TECHNICAL MEMORANDUM

To:	Kailash Mozumder and Steve Jesberg, City of Capitola
From:	Derek Wu P.E. and Frederik Venter P.E., Kimley-Horn and Associates, Inc.
Date:	May 26, 2022
Re:	**Park Avenue Traffic Calming – Corridor Alternatives and Recommended Improvements**

This technical memorandum presents the findings of potential traffic calming impacts to Park Avenue in the City of Capitola. The City of Capitola (City) is planning to construct traffic calming improvements on Park Avenue from Monterey Avenue to Coronado Street to reduce vehicle speeds and improve accessibility for bicyclists and pedestrians along the corridor.

1. Existing Conditions

Park Avenue between Monterey Avenue and Coronado Street is an existing east-west two-lane arterial facility with a curb to curb roadway width between approximately 30 to 40 feet. It is an asphalt paved road with one lane in each direction and provides direct access to single-family homes on the north side, the City's downtown village to the south, and freeway access to Highway 1 to the north. Numerous residential driveways and local streets, such as Washburn and Cabrillo, intersect Park Avenue as stop control on the minor approach. This section of Park Avenue is also part of the Pacific Coast bike route that runs from Half Moon Bay to Watsonville.

The Park Avenue roadway cross-section generally consists of 10.5-foot travel lanes, Class II bike lanes, a 5-foot wide sidewalk on the northside, and a variable wide shoulder on the southside. On-street parking is prohibited along Park Avenue except for signed areas on the southside. The posted speed limit is 25 mph, and an existing electronic speed feedback sign is located east of Cabrillo Street in the eastbound direction. An overview map of the study roadway segment is shown below in **Figure 1**.

Figure 1: Overview Map

2. Speed Survey Review

Speed zones are primarily established to protect the public from the unreasonable behavior of reckless, unreliable, or other dangerous drivers. Typically, speed limits are generally established at or near the 85th percentile speed (critical speed), which is defined as the speed at or below which 85 percent of traffic is moving.

In January 2020, the City conducted an Engineering and Traffic Study to determine vehicle speed limits per the California Vehicle Code and using speed survey data. For Park Avenue, the observed 85th percentile speed was 31 mph in the eastbound and westbound direction. The study recommended that a 25 mph speed limit be implemented in concurrence with the MUTCD. The 25 mph speed limit was obtained by a 5 mph reduction of the critical speed of 30 mph due to the existing number of access points, residential district density, and pedestrian and bicycle safety.

In July 2021, an additional speed survey was conducted. The speed survey collected an average daily traffic of 6,294 using tube counters to calculate vehicle speeds traveling along Park Avenue. The observed 85th percentile speed was 33 mph in the eastbound direction and 35 mph in the westbound direction. These observed 85th percentile speeds exceed the 25-mph posted speed limit on Park Avenue. A copy of the 2020 and 2021 speed surveys are attached in the **Appendix**.

3. Traffic Calming Design Alternatives

Kimley-Horn was tasked to evaluate potential traffic calming alternatives on Park Avenue that would reduce vehicle speeds and improve roadway conditions for bicycle and pedestrian access. Geo-referenced aerial photographs and Santa Cruz County GIS data were used to establish a base map for determining existing topographic features and developing preliminary concepts.

Up to three (3) alternative traffic calming concepts were developed for Park Avenue between Monterey Road and Coronado Street. The layouts of each traffic calming alternative are summarized below and attached in the **Appendix**.

Alternative 1 – Road Diet Striping

Improvements under Alternative 1 consist of striping buffer bike lanes and narrowing the vehicle traffic lanes enhance bicycle accessibility along Park Avenue. The existing Park Avenue roadway cross-section between Monterey and Cabrillo is 30’ to 34’ wide. Since this arterial facility needs to maintain Class II bike lanes and one vehicle travel lane in each direction, there is limited space and opportunities to introduce multiple traffic calming features. However, a road diet striping layout that incorporates green bike markings and buffer bike striping where there is adequate space is feasible. In addition, an electronic speed feedback sign in the westbound direction is proposed at the Washburn intersection.

- Road diet striping from Monterey to Coronado
- Buffered Class II bike lanes and green bike striping at conflict zones
- Speed feedback sign at Washburn

Alternative 2 – Lateral Shift

Improvements under Alternative 2 consist of the road diet striping layout from Alternative 1 but with additional horizontal deflection in the form of a lateral lane shift along Park Avenue between Cabrillo and Coronado. A lateral shift or chicane is a realignment of an otherwise straight street that causes the travel lanes to shift to one direction as a means to reduce vehicle speeds.

- Road diet striping from Monterey to Coronado
- Buffered Class II bike lanes and green bike striping at conflict zones
- Speed feedback sign at Washburn
- Series of lateral shifts from Cabrillo to Coronado

Alternative 3 – Median Shift

Improvements under Alternative 3 is similar to Alternative 2, but the proposed horizontal deflection between Cabrillo and Coronado consists of a series of medians to provide the lateral shift along Park Avenue.

- Road diet striping from Monterey to Coronado
- Buffered Class II bike lanes and green bike striping at conflict zones
- Speed feedback sign at Washburn
- Series of lateral shifts using medians from Cabrillo to Coronado

4. Traffic Calming Impacts to Vehicle Speed

Reducing vehicle speeds along street corridors improves the bicycling and pedestrian environment by diminishing the severity of crashes if they occur and enhancing the driver's ability to see and react to various road conditions. Physical geometric traffic calming elements can be divided into vertical, horizontal, or narrowing features.

- **Vertical** control measures consist of wide, slight pavement elevations that self-enforce a slower speed from motorists and typically have the highest reduction effect on speeds (i.e. speed tables).
- **Horizontal** control measures cause motorists to reduce speeds in response to a lateral shift and a need to navigate a curving travel lane.
- **Narrowing** or street width reduction control measures use a psycho-perceptive sense of enclosure to discourage speeding by incorporating landscaping or other vertical elements along the constricted pathway.

The traffic calming features proposed in the design alternatives consist of horizontal deflection from lateral shifts and chicanes along Park Avenue between Cabrillo and Coronado Street. Narrowing features from striping buffer bike lanes and reducing the travel lane width with a road diet would also reduce vehicle travel speeds through the corridor.

Potential Speed Reductions

Determining the potential speed calming impacts to a roadway is highly case-specific and is affected by many factors including, but not limited to, the geometrics and spacing of calming features, availability of alternative routes, and treatment of other streets in area wide applications, etc. Conducting a before-and-after study of the project site provides the best method to analyzing the actual effectiveness of a traffic calming element.

For this analysis, published before-and-after study results from FHWA and ITE publications were referenced to determine typical speed reductions for the proposed Park Avenue layouts. These collected studies have been used to generate summary speed statistics on various speed reducing countermeasures such as 85th percentile speed after treatment, average absolute change in 85th percentile speed from before to after treatment, and average percentage change in 85th percentile speed. The potential speed impacts from traffic calming Alternatives are summarized below in **Table 1**.

Table 1: Potential Speed Reduction from Traffic Calming Features

Estimated Speed Reduction from Traffic Calming Features										
					Vehicle Speeds					
Concept Name	Segment	Description	Traffic Calming Feature	Traffic Calming Type	2020 Survey (85%)	Estimated Change (%)	Estimated Reduced Speed		Estimated Speed Range	
Alternative 1 Road Diet	1	Monterey to Washburn	Road Diet	Narrowing	31.0	-4%	0.0	-2.0	31.0	29.0
	2	Washburn to Wesley	Road Diet / Speed Feedback (WB)	Narrowing / Signing		-4%	0.0	-2.0	31.0	29.0
	3	Wesley to Cabrillo	Road Diet	Narrowing		-4%	0.0	-2.0	31.0	29.0
	4	Cabrillo to Coronado	Road Diet / Speed Feedback (EB)	Narrowing / Signing		-4%	0.0	-2.0	31.0	29.0
Alternative 2 Lateral Shift	1	Monterey to Washburn	Road Diet	Narrowing	31.0	-4%	0.0	-2.0	31.0	29.0
	2	Washburn to Wesley	Road Diet / Speed Feedback (WB)	Narrowing / Signing		-4%	0.0	-2.0	31.0	29.0
	3	Wesley to Cabrillo	Road Diet	Narrowing		-4%	0.0	-2.0	31.0	29.0
	4	Cabrillo to Coronado	Chicane / Speed Feedback (EB)	Horizontal / Signing		-18%	-4.0	-6.0	27.0	25.0
Alternative 3 Median Shift	1	Monterey to Washburn	Road Diet	Narrowing	31.0	-4%	0.0	-2.0	31.0	29.0
	2	Washburn to Wesley	Road Diet / Speed Feedback (WB)	Narrowing / Signing		-4%	0.0	-2.0	31.0	29.0
	3	Wesley to Cabrillo	Road Diet	Narrowing		-4%	0.0	-2.0	31.0	29.0
	4	Cabrillo to Coronado	Chicane / Speed Feedback (EB)	Horizontal / Signing		-20%	-5.0	-7.0	26.0	24.0

Notes:
Average of eastbound and westbound 85th percentile speeds from 2020 City Engineering and Traffic Survey
Average speed percentile change from FHWA Engineering Countermeasures for Reducing Speed (2014)
Average speed reduction based on FHWA Traffic Calming ePrimer and ITE

As shown in Table 1, the proposed traffic calming features help reduce vehicle speeds at various levels. Of the physical geometric traffic calming elements, the lateral shift chicanes have the greatest potential to reduce speeds up to 20% while road diet features can potentially reduce speeds up to 4% based on past studies. The estimated speed change data summarized from FHWA and ITE applies for a single speed countermeasure. When multiple traffic calming features are utilized and designed appropriately, the combined speed reduction effects could be extended throughout the entire roadway corridor. The Alternative 3 layout has the potential to provide the greatest vehicle speed reduction through the Park Avenue corridor with the combined traffic calming improvements.

Estimated 85th Percentile Speed Profile

Using the estimated speed reduction effects presented in Table 1, preliminary speed profiles along the Park Avenue corridor were plotted in graphical format. The eastbound and westbound estimated 85th percentile speed for each complete street concept is plotted for every 100 feet along the Park Avenue alignment between Monterey Avenue (Station 10+00) and Coronado Street (Station 46+00). Speed profiles for vehicles traveling eastbound assume a 20-mph starting speed from accelerating at the stop controlled Monterey intersection while westbound vehicles assume a 20-mph starting speed from accelerating at the stop-controlled Coronado intersection. The speed profiles are presented below in **Table 2** and **Table 3**.

As shown in **Tables 2 and 3**, the proposed traffic calming features has the potential to reduce the existing 85th percentile speed throughout the entire roadway corridor. The greatest speed change occurs between Coronado and Cabrillo where the proposed horizontal deflection traffic calming features are implemented. The spacing of the proposed traffic calming features along the Park Avenue corridor can potentially control estimated vehicles speeds to 29 mph or less in-between intersections.

Table 2: Park Avenue Eastbound Speed Profile

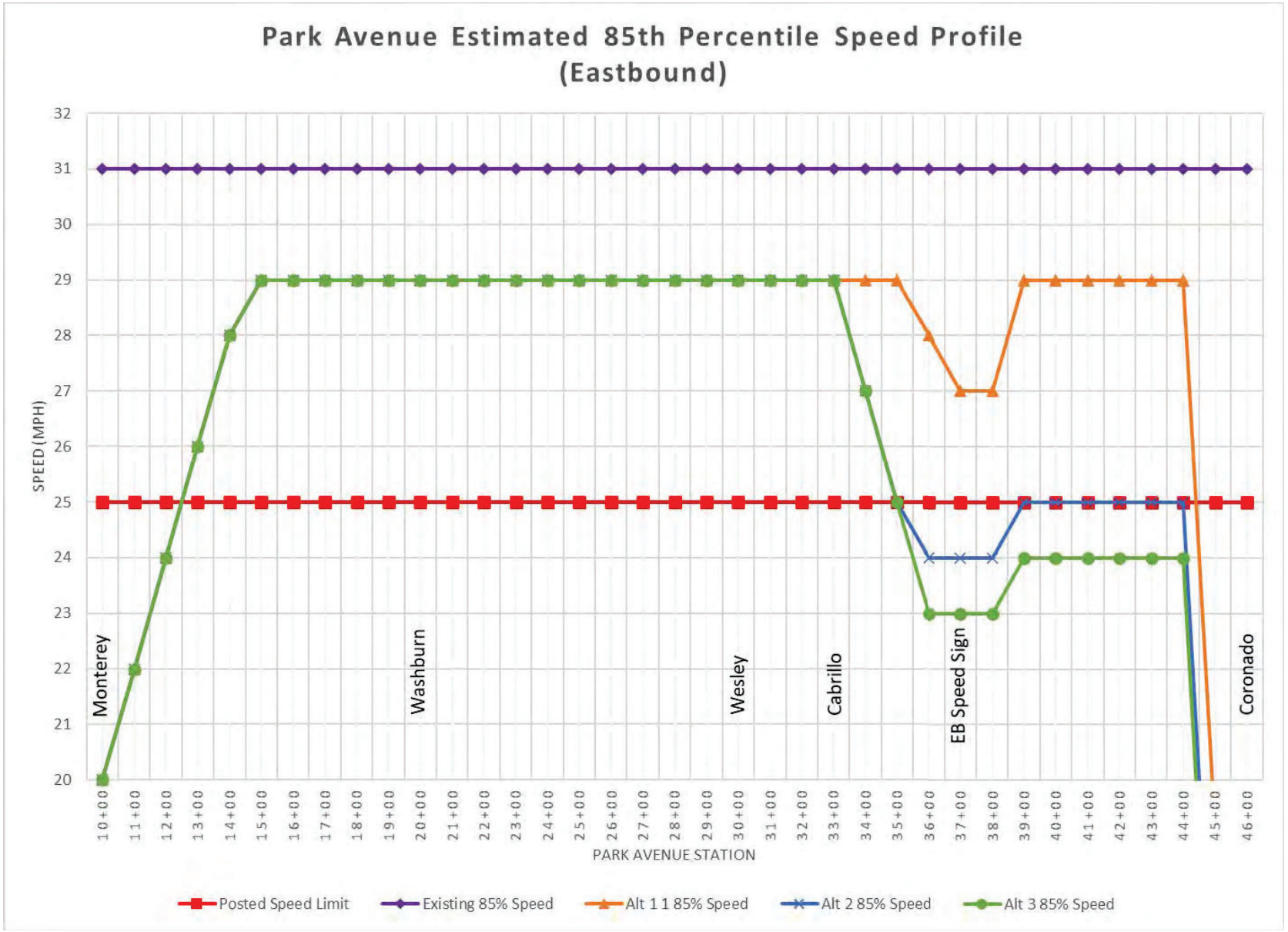
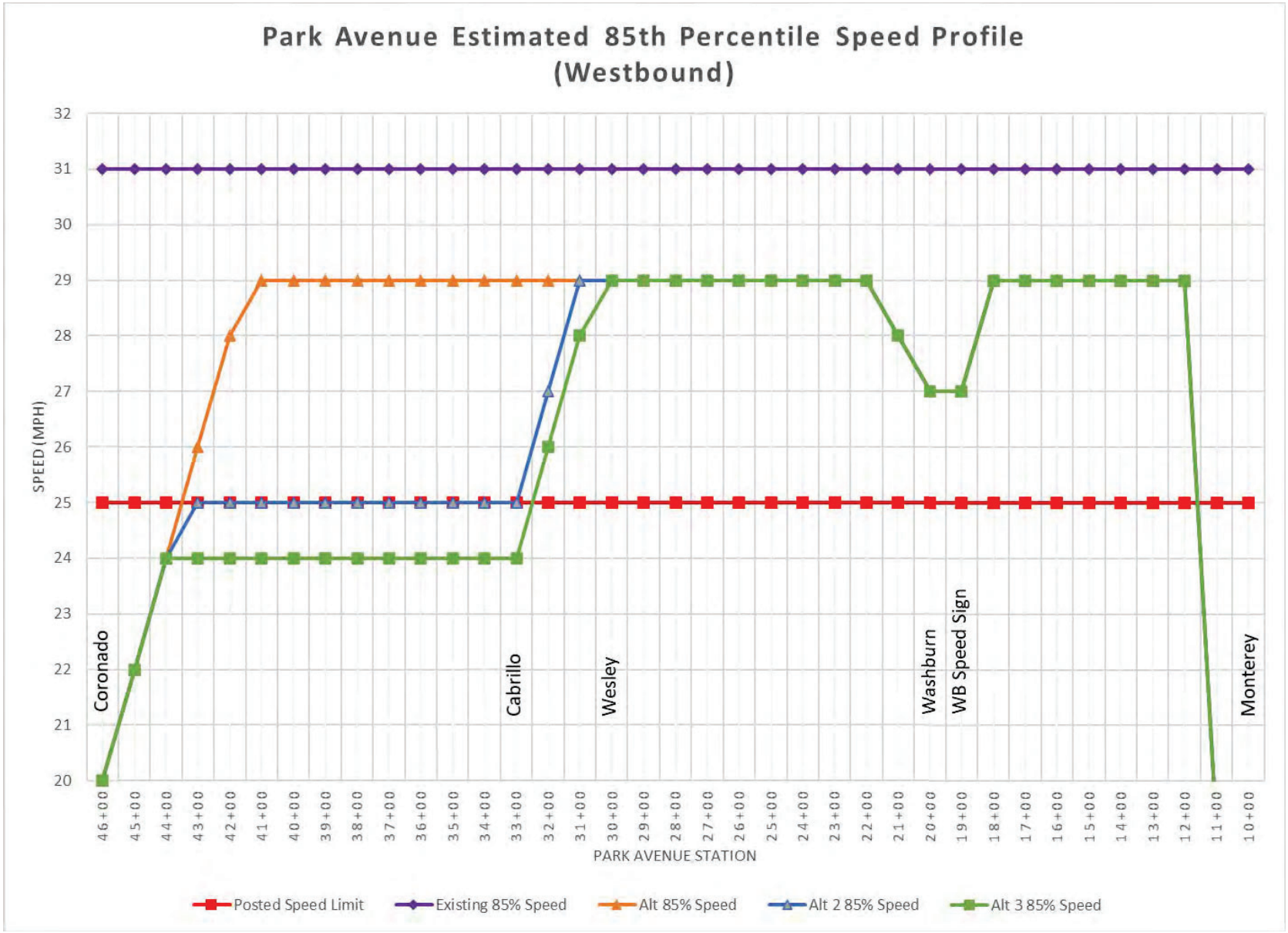


Table 3: Park Avenue Westbound Speed Profile

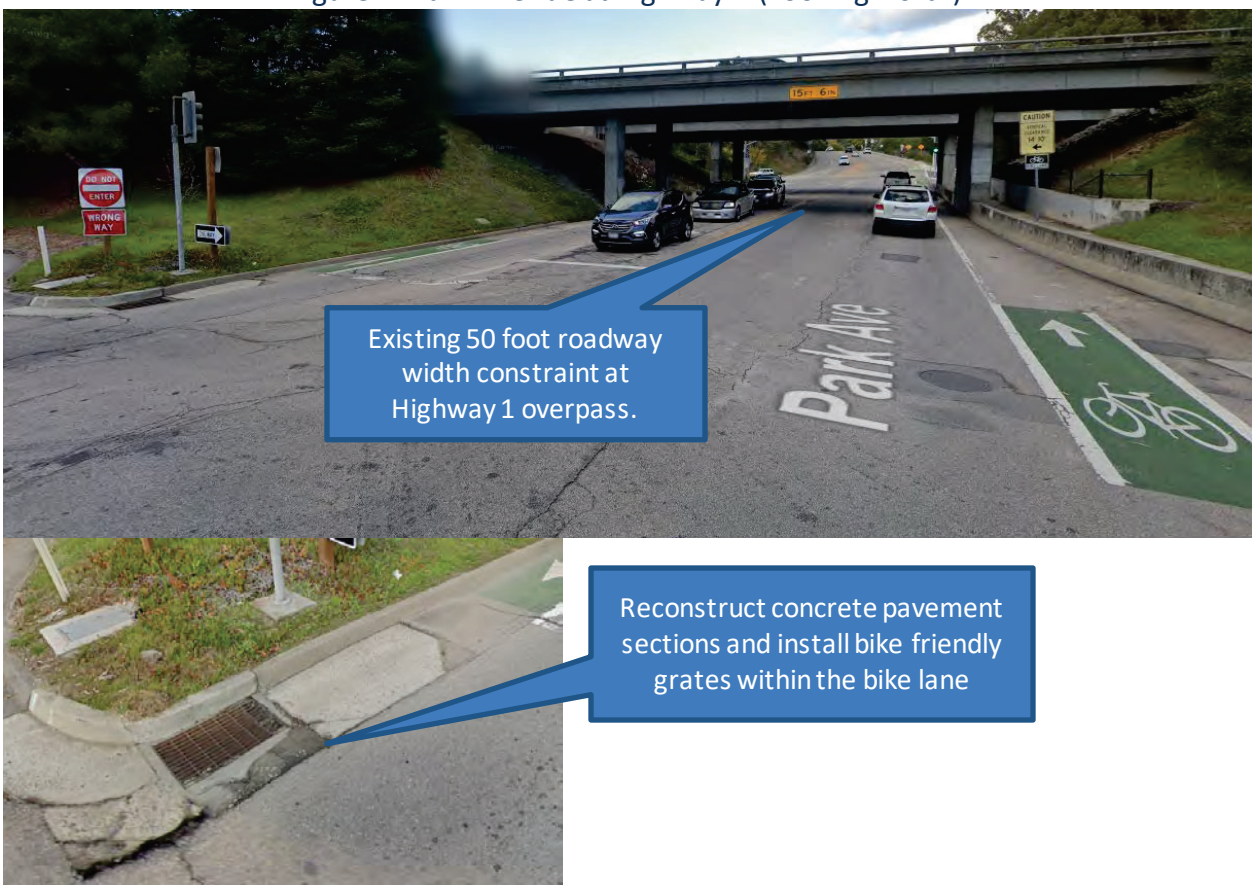


5. Potential Bicycle Access Improvements at Highway 1 Interchange

In 2016, the City added green bike striping on Park Avenue to improve bicycle visibility at the Highway 1 ramp intersections. The existing Park Avenue roadway cross-section at the Highway 1 overpass is approximately 50' wide between the bridge columns and consists of 4' Class II bike lanes, 10.5' travel lanes, and 11' left turn pockets which satisfy the minimum lane dimensions per Caltrans standard. Since this road section needs to maintain the existing Class II bike lanes and vehicle travel lanes in each direction, there is limited space and opportunities to introduce traffic calming features to further enhance bicycle accessibility.

A field review of the Highway 1 intersections revealed that some sections within the existing bike lane have uneven pavement and can potentially create a tripping hazard for bikes. To provide a smooth riding experience for cyclists, it is recommended to reconstruct the uneven pavement sections and replace the existing drainage grates with bicycle-friendly grates within the bike lane.

Figure 2: Park Avenue at Highway 1 (Looking North)



References

Federal Highway Administration. 2014. *Engineering Countermeasures for Reducing Speeds: A Desktop Reference of Potential Effectiveness.* https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/

Ewing, Reid. Institute of Transportation Engineers: Traffic Calming State of the Practice (August 1999)

Xu, Guan. February 17, 2017. Federal Highway Administration: Traffic Calming ePrimer. https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Appendix

- 2020 Park Avenue Speed Survey Data
- 2021 Park Avenue Speed Survey Data
- Traffic Calming Layout – Alternative 1
- Traffic Calming Layout – Alternative 2
- Traffic Calming Layout – Alternative 3

Street:	Park Ave
Limits:	Between Monterey Ave & Coronado St
Direction:	EB & WB

Factors

A. Prevailing Speed Data

Location of Survey	Park Ave. 200' W/O Coronado St.
Date of Survey	01/29/2020
Posted Speed Limit (mph)	25 and 35
# Speed Data Collected	201
85th Percentile (mph)	31
10 mph Pace	22-31
Percent in Pace	84%

B. Traffic Factors

Width	39'
Length of Segment (mi.)	0.68
Street Classification	Other Principal Arterial

C. Collision History

Date Range Covered	1/1/2017-12/31/2019
Total Accidents	Nine collisions, four injury

D. Roadway Conditions

Adjacent Land Use	It is primarily residential with substantial apartment complexes in the area.
Roadway Geometrics	Two-lane roadways. Sidewalks are present on parts of north and south of the roadway. A pedestrian crosswalk is in the middle of the segment. The segment features horizontal curves and multiple steady inclines.
Comments	After evaluating current critical and pace speeds, it is recommended that a 25-mph speed limit be implemented to be in concurrence with section 2B.13 of the MUTCD. The 25-mph speed limit was obtained by a 5-mph reduction of the critical speed of 30 mph due to the number of access points, Residential district density (as defined in section 515), and pedestrian and bicyclist safety. This section has an existing splti speed limit and it is reommended that the speed be equal in both sections to prevent confusion to drivers.

Speed Limit Change?	No
Existing Speed Limit: 25 and 35 MPH	**Recommended Speed Limit: 25 MPH**

This Survey conforms to section 627 and 40802 of the California Vehicle Code section 2B.13 of the California MUTCD and recommends a speed limit appropriate to facilitate the safe and orderly movement of traffic.

Approved and Authorized for release by the City of Capitola Public Works:

Signed: _____ **Title:** City Engineer
Steven E. Jesberg

City of Capitola

DATE: 1/29/20 **Location:** Park Ave 200' W/O Coronado St
TIME: 12:20-13:10 **Posted Speed:** 25 MPH Clear/Dry **Project #:** 20-8004-040

Eastbound & Westbound Spot Speeds

Speed mph	ALL Vehicles
<=10	
11	
12	
13	
14	
15	
16	
17	
18	1
19	2
20	4
21	4
22	11
23	12
24	12
25	17
26	18
27	24
28	21
29	22
30	18
31	13
32	9
33	5
34	4
35	2
36	2
37	
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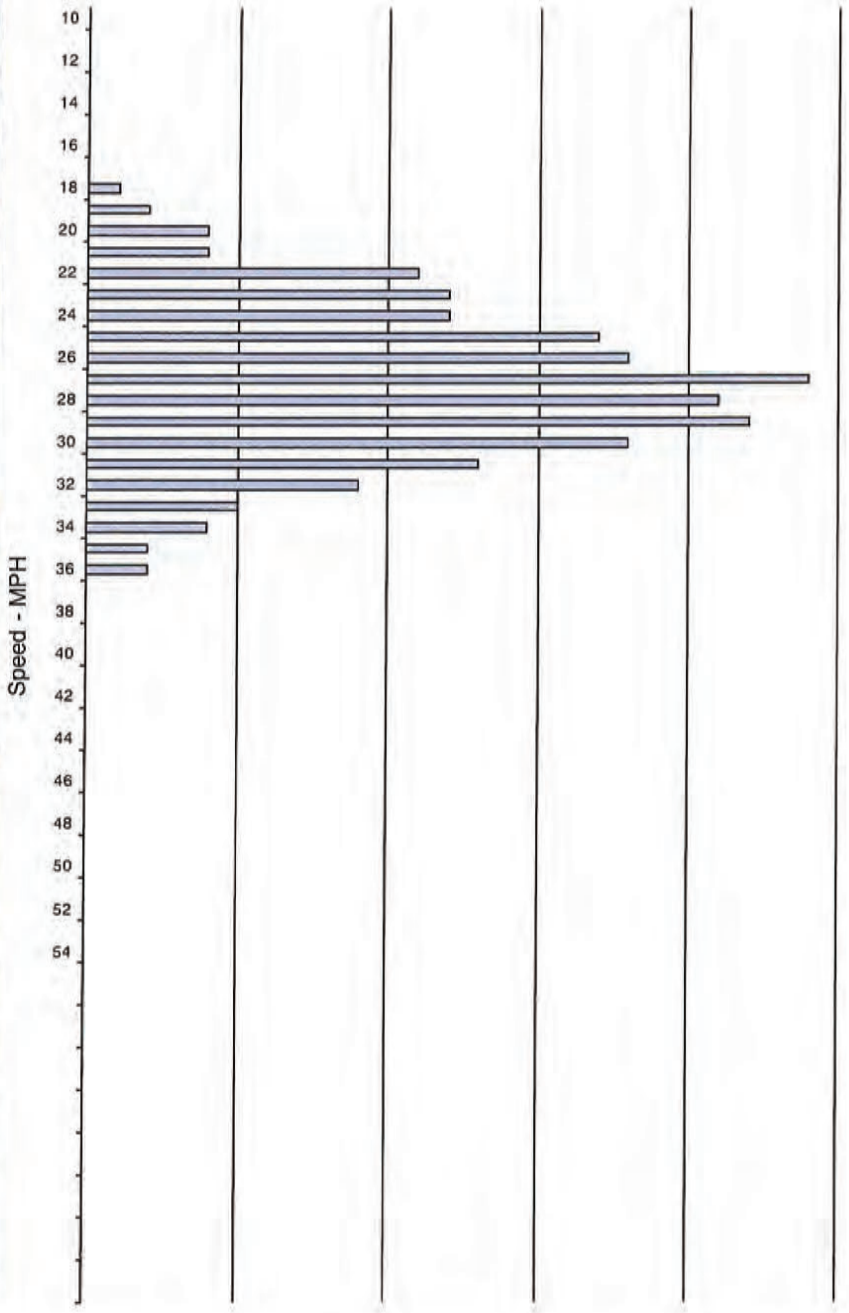


SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	201	18 - 36	27 mph	31 mph	22 - 31	168	84%	5% / 11	11% / 22

Prepared by National Data & Surveying Services

SPEED

316 Park Ave

Day: Sunday
Date: 7/25/2021

City: Capitola
Project #: CA21_090059_005e

East Bound

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	3	13	8	4	0	0	0	0	0	0	0	28
01:00	0	0	1	9	4	1	0	0	0	0	0	0	0	15
02:00	0	0	0	4	3	1	1	0	0	0	0	0	0	9
03:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2
04:00	0	0	1	3	2	0	0	0	0	0	0	0	0	6
05:00	0	0	0	1	3	1	0	0	0	0	0	0	0	5
06:00	0	1	1	8	7	2	1	0	0	0	0	0	0	20
07:00	0	1	15	27	19	6	0	0	0	0	0	0	0	68
08:00	1	2	21	51	26	2	0	0	0	0	0	0	0	103
09:00	2	5	31	67	35	4	0	0	0	0	0	0	0	144
10:00	0	7	66	81	41	4	1	0	0	0	0	0	0	200
11:00	3	11	56	89	56	10	0	0	0	0	0	0	0	225
12:00 PM	14	12	60	122	41	4	0	0	0	0	0	0	0	253
13:00	4	12	70	132	62	11	0	0	0	0	0	0	0	291
14:00	4	6	83	135	59	14	2	1	0	0	0	0	0	304
15:00	11	20	81	127	57	10	3	0	0	0	0	0	0	309
16:00	3	8	62	170	77	13	0	0	0	0	0	0	0	333
17:00	0	4	74	130	62	9	1	0	0	0	0	0	0	280
18:00	0	5	60	144	60	8	3	0	0	0	0	0	0	280
19:00	1	3	34	97	65	15	3	2	0	0	0	0	0	220
20:00	0	4	23	80	59	7	3	0	0	0	0	0	0	176
21:00	0	4	20	53	27	8	1	0	0	0	0	0	0	113
22:00	0	0	12	20	16	4	4	1	0	0	0	0	0	57
23:00	0	0	5	24	16	4	2	0	0	0	0	0	0	51
Totals	43	106	779	1588	805	142	25	4						3492
% of Totals	1%	3%	22%	45%	23%	4%	1%	0%						100%

AM Volumes	6	28	195	354	204	35	3	0	0	0	0	0	0	825
% AM	0%	1%	6%	10%	6%	1%	0%							24%
AM Peak Hour	11:00	11:00	10:00	11:00	11:00	11:00	02:00							11:00
Volume	3	11	66	89	56	10	1							225
PM Volumes	37	78	584	1234	601	107	22	4	0	0	0	0	0	2667
% PM	1%	2%	17%	35%	17%	3%	1%	0%						76%
PM Peak Hour	12:00	15:00	14:00	16:00	16:00	19:00	22:00	19:00						16:00
Volume	14	20	83	170	77	15	4	2						333

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	171		5%	544		16%	613		18%	2164		62%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Park Ave	East Bound	22	28	28	33	35	3492
Park Ave	West Bound	26	31	31	35	38	2802

Prepared by National Data & Surveying Services

SPEED

316 Park Ave

Day: Sunday
Date: 7/25/2021

City: Capitola
Project #: CA21_090059_005w

West Bound

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	3	2	1	2	0	0	0	0	0	0	8
01:00	1	0	1	2	7	1	0	0	0	0	0	0	0	12
02:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2
04:00	0	0	0	2	3	1	0	0	0	0	0	0	0	6
05:00	0	0	0	6	4	3	0	0	0	0	0	0	0	13
06:00	0	0	1	10	19	6	1	1	0	0	0	0	0	38
07:00	0	0	0	15	39	10	2	0	0	0	0	0	0	66
08:00	0	1	1	28	55	21	0	0	0	0	0	0	0	106
09:00	0	1	6	70	75	24	0	0	0	0	0	0	0	176
10:00	0	0	15	77	86	24	2	0	0	0	0	0	0	204
11:00	0	3	21	68	134	14	1	1	0	0	0	0	0	242
12:00 PM	2	2	10	108	157	24	1	1	0	0	0	0	0	305
13:00	0	0	21	127	107	22	0	0	0	0	0	0	0	277
14:00	0	0	13	135	128	16	1	0	0	0	0	0	0	293
15:00	0	4	26	115	115	10	0	0	0	0	0	0	0	270
16:00	2	6	9	56	74	22	4	0	0	0	0	0	0	173
17:00	1	0	9	70	83	21	2	0	0	0	0	0	0	186
18:00	0	0	8	41	60	21	0	0	0	0	0	0	0	130
19:00	0	1	2	30	57	18	2	0	0	0	0	0	0	110
20:00	0	1	7	21	37	17	0	0	0	0	0	0	0	83
21:00	2	2	3	12	16	8	3	1	0	0	0	0	0	47
22:00	0	1	1	5	10	10	0	0	0	0	0	0	0	27
23:00	0	0	1	7	8	7	3	0	0	0	0	0	0	26
Totals	8	22	155	1008	1279	302	24	4						2802
% of Totals	0%	1%	6%	36%	46%	11%	1%	0%						100%

AM Volumes	1	5	45	281	427	106	8	2	0	0	0	0	0	875
% AM	0%	0%	2%	10%	15%	4%	0%	0%						31%
AM Peak Hour	01:00	11:00	11:00	10:00	11:00	09:00		06:00						11:00
Volume	1	3	21	77	134	24	2	1						242
PM Volumes	7	17	110	727	852	196	16	2	0	0	0	0	0	1927
% PM	0%	1%	4%	26%	30%	7%	1%	0%						69%
PM Peak Hour	12:00	16:00	15:00	14:00	12:00	12:00	16:00	12:00						12:00
Volume	2	6	26	135	157	24	4	1						305

Directional Peak Periods All Speeds	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	172		6%	582		21%	359		13%	1689		60%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Park Ave	East Bound	22	28	28	33	35	3492
Park Ave	West Bound	26	31	31	35	38	2802

Prepared by National Data & Surveying Services

SPEED

850 Park Ave

Day: Sunday
Date: 7/25/2021

City: Capitola
Project #: CA21_090059_006e

East Bound

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	1	2	9	8	2	1	0	0	0	0	0	23
01:00	0	0	0	7	5	2	1	1	0	1	0	0	0	17
02:00	0	0	0	2	5	1	2	1	0	0	0	0	0	11
03:00	0	0	1	1	0	0	0	0	0	0	0	0	0	2
04:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4
05:00	0	0	0	2	2	2	1	0	0	0	0	0	0	7
06:00	0	1	2	5	7	3	2	0	0	0	0	0	0	20
07:00	1	1	1	14	36	12	3	1	0	0	0	0	0	69
08:00	0	0	7	21	46	18	4	0	0	0	0	0	0	96
09:00	0	0	10	47	65	21	2	0	0	0	0	0	0	145
10:00	0	0	3	51	71	42	4	0	0	0	0	0	0	171
11:00	0	0	6	35	105	45	12	0	0	0	0	0	0	203
12:00 PM	0	0	9	45	129	39	11	0	0	0	0	0	0	233
13:00	2	1	8	71	111	55	3	0	0	0	0	0	0	251
14:00	1	0	17	90	123	52	6	0	0	0	0	0	0	289
15:00	1	0	8	78	127	61	8	0	0	0	0	0	0	283
16:00	0	1	9	83	125	69	13	1	0	0	0	0	0	301
17:00	1	3	8	59	122	55	10	2	1	0	0	0	0	261
18:00	0	0	10	88	123	46	7	0	0	0	0	0	0	274
19:00	0	0	3	49	112	39	7	0	0	0	0	0	0	210
20:00	0	0	2	43	83	31	3	1	1	0	0	0	0	164
21:00	0	0	5	23	49	25	7	0	0	0	0	0	0	109
22:00	0	0	2	8	20	11	5	1	0	0	0	0	0	47
23:00	0	0	0	9	18	16	2	1	0	0	0	0	0	46
Totals	6	7	112	833	1496	654	115	10	2	1				3236
% of Totals	0%	0%	3%	26%	46%	20%	4%	0%	0%	0%				100%

AM Volumes	1	2	31	187	354	155	33	4	0	1	0	0	0	768
% AM	0%	0%	1%	6%	11%	5%	1%	0%		0%				24%
AM Peak Hour	07:00	06:00	09:00	10:00	11:00	11:00	11:00			01:00				11:00
Volume	1	1	10	51	105	45	12	1		1				203
PM Volumes	5	5	81	646	1142	499	82	6	2	0	0	0	0	2468
% PM	0%	0%	3%	20%	35%	15%	3%	0%	0%					76%
PM Peak Hour	13:00	17:00	14:00	14:00	12:00	16:00	16:00	17:00	17:00					16:00
Volume	2	3	17	90	129	69	13	2	1					301

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	165		5%	484		15%	562		17%	2025		63%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Park Ave	East Bound	27	32	32	37	40	3236
Park Ave	West Bound	28	33	33	38	41	2512

Prepared by National Data & Surveying Services

SPEED

850 Park Ave

Day: Sunday
Date: 7/25/2021

City: Capitola
Project #: CA21_090059_006w

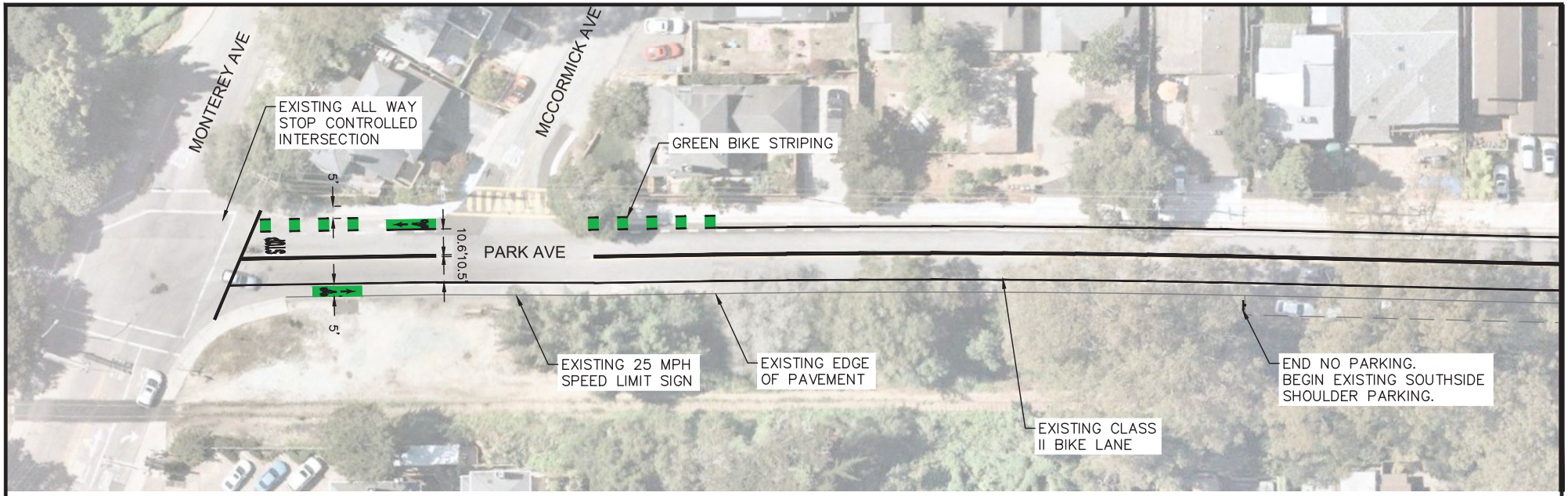
West Bound

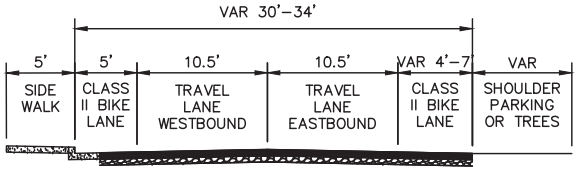
Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	3	5	1	1	1	0	0	0	0	0	11
01:00	0	0	0	1	5	3	1	0	0	0	0	0	0	10
02:00	0	0	0	0	2	2	1	0	0	0	0	0	0	5
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
04:00	0	0	0	1	2	1	2	0	0	0	0	0	0	6
05:00	0	0	0	3	6	1	3	0	0	0	0	0	0	13
06:00	0	0	0	9	13	8	3	1	0	0	0	0	0	34
07:00	0	1	1	9	30	16	2	0	0	0	0	0	0	59
08:00	0	3	2	10	39	13	9	1	0	0	0	0	0	77
09:00	0	0	0	27	67	43	13	0	0	0	0	0	0	150
10:00	0	0	1	37	94	49	12	0	0	0	0	0	0	193
11:00	0	0	3	32	80	82	15	3	0	0	0	0	0	215
12:00 PM	0	4	4	38	142	83	13	2	0	0	0	0	0	286
13:00	0	0	7	55	122	51	11	0	0	0	0	0	0	246
14:00	0	0	9	44	125	73	8	0	0	0	0	0	0	259
15:00	0	2	6	33	122	58	10	0	0	0	0	0	0	231
16:00	0	0	4	32	57	41	16	2	0	0	0	0	0	152
17:00	0	1	3	35	80	32	7	0	0	0	0	0	0	158
18:00	0	0	1	19	52	39	5	1	1	0	0	0	0	118
19:00	0	0	6	29	50	23	6	0	0	0	0	0	0	114
20:00	0	1	1	19	35	19	3	0	0	0	0	0	0	78
21:00	0	0	1	6	19	13	5	0	0	0	0	0	0	44
22:00	0	2	1	3	11	9	1	0	1	0	0	0	0	28
23:00	0	0	2	1	9	9	1	1	0	0	0	0	0	23
Totals		14	52	446	1168	670	148	12	2					2512
% of Totals		1%	2%	18%	46%	27%	6%	0%	0%					100%

AM Volumes	0	4	7	132	344	220	62	6	0	0	0	0	0	775
% AM		0%	0%	5%	14%	9%	2%	0%						31%
AM Peak Hour		08:00	11:00	10:00	10:00	11:00	11:00	11:00						11:00
Volume		3	3	37	94	82	15	3						215
PM Volumes	0	10	45	314	824	450	86	6	2	0	0	0	0	1737
% PM		0%	2%	13%	33%	18%	3%	0%	0%					69%
PM Peak Hour		12:00	14:00	13:00	12:00	12:00	16:00	12:00	18:00					12:00
Volume		4	9	55	142	83	16	2	1					286

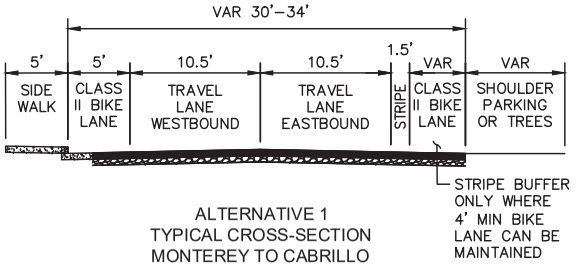
Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	136		5%	532		21%	310		12%	1534		61%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Park Ave	East Bound	27	32	32	37	40	3236
Park Ave	West Bound	28	33	33	38	41	2512

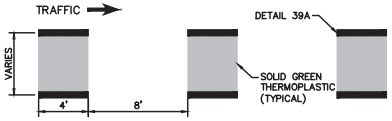




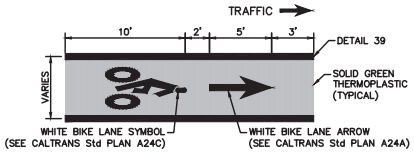
EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
MONTEREY TO CABRILLO



ALTERNATIVE 1
TYPICAL CROSS-SECTION
MONTEREY TO CABRILLO



GREEN BIKE MARKING - DASHED



GREEN BIKE MARKING

Kimley»Horn

NORTH

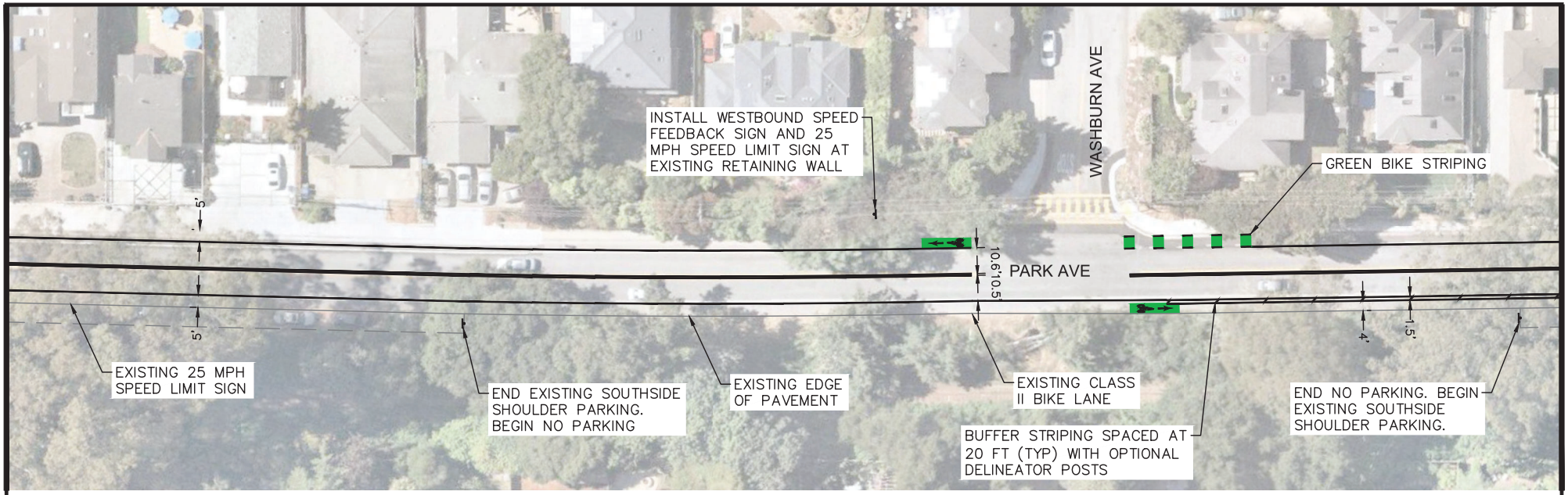
GRAPHIC SCALE IN FEET
0 20 40 80

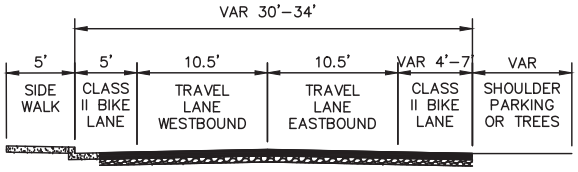
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

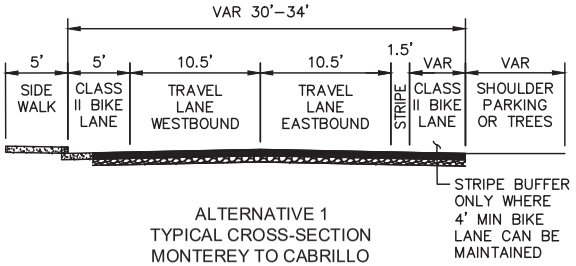
ALTERNATIVE 1 - ROAD DIET STRIPING
PROPOSED TC LAYOUT - SHEET 1

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

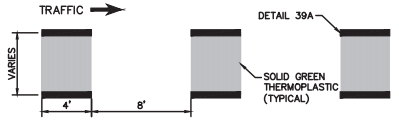




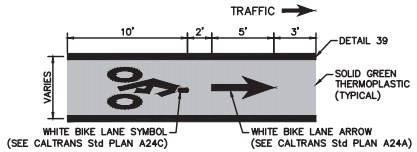
EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
MONTEREY TO CABRILLO



ALTERNATIVE 1
TYPICAL CROSS-SECTION
MONTEREY TO CABRILLO



GREEN BIKE MARKING - DASHED



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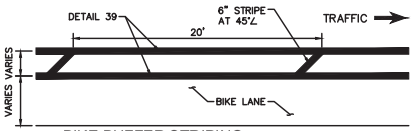


BIKE BUFFER STRIPING

Kimley»Horn

NORTH

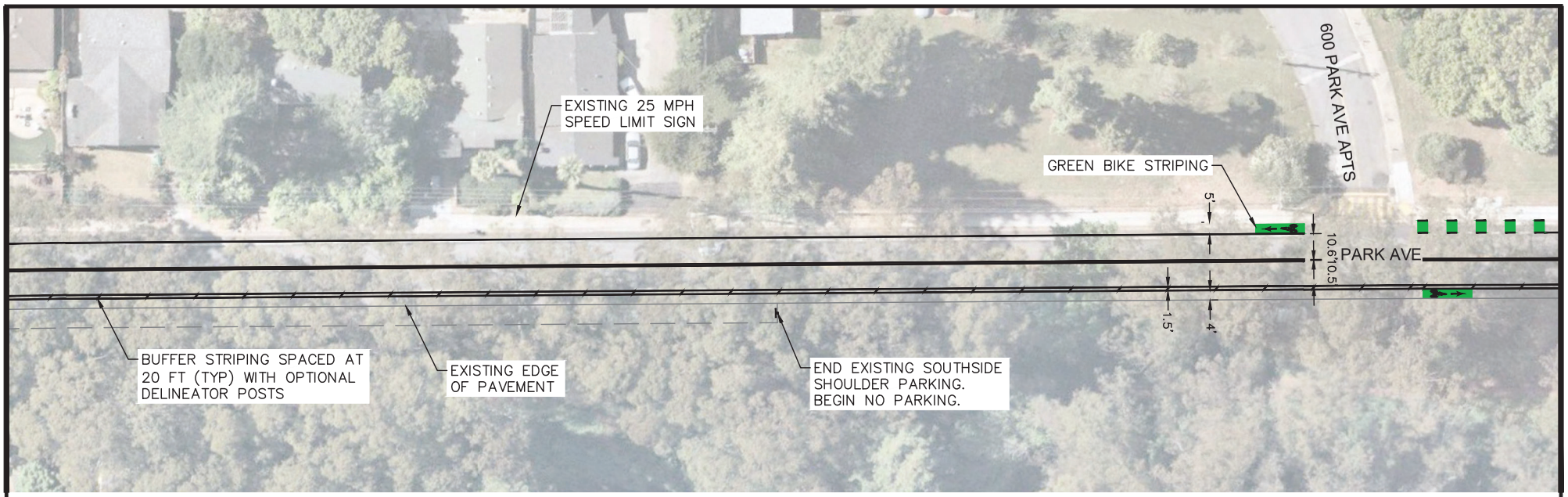
GRAPHIC SCALE IN FEET
0 20 40 80

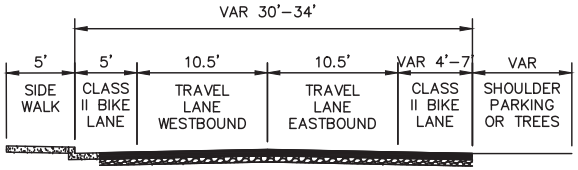
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

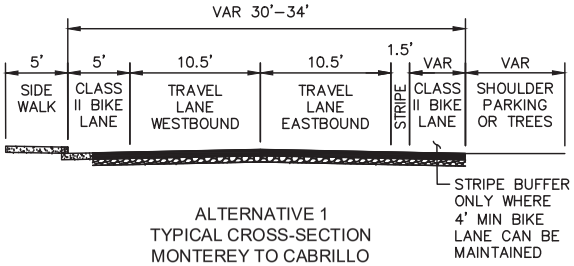
ALTERNATIVE 1 - ROAD DIET STRIPING
PROPOSED TC LAYOUT - SHEET 2

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

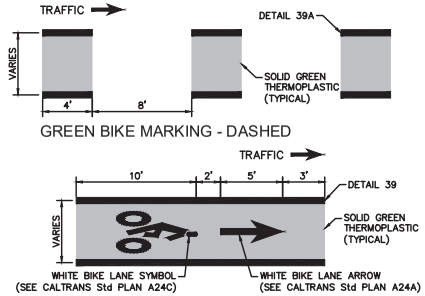




EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
MONTEREY TO CABRILLO



ALTERNATIVE 1
TYPICAL CROSS-SECTION
MONTEREY TO CABRILLO



Kimley»Horn

NORTH

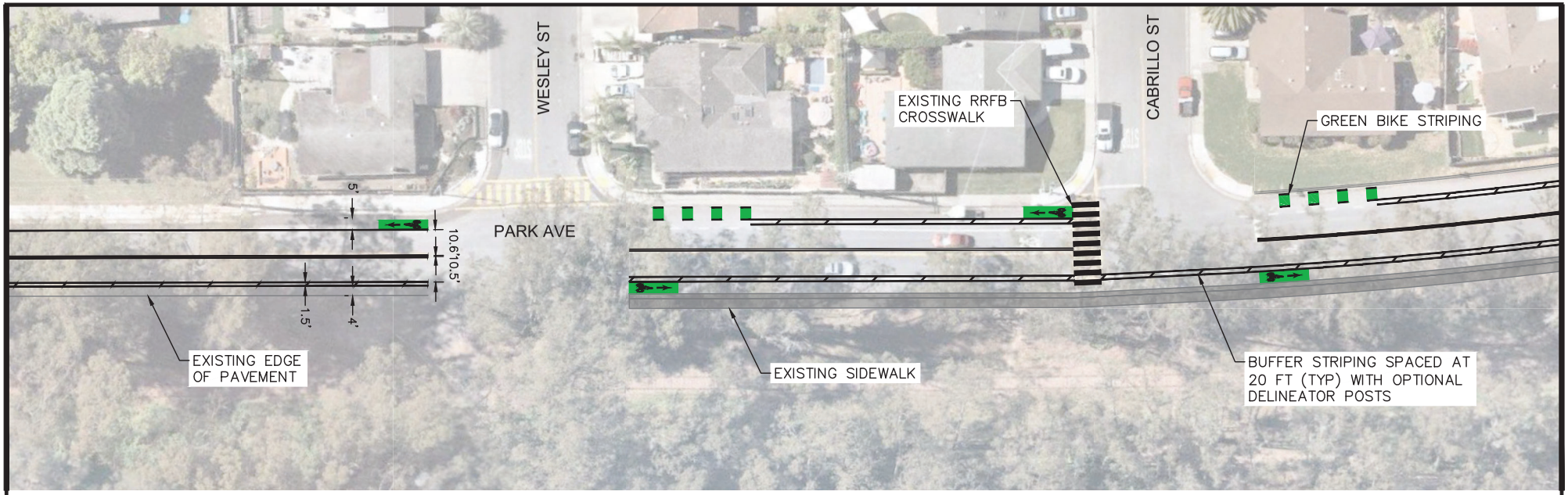
GRAPHIC SCALE IN FEET
0 20 40 80

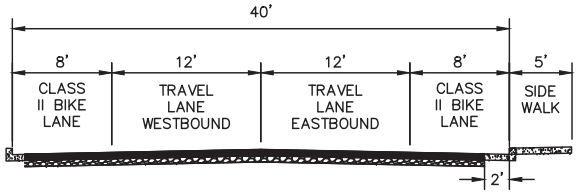
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

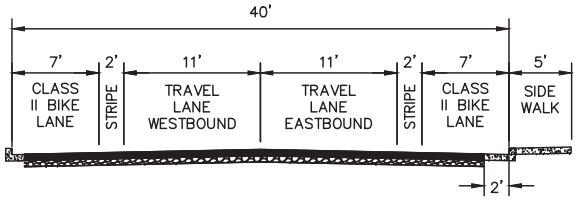
ALTERNATIVE 1 - ROAD DIET STRIPING
PROPOSED TC LAYOUT - SHEET 3

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

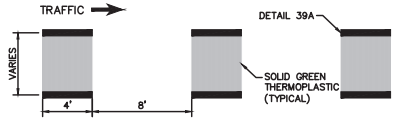




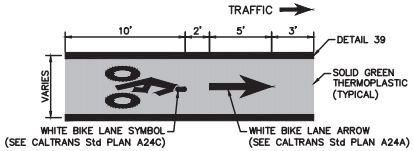
EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



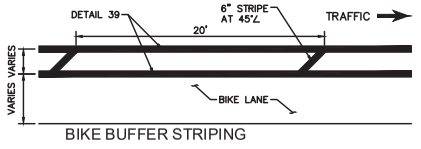
ALTERNATIVE 1
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



GREEN BIKE MARKING - DASHED



GREEN BIKE MARKING



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

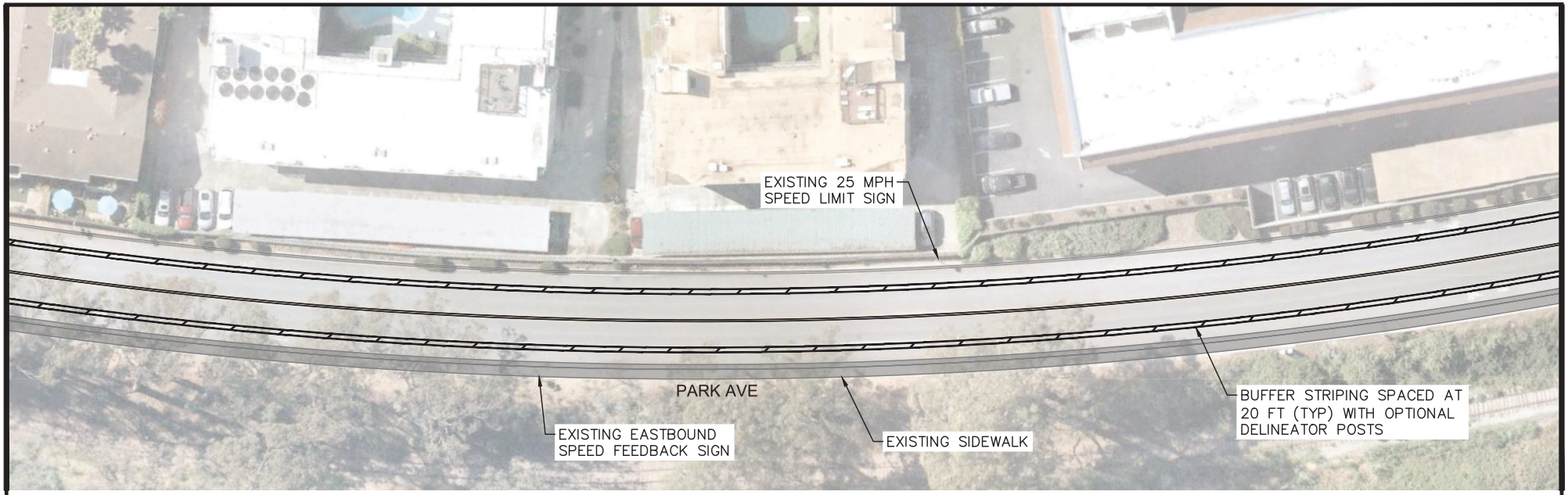
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

ALTERNATIVE 1 - ROAD DIET STRIPING
PROPOSED TC LAYOUT - SHEET 4

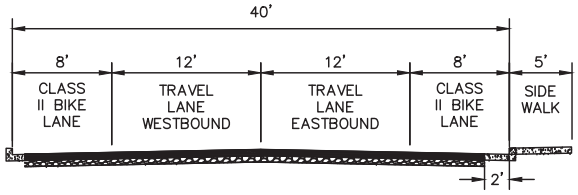
CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

DWW-097763139 MAY 2022

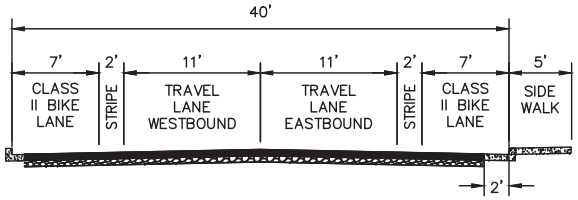
MATCHLINE



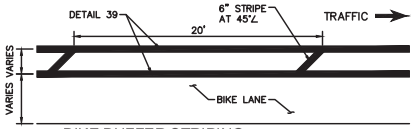
MATCHLINE



EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



ALTERNATIVE 1
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

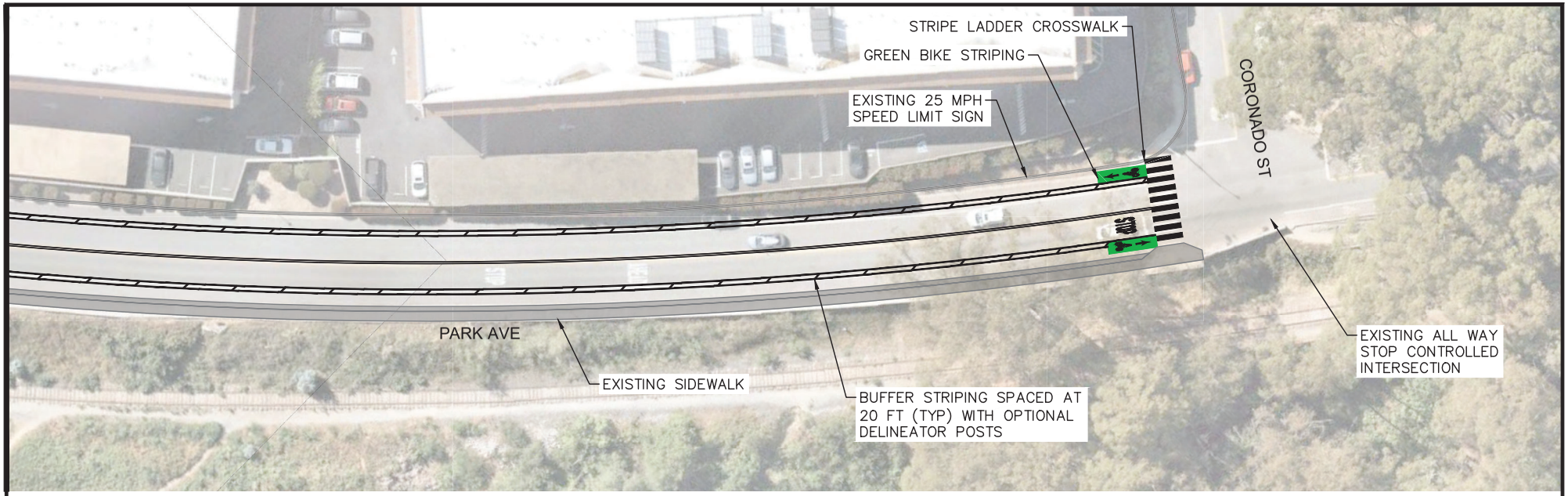
ALTERNATIVE 1 - ROAD DIET STRIPING
PROPOSED TC LAYOUT - SHEET 5

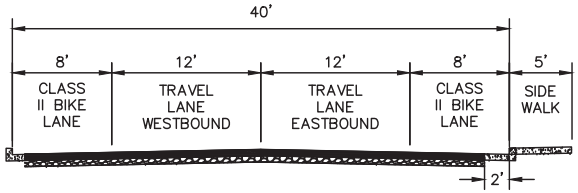
CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

DWW-097763139 MAY 2022

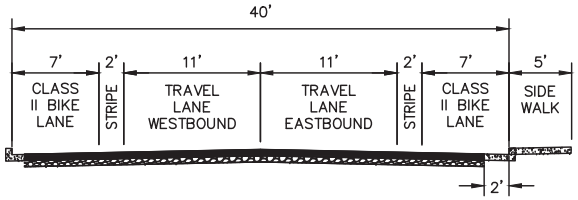
References

MATCHLINE

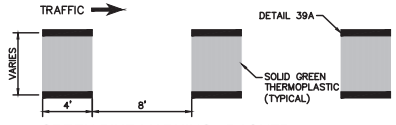




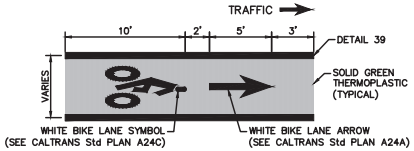
EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



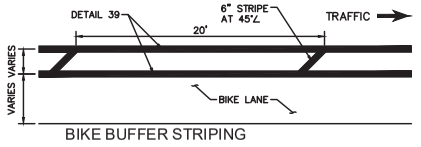
ALTERNATIVE 1
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



GREEN BIKE MARKING - DASHED



GREEN BIKE MARKING



BIKE BUFFER STRIPING

Kimley»Horn

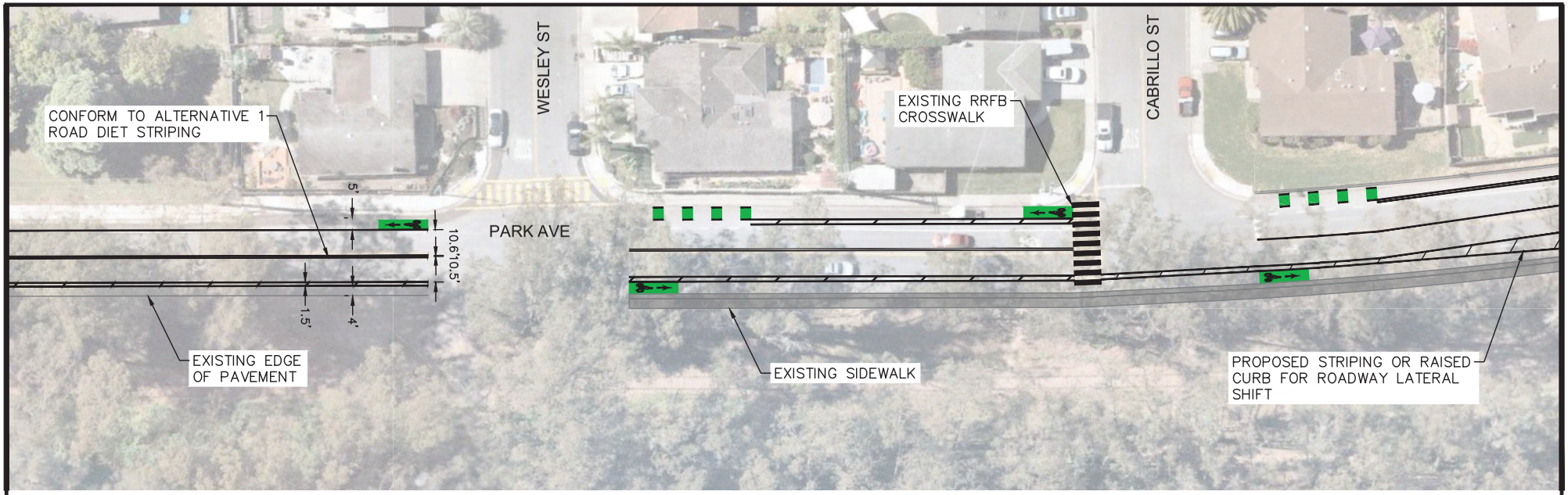
NORTH

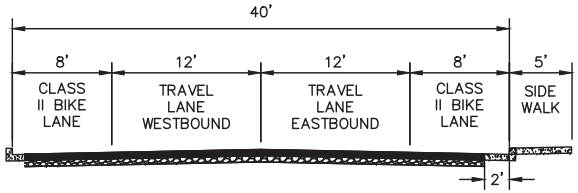
GRAPHIC SCALE IN FEET
0 20 40 80

CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

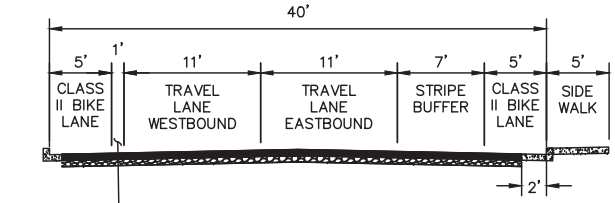
ALTERNATIVE 1 - ROAD DIET STRIPING
PROPOSED TC LAYOUT - SHEET 6

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

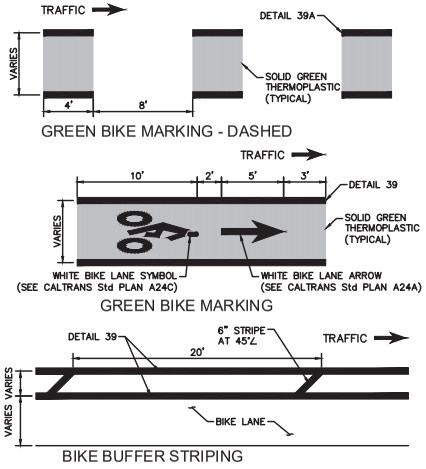




EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



ALTERNATIVE 2
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



Kimley»Horn

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

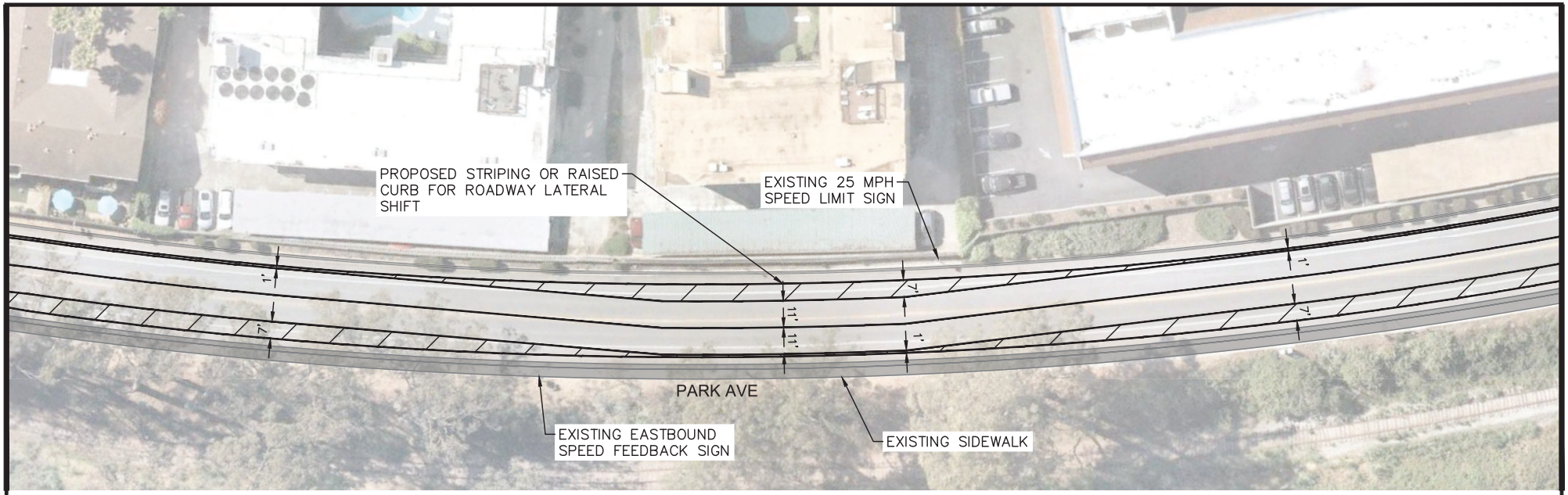
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

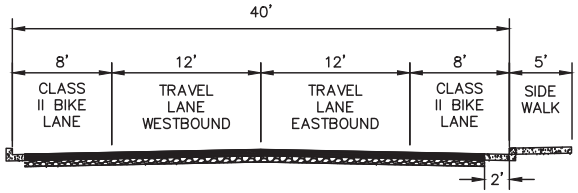
ALTERNATIVE 2 - LATERAL SHIFT
PROPOSED TC LAYOUT - SHEET 4

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

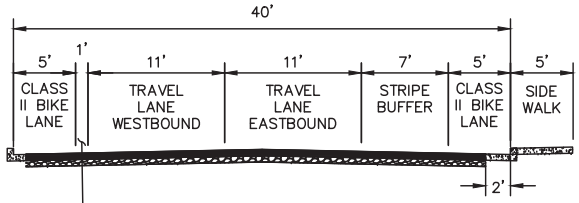
MATCHLINE



MATCHLINE - SEE BELOW

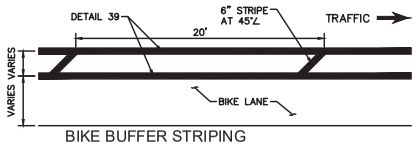


EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER (STRIPED)

ALTERNATIVE 2
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

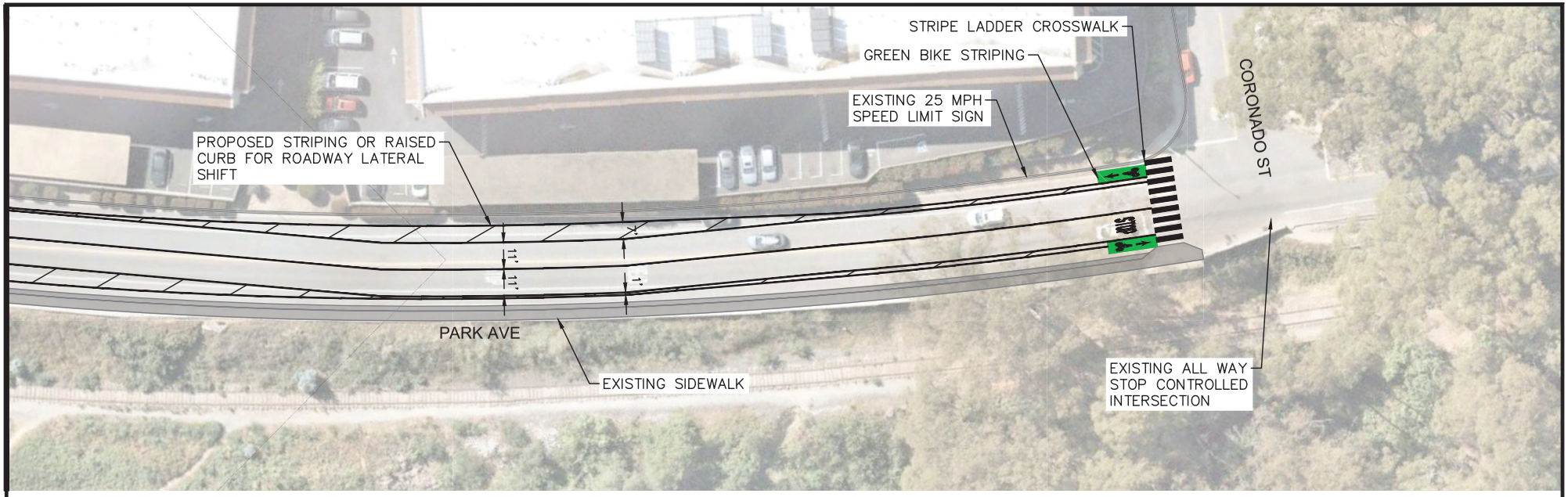
GRAPHIC SCALE IN FEET
0 20 40 80

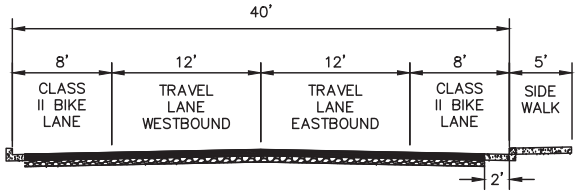
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

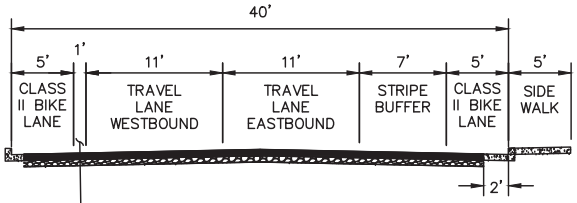
ALTERNATIVE 2 - LATERAL SHIFT
PROPOSED TC LAYOUT - SHEET 5

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING



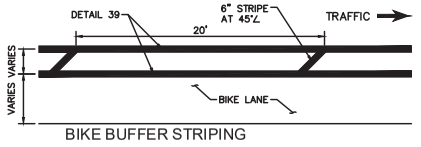


EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER (STRIPED)

ALTERNATIVE 2
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

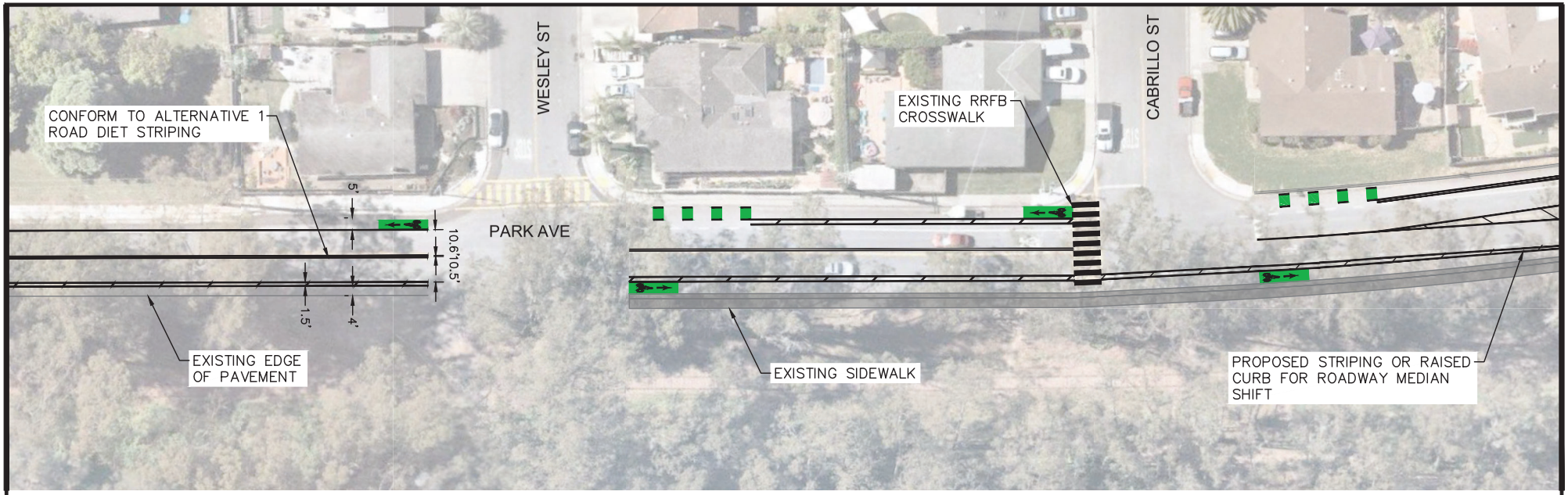
GRAPHIC SCALE IN FEET
0 20 40 80

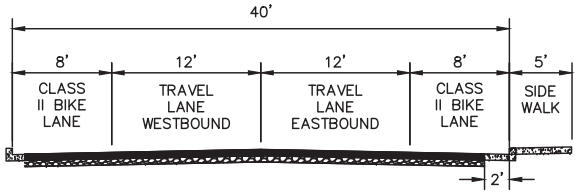
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

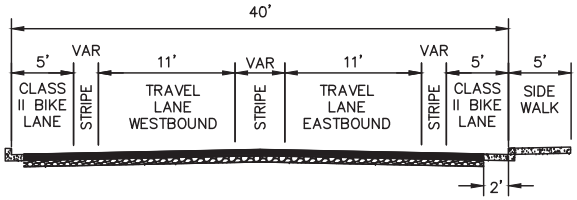
ALTERNATIVE 2 - LATERAL SHIFT
PROPOSED TC LAYOUT - SHEET 6

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

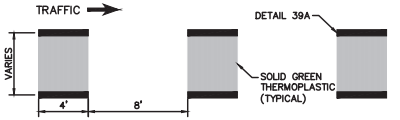




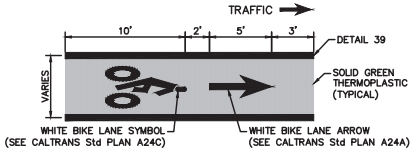
EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



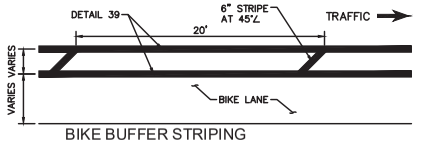
ALTERNATIVE 3
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



GREEN BIKE MARKING - DASHED



GREEN BIKE MARKING



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

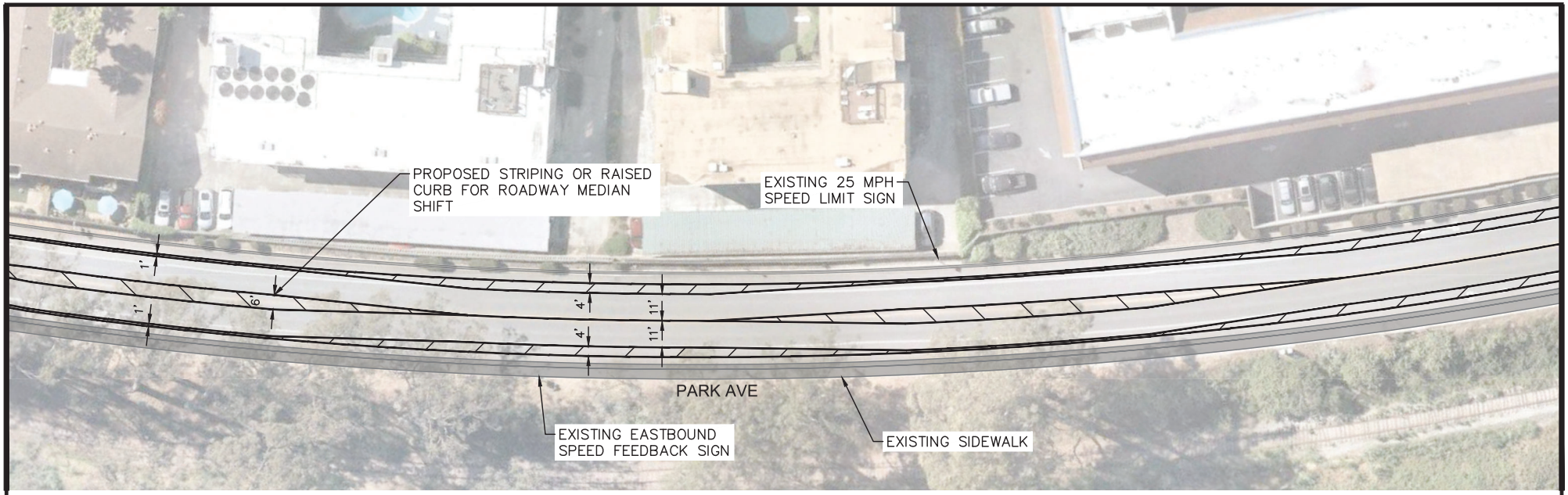
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

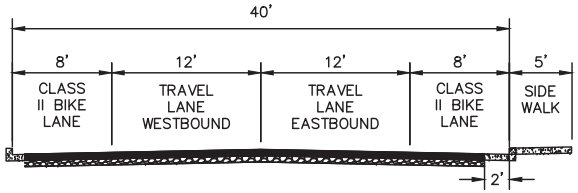
ALTERNATIVE 3 - MEDIAN SHIFT
PROPOSED TC LAYOUT - SHEET 4

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

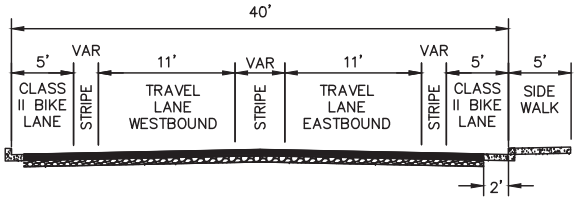
MATCHLINE



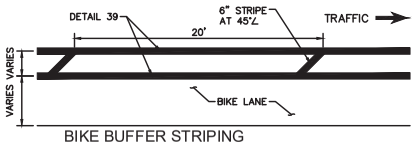
MATCHLINE - SEE BELOW



EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



ALTERNATIVE 3
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

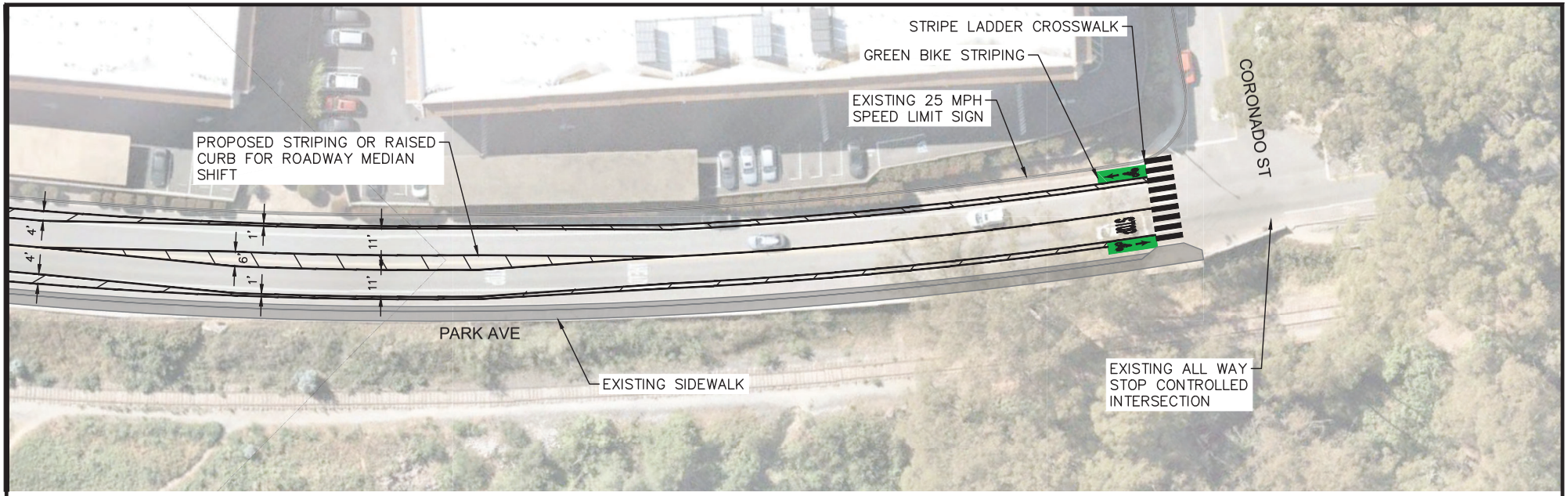
GRAPHIC SCALE IN FEET
0 20 40 80

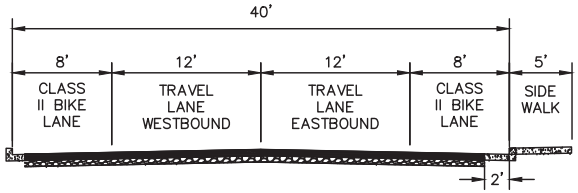
CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

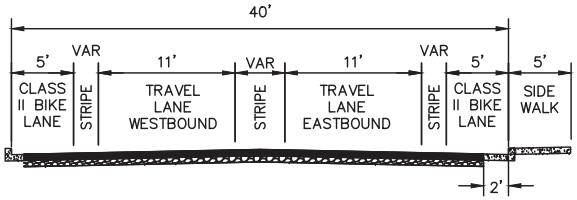
ALTERNATIVE 3 - MEDIAN SHIFT
PROPOSED TC LAYOUT - SHEET 5

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING

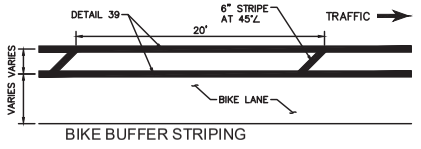




EXISTING PARK AVENUE
TYPICAL CROSS-SECTION
CABRILLO TO CORONADO



ALTERNATIVE 3
TYPICAL ROAD CROSS-SECTION
CABRILLO TO CORONADO



BIKE BUFFER STRIPING

Kimley»Horn

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

CONCEPT LAYOUT FOR PLANNING PURPOSES. NOT FOR CONSTRUCTION

DWW-097763139 MAY 2022

ALTERNATIVE 3 - MEDIAN SHIFT
PROPOSED TC LAYOUT - SHEET 6

CITY OF CAPITOLA - PARK AVENUE TRAFFIC CALMING