Walk Audit Report

SafeRoutes Napa County

SILVERADO MIDDLE SCHOOL

SILVERADO MIDDLE SCHOOL

1133 COOMBSVILLE ROAD NAPA, CA

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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.

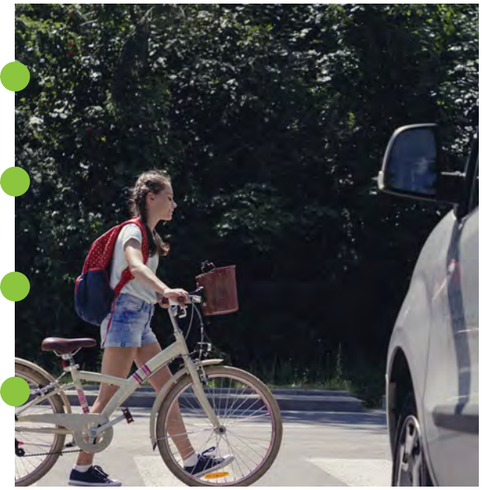
Schools and the community benefit immensely when students choose to walk or bike.

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.

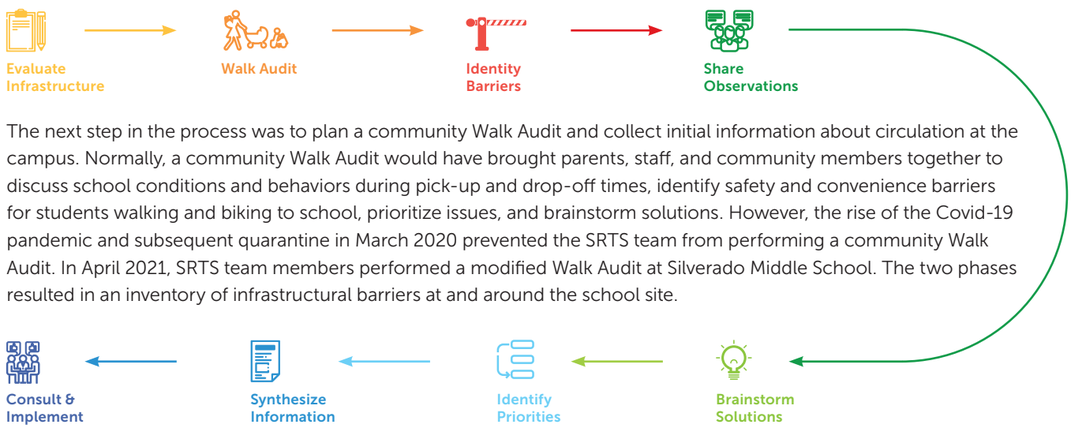
Education
Ensure that everyone learns how to travel safely and why biking and walking are important.

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 Silverado Middle School, starting in the summer of 2018. Information on physical and behavioral challenges was collected in two phases. In September 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.



The next step in the process was to plan a community Walk Audit and collect initial information about circulation at the campus. Normally, a community Walk Audit would have brought parents, staff, 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. However, the rise of the Covid-19 pandemic and subsequent quarantine in March 2020 prevented the SRTS team from performing a community Walk Audit. In April 2021, SRTS team members performed a modified Walk Audit at Silverado Middle School. The two phases resulted in an inventory of infrastructural barriers at and around the school site.

A report draft was shared with the Napa Valley Transportation Authority, the Napa County Office of Education, public works and planning representatives from the City of Napa, the local school district, law enforcement, 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.

SILVERADO MIDDLE SCHOOL
SCHOOL SUMMARY

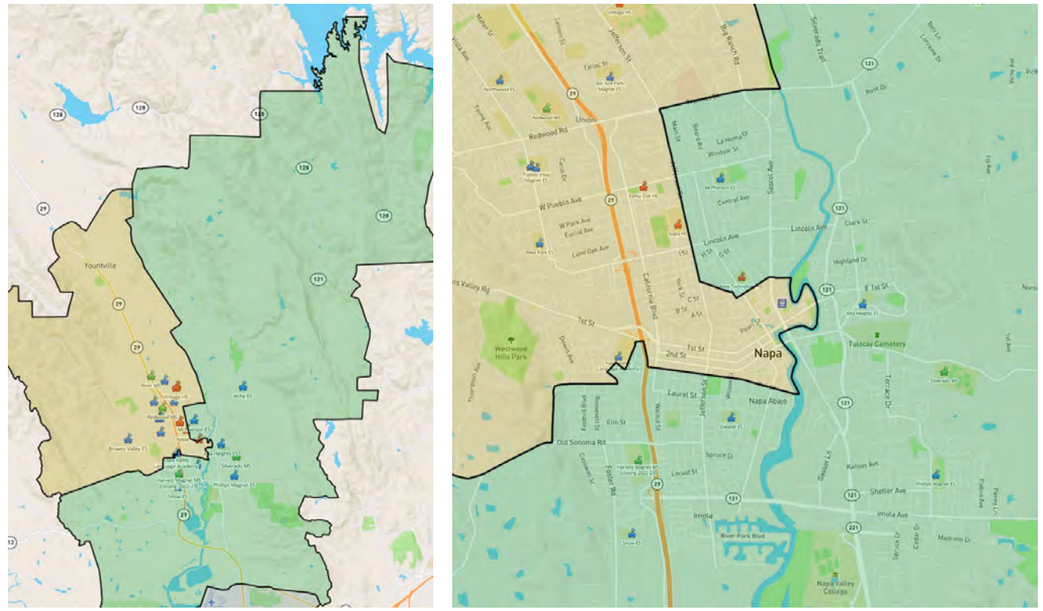
Principal	Jennifer Kohl	Grades	6-8
First Bell	8:20 AM	Enrollment	793
Last Bell	3:05 PM (1:02 PM on Wed.)	Street	1133 Coombsville Road
District	Napa Valley Unified	City	Napa, CA 94558

Overall Facility Rating[j]: Good

While NVUSD has an open enrollment policy, Silverado Middle School's default enrollment area covers a very large portion of Napa, including a large span of unincorporated Napa County down to Highway 12, east of the City, and up to the Lake Berryessa area in northeast. It also covers portions of the City east of Jefferson Street as well as south of Laurel Street and Oak Street.

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), 12.8% of students attending Silverado Middle School reside outside of the school's enrollment boundary.



Map 1: Silverado Middle School enrollment boundaries (shaded in green).

DATA

No data is currently available regarding the number of students who walk and bike to school at Silverado Middle School. Additional work is needed to establish a baseline of active transportation use for this school.

According to the results of the countywide EMC Research survey conducted in Spring 2021, 16% of respondents report that their K-8th grade children primarily walk to and/or from school and ~4% primarily bike. While nearly half (43%) say that their child has walked or biked to/from school at some point, 73% report using a single-family vehicle as the primary transportation method to and from school.

Total Enrollment by Group (2019-20)

ETHNICITY	SILVERADO MIDDLE SCHOOL	DISTRICT
Black or African American	0.3%	2.1%
American Indian or Alaska Native	0.1%	0.2%
Asian	0.8%	2.4%
Filipino	0.8%	6.9%
Hispanic or Latino	69.0%	55.6%
Native Hawaiian or Pacific Islander	0.1%	0.2%
White	27.2%	28.4%
Two or More Races	1.8%	4.0%
EXPERIENCE		
Socioeconomically Disadvantaged	66.8%	51.2%
English Learners	25%	20.5%
Students with Disabilities	9.8%	12.5%
Foster Youth	0.3%	0.4%
Homeless	2.0%	1.1%

Figure 2: Enrollment Data by Group

Countywide K-8 Primary Transportation to/from School (EMC Research)

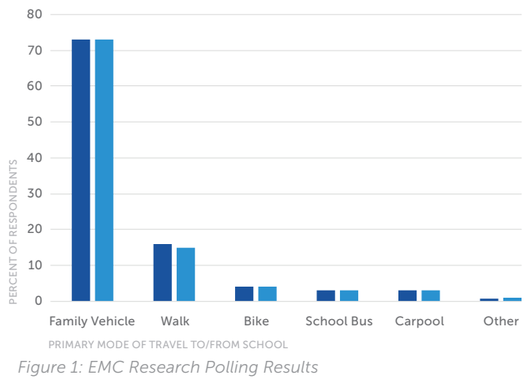


Figure 1: EMC Research Polling Results

***Note:** Data from EMC Research survey represents countywide behaviors, and school or city-level breakdowns are not available. See Appendix A for details on survey methods and respondent profiles.*

Student Enrollment by Grade Level (2019-2020)

	NUMBER OF STUDENTS
Grade 6	229
Grade 7	257
Grade 8	307
Total	**793**

Figure 3: Enrollment Data by Grade

NEIGHBORHOOD CONTEXT

Silverado Middle School is located at the east edge of the Napa city limits on Coombsville Road in the City's Terrace/Shurtleff Planning Area. To the east of the school, in County of Napa jurisdiction, are vineyards, the rural residential area of Coombsville Road and First through Fourth Avenues, and Stone Bridge School. These neighborhoods are lower density and more sprawling compared to City of Napa neighborhoods west of the school. There is open space south of the school and mostly single-family residential neighborhoods west of the school.

The neighborhood to the west of the school is a tract subdivision of single- family residences with some deep lot subdivisions and deep lot ranchettes. The street network in this neighborhood is mainly comprised of fragmented parallel streets with some loops and several lollipops. Lollipops can slow traffic in neighborhoods but reduce pedestrian route choice and interconnectivity.

Coombsville Road is a main east-west arterial street in Napa. West of the school, Coombsville intersects with Terrace Drive, a north-south collector. There is a small commercial area at the corner of Terrace and Coombsville. Terrace Drive connects to Shurtleff Avenue further south, which leads to Imola Avenue, an east-west collector. This street network serves several residential neighborhoods east of Soscol Avenue, as Coombsville and Imola are the two through east-west connections for these neighborhoods that lead into more central commercial districts in Napa City. Coombsville Road continues west to Silverado Trail and becomes Third Street, which connects to Soscol Avenue and downtown Napa, where there are major commercial districts in these areas.

Map 2: Silverado Middle School (marked by a yellow flag) is located in east Napa.

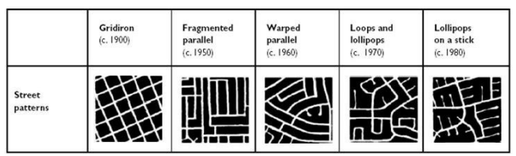


Figure 4: Street Patterns (Source: Southworth, 1997)

Silverado Middle School (red marker) is served by Coombsville Road.

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

The only access to Silverado Middle School is from Coombsville Road, so all school traffic of all modes is concentrated on Coombsville.

The school's main entrance is on Coombsville Road across the street from Jacks Lane. The school's loading zone and parking lot sits in front of the main entrance, so students must cross the lot/loading zone to reach campus. Students can either cross via a raised crosswalk through the middle of the lot or a different raised crosswalk on the southwest corner that separates this front lot from an access road leading to another small parking lot on the southwest side of campus. Circulation through the lot is one-way; motorists enter from Coombsville on the west side and exit on the east side.

A larger parking lot and loading zone are located off of Coombsville Road east of the main entrance. This area also includes a bus-only loading zone. Farther east still, an informal dirt parking lot is sometimes used by those accessing the school's athletic facilites on the east side of the campus. On the west side of the campus, a a fire access road leads to the small southwest parking lot.

Pedestrians and bicyclists approaching the school from the north side of Coombsville must cross Coombsville in the crosswalk at Jacks Lane in front of the main entrance, as there are no other crosswalks nearby; however, given neighborhood density east of the school and pedestrian infrastructure gaps in neighborhoods north of the school, pedestrians are more likely to approach school on the south side of Coombsville Road. where there is a sidewalk that connects to southwest neighborhoods. There are no sidewalks along Coombsville Road east of the driveway entrance to the front parking lot.

The raised crosswalk at the entrance to the fire access road that leads to the southwest parking lot.

Coombsville Road approaching the school.

The school loading zone in front of the main entrance to campus.

The school does not have formal parking policies or circulation plans that are sent out to parents. During an initial meeting pre-pandemic, school staff reported that a teacher is stationed at the large loading zone on the east side of campus to help regulate students and traffic. The school does provide direction in its Student Handbook for students who walk or roll to school (see Figure 5).

Bus service through NVUSD is available for Silverado Middle School students. Bus service includes 15 stops throughout the enrollment area. Additionally, students who live beyond 3 miles walking distance from school and attend their school of residence may apply for transportation through NVUSD. The Vine transit, operated by the Napa Valley Transportation Authority, does not provide regular service in the area.

The eastbound Coombsville sidewalk connects campus to neighborhoods west of the school.

BICYCLES/SKATEBOARDS/SCOOTERS: All students who ride bikes, skateboards or scooters to and from school must wear helmets. Students are required to lock bikes, skateboards and scooters in the cage by 8:05 each morning. Bicycles, skateboards and scooters may not be ridden on campus at any time. If students do not follow these expectations, bicycles/skateboards or scooter will be confiscated for parents or guardians to pick up. Silverado is not responsible for loss or damage to any bicycle, skateboard or scooter.

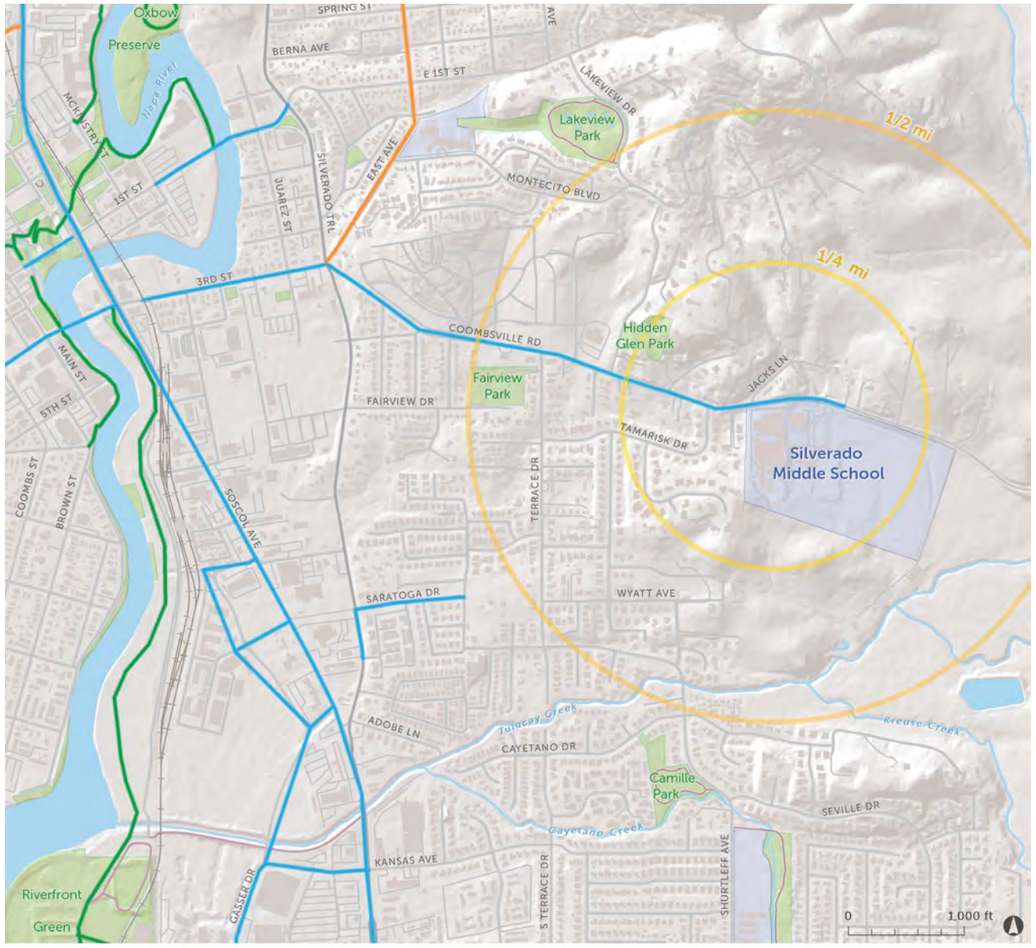
PEDESTRIANS: Students must use walkways when available. When there are no walkways, students are asked to walk AGAINST traffic. Cross streets only at marked crossings.

Figure 5: Bicycle and Pedestrian School Policies.

BICYCLE AND PEDESTRIAN INFRASTRUCTURE

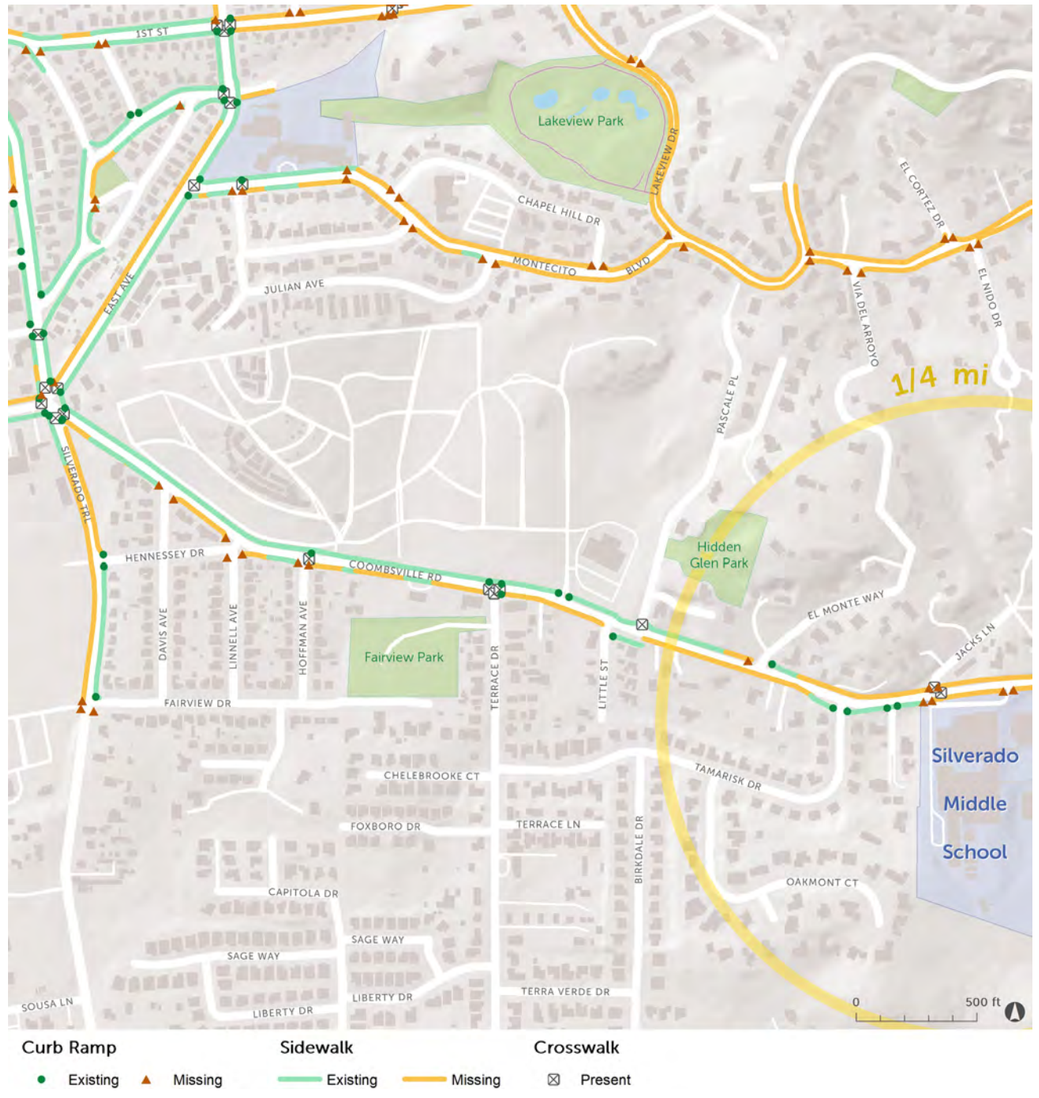
Silverado Middle School provides bike parking on campus for students. The school's several bike parking racks are located in a gated bike corral that is locked during school hours. The corral sits on the west side of campus, adjacent to the fire access lane about halfway toward the southwest parking lot. Students must bike on the fire access lane with traffic traveling to the southwest lot to reach the bike corral.

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

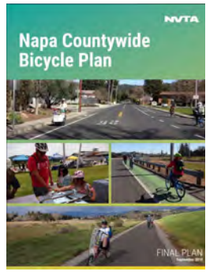
Silverado Middle School has regularly participated in annual countywide encouragement events such as Bike to School Day and Walk and Roll to School Day. Bike to School Day and Walk and Roll to School Day are annual encouragement events facilitated by Napa County Safe Routes to School in the spring and 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 and does not provide bike safety education.

Walk and Roll to School Day 2019 at Silverado Middle School.

YEAR	EVENT	STUDENT PARTICIPANTS
2016/17	Bike to School Day	42
2017/18	Bike to School Day	8
2018/19	Walk and Roll to School Day	103
2018/19	Bike to School Day	12
2019/20	Walk and Roll to School Day	67

Figure 6: Encouragement and Education Data

EXISTING PLANS



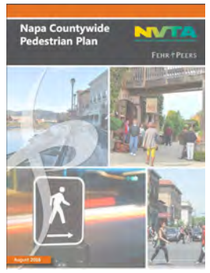
NVTA Napa Countywide Bicycle Plan (2019):

The Napa Countywide Bicycle Plan recommends installing bicycle facilities around the school site. It suggests installing Class II bike lanes on Terrace Drive, a Class III urban bikeway on Tamarisk Drive, and a Class III bike route east of the school on Coombsville Road.

NVUSD Facilities Master Plan (2016):

NVUSD's Facilities Master Plan lists projects for Silverado Middle School, including installing/upgrading fencing around the school perimeter, ADA (Americans with Disabilities Act) improvements, parking lot repair, and photo voltaic carports.

MEASURE H
BUILDING ON OUR VISION
NVUSD

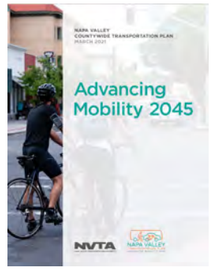


NVTA Napa Countywide Pedestrian Plan (2016):

The Napa Countywide Pedestrian Plan lists two recommended improvements near the school site. The 5-Way Intersection Modification would update the intersection at Silverado Trail, Third Street, Coombsville Road, and East Avenue, and the Terrace Drive Sidewalks would install/upgrade sidewalks on Terrace Drive.

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. One listed project, the Five-Way Intersection Modification that will update the intersection of Silverado Trail, Third Street, Coombsville Road, and East Avenue, will impact the school site.



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: 4/02/21
Day of the Week: Friday

Meeting Time: 1:45 PM
Weather: Sunny and slightly cloudy

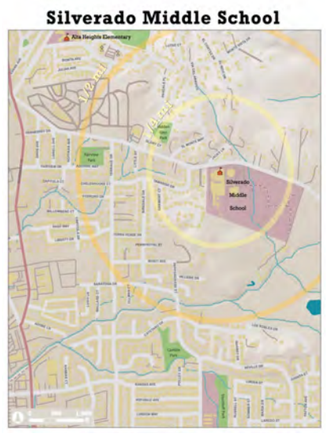
METHODOLOGY

Normally, the Community Walk Audit process would bring together school stakeholders, including parents, school staff, and potentially students, with the SRTS team to observe existing conditions during pick-up or drop-off time, identify barriers to safe walking or biking, and brainstorm solutions. During the observation period, participants would discuss the physical infrastructure around the school as well as the behavior of motorists, pedestrians, and bicyclists in the area, while also sharing their own experiences traveling to and from school on foot, bike, and by car. Following observation, the team would discuss their observations, map issue areas, and record and prioritize the major barriers identified during the exercise.

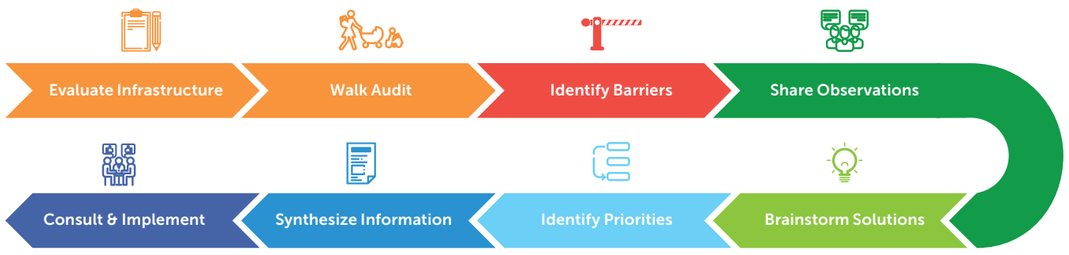
Due to the spread of Covid-19 in early 2020 and subsequent Shelter-in-Place mandates and social distancing guidelines, the SRTS team was unable to hold a Community Walk Audit for Silverado Middle School. In April 2021, members of the SRTS team performed a modified Walk Audit that mirrored the initial infrastructure audit. SRTS team members rode bikes in the area immediately around the school and along significant route corridors while taking notes and photographs of infrastructure and behavioral barriers to student pedestrians and bicyclists.

Streets examined included Coombsville Road, both around the school site and closer to central Napa, and Coombsville intersections such as Davis Avenue, Linnell Avenue, and Terrace Drive.

A Safe Routes to School Walk Audit at Napa High School.



SRTS team members used maps with quarter- and half-mile radii during the modified Walk Audit.

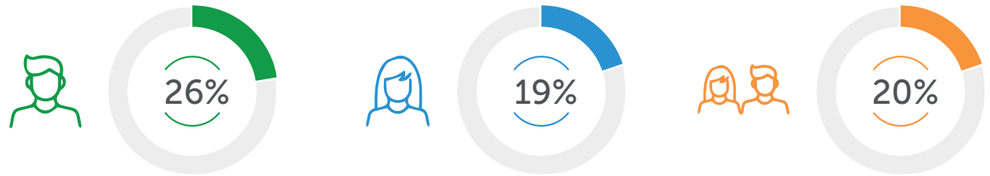


CONTEXT FOR **RECOMMENDATIONS**

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-440 – 441, NAI-443, NAP-074: COOMBSVILLE ROAD BIKE AND PEDESTRIAN FACILITIES

Narrative – Coombsville Road, a significant east-west arterial that runs through both City and County boundaries, borders the school on the north side and is the only access road to campus. Since all school traffic of all modes must travel along Coombsville Road for some portion of their route, this road is critical to school circulation and transportation. As Silverado Middle School is located on the very east end of City boundaries, the campus is located in an area where roadway surroundings become increasingly rural, which may impact motorist behavior.

IDENTIFIED BARRIERS

- ***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 bike lanes are substandard width, faded, or missing.
- ***Motorists obstruct bike lane –*** Motorists illegally park in the eastbound bicycle lane on Coombsville from Tamarisk Drive along the school frontage, obstructing the bike lane and forcing bicyclists to enter high-speed and high-volume traffic.
- ***Sidewalk gaps –*** There are several gaps in the eastboumd sidewalk, the side the school is on and the side that connects to several neighborhoods in walking and biking distance of the school. Sidewalk gaps can force students to walk in the roadway or cross in unmarked areas, and large enough gaps may deter students from walking altogether.

Class II bike lanes are high-stress on Coombsville Road largely due to the lack of separation between bicyclists and motorists.

- ***High-stress intersections –*** Many of the intersections along Coombsville are high-stress, due to motorists making fast turns to enter or exit Coombsville traffic, long crossing distances increasing time spent in the roadway, missing crosswalks reducing pedestrian visibility, and wide curb radii facilitating fast motorist turns.

RECOMMENDATIONS

- ***NAI-440 Class IV protected bike lanes –*** Upgrade the existing bike lanes to Class IV protected bike lanes from Silverado Trail to Silverado Middle School to increase separation between bicyclists and Coombsville traffic and prevent motorists from obstructing the bike lanes. Include green conflict markings in locations of high bicyclist/motorist conflict risk, such as major side street intersections and driveways where full separation is not feasible.
- ***NAI-441 Sidewalks –*** Fill all eastbound sidewalk gaps to provide a cohesive, separated pedestrian route along Coombsville.
- ***NAI-443 Intersections –*** For all intersections along Coombsville Road from Silverado Trail to Silverado Middle School, upgrade all crosswalks to high-visibility patterns and install appropriate modifications that shorten crossing distances, slow vehicle traffic, and improve pedestrian visibility. Large intersections that require significant re-design to improve bicyclist/pedestrian safety and comfort include Terrace Drive, Tamarisk Drive, and Linnell Avenue/Hennessy Drive (see specific intersection recommendations).
- ***NAP-074 Education and enforcement –*** Increase education to school families about motorists keeping bike lanes clear in advance of Class IV protected bike lane recommendation. Increase enforcement for area from Tamarisk Drive to school campus if needed.

RECOMMENDATION #NAI-446: COOMBSVILLE ROAD AND TAMARISK DRIVE INTERSECTION

Narrative – The Coombsville Road and Tamarisk Drive intersection is just west of Silverado Middle School campus. It is the closest intersection to the school that provides access to the neighborhoods southwest of the school. Many students who walk or bike from these southwest neighborhoods may prefer to enter Coombsville Road from Tamarisk Drive in order to minimize time spent on Coombsville with high-speed and high-volume traffic. Additionally, many students who travel along Coombsville Road from any point west of the school must navigate this intersection, given its vicinity to campus and it being on the same side of the street as campus (students may feel uncomfortable crossing Coombsville, and will likely try to remain on one side as much as possible).

IDENTIFIED BARRIERS

- ***Misaligned intersection –*** Tamarisk Drive is set back so Coombsville Road travel lines widen excessively, allowing motorists to make fast turning movements and increase speed approaching the school zone and increasing conflict risk for eastbound bicyclists.
- ***Low visibility –*** Steep elevations and setbacks in the intersection create visibility issues for all road users, increasing conflict risk.

Coombsville and Tamarisk intersection, facing west.

RECOMMENDATIONS

- ***Long-term:***
  - ***Redesign intersection –*** Redesign and modify the intersection to T-up the intersection with permanent materials to reduce crossing distance and curb radii, maintain minimum motorist travel lane widths to reduce facilitation of speeding, and improve pedestrian visibility.
- ***Short-term:***
  - ***Paint a high-visibility school-zone crosswalk across Tamarisk Drive to improve pedestrian visibility.*** Use paint and reflective, sturdy bollards to temporarily T-up the intersection, reduce crossing distance for pedestrians, maintain Coombsville Road minimum travel lane widths, and improve eastbound bicycle access.

RECOMMENDATION #NAI-447: COOMBSVILLE ROAD AND LINNELL AVENUE/ HENNESSY DRIVE INTERSECTION

Narrative – The Coombsville Road and Linnell Avenue/Hennessy Drive intersection is on eastbound Coombsville Road, the same side of the street as the school, near the five-way intersection. The Linell/Hennessy intersection is along routes to school from neighborhoods north of the school, the downtown area, and the closest access point to the Vine Trail shared-use path, which runs through the City of Napa. Hennessy Drive also intersects with nearby Silverado Trail, which may be a preferred route to the school for motorists travelling north on the Silverado Trail instead of the five-way intersection.

IDENTIFIED BARRIERS

- ***Misaligned intersection –*** This intersection between three streets, one of which is an arterial, creates an extremely long crossing distance for pedestrians with no crosswalks, generates more conflict risks between active users and motorists due to the many directions traffic may be travelling, and facilitates fast motorist turns with wide curb radii.

RECOMMENDATIONS

- ***Redesign intersection –*** Redesign the intersection to reduce crossing distances, reduce points of conflict between motorists and active users, potentially by increasing separation between road users, and slow vehicle traffic through intersection. Consider removing one leg of the intersection to limit turning movements in/out of Linell/Hennessey onto Coombsville. Paint crosswalks and bike facilities/conflict markings up to and through the intersection to improve visibility of active users.

Coombsville and Linnell/Hennessy intersection, facing west.

RECOMMENDATION #NAP-075: BICYCLE SAFETY EDUCATION

Narrative – Bicycle safety education is a crucial component of increasing biking mode share at a school site, as it teaches students rules of the road for bicyclists and safe biking behaviors such as scanning and signaling before turns. This understanding not only improves bicyclist safety, but also increases confidence and comfort for young bicyclists. Common unsafe behaviors that are done unknowingly due to lack of education, such as riding against traffic, riding on the sidewalk, and failing to stop at stop signs, are hazardous to student bicyclists, as this behavior is unpredictable to motorists and can increase risk of collisions. While many of these behaviors can be addressed through infrastructure, such as clearly marked bicycle facilities, implementing annual education on bicyclist safety within the school system can raise awareness of rules of the road and encourage safe behavior.

IDENTIFIED BARRIERS

- ***No bicycle safety education –*** Silverado Middle School has not historically provided students with bicycle safety education. A lack of bicycle safety education can result in unintentional unsafe student bicyclist behavior and a sense of discomfort riding a bike.

RECOMMENDATIONS

- ***Annual bike safety education –*** Provide annual bike safety education for all students, such as in-class/on-bike hybrid classes. Such programming is available to all Napa County public schools through the Napa County Safe Routes to School program.

Annual bike safety education helps prepare and encourage students to bike to school safely. Photo credit: Napa County Office of Education.

RECOMMENDATION #NAP-077: GROUP ENCOURAGEMENT PROGRAMS

Narrative – Vehicle congestion in the school zone can be a significant barrier to students walking and biking to school, especially when paired with bicycle and pedestrian infrastructure gaps. While infrastructure recommendations are underway, establishing group encouragement programs, such as walking school buses, bike trains, or carpool networks, can help reduce the number of vehicles in the school zone while improving road user comfort by establishing a greater bicyclist/pedestrian road presence through numbers and providing adult supervision that can be a shared responsibility amongst families.

IDENTIFIED BARRIERS

- ***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

- ***Group encouragement programs –*** Establish regularly-occurring bike trains/walking groups/carpools to reduce the number of vehicles in the school zone and improve visibility and comfort of student bicyclists/ pedestrians through increased numbers.

An example of a bike train group led by parent volunteers at El Roble Elementary School in Gilroy. (Photo by Ihui Lopez, Silicon Valley Bicycle Coalition).

RECOMMENDATION #NAI-448: COOMBSVILLE ROAD AND DAVIS AVENUE INTERSECTION

IDENTIFIED BARRIERS

- ***Long crossing distances –*** Long crossing distances in the intersection 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.
- ***No crosswalk –*** There is no crosswalk across Davis Avenue, reducing pedestrian visibility and sense of comfort.
- ***Wide curb radii –*** Wide curb radii on the corners of the intersection facilitate fast motorist turning movements.

Coombsville and Davis intersection, facing south.

RECOMMENDATIONS

- ***Paint crosswalk –*** Paint a crosswalk across Davis Avenue to improve pedestrian visibility and motorist yielding behavior.
- ***Curb extensions –*** Install curb extensions to T-up the intersection to reduce curb radii, improve pedestrian visibility and motorist yielding behavior, and reduce crossing distance. Existing and future bicycle facilities should be included in curb extension design, including conflict markings through the intersection.

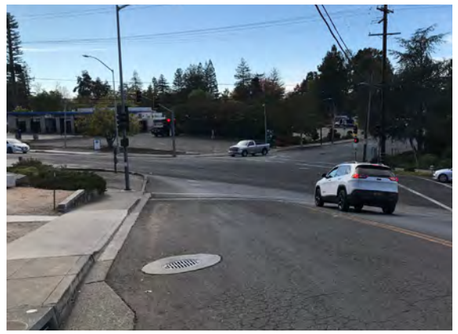
RECOMMENDATION #NAI-434: EAST AVENUE FIVE-WAY INTERSECTION

IDENTIFIED BARRIERS

- ***Five-way intersection –*** The five-way intersection of East Avenue/Silverado Trail/3rd Street/Coombsville Road experiences high volumes and speeds of traffic, has long crossing distances, wide curb radii, and free right turns, all of which increase risk of collisions with bicyclists and pedestrians and make the intersection challenging and unwelcoming.

RECOMMENDATIONS

- ***Intersection redesign –*** Fully redesign the intersection with implementation of Complete Streets elements. The City currently has plans for a double roundabout; implementation of such should include elements including Class I shared-use path access through the roundabouts, access ramps, and Rectangular Rapid Flashing Beacons at crosswalks.



The 5-way intersection, as seen from East Avenue.

RECOMMENDATION #NAI-450: TAMARISK DRIVE BICYCLE FACILITIES

IDENTIFIED BARRIERS

- ***No bicycle facilities –*** The lack of bicycle facilities on the corridor fails to provide a dedicated space for bicyclists and indicate to motorists where to expect bicyclists, making the corridor appear unwelcoming to bicyclists.

RECOMMENDATIONS

- ***Class III bike boulevard –*** Install Class III bike boulevards with sharrows and signage and traffic-calming measures from Terrace to Coombsville.

Tamarisk Drive does not have bicycle facilities.

RECOMMENDATIONS #NAI-439 AND NAI-451: TERRACE DRIVE BIKE/PED FACILITIES AND TRAFFIC-CALMING

IDENTIFIED BARRIERS

- ***Sidewalks –*** There are significant sidewalk gaps along the Terrace Drive corridor, and many existing sidewalks are narrow and do not accommodate students walking together. Sidewalk gaps may force students to walk in the road or cross in unmarked locations, and may deter students from walking altogether.

- ***No bicycle facilities –*** The lack of bicycle facilities on the corridor fails to provide a dedicated space for bicyclists and indicate to motorists where to expect bicyclists, making the corridor appear unwelcoming to bicyclists.

Some parts of Terrace Drive have no sidewalks.

- ***High speeds and volumes of traffic –*** Terrace Drive is a collector and carries significant volumes of traffic. The corridor is also long and straight with no traffic-calming or traffic control, which facilitates motorist speeding.

RECOMMENDATIONS

- ***NAI-439 Corridor study –*** Complete a corridor study for the Terrace Drive corridor as indicated in the adopted 2019 Bicycle Plan, considering the potential for Class II or Class I bike facilities. Fill sidewalk gaps and widen sidewalks to a minimum of 5 feet.

- ***NAI-451 Traffic-calming –*** Install traffic-calming measures throughout the corridor to reduce vehicle speeds; prioritize traffic-calming features that can also improve Terrace Drive crossings (ex. At Terra Verde Dr).

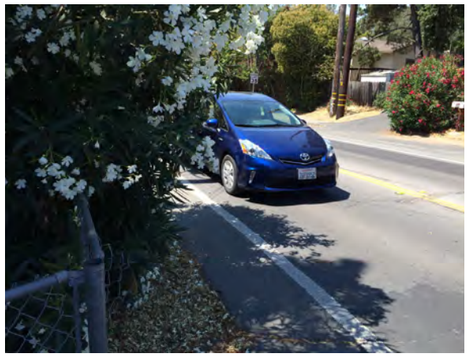
RECOMMENDATION #NAP-073: COOMBSVILLE BIKE LANE MAINTENANCE

IDENTIFIED BARRIERS

- ***Debris and vegetation –*** Debris and vegetation obstruct existing sidewalks and bike lanes along Coombsville Road, reducing accessibility and potentially forcing bicyclists out of the bike lane to avoid getting a flat tire or falling.

RECOMMENDATIONS

- ***Maintenance –*** Ensure that existing maintenance efforts reach bike lanes and sidewalks and keep these facilities clear. Increase maintenance frequency if needed.



Overgrown vegetation on Coombsville obstructs an already narrow bike lane.

RECOMMENDATION #NAP-076: ENCOURAGEMENT EVENTS

IDENTIFIED BARRIERS

- ***Infrequent encouragement programs –*** While annual countywide encouragement events are a great place to start, infrequent encouragement events are not effective enough in normalizing active transportation as an everyday mode of transportation.

RECOMMENDATIONS

- ***Encouragement programs –*** Continue to grow participation in annual encouragement events and organize additional encouragement events throughout the year (ex: Walk and Roll Wednesdays) with the goal of increasing frequency of events over time. Engage student leadership in organization and execution of encouragement events.

Marin County middle school students ran a "Hot Walk-alot" event to encourage active transportation to school. Photo credit: Marin County Safe Routes to School.

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.

RECOMMENDATIONS #NAI-016, NAI-017, AND NAI-069-: SHURTLEFF AVENUE (TERRACE TO IMOLA)

IDENTIFIED BARRIERS

- ***Sidewalk gaps along corridor***
- ***No bicycle facilities***
- ***Long corridor with multiple straightaways and no traffic-calming or traffic control facilitates motorist speeding***

RECOMMENDATIONS

- ***Fill sidewalk gaps on both sides from Lexington Court to Imola Avenue***
- ***Install Class II bike lanes***
- ***Install traffic-calming measures throughout corridor***

Relevant Reports:

- *Phillips Magnet Elementary School Walk Audit Report*

RECOMMENDATION #NAI-075: SHURTLEFF AVENUE AND PEPPERGRASS STREET INTERSECTION

IDENTIFIED BARRIERS

- ***Sweeping curve in road decreases visibility of bicyclists and pedestrians on the road.***

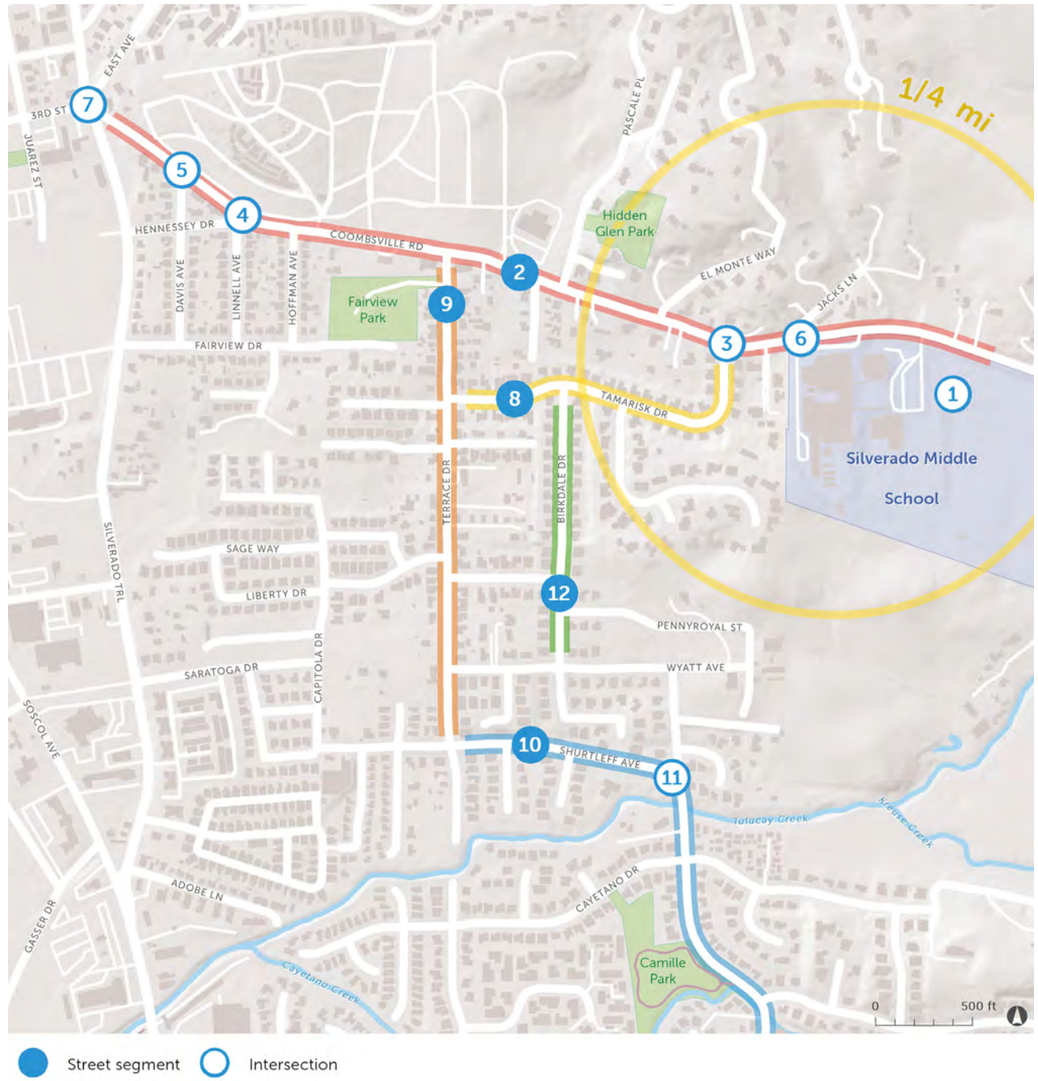
RECOMMENDATIONS

- ***Install temporary signage/stencils alerting motorists to presence of bicyclists where visibility is reduced at curve in the road until Class II bike lanes can be installed per 2019 Bike Plan.***

Relevant Reports:

- *Phillips Magnet Elementary School Walk Audit Report*

MAP OF RECOMMENDATIONS



Map 5: Recommendations

TABLE OF RECOMMENDATIONS

Infrastructure:

	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
1	School grounds	NAI-444	Bike parking located on west side of campus. Access may be a barrier – located on side driveway with no bicyclist/ vehicle separation. Bike racks positioned so only half of parking spaces are accessible.	Reposition bike racks in bike corral so that accessible parking spaces are maximized. If this requires relocating a bike rack out of the corral, move bike rack to secure location near main entrance to school. Expand bike parking capacity to meet 20% of student body.	$	Low
		NAI-445	Narrow sidewalks along frontage of school and leading out to Coombsville Road	Widen sidewalks to ensure adequate space for separated pedestrian access to campus.	$	Low
2	Coombsville Road from Silverado Trail to Silverado Middle School	NAI-440	Class II bike lanes are substandard, faded, or missing in some locations; high-stress on arterial corridor with high speeds and volumes of traffic. Illegal parking by motorists along eastbound Coombsville from Tamarisk to school/in front of school.	Upgrade bike lanes to Class IV protected bike lanes. Include green conflict paint in locations of bicyclist/motorist conflict risk (major side streets and driveways) where full separation is not feasible.	$$	High
		NAI-441	Several sidewalk gaps on eastbound side (school side); westbound sidewalk gap between Jacks Lane and Pascale Place	Fill eastbound sidewalk gaps.*	$$-$$$	High
		NAI-442		Fill westbound sidewalk gap.*	$$	Low
		NAI-443	Motorists turning left off Coombsville turn fast to prevent traffic build-up and focus on oncoming traffic (not peds/bikes). Long crossing distances, missing crosswalks, wide curb radii.	All crosswalks upgraded to high-visibility pattern and other modifications to shorten crossing distance, slow vehicle traffic, and improve pedestrian visibility. Large intersections that require significant re-design to improve bicyclist/ pedestrian safety and comfort include Terrace Dr, Tamarisk Dr, and Linnell/Hennessy (see specific intersection recommendations).	$-$$$$	High
3	Coombsville Road and Tamarisk Drive intersection	NAI-446	Misaligned intersection: Tamarisk Dr set back so Coombsville Road travel lines widen excessively, allowing motorists to make fast turning movements and increasing conflict risk for eastbound bicyclists. Steep elevations and setbacks create visibility issues for all users, increasing conflict risk.	Redesign intersection to T up intersection.	$$$	High
4	Coombsville Road and Linnell Avenue/ Hennessy Drive intersection	NAI-447	Misaligned intersection creates long crossing distances for pedestrians and generates more conflict risks between active users and motorists. Wide curb radii facilitate fast motorist turning movements. No crosswalks and eastbound bicycle facilities disappear at intersection.	Redesign intersection to reduce crossing distances, reduce points of conflict between motorists and active users, and slow vehicle traffic through intersection. Consider removing one leg of intersection to limit turning movements in/out of Linell/ Hennessey. Paint crosswalks and bike facilities/conflict markings up to and through intersection.	$$-$$$	High
5	Coombsville Road and Davis Avenue intersection	NAI-448	Long crossing distance and no crosswalk across Davis Avenue. Wide curb radii facilitate fast motorist turning movement.	Paint crosswalk and install significant curb extensions to T up intersection. Existing and future bicycle facilities should be included in curb extension design, including conflict markings through intersection.	$$-$$$	Medium
6	Coombsville Road and Jacks Lane intersection	NAI-449	Low-visibility crosswalk pattern in school zone, high-speed and volume Coombsville traffic is uncontrolled, westbound motorist sight line reduced due to elevation change. High volumes of school-related traffic during arrival and dismissal due single road access to campus.	Upgrade crosswalks to high-visibility school zone pattern. Install curb extensions if feasible while maintaining existing/future bike facilities. Install traffic-calming features for Coombsville traffic approaching crosswalk. Paint shark's teeth for Coombsville traffic. Install High-Intensity Activated crosswalk beacon.	$$-$$$	Low
7	East Avenue, 3rd Street, Silverado Trail, and Coombsville Road intersection*	NAI-434	Difficult 5-way intersection, long crossing distances, high traffic volumes and speeds, confusing angles, free right turns.	Full redesign of intersection with implementation of Complete Streets elements. City plans for roundabout implementation should include elements including Class I shared-use path access through roundabouts, access ramps, Rectangular Rapid Flashing Beacons at crosswalks.	$$$$	Medium
8	Tamarisk Drive from Terrace Drive to Coombsville Road	NAI-450	No bicycle facilities.	Install Class III bike boulevard with sharrows, signage, and traffic-calming.*	$$	Medium
9	Terrace Drive from Coombsville Road to Shurtleff Avenue	NAI-439	Significant sidewalk gaps, narrow existing sidewalks. No bicycle facilities. Collector carries significant volumes of traffic.	Complete corridor study as indicated in Bicycle Plan* (potential for Class II or Class I bike facilities). Fill sidewalk gaps* and widen sidewalks to minimum 5'.	$$$$	Medium
		NAI-451	Long, straight corridor with no traffic-calming or traffic control facilitates motorist speeding.	Install traffic-calming measures throughout corridor; prioritize traffic-calming features that can also improve Terrace Drive crossings (ex. Terra Verde Dr).	$$-$$$$	Medium

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

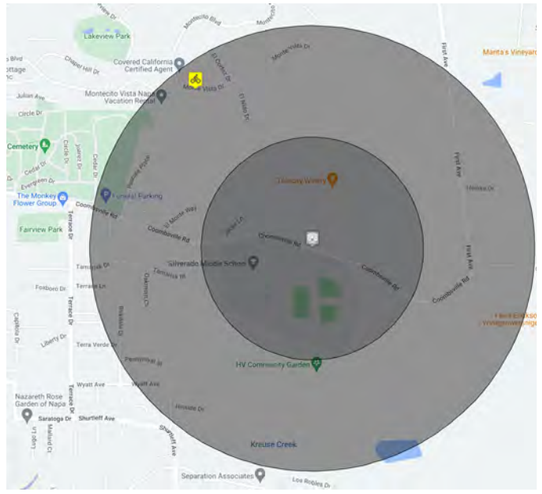
	LOCATION	ID #	BARRIER	RECOMMENDATION	COST	PRIORITY
10	Shurtleff Avenue from Terrace Drive to Imola Avenue	NAI-016	Sidewalk gaps along corridor.	Fill sidewalk gaps on both sides from Lexington Court to Imola Avenue.*	$$$$	**High**
		NAI-017	No bicycle facilities.	Install Class II bike lanes.*	$$	**Medium**
		NAI-069	Long corridor with multiple straightaways and no traffic-calming or traffic control facilitates motorist speeding.	Install traffic-calming measures throughout corridor.	$$-$$$$	**Medium**
11	Shurtleff Avenue and Peppergrass Street intersection	NAI-075	No crosswalk across Peppergrass Street and curb ramp on east corner of Peppergrass Street and Shurtleff Avenue; sweeping curve in road decreases visibility of bicyclists and pedestrians on the road.	Install temporary signage/stencils alerting motorists to presence of bicyclists where visibility is reduced at curve in the road until Class II bike lanes can be installed per 2019 Bike Plan.	$	**Medium**
		NAI-074		Paint crosswalk across Peppergrass Street. Install ADA-accessible curb ramp on east corner of intersection.	$	**Low**
12	Birkdale Drive from Wyatt Avenue to Tamarisk Drive	NAI-452	No bicycle facilities	Install Class III bike boulevard sharrows to inform road users of road-sharing (street is already traffic-calmed)	$	**Low**

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

Programmatic Improvements:

	ISSUE	ID #	RECOMMENDATION	LOCATION	FREQUENCY	COST	PRIORITY
1	Debris and vegetation obstruct existing sidewalks and bike lanes.	NAP-073	Ensure existing maintenance efforts reach bike lanes and sidewalks. Increase maintenance frequency if needed.	Coombsville Road from Silverado Trail to Silverado Middle School	Consistent with street sweeping schedule	$	**Medium**
2	Illegal parking by motorists along eastbound Coombsville from Tamarisk to school/ in front of school.	NAP-074	Education and enforcement in advance of Class IV recommendation.	Coombsville Road from Tamarisk Drive to school campus	As-needed	$	**High**
3	No bicycle safety education program.	NAP-075	Provide bicycle safety education to all students.	School site	Annual	$	**High**
4	Infrequency of encouragement events.	NAP-076	Continue growing participation in annual countywide encouragement events.	School site	Annual	$	**Medium**
5	Congestion in school zone.	NAP-077	Develop carpool program to reduce number of vehicles in school zone. Develop walking school bus and bike train programs.	School site	Monthly, with goal of increasing frequency	$	**High**

COLLISION MAP AND DATA



Map 6: Collision Map (2016-2020) (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	1	0	0	0	1
Total	0	0	1	0	0	0	1

Collision List

DATE	TIME	PRIMARY	SECONDARY	BIKE/PED
2017-04-23	17:44	Via Del Arroyo	Monte Vista Dr	Yes/No

Figure 7: Collision Data (2016-2020) (Source: UC Berkeley Transportation Injury Mapping System: SRTS Collision Map Viewer)

APPENDICES

FIGURES & MAPS

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

Acknowledgments

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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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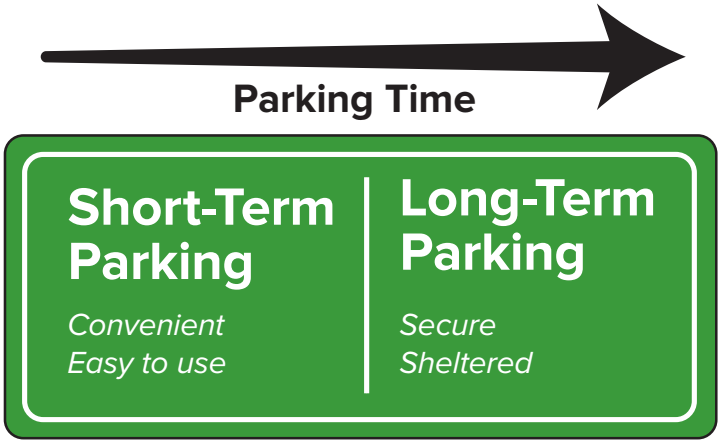
TABLE OF CONTENTS

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

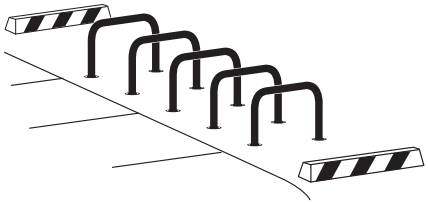
Effective bike parking for short-term users depends on two main factors: 1) proximity to the destination and 2) ease of use.

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.

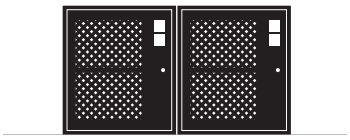
BIKE CORRALS

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**

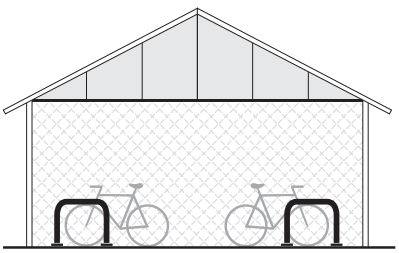
LONG-TERM PARKING

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

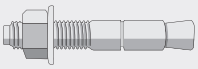
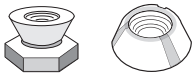
Selecting an appropriate installation surface and technique is key to creating bicycle parking that remains secure and attractive over time.

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

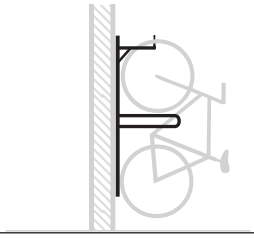
These rack styles do not meet all performance criteria but may be appropriate in certain constrained situations.

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

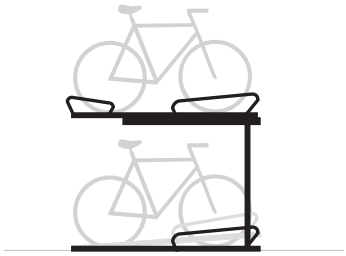
Variation of the wheelwell-secure rack designed to stagger handlebars vertically or horizontally to increase parking density. Reduces usability and limits kinds of bikes accommodated, but contains bikes well and aids in fitting more parking in constrained spaces.

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.

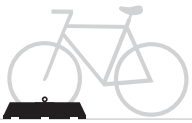
SCHOOLYARD
also called comb, grid

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

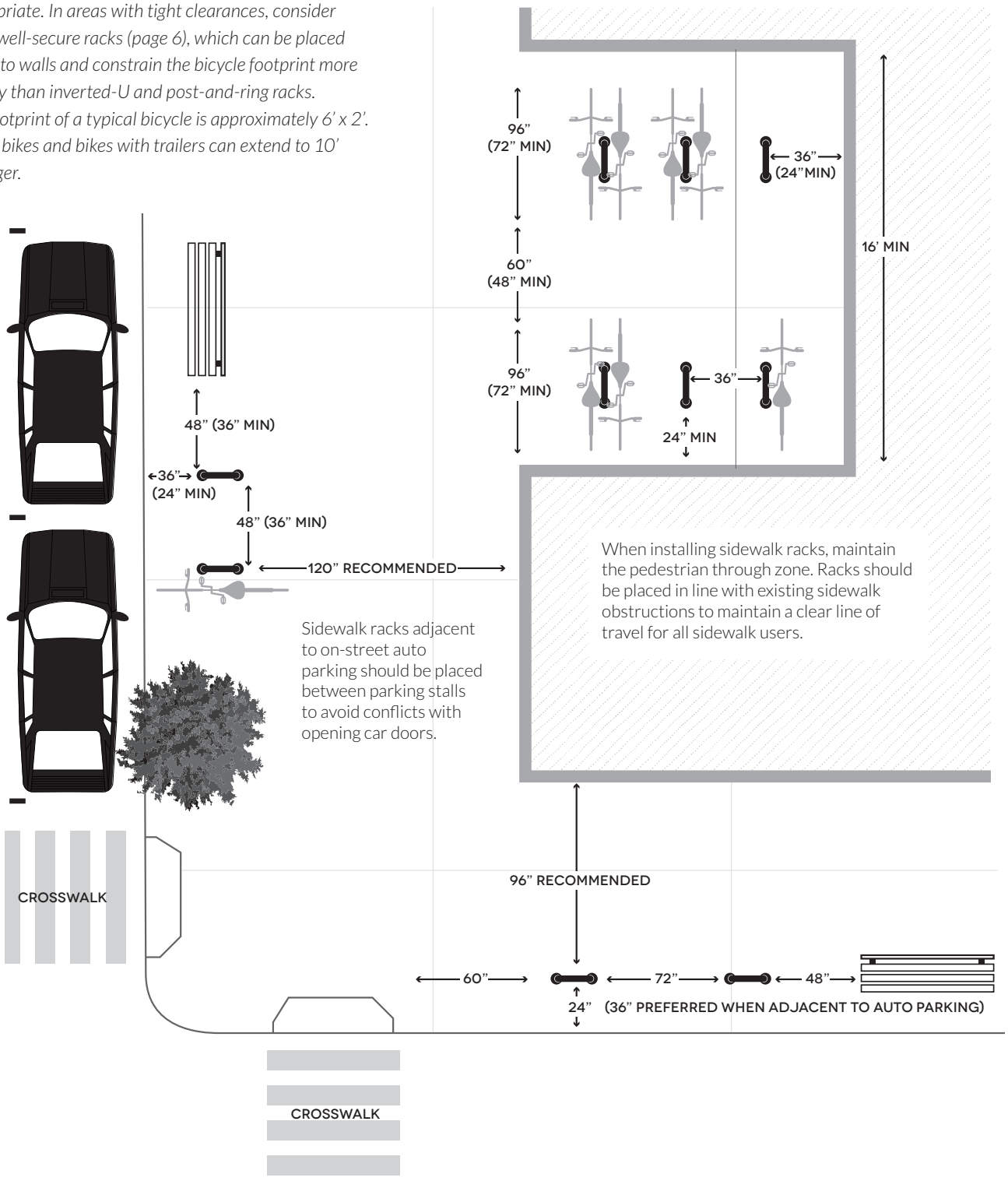
Most bicycle parking racks are made of carbon steel or stainless steel. Carbon steel requires a surface coating to resist rust while appropriate grades of stainless steel need no coating. Not all materials and coatings with the same name perform equally. Square tubing provides a security advantage as 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