

MEMORANDUM - DRAFT

To: Shabnam Yari, P.E.

Associate Transportation Engineer, City of Hayward

From: Adam Dankberg, P.E.

Kimley-Horn and Associates, Inc.

Date: April 29, 2020

Subject: Hayward Boulevard Feasibility Study – Existing Conditions

Overview

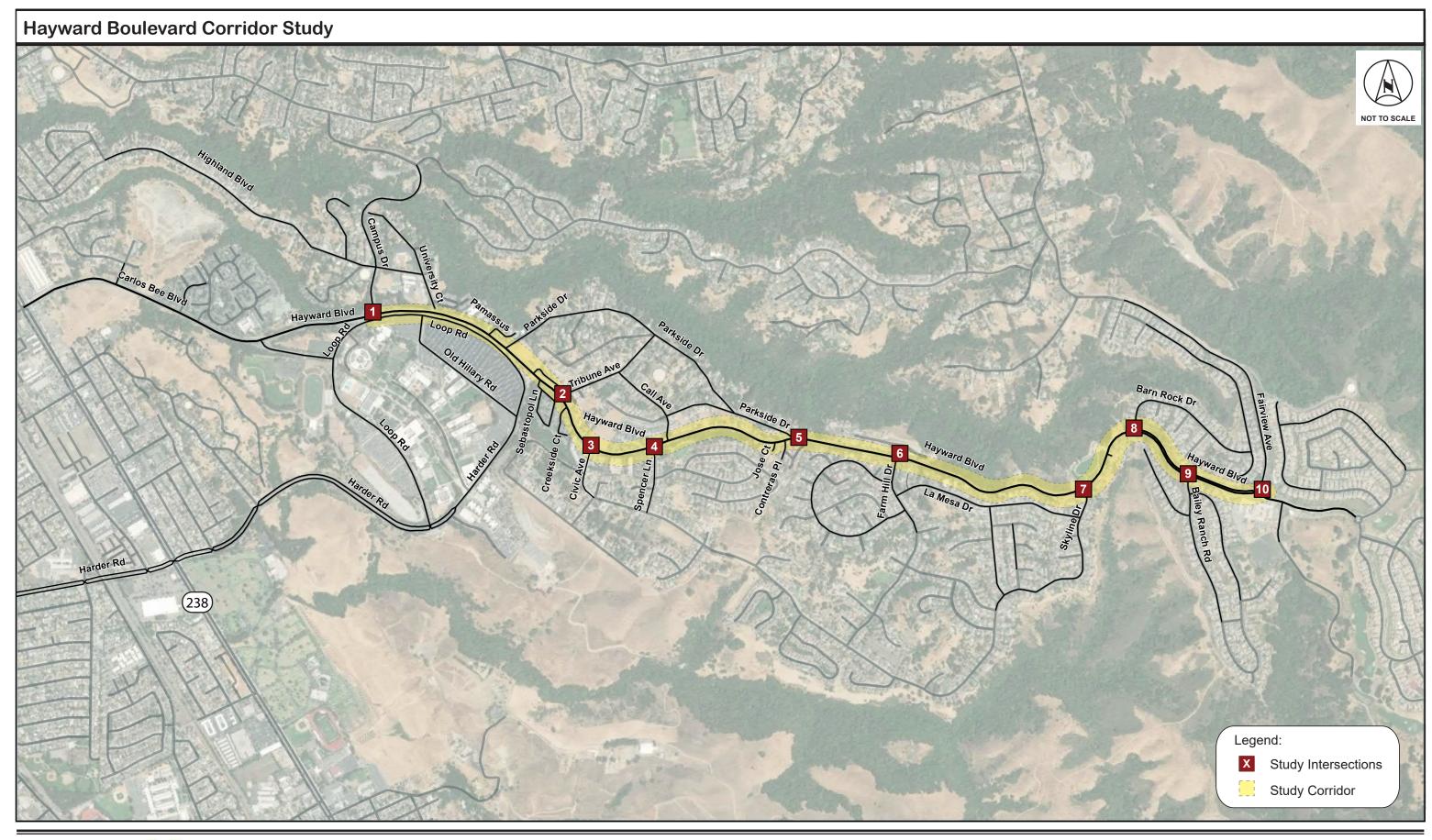
Hayward Boulevard is an east-west running arterial in the City of Hayward, California. It provides access to the Hayward Highlands neighborhood, California State University East Bay ("Cal State East Bay"), Stonebrae Elementary School, and various parks and recreational facilities. The City of Hayward ("City") is seeking to improve the Hayward Boulevard corridor with an emphasis on multimodal safety and connectivity. The City has commissioned the Hayward Boulevard Feasibility Study ("Study") to determine the current challenges along the corridor and develop a set of proposed improvements to address those challenges.

As part of the first task of the study effort, Kimley-Horn analyzed baseline conditions and constraints along Hayward Boulevard and its intersecting streets. This included a review of existing traffic and collision data as well as analysis of new traffic data collected for the study. This memorandum summarizes that analysis and provides a basis for identifying project needs.

Study Corridor

This study focuses on a 2.5-mile stretch of Hayward Boulevard which extends from Campus Drive to Fairview Avenue (the "study corridor"). This study corridor is classified as a minor arterial by the City of Hayward; it has 3 signalized intersections, 2 all-way stop-controlled intersections, 4 side-street stop-controlled intersections, and one roundabout. Between Campus Drive and Farm Hill Drive, the roadway consists of four travel lanes (two in each direction), and intermittently includes a median two-way left-turn lane. Between Farm Hill Drive and Fairview Avenue, the corridor consists of two travel lanes (one in each direction). The study corridor and study intersections are shown in **Figure 1**.

The study corridor is largely surrounded by single-family residential neighborhoods. Cal State East Bay is located at the western end of the study corridor, near Hayward Boulevard and Campus Drive. The university enrolls over 15,000 students each year. There is no direct vehicle access to the campus from the study corridor; drivers access the campus either via Carlos Bee Boulevard or Harder Road west of the study corridor limits. Stonebrae Elementary School is located at the eastern





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end of the study corridor; the school enrolls approximately 800 students in grades K-6 and employs approximately 80 teachers and staff. The study corridor has incomplete sidewalk coverage along its length; sidewalk gaps are discussed in greater detail in a later section. It is also designated as a Class III bike route. AC Transit provides local bus service along the study corridor.

Data Collection

New traffic volume data was collected for this Study in April and May 2019. All data was collected before the last day of instruction at Cal State East Bay (May 10th) and while Stonebrae Elementary school was in session. Auto, bicycle, pedestrian counts were collected at nine major intersections on the study corridor during weekday AM (7-9AM) and PM (2-6PM) peak periods. These counts were collected at the following intersections:

- Hayward Boulevard/Campus Drive
- Hayward Boulevard/Tribune Avenue
- Hayward Boulevard/Civic Avenue
- Hayward Boulevard/Spencer Lane
- Hayward Boulevard/Parkside Drive (between Call Ave and Farm Hill Drive)
- Hayward Boulevard/Farm Hill Drive
- Hayward Boulevard/Skyline Drive
- Hayward Boulevard/Barn Rock Rd
- Hayward Boulevard/Bailey Ranch Road

24-hour vehicle counts were conducted at the following locations over a period of three days (April 30th – May 2nd, 2019):

- Hayward Boulevard between Campus Dr and Parkside Dr
- Hayward Boulevard between Farm Hill Dr and Skyline Dr

Bicycle- and pedestrian-only volumes were collected on a Saturday (May 4th, 2019) from 9AM to 3PM at the following intersections:

- Hayward Boulevard/Campus Drive
- Hayward Boulevard/Civic Avenue
- Hayward Boulevard/Skyline Drive
- Hayward Boulevard/Farm Hill Drive
- Hayward Boulevard/Bailey Ranch Road
- Hayward Boulevard/Fairview Ave

Radar speed surveys were collected on a Wednesday (May 8th, 2019) during off-peak hours (9AM-3PM) period at the following locations:

- Hayward Boulevard between Campus Dr and Parkside Dr
- Hayward Boulevard 200 feet west of Call Avenue
- Hayward Boulevard between Parkside Drive and Farm Hill Dr
- Hayward Boulevard between Barn Rock Dr and Bailey Ranch Rd



Hayward Boulevard between Farm Hill Dr and Skyline

Floating car travel time data was collected along the study corridor on Wednesday, May 8th, 2019 during the AM (7-9AM) and PM (2-6PM) periods. Intersection-to-intersection travel times were recorded along the study corridor.

Field observations were conducted during AM and PM peak periods to qualitatively observe behaviors related to parking, pedestrian crossings/jaywalking, turning movements, pick-up/drop-off at the elementary school, and vehicular speeds.

Collision data for the study corridor was obtained from the Statewide Integrated Traffic Records System (SWITRS) for the five-year period beginning January 1st, 2014 and ending December 31st, 2018.

The City of Hayward provided historical traffic volumes at the Hayward Boulevard/Farm Hill Drive intersection from late August 2016.

Existing Facilities

Pedestrian

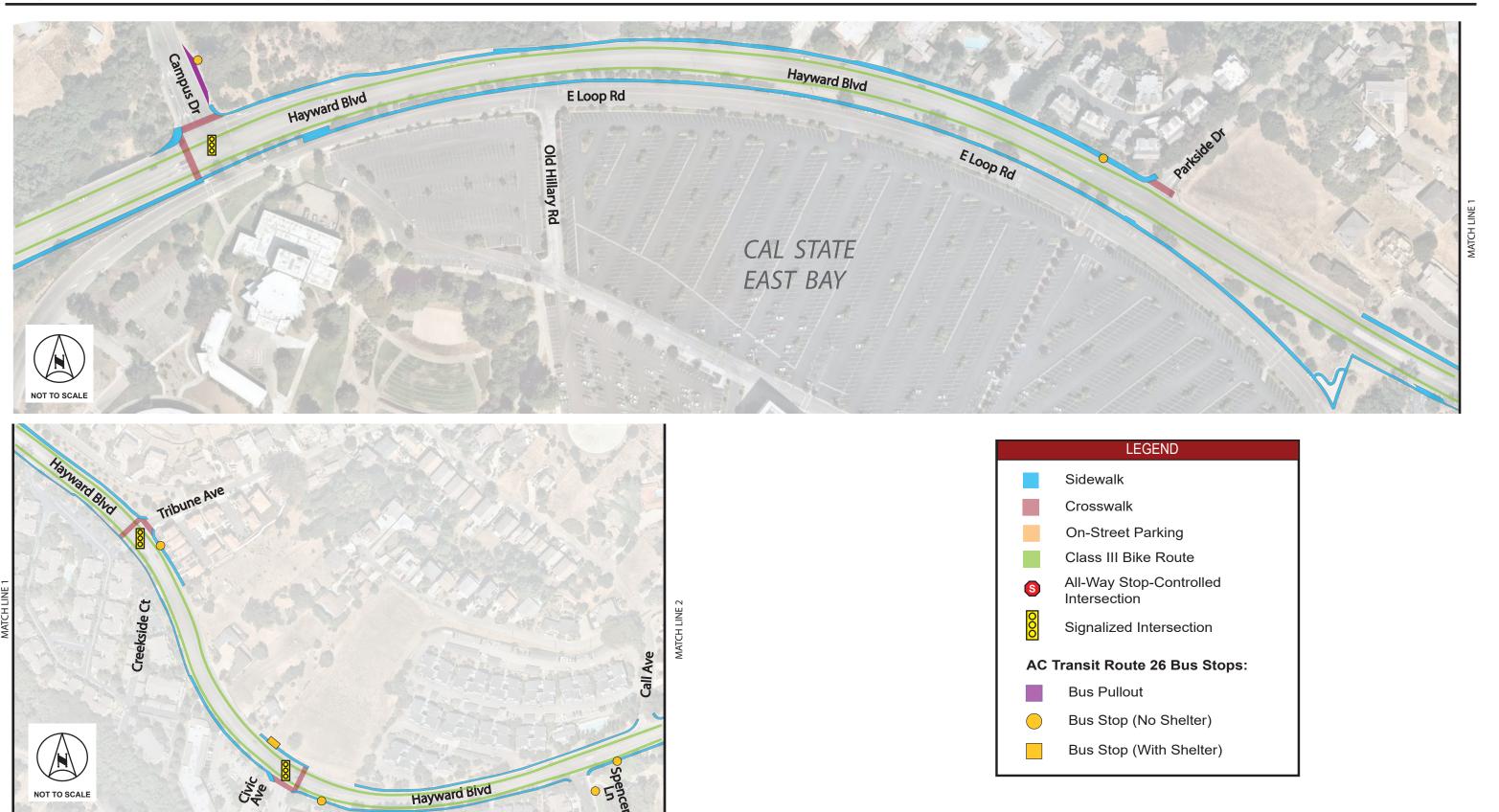
There is no sidewalk on eastbound Hayward Boulevard at Cal State East Bay campus. Instead, the pedestrian sidewalk is located along East Loop Road, parallel to the Hayward Boulevard segment without sidewalk. This path transitions into the Hayward Boulevard sidewalk via a path just west of Sebastopol Lane.

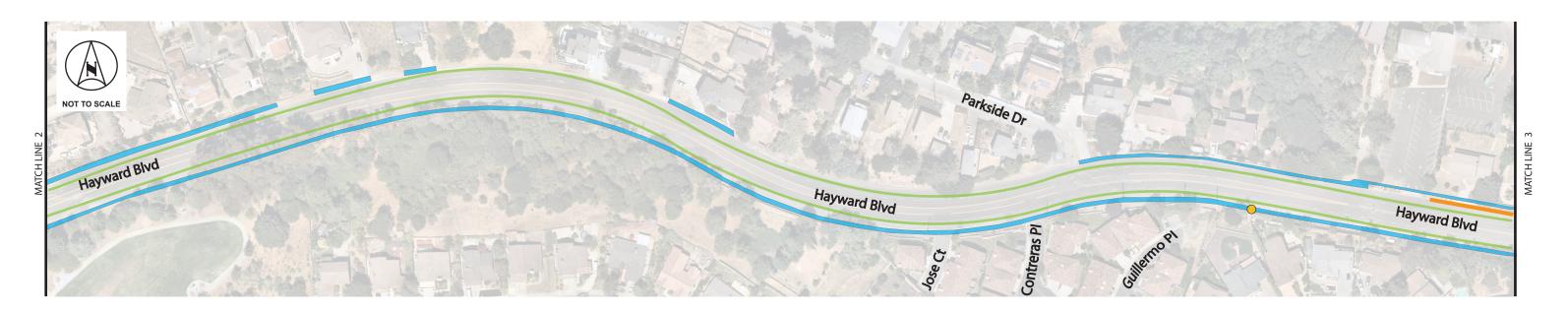
Sidewalk coverage varies along the study corridor. A sidewalk of varying width is provided on the south side of Hayward Boulevard along the entire length of the study corridor east of Cal State East Bay. Adjacent to Cal State East Bay, this sidewalk connects to the sidewalk on the north side of East Loop Road. On the north side of Hayward Boulevard, a sidewalk is provided along the length of the study corridor except at the following locations:

- From Parkside Drive (West) to 430 feet east of Parkside Drive (West)
- From Tribune Ave to Spencer Lane (sidewalk coverage varies parcel-to-parcel along this segment)
- From 550 feet east of Call Ave to Parkside Drive (East)
- From 270 feet east of Farm Hill Drive to Skyline Drive

At the above locations, there are unfinished surfaces and/or parkland behind a 6-inch asphalt concrete berm.

Pedestrian crossings across Hayward Boulevard are provided at the three signalized intersections on the study corridor (at Campus Drive, Tribune Avenue, and Civic Avenue), at the two all-way stop-controlled intersections (at Skyline Drive and Barn Rock Drive), and at the roundabout at Fairview Avenue. There are otherwise no marked pedestrian crossings across Hayward Boulevard. Existing pedestrian facilities along the study corridor are presented in **Figure 2**.

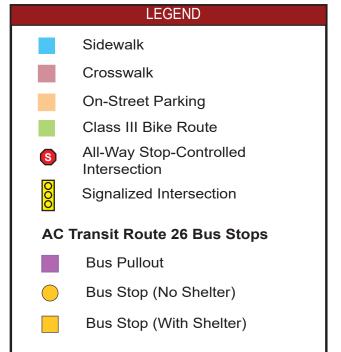














Bicycle

Hayward Boulevard is designated as a Class III Bike Route throughout the length of the study corridor, per the City's 2007 Bicycle Master Plan. The route is marked with signage throughout the study corridor and is marked with sharrows east of Skyline Drive.

Transit

AC Transit Line 94 provides service from Hayward BART Station and terminates at Hayward Boulevard and Fairview Avenue. Eastbound trips on the route traverse the entire study corridor; when heading westbound, Line 94 turns left at Skyline Drive and rejoins the study corridor at Spencer Lane. This route operates on weekdays between 5:05AM and 9:55 PM with 26 trips scheduled daily. There is no weekend service. Line 94 provides access to following major destinations:

- Hayward BART
- Downtown Hayward
- Bret Harte Middle School
- Hayward High School
- Cal State East Bay
- Stonebrae Elementary School

Along the study corridor, there are three westbound bus stops and five eastbound stops. All stops on the study corridor have a sign, but do not have bus pad or other amenities. Bus pullouts are not provided. The majority of bus stops are located far-side or near-side of a minor intersection with ADA crossing ramps. The westbound stop at Civic Avenue has a shelter and trash can but does not meet ADA accessibility requirements as the sidewalk is discontinuous on either side and the pedestrian crossing of Hayward Boulevard at Civic Avenue does not have an ADA-compliant curb ramp.

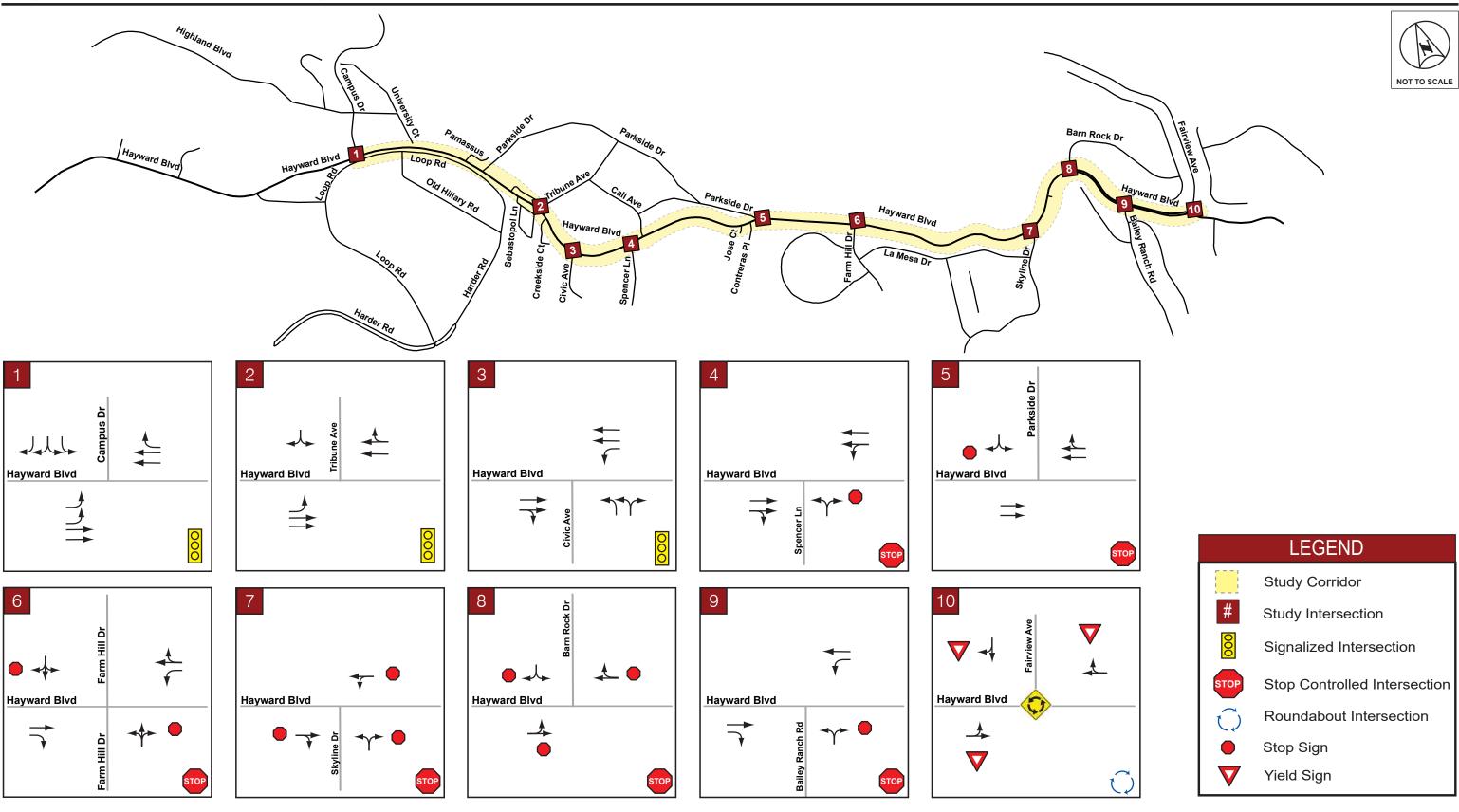
Existing bicycle, pedestrian, and transit facilities are shown in Figure 2.

Autos

Hayward Boulevard is classified as a minor arterial corridor by the City of Hayward. Within the study area, the posted speed limit varies between 35 miles per hour (between Campus Drive and Bailey Ranch Road) and 25 miles per hour near Stonebrae Elementary School (between Bailey Ranch Road and Fairview Avenue).

Between Campus Drive and Farm Hill Drive, Hayward Boulevard is two lanes in each direction. East of Farm Hill Drive, the road reduces to one lane each direction. There is no on-street parking in either direction, except for a short stretch in the westbound direction adjacent to JA Lewis Park and along the westbound direction between Farm Hill Drive and Highland Baptist Church.

The existing intersection geometry and traffic control types are shown in Figure 3.



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Existing Volumes

Autos

The average weekday daily traffic (ADT) volumes at two locations along the study corridor are shown in **Table 1**. As can be seen in the data, daily traffic volumes vary along the study corridor, with significantly heavier volumes occurring at the western end of the study corridor.

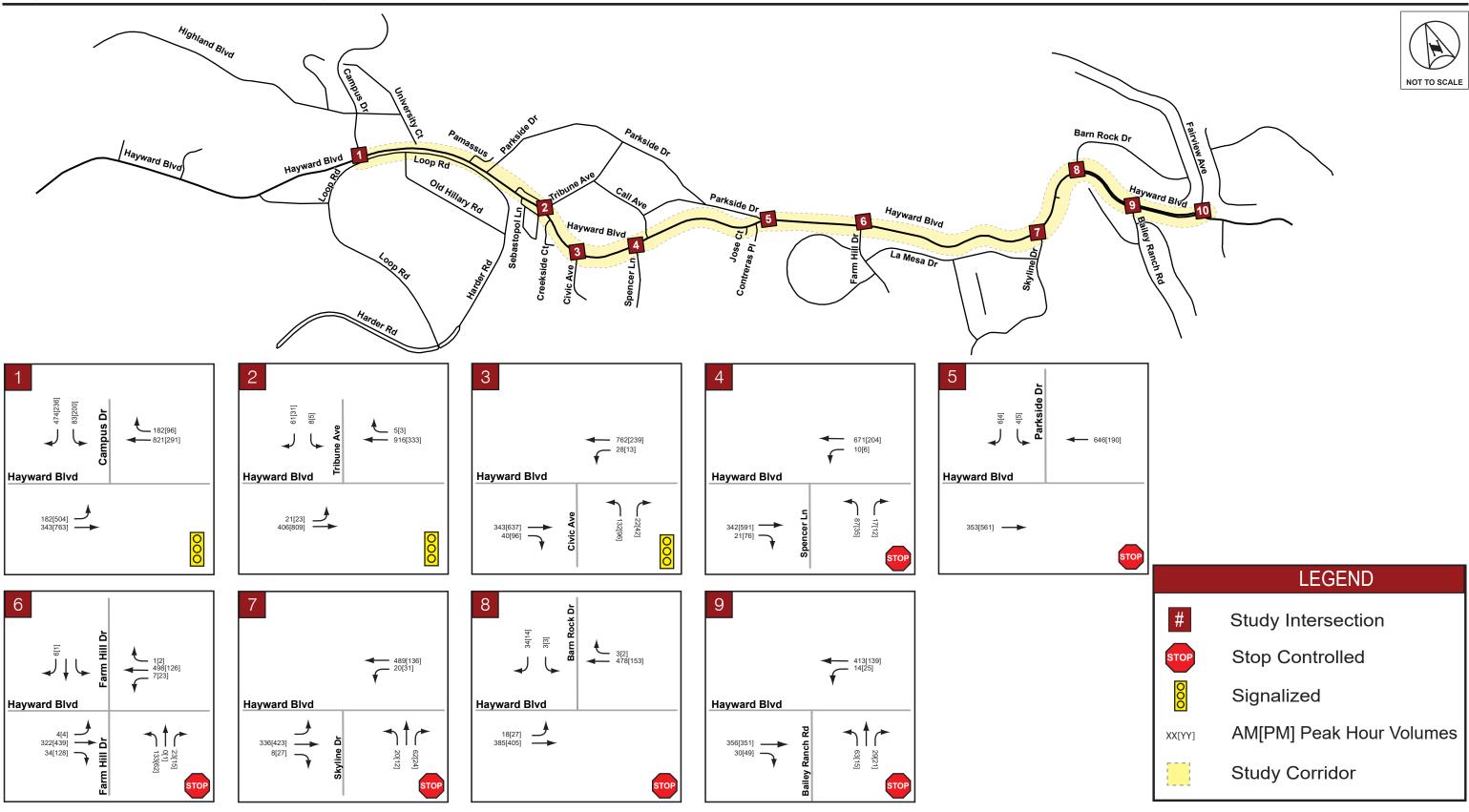
Table 1: Average Weekday Daily Traffic (ADT) Volumes

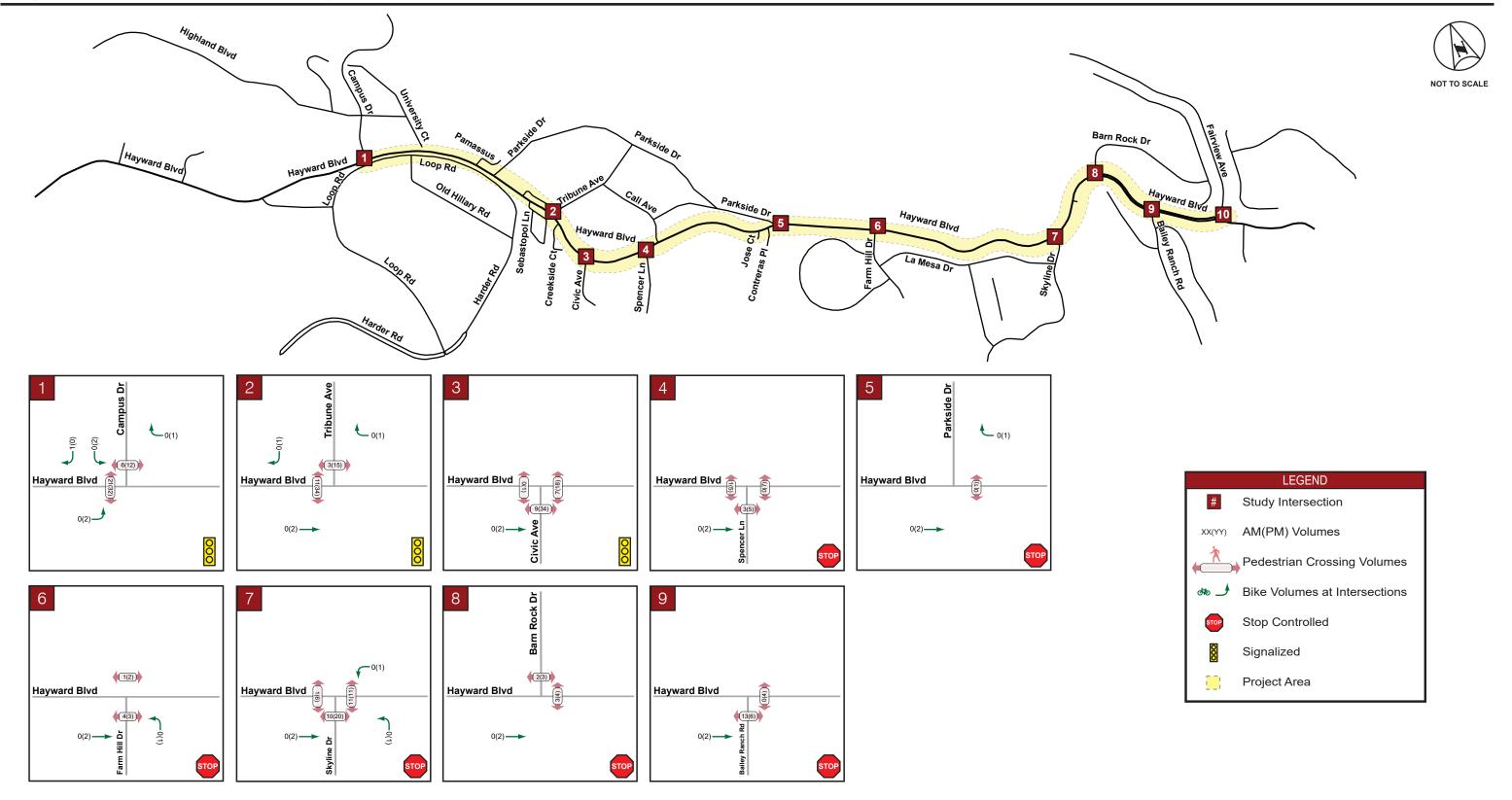
Location	ADT
Hayward Boulevard between Campus Drive and Parkside Drive	15,804
Hayward Boulevard between Farm Hill Drive and Skyline Drive	6,063

Intersection turning movement volumes were collected at nine major intersections along the study corridor during the AM and PM peak periods. Peak hour intersection turning movement volumes are shown in **Figure 4**.

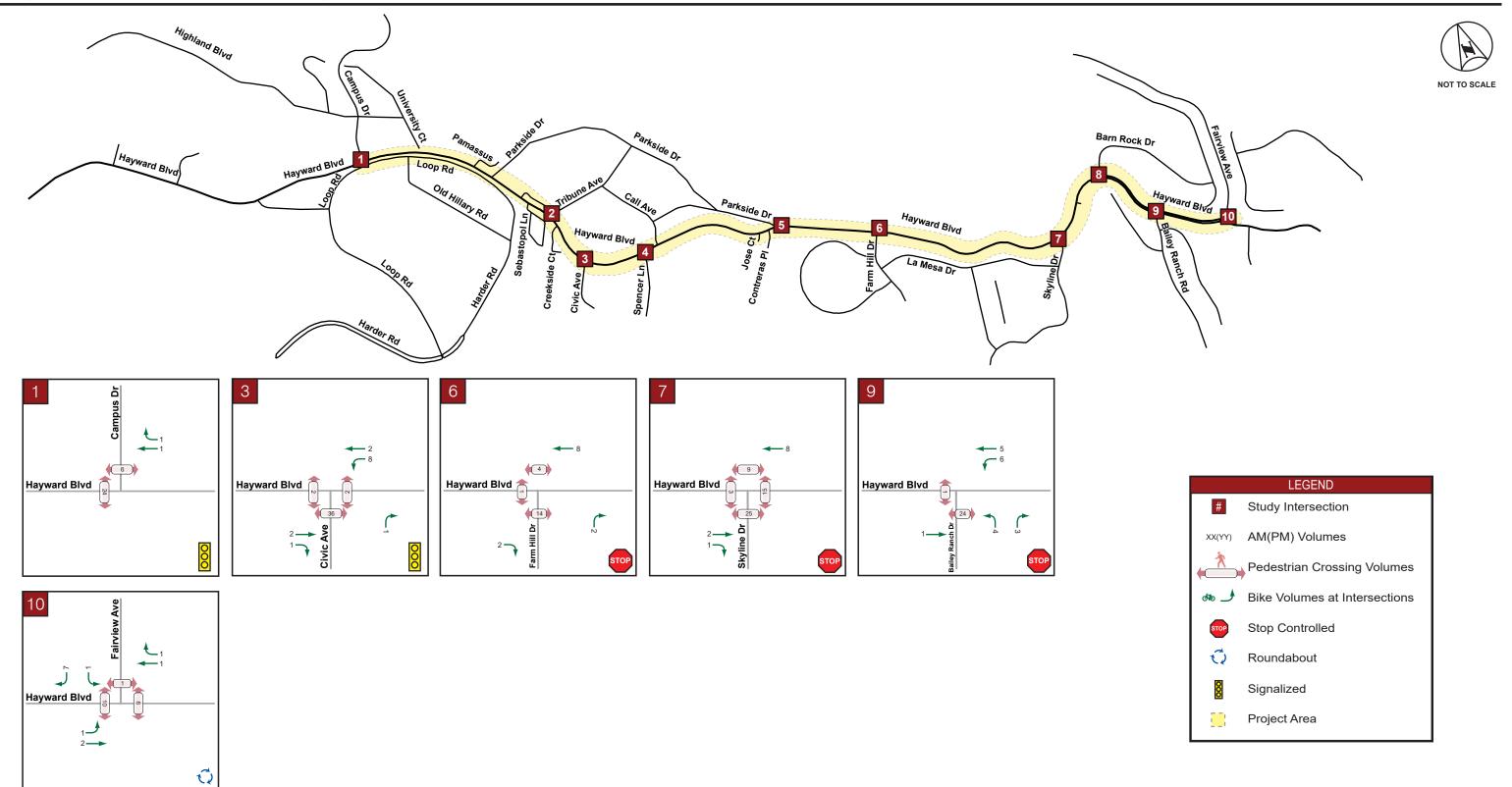
Bicycles and Pedestrians

Bicycle turning movement counts and pedestrian counts at crosswalks were collected at nine study intersections concurrently with vehicle turning movement counts during weekday peak periods. Additional bicycle and pedestrian counts were collected at six intersections on a Saturday from 9AM to 3PM to understand weekend bicycle and pedestrian activity. Weekend pedestrian activity was observed to be similar in volume to weekday activity; bike activity on the weekends was higher compared to weekday peak hour activity. **Figure 5** and **Figure 6** show existing weekday and weekend peak hour bicycle and pedestrian volumes, respectively.





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Collision History

Collision data was obtained from the SWITRS database. **Table 2** summarizes the collision history of the study corridor for a recent 5-year period (from January 1, 2014 through December 31, 2018). There was a total of 17 collisions documented over this time period. The most common collision type was broadside collisions (8). The violation type for most of these broadside collisions was a right-of-way violation. This suggests a pattern of collisions between vehicles traveling straight on Hayward Boulevard and vehicles turning on/off of the corridor. There was one recorded pedestrian-involved collision which occurred between Campus Drive and University Court.

Table 2: Study Corridor Collision History (2014-2018)

Location ¹		Number of Accidents by Type (2014-2018)								
		Sideswipe	Rear-End	Overturned	Vehicle/ Pedestrian	Hit Object	Broadside	TOTAL	Severe Injuries (# of people)	Fatalities
Hayward Boulevard & Carlos Bee Boulevard	-	-	1	-	-	1	-	2	0	0
Hayward Boulevard (Between Campus Drive & Carlos Bee Boulevard)	1	-	-	-	-	-	-	1	0	0
Hayward Boulevard (Between Campus Drive & University Drive)	-	-	-	-	1	-	-	1	0	0
Hayward Boulevard & Parkside Drive	-	-	-	-	-	1	1	2	0	0
Hayward Boulevard & Tribune Ave	-	1	-	-	-	-		1	0	0
Hayward Boulevard & Civic Ave	1	-		-	-	-	2	3	0	0
Hayward Boulevard & Spencer Lane	-	-	-	-	-		2	2	1	0
Hayward Boulevard & Jose Court	-	-	-	-	-	-	1	1	0	0
Hayward Boulevard (Between Spencer Lane & Jose Court)	-	-	-	-	-	1	-	1	1	0
Hayward Boulevard & Farm Hill Drive	-	-	-	-	-	-	1	1	0	0
Creekside Court & Hayward Boulevard	-	-	-	-	-	-	1	1	0	0
East Hayward Boulevard & Civic Avenue	-	-	1	-	-	-	-	1	0	0
Total	2	1	2	0	1	3	8	17	2	0

Source: Statewide Integrated Traffic Records System (SWITRS), 2014-2018

¹ Incidents assumed to be located at an intersection if they occurred within 200 feet of the intersection



Speeds

Speed surveys were conducted in five locations along the study corridor in May 2019. These surveys recorded the speeds of vehicles traveling in both directions on Hayward Boulevard during off-peak periods. The observed speeds thus reflect free-flow speeds. The results of the surveys are shown in **Table 3**.

Table 3: Speed Survey Results

Study Corridor Segment	Posted Speed	50 th Pe	rcentile Speed	l (mph)	85 th Percentile Speed (mph)			
Study Commun Sogment	Limit (mph)	Eastbound	Westbound	Combined	Eastbound	Westbound	Combined	
750' East of Campus Drive	35	40	42	40	45	47	47	
200' West of Call Avenue	35	36	37	37	42	41	41	
Between Parkside Drive and Farm Hill Dr	35	40	42	41	46	48	47	
Between Barn Rock Dr and Bailey Ranch Rd	25	29	32	30	34	37	35	
Between Farm Hill Dr and Skyline	25	36	32	34	40	36	39	

As shown in the above table, 85th percentile speeds are at least 10 mph greater than the speed limit in most surveyed locations.

Travel Times

Travel times along the study corridor were collected on May 8, 2019, during AM (7-9AM) and PM (2-6PM) peak periods. Travel times were collected using the floating car technique where the data collection vehicle travels at a rate consistent with others on the roadway at the time. Travel times were recorded intersection-to-intersection and for the entire corridor; signal delay was also recorded. The results for the entire corridor are summarized in **Table 4**. Generally, the results show that signal delay does not significantly affect travel times on the study corridor.

Table 4: Corridor-Wide Travel Time Results

Metric	AM I	Peak	PM Peak			
Metric	Eastbound	Westbound	Eastbound	Westbound		
Running Time	4:16	4:03	4:45	4:39		
Delay	0:10	0:12	0:17	0:16		
Total Travel Time	1 4.76 1 4		5:01	4:55		
Average Speed (mph)	34.4	36.0	30.4	31.1		

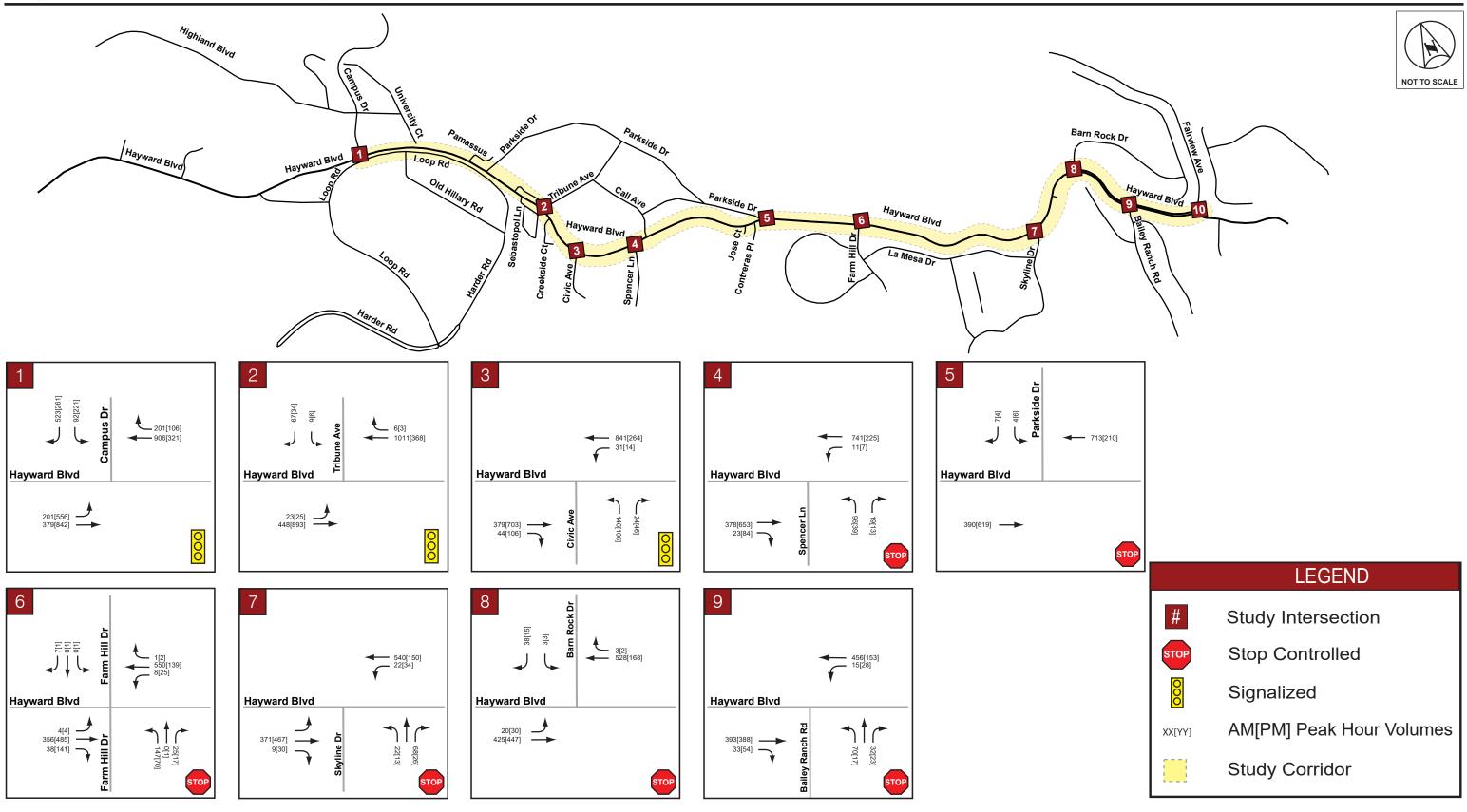


Traffic Analysis

The existing study corridor was modeled using Synchro traffic modeling software and HCM 2000 methodology, per the *City of Hayward Interim Traffic Study Guidelines* (March 2017). The baseline traffic analysis was performed for Existing (2019) and Future (2024) conditions during AM and PM peak hours. Operating conditions experienced by drivers are described in terms of Level of Service (LOS) and delay. Per City guidelines, a minimum of a level of service E shall be maintained at signalized intersections, except when a LOS F is deemed acceptable due to mitigations being infeasible. For unsignalized intersections, there is no LOS threshold, but City guidelines indicate that the intersection LOS and delay should be reported, and warrants for traffic signals, pedestrian signals, and stop signs should be checked for new projects. Delay for signalized or all-way stop-controlled intersections is reported in terms of average delay for all vehicles at the intersection. Delay for side-street stop-controlled intersections is reported in terms of the average delay for the worst side-street movement only.

FUTURE VOLUMES

Per City direction, five-year horizon year traffic volumes were developed. Volumes were calculated assuming a 2 percent annual growth rate. This growth rate was applied to the existing intersection turning movement volumes collected in 2019. Future peak hour traffic volumes are shown in **Figure 7**.







Baseline Conditions Results

Table 5 shows the results of the existing conditions (2019) traffic analysis. As shown, the study intersections operate at LOS A to E during the AM and PM peak hours.

Table 5: Existing Conditions Traffic Analysis Results

		Intersection	LOS	AM	1 Peak	PM Peak	
#	Intersection	Control	Standard	LOS	Delay	LOS	Delay
1	Hayward Boulevard/Campus Drive	Signal	Е	В	13.3	В	15.0
2	Hayward Boulevard/Tribune Ave	Signal	E	Α	5.4	Α	3.4
3	Hayward Boulevard/Civic Ave	Signal	Е	Α	5.6	Α	5.0
4	Hayward Boulevard/Spencer Lane	SSSC	-	С	19.0	С	16.6
5	Hayward Boulevard/Parkside Drive	SSSC	-	В	13.4	В	10.9
6	Hayward Boulevard/Farm Hill Drive	SSSC	-	E	38.2	С	16.8
7	Hayward Boulevard/Skyline Drive	AWSC	-	С	15.5	В	11.4
8	Hayward Boulevard/Barn Rock Drive	AWSC	-	В	14.4	В	11.0
9	Hayward Boulevard/Bailey Ranch Rd	SSSC	-	С	17.7	В	11.9

Note: SSSC = Side-Street Stop Control; AWSC = All-Way Stop Control

Future baseline conditions assumed no geometric modifications from existing conditions. Traffic delays and level of service were analyzed using Synchro models and results are shown in **Table 6**.

Most intersections along the study corridor experience a slight increase in delay relative to existing conditions for both peak periods. Notably, the Hayward Boulevard/Farm Hill Drive intersection experienced delays at LOS F in the AM Peak. This is a result of high delays for side-street movements coming from Farm Hill Drive and turning left onto Hayward Boulevard.

Table 6: Future Baseline Conditions Traffic Analysis Results

		Intersection Control	LOS	AM Peak		PM Peak	
#	Intersection		Standard	LOS	Delay	LOS	Delay
1	Hayward Boulevard/Campus Drive	Signal	E	В	13.9	В	15.8
2	Hayward Boulevard/Tribune Ave	Signal	E	Α	5.6	Α	3.6
3	Hayward Boulevard/Civic Ave	Signal	E	Α	5.8	Α	5.1
4	Hayward Boulevard/Spencer Lane	SSSC	-	С	22.3	С	18.6
5	Hayward Boulevard/Parkside Drive	SSSC	-	В	14.1	В	11.6
6	Hayward Boulevard/Farm Hill Drive	SSSC	-	F	63.0	С	19.0
7	Hayward Boulevard/Skyline Drive	AWSC	-	С	19.5	В	12.7
8	Hayward Boulevard/Barn Rock Drive	AWSC	-	С	17.2	В	12.1
9	Hayward Boulevard/Bailey Ranch Rd	SSSC	-	С	20.5	В	12.5

Note: SSSC = Side-Street Stop Control; AWSC = All-Way Stop Control



Field Observations

Field observations were conducted on May 9th, 2019 during the AM and PM peak periods. Key takeaways on general travel patterns and behaviors along the study corridor include the following:

- Pedestrians jaywalk across the portions of Hayward Boulevard adjacent to Cal State East Bay between Campus Drive and Parkside Drive. There is also no pedestrian crossing facility across Hayward Boulevard for the half-mile stretch of Hayward Boulevard between Campus Drive and Tribune Avenue, and there is no sidewalk on the north side of Hayward Boulevard between Parkside Drive and Tribune Avenue. Jaywalkers were counted for 1.5 hours during the AM peak period and during 1 hour of the PM peak period. A total of 36 jaywalkers were counted during the observed period in the AM peak and 28 jaywalkers were counted during the observed period in the PM peak.
- Vehicles were observed exceeding the speed limit in many locations. Speeds appeared to be highest at two locations:
 - Adjacent to Cal State East Bay
 - The straightaway portion of the study corridor between Farm Hill Drive and Parkside Drive
- Some speeding vehicles were observed running red lights and making rolling right turns at Campus Drive.
- The steeper downhill portions of the study corridor, especially around Spencer Lane, appear to encourage higher vehicle speeds.
- Minimal bicycle activity was observed throughout the study corridor.
- Traffic congestion was not observed during either the AM or PM peaks, except for the concentrated school pick-up/drop-off activity that occurred around class start/end times at Stonebrae Elementary School.
- There are gaps in sidewalks in numerous locations throughout the study corridor. In some locations with sidewalks, the effective width of the sidewalk is reduced by overgrown vegetation.
- On-street parking on Hayward Boulevard, where it is provided, was not observed to be highly utilized.
- Sight distance is constrained along the segment of the study corridor between Farm Hill Drive and Skyline Drive, where horizontal curves, steep grades, retaining walls, and vegetation all constrain sight distance.
- Stonebrae Elementary School pick-up and drop-off activity was observed during the morning and afternoon peaks.
 - Drop-off activity at the school peaks in the morning at around 8:15 AM. Students were typically dropped off at the pick-up/drop-off space in the rear of the school, or in the bus pull-out area off Hayward Boulevard just west of Fairview Avenue. Drop-off activity generally subsided by 8:25 AM.
 - Students walking to and from school along Hayward Boulevard were all walking on the south side of the road and appeared to all come from the Bailey Ranch neighborhood; no students were observed walking to or from the school from any other location.



- In the afternoon, a queue of drivers waiting to pick up students develops; it starts in the rear parking lot of the school and extends north along Carden Lane, west along Stonebrae Country Club Drive, and through the Hayward Boulevard/Fairview Avenue roundabout. At its longest, the queue extended three cars west of the roundabout. This queue causes some cars to idle curbside along Hayward Boulevard and Stonebrae Country Club Drive, which is signed for "No Parking – Any Time."
- In the afternoon, some drivers appeared to queue up on the east side of Bailey Ranch Road; students would walk down Hayward Boulevard to meet the cars there instead of getting picked up in the school parking lot.
- No jaywalking activity was observed at or around the school; however, as noted above, the only people seen walking to or from the school were coming from a neighborhood which can be accessed from the school without making any major street crossings.

Conclusions and Next Steps

Figure 8 shows the key issues and needs identified through the analysis described in this memorandum. The analysis identified the following issues along the study corridor:

- Vehicles consistently drive above the posted speed limit at multiple locations along the study corridor. This creates an unsafe environment for vehicles, pedestrians, and bicyclists along the corridor.
- Gaps in sidewalks and a lack of crosswalks across Hayward Boulevard, lead to a lack of pedestrian connectivity throughout the study corridor
- The high proportion of broadside collisions along the study corridor is consistent with the above-mentioned issue of high speeds on Hayward Boulevard high speeds create additional challenges for side-street vehicles turning onto the corridor.

As part of the feasibility study, the project team will be engaging in public outreach to develop a full understanding of study corridor needs. The feedback received during that outreach will be used to supplement the existing conditions analysis in this memorandum and will inform the development of improvement concepts.

