Walk Audit Report

SafeRoutes
Napa County

VINTAGE HIGH SCHOOL

VINTAGE HIGH SCHOOL

1375 TROWER AVENUE
NAPA, CA

—

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ACKNOWLEDGEMENTS

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EXECUTIVE **SUMMARY**

THE NAPA COUNTY SAFE ROUTES TO SCHOOL PROGRAM

The Napa County Safe Routes to School (SRTS) Program is a partnership between the Napa County Office of Education (NCOE), Napa County Bicycle Coalition (NCBC) and Napa Valley Transportation Authority (NVTA). Since 2008, the Program has provided high-quality bicycle and pedestrian safety education and encouragement programs and has worked closely with the public agency and school stakeholders to make walking and bicycling safer and more accessible for children throughout Napa County.

According to 2015 California Office of Traffic Safety (OTS) data, the data available when the SRTS program was applying for grant funding, Napa County ranked 1st in per capita number of collisions of bicyclists under the age 15, 2nd in total fatal and injury-causing collisions, and 3rd in overall pedestrian collisions. According to the most recent OTS data (2018), Napa County ranked 8th for bicyclist collisions statewide (58 counties), 7th for speed-related collisions, and 6th for total fatal and injury-causing collisions. A decades-long decline in the number of students walking and biking to school, as well as increased awareness of the significant traffic congestion, air pollution, and related issues associated with students being driven to school galvanized local agency partners to expand the existing program.

> The goal of the Walk Audit Report is to **identify, evaluate, prioritize, and offer solutions** to infrastructure and non-infrastructure barriers to students safely walking and biking to school in Napa County.

In 2017, the Napa County SRTS program secured funding through the Caltrans Active Transportation Program (ATP) and One Bay Area Grant (OBAG) Cycle II programs to expand education programs and initiate a series of evaluations at each public school countywide. NCOE has been leading education and engagement programs under the current program, while NCBC has led evaluations of active transportation barriers at all 36 school sites.

WHY SAFE ROUTES TO SCHOOL?

Safe Routes to School is national initiative committed to increasing the number of students who walk or bike to school, and making it safe, convenient, and fun for kids to do so. In doing so, SRTS aims to improve kids' safety and increase health and physical activity. Concerned by the declining number of students walking and biking to school over recent decades and the related long-term health and traffic consequences, Congress made federal funding available for SRTS programs nationwide in 2005. Since then, SRTS programs have been implemented at more than 14,000 schools in all 50 states.

Studies have linked SRTS programs to increased walking and biking to school[ab] and reduced pedestrian-motorist collisions[cd]. This can lead to safer, healthier, and more focused students, while also benefitting local and school communities.

Regularly walking or biking increases children's daily levels of physical fitness and improves their cardiovascular health[e].

Student health has been linked to improved academic performance[fg]. When students walk or bike to school, the fresh air and exercise allow them to arrive refreshed, energized and ready to focus. Children have a greater sense of spatial awareness and knowledge when they are actively engaged in their transportation, allowing them to better recognize and navigate their neighborhoods independently[h]. Families are also provided with a low-cost transportation option that can significantly reduce their annual expenses[i].

When a greater share of students walk or bike to school, local and school communities benefit too. Fewer cars being driven to school can improve the air quality of surrounding neighborhoods by decreasing air pollutant emissions and increase street safety through reduced traffic congestion and noise pollution. This can also improve campus safety and reduce circulation hazards around the school site. Walking or biking is a reliable form of transportation, which can reduce student absence and tardiness. By reducing the number of short-distance school bus trips, increased student walking and biking can also help school districts save funds by decreasing costly bus service.

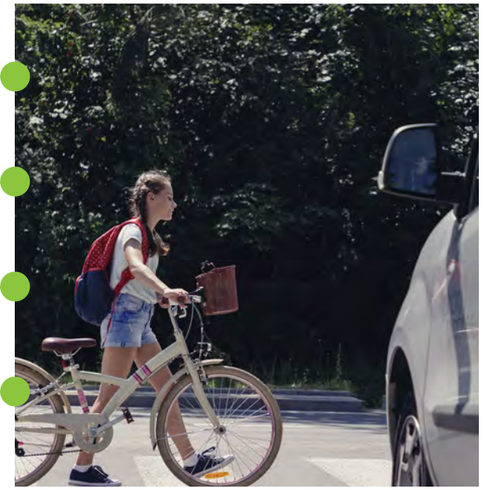
Schools and the community benefit immensely when students choose to walk or bike.

Student health has been linked to improved academic performance.

Walking or biking can provide a reliable form of transportation, leading to reduced student absence and tardiness.

Children arrive ready to learn and are less likely to experience discipline issues.

Fewer cars dropping off and picking up students improves campus safety and reduces circulation hazards.



THE SIX E'S

Safe Routes to School programs originally followed a comprehensive approach that addressed the "Five E's" – education, encouragement, enforcement, evaluation, and engineering. In 2017, when the Napa County SRTS program obtained funding to perform Walk Audit evaluations, the "Five E's" had recently been altered to add a sixth "E" – equity. In June 2020, after a significant portion of the Walk Audit evaluation work had been completed, the "Six E's" framework was again altered, dropping enforcement and adding engagement. These changes were led by the Safe Routes to School National Partnership.

The current "Six E's" framework is described below. Although enforcement is no longer one of the "Six E's", a brief definition of enforcement is included, as it was part of the approach used by the Napa County SRTS program during the majority of the Walk Audit evaluation process. Enforcement statistics are not emphasized in this report, as this element needs more study and review.

Engagement
Listen to community members and work with existing community organizations.

Equity
Recognize the unique barriers that different people face in living healthy, fulfilled lives, and craft policies, programs, and overall approaches with those various challenges and needs in mind.

Engineering
Design streets and schools for walkers and bikers to use safely and conveniently.

Encouragement
Promote walking and biking in the school community through events, programs and incentives.

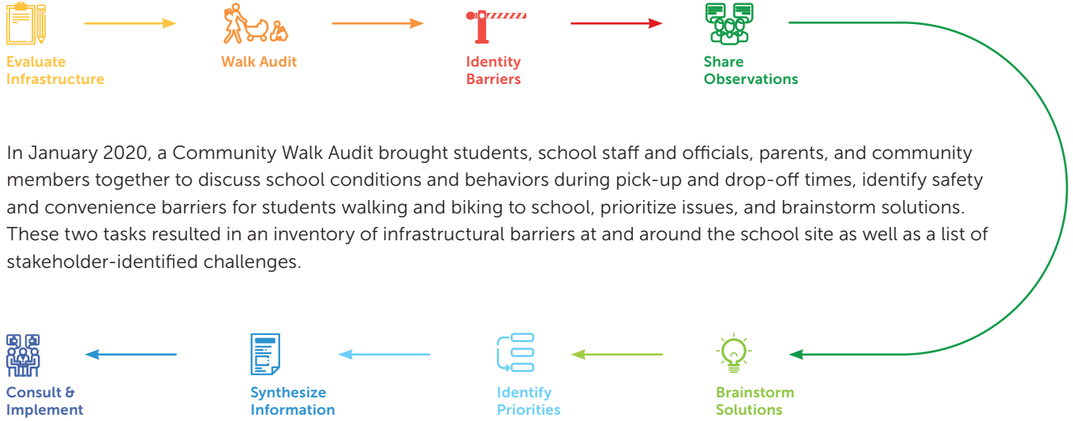
Education
Ensure that everyone learns how to travel safely and why biking and walking are important.

Evaluation
Track progress toward our shared safety goals, develop programs accordingly.

Enforcement (no longer an "E'):
Enforce traffic safety laws and school policies and target risky behaviors. No longer recommended as foundational to the start, maintenance, or growth of Safe Routes to School programs.

REPORT PROCESS

The SRTS team conducted a comprehensive evaluation of the barriers to students walking and biking to and from Vintage High School, starting in the summer of 2018. Information on physical and behavioral challenges was collected in two phases. In August 2018, the SRTS team completed an initial infrastructure audit of the school site and the surrounding neighborhood within a half-mile of the school. SRTS team members walked and rode bicycles throughout the school neighborhood, taking photographs of barriers and logging them into Fulcrum, a GPS-enabled data collection smartphone app.



In January 2020, a Community Walk Audit brought students, school staff and officials, parents, and community members together to discuss school conditions and behaviors during pick-up and drop-off times, identify safety and convenience barriers for students walking and biking to school, prioritize issues, and brainstorm solutions. These two tasks resulted in an inventory of infrastructural barriers at and around the school site as well as a list of stakeholder-identified challenges.

A report draft was shared with the Napa Valley Transportation Authority, the Napa County Office of Education, law enforcement, public works and planning representatives from the City of Napa, the local school district, and school stakeholders, and their feedback was incorporated into the final version. As part of the larger countywide project, the SRTS team engaged EMC Research, a national public opinion research firm to conduct a comprehensive survey of parents' perceptions around walking and biking to school (see Appendix A). The Walk Audit report outlines the information gathered during this multi-year process and provides recommendations for improvements.

VINTAGE HIGH SCHOOL
SCHOOL SUMMARY

Principal	Sarah O'Connor
First Bell	8:00 AM
Last Bell	3:00 PM (2:02 PM on Wednesdays)
District	Napa Valley Unified

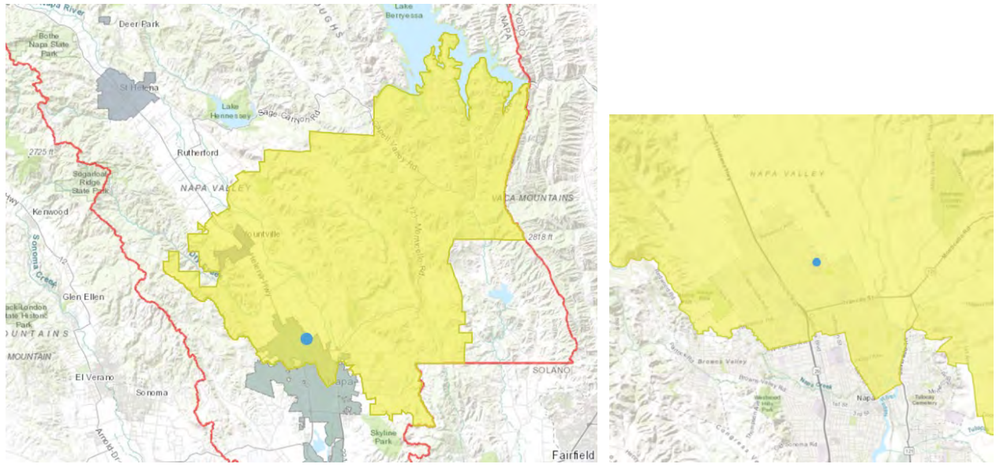
Grades	9-12
Enrollment	1,814
Street	1375 Trower Avenue
City	Napa, CA 94558

Overall Facility Rating[j]: Good

While NVUSD has an open enrollment policy, Vintage High School's default enrollment area covers the northern third of the City of Napa, the City of Yountville, and a large span of unincorporated Napa County north, northeast, and east of the City of Napa.

Through the open enrollment policy, families may apply to NVUSD for their student to attend a school other than their school of residence. Out-of-district students may also apply through the open enrollment process. This often results in students living farther away from school, making them more likely to rely on driving for transportation. At schools where open enrollment students constitute a high proportion of their enrollment, this can cause higher vehicular traffic volumes around the school during pick-up and drop-off.

According to the most recent data (2020-21 school year), 18.8% of students attending Vintage High School reside outside of the school's enrollment boundary.



Map 1: The enrollment boundary of Vintage High School (indicated by a blue dot) covers a large area of unincorporated Napa County.

DATA

There is currently no data regarding the number of students who walk or bike to school at Vintage High School. The school's assistant principal estimates that roughly 10-15% of students walk or bike to school, with more students walking than biking. Additional work is needed to establish a baseline of active transportation use for this school.

Data collected from the countywide EMC Research survey (Appendix A) conducted in Spring 2021 reflects parent perspectives on walking and biking to school for K-8 students only, and therefore cannot be directly applied to Napa High School.

Total Enrollment by Group (2019-20)

ETHNICITY	VINTAGE HIGH SCHOOL	DISTRICT
Black or African American	0.4%	2.1%
American Indian or Alaska Native	0.3%	0.2%
Asian	0.9%	2.4%
Filipino	0.6%	6.9%
Hispanic or Latino	50.9%	55.6%
White	42.6%	28.4%
Native Hawaiian or Pacific Islander	0.2%	0.2%
Two or More Races	4.0%	4.0%
EXPERIENCE		
Socioeconomically Disadvantaged	42.6%	51.2%
English Learners	6.0%	20.5%
Students with Disabilities	7.2%	12.5%
Foster Youth	0.3%	0.4%
Homeless	0.7%	1.1%

Figure 1: Enrollment Data by Group

Student Enrollment by Grade Level (2019-2020)

	NUMBER OF STUDENTS
Grade 9	519
Grade 10	476
Grade 11	426
Grade 12	393
Total	**1,814**

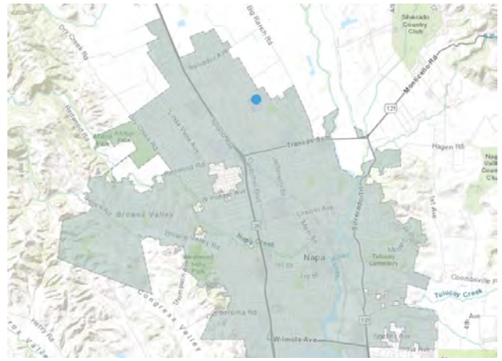
Figure 2: Enrollment Data by Grade

NEIGHBORHOOD CONTEXT

Vintage High School is located in northeast Napa on the southeast corner of Trower Avenue and Jefferson Street, two arterials. Salvador Creek runs along the west and south boundaries of the school. The school is bordered by agricultural land to the northeast, residential areas to the north, west, and southwest, and residences and some parks and agricultural space to the southeast. The neighborhoods surrounding the school are primarily composed of single-family residences. The northwest neighborhoods were mostly built in the 1970s and 80s, though some were built in the mid-2000s, the southwest neighborhoods were built in the 1950s and 60s, and the southeast neighborhoods were largely built in either the 1960s and 70s or the late 1980s and early 90s, though some residences are as recent as the 2000s and 2010s.

The street patterns around the school are primarily fragmented parallel, with several lollipops and some curvilinear streets to the south. Fragmented parallel and curvilinear streets reduce walkability by decreasing pedestrian route choice and interconnectivity. While lollipops can reduce traffic levels and speeds, they also reduce pedestrian route choice.

Destinations of interest around Vintage High School include Garfield Park to the southeast, Solomon Park to the north, Vintage High Agri Department and Bel Aire Park Magnet School to the south, and Willow Elementary School to the northwest, the latter two being schools where students may have siblings.



Map 2: Vintage High School (blue dot) is located in northeast Napa (city boundaries shaded blue).

Aerial photo of Vintage High School and surrounding neighborhood.

EXISTING **CONDITIONS**

The Safe Routes to School Team conducted an initial evaluation of the school site and surrounding area prior to conducting the Community Walk Audit. The Fulcrum App software was used to map and record significant point and segment issues within a half-mile range of the school. The team also collected information on local and school transportation policies and programs from conversations with the school's staff and administrators, as well as documents from the school and City websites.

SITE CIRCULATION

Site circulation at Vintage High School occurs mostly along Trower Avenue, with some activity at Jefferson Street as well.

There are two parking lots for Vintage High School: one on Trower Avenue and one off of Jefferson Street. The school's official loading zone runs along the length of the front parking lot off of Trower Avenue; motorists enter through the west entrance, drive in a counterclockwise direction through the parking lot and loading zone, and exit through the east exit. One-way circulation is indicated by white painted arrows. Motorists may also park in the parking lot or along Trower Avenue, east of Solomon Avenue on the eastbound side or anywhere along the westbound side, to pick-up and drop-off students. There is also a U-shaped drive-through just west of the parking lot on Trower Avenue, which can also be used by motorists for loading. There are also a few small parking areas off of the U-shaped drive through on Trower Avenue.

Some motorists use the large parking lot off of Jefferson Street to drop off and pick up students. The Jefferson Street parking lot is considered student parking, though there are some spaces reserved for staff.

The Jefferson Street parking lot.

There is no loading zone in this parking lot. Students arriving by bike or on foot from south of the school may elect to cut across this parking lot to reach the school campus.

The loading zone in the Trower Avenue parking lot.

As both the front and back entrances to the school are highly-utilized by motorists, student pedestrians and bicyclists must navigate the adjacent streets while sharing the road with high volumes of vehicles during drop-off and pick-up times. Student pedestrians and bicyclists can access campus on Jefferson Street by walking through the Jefferson Street parking lot and crossing one of three bridges across the Salvador Creek or on Trower Avenue via one of two sidewalks that go around/through the front parking lot. There is also an informal bicycle/pedestrian path from the Austin Miller Memorial Bike Path that runs along Salvador Creek to campus. Additionally, there is a paved path that connects the east end of Sierra Avenue/ the west end of the Austin Miller Memorial Bike Path to the school's Jefferson Street parking lot. There is also a pedestrian gate at the north end of Willis Drive that connects to the school's back parking lot; however, this gate may be locked at certain times.

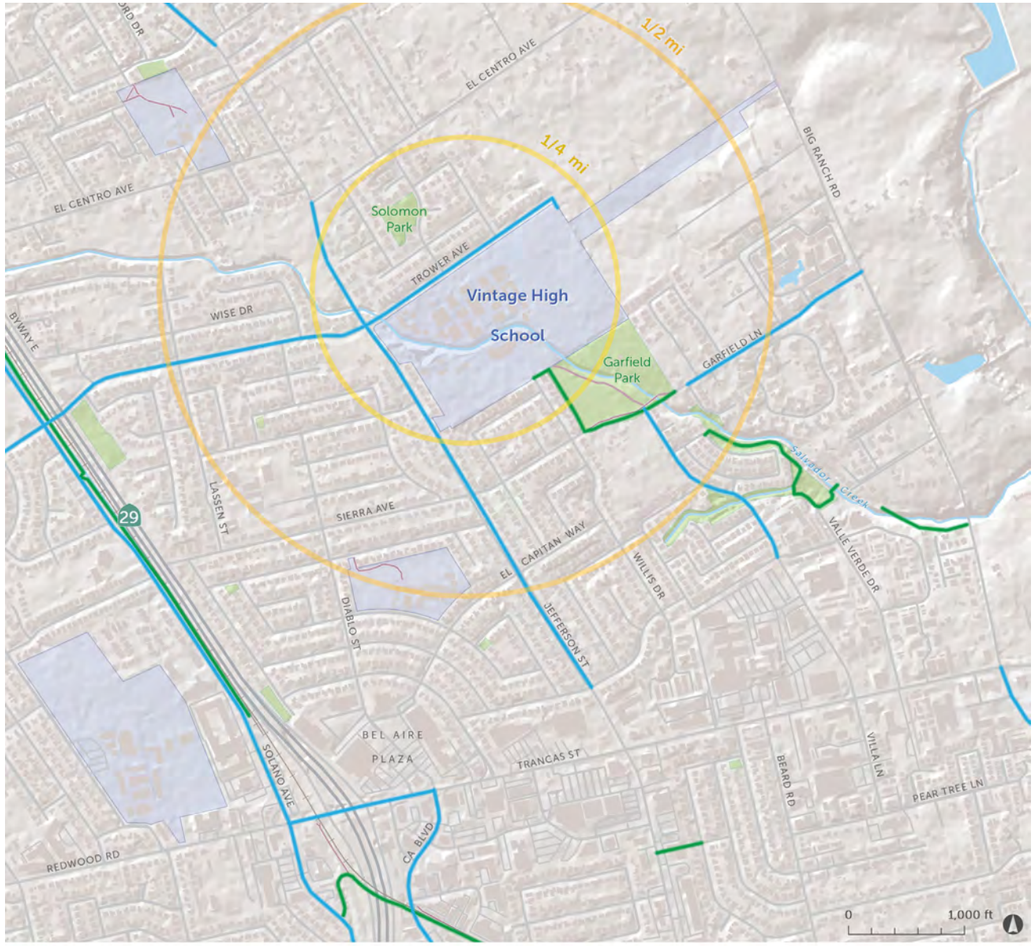
The informal dirt path that connects the Austin Miller path to the back of the school.

Limited bus service is available for students at Vintage High School through NVUSD. Bus routes include Yountville and the Berryessa area. Bus pick-up and drop-off occurs in the Trower Avenue loading zone. Additionally, students who live beyond 4.25 miles walking distance and attend their school of residence may apply for transportation through NVUSD. The Vine transit N line, operated by the Napa Valley Transportation Authority, provides service in north/central Napa, mostly along Trancas Street and its stop at Claremont Way is as near to Vintage High as it comes (just over one mile away).

BICYCLE AND PEDESTRIAN INFRASTRUCTURE

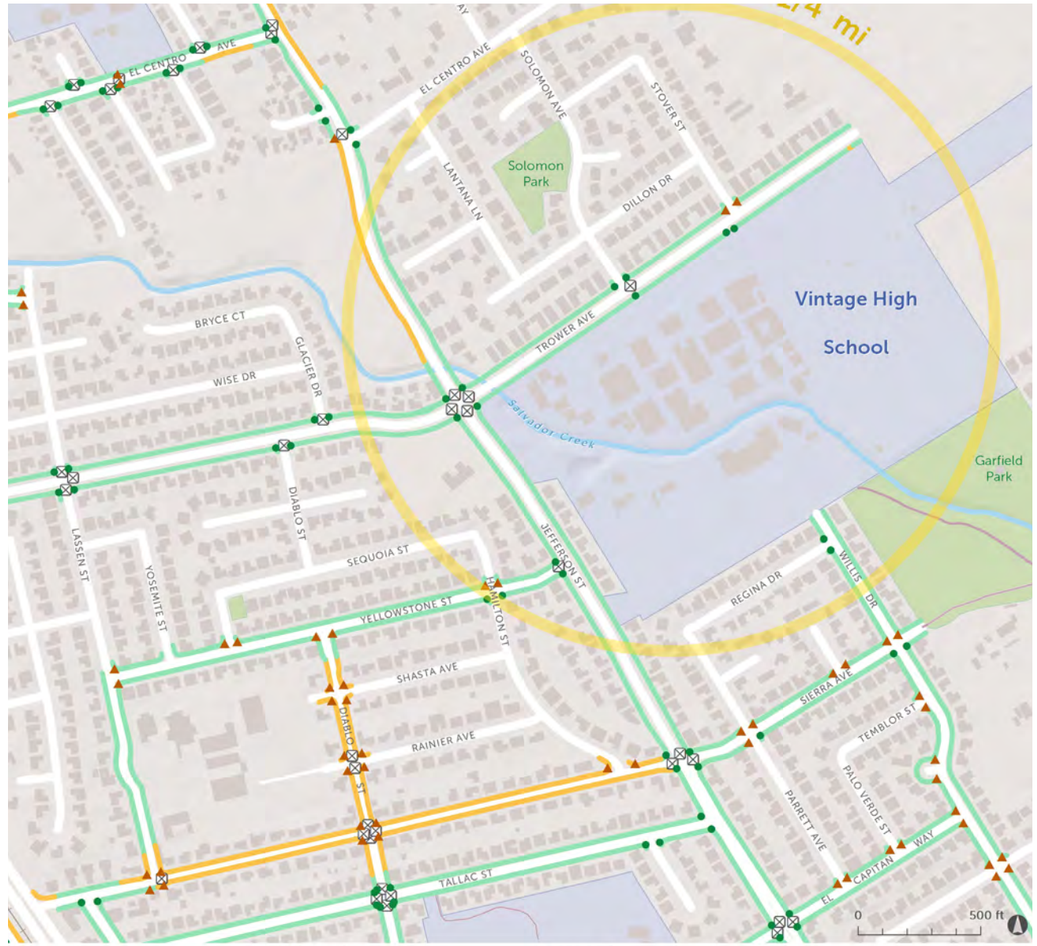
Vintage High School provides bicycle parking on-campus near the front entrance to the school off of Trower Avenue. The wave-style bicycle racks provide roughly 20 bike parking spaces.

MAP OF EXISTING BICYCLE FACILITIES



Map 3: Existing Bicycle Facilities
(Map source: Napa Valley Transportation Authority Napa Countywide Bicycle Plan (2019))

MAP OF EXISTING PEDESTRIAN FACILITIES



Map 4: Existing Pedestrian Facilities
(Map source: Napa Valley Transportation Authority Napa Countywide Pedestrian Plan (2016))

ENCOURAGEMENT AND EDUCATION PROGRAMS

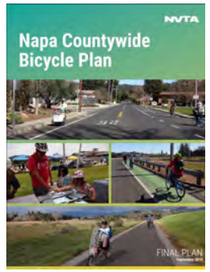
Vintage High School has consistently participated in annual countywide encouragement events, such as Bike to School Day and Walk and Roll to School Day. Bike to School Day and Walk and Roll to School Day are annual encouragement events facilitated by Napa County Safe Routes to School in the spring and fall, respectively, that celebrate students making the healthy choice to walk or bike to school.
The school has not expanded its encouragement program beyond these annual events nor provided bicycle safety education.

Walk to School Day at Vintage High School.

YEAR	EVENT	STUDENT PARTICIPANTS
2015/16	Bike to School Day	25
2016/17	Bike to School Day	30
2017/18	Bike to School Day	31
2018/19	Walk and Roll to School Day	101
2018/19	Bike to School Day	31
2019/20	Walk and Roll to School Day	183

Figure 4: Encouragement and Education Data

EXISTING PLANS



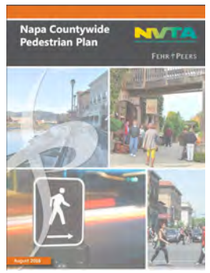
NVTA Napa Countywide Bicycle Plan (2019):

The Napa Countywide Bicycle Plan recommends bicycle facility improvements around the school site. Jefferson Street is designated to be a study corridor, and the Class II bike lanes on Trower Avenue are recommended to be continued east to Big Ranch Road when Trower Avenue is extended. A Class I facility is recommended to begin at the northwest corner of Trower and Jefferson that follows Salvador Creek to connect to the existing Class I on Maher Street. Some Class III facilities are recommended for nearby streets, such as El Centro Avenue and Lassen Street.

NVUSD Facilities Master Plan (2016):

NVUSD's Facilities Master Plan lists several projects for Vintage High School, including installing campus perimeter fencing and site ADA improvements. These projects may impact site circulation in the future.

MEASURE H
BUILDING ON OUR VISION
NVUSD



NVTA Napa Countywide Pedestrian Plan (2016):

The Napa Countywide Pedestrian Plan cites a few proposed improvements around the school site. It recommends a Class I multi-use path along Salvador Creek, from Maher Street to Big Ranch Road. The plan also proposes a grade-separated overpass at Trower Avenue at SR 29 and installing sidewalks along Sierra Avenue from SR 29 to Jefferson Street.

NVTA Napa Valley Countywide Transportation Plan: Advancing Mobility 2045 (2021):

The NVTA Countywide Transportation Plan is a long-range plan of countywide transportation priorities that provides a direction for the four- to five-year plan while considering a 25-year planning horizon. This plan is part of the regional planning process for the Regional Transportation Plan by the Metropolitan Transportation Commission. There are 28 projects by the City of Napa listed in the Plan; three listed projects – SR 29 over Trower Avenue, Trower Avenue Extension, and Sierra Avenue Sidewalks – impact the school area.

CITY OF NAPA

City of Napa General Plan 2020 (1998) / 2040 (Not Yet Adopted):

The current General Plan for the City of Napa was adopted in 1998; a General Plan update began in 2018 and at the time of this report, is still ongoing. The General Plan update strives to build a more livable, sustainable, and inclusive future for the City of Napa by outlining the City's plan for land use, housing, transportation, climate change, and more. One of the draft guiding principles for the General Plan update is to "increase travel options through enhanced walking, bicycling, and public transportation systems, and promote mobility through increased connectivity and intelligent transportation management.

WALK **AUDIT**

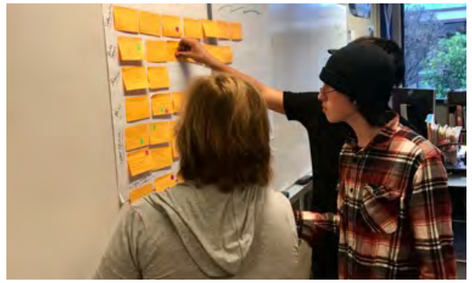
Date: 1/24/20
Day of the Week: Friday

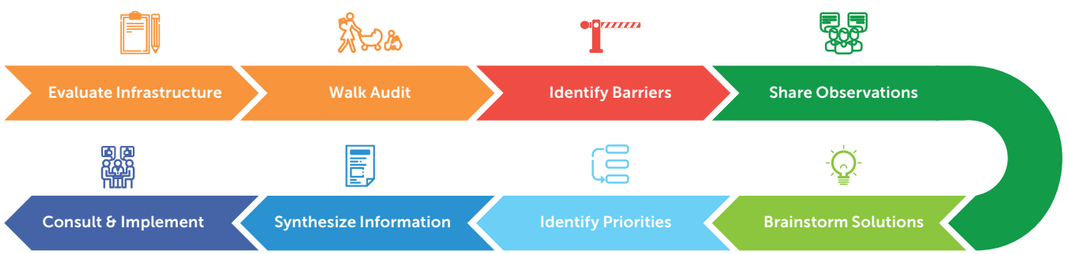
Meeting Time: 2:45 PM
Weather: Partly cloudy and pleasant

METHODOLOGY

The Community Walk Audit brought school stakeholders together to observe existing conditions, identify barriers to students safely walking or biking, and brainstorm solutions. The Walk Audit team consisted of four students, three teachers, two parents, the school's assistant principal, an NVUSD Board of Education trustee, and an NCBC Board member. The group met and discussed the SRTS program and the process and purpose of the Walk Audit. The team then split up into two groups. Both groups walked to the front of the school and headed west along Trower Avenue. One group walked south on Jefferson Street, through the back parking lot, and over the west pedestrian bridge back onto campus, while the other group walked further west on Trower Avenue. Throughout the walk, the groups identified major safety issues and shared their experiences traveling to and from the school. The groups returned to the school to discuss their observations, map issue areas, and record and prioritize the major barriers identified during the exercise.

During the prioritization exercise, participants wrote down three barriers that were of high priority to them on sticky notes, placed them on a poster, and organized them into sections based on similar topics. Then, participants were given three round stickers to place on issues that they felt were most important and needed to be solved most urgently. Participants could spread their stickers out or put multiple stickers on one issue. The group then reviewed the major barriers and explored potential solutions to each issue. Participants repeated the prioritization process with potential solutions to the barriers identified.





WALK AUDIT FINDINGS

This section of the report lists the barriers identified by Walk Audit participants during the Walk Audit activity. The barriers listed in the following table are the results of the Walk Audit prioritization activities – the content and language used reflect what Walk Audit participants wrote on their sticky notes.

The barrier identification and prioritization exercise resulted in a list of location-specific and geographically general barriers organized by Vote Score in the table below. Vote Score was determined during the prioritization exercise by the number of stickers and sticky notes addressing a particular issue, with a higher number correlating to a higher Vote Score, indicating a higher importance to Walk Audit participants.

Stakeholder-Identified Barriers:

DESCRIPTION	LOCATION	VOTE SCORE
Poor lighting	School campus (especially south entrance)	7
Poor motorist yielding behavior, low pedestrian visibility, dangerous crosswalk	Trower Ave and Solomon Ave	7
Insufficient number of crosswalks	General area	6
Poor road quality (rough roads, large cracks in streets/sidewalks)	General area	6
Poor sidewalk quality (broken and cracked)	General area	5
Inadequate bike facilities (faded and surface cracking)	Jefferson St	5
Obstructed bike lanes	Trower Ave	5
Unsafe bike facilities (bike lanes next to speeding cars)	General area	4
Busy parking lot (multiple lanes, motorist/pedestrian conflicts)	Trower Ave parking lot	4
Unsafe crosswalk	Trower Ave parking lot	3
Narrow sidewalks	Trower Ave	3
Low pedestrian visibility at crosswalks	General area	3
Inadequate wayfinding (knocked over signs, faulty road signs)	General area	2
Obstructed sidewalks	Trower Ave	1
Obstructed sidewalks (vegetation, trash)	General area	1
Inadequate bike parking (difficult to find, uncovered)	School site	1
Poor/faded road striping	General area	1
Speeding/aggressive driving	General area	1
Congestion	General area	1
Lack of accessibility	General area	1
Busy intersection with cars, pedestrians, bicyclists	Trower Ave and Jefferson St	1
Sidewalk cutouts needed	General area	1
Need pedestrian flow study to prioritize routes	General area	1

Figure 5: Walk Audit Stakeholder-Identified Barriers

Stakeholder-Identified Treatments:

DESCRIPTION	BARRIER ADDRESSED	LOCATION	PRIORITY
Painted conflict markings	Low bicyclist visibility, bicycle/motorist conflict risk	Trower Ave/Jefferson St intersection	8
Buffered bike lane	High-stress bike lanes	Trower Ave and Jefferson St	7
Rectangular Rapid Flashing Beacons	Poor motorist yielding behavior, low pedestrian visibility	Trower Ave at Solomon Ave	7
Raised crosswalk	Poor motorist yielding behavior, low pedestrian visibility, motorist speeding	Trower Ave at Solomon Ave	6
Install stop sign or light	Poor motorist yielding behavior	Trower Ave at Solomon Ave	4
"Countdown" for students to cross	Motorist/pedestrian conflict risk	Trower Ave at Solomon Ave	4
Pedestrian scale lighting	Low lighting	General area	3
Repair roads and sidewalks	Poor/rough road quality; broken/displaced sidewalks	General area	3
Install raised crosswalks	Busy parking lot(s), speeding, low pedestrian visibility, poor motorist yielding behavior	Front and back parking lots	3
Multi-use path	No bicycle facilities/high-stress bicycle facilities	General area	2
Buffered bike lane	High-stress bicycle facilities	Trower Ave	2
Widen sidewalk	Narrow sidewalks	Trower Ave	2
Increase school zone signage	Speeding/aggressive driving	Trower Ave/Jefferson St intersection	2
Raised curbs for pedestrians	Poor motorist yielding behavior, low pedestrian visibility	Trower Ave/Jefferson St intersection	2
Re-paint travel lanes	Faded paint	General area	2
Repave bike lanes	Rough road quality, faded paint	Trower Ave and Jefferson St	1
High volume sidewalk/multi-use path to school site	High-stress bicycle facilities; narrow sidewalks in high pedestrian volume area	General region	1
Clearer lane control for bikes	Busy intersection, motorist/bicyclist conflict risk	Eastbound Trower Ave at Jefferson St	1
Install stop signs	Speeding, poor motorist yielding behavior	All crosswalks in area	1
Crossing guards	Speeding, poor motorist yielding behavior	General area	1
Curb extension	Long crossing distance, fast motorist turns, poor motorist yielding behavior, low pedestrian visibility	Trower Ave/Jefferson St intersection	1
Increase pedestrian signage	Speeding, poor motorist yielding behavior	General area	1
Extend Trower Avenue to Big Ranch	Congestion on Trower	Trower Ave	1

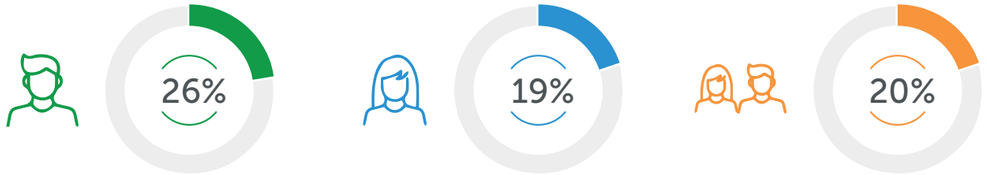
Figure 6: Walk Audit Stakeholder-Identified Treatments

CONTEXT FOR **RECOMMENDATIONS**

IMPACT OF BARRIERS/HAZARDS ON COMMUNITY

Barriers to safe walking and bicycling, both infrastructure and non-infrastructure, can greatly discourage communities from engaging in active transportation. The quality, accessibility, and connectivity of bicyclist and pedestrian travel networks strongly influence the rates of walking and bicycling as a mode of daily transport[1]. Public policies and attitudes, such as traffic-calming measure enforcement and parking limitations, also contribute to the efficacy of pedestrian/bicycle networks. Thus, barriers to accessibility and connectivity must be addressed in order to encourage increased and safe walking and cycling.

Barriers that discourage walking and bicycling prevent communities from gaining the health benefits offered by active transportation. For children, physical activity can improve cognitive function, bone health, cardiorespiratory and muscular fitness, and mental wellness[2]. Adults benefit from lower risk of cardiovascular disease, hypertension, dementia, anxiety, and falls for older adults, as well as improved quality of life, physical function, bone health, and sleep.



However, only about **26% of men**, **19% of women**, and **20% of adolescents** are meeting the aerobic and muscle-strengthening guidelines developed by the Department of Health. Increased walking and biking to school can help boost that percentage by incorporating physical activity into one's daily routine and encouraging further active transportation choices.

Lack of safe bicycle/pedestrian facilities can also negatively impact the environment, as more people will choose to drive rather than bike or walk. Passenger cars and light-duty trucks produced **over half of the transportation sector emissions in 2017**[3].

50%

29%

The transportation sector produced the most greenhouse gas emission of any economic sector, releasing **up to 29% of total US greenhouse gas emissions** for the year.

Furthermore, **transportation emissions have increased around 400 million metric tons** since 1990 due to increased vehicle demand. Thus, decreasing vehicle use by creating bicycle/pedestrian networks that are safe from potential hazards and barriers can help mitigate these environmental effects.

400 MILLION

In addition to the consequences already discussed, barriers to safe walking and bicycling can lead to increased collisions and conflicts between motorists, pedestrians, and bicyclists. Safety barriers can lead to more people choosing to drive, even if the destination is within walking or biking distance, increasing traffic congestion. Children have fewer opportunities to develop their sense of independence through walking and biking to school, and the community is hindered from enjoying the social and economic benefits of bicycling and walking. Safety barriers and hazards that discourage increased walking and bicycling can considerably impact many different parts of a community, which is why it is so crucial to address and resolve them.

[1] Kuzmyak, Richard J., Dill, Jennifer. "Walking and Bicycling in the United States: The Who, What, Where, and Why." TR News May-June 2012: 4-15. Web. [2] U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: U.S. Department of Health and Human Services; 2018. [3] Sources of Greenhouse Gas Emissions, United States Environmental Protection Agency. Web.

RECOMMENDATIONS

Recommendations were determined by Napa County Safe Routes to School staff, taking into account the feedback and results from the Walk Audit activity, Fulcrum data, existing plans, and local stakeholder input. Priority levels for recommendations were calculated through consideration of vehicle, pedestrian, and bicyclist traffic volumes; vehicular traffic speed; collision history; presence of existing bicycle/pedestrian facilities; proximity to major identified routes to school; high-level potential cost/complexity of recommendation; and Walk Audit participant input.

This section outlines and explains high and medium priority recommendations specific to the school site. School site-specific recommendations of all priority levels can be found in the "Table of Recommendations" section. Universal recommendations that apply to all school sites are described in Appendix B. Recommendations that are focused on infrastructure treatments are denoted by "NAI," and recommendations that suggest programmatic treatments are denoted by "NAP." Please note that implementing these recommendations will often require further evaluation and study, as well as design, right-of-way acquisition, compliance checks with existing laws, and coordination with utility, public safety, and other local government departments.

RECOMMENDATIONS #NAI-178 AND NAI-180: VINTAGE HIGH CAMPUS HIGH PRIORITY RECOMMENDATIONS

Narrative – The school provides a row of wave-style bike racks for campus bicycle parking near the main campus entrance on Trower Avenue. However, the school does not provide bike parking near the back entrance of the school off of Jefferson Street, which may be a preferred entrance for students who wish to avoid drop-off/pick-up congestion on Trower Avenue and the Jefferson/Trower intersection. Student pedestrians and bicyclists who enter campus via Jefferson Street must also navigate the large back parking lot during busy arrival and dismissal times, as there is no separated path for bicyclists and pedestrians around the lot.

IDENTIFIED BARRIERS

- ***Insufficient bike parking –*** On-campus bike parking is provided at only one entrance near Trower Avenue, and only offers about 20 spaces, enough for roughly 1% of the student population. A perceived lack of secure bike parking in visible, convenient locations near school entrances, and potential theft resulting from informal bike parking, can deter students from biking to school.
- ***No sidewalk through Jefferson lot –*** There are no sidewalks through the back parking lot off of Jefferson Street, forcing bicyclists and pedestrians to navigate traffic in the parking lot.

Existing bicycle parking only provides enough parking for about 1% of the student body.

RECOMMENDATIONS

- ***NAI-178 Bike parking –*** Install more bicycle parking in the front of the school near Trower Avenue entrances and at back entrances of the school off of Jefferson Street. See Appendix D for bike parking guidelines.
- ***NAI-180 Shared-use path –*** Install a shared-use path along the perimeter of the Jefferson parking lot to provide a direct and separated path from the Jefferson sidewalk to the bridge to campus.

RECOMMENDATIONS #NAI-183 AND NAI-184: JEFFERSON STREET MULTIMODAL ACCESS (SALVADOR/TROWER)

Narrative – Jefferson Street borders the school on the west side, provides access to campus through the school's back parking lot, and is a key north-south connection to Trower Avenue for students travelling to the school's Trower entrances. Jefferson Street is an integral high-volume north-south arterial corridor that runs from Salvador Avenue to Atrium Parkway, spanning nearly the entire City limits on the east side of SR 29. Jefferson Street is a key part of direct routes to several residential neighborhoods, commercial destinations such as shopping centers, pharmacies, and health services, schools, and downtown throughout the east side of Napa; consequently, Jefferson plays a crucial role in the multimodal transportation network for the City of Napa. The segment from Salvador Avenue to Trower Avenue is along direct routes for students travelling to neighborhoods north of the school or to Willow Elementary School or River Middle School, where students may have siblings.

IDENTIFIED BARRIERS

- ***Sidewalk gaps –*** Sidewalk gaps along both sides of Jefferson Street (northbound: 4066 Jefferson Street to 4010 Jefferson Street; southbound: El Centro Avenue east to 3912 Jefferson Street) may force pedestrians to walk in the road or cross the street in unmarked locations; large sections of missing sidewalks can prevent students from walking to school altogether.
- ***Auto-oriented corridor –*** Jefferson Street's current design, featuring wide lanes on a relatively straight corridor with no traffic-calming and little traffic control, prioritizes vehicle speed, volumes, and convenience and facilitates frequent motorist speeding.
- ***High speeds and volumes of traffic –*** Jefferson Street carries extremely high volumes of high-speed traffic, which many bicyclists and pedestrians do not feel comfortable or safe navigating.

The southbound bike lane on Jefferson Street ends at Joshua Court.

- ***High-stress bicycle facilities –*** The existing Class II bicycle facilities are high-stress for riders due to the lack of separation between high speeds and volumes of vehicle traffic and high conflict-risk intersections. This high stress is exacerbated in areas where there are bicycle facility gaps or bicycle facilities do not reach all the way up to an intersection.
- ***High-stress crosswalks –*** Infrequent and high-stress/conflict-risk crosswalks across Jefferson Street along the corridor makes travelling along the corridor challenging and inconvenient for pedestrians and creates a higher risk of road user conflict.
- ***Minimal shade –*** Minimal shade along the corridor, in addition to being adjacent to high volumes of vehicle traffic, creates an increased heat effect that deters walking along the corridor.

RECOMMENDATIONS

- ***NAI-184 –*** Improved multimodal access
  - ***Long-term: Road diet –*** Implement a road diet and redesign of corridor to improve and prioritize safe, accessible, and comfortable multi-modal transportation through a Complete Streets framework as part of adopted Bike Plan corridor study designation. Integrate specific recommendations from SRTS reports into road redesign.
  - ***Short-term: Fill bike facility gaps and extend bike facilities to intersection at Trower Avenue.*** Install quick-build traffic-calming features. Upgrade bike lanes to Class IV protected bike lanes (using parking-protected Class IVs where necessary) and include conflict markings where needed along major side streets/driveways.
- ***183 –*** Fill sidewalk gaps - Fill sidewalk gaps to provide a continuous pedestrian network and reduce unnecessary pedestrian road crossings.

RECOMMENDATION #NAI-185: JEFFERSON STREET MULTIMODAL ACCESS (TROWER/RUBICON)

Narrative – Jefferson Street borders the school on the west side, provides access to campus through the school's back parking lot, and is a key north-south connection to Trower Avenue for students travelling to the school's Trower entrances. Jefferson Street is an integral high-volume north-south arterial corridor that runs from Salvador Avenue to Atrium Parkway, spanning nearly the entire City limits on the east side of SR 29.

Jefferson Street is a key part of direct routes to several residential neighborhoods, commercial destinations such as shopping centers, pharmacies, and health services, schools, and downtown throughout the east side of Napa; consequently, Jefferson plays a crucial role in the multimodal transportation network for the City of Napa. The segment from Trower Avenue to Rubicon Street is along direct routes for students travelling to neighborhoods south of the school, to Bel Aire Park Magnet Elementary School where students may have siblings, or to commercial destinations along Trancas Street.

IDENTIFIED BARRIERS

- ***Auto-oriented corridor –*** Jefferson Street's current design, featuring wide lanes on a relatively straight corridor with no traffic-calming and little traffic control, prioritizes vehicle speed, volumes, and convenience and facilitates frequent motorist speeding.

- ***High speeds and volumes of traffic –*** Jefferson Street carries extremely high volumes of high-speed traffic, which many bicyclists and pedestrians do not feel comfortable or safe navigating.

- ***High-stress bicycle facilities –*** The existing Class II bicycle facilities create high stress for riders due to the lack of separation between high speeds and volumes of vehicle traffic and high conflict-risk intersections. This high stress is exacerbated in areas where bicycle facilities narrow to substandard widths (less than five feet) and where bicyclists are riding between parked vehicles and moving traffic.

Unprotected bicycle lanes on Jefferson Street create high stress, deterring most interested bicyclists from riding.

- ***High-stress crosswalks –*** Infrequent and high-stress/conflict-risk crosswalks across Jefferson Street along the corridor makes travelling along the corridor challenging and inconvenient for pedestrians and creates a higher risk of road user conflict.

- ***Minimal shade –*** Minimal shade along the corridor, in addition to being adjacent to high volumes of vehicle traffic, creates an increased heat effect that deters walking along the corridor.

RECOMMENDATIONS

- ***Road diet –*** Implement a road diet and redesign of corridor to improve and prioritize safe, accessible, and comfortable multi-modal transportation through a Complete Streets framework as part of adopted Bike Plan corridor study designation. Integrate specific recommendations from SRTS reports into road redesign.

- ***Short term: Extend bike facilities to/through all intersections.*** Install quick-build traffic-calming features. Upgrade bike lanes between Sierra Avenue and Trower Avenue to buffered bike lanes by narrowing widths of travel lanes and center turn lane to create enough space. Paint conflict markings at major intersections.

RECOMMENDATIONS #NAI-190 – NAI-192: TROWER AVENUE BICYCLE FACILITIES (SR 29/JEFFERSON)

Narrative – Trower Avenue is a significant east-west arterial on the north side of Napa, spanning from Dry Creek Road to Stover Street and providing connections to other important transportation corridors, including Solano Avenue, SR 29, Jefferson Street, and the Vine Trail shared-use path. Trower Avenue borders the school on the north side and provides access to the school's main entrances, on-campus bicycle parking, and front parking lot/student loading zone. As a result, Trower Avenue is highly-travelled by all modes of transportation during peak school arrival and dismissal times. For students who use the Vine Trail shared-use path to travel to school, exiting the trail onto Trower Avenue is the closest exit point to the school, making Trower Avenue is a significant connection for active transportation users.

IDENTIFIED BARRIERS

- ***Auto-oriented corridor –*** Trower Avenue's current design, featuring wide lanes on a relatively straight corridor with no traffic-calming and little traffic control, prioritizes vehicle speed, volumes, and convenience and facilitates frequent motorist speeding.

- ***High speeds and volumes of traffic –*** Trower Avenue carries high volumes of high-speed traffic, which many bicyclists and pedestrians do not feel comfortable or safe navigating.

Trower Avenue currently has Class II bike lanes.

- ***Congestion –*** Trower Avenue tends to become congested during peak commute and school hours due to its role as an arterial and the multiple nearby school it serves, which can induce impatient driver behavior and make navigating traffic feel chaotic and hazardous to bicyclists and pedestrians.

- ***High-stress bicycle facilities –*** The existing Class II bicycle facilities create high stress for riders due to the lack of separation between high speeds and volumes of vehicle traffic and high conflict-risk intersections.

- ***Bike lane ends –*** The eastbound (south) bike lane suddenly ends early west of the Trower and Jefferson intersection, which reduces bicyclist visibility at the intersection and can lead to road user confusion.

RECOMMENDATIONS

- ***NAI-190 Bicycle facilities –*** Upgrade the existing bike facilities to buffered Class II bike lanes or Class IV protected bike lanes where feasible to increase space/separation between bicyclists and vehicle traffic.

- ***NAI-191 Bike lane at Jefferson –*** Approaching the Trower/Jefferson intersection from the west, make the third vehicle travel lane a dedicated right-turn lane and pull bike lane up to the intersection with green conflict markings for merge across right-hand travel lane to provide clear guidance on bicyclist positioning approaching the intersection. See additional recommendations for Jefferson/Trower intersection.

- ***NAI-192 Roadway redesign –*** Redesign the roadway with narrowed vehicle lanes (10' travel lanes, 12' turn lane) to create space for upgraded bike facilities. Implement traffic-calming measures along the corridor.

RECOMMENDATION #NAI-193: TROWER AVENUE AND JEFFERSON STREET INTERSECTION

Narrative – The Trower Avenue and Jefferson Street intersection is a highly-travelled intersection between two arterials in the school zone and is part of most direct routes to school due to its vicinity to school campus. The intersection becomes extremely congested during school arrival and dismissal times, largely due to motorists dropping off/picking up students in the loading zone or in front of the school on Trower Avenue. As Trower Avenue dead-ends east of the school campus, most motorists exit the school area the same way they arrived, ultimately directing most vehicle traffic back to the Trower/Jefferson intersection. As Jefferson Street and Trower Avenue are along direct routes to school for students walking and biking, this intersection experiences high levels of multimodal traffic.

IDENTIFIED BARRIERS

- ***Large, busy intersection –*** This intersection of two arterials is a key intersection in the school zone, as it is highly travelled by all modes of transportation, both school-related and non-school related, which can increase road user conflict risk and can feel chaotic and challenging for students.
- ***Motorist behavior –*** Walk Audit participants reported multiple unsafe motorist behaviors in this intersection, such as speeding through the intersection and failing to yield to pedestrians, largely due to impatience caused by congestion.
- ***Low-visibility crosswalks -*** The crosswalks are faded and painted with a standard, parallel line pattern, despite being located in a highly-travelled school zone.

The Trower Avenue and Jefferson Street intersection.

RECOMMENDATIONS

- ***Leading Pedestrian Interval –*** Install Leading Pedestrian Intervals for all crosswalks to provide pedestrians with a protected head-start through the intersection, improving driver awareness of pedestrians and reducing risk of turning conflicts.
- ***No right-turn on red –*** Prohibit right turns on red lights to reduce instances of conflict between pedestrians crossing the street and motorists turning right.
- ***Bicycle facilities –*** Continue bicycle facilities leading up to and through the intersection to maintain a cohesive path for bicyclists and increase road user predictability in the intersection.
- ***High-visibility crosswalks –*** Repaint all crosswalks with a high-visibility school-zone pattern to increase pedestrian visibility and motorist yielding behavior.
- ***Protected intersection –*** Given high volumes of multimodal traffic and importance of both arterial roads, explore options for installing a protected intersection.

RECOMMENDATION #NAP-022: TROWER AVENUE NEIGHBORHOOD EDUCATION

Narrative – As a key east-west arterial that provides direct access to campus and the closest entrance to bicycle parking, as well as the most direct connection to the Vine Trail shared-use path, Trower Avenue is an important route for bicyclists travelling to and from the school. However, the existing bike lanes on Trower Avenue are frequently blocked by garbage bins from several residences along the street, forcing bicyclists to merge into the travel lane, which can be particularly hazardous during periods of high traffic volumes, such as school arrival and dismissal times.

IDENTIFIED BARRIERS

- ***Obstructed bike lanes –*** Bicycle lanes along Trower Avenue (SR 29 to east end) are frequently obstructed with trash bins, forcing bicyclists to merge with vehicle traffic and increasing risk of collisions.

RECOMMENDATIONS

- ***Neighborhood education –*** Execute a neighborhood education program regarding correct trash bin placement to reduce bike lane obstruction on an annual and/or as-need basis.

Trower Avenue bike lanes are frequently obstructed on trash collection day.

RECOMMENDATIONS #NAP-024 AND NAP-026: ON-CAMPUS ENCOURAGEMENT AND EDUCATION

Narrative – A vehicle-oriented transportation culture contributes to students choosing not to walk or bike to school. In addition to infrastructure barriers, much of which exists due to this transportation culture, many students drive or are driven to school because it is the „cool" or „normal" thing to do, or because they have recently earned their driver's license, a source of excitement and sense of independence. It is also likely that many students are unaware of the impacts their everyday transportation choices have on their health, environment, and community. An increase in encouragement programming can help raise awareness of and enthusiasm towards active transportation and complement infrastructure improvements. Additionally, bicycle safety education is a crucial component of increasing biking mode share and safety at a school site, as it teaches students rules of the road and safe biking behaviors, reminding students that bicyclists have the same rights and responsibilities as motorists. This understanding not only improves bicyclist safety, but also increases confidence and comfort for students.

IDENTIFIED BARRIERS

- ***Vehicle-oriented transportation culture –*** Being surrounded by a vehicle-oriented transportation culture significantly contributes to students developing the habit of driving or being driven to school.
- ***Congestion in school zone –*** Congestion in the school zone during school arrival and dismissal times can increase conflict risk and make the school zone feel unpredictable and unsafe to bicyclists and pedestrians, especially in conjunction with infrastructure barriers.
- ***No existing bike education –*** The lack of a bicycle safety education program can result in unintentional unsafe student bicyclist behavior and a sense of discomfort riding a bike.

Leadership students at American Canyon High School host a welcome table during Walk and Roll to School Day 2021.

RECOMMENDATIONS

- ***Encouragement events –*** Continue participation in annual countywide encouragement events with the goal of increasing student participation. Empower student clubs, classes, and organizations like Student Council in developing and hosting additional independent active transportation encouragement events. Students should lead encouragement efforts, as peer-to-peer messaging is more effective and engaging.
- ***Annual bicycle education –*** Provide annual bike safety and maintenance education to all students to ensure that all students are familiar with rules of the road and taking care of their bikes.

RECOMMENDATIONS #NAI-177 AND NAI-179: VINTAGE HIGH CAMPUS MEDIUM PRIORITY RECOMMENDATIONS

IDENTIFIED BARRIERS

- ***Low lighting –*** Walk Audit participants identified low lighting as a barrier, particularly at the back entrance off of Jefferson Street and along campus footbridges, as it reduces pedestrian and bicyclist visibility and sense of safety.
- ***Trower parking lot –*** The Trower parking lot in front of the main school entrance becomes busy and congested during school arrival and dismissal times, making the crosswalk through the parking lot that pedestrians must use to reach campus at risk of user conflicts.

Two driveways flank the central pedestrian path to campus through the Trower parking lot.

RECOMMENDATIONS

- ***NAI-177 Pedestrian-scale lighting –*** Install pedestrian-scale lighting throughout campus, particularly around school access points and bicycle parking locations, to improve visibility and sense of safety.
- ***NAI-179 Reduce parking lot driveways –*** On the Trower parking lot, close the middle entrance and exit flanking the parking lot crosswalk to reduce sudden pedestrian/motorist conflicts.

RECOMMENDATION #NAI-181: TROWER AND SOLOMON INTERSECTION UPDATES

IDENTIFIED BARRIERS

- ***Uncontrolled Trower traffic –*** Trower Avenue traffic is uncontrolled at this intersection, facilitating motorists driving through the intersection without slowing down and reducing motorist yielding behavior. This is particularly hazardous during school arrival and dismissal times, when congestion around the school site causes motorists to behave impatiently and fail to yield to pedestrians.

- ***Faded crosswalk –*** The existing crosswalk across Trower Avenue is faded despite leading up to the main school access point on Trower, making it highly-travelled by student pedestrians.

The crosswalk across Trower Avenue at Trower and Solomon.

RECOMMENDATIONS

- ***Curb extensions –*** Install curb extensions on both sides of the Trower Avenue crosswalk to improve pedestrian visibility and motorist yielding behavior, slow motorists through the intersection, and reduce the crossing distance for pedestrians.

- ***High-visibility crosswalks –*** Repaint the existing high-visibility school-zone crosswalk across Trower Avenue and paint a new high-visibility school-zone crosswalk across Solomon Avenue to improve pedestrian visibility and motorist yielding behavior.

RECOMMENDATION #NAI-186: JEFFERSON STREET PARKING LOT EXIT

IDENTIFIED BARRIERS

- ***Jefferson parking lot exit –*** Motorists exiting the Jefferson Street parking lot, particularly those turning left, frequently obstruct the bike lane in order to see oncoming traffic or when waiting for a gap in traffic to turn.

The Jefferson Street parking lot entrance/exit.

RECOMMENDATIONS

- ***Parking lot exit redesign –*** Extend the curbside red zone south of the parking lot entrance to improve visibility. Transition the bike lane alignment along the red zones and in front of the parking lot exit to run next to the curb. Paint conflict markings in bike lane within the red zones and in front of parking lot exit. Reinforce the "no parking" red zones with hash striping. Upgrade the crosswalk across the parking lot exit to a raised crosswalk to deter motorist queuing from blocking the sidewalk.

RECOMMENDATION #NAI-189: TROWER AVENUE BICYCLE FACILITIES (JEFFERSON/EAST END)

IDENTIFIED BARRIERS

- ***Motorist/bicyclist conflict area –*** The existing bike lanes on Trower Avenue east of Jefferson Street can have a high risk of motorist/bicyclist conflicts where parking is available, as motorists picking up/dropping off students frequently cross the bike lane. Additionally, Walk Audit participants reported motorists using the bike lane in front of the school to pick up and drop off students. This issue may be exacerbated upon implementation of the Trower Avenue expansion project.

The eastbound Trower Avenue bike lane in front of the school campus.

RECOMMENDATIONS

- ***Protected bike lanes –*** Install Class IV protected bike lanes on both sides of the street, transitioning to parking protected Class IV bike lanes east of the U-shaped parking lot.

- ***One lane eastbound –*** Contingent on implementation of intersection redesign at Trower Avenue/Jefferson Street intersection, redesign Trower Avenue just east of intersection to one travel lane eastbound.

RECOMMENDATION #NAI-195: SALVADOR CREEK PATHWAY

IDENTIFIED BARRIERS

- ***Informal path –*** The existing path along Salvador Creek from the Austin Miller memorial path to Vintage High campus is a narrow, dirt path through a field, providing only limited accessibility and becoming unusable during the wet season when it becomes muddy.

RECOMMENDATIONS

- ***Class I shared-use path –*** Widen and pave the informal path to Class I shared-use path standards from Vintage High campus to Austin Miller memorial path to improve accessibility and comfort and ensure usability year-round.

The existing path to campus from the Austin Miller memorial path is an informal dirt path.

RECOMMENDATION #NAI-199: JEFFERSON STREET AND EL CENTRO AVENUE (SOUTH) CURB EXTENSIONS

IDENTIFIED BARRIERS

- ***Long crossing distances –*** Long crossing distances in the intersection, particularly across Jefferson Street, push pedestrians further out of the range of vision of motorists and requires them to be in the roadway for a longer time than necessary, increasing the risk of collisions.

- ***Wide curb radii –*** Wide curb radii on the corners of the intersection facilitate fast motorist turning movements.

RECOMMENDATIONS

- ***Curb extensions –*** Install curb extensions on the northwest, northeast, and southeast corners to reduce crossing distance, reduce curb radii, and improve pedestrian visibility.

Jefferson Street and El Centro Avenue intersection.

RECOMMENDATION #NAI-206: AUSTIN MILLER MEMORIAL BIKE PATH

IDENTIFIED BARRIERS

- ***Rough path –*** The existing Class I shared-use path is extremely rough, making the path difficult and unpleasant to bike on.

- ***No landscaping –*** The lack of landscaping makes the path unwelcoming/unpleasant to use, particularly during hot weather.

- ***Excessive bollards –*** An excessive number of bollards at the Sierra Avenue entrance to the path block bicyclists from safely/conveniently entering.

RECOMMENDATIONS

- ***Repave path –*** Repave the Austin Miller memorial path and widen to 10 feet (Class I standards) to better accommodate bicyclists and pedestrians sharing the path.

- ***Reduce bollards –*** Remove at least two bollards from the Sierra Avenue entrance to improve bicycle access to the trail.

- ***Shade –*** Dependent on Sierra Avenue extension project feasibility and timeline, install shade-providing landscaping to make the path more welcoming and comfortable for bicyclists and pedestrians.

Several bollards at the entrance to the Austin Miller memorial path make entering the path on a bike challenging.

RECOMMENDATION #NAP-021: TROWER AVENUE STREET-SWEEPING

IDENTIFIED BARRIERS

- ***Obstructed bike lanes –*** The existing bike lanes on Trower Avenue (SR 29 to east end) are frequently obstructed with debris, posing a flat tire/fall risk or forcing bicyclists to unexpectedly merge with vehicle traffic.

RECOMMENDATIONS

- ***Street-sweeping –*** Slow down the existing street-sweeping to ensure that bike lanes are swept regularly with travel lanes. Increase sweeping frequency if needed.

A Class II bike lane on Trower Avenue.

RECOMMENDATION #NAP-025: STUDENT-LED EDUCATION CAMPAIGNS

IDENTIFIED BARRIERS

- ***Vehicle-oriented transportation culture –*** Being surrounded by a vehicle-oriented transportation culture significantly contributes to students developing the habit of driving or being driven to school.

The teen program of Marin County Safe Routes to School provides resources, messaging, and events tailored to students in middle and high school. Image credit: Marin County Safe Routes to School.

- ***Congestion in school zone –*** Congestion in the school zone during school arrival and dismissal times can increase conflict risk and make the school zone feel unpredictable and unsafe to bicyclists and pedestrians, especially in conjunction with infrastructure barriers.

RECOMMENDATIONS

- ***Student-led Programs –*** Empower student clubs, classes, and organizations like Student Council in developing and executing regular active transportation education campaigns. Students should lead education efforts, as peer-to-peer messaging is more effective and engaging. Education outreach initiatives can help increase awareness amongst students of the various benefits of active transportation. For example, an Environmental Club can emphasize how walking and biking reduces greenhouse gases, and a Leadership Club can highlight the positive physical and mental health effects of active transportation.

ADDITIONAL CONSIDERATIONS

Improvements listed in this section are those within a half-mile radius that are either considered significant to the school area but are not located along routes to the school based on the school's enrollment boundary or were ranked as a higher priority during the Walk Audit for another nearby school. These barriers are listed as high or medium priority due to their impact on routes to nearby schools in the neighboring areas and will be analyzed in more depth in the reports for the affected schools.

RECOMMENDATION #NAI-196: EL CAPITAN WAY AND JEFFERSON STREET INTERSECTION

IDENTIFIED BARRIERS

- ***Missing red zones***
- ***Wide curb radii***
- ***Missing crosswalk***
- ***High-speeds and volumes of uncontrolled Jefferson traffic***
- ***Long crossing distance***
- ***ADA-accessibility issues at median***

RECOMMENDATIONS

- ***Curb extensions***
- ***High-visibility crosswalks***
- ***New high-visibility crosswalk across south leg***
- ***Rectangular Rapid Flashing Beacons for Jefferson crosswalk***
- ***ADA-compliant ramps on median***

Relevant Reports:

- *Bel Aire Park Magnet Elementary School Walk Audit Report*

RECOMMENDATION #NAI-197: JEFFERSON STREET AND SIERRA AVENUE INTERSECTION

IDENTIFIED BARRIERS

- ***High-speeds and volumes of uncontrolled Jefferson traffic***
- ***Long crossing distance***
- ***Wide curb radii***
- ***Missing crosswalk south side***
- ***Poor motorist yielding behavior***

RECOMMENDATIONS

- ***Curb extensions***
- ***High-visibility crosswalks***
- ***New high-visibility crosswalk on south side***
- ***Updated traffic control device with road expansion***

Relevant Reports:

- *Bel Aire Park Magnet Elementary School Walk Audit Report*

RECOMMENDATION #NAI-198: JEFFERSON STREET AND EL CENTRO AVENUE (SOUTH) CROSSWALKS

IDENTIFIED BARRIERS

- ***Faded crosswalk***
- ***Missing crosswalk***

RECOMMENDATIONS

- ***High-visibility crosswalks***

Relevant Reports:

- *Willow Elementary School Walk Audit Report*

RECOMMENDATION #NAI-200: JEFFERSON STREET AND EL CENTRO AVENUE (NORTH) INTERSECTION

IDENTIFIED BARRIERS

- ***Faded, low-visibility crosswalks***
- ***High-speed/-volume Jefferson traffic uncontrolled***

RECOMMENDATIONS

- ***Curb extensions***
- ***High-visibility school-zone crosswalks***

Relevant Reports:

- *Willow Elementary School Walk Audit Report*

RECOMMENDATION #NAI-201: JEFFERSON STREET AND TALLAC STREET INTERSECTION

IDENTIFIED BARRIERS

- ***Missing crosswalk***
- ***Wide curb radii***
- ***Long crossing distance***
- ***Misaligned curb ramps***
- ***High-speed/-volume Jefferson traffic uncontrolled***

RECOMMENDATIONS

- ***Curb extensions***
- ***High-visibility crosswalk***

Relevant Reports:

- *Bel Aire Park Magnet Elementary School Walk Audit Report*

MAP OF RECOMMENDATIONS

Map 5: Recommendations

TABLE OF RECOMMENDATIONS

Infrastructure:

	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
1	Vintage High School campus	NAI-177	Low/not enough lighting (especially at back entrance off of Jefferson and along footbridges).	Install pedestrian-scale lighting throughout campus.	$	**Medium**
		NAI-178	Insufficient bike parking.	Install more bike parking in the front of the school (Trower) and bike parking near back entrance (Jefferson) of school. See Appendix D: Bike Parking for guidelines.	$	**High**
		NAI-179	Trower parking lot – busy crosswalk. Very congested, lots of pedestrian/car interactions, double parking.	Close middle parking lot entrance and exit flanking Trower and Solomon crosswalks.	$	**High**
		NAI-180	No sidewalks in the back (Jefferson) parking lot.	Install shared-use path along perimeter of Jefferson parking lot providing direct path from Jefferson sidewalk to bridge to campus.	$$	**High**
2	Trower Avenue and Solomon Avenue intersection	NAI-181	Uncontrolled Trower traffic, congestion around crosswalk during peak school hours, faded crosswalk, poor motorist yielding behavior.	Install curb extensions on both sides of crosswalk. Repaint existing high-visibility crosswalk across Trower. Paint high-visibility school crosswalk across Solomon.	$-$$	**Medium**

	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
3	Jefferson Street from Salvador Avenue to Trower Avenue	NAI-182	Poor road quality around Trower Avenue intersection.	Repave road and paint bike facilities up to intersection.	$$$$	**Low**
		NAI-183	Sidewalk gaps along both sides of Jefferson Street (northbound: 4066 Jefferson Street to 4010 Jefferson Street; southbound: El Centro Avenue south to 3912 Jefferson Street).	Long term: Fill sidewalk gaps.* Short term: See recommendation about crosswalk at Jefferson and Gordon.	$$	**High**
		NAI-184	Wide, straight, auto-oriented corridor designed to prioritize vehicle speed. Road design facilitates frequent motorist speeding. Narrow sidewalks with gaps, infrequent and high-stress crosswalks across the corridor, and minimal shade make this challenging and unwelcoming for pedestrians. High-stress, inconsistent bike facilities are not comfortable for most riders. Bike facility gaps (northbound: Darling Street to El Centro east; southbound: Joshua Court to El Centro Avenue west, 3916 Jefferson Street to Trower Avenue); northbound lane north of Trower and southbound lane south of Trower do not reach intersection.	Long-term: Road diet and redesign of corridor to improve and prioritize safe, accessible, and comfortable multi-modal transportation through a Complete Streets framework as part of adopted Bike Plan corridor study designation*. Integrate specific recommendations from SRTS reports into road redesign. Short term: Fill bicycle gaps and extend bike facilities to intersection at Trower Avenue. Install quick-build traffic-calming features. Upgrade bike lanes to Class IV protected bike lanes (using parking-protected Class IVs where necessary), including conflict markings where needed (along major side streets – El Centro Ave).	$$-$$$$	**High**

	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
4	Jefferson Street from Trower Avenue to Rubicon Street	NAI-185	Wide, straight, auto-oriented corridor designed to prioritize vehicle speed. Road design facilitates frequent motorist speeding. Infrequent and high-stress crosswalks across the corridor, and minimal shade make this challenging and unwelcoming for pedestrians. High-stress bike facilities are not comfortable for most riders, especially between moving traffic and parked cars.	Long term: Road diet and redesign of corridor through a Complete Streets framework as part of adopted Bike Plan corridor study designation*, integrating SRTS recommendations into road redesign. Short-term: Extend bike facilities to/through all intersections. Install quick-build traffic-calming features. Upgrade bike lanes between Sierra Avenue and Trower Avenue to buffered bike lanes by narrowing widths of travel lanes and center turn lane to create enough space. Paint conflict markings at major intersections.	$$-$$$$	**High**
		NAI-186	Left turn exit from back parking lot onto southbound Jefferson Street has low visibility – cars pull out and obstruct bike lane/ sidewalk.	Extend red zone south of parking lot entrance to improve visibility. Transition bike lane alignment in red zones to run next to curb in front of parking lot exit. Paint conflict markings in bike lane within red zones and in front of parking lot exit. Reinforce red zones with hash striping. Upgrade crosswalk across parking lot exit to raised crosswalk.	$-$$	**Medium**
		NAI-187	Crosswalks south of Trower Avenue too far for convenient for access to back entrance of school.	Install crosswalk at Jefferson/ Yellowstone intersection across Jefferson with high-visibility pattern, curb extensions, and Rectangular Rapid Flashing Beacons.	$$	**Low**
5	Trower Avenue from Jefferson Street to east end of Trower	NAI-188	Poor road quality (Jefferson Street to Solomon Avenue).	Repave road.	$$$	**Low**
		NAI-189	Motorists loading in the bike lane in front of the school, high motorist/bicyclist conflict area.	Road redesign to one travel lane eastbound (west side). Install Class IV protected bike lanes on both sides, transitioning to parking protected Class IV east of U-shaped parking lot.	$$	**Medium**

	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
6	Trower Avenue from SR 29 to Jefferson Street	NAI-190	High-stress bicycle facilities – unprotected bike lanes adjacent to high-speed and high-volume traffic.	Upgrade bike facilities to buffered Class II bike lanes or Class IV protected bike lanes where feasible.	$$	**High**
		NAI-191	Eastbound (south) bike lane suddenly ends early west of Trower and Jefferson intersection.	Make third vehicle travel lane a dedicated right-turn lane and pull bike lane up to intersection with green conflict markings for merge across right-hand travel lane. See recommendations for Jefferson/ Trower intersection.	$	**High**
		NAI-192	Wide, straight, auto-oriented corridor designed to prioritize vehicle speed. Road design facilitates frequent motorist speeding. Congestion may result in impatient driver behavior.	Redesign roadway with narrowed vehicle lanes (10' travel lanes, 12' turn lane) to create space for upgraded bike facilities. Implement traffic-calming measures along corridor.	$$	**High**
7	Trower Avenue and Jefferson Street intersection	NAI-193	Large, busy intersection, congestion leading to impatient driving, motorists speeding through intersection and not looking for pedestrians, faded low-visibility crosswalks.	Install Leading Pedestrian Interval and prohibit right turns on red lights. Continue bike facilities through intersection. Repaint crosswalks with high-visibility pattern. Explore options for protected intersection.	$-$$$	**High**
		NAI-194	Lack of school zone signage.	Install school zone signage.	$	**Low**
8	Salvador Creek pathway from Vintage High School to Austin Miller Memorial Path	NAI-195	Narrow, informal desire path through field along Salvador Creek, muddy in the winter.	Widen and pave informal path to Class I standards.	$$-$$$	**Medium**
9	El Capitan Way and Jefferson Street intersection	NAI-196	Missing red zones around crosswalks. Wide curb radii. No crosswalk on south side. High-speed traffic and long crossing distances reduce visibility of pedestrians trying to cross. No ramp at north median and pedestrian crossing sign at median blocks visibility for wheelchair/stroller users who have to go around the median.	Install curb extensions on all corners, upgrade existing crosswalks to high-visibility pattern. Install new high-visibility crosswalk across south leg. Install Rectangular Rapid Flashing Beacons for crosswalk across Jefferson. Install ADA-compliant ramps on medians.	$$	**High**
10	Jefferson Street and Sierra Avenue intersection	NAI-197	High-speed and high-volume uncontrolled traffic on Jefferson Street makes crossing difficult and uncomfortable for pedestrians. Poor motorist yielding behavior. Long crossing distances, wide curb radii. Northwest curb ramp is not aligned with crosswalk. No crosswalk on south side (the more direct route to Bel Aire Park school).	Install curb extensions on all corners. Upgrade all crosswalks to be a high-visibility school zone pattern and add a high-visibility school-zone crosswalk across the south leg. With expansion of Sierra Avenue, consider further improvements for motorist yielding behavior and pedestrian comfort crossing Jefferson Street with implementation of updated traffic control device (ex: full signalization, High-Intensity Activated crosswalk beacon, etc).	$$-$$$	**High**

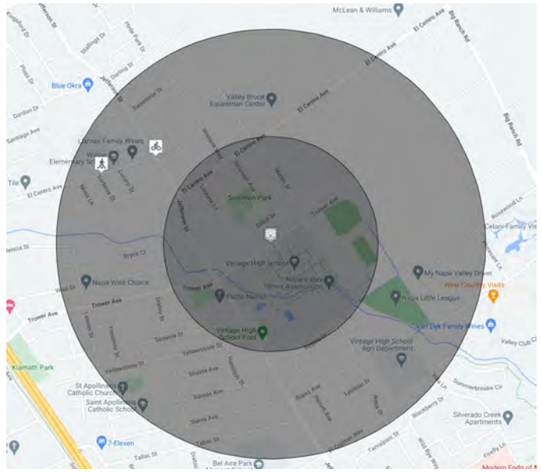
	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
11	Jefferson Street and El Centro Avenue (south) intersection	NAI-198	Faded crosswalk across Jefferson Street, no crosswalk across El Centro Avenue. Wide curb radii, long crossing distances.	Repaint high-visibility crosswalk across Jefferson St, paint new high-visibility crosswalk across El Centro Ave.	$	**Medium**
		NAI-199		Install curb extensions on northwest, northeast, and southeast corners.	$$	**Medium**
12	Jefferson Street and El Centro Avenue (north) intersection	NAI-200	Low-visibility, faded crosswalks, crosswalk across Jefferson leads to side with no sidewalk, high-speed/-volume Jefferson traffic uncontrolled.	Install curb extension on northwest and southwest curbs (accommodating bike facilities) and upgrade crosswalks to high-visibility pattern. Add curb extension to east side of Jefferson and traffic control for Jefferson traffic when sidewalk gaps are filled.	$$	**High**
13	Jefferson Street and Tallac Street intersection	NAI-201	No crosswalk across Tallac Street. Wide curb radii. Misaligned non-ADA compliant curb ramps. Long crossing distance across Tallac. High-speed/-volume Jefferson traffic uncontrolled.	Paint high-visibility crosswalk across Tallac Street and install curb extensions for this crosswalk (use quick-build materials like bollards or floating curb extension design to avoid storm grate relocation).	$-$$	**Medium**
14	El Centro Avenue (south) and Solomon Avenue intersection	NAI-202	Curb ramp missing from south corner; faded crosswalk across El Centro Avenue; no crosswalk across Solomon Avenue. Important as a route for students from northeast Jefferson to avoid sidewalk gaps on Jefferson.	Install ADA-compliant curb ramps, repaint high-visibility crosswalk across El Centro and install curb extensions, paint new crosswalk across Solomon.	$$	**Low**
15	Sierra Avenue from Jefferson Street to Lassen Street	NAI-203	No sidewalks from Jefferson Street to Lassen Street.	Install sidewalks on both sides of the road.* Address long crossing distance and wide curb radius at Hamilton St intersection.	$$$	**Low**
16	Sierra Avenue and Parrett Avenue intersection	NAI-205	No crosswalks; curb ramps missing from northeast, northwest, and southwest corners.	Install crosswalks across Parrett Avenue and install ADA-compliant curb ramps.	$	**Low**
17	Austin Miller Memorial Bike Path	NAI-206	Rough path, lack of landscaping makes path unwelcoming/unpleasant to use in hot weather, excessive bollards at Sierra Avenue entrance block bicycles from safely entering.	Repave path and widen, and remove at least two bollards at Sierra Avenue entrance to improve bicycle access. Dependent on Sierra Ave extension project feasibility, install shade-providing landscaping.	$$	**Medium**

** = projects included in Napa Countywide Pedestrian Plan (2016) or Napa Countywide Bicycle Plan (2019)*

Programmatic Improvements:

	ISSUE	ID #	RECOMMENDATION	LOCATION	FREQUENCY	COST	PRIORITY
1	Obstructed bike lanes (debris and trash bins)	NAP-021	Slow down street-sweeping to ensure bike lanes are swept with travel lanes and increase sweeping frequency if needed.	Trower Avenue from SR 29 to east end of street	Consistent with existing street-sweeping	$	**Medium**
		NAP-022	Execute neighborhood education program regarding correct trash bin placement to reduce bike lane obstruction		Annually and/or as-needed	$	**High**
2	Sidewalks obstructed with trash and overgrown vegetation (especially west of Jefferson St)	NAP-023	Increase vegetation management around Napa Community Garden to reduce sidewalk obstruction	Trower Avenue (especially eastbound side west of Jefferson St)	As-needed	$	**Low**
3	Vehicle-oriented transportation culture, congestion in school zone	NAP-024	Continue growing participation in annual encouragement events. Engage student body to lead independent encouragement events quarterly, with a goal of increasing frequency over time.	School site	Annual for countywide events; quarterly for independent events	$	**High**
		NAP-025	Initiate and provide support for student-led education campaigns about benefits of active transportation and intersections with important topics (health, climate, etc.)	School site	Annual	$	**Medium**
4	No bicycle safety education program	NAP-026	Organize annual on-campus bike maintenance and safety workshop for students	School-site	Annual	$	**High**

COLLISION MAP AND DATA



Map 6: Collision Map (2017-2021) (Source: UC Berkeley Transportation Injury Mapping System: SRTS Collision Map Viewer)

Summary Statistics

RADIUS	FATAL	SEVERE INJURY	VISIBLE INJURY	COMPLAINT OF PAIN	PEDESTRIAN	BICYCLE	TOTAL
< .25 mi.	0	0	0	0	0	0	0
.25-.5 mi.	0	0	0	2	1	1	2
Total	0	0	0	2	1	1	2

Collision List

DATE	TIME	PRIMARY	SECONDARY	BIKE/PED
2019-10-17	08:25	El Centro Av	Verbena St	No/Yes
2020-09-25	16:00	El Centro Av	Jefferson St	Yes/No

Figure 6: Collision Data (2017-2021) (Source: UC Berkeley Transportation Injury Mapping System: SRTS Collision Map Viewer)

APPENDICES

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Appendix B: Universal Recommendations

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FOOTNOTES

[a] Noreen McDonald, Ruth Steiner, Chanam Lee, Tori Rhoulac Smith, Xuemei Zhu and Yizhao Yang (2014). "Impact of the Safe Routes to School Program on Walking and Bicycling." Journal of the American Planning Association. Vol 80, Iss 2, p 153-167.

[b] Orion Stewart, Anne Vernez Moudon, and Charlotte Claybrooke (2014) Multistate Evaluation of Safe Routes to School Programs. American Journal of Health Promotion: January/February 2014, Vol. 28, No. sp3, pp. S89-S96.

[c] Peter A Muennig et al., 'The Cost-Effectiveness Of New York City's Safe Routes To School Program', American Journal Of Public Health, iss 0 (2014): 1-6.

[d] David Ragland, S Pande, J Bigham and FJ Cooper. (2014, January). Ten years later: examining the long-term impact of the California Safe Routes to School program. Presented at the Transportation Research Board 93rd Annual Meeting, Washington DC. Available at http://docs.trb.org/prp/14-4226.pdf.

[e] Davison K, Werder J and Lawson, C. "Children's Active Commuting to School: Current Knowledge and Future Directions." Preventing Chronic Disease, 5(3): A100, July 2008.

[f] Hillman CH, Pontifex MB, Raine LB, Castelli DM, Hall EE, Kramer AF. The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children. Neuroscience. 2009;159(3):1044-1054. doi:10.1016/j.neuroscience.2009.01.057

[g] Castelli, D.M., Glowacki, E., Barcelona, J.M., Calvert, H.G., & Hwang, J. (2015). Active Education: Growing Evidence on Physical Activity and Academic Performance. [Research brief.] Active Living Research. http://activelivingresearch.org/sites/default/files/ALR_Brief_ActiveEduc....

[h] Appleyard, B. (2017). The meaning of livable streets to schoolchildren: An image mapping study of the effects of traffic on children's cognitive development of spatial knowledge. Journal of Transport & Health, 5.

[i] AAA. Cost of Owning and Operating Vehicle in U.S. Increased 1.9% According to AAA's 2012 Your Driving Costs Study. 2012. http://newsroom.aaa.com/2012/04/costof-owning-and-operating-vehicle-in-u....

[j] Overall Facility Rating determined from 2019-20 School Accountability Report Card

APPENDIX A

EMC Survey Toplines

Safe Routes to School Walk Audit Report and Active Transportation Action Plan

Evaluation: Research & Methodology

- **Purpose: Gain insight into parent practices, perceptions, and attitudes around children walking and riding bicycles to and from school; explore barriers to behavior change**
- **Quantitative survey of 459 parents of K-8 students in Napa County**
  - Conducted online and by telephone, offered in English and Spanish
  - Conducted March 11 – April 12, 2021
  - Participants recruited via communications from school districts and targeted online and telephone contacts
  - *Survey methods were designed to include as many participants as possible; not a random sample*
- **Qualitative follow-up research**
  - One online focus group with 7 participants in English; 4 in-depth telephone interviews in Spanish
  - Conducted May 20 – 28, 2021
  - Targeted parents who lived within two miles of their school site and would like their children to walk or bike to school

Survey of Parents/Guardians of at least one child in K-8th Grade
Napa County, California
Hybrid Email-to-Web/Text-to-Web/Live Telephone Survey
Conducted March 11-April 12, 2021
n=459
EMC Research #21-6420

All numbers in this document represent percentage (%) values, unless otherwise noted.
Please note that due to rounding, percentages may not add up to exactly 100%.

INTRO: Your opinions are important! Thank you for participating in this survey EMC Research is conducting on behalf of the Napa County Safe Routes to School program in partnership with local school districts. You may have been contacted previously to complete this survey via telephone and we ask each individual only complete the survey once.

Your responses will remain completely confidential. Please try to answer every question even if you're not sure. If you need to, you may skip a question.

1. Are you the parent or guardian of any children currently attending kindergarten through eighth grade in one or more of the school districts located in Napa County below? *Please select the District(s) that your K-8th grade student(s) is/are currently enrolled in, check all that apply.* **(MULTIPLE RESPONSES ACCEPTED)**

Calistoga Joint Unified School District	0
Howell Mountain Elementary School District	-
Napa Valley Unified School District	97
Pope Valley Union Elementary School District	0
Saint Helena Unified School District	2
Another District or school in Napa County (please specify)	1
None of the above → **TERMINATE**	-
(No response) → **TERMINATE**	-

2. Please indicate below what grade(s) your child/children are in. *Please select all that apply.* **(MULTIPLE RESPONSES ACCEPTED)**

Kindergarten	22
1st grade	17
2nd grade	15
3rd grade	20
4th grade	15
5th grade	15
6th grade	14
7th grade	12
8th grade	9
9th through 12th grade → **TERMINATE IF ONLY RESPONSE SELECTED**	14
(No response) → **TERMINATE**	-

(IF MORE THAN ONE K-8 STUDENT: "Although you have multiple children in K-8, we ask that you please think about your **oldest K-8** child when answering the next questions."**)**

For these next few questions, please think back to when your **(**child was**/**children were**)** attending school **before** the COVID-19 pandemic.

3. On most days, what was the primary way your **(**K-8 child**/**oldest K-8 child**)** travelled **to** school?

Family vehicle (only children in your family)	73
Carpool (children from other families)	3
School bus	3
Other public transportation	0
Bike	4
Walk	16
Other (scooter, skateboard, inline skates, etc.)	0
(No response)	0

4. And on most days, what was the primary way your **(**K-8 child**/**oldest K-8 child**)** travelled **from** school?

Family vehicle (only children in your family)	73
Carpool (children from other families)	3
School bus	3
Other public transportation	1
Bike	4
Walk	15
Other (scooter, skateboard, inline skates, etc.)	0
(No response)	0

5. How long did it normally take your **(**K-8 child**/**oldest K-8 child**)** to get to/from school?

Less than 5 minutes	18
5-10 minutes	42
11-15 minutes	22
16-20 minutes	8
More than 20 minutes	9
(No response)	0

6. Has your **(**K-8 child**/**oldest K-8 child**)** ever walked or biked to/from school?

Yes	43
No	56
(No response)	0

7. **(ONLY ASKED IF Q6=1, 'Yes, has walked/biked to/from school')** In what grade did your child begin to walk or bike to/from school? **(n=199)**

Pre-school	7
Kindergarten	30
1st grade	9
2nd grade	6
3rd grade	10
4th grade	8
5th grade	9
6th grade	13
7th grade	6
8th grade	1
9th through 12th grade	1
(No response)	2

8. Thinking generally, what grade would you feel comfortable with a child walking or biking to/from school?

Pre-school	1
Kindergarten	5
1st grade	2
2nd grade	2
3rd grade	5
4th grade	14
5th grade	12
6th grade	16
7th grade	10
8th grade	7
9th through 12th grade	13
I would not feel comfortable at any grade	14
(No response)	1

9INT. Continuing to think about times **before** the COVID-19 pandemic, please indicate how comfortable **you** were with your **(**K-8 child**/**oldest K-8 child**)** doing each of the following.

SCALE:	Very Comfortable	Somewhat Comfortable	Not too Comfortable	Not at all Comfortable	(No Response)	Total Comfort.	Total Not Comfort.
(RANDOMIZE)							
9. Taking a bus to school	32	33	17	15	3	**65**	**32**
10. Walking to school without an adult	8	18	19	54	1	**26**	**73**
11. Riding a bike to school without an adult	7	17	22	53	2	**23**	**75**
12. Walking to school with an adult	66	19	6	8	1	**85**	**14**
13. Riding a bike to school with an adult	45	29	11	13	2	**74**	**24**
(END RANDOMIZE)							

14. **(ONLY ASKED IF Q10=3 OR 4, 'not comfortable')** What would you say is the **main** reason you were not comfortable with your **(**K-8 child**/**oldest K-8 child**)** **walking** to school without an adult?
(VERBATIM RESPONSES CODED INTO BELOW CATEGORIES) (n=335)

Worry for child's safety/Crime	28
Not old enough	19
Live too far away	17
Traffic/Busy streets	11
Street crossing/Intersections	6
Not enough sidewalks	5
Crossing Highway 29	3
Other	8
Don't know	1

15. **(ONLY ASKED IF Q11=3 OR 4, 'not comfortable')** What would you say is the **main** reason you were not comfortable with your **(**K-8 child**/**oldest K-8 child**)** **riding a bike** to school without an adult?
(VERBATIM RESPONSES CODED INTO BELOW CATEGORIES) (n=324)

Worry for child's safety/Crime	29
Not old enough	18
Traffic/Busy streets	13
Live too far away	9
Street crossing/Intersections	5
Crossing Highway 29	4
Can't ride a bike	4
Not enough sidewalks	3
No bike lanes	3
Other	10
Don't know	1

For these next few questions, please think back to when your **(**child was**/**children were**)** attending school **before** the COVID-19 pandemic.

16INT. Please indicate whether you agree or disagree with each of the following statements.

SCALE:	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	(No Response)	Total Agree	Total Disagree
(RANDOMIZE)							
16. I would generally like my K-8 **(**child**/**children**)** to be able to walk or bike to/from school.	43	32	12	12	0	**76**	**24**
17. My K-8 **(**child enjoys**/**children enjoy**)** walking and/or biking places.	57	31	8	4	0	**88**	**12**
18. I would never let my K-8 **(**child**/**children**)** walk or bike to/from school.	20	24	27	28	0	**44**	**55**
19. It is safe for children to walk or bike in my area.	13	45	22	20	-	**58**	**42**
20. There are enough bike paths and sidewalks for my K-8 **(**child**/**children**)** to walk or bike to/from school.	13	27	20	39	1	**40**	**60**
21. I am concerned about speeding or distracted drivers if/when my **(**child**/**children**)** walk or bike to/from school.	81	15	2	2	0	**96**	**4**
22. The school is too far away for my K-8 **(**child**/**children**)** to walk or bike there.	37	19	15	29	0	**55**	**45**
23. My K-8 **(**child**/**children**)** cannot bike to and from school because of their before- or after-school commitments.	13	26	25	35	1	**39**	**60**
24. Walking or biking to and from school is a good way for my K-8 **(**child**/**children**)** to get physical exercise.	69	25	3	3	1	**93**	**6**
25. Walking or biking to and from school is a good way for me to spend quality time with my K-8 **(**child**/**children**)**.	55	30	7	6	1	**85**	**14**
26. I would only allow my K-8 **(**child**/**children**)** to walk or bike to and from school if I, or another adult, can accompany them.	54	25	12	8	0	**79**	**21**
(END RANDOMIZE)							

27INT. Next, you will see some things that local schools and other organizations could do that may affect how you feel about your **(**K-8 child**/**oldest K-8 child**)** biking to school once the COVID-19 pandemic has ended. For each, please indicate if the item would make you feel more comfortable about allowing your **(**K-8 child**/**oldest K-8 child**)** to walk or bike to school once the COVID-19 pandemic has ended.

SCALE:	Much More Comfortable	Somewhat More Comfortable	A Little More Comfortable	(No Difference)	(Don't Know)
(RANDOMIZE)					
27. Limit how much children have to carry in their backpacks	36	25	14	24	1
28. Provide children and parents with information and maps on safe routes to and from school	37	24	16	22	1
29. Offer free bicycle safety courses for children to learn how to ride safely on local streets	43	21	21	15	0
30. Provide opportunities for children to practice biking in a car-free environment	42	23	14	20	-
31. Offer free pedestrian safety classes for children	39	20	21	19	1
32. Provide crossing guards at major intersections	62	22	10	6	-
33. Organize groups of students to walk or bike to/from school together	42	26	17	14	1
34. Provide a local parent or adult volunteer to walk or bike with children to/from school	36	27	15	20	1
35. Add designated bike lanes to roads	46	24	15	14	-
36. Improve the condition of existing bike lanes	47	23	14	16	1
37. Add more bike paths that are separated from the road	62	17	11	9	0
38. Add more sidewalks	53	21	13	12	1
39. Fix missing or broken sidewalks	56	19	15	10	1
40. Increase the visibility and safety of crosswalks	61	20	11	8	0
41. Increase the police presence on routes that lead to schools	52	23	13	12	1
42. Reduce the speed of traffic on streets that kids use to walk or bike to school	53	21	15	11	1
(END RANDOMIZE)					

43. Is there something else that could be done that would make you feel more comfortable about allowing your **(**K-8 child**/**oldest K-8 child**)** to walk or bike to school once the COVID-19 pandemic has ended? **(VERBATIM RESPONSES CODED INTO BELOW CATEGORIES)**

Nothing/No additional comments	42
Add or improve bike paths/Sidewalks/Crosswalks	15
Increase crossing guards/Supervision/Police presence	11
School is too far away/Can't use active modes	9
Speeding concerns/Increased road law enforcement	5
Increase safety related to Highway 29	2
Already walks/bikes/etc.	2
Provide bikes/Equipment/Storage	2
Other	10
Don't know/Refused	2

44. About how far does your **(**K-8 child**/**oldest K-8 child**)** live from school? If you're not sure, give your best guess.

Less than ½ mile	14
½ mile up to 1 mile	19
1 mile up to 2 miles	21
2 miles up to 3 miles	14
3 miles up to 5 miles	15
5 miles or more	16
(No response)	1

45. Does your **(**K-8 child**/**oldest K-8 child**)** currently have their own working bicycle?

Yes	79
No	21
(No response)	-

46. Did you ride a bicycle when you were your K-8 **(**child's**/**children's**)** age?

Yes	78
No	21
(No response)	0

These last questions are for statistical purposes only. Your responses will remain completely confidential.

47. Do you identify as…

Male	14
Female	83
Non-binary	-
Another gender identity	-
Prefer not to respond	3

48. What year were you born? **(YEARS CODED INTO CATEGORIES)**

18-29 (2003-1992)	5
30-39 (1982-1991)	36
40-49 (1972-1981)	45
50-64 (1957-1971)	12
65 or older (1956 or earlier)	1
Prefer not to respond	1

49. Do you consider yourself to be…

Hispanic or Latino	38
White or Caucasian	41
African American or Black	1
Asian or Pacific Islander	7
Something else	3
Prefer not to respond	10

50. Do you…

Own or are buying the home or apartment where you live	55
Rent or lease	35
Prefer not to respond	10

THANK YOU!

APPENDIX B

Universal Recommendations

Safe Routes to School Walk Audit Report and Active Transportation Action Plan

Appendix B
Napa County SRTS Walk Audit Report
Universal Recommendations

The Napa County Safe Routes to School (SRTS) Walk Audit Report Universal Recommendations apply to all public schools in Napa County, which reflects the schools served under the SRTS program. Universal recommendations are meant to supplement site-specific recommendations and address common barriers in the bicycle/pedestrian network around schools in a concise and consistent manner.

Universal Recommendation 1: High-Visibility School Zone Crosswalks

Federal Highway Administration data[1] indicates that high-visibility crosswalk striping improves the visibility of crosswalks compared to standard parallel lines and can improve yielding behavior by drivers[2]. Additionally, crosswalk visibility enhancements, which include but are not limited to high-visibility crosswalks, can reduce crashes by 23-48%[1].

- Recommendation: High-visibility (continental or ladder pattern) crosswalks should be implemented at the following locations:
    - Utilizing the California Vehicle Code (CVC) §21368 requirements for designating crosswalks as "school zone" crosswalks (painted yellow), all school zone crosswalks;
    - And, all marked crosswalks at an intersection with a designated collector or arterial roadway within 1320 feet (0.25 miles) of a school (following the same measuring method as CVC §21368)

This recommendation applies to existing and future crosswalks. It does not provide guidance for new crosswalk warrants; it is primarily focused on the improvement of crosswalks within the roughly ¼ mile radius examined through the Walk Audit process.

Universal Recommendation 2: Intersection Daylighting

Daylighting is the practice of removing visual barriers, including parked vehicles, within a certain distance of a crosswalk or intersection to greatly improve visibility for pedestrians, bicyclists, and motorists. The National Association of City Transportation Officials recommends removing parking within 20-25 feet of an intersection. Daylighting can be accomplished through permanent infrastructure, such as concrete curb extensions, or more cost-effective materials, such as paint and bollards.

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[1] https://safety.fhwa.dot.gov/ped_bike/step/docs/TechSheet_VizEnhancemt_508compliant.pdf

2 Pulugartha, S. S., V. Vasudevan, S. S. Nambisan, and M. R. Dangeti. Evaluating the Effectiveness on Infrastructure-Based Countermeasures on Pedestrian Safety. Presented at the 91st Annual Meeting of the Transportation Research Board, Washington, D.C., 2012.

- Recommendation: Daylighting strategies should be implemented at the following intersections:
    - Those that are in the school zone as defined by CVC §21368;
    - Those that are intersections with a designated collector or arterial roadway within 2640 feet (0.5 miles) of a school (following the same measuring method as CVC §21368).

Universal Recommendation 3: Sidewalk Width Adjacent to School Campus

A barrier frequently identified during Walk Audits throughout the county was that sidewalks immediately adjacent to the school were too narrow for the high volumes of pedestrians generated during school arrival and dismissal times. Most of these sidewalks were roughly 4 feet wide, including space for utility and signage poles. While these sidewalks may meet specific municipal standards, they do not accommodate high volumes of school-related pedestrians and can deter or prevent students from walking to school if they travel with their families, in groups, or use a mobility assistance device. This is especially so when sidewalks are obstructed by utility poles, signal boxes, and other objects.

- Recommendation: All sidewalks that lead to a school campus entrance should be a minimum of 6 feet wide within at least 250 feet of the school entrance; if a school has only one entrance, the sidewalk leading to that entrance should be a minimum of 8 feet wide within 250 feet of that entrance.

Universal Recommendation 4: Class III Bike Boulevard Traffic-Calming

Class III bicycle boulevards are on-street bicycle facilities that have traditionally been marked by signage and share-the-road stencils ("sharrows") painted in the vehicle travel lane. Class III facilities do not provide any separation between bicyclists and motorists and instead indicate to road users that bicyclists and motorists must share the road. Such facilities are intended to be installed on low-speed (25 mph or less*) and low-volume (<3,000 vehicles/day*) roadways; however, the current practice of implementing only signage and sharrows for Class III routes frequently does not meet the comfort and safety perception needs of the "Interested but Concerned" user profile of bicyclists, which includes an estimate of 51%-56% of the population and is typically the profile assumed for most school-age children. To create a lower stress bicycle network, the Federal Highway Administration describes improving bicycle boulevards by "slowing motor vehicle speeds and implementing other speed management measures."

- Recommendation: All Class III bicycle boulevards should be marked with sharrows and signage and must be treated with traffic-calming strategies to enforce the desired speed limit and prevent motorist speeding. Class III bicycle boulevards adjacent to school campuses or along roadways that facilitate

motorist speeding (long, straight, and/or minimal traffic control) should be prioritized for traffic-calming treatments.

* Metrics established by the Federal Highway Association in their 2019 Bikeway Selection Guide.

Universal Recommendation 5: Curb Ramps (Americans with Disabilities Act)

Some of the early Walk Audit reports specifically call out intersections or other pedestrian access points where curb ramps compliant with the Americans with Disabilities Act were missing, which creates a significant connectivity barrier for pedestrians who use mobility assistance devices. However, following these reports, the Napa County Safe Routes to School team recognized that many intersections and pedestrian access points were missing these curb ramps and that individually identifying each missing curb ramp would be redundant, particularly given data from the Napa Countywide Pedestrian Plan (2016). Consequently, though some early reports do mention lack of accessible curb ramps, a universal recommendation was created to address this important pedestrian barrier while avoiding redundancy in reports.

- Recommendation: In alignment with the Americans with Disabilities Act, when implementing recommendations made in Napa County Safe Routes to School reports that impact the curb at intersections, pedestrian crossings, or other pedestrian access points, curb ramps that are compliant with the Americans with Disabilities Act should be installed.

APPENDIX C

Quick Build Brochure

Safe Routes to School Walk Audit Report and Active Transportation Action Plan

QUICK-BUILD BIKEWAY NETWORKS FOR SAFER STREETS

Delivering Safer Streets in Weeks or Months, Instead of Years

How to Meet Public Demand for Safe Bikeway Networks—Affordably, Quickly, and Inclusively

Photo credit: Alta Planning + Design

CASE STUDY

Adeline Street in Berkeley got protected bike lanes 20 years ahead of schedule, when Bike East Bay worked closely with the city to incorporate planned lanes into the repaving schedule, saving time and money by simply adding bike infrastructure to an existing project, one funded through a local infrastructure bond measure. The City of Berkeley garnered extensive public input on the Adeline Corridor, making this a great example of quick-build speeding up existing bike infrastructure planning, bringing bike lanes to Berkeley in 2019 instead of 2039.

WHY QUICK-BUILD? WHY NOW?

Biking is up in many communities in California, including those that started with low rates of bicycling, as people seek out healthy and safe transportation and recreation. Californians are discovering they can be healthier and happier simply by getting out on two wheels.

Meanwhile, agency budgets are down. Plans to spend millions on infrastructure may no longer be realistic. More than ever, the public demands that transportation projects are equitable and responsive to the needs of neglected communities.

Quick-build is a method of building bike and pedestrian safety improvements—protected bike lanes, pedestrian crossings, slow streets, parklets, and more—now, within your budget. In challenging times, quick-build projects are crucial to building trust in the government's ability to deliver public benefit. And quick-build infrastructure can engage the public better than ever, and be more inclusive and equitable than traditional infrastructure.

> *"We as transportation experts need to be thinking strategically about whether or not we need to spend three years talking about doing something important, or three weeks to just try something."*
>
> — Warren Logan
>
> *Transportation Policy Director of Mobility and Interagency Relations at Oakland Mayor's Office*

WHAT IS QUICK-BUILD?

The Basics

- Quick-build projects use materials that can be installed quickly and at low cost. Build projects from posts, planters, and stripes of paint, not new pavement or curb alignments.
- **Quick-build projects are installed on a trial basis.** Temporary installations allow for adjusting or removing elements in response to public feedback. Successful projects may become permanent, exactly as installed, or upgraded with more durable materials.
- **Quick-build should incorporate rigorous community engagement.** A project on the ground can serve much more effectively than a PowerPoint or rendering for trying something out and allowing community residents to respond. Gather feedback and input, and change designs accordingly.

Materials

From paint, traffic cones, and A-boards to concrete curb barriers, planters, and temporary raised crosswalks, a wide variety of materials work well for creating quick-build projects. The full Quick-Build Toolkit provides thorough, detailed descriptions of materials that can make for an effective and inexpensive project to meet your community's needs.

Photo credits, top to bottom: Alta Planning + Design; Real Hartford; Alta Planning + Design; Street Plans Collaborative

CASE STUDY

In August of 2020, the City of San Luis Obispo converted one of the three motor vehicle lanes of downtown Higuera Street into a buffered bike lane, as part of Open SLO, the city's pilot program to expand the use of public spaces (with parklets and bike/ped spaces) during the COVID-19 pandemic. The project was installed with paint, took less than a week to install, and cost a mere $15K instead of the more than $150K it would have taken to put in a traditional bike lane by sealing and restriping the whole street as the city would normally do.

Photo credit: Bike SLO County

WHO?

Your Quick-Build Project Team

Team leader. Quick-build projects need a "chief" (usually city staff) tasked with project facilitation, keeping the momentum going, establishing lines of communication, and accepting and evaluating feedback.

Community leaders. Because evaluation and adjustment are essential for successful quick builds, make sure community leaders are on board from the beginning. Look to businesses, residential associations, places of worship, and nearby schools. Bring in bike/ped advocacy organizations and other CBOs, including those based in disadvantaged communities and led by people of color.

Department liaisons. Your project may impact transit, street sweeping, parking enforcement, maintenance, waste management and recycling, and emergency response. Involve other agencies as necessary to ensure you don't forget a critical aspect.

Elected Officials. They have the power to marshal funding for quick-build projects. They will hear from constituents, so communication channels between the project team and electeds must be open for effective project evaluation.

Communications. Ideally, include a dedicated communications person on your team. Because this is a new method, and people are used to years of discussion, publicize quick-build's temporary nature. Talk about the project's intended benefits, and listen to feedback about the actual impacts.

Community Engagement

Community engagement is essential and also very effective, because it's easy to engage people in providing feedback on real-world solutions that they can see and use. Here are the keys:

- Start engaging with the community before you install the project so that residents' opinions are included from the get-go.
- Be inclusive in your outreach, including perspectives from disadvantaged communities and people of color.
- Emphasize the project's temporary nature, and the ability to change the project after it's installed.
- Implement effective feedback mechanisms during the project, making sure to plan and budget for project adjustments in response to input.

CASE STUDY

The El Cajon Boulevard Business Improvement Association ("The Boulevard") got city councilmembers and the mayor on board to fund a pilot bus and bike lane along a 3-mile stretch of San Diego's El Cajon Boulevard. The Boulevard staff brought in diverse stakeholders and built on longstanding relationships to push the city to dedicate a lane for El Cajon Boulevard's new bus rapid transit line, and got bikes included on this Vision Zero corridor. The entire three-mile project, which launched in January 2020, cost $100K, funded by San Diego's general fund.

Photo credit: Holly Raines

WHERE?

Which Projects are Best for Quick-Build?

Some projects are better than others for the quick-build method.

- **Look to existing plans.** Your community's current active transportation plan already identifies key improvements and priorities. Most such plans will take decades to complete with traditional methods and funding. Quick-build can take those plans to reality much sooner.
- **Fill gaps in the bikeway network, especially now when more people are bicycling.** Look to improve intersections that are dangerous to navigate, short sections of crosstown routes that use busy streets, or long sections of streets that could become "slow streets" to connect neighborhoods.
- **Put disadvantaged communities first.** If your plan doesn't already incorporate an equity analysis to set priorities, this is your chance. Look at a model plan like Oakland's "Let's Bike Oakland" bicycle plan which incorporates a framework of equity and a focus on improving well-being for the city's most vulnerable groups.

If a project is funded and on schedule to be built within a year or two, turn your attention to projects that will take years without quick build. Projects that require expensive modifications—new traffic signals, bridges, reconfigured curbs—are not good quick-build candidates.

Photo credit: Alta Planning + Design

Funding for Quick-Build

POTENTIAL FUNDING SOURCES IN CALIFORNIA

Available funding for quick-build projects varies a lot from one municipality to the next. But here are a few ideas.

- Public works departments' essential repaving and repair projects are great opportunities to put in quick-build projects at low cost.
- Local and regional funds such as general fund, sales tax revenue, and Air Quality Management District funds can be used for quick-build projects.
- Tack on costs to another publicly-funded transportation project, or even a private project. For example, a development project that is required to repave and stripe new bike lanes might install a protected bike lane using quick-build materials instead.
- In 2020, the **Active Transportation Program** piloted a special quick-turnaround funding pot for quick-build projects, with an earlier (summer) deadline. Keep an eye on the ATP to see if they continue to offer this funding in future years. CalBike will be pushing them to do so.
- PeopleForBikes has a **small grant program** for infrastructure projects.
- AARP's **Community Challenge grant** could fund a quick-build project.

This resource was prepared in partnership with Alta Planning + Design. For more information see our complete **Quick-Build Guide**.

CALIFORNIA BICYCLE COALITION

APPENDIX D

Bike Parking Guidance

Safe Routes to School Walk Audit Report and Active Transportation Action Plan

ESSENTIALS OF

BIKE PARKING

Selecting and installing bicycle parking that works

apbp

Association of Pedestrian and Bicycle Professionals

Expertise for Active Transportation

Essentials of Bike Parking
Revision 1.0, September 2015

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Cover image: *Sign D4-3 from Standard Highway Signs, 2004 Edition, http://mutcd.fhwa.dot.gov/ser-shs_millennium_eng.htm*

APBP is an association of professionals who plan, implement and advocate for walkable and bicycle-friendly places.

Association of Pedestrian and Bicycle Professionals

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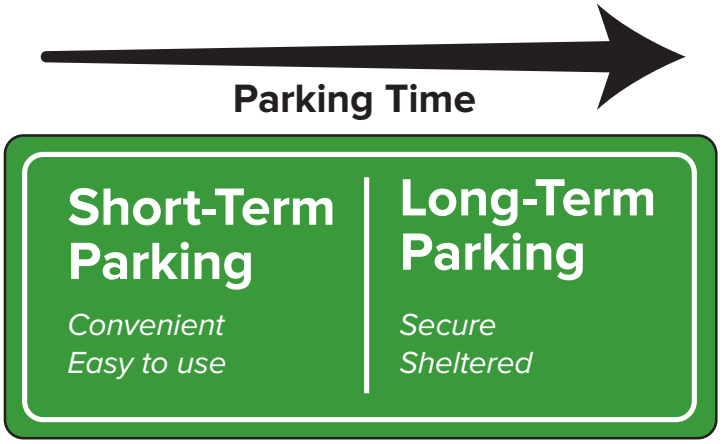
INTRODUCTION

Among the necessary supports for bicycle transportation, bike parking stands out for being both vital and easy. Still, it requires some attention to get it right. Bike parking may go unused if it's not more appealing to users than the nearest sign post. A minor mistake in installation can make a quality rack unusable. The variety of bicycle sizes, shapes, and attachments continues to increase, and good bike parking should accommodate all types.

The Association of Pedestrian and Bicycle Professionals (APBP) prepared this guide for people planning to purchase or install bike parking fixtures on a limited scale. It is a brief overview of APBP's comprehensive *Bicycle Parking Guidelines* handbook, available at www.apbp.org.

This guide divides bike parking into short-term and long-term installations. These two kinds of parking serve different needs, and the starting point for most bike parking projects is recognizing whether the installation should serve short-term users, long-term users, or both. If users will typically be parking for two hours or longer, they are likely to value security and shelter above the convenience and ease that should characterize short-term parking.



SHORT-TERM PARKING

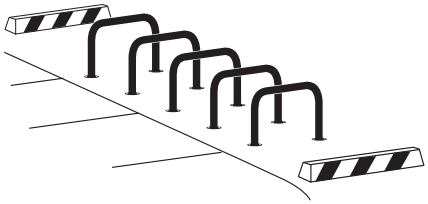
Effective bike parking for short-term users depends on two main factors: 1) proximity to the destination and 2) ease of use.

Short-term parking is designed to meet the needs of people visiting businesses and institutions, and others with similar needs—typically lasting up to two hours. Short-term users may be infrequent visitors to a location, so the parking installation needs to be readily visible and self-explanatory.

INVERTED U

POST & RING

CORRAL



SITE PLANNING

Location

Short-term bike parking should be visible from and close to the entrance it serves—50' or less is a good benchmark. Weather-protected parking makes bicycle transportation more viable for daily and year-round use, and it can reduce the motivation for users to bring wet bicycles into buildings. Area lighting is important for any location likely to see use outside of daylight hours.

Security

All racks must be sturdy and well-anchored, but location determines the security of short-term parking as much as any other factor. Users seek out parking that is visible to the public, and they particularly value racks that can be seen from within the destination. Areas with high incidence of bicycle theft may justify specific security features such as specialty racks, tamper-proof mounting techniques, or active surveillance.

Quantity

Many jurisdictions have ordinances governing bike parking quantity. APBP's full *Bicycle Parking Guidelines* offers complete recommendations for the amount and type of parking required in various contexts. In the absence of requirements, it's okay to start small—but bear in mind that perceived demand may be lower than the demand that develops once quality parking appears.

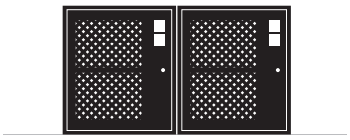
BIKE CORRALS

Some cities with limited sidewalk space and strong bicycle activity place bike parking in on-street "bike corrals" located in the street area adjacent to the curb. Bike corrals can sometimes make use of on-street areas that are unsuitable for auto parking. When replacing a single auto parking space, a corral can generally fit 8 to 12 bicycles. APBP's full *Bicycle Parking Guidelines* provides details about designing and siting bike corrals. **apbp.org**

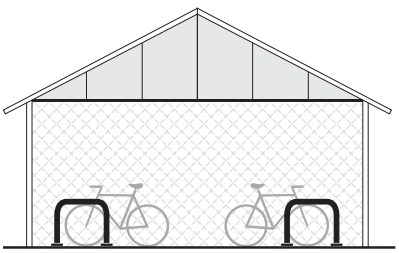
LONG-TERM PARKING

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. These users typically park either at home or at a routine destination such as a workplace. They often leave their bicycles unmonitored for a period of several hours or longer, so they require security and weather protection that let them park without unreasonable concern for loss or damage.

Long-term parking can take a variety of forms, including a room within a residential building or workplace, a secure enclosure within a parking garage, or a cluster of bike lockers at a transit center. Some long-term parking is open to the public—such as a staffed secure enclosure at a transit hub—and some of it is on private property with access limited to employees, residents, or other defined user groups.



BIKE LOCKERS



SHELTERED SECURE ENCLOSURE

SITE PLANNING

Location

Appropriate locations for long-term parking vary with context. Long-term parking users are typically willing to trade a degree of convenience for weather protection and increased security. Long-term installations emphasize physical security above public visibility. Signage may be needed for first-time users.

Security

Security is paramount for quality long-term parking. Access to parked bicycles can be limited individually (as with lockers) or in groups (as with locked bike rooms or other secure enclosures). Options for access control include user-supplied locks, keys, smart cards, and other technologies.

Quantity

Refer to local ordinances or the comprehensive APBP *Bicycle Parking Guidelines* to determine the amount and type of parking required for various contexts.

SPECIAL CONSIDERATIONS FOR LONG-TERM PARKING

In many ways, short-term and long-term parking function similarly and are served by the same guidelines. Some exceptions are noted below.

Density

The competition of uses for high-security and sheltered locations creates particular pressure on long-term parking to fit more bicycles in less space. When parking needs cannot be met with standard racks and spacing recommended in this guide, consider rack systems designed to increase parking density. See the high-density racks table on page 7. Note that increasing density without careful attention to user needs can create parking that excludes people because of age, ability, or bicycle type. This may result in people parking bicycles in other less desirable places or choosing not to bike at all.

Bicycle design variety

Long-term parking facilities should anticipate the presence of a variety of bicycles and accessories, including—depending on context—recumbents, trailers, children's bikes, long-tails, and others. 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.

Performance criteria

The bike rack criteria in the next section apply to racks used in any installation, regardless of its purpose. Long-term installations often use lockers and group enclosures not discussed in this guide. Such equipment raises additional considerations that are discussed in detail in APBP's full *Bicycle Parking Guidelines*. **apbp.org**

INSTALLATION

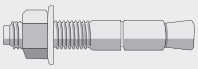
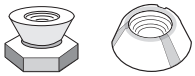
Selecting an appropriate installation surface and technique is key to creating bicycle parking that remains secure and attractive over time.

INSTALLATION SURFACE

A sturdy concrete pad is an ideal surface for installing bicycle parking. Other surfaces often encountered include asphalt, pavers, and soft surfaces such as earth or mulch. These surfaces can accommodate in-ground mounting or freestanding bike racks such as inverted-U racks mounted to rails. See APBP's *Bicycle Parking Guidelines* for details. **apbp.org**

INSTALLATION FASTENERS

When installing racks on existing concrete, consider the location and select appropriate fasteners. Drill any holes at least three inches from concrete edges or joints. Some locations benefit from security fasteners such as concrete spikes or tamper-resistant nuts on wedge anchors. Asphalt is too soft to hold wedge and spike anchors designed for use in concrete. Installing bike parking on asphalt typically requires freestanding racks and anchor techniques specific to asphalt.

FASTENERS		
CONCRETE SPIKE		Installs quickly in concrete with a hammer. Tamper-resistant. Removal may damage concrete and/or rack.
CONCRETE WEDGE ANCHOR		Allows for rack removal as needed. Not tamper-resistant, but can accommodate security nuts (below).
SECURITY NUTS		Use with concrete wedge anchors. Security nuts prevent removal with common hand tools.

INSTALLATION TECHNIQUES

When installing racks on existing concrete, choose those with a surface-mount flange and install with a hammer drill according to the specifications of the mounting hardware selected. When pouring a new concrete pad, consider bike parking fixtures designed to be embedded in the concrete. Because replacing or modifying an embedded rack is complicated and costly, this installation technique requires particular attention to location, spacing, rack quantity, and material.

BICYCLE RACK SELECTION

PERFORMANCE CRITERIA FOR BIKE PARKING RACKS

These criteria apply to any rack for short- or long-term use.

CRITERIA	DETAILS
Supports bike upright without putting stress on wheels	The rack should provide two points of contact with the frame—at least 6" apart horizontally. Or, if a rack cradles a bicycle's wheel, it must also support the frame securely at one point or more. The rack's high point should be at least 32".
Accommodates a variety of bicycles and attachments	The racks recommended on page 6 ("racks for all applications") serve nearly all common bike styles and attachments—if installed with proper clearances (see placement section). Avoid designs and spacing that restrict the length, height, or width of bicycles, attachments, or wheels.
Allows locking of frame and at least one wheel with a U-lock	A closed loop of the rack should allow a single U-lock to capture one wheel and a closed section of the bike frame. Rack tubes with a cross section larger than 2" can complicate the use of smaller U-locks.
Provides security and longevity features appropriate for the intended location	Steel and stainless steel are common and appropriate materials for most general-use racks. Use tamper-resistant mounting hardware in vulnerable locations. Rack finish must be appropriate to the location (see materials and coatings section).
Rack use is intuitive	First-time users should recognize the rack as bicycle parking and should be able to use it as intended without the need for written instructions.

RACK STYLES

The majority of manufactured bike racks fall into one of the categories on pages 6-8. Within a given style, there is wide variation among specific racks, resulting in inconsistent usability and durability. APBP recommends testing a rack before committing broadly to it.

RACKS FOR ALL APPLICATIONS

When properly designed and installed, these rack styles typically meet all performance criteria and are appropriate for use in nearly any application.

INVERTED U
also called staple, loop

Common style appropriate for many uses; two points of ground contact. Can be installed in series on rails to create a free-standing parking area in variable quantities. Available in many variations.

POST & RING

Common style appropriate for many uses; one point of ground contact. Compared to inverted-U racks, these are less prone to unintended perpendicular parking. Products exist for converting unused parking meter posts.

WHEELWELL-SECURE

Includes an element that cradles one wheel. Design and performance vary by manufacturer; typically contains bikes well, which is desirable for long-term parking and in large-scale installations (e.g. campus); accommodates fewer bicycle types and attachments than the two styles above.

This guide analyzes the most common styles of bike racks, but it is not exhaustive. Use the performance criteria on page 5 to evaluate rack styles not mentioned. Custom and artistic racks can contribute to site identity and appearance, but take care that such racks don't emphasize appearance over function or durability.

HIGH-DENSITY RACKS

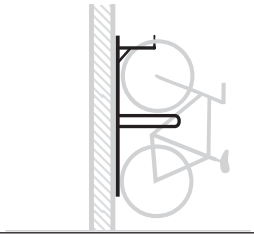
These rack styles do not meet all performance criteria but may be appropriate in certain constrained situations.

High-density rack systems can maximize the use of limited parking space, but they don't work for all users or bicycles. If installing these racks, reserve additional parking that accommodates bicycles with both wheels on the ground for users who are not able to lift a bicycle or operate a two-tier rack, or for bikes that are not compatible with two-tier or vertical racks.

STAGGERED WHEELWELL-SECURE

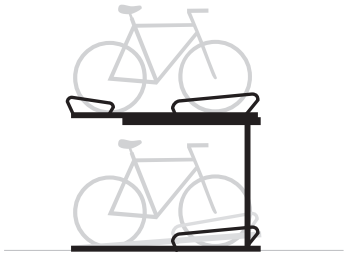
Variation of the wheelwell-secure rack designed to stagger handlebars vertically or horizontally to increase parking density. Reduces usability and limits kinds of bikes accommodated, but contains bikes well and aids in fitting more parking in constrained spaces.

VERTICAL



Typically used for high-density indoor parking. Not accessible to all users or all bikes, but can be used in combination with on-ground parking to increase overall parking density. Creates safety concerns not inherent to on-ground parking.

TWO-TIER



Typically used for high-density indoor parking. Performance varies widely. Models for public use include lift assist for upper-tier parking. Recommend testing before purchasing. Creates safety concerns not inherent to on-ground parking, and requires maintenance for moving parts.

RACKS TO AVOID

Because of performance concerns, APBP recommends selecting other racks instead of these.

WAVE
also called undulating or serpentine

Not intuitive or user-friendly; real-world use of this style often falls short of expectations; supports bike frame at only one location when used as intended.

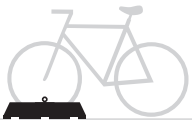
SCHOOLYARD
also called comb, grid

Does not allow locking of frame and can lead to wheel damage. Inappropriate for most public uses, but useful for temporary attended bike storage at events and in locations with no theft concerns. Sometimes preferred by recreational riders, who may travel without locks and tend to monitor their bikes while parked.

COATHANGER

This style has a top bar that limits the types of bikes it can accommodate.

WHEELWELL



Racks that cradle bicycles with only a wheelwell do not provide suitable security, pose a tripping hazard, and can lead to wheel damage.

BOLLARD

This style typically does not appropriately support a bike's frame at two separate locations.

SPIRAL

Despite possible aesthetic appeal, spiral racks have functional downsides related to access, real-world use, and the need to lift a wheel to park.

SWING ARM SECURED

These racks are intended to capture a bike's frame and both wheels with a pivoting arm. In practice, they accommodate only limited bike types and have moving parts that create unneeded complications.

RACK MATERIALS & COATINGS

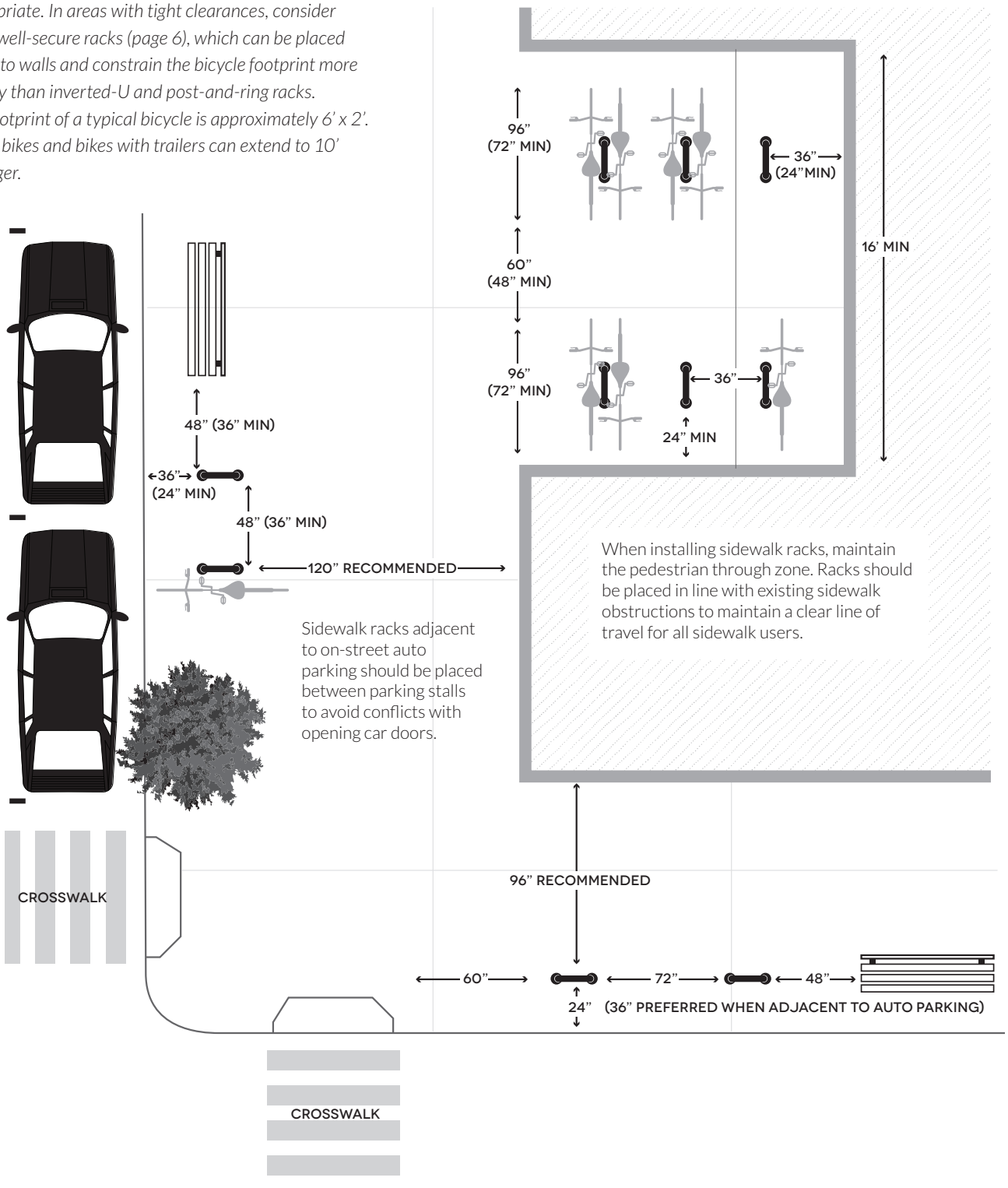
Most bicycle parking racks are made of carbon steel or stainless steel. Carbon steel requires a surface coating to resist rust while appropriate grades of stainless steel need no coating. Not all materials and coatings with the same name perform equally. Square tubing provides a security advantage as round tubing can be cut quietly with a hand-held pipe cutter. Before purchasing racks, talk to suppliers about your particular conditions and choose a material and coating that suit your needs. The following are common choices, depending on local considerations and preferences.

RACK MATERIAL – COATING	RELATIVE PURCHASE COST	DURABILITY	CAUTIONS
Carbon steel - galvanized	Usually lowest	Highly durable and low-maintenance; touch-up, if required, is easy and blends seamlessly	Utilitarian appearance; can be slightly rough to the touch
Carbon steel - powder coat* (TGIC or similar)	Generally marginally higher than galvanized	Poor durability	Requires ongoing maintenance; generally not durable enough for long service exposed to weather; not durable enough for large-scale public installations
Carbon steel - thermoplastic	Intermediate	Good durability	Appearance degrades over time with scratches and wear; not as durable as galvanized or stainless
Stainless steel - no coating needed, but may be machined for appearance	Highest	Low-maintenance and highest durability; most resistant to cutting	Can be a target for theft because of salvage value; maintaining appearance can be difficult in some locations

** When applied to carbon steel, TGIC powder coat should be applied over a zinc-rich primer or galvanization to prevent the spread of rust beneath the surface or at nicks in the finish.*

PLACEMENT

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.



APPENDIX E

Recommendation
Cost Range Estimates

Safe Routes to School Walk Audit Report and Active Transportation Action Plan

Appendix E: Recommendation Cost Range Estimates

Cost estimate was one of many factors considered when prioritizing recommendations for Napa County Safe Routes to School Walk Audit reports. Recommendations in which a high cost estimate would considerably delay implementation of the recommendation may have been given a lower priority level in order to prioritize recommendations that are lower cost and therefore more likely to be installed more quickly. Cost was considered on a high-level scale; real cost ranges of recommendations may differ from cost range estimates included in Walk Audit reports.

Cost range estimates for Safe Routes to School Walk Audit recommendations are as follows:

$	< $25,000
$$	Between $25,000 and $250,000
$$$	$250,000 to $1 million
$$$$	> $1 million

APPENDIX F

Next Steps

Safe Routes to School Walk Audit Report and Active Transportation Action Plan

From Recommendations to Action: Next Steps

Napa County Bicycle Coalition (NCBC) has concluded the final task under the Napa County Safe Routes to School Program in coordination with the Napa County Office of Education, funded under the One Bay Area Grant and the Active Transportation Program.

Evaluation of active transportation barriers at school sites are complete and final reports of recommendations for each school in Napa County will be published in the spring of 2022. The NCBC team is already planning the next phase of Safe Routes to School that will help bring these recommendations into reality. Supported by a "Quick Strike" grant through the Metropolitan Transportation Commission (MTC), NCBC will continue its SRTS work over the course of this next year.

NCBC SRTS Quick Strike Program Elements (2022-2023):

- Engage parents in advocating for implementing the recommendations. Hold safety summits at various school sites that raise awareness of the recommendations and provide a forum for parents to discuss strategies and to plan next steps. Work with schools and other stakeholders to implement recommendations. Build a Safe Routes to School (SRTS) Advisory Committee, including "parent champions" from key school sites, to help guide the SRTS program into the next phase of growth and engagement and to help ensure the long-term viability of the program, providing a structure both for stakeholder feedback and input, as well as for increased local investment in future program activities.
    - Action Steps:
        - Hold up to seven safety summits at various school sites
        - Form SRTS advisory committee
- Provide education and encouragement programming at elementary and middle schools that includes bike rodeos throughout the year, Bike Month (and Bike to School Day) in the spring, and Walk and Roll to School Day in the fall. This programming aims to increase the number of students who walk or bike to school and to ensure that, as barriers are removed and facilities are improved, youth have the skills and confidence to take advantage of improvements.
    - Action Steps:
        - Hold up to 14 Bike Rodeos at elementary and middle schools
        - Provide outreach and support for Walk and Roll to School Day and Bike Month activities at up to seven school sites
        - Support local Agricultural & Hospitality Industry workers with bicycle safety education
- Conduct community-based safety education programming that reaches identified populations of concern. Through bilingual Family Biking Workshops, community rides in partnership with other local organizations, and safety education outreach to agricultural

and hospitality workers, NCBC will tailor our programming to help engage the full spectrum of our community.

    - Action Steps:
        - Conduct up to nine bilingual Family Biking Workshops
        - Conduct up to six community events and rides

- Secure future funding for the Safe Routes to School Partnership (SRTS). We believe that every student should be able to safely walk or ride a bike to school. The SRTS program provides vital safety education, encouragement, and community engagement programs to thousands of students annually while advocating for facilities that make active transportation safe and accessible. SRTS will be a key force in helping to make the Walk Audit recommendations a reality. Napa County is one of the only counties in the region that lacks dedicated, long-term funding for these programs and efforts, and without that support implementing the recommendations will face more barriers.
    - Action Steps:
        - Apply for competitive and discretionary grant funding
        - Seek funding support from jurisdictions
        - Seek funding support from community health
        - Provide annual program reports to stakeholders