Hollenbeck Bike Lane Study

Draft Report | November 2025

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Sunnyvale

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Sunnyvale

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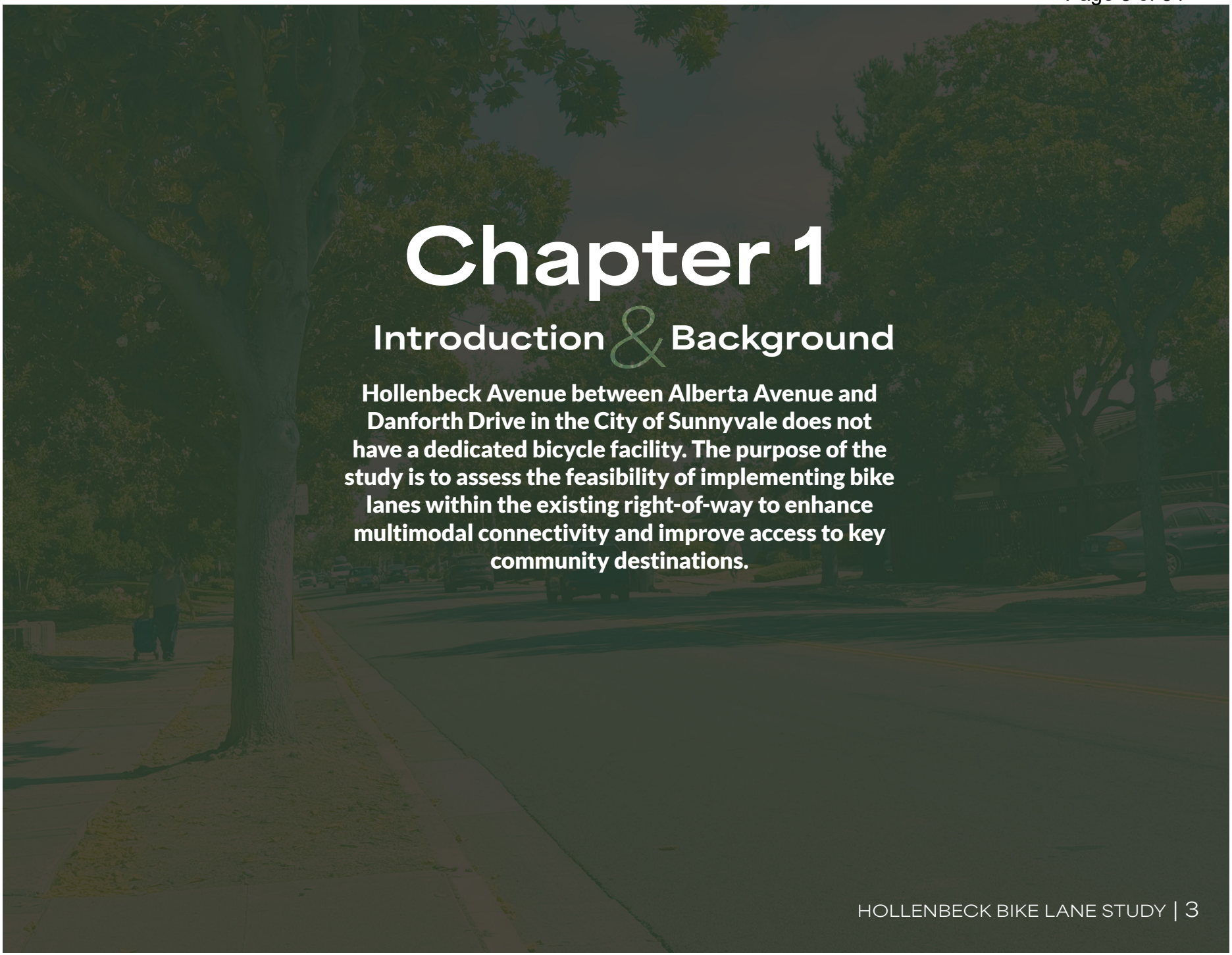


Chapter 1

Introduction & Background

Hollenbeck Avenue between Alberta Avenue and Danforth Drive in the City of Sunnyvale does not have a dedicated bicycle facility. The purpose of the study is to assess the feasibility of implementing bike lanes within the existing right-of-way to enhance multimodal connectivity and improve access to key community destinations.

STUDY OVERVIEW

Hollenbeck Avenue between Alberta Avenue and Danforth Drive in the City of Sunnyvale does not have a dedicated bicycle facility.

The purpose of the study is to assess the feasibility of implementing bike lanes within the existing right-of-way to enhance multimodal connectivity and improve access to key community destinations.

This study commenced in April 2024, to analyze the current vehicle and bicycle circulation and parking usage in the area and to evaluate the potential implementation of bike lanes. As part of this study, extensive outreach to local residents and stakeholders was conducted, including small group interviews with neighboring institutions, two community meetings, an online survey, three Bicycle and Pedestrian Commission (BPAC) meetings, and one study session with the City Council. This community outreach helped guide the development and evaluation of potential options for this corridor. The study also analyzed multiple years of collision data, as well as multiple weekdays and weekend days of average daily traffic (ADT) counts, bicycle counts, and parking counts. Results from the data analysis are summarized in this Report with full memoranda and methodologies included as Appendices.

The City Council will consider the design options and decide on the best path forward given the collected community input and analysis findings.

STUDY BACKGROUND

This study was initiated through the City's Study Issue process following a recommendation from the Bicycle and Pedestrian Advisory Commission (BPAC). It was ranked and approved by the City Council in 2023 and subsequently funded as part of the FY 2023/24 Budget.

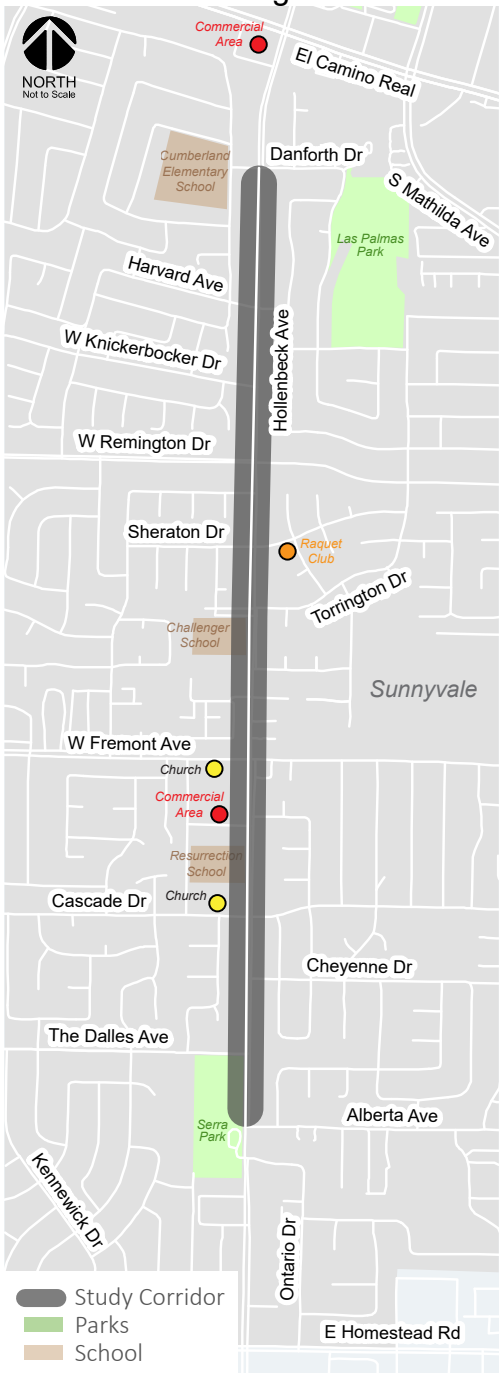


Figure 1: Project Limits

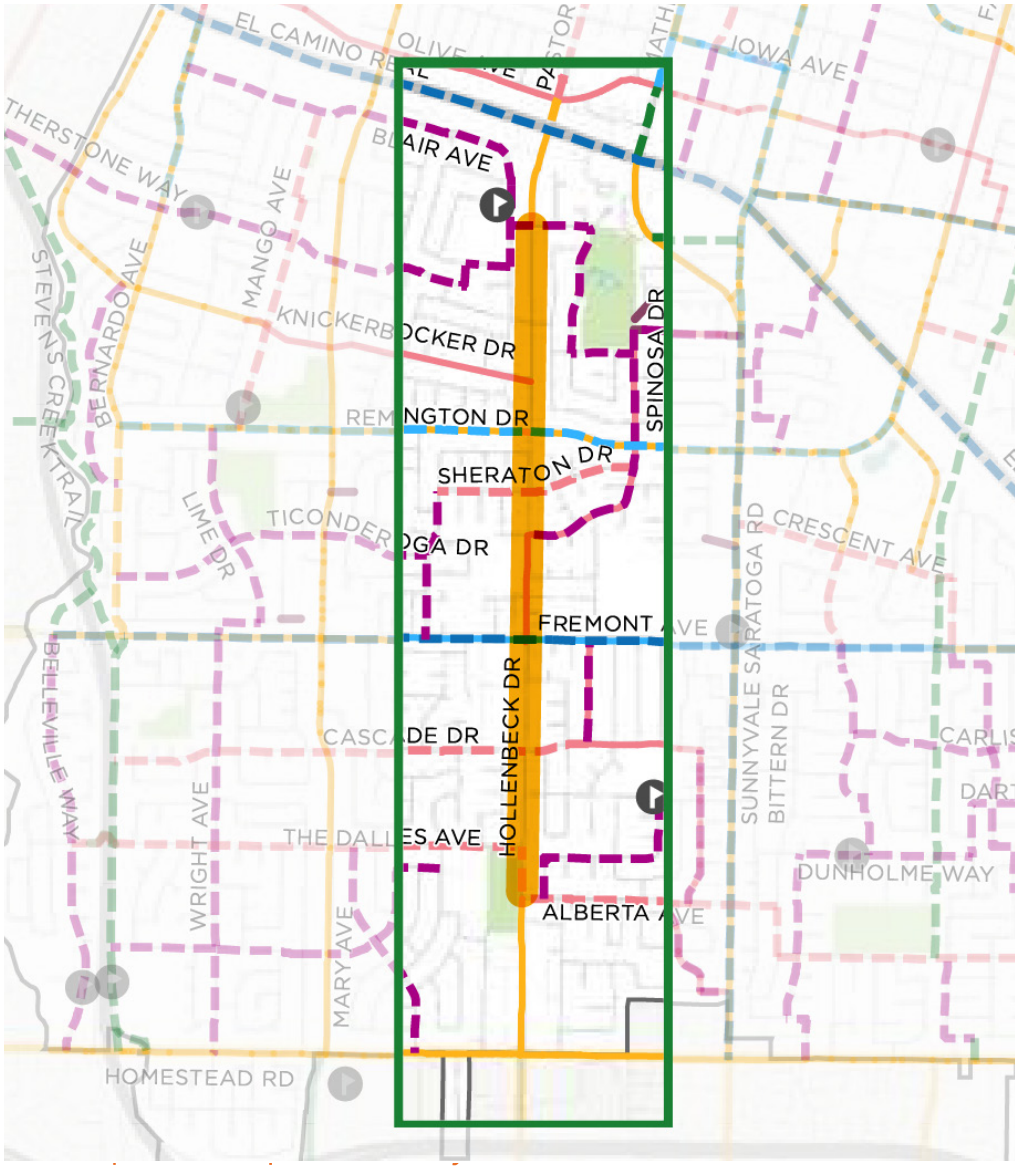


Figure 2: Sunnyvale Complete Bikeway Network; Source: Sunnyvale Active Transportation Plan 2020

ADOPTED PLANS AND POLICIES

The City of Sunnyvale has adopted plans to guide improvements to the City's bicycle and pedestrian facilities.

CITY OF SUNNYVALE GENERAL PLAN - LAND USE AND TRANSPORTATION, SEPTEMBER 2021

The City's General plan includes goals and policies relating to future land use development and transportation improvements. The framework for the General Plan's Land Use and Transportation chapter is based on a concept of a Complete Community, which includes features like comfortable, safe, convenient, and complete pedestrian and bicycle networks throughout Sunnyvale and reduction in automobile trip making. The City's policies also prioritize the movement of bicycles, pedestrians, and vehicles over parking.

CITY OF SUNNYVALE ACTIVE TRANSPORTATION PLAN (ATP), AUGUST 2020

This plan (ATP) provides a vision for improving and encouraging bicycle and pedestrian travel in and through Sunnyvale. It contains an analysis of existing

bicycle and pedestrian facilities and provides recommendations for specific areas where facilities could be improved or expanded. It includes objectives, strategies, and performance measures to guide improvements to the City's bicycle and pedestrian facilities.

The ATP defines the following facility types for Sunnyvale.

The plan recommends a Class II bike lane between Alberta Avenue and The Dalles Avenue and pedestrian crossing improvements along several intersections along the study corridor including Hollenbeck Avenue at Fremont Avenue, Sheraton Drive, Alberta Avenue, The Dalles Avenue, Cheyenne Drive, Cascade Drive, Harvard Avenue, and Danforth Drive. The plan does not have any bicycle facility recommendation on Hollenbeck Avenue between the Dalles Avenue and Danforth Drive.

CLASS I

SHARED-USE PATH

- An off-street path shared by bikes and pedestrians, fully separated from vehicles, offering the highest safety and comfort.

CLASS II

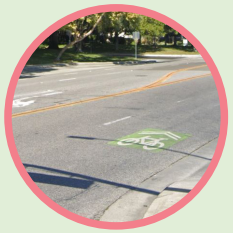
BICYCLE LANE

- A striped lane on the road for bikes, sometimes with a painted buffer for extra separation from traffic or parked cars.

CLASS IIB

BUFFERED BICYCLE LANE

- A bike lane on the road with a 2–4 ft painted buffer between bikes and cars, increasing safety and comfort.



CLASS III

BICYCLE ROUTE

- A street shared with cars, marked with signs or sharrows to guide and connect bike travel.

CLASS IIIB

BICYCLE BOULEVARD

- A low-traffic street designed for bikes, with calming features like speed humps or lower speed limits to make riding more comfortable.

CLASS IV

SEPARATED BIKEWAY

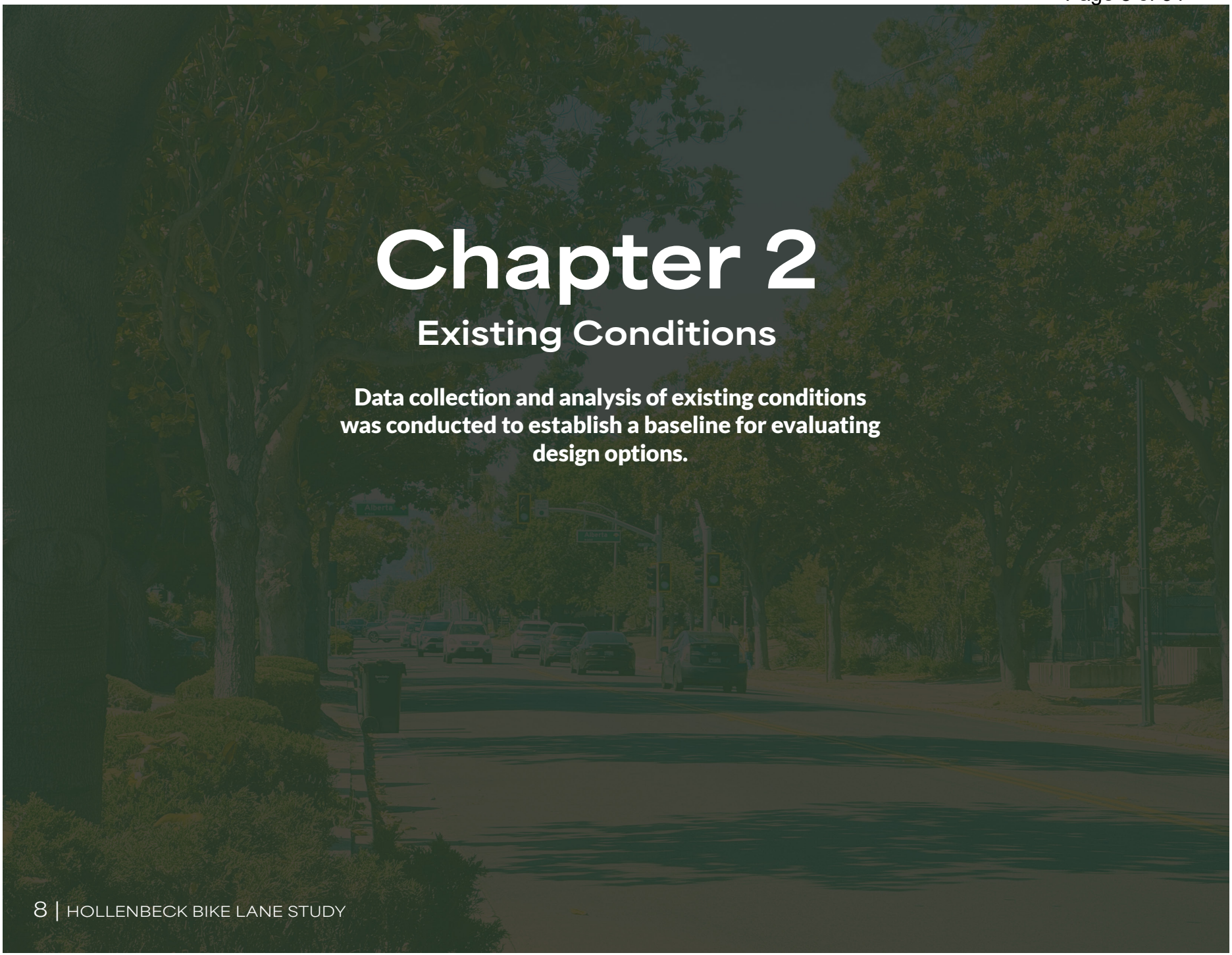
- A bike lane separated from cars by a physical barrier, such as posts, parking, or medians, for greater protection.

SUNNYVALE VISION ZERO PLAN, JULY 2019

This is a community-driven and data-driven initiative to eliminate preventable traffic fatalities and serious injuries. The City aims to reduce collisions through improved transportation infrastructure and programming. The plan identifies Hollenbeck Avenue, between Homestead Road and Cascade Drive and between Knickerbocker Drive and El Camino Real, as part of the City's High Injury Network (HIN).

SUNNYVALE ROADWAY SAFETY PLAN, SEPTEMBER 2020

This builds upon the initial groundwork and goal setting completed through the development of the Sunnyvale Vision Zero Plan and provides the resources necessary for the future preparation of successful Highway Safety Improvement Program (HSIP) grant applications for design and construction. It includes collision and roadway characteristic database development, review of local collision data, safety data analysis, collision profile analysis, safety countermeasure identification, and project development. The segment of Hollenbeck Avenue between The Dalles Avenue and Bend Drive and the intersection of Danforth Drive and Hollenbeck Avenue have been identified as City's priority project locations due to a history of high collision densities and a high level of public feedback on perceived issues and safety concerns.



Chapter 2

Existing Conditions

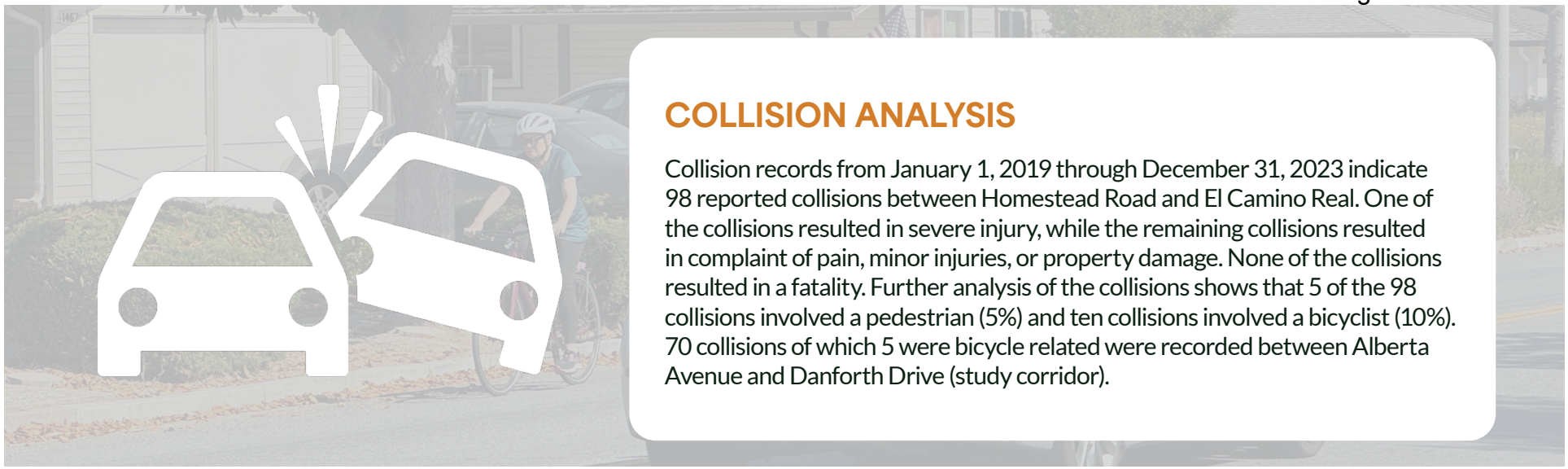
Data collection and analysis of existing conditions was conducted to establish a baseline for evaluating design options.

Figure 3: Existing Project Corridor

CORRIDOR OVERVIEW

The study evaluates a 1.6-mile section of Hollenbeck Avenue between Danforth Drive in the north and Alberta Avenue in the south. Hollenbeck Avenue is a residential collector within the City of Sunnyvale with a posted speed limit of 30 mph. It generally has a curb-to-curb width of 40 feet, consists of one travel lane in each direction, and permits on-street parking on both sides as shown in Figure 3. A VTA local bus also runs along Hollenbeck Avenue between Fremont Avenue and Remington Drive in the northbound direction.

The corridor serves a diverse mix of land uses, including single-family residential neighborhoods, two private schools, a public elementary school within 500 feet, two churches, Serra Park, a swim and racquet club, and neighborhood-serving commercial uses. South of Homestead Road, Hollenbeck Avenue transitions to Stelling Road, providing access to De Anza College. To the north, past El Camino Real, it transitions to Pastoria Avenue, which connects to the Caltrain station via Evelyn Avenue.



COLLISION ANALYSIS

Collision records from January 1, 2019 through December 31, 2023 indicate 98 reported collisions between Homestead Road and El Camino Real. One of the collisions resulted in severe injury, while the remaining collisions resulted in complaint of pain, minor injuries, or property damage. None of the collisions resulted in a fatality. Further analysis of the collisions shows that 5 of the 98 collisions involved a pedestrian (5%) and ten collisions involved a bicyclist (10%). 70 collisions of which 5 were bicycle related were recorded between Alberta Avenue and Danforth Drive (study corridor).

BICYCLE COLLISIONS

Five bicycle collisions occured along the study corridor.

Table 1 provides a breakdown of the collisions by primary collision factor.

Primary Collision Factor	Number of Bicycle Collisions
Improper Turning	1
Auto R/W Violation	1
Other Hazardous Movement	1
Unknown	1
Unsafe Speed	1
TOTAL	**5**

Table 1: Number of Bicycle Collisions by Primary Collision Factor

As shown in Figure 4, 2 of the 5 collisions occurred at intersections and the other 3 collisions occurred mid-block along Hollenbeck Avenue. The collisions at the intersections were primarily due to failure to yield to oncoming bicycle traffic in the intersection or crosswalk or due to an unsafe turn.

The midblock collisions occurred due to the bicyclist riding in the incorrect direction, colliding with a parked car, or due to an unsafe lane change.

Figure 4: Locations of Bicycle Collisions

BIKE COUNTS

Bike counts were collected in October 2024 at ten locations on Hollenbeck Avenue for six hours on three typical weekdays and on two typical weekend days when school was in session during the morning, school PM, and evening commute hours. Counts were collected at locations where Hollenbeck Avenue has bike lanes and does not have bike lanes to understand how bike volumes vary based on availability of bike facilities. Bikes were observed at all count locations along the corridor.

A 6-hour bike count of 50 to 87 bikes on weekdays and 26 to 77 bikes on weekends was observed along the corridor, with slightly higher counts observed at locations that have bike lanes.

COMPARISON OF PARALLEL CORRIDORS

To understand how the bicycle counts along Hollenbeck Avenue compare with north-south parallel streets that have bike lanes, a 14 hour weekday bike count was collected along Hollenbeck Avenue, Mary Avenue, and Sunnyvale-Saratoga Road near similar cross streets.

As shown in Table 2, Mary Avenue (374 bikes) had much higher bike volumes compared to Hollenbeck Avenue (105 bikes) and Sunnyvale-Saratoga Road (162 bikes). Table 2 outlined various factors that could influence people's decision to bike along a corridor.

Table 2: Comparison of Parallel Corridors

	ROADWAY CHARACTERISTICS								
	14-Hour Weekday Bike Volume[1]	Roadway Classification[2]	Speed Limit	Bike Lane Width[3]	Vehicle Lanes Per Direction	On-Street Parking	Bus Frequency	Driveway Density	Major Connecting Destinations (within 1 mile radius)
Hollenbeck Ave	105	Residential Collector	30 mph	None	1	Both Sides	1 bus every 30 minutes	High	Cupertino, De Anza College, Apple, Nearby Schools/Park, Downtown Sunnyvale, Sunnyvale Caltrain
Mary Ave	374	Class II Arterial	35 mph	6 ft	1	Both Sides	1 bus every 30 minutes	High	Cupertino, De Anza College, Apple, Nearby Schools/Park, Downtown Sunnyvale, Sunnyvale Caltrain, Peery Park Offices
Sunnyvale-Saratoga Road	162	Class I Arterial (Regionally Significant)	40 mph	6 ft	3	None	1 bus every 20 minutes	Low	Saratoga, Cupertino, De Anza College, Apple, Nearby Schools/Park, Downtown Sunnyvale, Sunnyvale Caltrain, Peery Park Offices, Moffett Park Offices

Notes:

1. 14-Hour weekday bike volumes were collected at a midblock location north of Fremont Ave for all three corridors in October 2024.
2. Roadway classification referenced from the Sunnyvale General Plan.
3. Bike lane widths represent typical bike lane width on each corridor between Homestead Road and El Camino Real. Hollenbeck does not have bike lanes for the majority of this corridor and is labeled as "None".

AVERAGE DAILY TRAFFIC (ADT)

Average weekday ADT volumes along the corridor range from approximately 7,900 to 13,500 vehicles and average weekend ADT volumes range from approximately 5,720 to 9,730 vehicles. The highest ADT for weekdays and weekend days was counted south of The Dalles Avenue.

SPEEDS

The 85th percentile speed along the corridor in both directions is approximately 34mph, which is higher than the posted speed limit of 30mph along the corridor. The 85th percentile speed is the speed that 85 percent of the motorists drive at or below.

PARKING ANALYSIS

The study analyzed parking utilization for on street parking on Hollenbeck Avenue, parking in the driveways of homes along Hollenbeck Avenue, and parking on side streets within 500 feet of Hollenbeck Avenue.

AVAILABLE LEGAL PARKING SPACES

Figure 5 shows the locations where on-street parking, full-time and part-time, is allowed along the study corridor and its side streets. The number of legal parking spaces was determined based on AB 413: California Daylighting Law, presence of painted curbs, bus stops, fire hydrants, and no parking signage. As shown in the figure, on-street parking is generally allowed along most segments of the study corridor.

OFF-STREET PARKING SPACES

The number of available off-street parking spaces at adjacent residential driveways were calculated assuming two driveway parking spaces for each single-family home. It should be noted that generally the homes along the corridor have two car parking garages, and some homes have an extra wide driveway that can accommodate a third parked vehicle.

Figure 5: Legal On-Street Parking Spaces along the Study Corridor and Side Streets

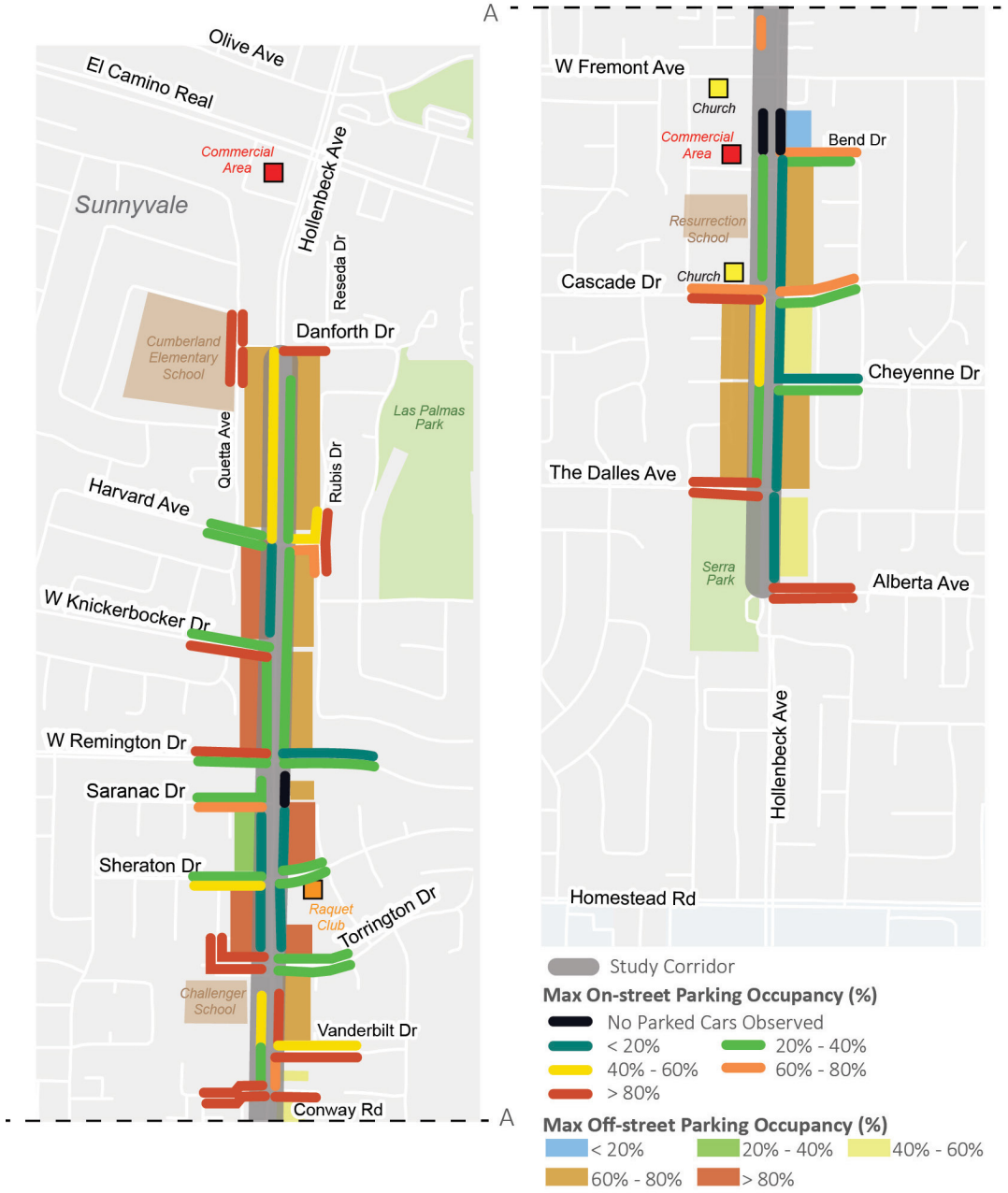


Figure 6: Maximum Parking Utilization - On-Street and Off-Street

PARKING UTILIZATION

Parking occupancy data was collected for on-street parking along Hollenbeck Avenue, off-street parking in residential driveways, and on-street parking on side streets within 500 feet of Hollenbeck Avenue. Counts were conducted on three weekdays and two weekend days, during nighttime hours and school pick-up times, to capture periods when parking demand is typically highest.

Maximum parking utilization for on-street parking along each segment of the study corridor, off-street parking at adjacent residential driveways, and on-street parking on side streets within 500 feet of Hollenbeck Avenue is shown on Figure 6. There are a total of 177 on-street parking spaces available on the west side of the study corridor and 163 spaces on the east side of the study corridor. A maximum average parking utilization of 33 percent (58 spaces) was observed in the west side of the study corridor and 23 percent (38 spaces) was observed in the east side of the study corridor. However, there are some segments where the observed maximum parking utilization was over 80 percent and others where no parked cars were observed.

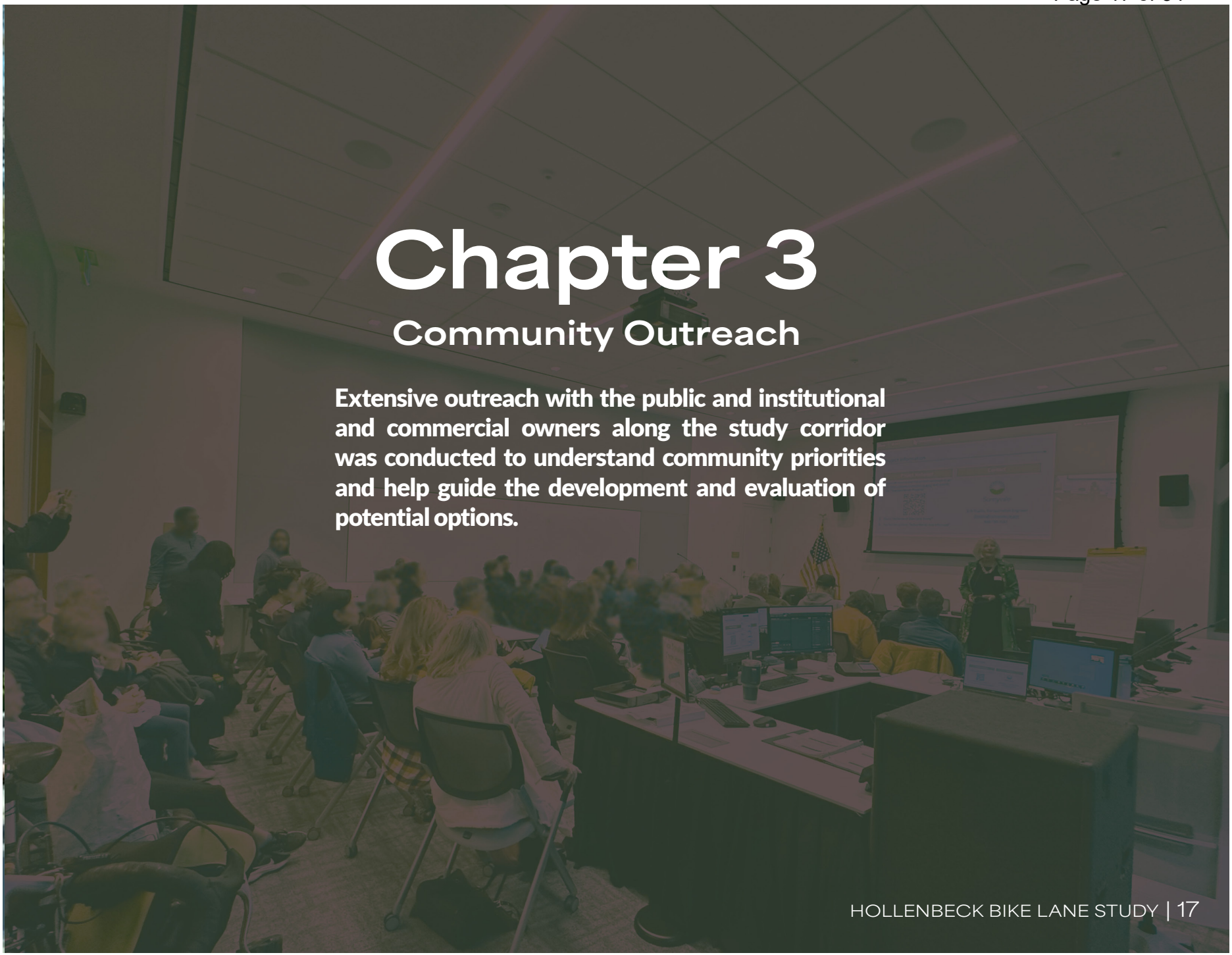
ON-STREET PARKING ON SIDE-STREETS

As shown on Figure 6, on-street parking utilization on the side streets within 500-feet of the corridor varies. Some side-streets were observed to have heavy on-street parking utilization (over 80 percent), while other side streets had low on-street parking utilization of below 20 percent.

OFF-STREET PARKING IN DRIVEWAYS

Figure 6 also illustrates the maximum off-street parking utilization of residential driveways along the corridor. The off-street parking utilization of residential driveways was observed to be generally over 60 percent on most segments. Some segments were observed to have greater than 100 percent driveway parking utilization. This is because some homes along the corridor have an extra wide driveway where more than two cars can be parked, and the analysis assumed all driveways can accomodate two vehicles only despite the wider driveway.

Many residents/visitors may choose to park in their driveways if they have space available to do so. However, since it is unknown who is parking on-street, and whether those resident's homes have driveways that can accommodate additional vehicles, this analysis did not account for off-street parking utilization.



Chapter 3

Community Outreach

Extensive outreach with the public and institutional and commercial owners along the study corridor was conducted to understand community priorities and help guide the development and evaluation of potential options.

COMMUNITY OUTREACH

As a part of this study, extensive outreach with the public and institutional and commercial owners was conducted. Community priorities for the corridor were explored through the question and answer session during community meetings, an online survey, BPAC Meetings, and a City Council study session.

ENGAGEMENT STRATEGIES

PROJECT WEBSITE

The City of Sunnyvale launched a project webpage in April 2024 and provided information about the project throughout the study. This website was a key landing page for residents looking for project information, including project documents, public event details, and recordings of public workshops. The webpage also provided an opportunity for members of the public to submit feedback directly to the project manager throughout the study by email and phone.

PROJECT UPDATE NOTIFICATION

The meetings were promoted through the typical Sunnyvale channels: City website, Hollenbeck Bike Lane Study Webpage, email newsletter, social media channels, and City Council announcements. In addition, postcards were mailed to residents in Sunnyvale that live within 1,000 feet of the corridor before the first community outreach meeting and announcements were publicized by the Schools, Districts, and PTAs.

SUMMARY OF COMMUNITY INPUT:

SAFETY CONCERNS:

- Reports of near-miss collisions
- Door zone
- Speeding
- Concerns for students biking and walking to and from school

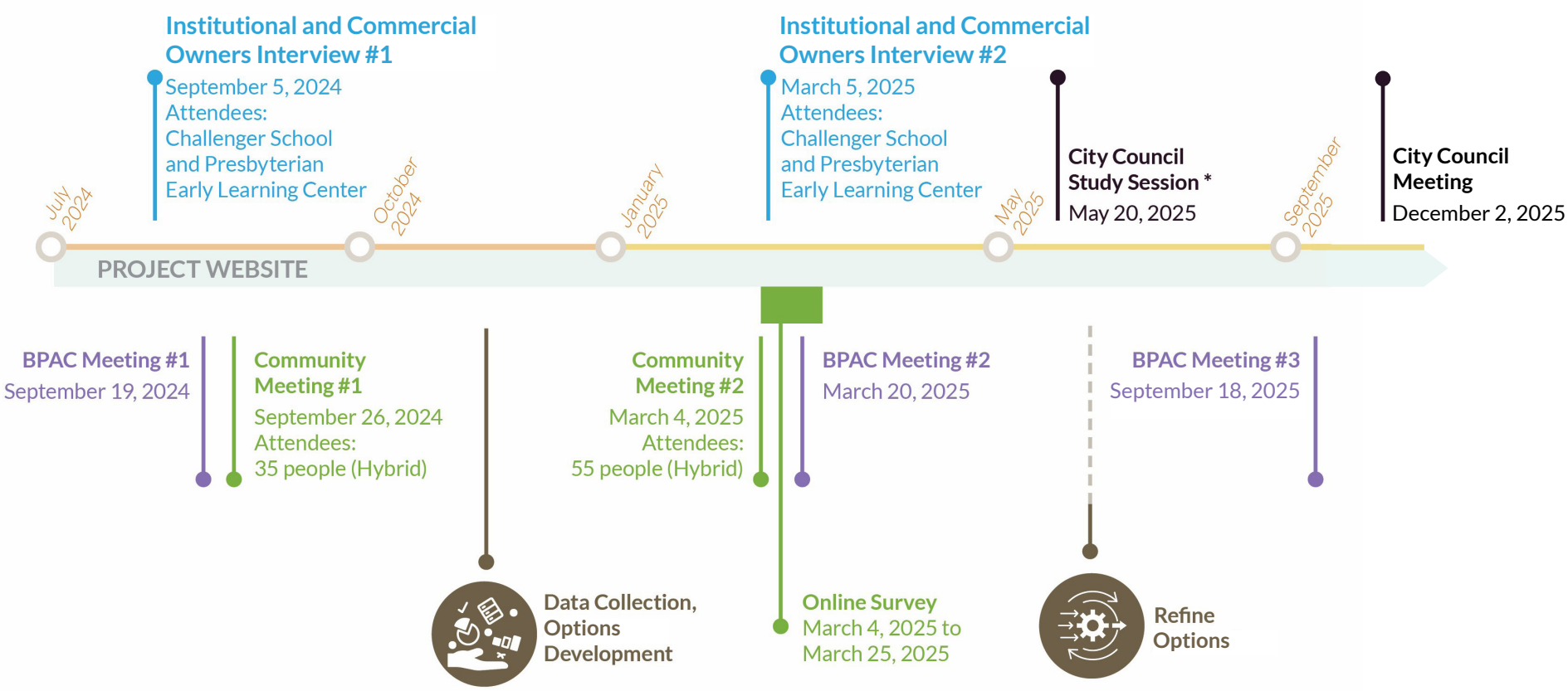
PARKING & MOBILITY IMPACTS:

- Parking loss impacts residents and visitors
- Desire for better crossings if walking distances increase
- Accessibility concerns for seniors and mobility-challenged individuals
- Maintain access for service/delivery vehicles
- On-street parking needed for ADUs and added housing

OTHER:

- Feasibility of funding and cost estimates
- School-area operations during pick-up/drop-off
- Changes to intersection geometry to accommodate bike lanes

OUTREACH MEETINGS



*** City Council Study Session**

May 20, 2025
The team presented the project to the City Council during a study session scheduled for May 20, 2025. The purpose of this meeting was to share project options and community feedback received, identify any refinement needed for the options, and receive information needed to help Council select an alternative. The Council directed the City staff to explore additional options including a new Option 2B, where parking is removed on one side of the corridor to accommodate a bicycle lane in each direction.

COMMUNITY SURVEY

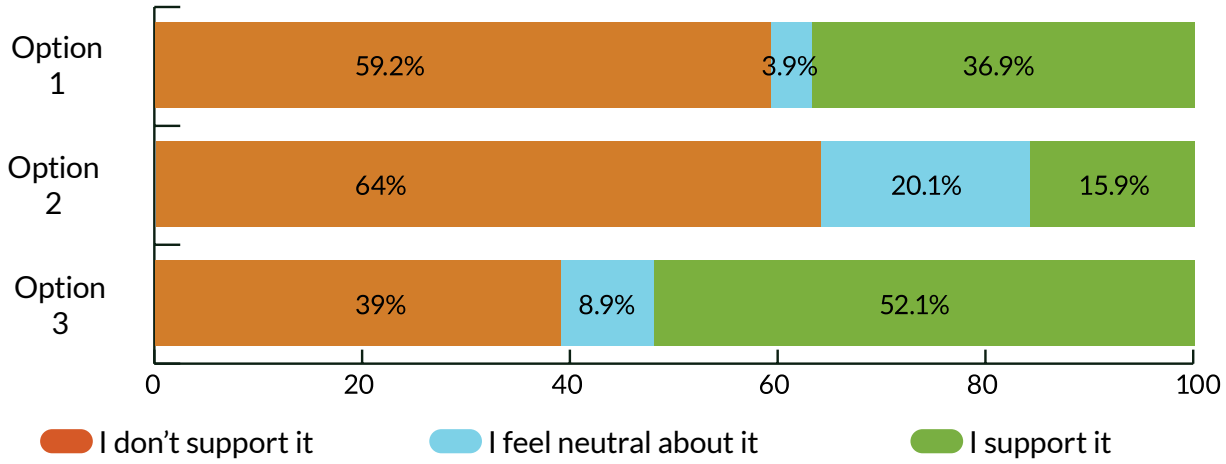
An online survey was conducted from March 4 to March 25, 2025, to gather public feedback on proposed changes to Hollenbeck Avenue.

*It received **703 responses**: 35% from residents on Hollenbeck, 34% from nearby blocks, 18% from elsewhere in Sunnyvale, and 13% from outside the city.*

Most respondents drive the corridor, though some also walk or bike—especially those from outside the immediate area. Support for the options varied by location and travel mode. Residents on Hollenbeck preferred keeping parking as-is (Option 3), while others favored buffered bike lanes with no parking (Option 1). Option 2 drew mixed reviews, with concerns about alternating parking and safety.

If improvements were made, 46% said they'd bike under Option 1, 36% under Option 2, compared to 25% who bike there now.

A full analysis of the survey results is provided in Appendix C. Options are discussed in detail in Chapter 4.



- Option 1: Install class II buffered bike lanes with removal of all on-street parking
- Option 2: Install class II bike lanes with removal of some alternating parking
- Option 3: No change to on-street parking

Chapter 4

Options

Three potential options were developed based on the data collected and community input received.

The fourth option was added based on input from the City Council Study Session.

The study team developed three potential options based on the data collected and community input received (see Figure 7). The options include:

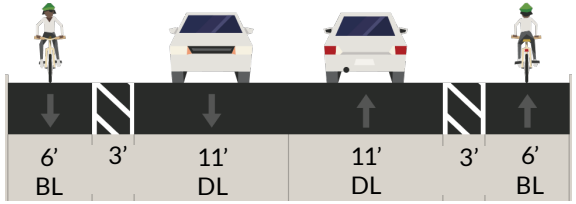
- Option 1: Install class II buffered bike lanes with removal of all on-street parking
- Option 2A: Install class II bike lanes with alternating on-street parking
- Option 2B*: Install class II bike lanes with on-street parking retained generally on the west side
- Option 3: No change to on-street parking

** added based on City Council Study Session*

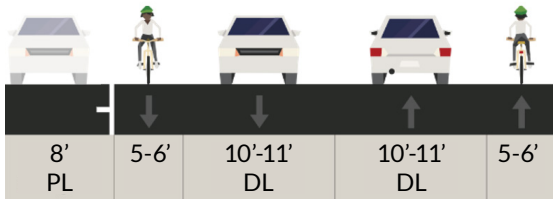
For each option, the evaluation considered the following tradeoffs:

- Right-of-way and intersection treatments
- On-street parking implications
- Safety benefits
- School pick-up/drop-off operations implications
- Cost to implement

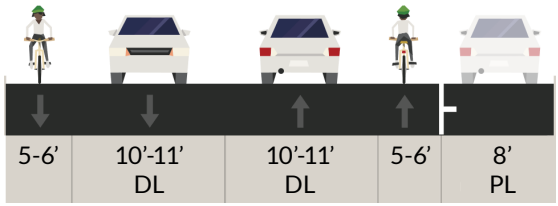
Figure 7: Potential Options Developed



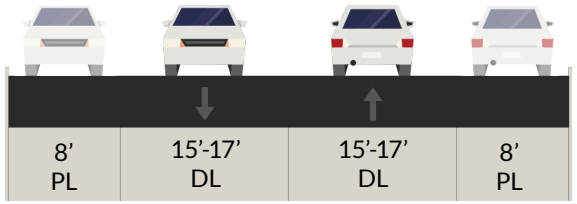
Option 1 - 6' Bike Lanes and 3' Buffer, No on-street parking



Option 2A - 5-6' Bike Lanes, On-street parking on one-side only; Alternating Parking



Option 2B - 5-6' Bike Lanes, On-street parking on one-side only; Parking on West Side



Option 3 - Maintain Existing Conditions, Consistent with ATP

BL = Bike Lane, DL = Drive Lane, PL = Parking Lane

OPTION 1: INSTALL CLASS II BUFFERED BIKE LANES WITH REMOVAL OF ALL ON-STREET PARKING

This option would add a class II buffered bike lane in each direction along the study corridor resulting in the removal of all on-street parking.

TREATMENT AT INTERSECTIONS

Most intersections along Hollenbeck Avenue are unsignalized and do not have turn-lanes. Therefore, the class II buffered bike lane can continue through those intersections. The proposed modifications to the signalized intersections along Hollenbeck Avenue under this option are described below and shown in Figure 8:

HOLLENBECK AVENUE AND REMINGTON DRIVE

Per the *Sunnyvale Downtown Specific Plan Environmental Impact Report*, an improvement was identified at this intersection with the buildout of the Specific Plan under cumulative conditions. The improvement includes restriping northbound and southbound Hollenbeck Avenue to provide for a dedicated left-turn and a shared through-right turn lane. With the proposed additional turn lane, the south leg of Hollenbeck Avenue would not be able to accommodate a bike lane in the northbound direction. Instead, a Class III bike route would be provided for this section of (approximately 200') northbound Hollenbeck Avenue.

This would be the only location along Hollenbeck Avenue where the bike lane would be discontinuous, in either direction.

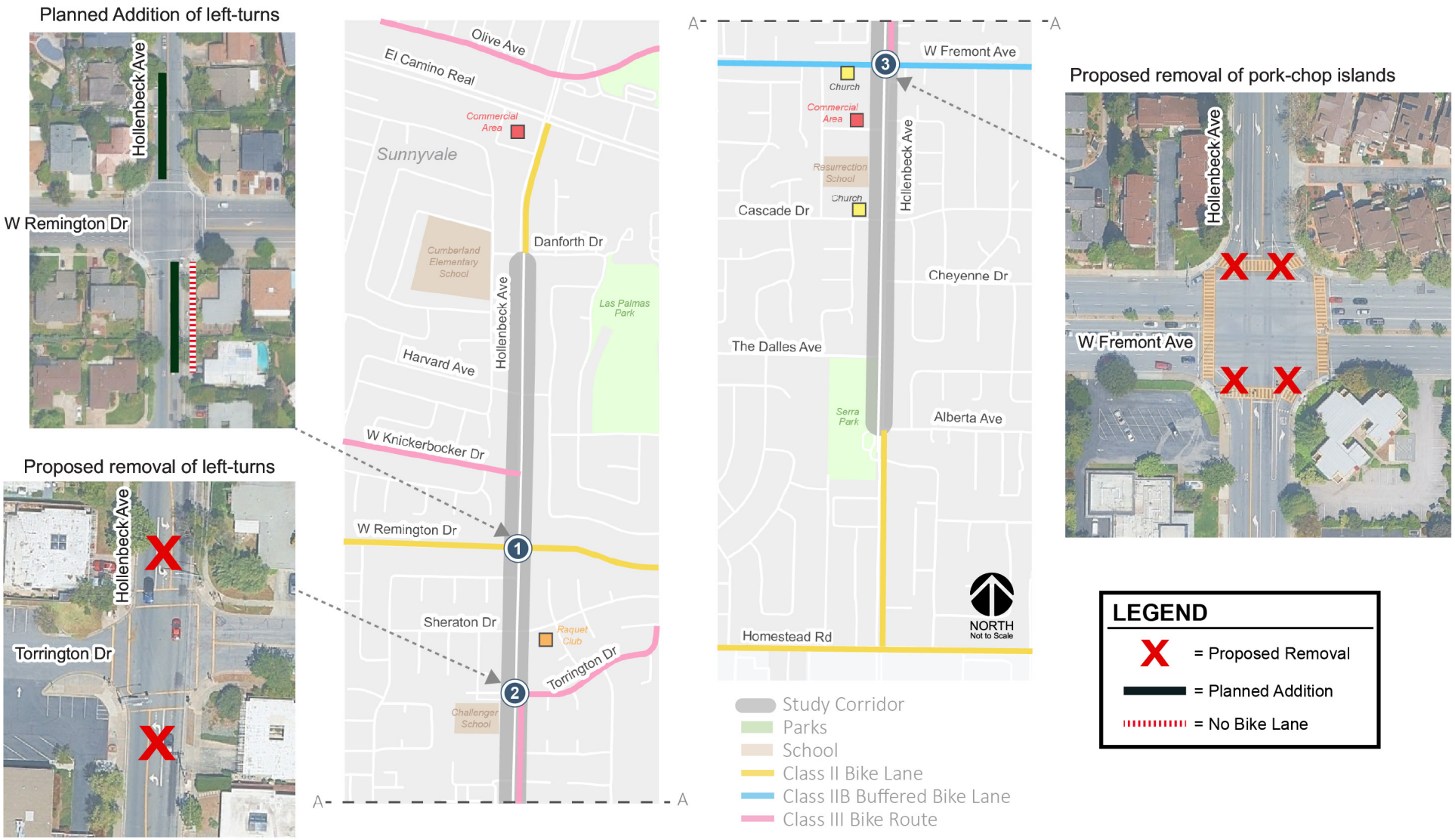
HOLLENBECK AVENUE AND TORRINGTON DRIVE

This intersection has a left-turn lane, one shared through-right lane, and a receiving lane on the north and south legs. In order to accommodate minimum 5 feet-wide bike lanes at this intersection within the existing right-of-way, the northbound and southbound left-turn lanes would need to be removed. The removal of the left-turn lanes is not expected to considerably affect the intersection's operations under existing or future conditions.

HOLLENBECK AVENUE AND FREMONT AVENUE

This intersection has left-turn lanes, pork chop islands, and right-turn slip lanes on Hollenbeck Avenue. The current width between the pork chop islands do not provide sufficient widths to fit the proposed bike lanes and maintain existing travel lanes. Therefore, to incorporate bike lanes, the pork chop islands would need to be removed. This improvement would also improve pedestrian and bicycle safety by reducing crossing distances, improving sightlines, reducing vehicle turning speeds, and lowering conflict points. Additionally, the lane geometry at this intersection would be unchanged and vehicular operations would not be impacted.

Figure 8: Treatment at Intersections



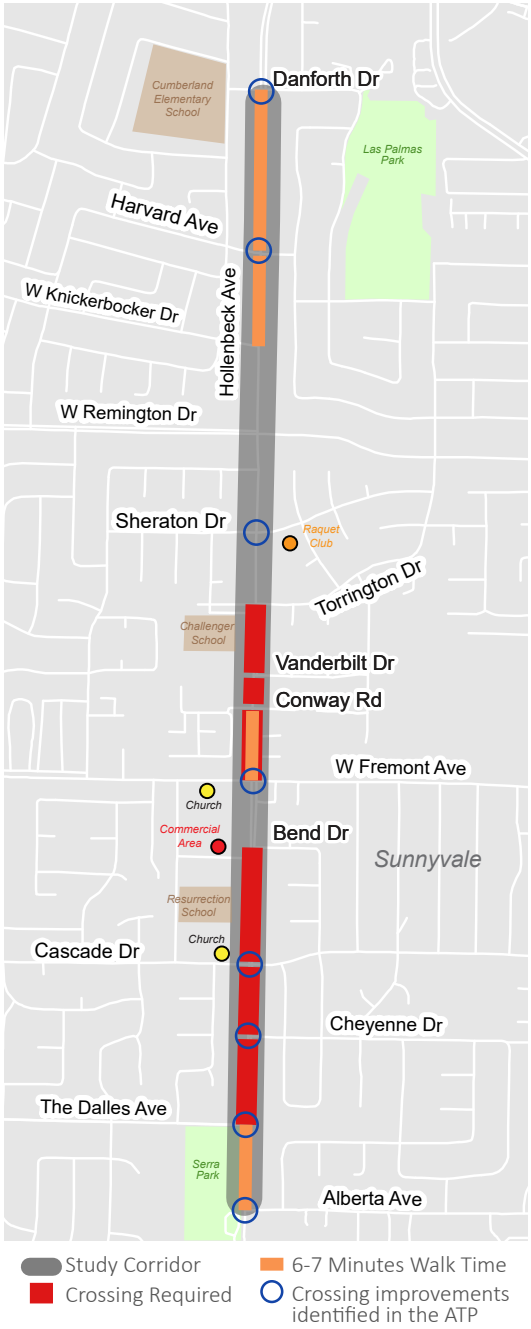


Figure 9: Option 1: Buffered Bike Lanes

ON-STREET PARKING IMPLICATIONS

The removal of on-street parking on Hollenbeck Avenue would require people to park their cars on side streets or driveways. Each block was evaluated based on 1) the maximum observed parking utilization on the segment, 2) the availability of parking on at least one side-street, 3) walk-time to the side-street, and 4) potential need to cross the side-street to find parking.

As shown in Figure 9, the walk time to find on-street parking could be greater than 6 to 7 minutes for four segments.

This analysis is conservative, using the highest observed parking occupancy and not including driveways for parking spillover to show a worst-case scenario. Many homes have driveways for two or three cars, and off-street parking on some segments is below 80 percent, meaning residents could use available driveway space. It is expected that some residents will park on their driveways therefore the actual parking spillover will be less, but for the purpose of this study we have used conservative assumptions.

REVIEW OF EXISTING PEDESTRIAN FACILITIES

The analysis assumes that residents/visitors could park cars on side-streets on the opposite side of the roadway and cross the intersection to walk to their residence.

As shown in Figure 9, six segments could require crossing improvements.

The Sunnyvale ATP identifies the following pedestrian related improvements along the study corridor.

- Crossing improvement at the intersection of Fremont Avenue and Hollenbeck Avenue (Completed)*
- Traffic control improvement at the intersection of Sheraton Drive and Hollenbeck Avenue
- Pedestrian improvements at the intersections of Hollenbeck Avenue with Alberta Avenue, The Dalles Avenue, Cheyenne Drive, Cascade Drive, and Danforth Drive (Completed at Danforth Drive)
- Safe routes to school improvements at the intersection of Hollenbeck Avenue with Harvard Avenue (Completed)

**Note that if a bicycle facility is implemented along Hollenbeck Avenue, the intersection of Fremont Avenue and Hollenbeck Avenue would be redesigned to remove right-turn slip lanes and tighten curb radius as discussed on page 23.*

Per the ATP, these pedestrian improvements may include high visibility crosswalks, curb ramps, improved lighting, additional time for pedestrian crossing, stop bars, curb radius reductions etc.

The pedestrian improvements identified in the ATP will address the crossing improvements that might be needed at most intersections where potential need for crossing the corridor to find parking might occur except for the segment between Conway Road and Vanderbilt Drive. The crossings at this segment are expected to be minor. Furthermore, this segment is located within 500 feet of two signalized; Fremont Avenue and Hollenbeck Avenue to the south and Torrington Drive and Hollenbeck Avenue to the north. These intersections can be used to cross the corridor.

SAFETY BENEFITS

OPTION'S EFFECT ON SPEED MANAGEMENT

This option would reduce vehicle travel lane widths to 10 feet (or 11 feet if VTA bus travels on it). According to the FHWA Traffic Calming ePrimer, narrower lanes increase driver attentiveness and encourage slower speeds, particularly on urban and suburban roadways. Therefore, this option could potentially lower the vehicular travel speed along Hollenbeck Avenue.

OPTION'S EFFECT ON BICYCLE CONNECTIVITY

This option would provide dedicated buffered bicycle lanes along the study stretch of Hollenbeck Avenue (except for one side of Hollenbeck approximately 200 feet south of the Remington Drive intersection). At all intersections except Remington Drive, bicycle lanes can be extended to the intersection. This would provide a dedicated lane for bicyclists to travel, and alert drivers of bicyclists when they cross into the bike lane for turn maneuvers.

At the midblock sections, because of the dedicated bike lanes, this option would help address collisions with parked vehicles because bicyclists now have their dedicated lane to travel throughout the corridor.

The bike lane buffers proposed in this option further separates bicyclists from vehicles, and improves comfort for bicyclists.

SCHOOL PICK-UP/DROP-OFF OPERATIONS IMPLICATIONS

Removal of on-street parking along the school frontages may result in a queue of cars in the vehicle lane. However, this is expected to occur only for a short period of time and not considerably affect vehicular operations.

COST TO IMPLEMENT

The estimated cost to implement this option is $5.0 million. The cost estimates only include the implementation of bike lanes along the corridor and intersection modifications and does not include any pedestrian improvements. The ATP identifies several pedestrian improvements along this corridor and these would be implemented as separate projects. The planning level conceptual design for Option 1 is provided in Appendix D.

OPTION 2: INSTALL CLASS II BIKE LANES WITH REMOVAL OF SOME ON-STREET PARKING

This option considers the installation of a Class II bike lane along the study corridor while retaining parking where possible. There were two options considered under this option.

- 2A: Class II Bike Lanes with Alternating On-street Parking
- 2B: Class II Bike Lanes with On-street Parking Retained generally on the West Side

A factor in determining the side of the street to retain on-street parking in Option 2B was to maximize the available on-street parking spaces along the corridor. The west side currently has a greater number of on-street parking spaces (177) versus the east side (163), has a higher maximum average parking utilization (west side – 33 percent and east side – 23 percent), and has frontages of the schools where queuing occurs during pick-up and drop-off times.

TREATMENT AT INTERSECTIONS

The intersection improvements and constraints described for Option 1 also apply here. At Hollenbeck Avenue and Fremont Avenue, removing the porkchop islands would eliminate the southbound merge lane, allowing the extra right-of-way to be used for more parking. Removing the northbound merge lane would allow the addition of two parking spaces as well.

ON-STREET PARKING IMPLICATIONS

OPTION 2A

As discussed under the right-of-way analysis section, Option 2 would allow parking to be maintained along one side of the corridor. Under Option 2A, instead of retaining parking only on one side of the corridor, a staggered parking concept was developed where on-street parking would alternate between the left and right sides of the roadway at somewhat regular intervals with the goal of minimizing pedestrian crossings across Hollenbeck Avenue. The design would include lateral shifts designed per California Manual on Uniform Traffic Control Devices (CA MUTCD) between staggered sections to avoid abrupt movements for drivers.

Design Tradeoffs

There are many different priorities that can influence this design. For example:

- How to retain the most number of parking spaces?
- How to minimize parking spillover to side streets?
- How to ensure sufficient lateral shifts are included to traffic calm the street?

Every time the parking switches sides, a transition zone has to be provided, which results in up to 6 lost parking spaces per transition zone. Striping at intersections also has to be lined up to reduce driver confusion at intersections. Therefore, prioritizing each factor will negatively affect the other priorities.

Figure 10 illustrates a staggered parking concept. This concept was designed to maximize parking retained in front of residential homes while still ensuring there were lateral shifts built into the concept.

East Side of Hollenbeck Avenue

The east side of the study corridor currently has 163 legal on-street parking spaces of which the observed parking occupancy is 38. Under Option 2A, 88 parking spaces would be retained along the corridor including some parking spaces being added between the segments of Fremont Avenue and Conway Road and Vanderbilt Drive and Torrington Drive due to the roadway being wider than forty feet at these segments.

West Side of Hollenbeck Avenue

The west side of the study corridor currently has 177 legal on-street parking spaces of which the observed parking occupancy is 58. Under Option 2A, 56 parking spaces would be retained along the corridor including the added parking spaces along the south leg of Hollenbeck Avenue at Fremont Avenue.

As discussed under Option 1, this analysis is considered conservative because it is based on the observed maximum parking demand for each segment. Therefore, the actual parking spillover to the side-streets may be lower.

As shown in Figure 10, the walk time to find on-street parking would be six to seven minutes for one street segment. No segments could require crossing the street to find on-street parking.

Figure 10: Option 2A: Bike Lanes with Parking on One-side, Alternating

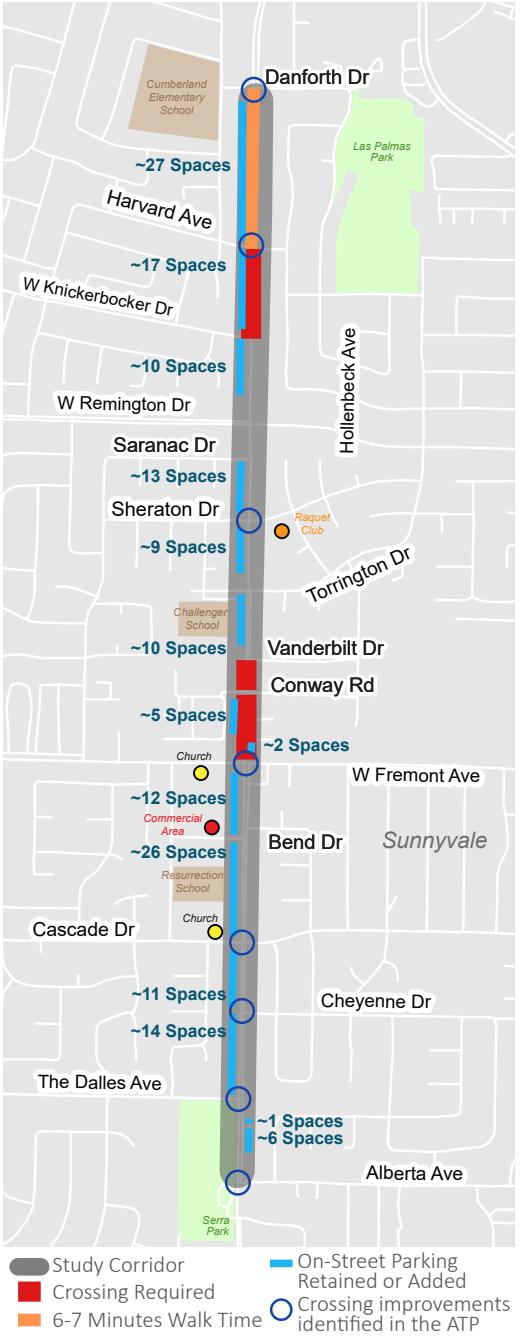


Figure 11: Option 2B: Bike Lanes with Parking Generally Retained on West Side

OPTION 2B

Under the implementation of Option 2B, on-street parking would generally be retained on the west side of the corridor except for the segment between Alberta Avenue and The Dalles Avenue where it would be retained on the east side of the corridor. This is because the west side of this segment fronts Serra Park, which currently has no on-street parking allowed. Therefore, this option would maintain the current no on-street parking along this segment.

The corridor segment between Saranac Drive and Remington Drive will lose on-street parking on both sides of the corridor to accommodate the planned improvement at the Hollenbeck Avenue and Remington Drive intersection. The corridor segment between Conway Road and Vanderbilt Road will lose on-street parking on both sides of the corridor due to the narrowing of the south leg of Hollenbeck Avenue at Conway Road to 32 feet. Six parking spaces would be added to the west side on the south leg of Hollenbeck Avenue at Fremont Avenue and two parking spaces would be added on the east side of the corridor segment between Fremont Avenue and Conway Road. The total number of on-street parking spaces retained under this option on the west side would be 154 spaces and the east side would be 9 spaces.

The removal of on-street parking on the east side would require people to park their cars on side streets or cross the street. As shown in Figure 10, the walk time would be 6 to 7 minutes for one segment to find on-street parking. 3 segments could require crossing the street to find on-street parking.

SAFETY BENEFITS

OPTION'S EFFECT ON SPEED MANAGEMENT

Similar to Option 1, Option 2 would reduce vehicle travel lane width which could potentially lower the vehicular travel speed along Hollenbeck Avenue.

Additionally, Option 2A introduces staggered parking along the study corridor, which would create lateral shifts in the travel lanes. Per Caltrans Traffic Calming Guidance Resources, a lateral shift forces vehicles to adjust their trajectory as they travel along the road, which slows them down and increases driver attentiveness. Therefore, Option 2A's

effect on speed management could be considered slightly higher than Option 1 or Option 2B.

OPTION'S EFFECT ON BICYCLE SAFETY

Similar to Option 1, Option 2 would also provide dedicated bike lanes (although not buffered) along the study segment of Hollenbeck Avenue (except for one side of Hollenbeck approximately 200 feet south of the Remington Drive intersection).

The presence of dedicated bike lanes would help address the observed vehicle-bicycle collisions at both intersections and mid-block in the same fashion as Option 1. However, Option 2 does not provide bike lane buffers, so bicycles would not have that additional 2 to 3 feet of physical separation from vehicles. Option 2 would also retain some parking, so bicycles would also need to be mindful of parked vehicles and potential dooring as they bike in the bike lane. Therefore, Option 2's effect on bicycle safety could be considered slightly lower than Option 1.

Furthermore, under Option 2A, transition zones created by staggered parking have led to observed issues based on community input. Anecdotal evidence suggests that vehicles are frequently parked in these transition areas, even when the space is insufficient to accommodate the full length of a passenger vehicle. As a result, parts of the vehicles often encroach into the bike lane, creating potential conflicts and increasing discomfort for bicyclists. This could be reduced by providing better signing and striping at the transition zones. In contrast, Option 2B does not include such transition zones, resulting in a more consistent and predictable environment for cyclists.

SCHOOL PICK-UP/DROP-OFF OPERATIONS IMPLICATIONS

Under Option 2A, the removal of on-street parking along the school frontages may result in a queue of cars in the vehicle lane. However, this is expected to occur only for a short period of time and not considerably affect vehicular operations.

Under Option 2B, parking would be retained on the west side of the corridor which has Challenger School and Resurrection School along its frontage. The parking along Challenger School could continue to be time restricted as it is currently. Any queue of cars along the curb due to school pick-up and drop-off times could be accommodated in this parking lane.

COST TO IMPLEMENT

The estimated cost to implement Option 2A or 2B is $5.0 million.

OPTION 3: NO CHANGE

The no change option would maintain the on-street parking on Hollenbeck Avenue as it is today. Since the curb-to-curb right-of-way along the study corridor is limited, bicycle lanes cannot be accommodated on the corridor if on-street parking is maintained as is.

It should be noted that as described in Chapter 1, there are several improvement projects already identified in the City's Active Transportation Plan (ATP) that are yet to be completed along this corridor that could affect on-street parking.

IMPLICATIONS OF THIS OPTION

This option would not affect the currently available on-street parking supply beyond the parking implications caused by the above mentioned projects already identified in the City's plans.

This option would also offer no improvements in terms of speed management, bicyclist comfort level, and bicycle safety.

Table 3: Options Comparison

	Opt 1	Opt 2A	Opt 2B	Opt 3
Resulting on-street parking supply (spaces)	✗	~144	~163	340
Provide designated bicycle facility	✓	✓	✓	✗
Implementation Cost	~$5.0 M	~$5.0 M	~$5.0 M	--

Option 1: Buffered Bike Lanes
Option 2A: Bike Lanes with parking on one side, alternating
Option 2B: Bike Lanes with parking on one side, generally west-side
Option 3: Maintain existing conditions

OTHER OPTIONS CONSIDERED

Options considered but are not suitable for this corridor include:

- Part-time bike lane with on-street parking allowed during certain times of the day
- Parking protected bike lane
- Two-way cycle track on one side and parking on the other side
- Two-way cycle track in the middle of the road
- Turning Hollenbeck Avenue into a one-way street

These options were deemed not suitable because:

- Impacts to bicycling occurring during times when on-street parking is allowed would not be addressed;
- The roadway configuration proposed under some options would not be able to accommodate the minimum widths required for bike lanes, buffers, travel lanes, and parking lanes;
- Additional conflicts at intersections and driveways might be introduced requiring bike signals or creating access issues; or
- Vehicle operations might be substantially affected requiring an operations analysis for a larger study area, not in the scope of this project.

A. Part-time Bike Lane; Source: Google Earth, B. Two-way Cycle Track on One Side; Source: NACTO, C. Parking-Protected Bike Lane; Source: NACTO

FUTURE CONSIDERATIONS

Future considerations for this corridor include the following:

TRAFFIC CALMING: The community highlighted that there are speeding concerns along this corridor and that there is a need to calm this street. Hollenbeck Avenue is a residential collector street within the City of Sunnyvale, and per the City's recently updated neighborhood traffic calming policy, it is eligible for traffic calming if it meets the speed thresholds under this policy. However, evaluation of this street for traffic calming is not part of this project's scope and must follow the process laid out under the City's Traffic Calming Policy (Council Policy 1.2.4)

- **PEDESTRIAN IMPROVEMENTS:** With the implementation of either Option 1 or Option 2, pedestrian activity, especially pedestrian crossings along the study corridor may increase due to residents/visitors currently using on-street parking on Hollenbeck Avenue having to park on side streets or across the road where parking is retained. There are a few intersections along the corridor that do not have marked crosswalks, ADA compliant curb ramps, and lighting. The Sunnyvale ATP identifies pedestrian improvements along several intersections along this corridor. In addition to these improvements, the City should monitor the increase in pedestrian crossings along this corridor, where improvements have not already been identified, and potentially improve existing crossings or add additional crossings if warranted.

Appendices