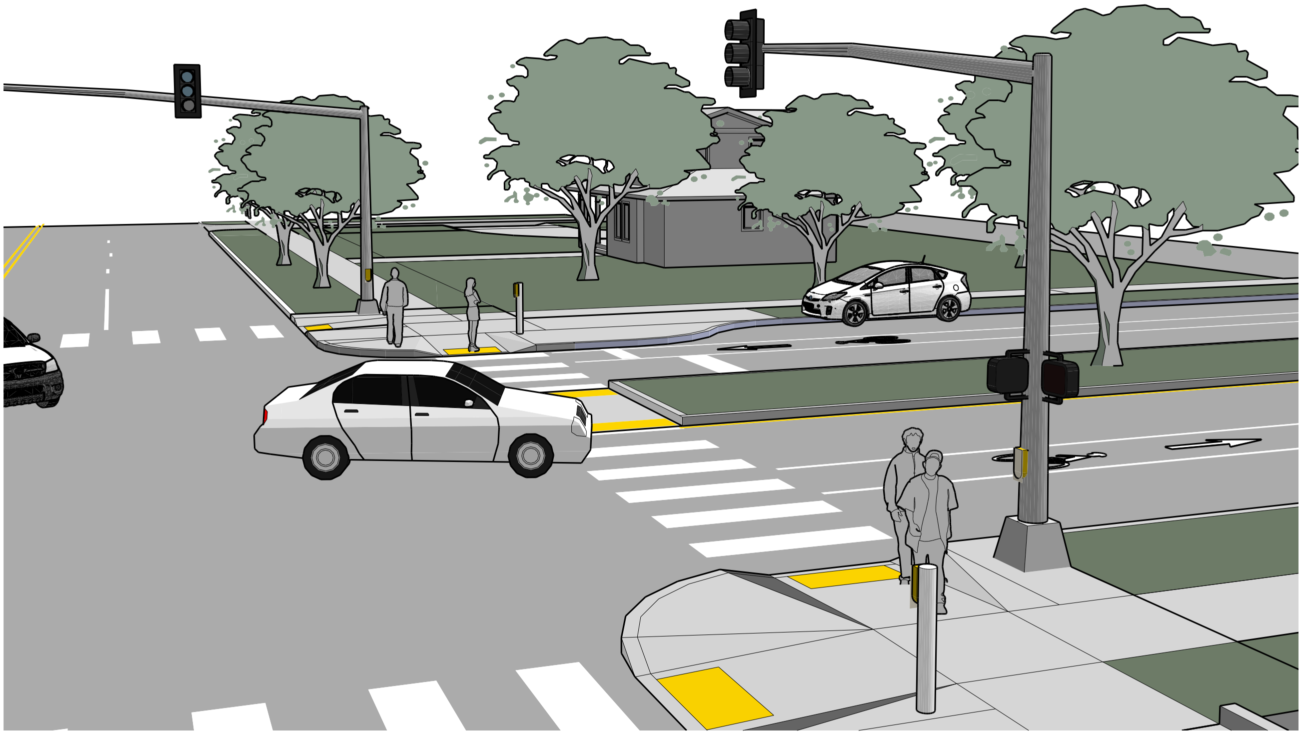
- Median refuge islands can be installed on roadways with existing medians or on multi-lane roadways where adequate space exists
- Median Refuge Islands should always be paired with crosswalks, and should include advance pedestrian warning signage when installed at uncontrolled crossings.
- On multi-lane roadways, consider configuration with active warning beacons for improved yielding compliance.

Approximate Cost

The approximate cost to install a median refuge island ranges from $500 to $1,100 per foot, or about $3,500 to $4,000, depending on the design, site conditions, landscaping, and whether the median can be added as a part of a larger street reconstruction project or utility upgrade.

Pedestrian Signalization Improvements

Pedestrian signal heads indicate to pedestrians when to cross at a signalized crosswalk. All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage. Pedestrian signals should be used at traffic signals wherever warranted, according to the MUTCD.



Typical Use

- Countdown pedestrian signals are particularly valuable for pedestrians, as they indicate whether a pedestrian has time to cross the street before the signal phase ends. Countdown signals should be used at all new and rehabilitated signalized intersections.
- Adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street.
- There are several types of signal timing for pedestrian signals, including concurrent, exclusive, “Leading pedestrian interval” (LPI), and all-red interval. In general, shorter cycle lengths and extended walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best.
- Leading Pedestrian Intervals (LPI) are used to reduce right turn and permissive left turn vehicle and pedestrian conflicts. The through pedestrian interval is initiated first, in advance of the concurrent through/right/permissive left turn interval. The LPI minimizes vehicle-pedestrian conflicts because it gives pedestrians a 3-10 second head start into the intersection, thereby making them more visible, and reducing crossing exposure time. Accessible Pedestrian Signals (APS) are recommended with an LPI.
- Automated pedestrian phases are preferred to passive or active detection, particularly in areas of high pedestrian activity.

A Pedestrian Island in large intersections helps shorten crossing distances. Source: Google Streetview

Design Features

- The MUTCD recommends that traffic signal timing assumes a pedestrian walking speed of 3.5 ft per second.[1]
- At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3 ft per second should be assumed. Special pedestrian phases can be used to provide greater visibility or more crossing time for pedestrians at certain intersections.
- Pedestrian pushbuttons may be installed at locations where pedestrians are expected intermittently. Otherwise, pedestrian signals should be automated with traffic signals. When used, pushbuttons should be well signed and within reach and operable from a flat surface for pedestrians in wheelchairs and with visual disabilities. They should be conveniently placed in the area where pedestrians wait to cross. Section 4E.09 within the MUTCD provides detailed guidance for the placement of pushbuttons to ensure accessibility.

Further Considerations

- When pushbuttons are used, they should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk. Pushbuttons should be marked (for example, with arrows) so that it is clear which signal is affected.
- In areas with very heavy pedestrian traffic, consider an all-pedestrian signal phase to give pedestrians free passage in the intersection when all motor vehicle traffic movements are stopped.
- An exclusive pedestrian signal phase called a “Pedestrian Scramble” can be provided to reduce vehicle turning conflicts.

Materials and Maintenance

It is important to perform ongoing maintenance of traffic control equipment. Consider semi-annual inspections of controller and signal equipment, intersection hardware, and detectors.

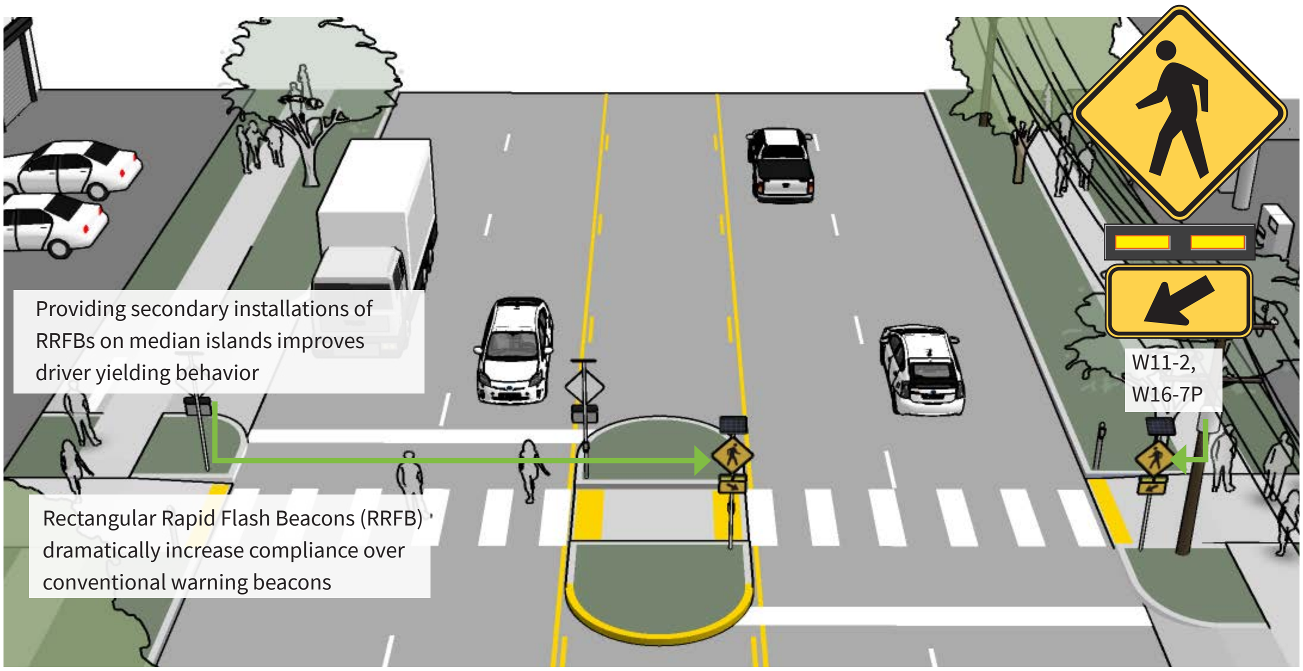
Approximate Cost

Adjusting signal timing is relatively inexpensive, as it requires only a few hours of staff time to accomplish. New signal equipment ranges from $20,000 to $140,000.

1 In Carson City, 3.5 ft per second is used for the Flashing Don't Walk (FDW) interval and 3.0 ft per second for the WALK interval.

Rectangular Rapid Flashing Beacons (RRFB)

Rectangular Rapid Flash Beacons (RRFB) are a type of active warning beacon used at unsignalized crossings. They are designed to increase motor vehicle yielding compliance on multi-lane or high-volume roadways. Guidance for marked/unsignalized crossings applies.



Typical Use

RRFBs are typically activated by pedestrians manually with a pushbutton, or can be actuated automatically with passive detection systems.

RRFBs shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.

RRFBs shall initiate operation based on user actuation and shall cease operation at a predetermined time after the user actuation or, with passive detection, after the user clears the crosswalk.

Materials and Maintenance

RRFBs should be regularly maintained to ensure that all lights and detection hardware are functional.

Design Features

Guidance for marked/unsignalized crossings applies.

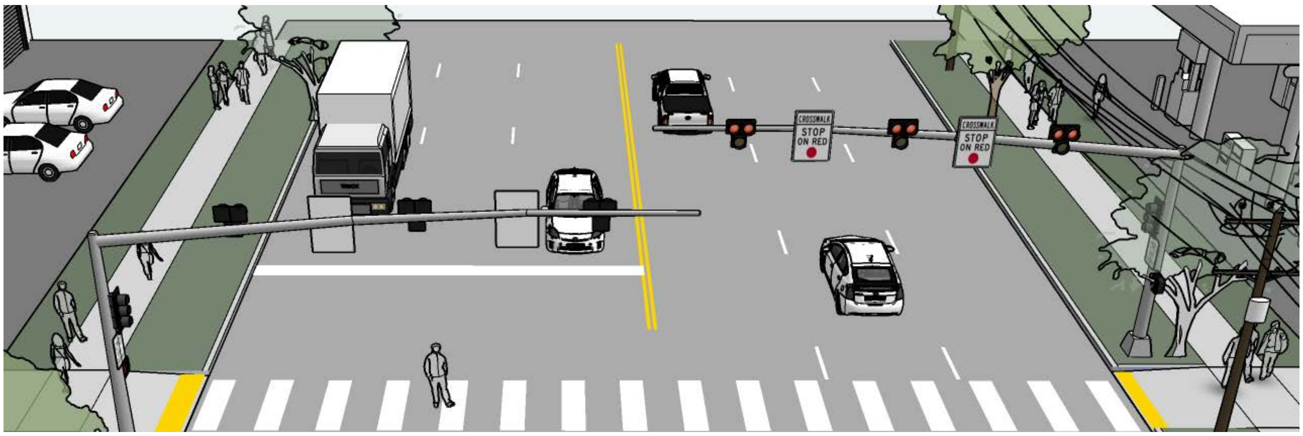
- A study of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent. A four-beacon arrangement raised compliance to 88%. Additional studies of long term installations show little to no decrease in yielding behavior over time.
- See FHWA Interim Approval 21 (IA-21) for more information on device application standards.

Approximate Cost

RRFBs range in price from $5,000 to $20,000 for a solar powered unit depending on the location, width of the road and other factors.

Pedestrian Hybrid Beacon (PHB)

Hybrid beacons or High-Intensity Activated Crosswalk (HAWK) beacons are used to improve unsignalized intersections or midblock crossings of major streets. It consists of a signal head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk. The signal is only activated when a pedestrian and/or bicyclist is present, resulting in minimal delay for motor vehicle traffic.



Typical Use

PHBs are only used at marked mid-block crossings or unsignalized intersections. They are typically activated with a pedestrian pushbutton at each end. If a median refuge island is used at the crossing, another pedestrian pushbutton can be located on the island to create a two-stage crossing.

Design Features

- PHBs may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable pedestrian crossings.
- If installed within a signal system, signal engineers should evaluate the need for the PHB to be coordinated with other signals.
- The MUTCD recommends but does not require that PHBs be installed at least 100 feet from side streets that are controlled by stop or yield signs. Many agencies have implemented successful projects at otherwise uncontrolled intersections.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.

Further Considerations

- PHBs may also be actuated by infrared, microwave, or video detectors.
- Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.
- The installation of PHBs should also include public education and enforcement campaigns to ensure proper use and compliance.

Materials and Maintenance

PHBs are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

Approximate Cost

PHBs are more expensive than other beacons, ranging in costs from $150,000 to $250,000, but are generally less expensive than full signals. PHBs may be side mounted in some contexts or solar powered to provide additional flexibility and costs closer to a RRFB installation.

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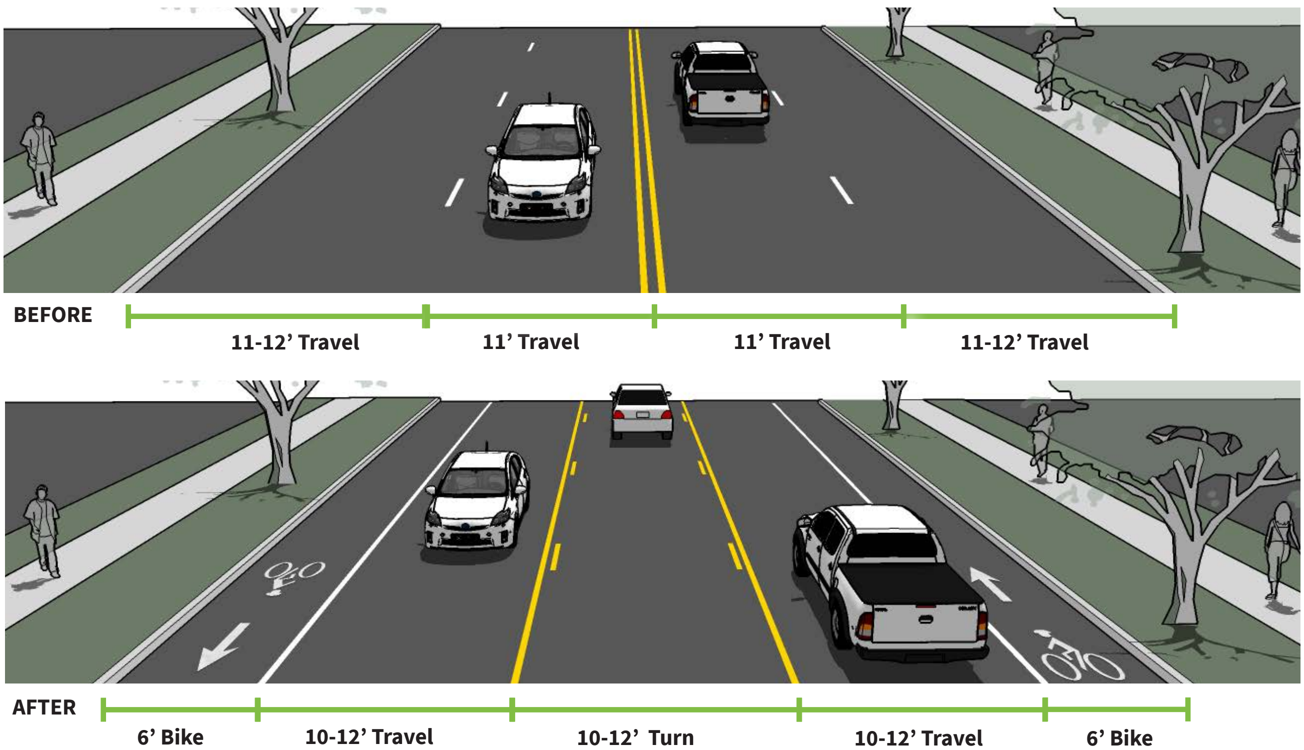
Section 3

Bicycle Toolbox

Lane Reconfigurations and Road Diets

Streets with excess roadway capacity or wider lanes often make excellent candidates for lane reconfigurations or road diet projects. The removal of a single travel lane will generally provide sufficient space for bike lanes on both sides of a street. Even if the width of the sidewalk does not increase, pedestrians benefit from the buffer that the new bike lanes create between the sidewalk and travel lanes. Although the actual roadway crossing distance has not been reduced, the addition of bike lanes reduces the number of vehicle travel lanes pedestrians must cross.



Typical Use

- Depending on a street’s existing configuration, traffic operations, user needs, and comfort level, various lane reconfigurations may be appropriate.
- For instance, a four-lane street (with two travel lanes in each direction) could be modified to provide one travel lane in each direction, a center turn lane, and bike lanes.
- Prior to implementing this measure, a traffic analysis should identify potential impacts, including diversion to other parallel neighborhood streets. Road diets should also consider school, city bus, emergency service access, and other truck volumes.

Design Features

- Narrower lanes generally encourage slower vehicle speeds, higher comfort for people walking and biking.
- Vehicle lane width: Width depends on project. No narrowing may be needed if a lane is removed. Lanes along transit and freight routes may need a minimum of 11 feet to accommodate larger vehicles.
- Bicycle lane width: Standard bicycle lane width is 5-6 feet as measured from the face of the curb. A buffered bike lane requires an additional 2-3 feet.
- Number of Lanes: Generally, 3 lanes with a center turn lane can provide a capacity of 20,000 vehicles per day., with some examples carrying over 24,000 vehicles per day.

Before-and-after road reconfiguration on Duquesne Avenue in Culver City, CA. General Flow lanes were narrowed to make way for a bike lane while retaining parking.

Materials and Maintenance

Road configurations are often paired with the road repaving schedule to reduce costs. Use bicycle compatible drainage grates, and ensure they are flush with the pavement.

Approximate Cost

Adding striped shoulders can cost as little as $1,000 per mile if old paint does not need to be removed.

The cost for restriping a street to bike lanes or reducing the number of lanes to add on-street parking is approximately $11 per foot on street, depending on the number of lane lines to be removed.

The approximate cost for restriping a roadway as depicted can range from $10,000-$60,000 per mile.

Bike Boulevards

A Bike Boulevard is a low-speed, low-volume roadway that is designed to enhance comfort and convenience for people bicycling. It provides better conditions for bicycling while improving the neighborhood character and maintaining emergency vehicle access. Bike Boulevards are intended to serve as a low-stress bikeway network, providing direct, and convenient routes across Carson City. Key elements of Bike Boulevards are unique signage and pavement markings, traffic calming and diversion features to maintain low vehicle volumes, and convenient major street crossings.

Typical Use

- Parallel with, and in close proximity to major thoroughfares (1/4 mile or less) on low-volume, low-speed streets.
- Follow a desire line for bicycle travel that is ideally long and relatively continuous (2-5 miles).
- Avoid alignments with excessive zigzag or circuitous routing. The bikeway should have less than 10% out of direction travel compared to shortest path of primary corridor.
- Local streets with traffic volumes of fewer than 3,000 vehicles per day and posted speed limits of 25 miles per hour. Utilize traffic calming to maintain or establish low volumes and discourage vehicle cut through / speeding.

Design Features

- Signs and pavement markings are the minimum treatments necessary to designate a street as a bike boulevard.
- Implement volume control treatments based on the context of the bike boulevard, using engineering judgment. While motor vehicle volumes should not exceed 3,000 vehicles per day, ideal conditions are 1,500 vehicles per day or less.
- Intersection crossings should be designed to enhance comfort and minimize delay for bicyclists of diverse skills and abilities

A Painted Intersection, planters, and curb extensions to reinforce that the street is intended for local, slow-speed use instead of cut-through vehicle traffic.

An example of an large pavement marking to reinforce that the street is a Bike Boulevard.

Further Considerations

- Bike Boulevards are established on streets that improve connectivity to key destinations and provide a direct, low-stress route for bicyclists, with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority over other modes.
- Bike Boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the Bike Boulevard.
- Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Materials and Maintenance

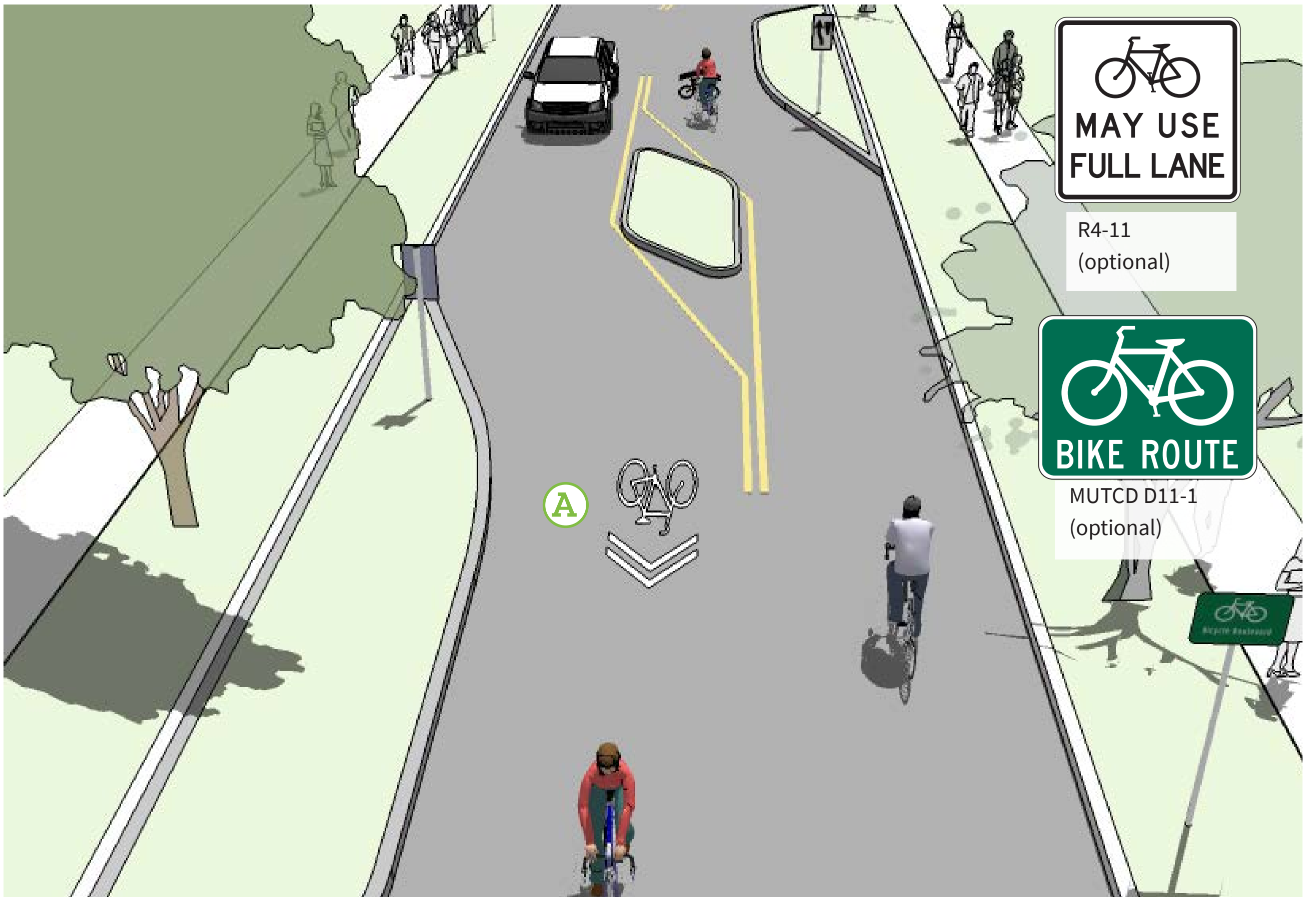
Bike Boulevards require few additional maintenance requirements to local roadways. Signage, signals, and other traffic calming elements should be inspected and maintained according to local standards.

Approximate Cost

Costs vary depending on the type of treatments proposed for the corridor. Simple treatments such as wayfinding signage and markings are most cost-effective, but more intensive treatments will have greater impact at lowering speeds and volumes, at higher cost. Costs can range from $5,000/mile on the simple end to $50,000/mile for significant horizontal deflection and diversion.

Shared Lane Markings

Shared Lane Marking (SLM) or "Sharrow" stencils are lane positioning stencils that can enhance shared roadways. The MUTCD approved pavement marking can serve a number of purposes, such as making motorists aware of the need to share the road with bicyclists, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent collisions with drivers opening car doors.



Typical Use

- Shared Lane Markings are not appropriate on paved shoulders or in bike lanes, and should not be used on roadways that have a posted speed greater than 35 mph.
- Shared Lane Markings should be implemented in conjunction with BIKES MAY USE FULL LANE signs.

Design Features

A Placement in the center of the travel lane is preferred in constrained conditions.

- Markings should be placed immediately after intersections and spaced at 250 foot intervals thereafter.
- The MUTCD recommends centering the marking a minimum of 11 feet from the curb face with on-street parking and a minimum of 4 feet from the curb with no parking. Larger offsets are frequently desirable.

Sharrows also serve as positional guidance and raise bicycle awareness where there is not space to accommodate a full-width bike lane. Center lane markings may or may not be necessary depending on travel lane widths. Narrower two way residential streets (less than 22 ft between parked cars) have a natural traffic calming effect without center turn lanes.

Further Considerations

- Consider modifications to signal timing to induce a bicycle-friendly travel speed for all users.
- Though not always possible, placing the markings outside of vehicle tire tracks will increase the life of the markings and the long-term cost of the treatment.
- A green thermoplastic background can be applied to further increase the visibility of the shared lane marking.

Materials and Maintenance

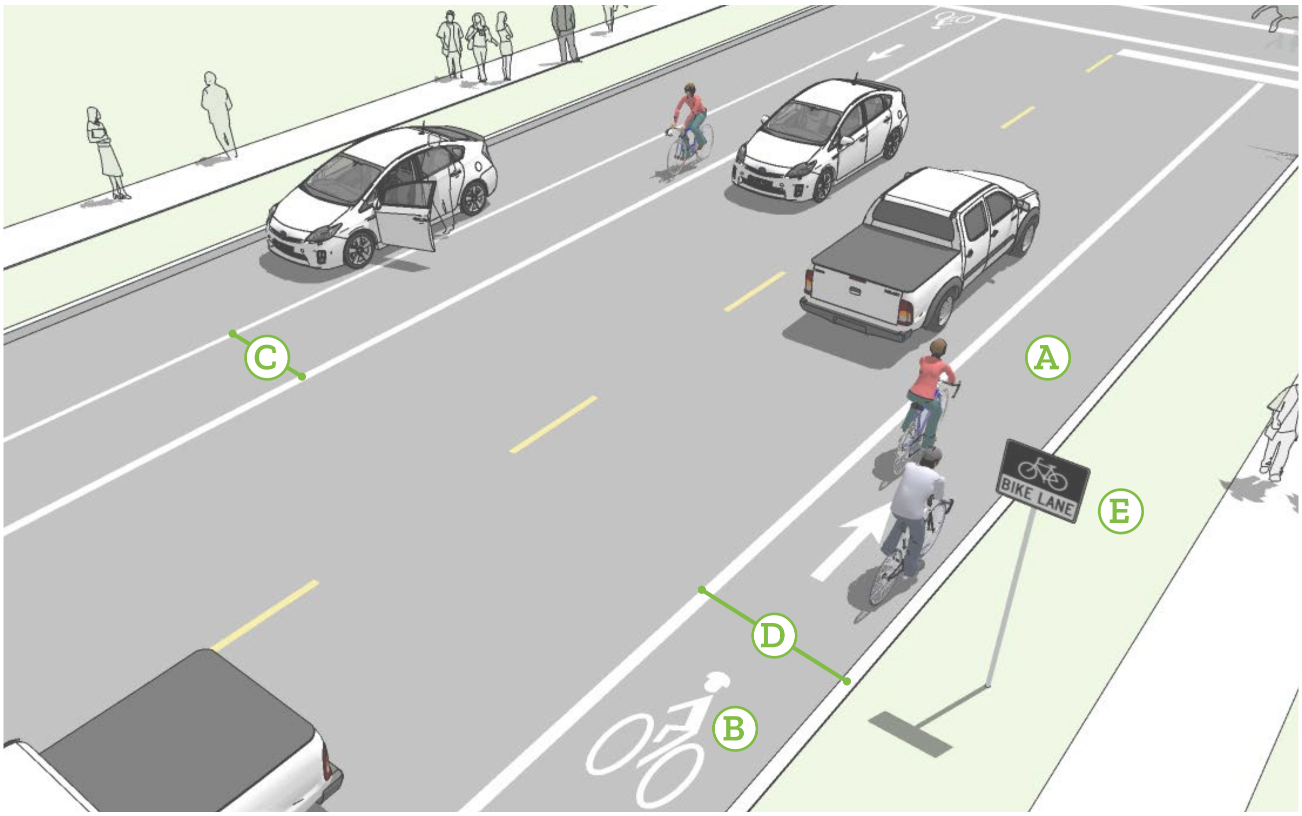
- Shared lane markings should be inspected annually and maintained accordingly, especially if located on roadways that feature high vehicle turning movements, or bus, or truck traffic. They can be placed in the center of the lane of travel to reduce wear from vehicles.

Approximate Cost

Sharrows typically cost $200 per each marking for a lane-mile cost of $4,200, assuming the MUTCD guidance of sharrow placement every 250 feet.

Bicycle Lanes

On-street bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signs. The bike lane is located directly adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.



Typical Use

- Bike lanes may be used on any street with adequate space, but are most effective on streets with moderate traffic volumes ≤ 6,000 ADT (≤ 3,000 preferred).
- Bike lanes are most appropriate on streets with lower to moderate speeds ≤ 25 mph.
- Appropriate for skilled adult riders on most streets.
- May be appropriate for children when configured as 6+ ft wide lanes on lower-speed, lower-volume streets with one lane in each direction.

Design Features

(A) Mark inside line with 6" stripe. **(MUTCD 9C.04)** Mark 4" parking lane line or "Ts".

(B) Include a bicycle lane marking **(MUTCD Figure 9C-3)** at the beginning of blocks and at regular intervals along the route. **(MUTCD 9C.04)**

(C) 6 foot width preferred adjacent to on-street parking, (5 foot min.)

(D) 5–6 foot preferred adjacent to curb and gutter (4 foot min.) or 4 feet more than the gutter pan width.

(E) The R3-17 "Bike Lane" sign is optional, but recommended in most contexts.

Further Considerations

- On high speed streets (≥ 40 mph) the minimum bike lane should be 6 feet.
- It may be desirable to reduce the width of general purpose travel lanes in order to add or widen bicycle lanes.
- On multi-lane streets, the most appropriate bicycle facility to provide for user comfort may be buffered bicycle lanes or physically separated bicycle lanes.

Manhole Covers and Grates:

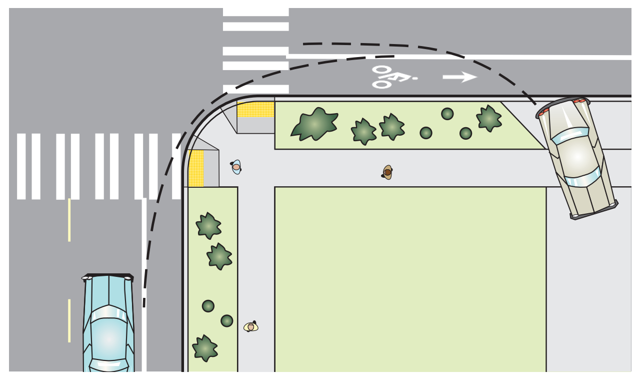
- Manhole surfaces should be manufactured with a shallow surface texture in the form of a tight, nonlinear pattern
- If manholes or other utility access boxes are to be located in bike lanes within 50 ft. of intersections or within 20 ft. of driveways or other bicycle access points, special manufactured permanent nonstick surfaces are required to ensure a controlled travel surface for cyclists breaking or turning.
- Manholes, drainage grates, or other obstacles should be set flush with the paved roadway. Roadway surface inconsistencies pose a threat to safe riding conditions for bicyclists. Construction of manholes, access panels or other drainage elements should be constructed with no variation in the surface. The maximum allowable tolerance in vertical roadway surface will be 1/4 of an inch.

Materials and Maintenance

Bike lane striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway.

Bike lanes should also be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

Bike lanes provided dedicated spaces for cyclists to ride on the street.



Place Bike Lane Symbols to Reduce Wear

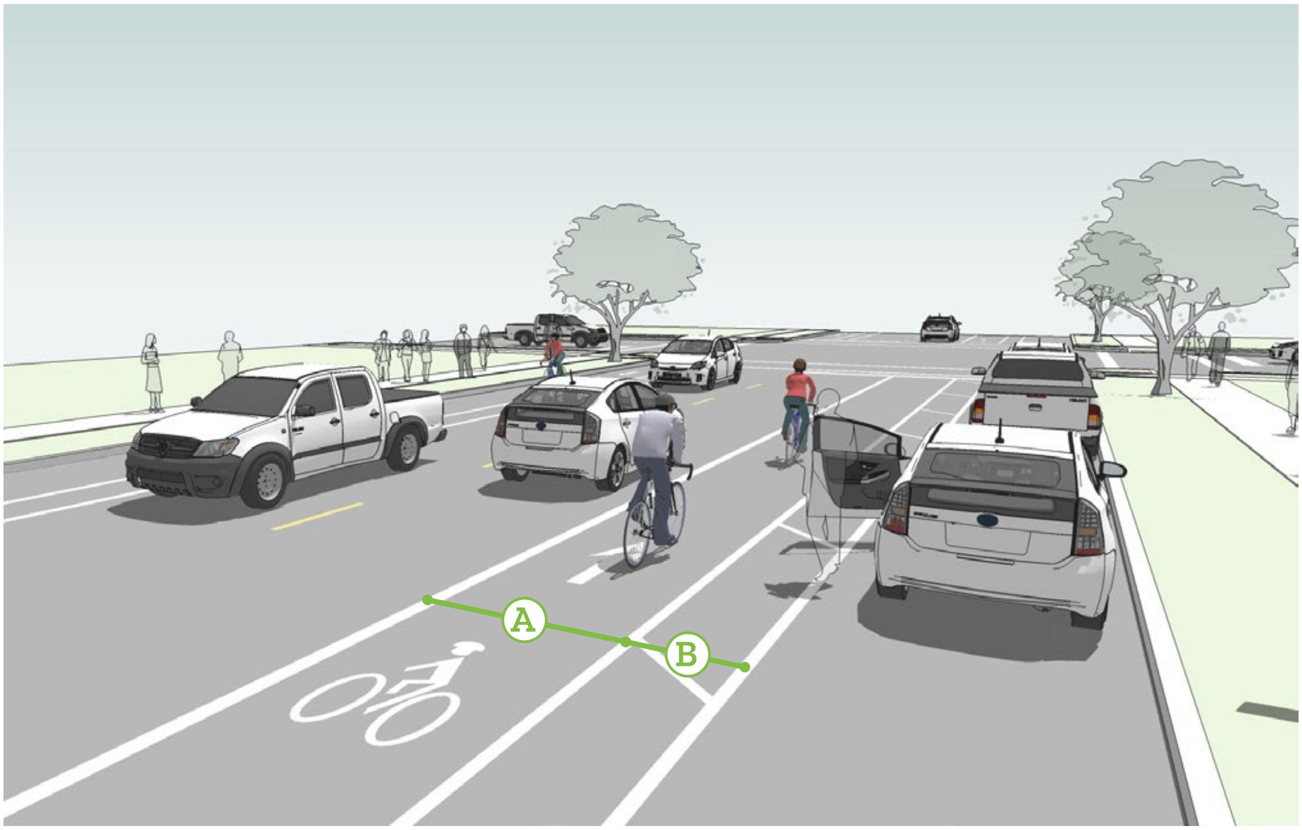
Bike lane word, symbol, and/or arrow markings **(MUTCD Figure 9C-3)** *shall be placed outside of the motor vehicle tread path in order to minimize wear from the motor vehicle path.* **(NACTO 2012)**

Approximate Cost

The cost for installing bicycle lanes varies and will depend on the implementation approach. Typical costs are $16,000 per mile for restriping using paint. More durable thermoplastic materials and the cost of repaving, or removing/replacing existing vehicle lane striping is not accounted for in this estimate. .

Buffered Bicycle Lanes

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane.



Typical Use

- Anywhere a conventional bike lane is being considered.
- While conventional bike lanes are most appropriate on streets with lower to moderate speeds (≤ 25 mph), buffered bike lanes are appropriate on streets with higher speeds (+25 mph) and high volumes or high truck volumes (up to 6,000 ADT).
- On streets with extra lanes or lane width.
- Appropriate for skilled adult riders on most streets.

Design Features

A The minimum bicycle travel area (not including buffer) is 5 feet wide.

B Buffers should be at least 2 feet wide. If buffer area is 4 feet or wider, white chevron or diagonal markings should be used.

- For clarity at driveways or minor street crossings, consider a dotted line.
- There is no standard for whether the buffer is configured on the parking side, the travel side, or a combination of both.

Buffered bike lanes should consider both vehicular traffic and parked cars.

The use of additional pavement markings delineates space between vehicles and cyclists.

Further Considerations

- Color may be used within the lane to discourage motorists from entering the buffered lane.
- A study of buffered bicycle lanes found that, in order to make the facilities successful, there needs to also be driver education, improved signage and proper pavement markings.[1]
- On multi-lane streets with high vehicles speeds, the most appropriate bicycle facility to provide for user comfort may be physically separated bike lanes.
- NCHRP Report #766 recommends, when space is limited, installing a buffer space between the parking lane and bicycle lane where on-street parking is permitted rather than between the bicycle lane and vehicle travel lane.[2]

Materials and Maintenance

Bike lane striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway.

Bike lanes should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

Approximate Cost

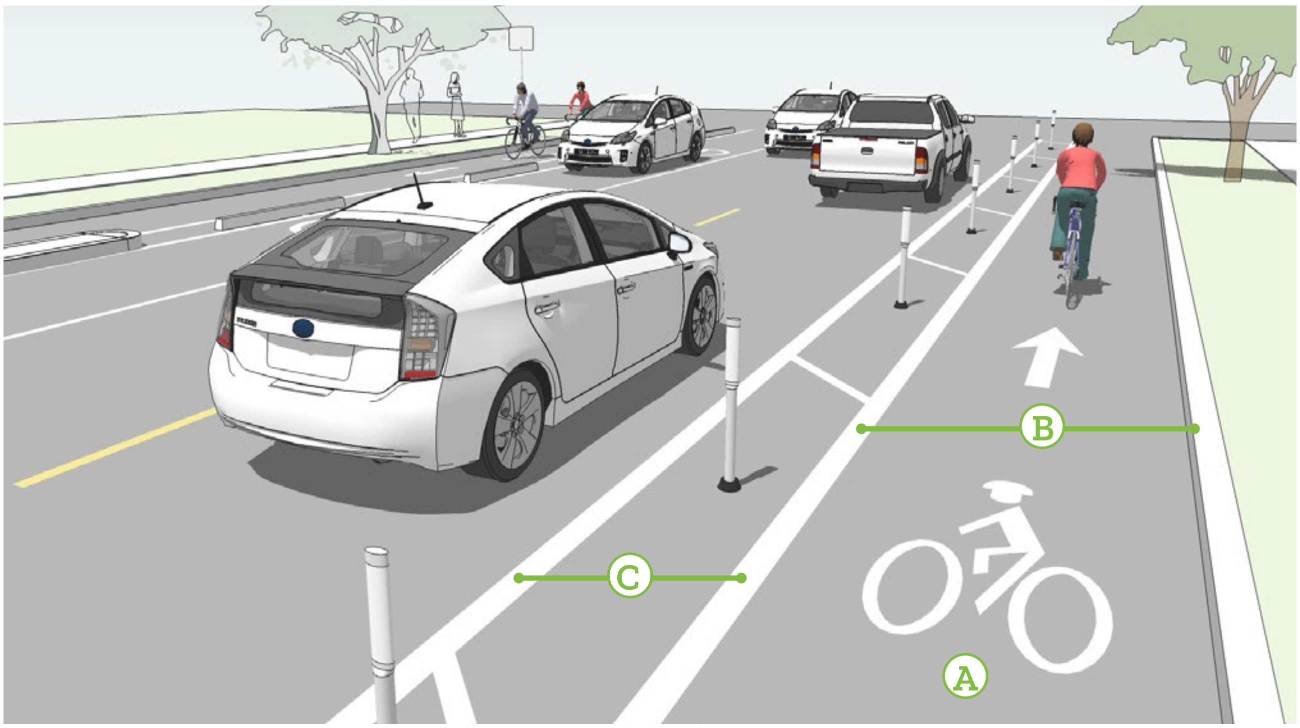
The cost for installing buffered bicycle lanes will depend on the implementation approach. Typical costs are $16,000 per mile for paint based restriping. More durable thermoplastic materials and the cost of repaving, or removing/replacing existing vehicle lane striping is not accounted for in this estimate.

1 Monsere, C.; McNeil, N.; and Dill, J., "Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track and SW Stark/ Oak Street Buffered Bike Lanes. Final Report" (2011).Urban Studies and Planning Faculty Publications and Presentations.

2 National Cooperative Highway Research Program. Report #766: Recommended Bicycle Lane Widths for Various Roadway Characteristics.

One-Way Separated Bikeway

One-way separated bikeways, also known as protected bikeways or cycle tracks, are on-street bikeway facilities that are separated from vehicle traffic. Physical separation is provided by a barrier between the bikeway and the vehicular travel lane. These barriers can include flexible posts, bollards, parking, planter strips, extruded curbs, or on-street parking. Separated bikeways using these barrier elements typically share the same elevation as adjacent travel lanes, but the bikeway could also be raised above street level, either below or equivalent to sidewalk level.



Typical Use

- Along streets on which conventional bicycle lanes would cause many bicyclists to feel stress because of factors such as multiple lanes, high bicycle volumes, high motor traffic volumes (9,000-30,000 ADT), higher traffic speeds (25+ mph), high incidence of double parking, higher truck traffic (10% of total ADT) and high parking turnover.
- Along streets for which conflicts at intersections can be effectively mitigated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.

Design Features

(A) Pavement markings, symbols and/or arrow markings must be placed at the beginning of the separated bikeway and at intervals along the facility based on engineering judgment to define the bike direction. **(MUTCD 9C.04)**

(B) 7 foot width preferred in areas with high bicycle volumes or uphill sections to facilitate safe passing behavior (5 ft minimum).

(C) When placed adjacent to parking, the parking buffer should be 3 ft wide to allow for passenger loading and to prevent door collisions.

- When placed adjacent to a travel lane, one-way raised cycle tracks may be configured with a mountable curb to allow entry and exit from the bicycle lane for passing other bicyclists or to access vehicular turn lanes.

Parked cars serve as a barrier between bicyclists and the vehicle lane. Barriers could also include flexible posts, bollards, planters, or other design elements. Source: Bike East Bay

Further Considerations

- If the buffer area is 4 feet or wider, white chevron or diagonal markings should be used. Curbs may be used as a channeling device. Grade-separation provides an enhanced level of separation in addition to buffers and other barrier types.
- Where possible, physical barriers such as removable curbs should be oriented towards the inside edge of the buffer to provide as much extra width as possible for bicycle use.
- A retrofit separated bikeway has a relatively low implementation cost compared to road reconstruction by making use of existing pavement and drainage and using a parking lane as a barrier.
- Gutters, drainage outlets and utility covers should be designed and configured as not to impact bicycle travel.
- For clarity at major or minor street crossings, consider a dotted line for the buffer boundary where cars are expected to cross.
- Special consideration should be given at transit stops to manage bicycle and pedestrian interactions.

Materials and Maintenance

Bikeway striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway. Green conflict striping (if used) will also generally require higher maintenance due to vehicle wear.

Bikeways should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

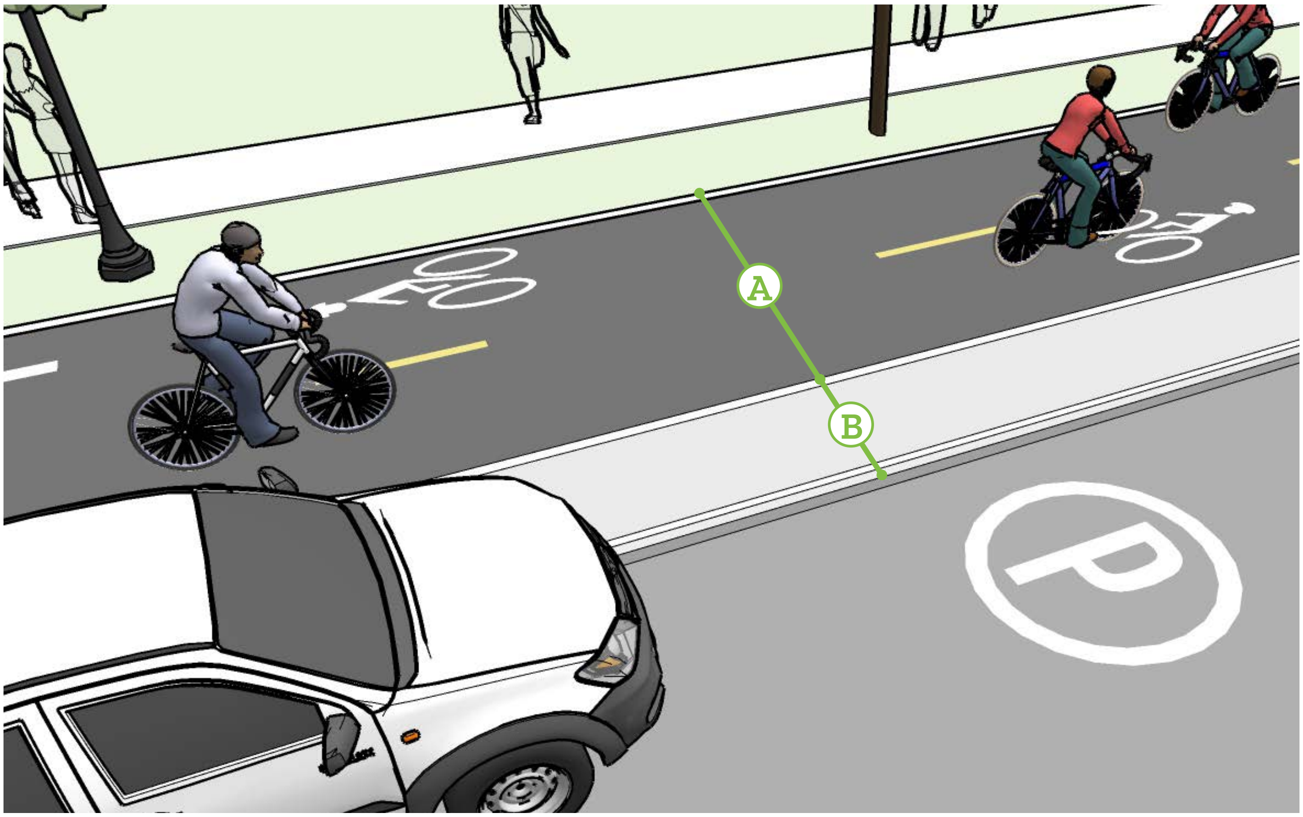
Access points along the facility should be provided for street sweeper vehicles to enter/exit the separated bikeway,

Approximate Cost

Separated bikeway construction costs can vary drastically depending on the type of separation used, the amount of new curb and gutter, stormwater mitigation, and crossing treatments. On the lower end of the scale, construction of a striped parking protected bikeway without delineators or other vertical elements can cost as little as $16,000 per mile.

Two-Way Separated Bikeway

Two-Way Separated Bikeways are bicycle facilities that allow bicycle movement in both directions on one side of the road. Two-way separated bikeways share some of the same design characteristics as one-way separated bikeways, but often require additional considerations at driveway and side-street crossings, and intersections with other bikeways.



Typical Use

- Works best on the left side of one-way streets.
- Streets with high motor vehicle volumes and/or speeds
- Streets with high bicycle volumes.
- Streets with a high incidence of wrong-way bicycle riding.
- Streets with few conflicts such as driveways or cross-streets on one side of the street.
- Streets that connect to shared use paths.

Design Features

A 12 foot operating width preferred (10 ft minimum) width for two-way facility.

- In constrained locations an 8 foot minimum operating width may be considered.

B Adjacent to on-street parking a 3 foot minimum width channelized buffer or island shall be provided to accommodate opening doors. **(NACTO, 2012**

- Additional signalization and signs may be necessary to manage conflicts.

Two-Way Separated Bikeway

A two-way facility can accommodate cyclists in two directions of travel.

Further Considerations

- A two-way separated bikeway on one way street should be located on the left side.
- A two-way separated bikeway may be configured at street level or as a raised separated bikeway with vertical separation from the adjacent travel lane.
- Two-way separated bikeways should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles.

Materials and Maintenance

Bikeway striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway. Green conflict striping (if used) will also generally require higher maintenance due to vehicle wear.

Bikeways should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

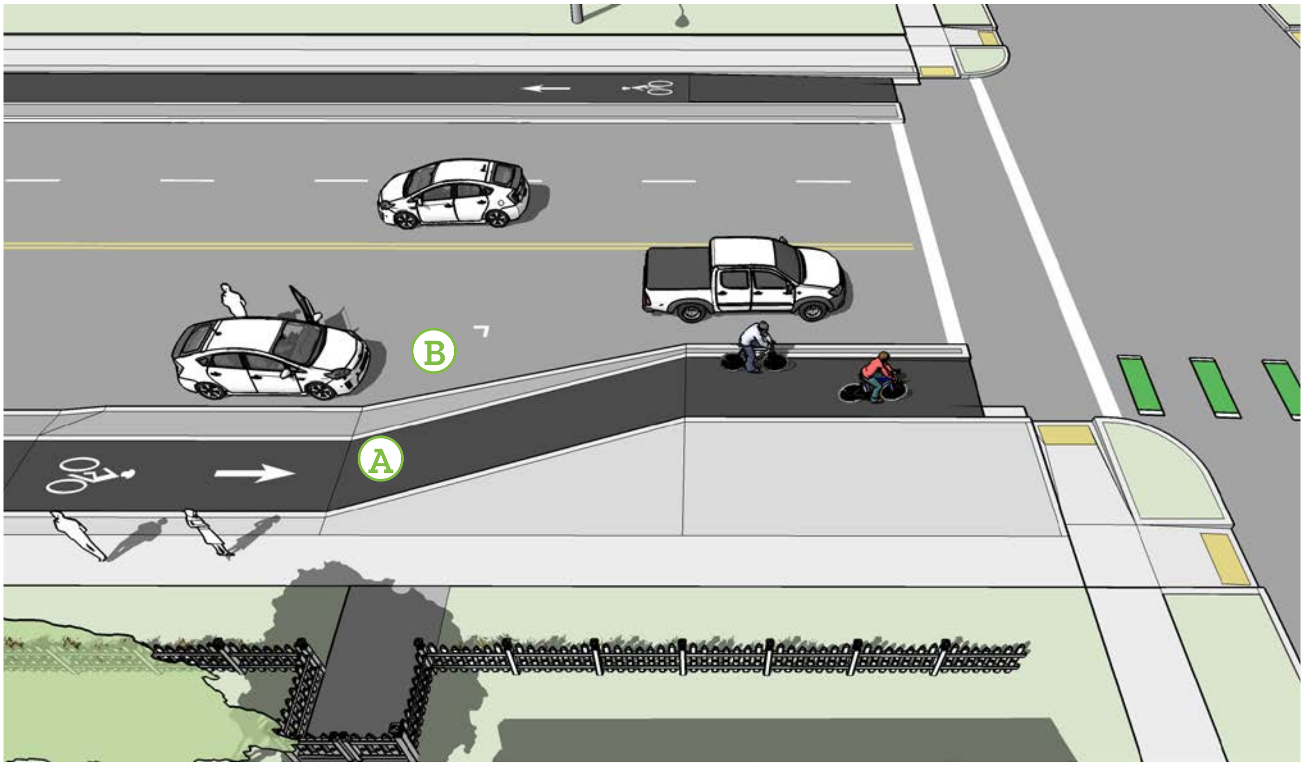
Access points along the facility should be provided for street sweeper vehicles to enter/exit the separated bikeway.

Approximate Cost

Separated bikeway construction costs can vary drastically depending on the type of separation used, the amount of new curb and gutter, stormwater mitigation, and crossing treatments. On the lower end of the scale, construction of a striped parking protected bikeway with delineators or other vertical elements can cost as little as $15,000-$30,000 per mile.

Bend-In

To increase the visibility of bicyclists for turning motorists, a "bend-in" intersection approach laterally shifts the separated bikeway immediately adjacent to the turning lane.



Typical Use

- Bikeways separated by a visually intensive buffer or on-street parking.
- Where it is desirable to create a curb extension at intersections to reduce pedestrian crossing distance.
- Where space is not available to bend-out the bikeway prior to the intersection.

Design Features

(A) At least 20 ft prior to an intersection, provide between 20 – 40 ft of length to shift the bikeway closer to motor vehicle traffic.

(B) Where the separated bikeway uses parked cars within the buffer zone, parking must be prohibited at the start of the transition.

- Place a "Turning Vehicles Yield to Bikes" sign (modified MUTCD R10-15) prior to the intersection.
- Optional - Provide a narrow buffer with vertical delineators between the travel and lane and bikeway to increase comfort for bicycle riders and slow driver turning speed.

Clear sight lines at intersections and driveways for people on bikes and people driving are an important aspect of this design.

The approach to an adjacent crossing intersection in Vancouver, BC.

Further Considerations

- The design creates an opportunity for a curb extension, to reduce pedestrian crossing distance. This curb extension can also create public space which can be used bike parking corrals, bikeshare stations, parklets, public art exhibits, and/or stormwater features such as bioswales.
- Can be paired with intersection crossing markings such as green colored pavement to raise awareness of conflict points.

Materials and Maintenance

Bikeway striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway. Green conflict striping (if used) will also generally require higher maintenance due to vehicle wear.

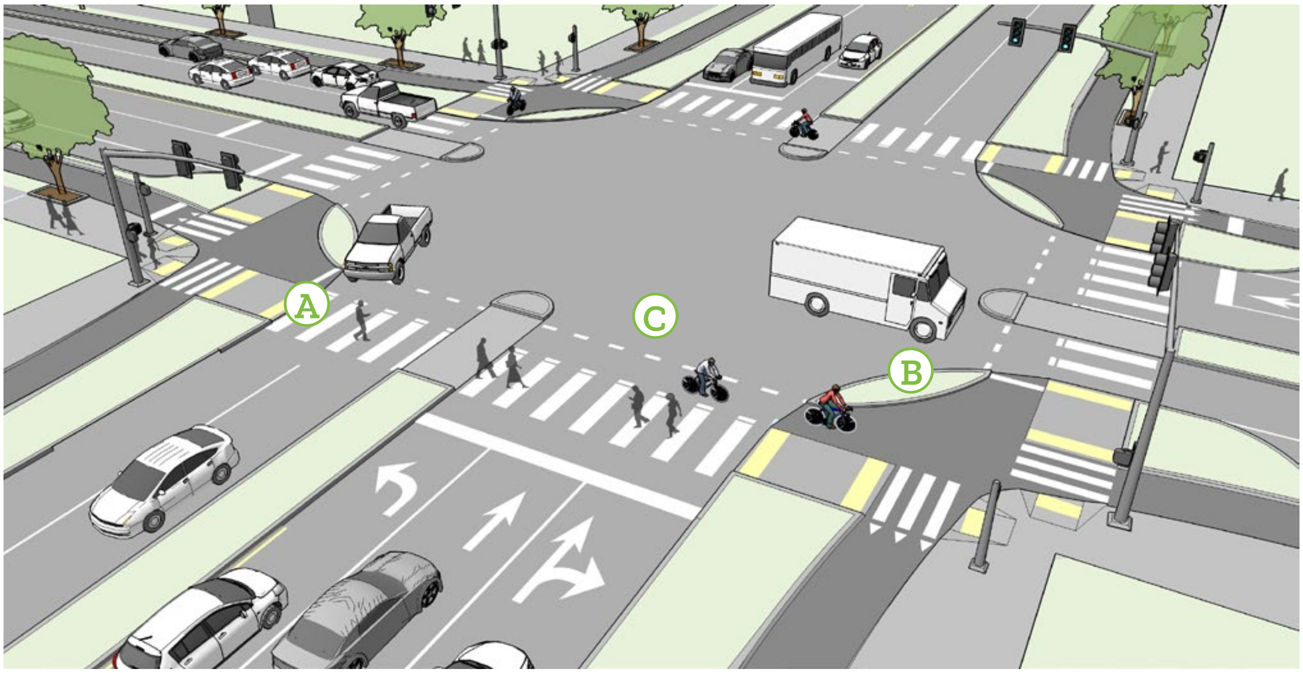
Bikeway should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

Approximate Cost

The costs of the lateral shift or protected intersection elements vary depending on materials used and degree of implementation desired. Inexpensive materials can used, such as paint, concrete planters, and bollards.

Protected Intersection

A protected intersection, or "Bend Out" uses a collection of intersection design elements to maximize user comfort within the intersection and promote a high rate of motorists yielding to people bicycling. The design maintains a physical separation within the intersection to define the turning paths of motor vehicles, slow vehicle turning speed, and offer a comfortable place for people bicycling to wait at a red signal.



Typical Use

- Streets with separated bikeways protected by wide buffer or on-street parking.
- Where two separated bikeways intersect and two-stage left-turn movements can be provided for bicycle riders.
- Helps reduce conflicts between right-turning motorists and bicycle riders by reducing turning speeds and providing a forward stop bar for bicycles.
- Where it is desirable to create a curb extension at intersections to reduce pedestrian crossing distance.

Design Features

A. Setback bicycle crossing of 19.5 feet allows for one passenger car to queue while yielding. Smaller setback distance is possible in slow-speed, space constrained conditions.

B. Corner island with a 15-20 foot corner radius slows motor vehicle speeds. Larger radius designs may be possible when paired with a deeper setback or a protected signal phase, or small mountable aprons. Two-stage turning boxes are provided for queuing bicyclists adjacent to corner islands.

C. Use intersection crossing markings.

Protected intersections feature a corner safety island and intersection crossing markings.

Protected intersections incorporate queuing areas for two-stage left turns.

Further Considerations

- Pedestrian crosswalks may need to be further set back from intersections in order to make room for two-stage turning queue boxes.
- Wayfinding and directional signage should be provided to help bicycle riders navigate through the intersection.
- Colored pavement may be used within the corner refuge area to clarify use by people bicycling and discourage use by people walking or driving.
- Intersection approaches with high volumes of right turning vehicles should provide a dedicated right turn only lane paired with a protected signal phase. Protected signal phasing may allow different design dimensions than are described here.

Materials and Maintenance

- Green conflict striping (if used) will also generally require higher maintenance due to vehicle wear.
- Bikeways should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.
- Bikeways protected by concrete islands or other permanent physical separation, can be swept by street sweeper vehicles with narrow widths.

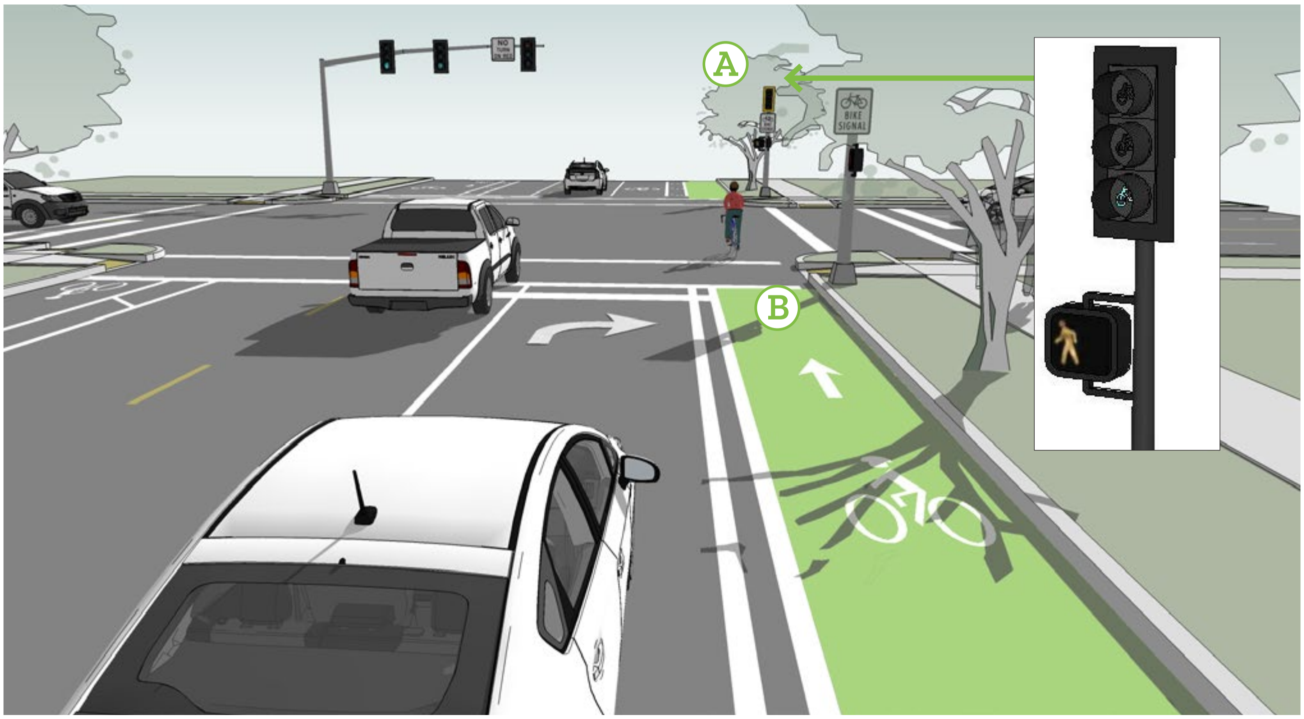
Approximate Cost

The cost of protected intersection elements vary depending on materials used and degree of implementation desired.

- Complete reconstruction costs comparable to a full intersection.
- Retrofit implementation may be possible at lower costs if existing curbs and drainage are maintained. Inexpensive materials can used, such as paint, concrete planters, and bollards.

Separated Bicycle Signal Phase

Separated bicycle lane crossings of signalized intersections can be accomplished through the use of a bicycle signal phase which reduces conflicts with motor vehicles by separating bicycle movements from any conflicting motor vehicle movements. Bicycle signals are traditional three lens signal heads with green, yellow and red bicycle stenciled lenses.



Typical Use

- Two-way protected bikeways where contraflow bicycle movement or increased conflict points warrant protected operation.
- Bicyclists moving on a green or yellow signal indication in a bicycle signal shall not be in conflict with any simultaneous motor vehicle movement at the signalized location
- Right (or left) turns on red should be prohibited in locations where such operation would conflict with a green bicycle signal indication.

Design Features

(A) An additional "Bicycle Signal" sign should be installed below the bicycle signal head.

(B) Designs for bicycles at signalized crossings should allow bicyclists to trigger signals via pushbutton, loop detectors, or other passive detection, to navigate the crossing.

- On bikeways, signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists. **(MUTCD 9D.02)**

A bicycle signal head at a signalized crossing creates a protected phase for cyclists to safely navigate an intersection.

A bicycle detection system triggers a change in the traffic signal when a bicycle is detected.

Further Considerations

- A bicycle signal should be considered for use only when the volume/collision or volume/geometric warrants have been met.
- The Federal Highway Administration (FHWA) has approved bicycle signals for use, if they comply with requirements from Interim Approval 16 (I.A. 16). Bicycle Signals are not approved for use in conjunction with Pedestrian Hybrid Beacons.
- Bicyclists typically need more time to travel through an intersection than motor vehicles. Green light times should be determined using the bicycle crossing time for standing bicycles.
- Bicycle detection and actuation systems include user-activated buttons mounted on a pole, loop detectors that trigger a change in the traffic signal when a bicycle is detected and video detection cameras, that use digital image processing to detect a change in the image at a location.

Materials and Maintenance

Bicycle signal detection equipment should be inspected and maintained regularly, especially if detection relies on manual actuation. Pushbuttons and loop detectors will tend to have higher maintenance needs than other passive detection equipment.

Approximate Cost

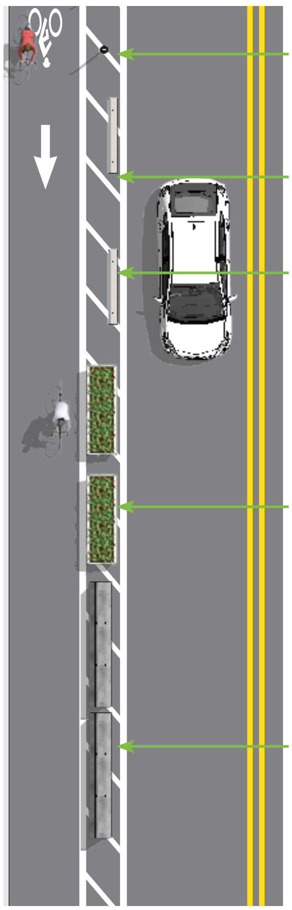
Bicycle signal heads have an average cost of $12,800.

Video detection camera system costs range from $15,000 to $25,000 per intersection.

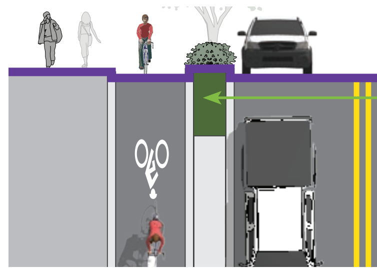
Separated Bikeway Barriers

Separated bikeways may use a variety of vertical elements to physically separate the bikeway from adjacent travel lanes. Barriers may be robust constructed elements such as curbs, or may be more interim in nature, such as flexible delineator posts.

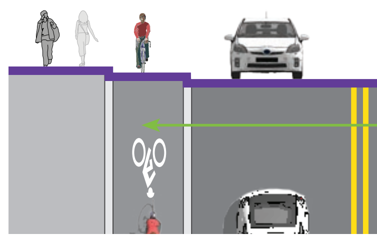
Barrier Separation



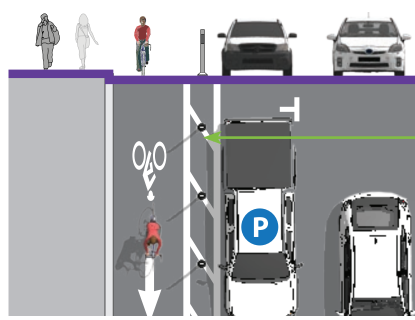
Media Separation



Grade Separation



Parking Separation



Typical Use

Appropriate barriers for retrofit projects:

- Parked Cars
- Flexible delineators
- Bollards
- Planters
- Parking stops

Appropriate barriers for reconstruction projects:

- Curb separation
- Medians
- Landscaped medians
- Raised protected bike lane with vertical or mountable curb
- Pedestrian Refuge Islands

Raised separated bikeways are bicycle facilities that are vertically separated from motor vehicle traffic.

Design Features

- Maximize effective operating space by placing curbs or delineator posts as far from the through bikeway space as practicable.
- Allow for adequate shy distance of 1 to 2 feet from vertical elements to maximize useful space.
- When next to parking allow for 3 feet of space in the buffer space to allow for opening doors and passenger unloading.
- The presences of landscaping in medians, planters and safety islands increases comfort for users and enhances the streetscape environment.

Further Considerations

- With new roadway construction, a raised separated bikeway can be less expensive to construct than a wide or buffered bicycle lane because of shallower trenching and sub base requirements.
- Parking should be prohibited within 30 feet of the intersection to improve visibility.

Materials and Maintenance

Separated bikeways protected by concrete islands or other permanent physical separation, can be swept by smaller street sweeper vehicles.

Access points along the facility should be provided for street sweeper vehicles to enter/exit the separated bikeway.

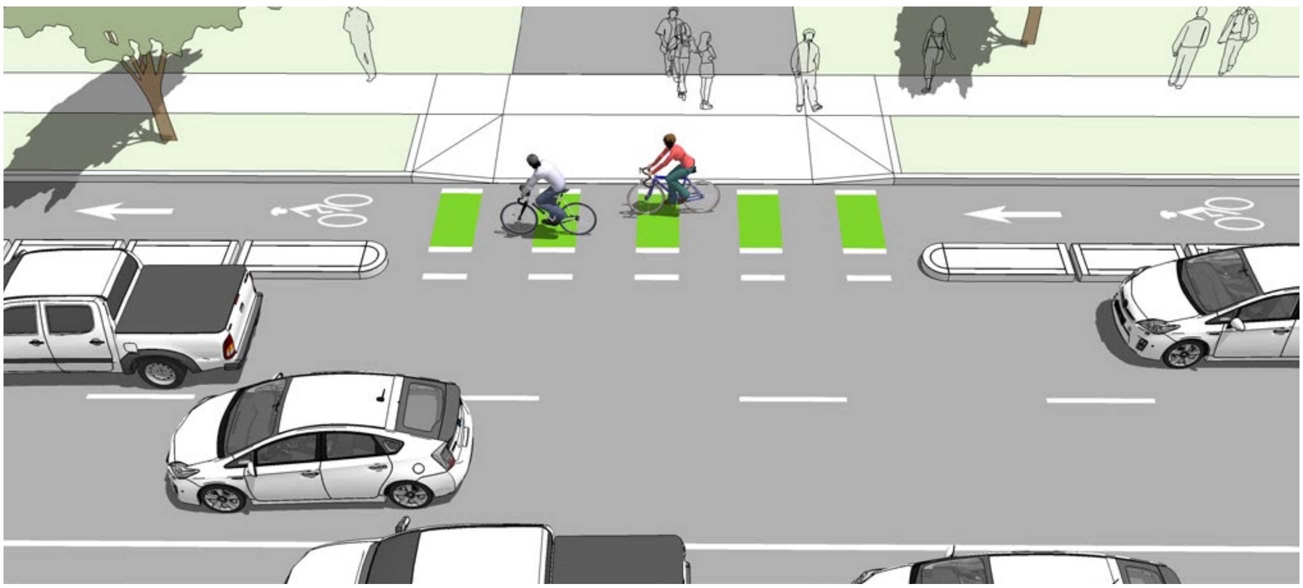
Approximate Cost

Separated bikeway barrier material costs can vary greatly, depending on the type of material, the scale, and whether it is part of a broader construction project.

Separated Bikeways at Driveways (and Minor Streets)

The added separation provided by separated bikeways creates additional considerations at intersections and driveways when compared to conventional bicycle lanes. Special design guidelines are necessary to preserve sightlines and denote potential conflict areas between modes, especially when motorists turning into or out of driveways may not be expecting bicycle travel opposite to the main flow of traffic.

At driveways and crossings of minor streets, bicyclists should not be expected to stop if the major street traffic does not stop.



Typical Use

- Along streets with separated bikeway where there are intersections and driveways.
- Higher frequency driveways or crossings may require additional treatment such as conflict markings and signs.

Design Features

- Remove parking to allow for the appropriate clear sight distance before driveways or intersections to improve visibility. The desirable no-parking area is at least 30 feet from each side of the crossing.
- Use colored pavement markings and/or shared line markings through conflict areas at intersections.
- If a raised bikeway is used, the height of the lane should be maintained through the crossing, requiring automobiles to cross over.
- Motor vehicle traffic crossing the bikeway should be constrained or channelized to make turns at sharp angles to reduce travel speed prior to the crossing.
- Driveway crossings may be configured as raised crossings to slow turning cars and assert physical priority of travelling bicyclists.
- Motor vehicle stop bar on cross-streets and driveways is setback from the intersection to ensure that drivers slow down and scan for pedestrians and bicyclists before turning.

Intersection crossing markings can be used at high volume driveway and minor street crossings, as illustrated above.

Further Considerations

- Removing obstructions and providing clear sight distance at crossings increases visibility of bicyclists.
- Treatments designed to constrain and slow turning motor vehicle traffic will slow drivers to bicycle-compatible travel speeds prior to crossing the separated bikeway.

Materials and Maintenance

Green conflict striping and markings, will require higher maintenance where vehicles frequently traverse over them at driveways and minor intersection. Green conflict striping (if used) will also generally require higher maintenance due to vehicle wear.

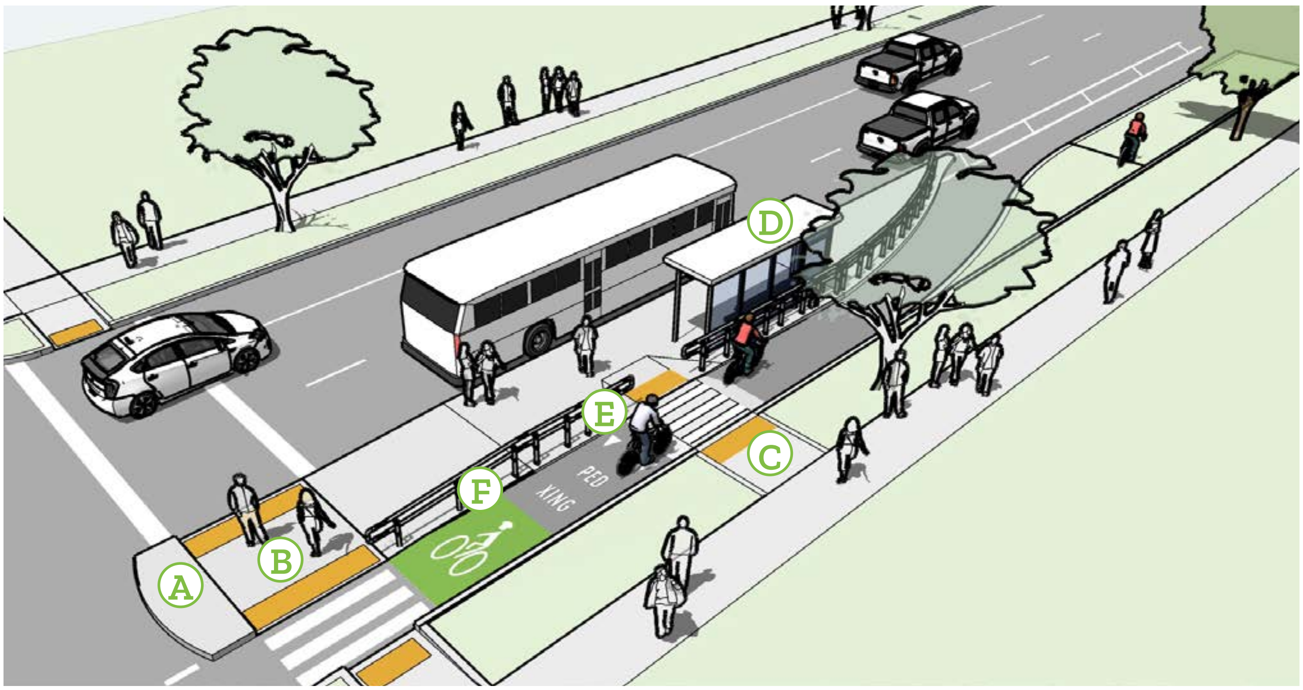
Approximate Cost

The cost for installing high visibility colored crossing markings will depend on the materials selected and implementation approach. Typical costs range from \$1.20/sq. ft. installed for paint to \$14/sq. ft. installed for thermoplastic. Colored pavement is more expensive than standard asphalt installation, costing 30-50% more than non-colored asphalt.

Separated Bikeways at Transit Side Boarding Islands

A transit side boarding island is a channelized lane for bicyclists designed to provide a path for bicyclists to pass stopped transit vehicles, and clarify interactions between pedestrians, bicyclists, and passengers, boarding and alighting.

This is particularly helpful on corridors with high volumes of transit vehicles and bicyclists, where "leapfrogging" may occur, and on separated bikeway corridors where maintaining physical separation is important to maintain user comfort.



Typical Use

- Routes where bike lanes or separated bikeways and transit operations overlap.
- Provides an in-lane stop for buses, reducing delay at stops.
- Median refuge also provides a shorter crossing for pedestrians at intersections

Design Features

Ⓐ Pedestrian median refuge island (optional) shortens the crossing distance at intersections.

Ⓑ Pedestrian ramp into crosswalks should be ADA compliant with detectable warning surfaces.

Ⓒ Direct pedestrians to crossing locations to minimize conflicts between modes.

Ⓓ High volume stops should have room for appropriately sized shelters and transit amenities.

Ⓔ Pavement markings and signage should clarify expectations among users. The bikeway could also ramp up to sidewalk level at this crossing to reduce bicycle speeds and enhance ADA access to the stop.

Ⓕ Pavement markings on the bikeway should define the bicycle path of travel to minimize intrusion by pedestrians, except at designated crossings.

A transit side boarding island clarifies user spaces and minimizes conflict between bicyclists. pedestrians, transit passengers, buses, and vehicles.

Further Considerations

- Transit island should be wide enough to accommodate mobility devices. An 8'x 5' accessible clear space is required at the front door per ADA requirements.
- Transit platforms should feature pedestrian scale lighting.
- Side boarding island will require detectable warning surfaces along full length of platform if greater than 6" high.

Materials and Maintenance

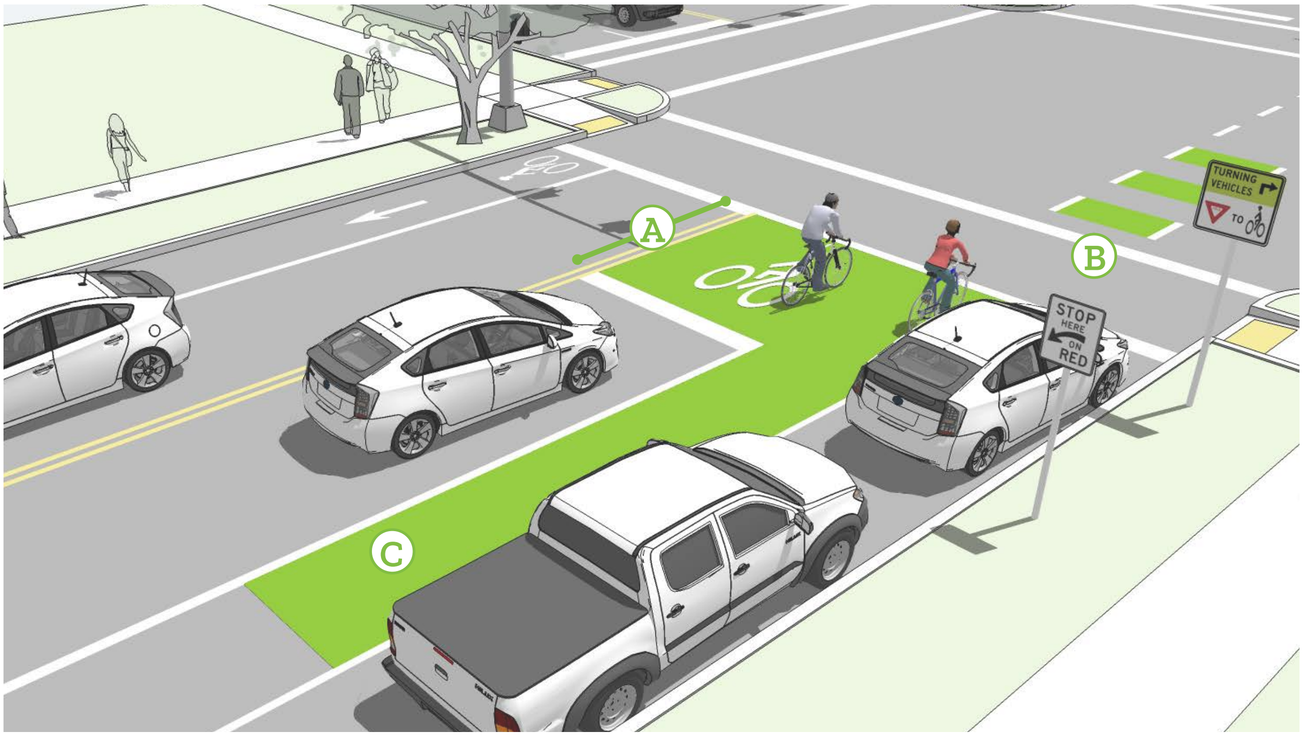
Similar to median refuge islands, side boarding islands may require frequent maintenance of road debris. If at street grade, the bikeway can be swept by street sweeper vehicles with narrow widths.

Approximate Cost

The approximate cost of a side boarding island is similar to median refuge islands ranging from $500 to $1,100 per foot, or about $3,500 to $4,000, depending on the design, and site conditions. This cost is exclusive of transit shelters and amenities, landscaping, and lighting.

Bicycle Box

A bicycle box is an experimental treatment, designed to provide bicyclists with a safe and visible space to get in front of queuing traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box. On a green signal, all bicyclists can quickly clear the intersection. This treatment received Interim Approval from the FHWA in 2016.



Typical Use

- At potential areas of conflict between bicyclists and turning vehicles, such as a right or left turn locations.
- At signalized intersections with high bicycle volumes.
- At signalized intersections with high vehicle volumes.
- Not to be used on downhill approaches to minimize the right hook threat potential during the extended green signal phase.

Design Features

A. 14 foot minimum depth from back of crosswalk to motor vehicle stop bar. **(NACTO, 2012)**

B. A "No Turn on Red" **(MUTCD R10-11)** sign shall be installed overhead to prevent vehicles from entering the Bike Box. A "Stop Here on Red" **(MUTCD R10-6)** sign should be post mounted at the stop line to reinforce observance of the stop line.

C. A 50 foot ingress lane should be used to provide access to the box.

- Use of green colored pavement is recommended.

A bike box allows for cyclists to wait in front of queuing traffic, providing high visibility and a head start over motor vehicle traffic.

Further Considerations

- This treatment positions bicycles together and on a green signal, all bicyclists can quickly clear the intersection, minimizing conflict and delay to transit or other traffic.
- Pedestrian also benefit from bike boxes, as they experience reduced vehicle encroachment into the crosswalk.
- Bike boxes require permission from the FHWA to implement, and jurisdictions must receive approval prior to implementation. A State may request Interim Approval for all jurisdictions in that State.[1]
- Bike boxes should not be used to accommodate bicyclist turns at intersections that have substantial parallel green time as bicyclists cannot safely occupy the box when arriving on green.

Materials and Maintenance

Bike boxes are subject to high vehicle wear, especially turning passenger vehicles, buses, and heavy trucks. As a result, bike boxes with green coloring will require more frequent replacement over time. The life of the green coloring will depend on vehicle volumes and turning movements, but thermoplastic is generally a more durable material than paint.

Approximate Cost

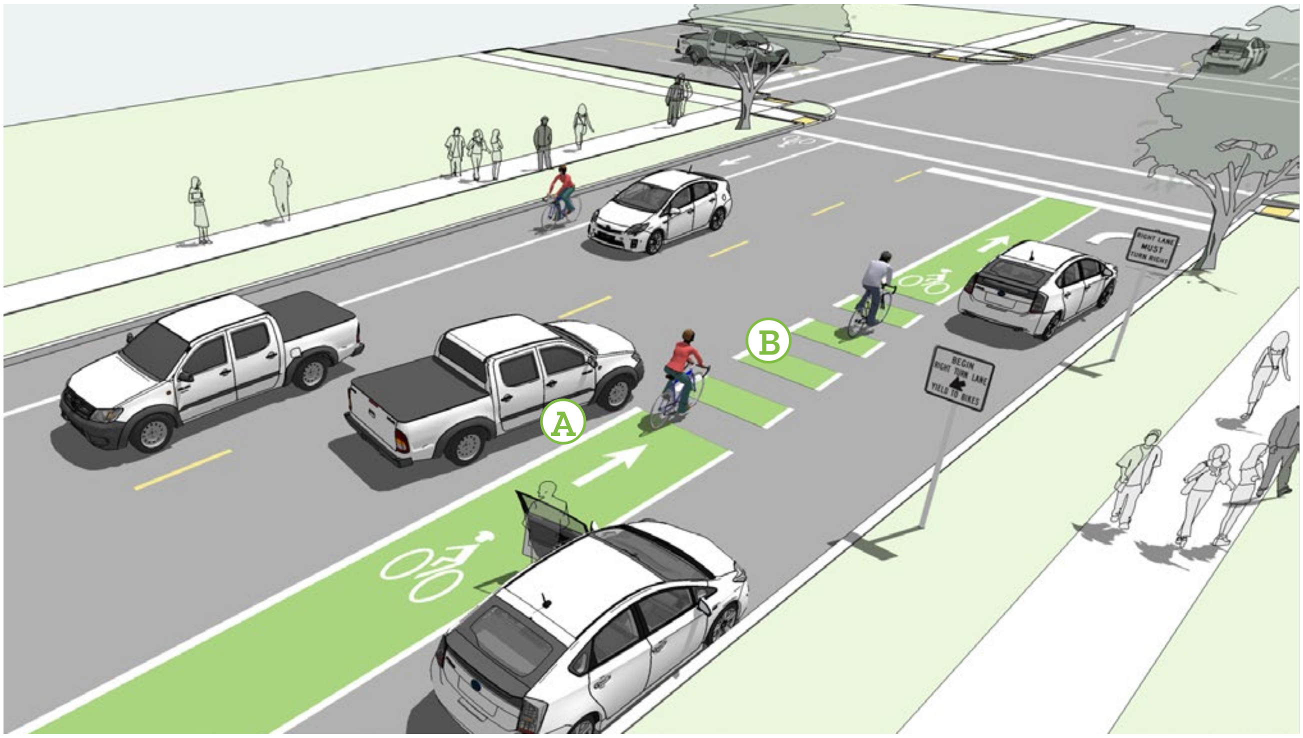
Costs will vary due to the type of paint or thermoplastic used and the size of the bike box, as well as whether the treatment is added at the same time as other road treatments.

Typical costs range from $1.20/sq. ft. installed for paint to $14/sq. ft. installed for thermoplastic.

1 *FHWA. Interim Approval for Optional Use of an Intersection Bicycle Box (IA-18). 2016.*

Colored Pavement Treatment

Colored pavement within a bicycle lane may be used to increase the visibility of the bicycle facility, raise awareness of the potential to encounter bicyclists, and reinforce priority of bicyclists in conflict areas.



Typical Use

- Within a weaving or conflict area to identify the potential for bicyclist and motorist interactions and assert bicyclist priority.
- Across intersections, driveways and Stop or Yield-controlled cross-streets.
- At bike boxes and two-stage turn boxes

Design Features

Ⓐ Typical white bike lane striping (solid or dotted 6” stripe) is used to outline the green colored pavement.

Ⓑ In weaving or turning conflict areas, preferred striping is dashed, to match the bicycle lane line extensions.

- The colored surface should be skid resistant and retro-reflective **(MUTCD 9C.02.02).**
- In exclusive use areas, such as bike boxes, color application should be solid green.

Green colored conflict striping indicates the path of travel of people on bicycles, and alerts people intending to turn across the bike lane to yield when bicyclists are present.

Further Considerations

- Green colored pavement shall be used in compliance with FHWA Interim Approval (FHWA IA-14.10).[1]
- While other colors have been used (red, blue, yellow), green is the recommended color in the US.
- The application of green colored pavement within bicycle lanes is an emerging practice. The guidance recommended here is based on best practices in cities around the county.

Materials and Maintenance

As intended, paint or thermoplastic are placed in locations that are trafficked by vehicles, and are subject to high vehicle wear. Colored pavement treatments will experience higher rates of wear at locations with higher turning vehicles, buses, and heavy trucks. At these locations, green coloring will require more frequent replacement over time.

The life of the green coloring will depend on vehicle volumes and turning movements, but thermoplastic is a more durable material than paint.

Approximate Cost

The cost for installing colored pavement markings will depend on the materials selected and implementation approach. Typical costs range from $1.20/sq. ft installed for paint to $14/sq. ft installed for thermoplastic. Colored pavement is more expensive than standard asphalt installation, costing 30-50 percent more than non-colored asphalt.

1 FHWA. Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14). 2011.

Short-Term Bicycle Parking

People need a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

Information on short- and long-term bike parking has been informed by the Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guide, which is updated frequently and is available online at www.apbp.org.

Application

Bike Racks

- Bike racks provide short-term bicycle parking and are meant to accommodate visitors, customers, and others expected to depart within two hours. It should be an approved standard rack, appropriate location and placement.

Bike Corrals

- On-street bike corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking.
- Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking.
- Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces.

Design Features

Bike Racks

- When placed on sidewalks, 2 feet minimum from the curb face to avoid 'dooring.'
- 4 feet between racks to provide maneuvering room.
- Locate close to destinations; 50 feet maximum distance from main building entrance.
- Minimum clear distance of 6 feet should be provided between the bicycle rack and the property line.
- While bike racks could be installed perpendicular or parallel to the curb, it is important to ensure there is sufficient room for pedestrian traffic, even when a bike is locked to the rack.

Bike Corrals

- Bicyclists should have an entrance width from the roadway of 5-6 feet.
- Can be used with parallel or angled parking.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as delimitation on one side.

Further Considerations

- Where the placement of racks on sidewalks is not possible (due to narrow sidewalk width, sidewalk obstructions, street trees, etc.), bicycle parking can be provided in the street where on-street vehicle parking is allowed in the form of on-street bicycle corrals.
- Some types of bicycle racks may meet design criteria, but are discouraged except in limited situations. This includes undulating "wave" racks, schoolyard racks, and spiral racks. These discouraged racks are illustrated on the following page.
- Bike racks should be made of thick stainless steel to reduce the chance of thieves cutting through the racks to take bicycles. Square tubing can provide further protection from cutting, as well.
- If a bike rack is installed as surface mount, countersink bolts or expansion bolts should be used to keep the rack in place. Covering the bolts with putty or epoxy can provide additional protection.

References

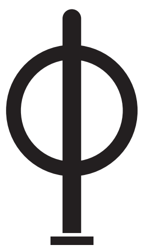
- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- APBP. Bicycle Parking Guide 2015.

Inverted-U racks provide two points of contact.

Racks with square tubing, good spacing, and a concrete base likewise offer two points of contact.

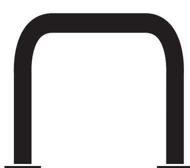
Types of Bike Racks to Use

These racks provide two points of contact with the bicycle, accommodate varying styles of bike, allow for the frame of a bicycle and at least one wheel to be secured by most U-locks, and are intuitive to use.

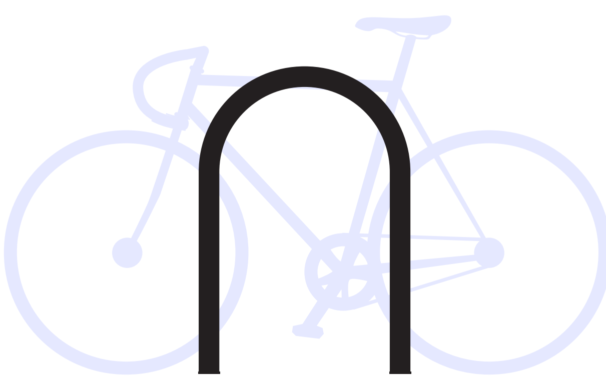


POST & RING

WHEELWELL SECURE



INVERTED-U



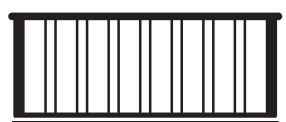
Communities may consider purchasing branded U-racks for installation on sidewalks.

Types of Bike Racks to Avoid

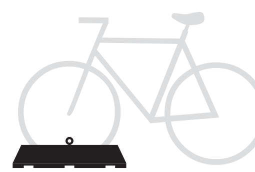
These racks do not provide support at two places on the bike, can damage the wheel, do not provide an opportunity for the user to lock the frame of their bicycle easily, and are not intuitive to use. Because of performance concerns, the APBP Essentials of Bike Parking Report recommends selecting other racks instead of these.

WAVE

SPIRAL



COMB



WHEELWELL

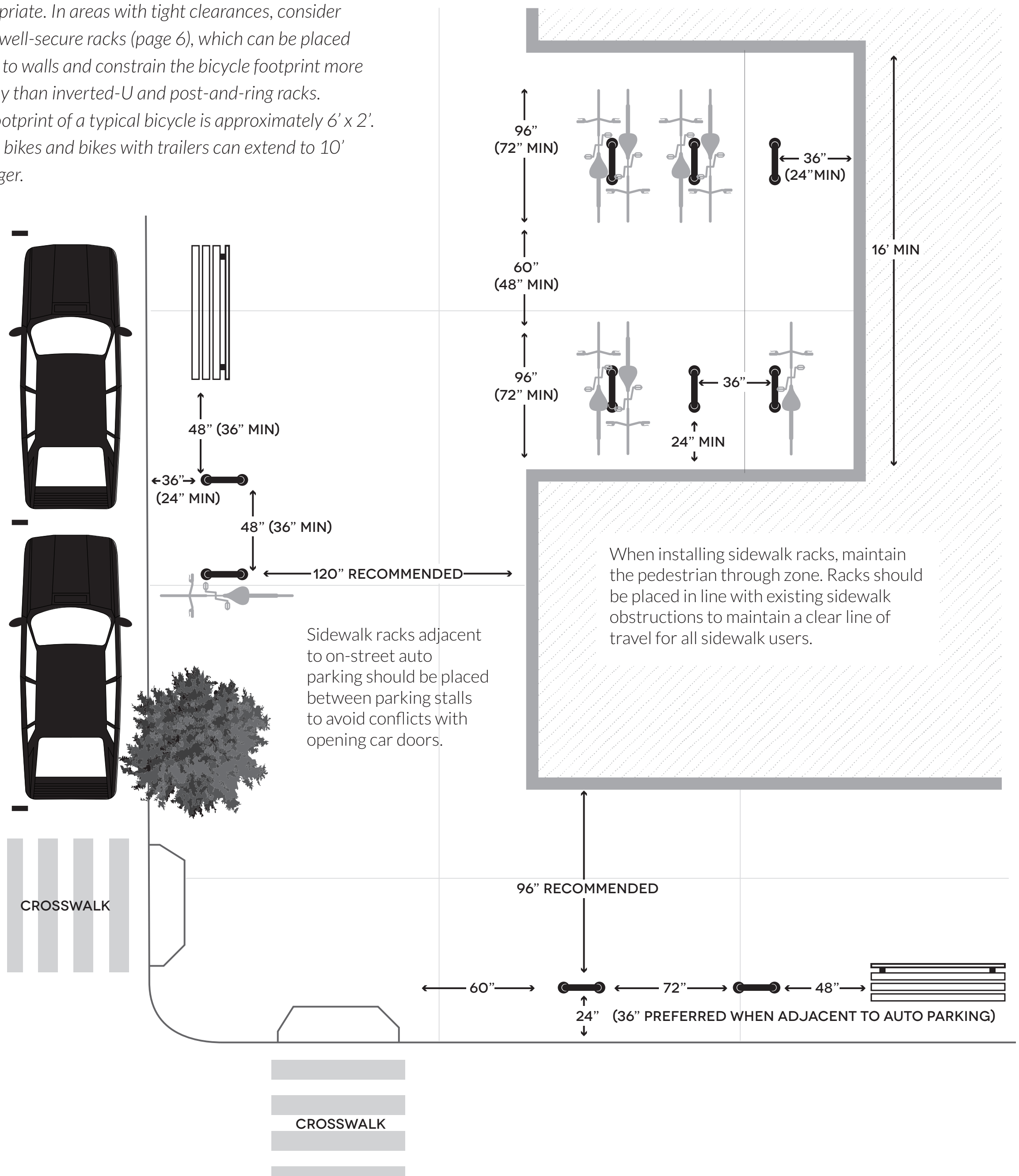
COATHANGER

BOLLARD

Graphics courtesy of Association of Pedestrian and Bicycle Professionals Essentials of Bike Parking report (2015).

Space Requirements

The following minimum spacing requirements apply to some common installations of fixtures like inverted-U or post-and-ring racks that park one bicycle roughly centered on each side of the rack. Recommended clearances are given first, with minimums in parentheses where appropriate. In areas with tight clearances, consider wheelwell-secure racks (page 6), which can be placed closer to walls and constrain the bicycle footprint more reliably than inverted-U and post-and-ring racks. The footprint of a typical bicycle is approximately 6' x 2'. Cargo bikes and bikes with trailers can extend to 10' or longer.



Long-Term Bicycle Parking

Users of long-term parking generally place high value on security and weather protection. Long-term parking is designed to meet the needs of employees, residents, public transit users, and others with similar needs.

Information on short and long term bike parking has been obtained from the APBP Bicycle Parking Guide, which is updated frequently and is available online at www.apbp.org.

Application

- At transit stops, bike lockers or a sheltered secure enclosure may be appropriate long term solutions.
- On public or private property where secure, long-term bike parking is desired.
- Near routine destinations, such as workplaces, universities, hospitals, etc.

Design Features

Bike Lockers

- Minimum dimensions: width (opening) 2.5 feet; height 4 feet; depth 6 feet.
- 4 foot side clearance and 6 foot end clearance. 7 foot minimum distance between facing lockers.

Secure Parking Area

- Closed-circuit television monitoring or on-site staff with secure access for users.
- Double high racks & cargo bike spaces.
- Bike repair station with bench and bike tube and maintenance item vending machine.
- Bike lock “hitching post” – allows people to leave bike locks.

Further Considerations

- As the APBP Bike Parking Guide notes, increasing density of bike racks in a long-term facility without careful attention to user needs can exclude users with less-common types of bicycles which may be essential due to age, ability, or bicycle type.
- To accommodate trailers and long bikes, a portion of the racks should be on the ground and should have an additional 36” of in-line clearance.

References

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- APBP. Bicycle Parking Guide 2015.

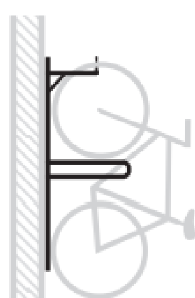
High Density Bike Racks

Racks may be used that increase bike parking density, like the ones below. While these types of racks provide more spaces, racks that require lifting should not be used exclusively. People with heavier bikes (i.e. cargo bikes) or people with disabilities or people who are simply small in stature may be unable to lift their bikes easily.

Bike Parking Rooms

Long term bike parking may be available in dedicated rooms in residential and commercial buildings. Bicycle parking can be accommodated in 15 square feet per space or less.

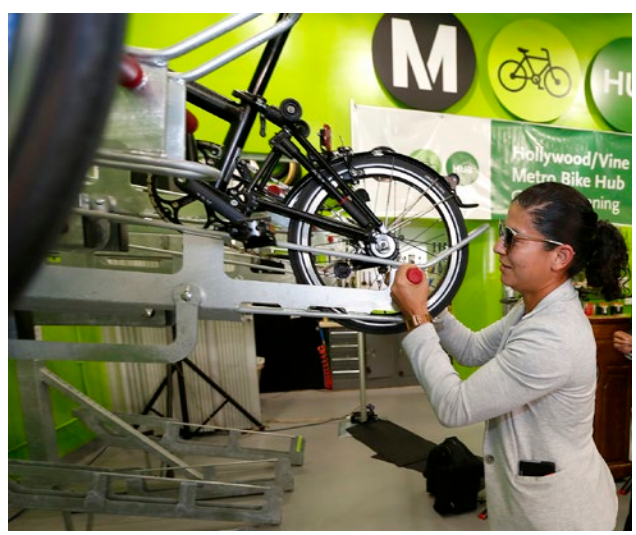
STAGGERED WHEELWELL-SECURE



VERTICAL

TWO-TIER

Bike lockers



Secured parking areas

Where should parking be located?

Well-located bike parking will be:

- Visible to the public.
- Near primary entrances/exits, as close to the entrance as the first motor vehicle parking spot not designated for people with disabilities when possible.
- Easily accessed without dismounting a bike.
- Clear of obstructions which might limit the circulation of users and their bikes.
- In areas that are well-lit.
- Installed on a hard, stable surface that is unaffected by weather.

How much parking should be provided?

APBP's Essentials of Bicycle Parking Recommendations

The Association of Pedestrian and Bicycle Professionals' (APBP) has published recommendations for bicycle parking locations and quantities. These guidelines and recommendations are based on industry best practices as well as APBP's Essentials of Bicycle Parking Recommendations, but can be adjusted to meet the context and needs of each community.

Recommendations for Bicycle Parking Locations and Quantities

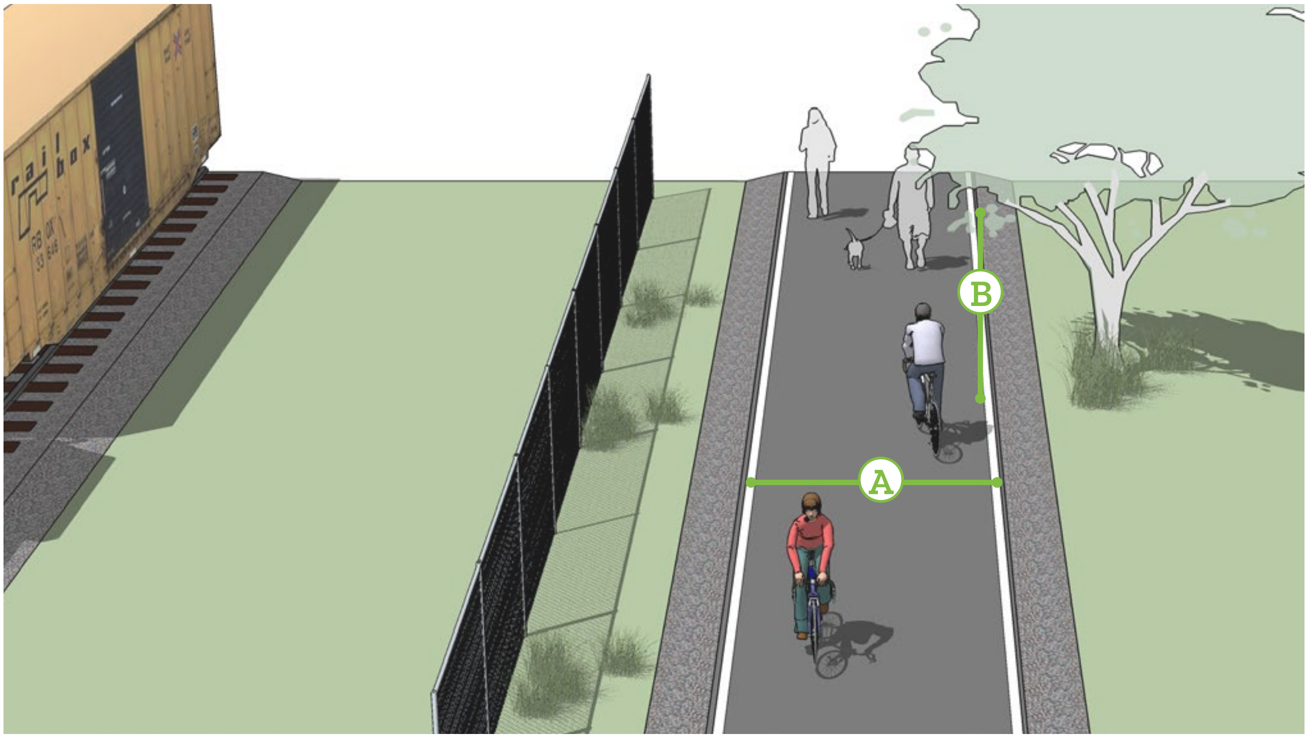
Land Use or Location	Physical Location	Quantity (Minimum)
Parks	Adjacent to restrooms, picnic areas, fields, and other attractions	8 bicycle parking spaces per acre
Schools	Near office and main entrance with good visibility	8 bicycle parking spaces per 40 students
Public Facilities (e.g., libraries, community centers)	Near main entrance with good visibility	8 bicycle parking spaces per location
Commercial, Retail, and Industrial Developments (over 10,000 square feet)	Near main entrance with good visibility	1 bicycle parking space per 15 employees or 8 bicycles per 10,000 square feet
Shopping Centers (over 10,000 square feet)	Near main entrance with good visibility	8 bicycle parking spaces per 10,000 square feet
Transit Stations	Near platform, security or ticket booth	1 bicycle parking space or locker per 30 automobile parking spaces
Multi-Family Residential	Near main entrance with good visibility	1 short-term bicycle parking space per 10 residential units and 1 long-term bicycle parking space per 2 residential units

Section 4

Mixed Use Toolbox

Shared Use Path

Shared use paths are off-street facilities that can provide a desirable transportation and recreation connection for users of all skill levels who prefer separation from traffic. They often provide low-stress connections to local and regional attractions that may be difficult, or not be possible on the street network.



Typical Use

- In abandoned rail corridors (commonly referred to as Rails-to-Trails or Rail-Trails.
- In active rail corridors, trails can be built adjacent to active railroads (referred to as Rails-with-Trails).
- In utility corridors, such as power line and sewer corridors.
- In waterway corridors, such as along canals, drainage ditches, rivers, and creeks.
- Along roadways.

Design Features

A 8 ft is the minimum width (with 2’ ft shoulders) allowed for a two-way bicycle path and is only recommended for low traffic situations.

- 10 ft is recommended in most situations and will be adequate for moderate to heavy use.
- 12 ft is recommended for heavy use situations with high concentrations of multiple users. A separate track (5’ minimum) can be provided for pedestrian use.

Lateral Clearance

- A 2 ft or greater shoulder on both sides of the path should be provided. An additional ft of lateral clearance (total of 3') is required by the MUTCD for the installation of signage or other furnishings.
- If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night.

Overhead Clearance

B Clearance to overhead obstructions should be 8 ft minimum, with 10 ft recommended.

Striping

- When striping is required, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines.
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

Further Considerations

- The provision of a shared use path adjacent to a road is not a substitute for the provision of on-road accommodation such as paved shoulders or bike lanes, but may be considered in some locations in addition to on-road bicycle facilities.
- To reduce potential conflicts in some situations, it may be better to place one-way sidepaths on both sides of the street.
- The design of the trail should conform to Crime Prevention Through Environmental Design (CPTED) principles. CPTED is a framework that encourages intuitive visual cues to guide path users, increase the visibility of the corridor and adjacent landmarks and properties, careful design that indicates active use and upkeep, and manages conflicting uses, and regular maintenance to prevent improper or illegal uses.

Shared Use Paths offer pedestrians and bicyclists space to be active away from vehicle traffic. Source: Peter Stetson.

Materials and Maintenance

Shared use paths must be regularly maintained so that they are free of potholes, cracks, root lift, and debris. Signage and lighting should also be regularly maintained to ensure shared use path users feel comfortable, especially where visibility is limited.

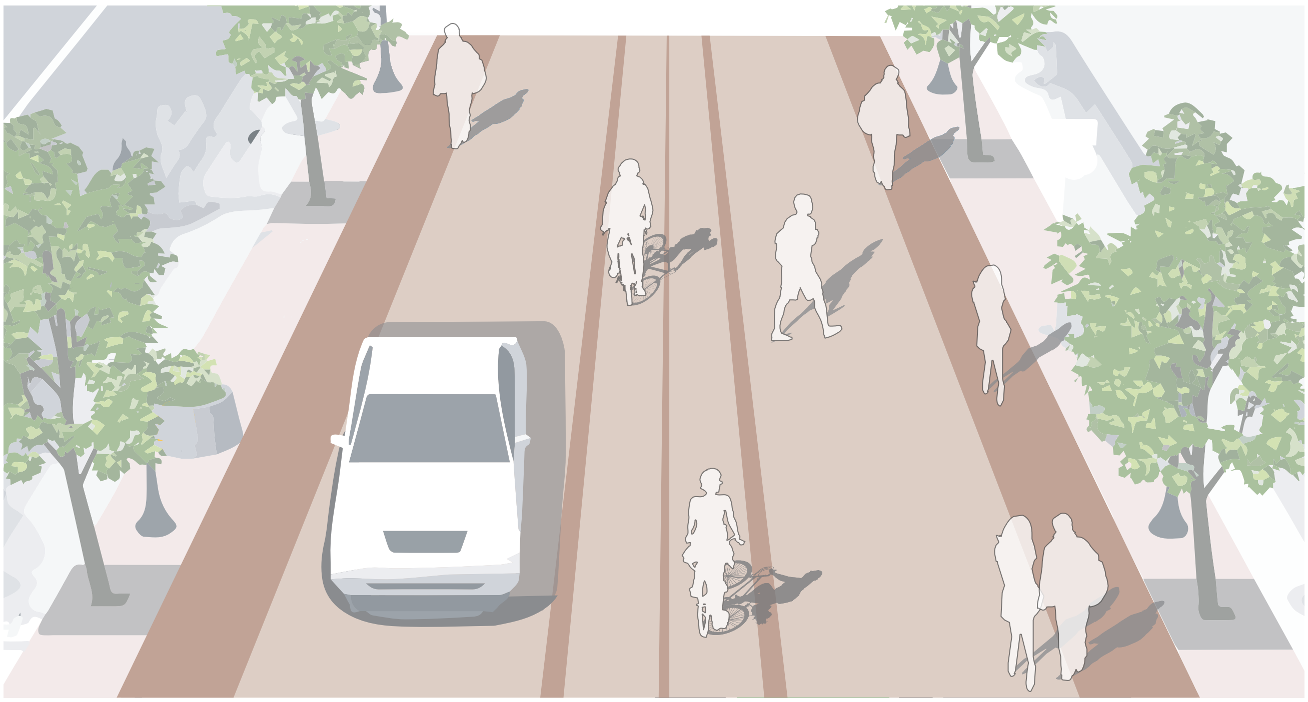
Adjacent landscaping should be regularly pruned, to allow adequate sightlines, daylight, and pedestrian-scale lighting, and so as not to obstruct the path of travel of trail users.

Approximate Cost

The cost of a shared use path can vary, but typical costs are between $65,000 per mile to $4 million per mile. These costs vary with materials, such as asphalt, concrete, boardwalk and other paving materials, lighting, and ROW acquisition.

Shared Street

A shared street is a street with no designated space for bicyclists, pedestrians or vehicles. Pedestrian and bicycle travel is prioritized, speeds are limited by the speed of pedestrians and bicyclists, and pavement materials, landscaping and amenities communicate that this is not a standard road. Vehicle volumes should be very low with only local vehicles (no through travel) using the street.



Typical Use

- Utilized in areas with high pedestrian activity that need to maintain limited access for vehicles and loading / unloading delivery trucks at designated hours.
- In commercial areas, a shared street environment should be considered in places where pedestrian activity is high and vehicle volumes are either low or discouraged.
- In residential areas, a shared street should be considered in places where sidewalks are limited, pedestrian activity and use of streets as public space is high, and vehicle volumes are low.

Design Features

- Vehicle use should be limited to destinations along the shared street (residences, parking garages, maintenance and emergency access vehicles).
- Vehicle speeds should be no more than 15 mph.
- The entrance to the shared street should be designed so that the shared street is clearly recognizable (through signage, surface material, amenities and landscaping).
- Landscaping should include canopy trees for shade and to enhance the bicycle and pedestrian environment, but should not restrict visibility.
- Amenities such as benches, cafe seating, and moveable landscaping elements should be included to communicate the prioritization of pedestrians and bicyclists, but should not restrict visibility.
- A clear width (void of vertical objects) should be provided to ensure emergency vehicle access.

Shared streets in active commercial areas become destinations themselves.

In residential areas, shared streets expand public space and create new places for people to play.

Additional References and Guidelines

FHWA, Achieving Multimodal Networks: Applying Design Flexibility & Reducing Conflicts, "Shared Streets". 2016.

Examples:

- Jack London Square, Oakland, CA
- Wall Street, Asheville, NC
- Bell Street Park, Seattle, WA
- Old Firehouse Alley, Fort Collins, CO
- Calle Guanajuato, Ashland, OR
- Winthrop Street, Cambridge, MA
- First Street North, Jacksonville Beach, FL

Materials and Maintenance

Pavement materials should be similar to that of a pedestrian pathway or plaza using concrete, colored concrete, paving stones or similar materials. Pavement materials and depths should be designed to accommodate vehicular travel, but should clearly signal to all roadway users that pedestrians have priority.

Approximate Cost

The cost of a shared street can vary depending on materials (such as asphalt, concrete, and other paving materials), lighting, landscaping, and ROW acquisition.

Sidepath Design

A sidepath is a bidirectional shared use path located immediately adjacent and parallel to a roadway. Sidepaths can offer a high-quality experience for users of all ages and abilities.

Typical Use

Sidepaths should be considered where one or more of the following conditions exist:

- The adjacent roadway has relatively high volume and/or high-speed motor vehicle traffic that might discourage many people bicycling from riding on the roadway to achieve the targeted low stress. Sidepaths do not preclude the installation or maintenance of existing bike lanes.
- Along corridors with few intersections with minor streets and driveways.
- To provide continuity between existing segments of shared use paths.
- For use near schools, neighborhoods, and mixed use commercial areas, where increased separation from motor vehicles is desired, and there are few roadway and driveway crossings.

Design Features

- Sidepaths shall be designed to meet transportation standards as defined by AASHTO, PROWAG, and MUTCD.
- Materials: Asphalt is the standard paving material for sidepaths.
- Minimum Width: Minimum width of a sidepath is 10’. Where user volumes are high, additional width, as well as parallel facilities such as bike lanes and sidewalk can provide needed space.
- Roadway Separation: The preferred minimum roadway separation width is 6.5 - 16.5’ **(Schepers, 2011).** Absolute minimum separation width of 5’ **(AASHTO Bike Guide 2012, p. 5-11).**
- Roadway Separation: Separation from roadway traffic is an essential design feature of sidepaths. Separation should increase as volumes and speed of adjacent roadway increase **(AASHTO Bike Guide 2012, p. 5-11).**

A sidepath provides a continuous path of travel along roadway corridors with few driveways or intersections. Depending on the anticipated volumes and context, the sidepath can be constructed in lieu of sidewalk and/or bike lanes. Oftentimes, anticipated volumes, mix of skills, or other factors such as route continuity will also be considered in the decision to also include bike lanes and sidewalks.

- Horizontal Clearance: A lateral clearance to landscaping, street furnishings and signs is required. MUTCD identifies minimum clearance. Signs and other street furniture should be placed outside of the minimum path width.
- Vertical Clearance: Standard clearance to overhead obstructions is 10'.
- Cross Slope and Running Slope: As sidepaths are typically located within public rights of way, their designs are governed by ADA guidelines.

Further Considerations

- Sight Lines: It is important to keep approaches to intersections and major driveways clear of obstructions due to parked vehicles, shrubs, and signs on public or private property.
- Corner radii at driveways and minor streets should be minimized to facilitate vehicle turning speeds of 10-15 mph.

Materials and Maintenance

Like shared use paths, Sidepaths must be regularly maintained so that they are free of potholes, cracks, root lift, and debris. Signage and lighting should also be regularly maintained to ensure sidepath users feel comfortable, especially in areas where visibility is limited.

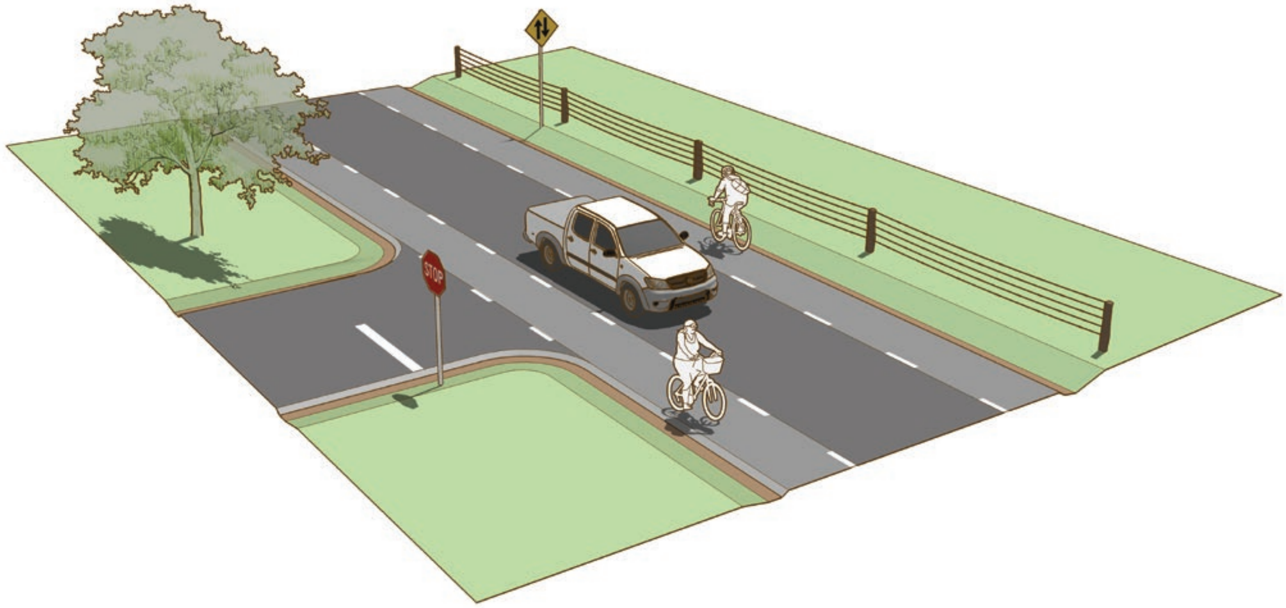
Adjacent landscaping should be regularly pruned, to allow adequate sightlines along the path and at minor street crossings and driveways, allow for daylight, and pedestrian-scale lighting, and so as not to obstruct the path of travel of trail users.

Approximate Cost

The cost of a sidepath can vary, but typical costs are similar to shared use paths between $90,000 per mile to $4 million per mile. These costs vary with materials, such as asphalt, concrete, boardwalk, and other paving materials, and ROW acquisition.

Advisory Shoulder

Roads with advisory shoulders accommodate low to moderate volumes of two-way motor vehicle traffic and provide a prioritized space for bicyclists with little or no widening of the paved roadway surface. An approved Request to Experiment is required to implement Advisory Shoulders, called "dashed bicycle lanes" in the FHWA experimentation process.



Typical Use

- Most appropriate on streets with low to moderate volumes and moderate speeds of motor vehicles.
- Roadways in built-up areas with constrained connections, bicycle and pedestrian demand, and limited available paved roadway space.
- Advisory shoulder designs work best on road segments without frequent stop or signal controlled intersections.

Design Features

- The preferred width of the advisory shoulder space is 6 ft. Absolute minimum width is 4 ft when no curb and gutter is present.
- Consider using contrasting paving materials between the advisory shoulder and center travel lane to differentiate the advisory shoulder from the center two-way travel lane in order to minimize unnecessary encroachment and reduce regular straddling of the advisory shoulder striping.
- Preferred two-way center travel lane width is 13.5–16 ft although may function with widths of 10–18 ft. **(Small and Rural Multimodal Networks Report, Table 2-2)**
- A broken lane line used to delineate the advisory shoulder should consist of 3 ft line segments and 6 ft gaps.
- Use signs to warn road users of the special characteristics of the street.

Advisory shoulders create usable shoulders for bicyclists on a roadway that is otherwise too narrow to accommodate one. The shoulder is delineated by pavement marking and optional pavement color. Motorists may only enter the shoulder when no bicyclists are present and must overtake these users with caution due to potential oncoming traffic.

Further Considerations

- Unlike a conventional shoulder, an advisory shoulder is a part of the traveled way, and it is expected that vehicles will regularly encounter meeting or passing situations where driving in the advisory shoulder is necessary and safe
- Advisory shoulders may function as an interim measure where plans include shoulder widening in the future.
- Where additional edge definition is desired, stripe a normal solid white edge line in addition to the broken advisory shoulder line.
- In general, do not mark a center line on the roadway. Short sections may be marked with center line pavement markings to separate opposing traffic flows at specific locations, such as around curves, over hills, on approaches to at-grade crossings, and at bridges.
- Strive to maintain the visual definition of the advisory shoulder through all driveways and street crossings, and provide a conventional shoulder at controlled intersections.
- Advisory shoulders as described here are not intended for use by pedestrians. When advisory shoulders are intended for use by pedestrians, they must meet accessibility guidelines.

Materials and Maintenance

Shoulder striping will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway.

Advisory shoulders should also be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

Approximate Cost

The cost for installing advisory shoulders will depend on the implementation approach. Typical costs are $6,000 per mile when used on a street with no markings.