Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop and two-way stop control. All-way stop control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Exhibit 49a shows LOS criteria for unsignalized intersections.

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 – 50
F[1]	50

Source: *Highway Capacity Manual 7th Edition, Transportation Research Board, 2022.*

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned to an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Exhibit 49a. Level of Service Criteria for Unsignalized Intersections

		Existing AM		Existing PM	
Intersection	Control Type	Delay	LOS	Delay	LOS
3. LOVR & S. Bay Blvd	Signalized	29.4	C	35.6	D
4. LOVR & Fairchild Way	TWSC	20	C	18.7	C
5. LOVR & Sunset Dr	TWSC	21.5	C	28.7	D
6. LOVR & 10th St	Signalized	40.4	D	7.4	A
7. LOVR & 9th St	Signalized	37.4	D	26.1	C
8. LOVR & Palisades Ave	Signalized	27.5	C	26.6	C
9. LOVR & Ravenna Ave	TWSC	14	B	13.5	B
10. LOVR & Broderson Ave	TWSC	12.9	B	12.5	B
11. LOVR & Pine Ave	TWSC	17.9	C	16.2	C
12. LOVR & Alexander Ave	TWSC	11.5	B	10.6	B
13. LOVR & Doris Ave	Signalized	15.1	B	14.1	B

TWSC = Two Way STOP Control (STOP signs for vehicles on minor street approaches)

Exhibit 50. Existing LOS and Delay

As shown in Exhibit 51, with future traffic volumes and no project buildout, multiple intersections have worsened LOS or increased delay, with multiple operating at LOS E or worse. The most pronounced impacts are seen at S. Bay Boulevard, with an increased delay of over 75.5-77.3 seconds, Sunset Boulevard during PM peak, with a 74.3 second increase, and Fairchild Way during PM peak, with a 202.7 second increase.

		Future AM			Future PM		
Intersection	Control Type	Delay	LOS	Change	Delay	LOS	Change
3. LOVR & S. Bay Blvd	Signalized	105.7	F	77.3	111.1	F	75.5
4. LOVR & Fairchild Way	TWSC	63.3	F	43.3	221.4	F	202.7
5. LOVR & Sunset Dr	TWSC	31.4	D	9.9	103	F	74.3
6. LOVR & 10th St	Signalized	11.2	B	-29.2	13.1	B	5.7
7. LOVR & 9th St	Signalized	24.1	C	-13.3	17.7	B	-8.4
8. LOVR & Palisades Ave	Signalized	86.4	F	58.9	62.4	E	35.8
9. LOVR & Ravenna Ave	TWSC	18	C	4	24	C	10.5
10. LOVR & Broderson Ave	TWSC						
11. LOVR & Pine Ave	TWSC	22	C	4.1	17.2	C	1
12. LOVR & Alexander Ave	TWSC						
13. LOVR & Doris Ave	Signalized	20.2	C	5.1	16.2	B	2.1

TWSC = Two Way STOP Control (STOP signs for vehicles on minor street approaches)

Exhibit 51. Future Volume LOS and Delay

As shown in Exhibit 52, all intersections operate at LOS D or better under existing traffic volumes with project conditions. The only exception is LOVR and 9th Street under the alternate project conditions where left turns are eliminated at 10th Street.

		Existing AM + Project		Existing PM + Project	
Intersection	Control Type	Delay	LOS	Delay	LOS
3. LOVR & S. Bay Blvd	Signalized	28.4	C	35.6	D
4. LOVR & Fairchild Way	TWSC	24.5	C	25.9	D
5. LOVR & Sunset Dr	TWSC	14.7	B	16.2	C
6. LOVR & 10th St	Signalized	5.3	A	8	A
7. LOVR & 9th St	Signalized	29.7	C	39.3	D
8. LOVR & Palisades Ave	Signalized	27.5	C	26.6	C
9. LOVR & Ravenna Ave	TWSC	14	B	13.5	B
10. LOVR & Broderson Ave	TWSC	12.9	B	12.5	B
11. LOVR & Pine Ave	TWSC	17.9	C	16.2	C
12. LOVR & Alexander Ave	TWSC	11.5	B	10.6	B
13. LOVR & Doris Ave	Signalized	15.1	B	14.1	B
Alternative 2					
6. LOVR & 10th St	TWSC	10.9	B	14.5	B
7. LOVR & 9th St	Signalized	49.8	D	73.7	E

TWSC = Two Way STOP Control (STOP signs for vehicles on minor street approaches)

Exhibit 52. Existing + Project LOS and Delay

As shown in Exhibit 53, with future traffic volumes and full project buildout, multiple intersections have worsened LOS or increased delay, with multiple operating at LOS E or worse. LOVR and Fairchild Way during PM peak has the worst impact, with delay of 11.5 minutes.

		Future AM + Project			Future PM + Project		
Intersection	**Control Type**	**Delay**	**LOS**	**Change**	**Delay**	**LOS**	**Change**
3. LOVR & S. Bay Blvd	Signalized	105.7	F	77.3	111.1	F	75.5
4. LOVR & Fairchild Way	TWSC	103.7	F	79.2	690.5	F	664.6
5. LOVR & Sunset Dr	TWSC	21.9	C	7.2	28.2	D	12
6. LOVR & 10th St	Signalized	46	D	40.7	28	C	20
7. LOVR & 9th St	Signalized	31.3	C	1.6	17.9	B	-21.4
8. LOVR & Palisades Ave	Signalized	86.4	F	58.9	62.4	E	35.8
9. LOVR & Ravenna Ave	TWSC	17.9	C	3.9	18.7	C	5.2
10. LOVR & Broderson Ave	TWSC						
11. LOVR & Pine Ave	TWSC	22	C	4.1	17.2	C	1
12. LOVR & Alexander Ave	TWSC						
13. LOVR & Doris Ave	Signalized	20.6	C	5.5	16.6	B	2.5
Alternative 2							
6. LOVR & 10th St	TWSC	10.5	B	3.6	28	D	13.5
7. LOVR & 9th St	Signalized	37.5	D	-12.3	29	C	-44.7

TWSC = Two Way STOP Control (STOP sign for vehicles on minor street approaches)

Exhibit 53. Future Volume + Project LOS and Delay

The level of service and delay for the intersection of LOVR and Foothill Blvd, under the existing and roundabout scenarios, are shown in Exhibit 54. The LOS analyses show that converting the intersection into a single lane roundabout would significantly improve traffic operations in the intersection during both peak periods. For the AM peak period, delay would decrease by 2.8 vehicles/second and LOS would improve from LOS D to LOS A. For the PM peak period, delay would decrease by 29.6 vehicles/second and LOS would improve from LOS D to LOS A.

Overall, the project conditions have minimal impact on LOS and delay under both existing and future volumes when compared to operations under future traffic volumes and no changes. The only extreme difference is LOVR and Fairchild Way during PM peak hours, which is likely the result of increased traffic from the elimination of left-turn and through traffic at Sunset Boulevard.

Intersection	Peak Period	Existing (Signalized)		Single Lane Roundabout		Change (veh/sec)
		Delay (veh/sec)	LOS	Delay (veh/sec)	LOS	
Los Osos Valley Rd/W Foothill Blvd/ Sycamore Canyon Rd	AM	38.9	D	6.7	A	32.2
	PM	37.4	D	7.6	A	29.6

Exhibit 54. LOS Analysis

5.9. Intersection Control Evaluation: LOVR and Foothill Blvd

An Intersection Control Evaluation (ICE) was conducted for the Los Osos Valley Road and W Foothill Boulevard/Sycamore Canyon Road intersection for the following options:

1. Traffic Signal (Existing)
2. A single lane roundabout with a right-turn lane

An ICE is a data-driven analysis used to provide a well-balanced and comprehensive approach towards analyzing alternatives and selecting an optimal method of traffic control for an intersection. Some of the benefits of carrying out an ICE include the following:

- The opportunity to implement solutions that will be both cost-effective and sustainable
- The utilization of innovative practices that have had their effectiveness tested and proven
- Providing accountability, transparency, and data-driven support for transportation decisions
- The use of objective metrics that can assess the performance of multiple solutions

An ICE is generally conducted when substantial changes to the traffic control and geometry of an intersection are proposed. This allows for a thorough assessment of the impacts of various solutions prior to a final decision being made.

The intersection of Los Osos Valley Road and W Foothill Boulevard/Sycamore Canyon Road is a 4-way intersection in the City of San Luis Obispo, California. The intersection contains 2 through lanes, left turn lanes for W Foothill Blvd and Sycamore Canyon Rd, and right turn lanes for turns from LOVR to Foothill and from Foothill to LOVR (with merge lane). For bicycles, the intersection contains a 5’ – 10’ bike lane/shoulder on EB side, an 11’ bike lane/shoulder on WB side, and 6’ green bike lanes through the intersection. For pedestrians, there are crosswalks on the north leg (incomplete) and east leg of intersection, pedestrian refuges between right turn lanes and through lanes, and no sidewalks. The intersection is currently controlled by a traffic signal. The existing setup is shown in Exhibit 55, and the proposed single-lane roundabout is shown in Exhibit 56.

Exhibit 55. Intersection of LOVR and Foothill Blvd (existing)

Exhibit 56. Proposed single lane roundabout with right-turn lane

The ICE was conducted using existing (2023) AM and PM peak hour traffic volumes taken during the school year. The evaluation for the signalized intersection was taken using Highway Capacity Manual (HCM), 2000 in Synchro 11, and the evaluation for the roundabout was taken using HCM 7 in VISTRO.

We conducted an evaluation of the two options using the following measures to determine which would have the best intersection operations:

1. Level of Service (LOS) Analysis
2. 95th Percentile Queue Lengths (in Feet)

The 95th percentile queue length analyses were conducted using AM peak and PM peak hour period traffic volumes. The results are shown in Exhibit 57 and Exhibit 58.

Intersection	Peak Period	Signalized (Existing)							
		NBT	SBT	SBR	EBL	EBT	WBL	WBT	WBR
Los Osos Valley Rd/W Foothill Blvd/ Sycamore Canyon Rd	AM	16	>300	0	>300	>300	6	>300	66
	PM	[illegible]	>30[illegible]	0	>300	>300	8	>300	136
NB, SB, EB, WB = Northbound, South[illegible]astbo[illegible]d, We[illegible]bound									
L, T, R = Left-turn, Through, Right-turn									
# = 95th percentile volume exceeds capacity, queue may [illegible]ger									

Exhibit 57. Signalized 95th Percentile Queue Lengths (in Feet)

Intersection	Peak Period	Ro[illegible]ndabout							
		NBT	SBT	SBR	[illegible]BL	EBT	WBL	WBT	WBR
Los Osos Valley Rd/W Foothill Blvd/ Sycamore Canyon Rd	AM	0.14	20.28	10.25	40.12	48.37	[illegible].62	50.12	66
	PM	0.37	69.07	29.82	27.69	[illegible]2.69	39.24	47.25	136
NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound									
L, T, R = Left-turn, Through, Right-turn									
TL, TR = Shared Through and Left-turn, Shared Through and Right-turn									

Exhibit 58. Single Lane Roundabout 95th Percentile Queue Lengths (in Feet)

The 95th percentile queue length analysis for the single lane roundabout shows a significant decrease in queue lengths for both peak periods as opposed to the existing signalized setup. The only exception are increases for the southbound right-turn lanes and between the signalized westbound left-turn lane and roundabout westbound shared through and left-turn lane.

The LOS and 95th percentile queue length analyses show that converting the intersection into a single lane roundabout would yield substantial improvements in traffic operations. It is our understanding that this consistent with the Froom Ranch EIR findings.

The following Exhibit shows the overlap between the roundabout concept plan and parcel boundary data provided by San Luis Obispo County. This is an approximate illustration of the right-of-way that may need to be acquired for the roundabout conversion. The illustration is based on high resolution aerial imagery, and is not based on any topographic survey, and the roundabout design is only conceptual at present. Therefore, this should not be considered as a precise illustration.

Exhibit 59. Potential right-of-way acquisition needs for the LOVR/Foothill roundabout design

In terms of safety, roundabouts have been shown to have a positive effect, with crash reduction factors often exceeding 50%. However, the cost could be substantial, including right-of-way acquisition (roughly estimated, 0.38 acres as shown in the map above).

6. Corridor Concept Plan

This section presents the Corridor Concept Plan in the following sections:

- One-page overall corridor concept plan sheet, showing an overview of the entire corridor.
- Detailed segment and intersection plan sheets, showing more detailed conceptual design.
- Cross-section exhibit, showing existing and proposed typical cross-sections from 21 points along the study corridor.

The Corridor Concept Plan includes the following alternatives:

- For the intersection of LOVR and 10th Street, the primary alternative retains the existing traffic signal, while the secondary alternative eliminates the signal and restricts traffic from 10th Street to LOVR to right turn only.
- For the intersection of LOVR and Sunset Drive, the primary alternative removes the existing crosswalk and adds a median making both sides of the intersection right-in/right-out, while the secondary alternative retains the crosswalk and adds curb extensions to remove the effective crossing distance.

6.1. One Page Overall Corridor Concept Plan Sheet

6.2. Detailed Segment & Intersection Plan Sheets

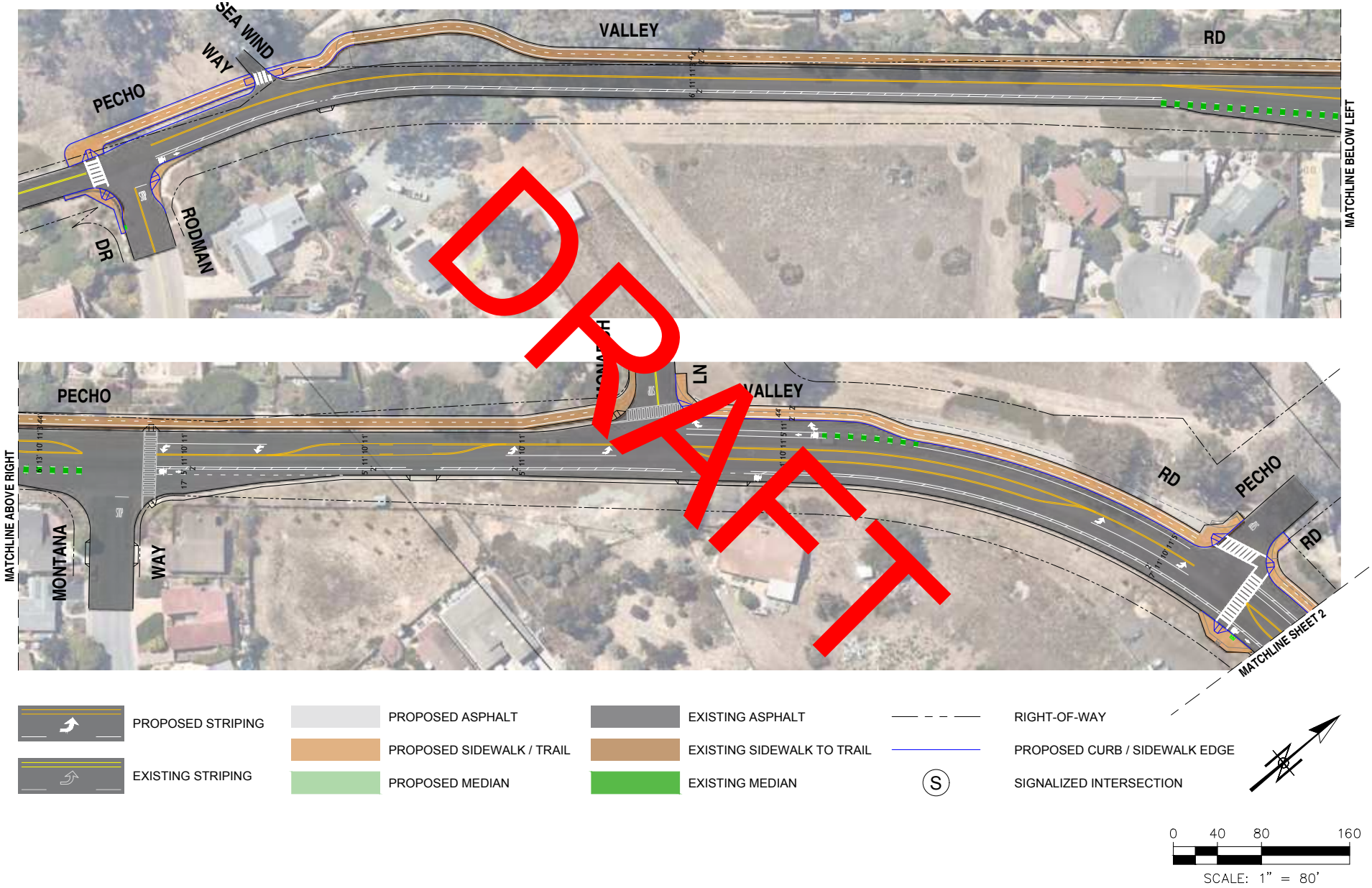

Exhibit 60. Concept plan sheet 1

Exhibit 61. Concept plan sheet 2

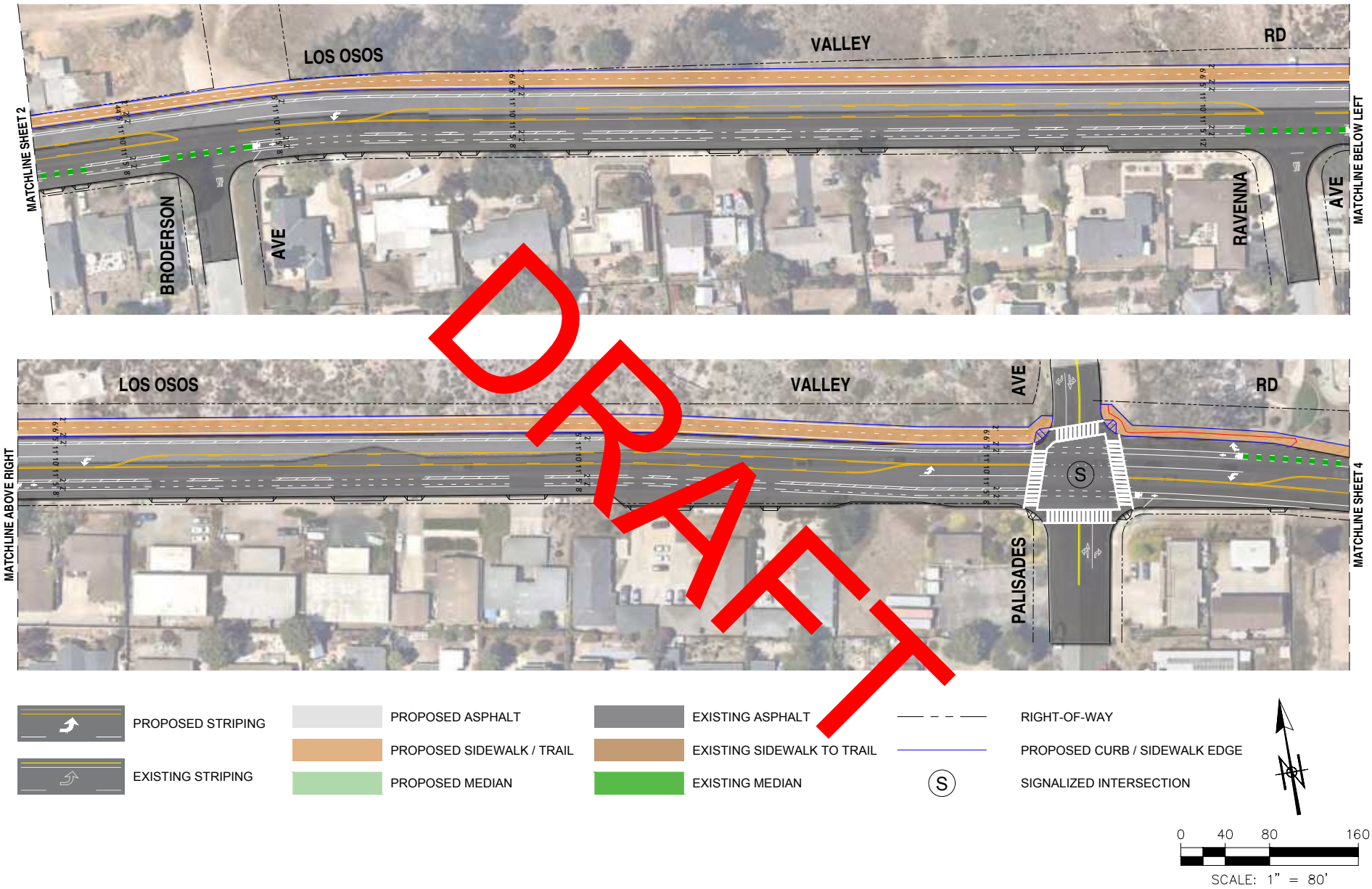

Exhibit 62. Concept plan sheet 3

Exhibit 63. Concept plan sheet 4

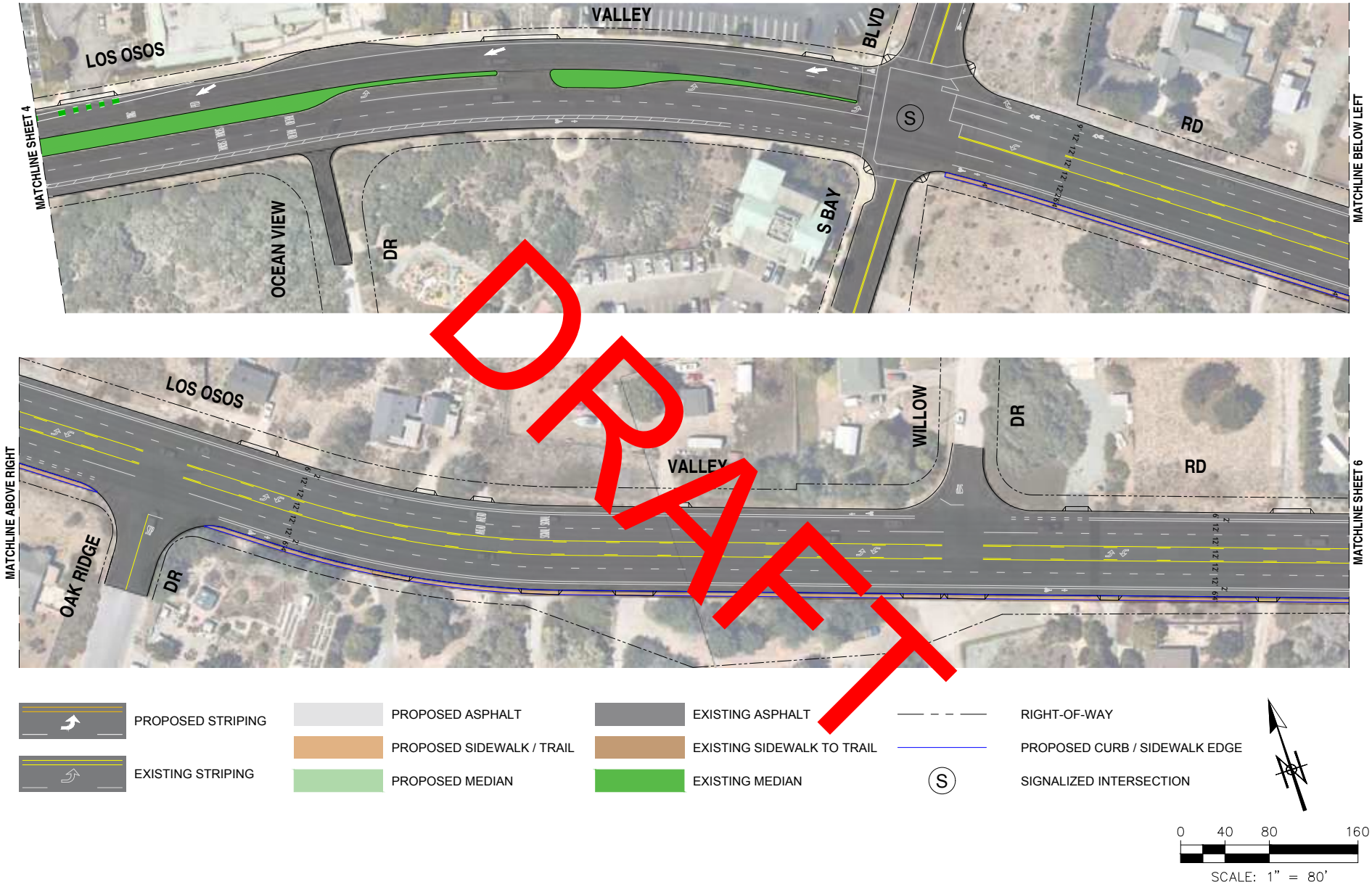

Exhibit 64. Concept plan sheet 5

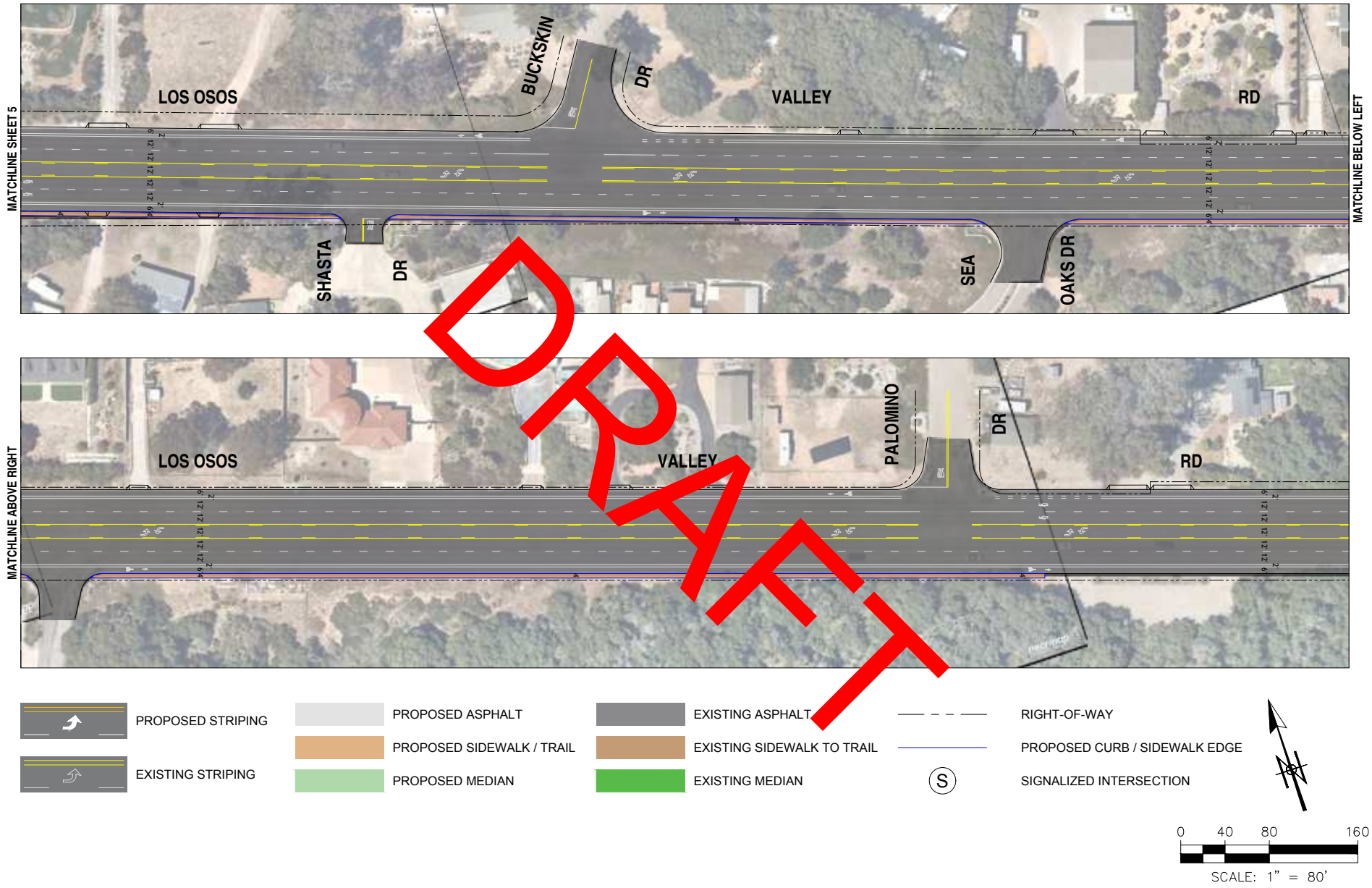

Exhibit 65. Concept plan sheet 6

6.3. Cross Sections Exhibit

This section contains existing typical cross-sections for points along the study corridor, accompanied by proposed cross-sections corresponding to the designs in the Corridor Concept Plan. The sections begin at the western end of the study area and move eastwards.

The cross-sections are organized by road segment (designated with the letters A through G) and the individual cross-section locations are numbered as shown on the map of cross-section locations (Exhibit 66).

The LOVR/Foothill Boulevard intersection is not shown as a cross-section because the Corridor Concept Plan recommends a conversion of the intersection to a roundabout, which would involve a complete redesign of the intersection and is not accurately representable in the cross-section view.

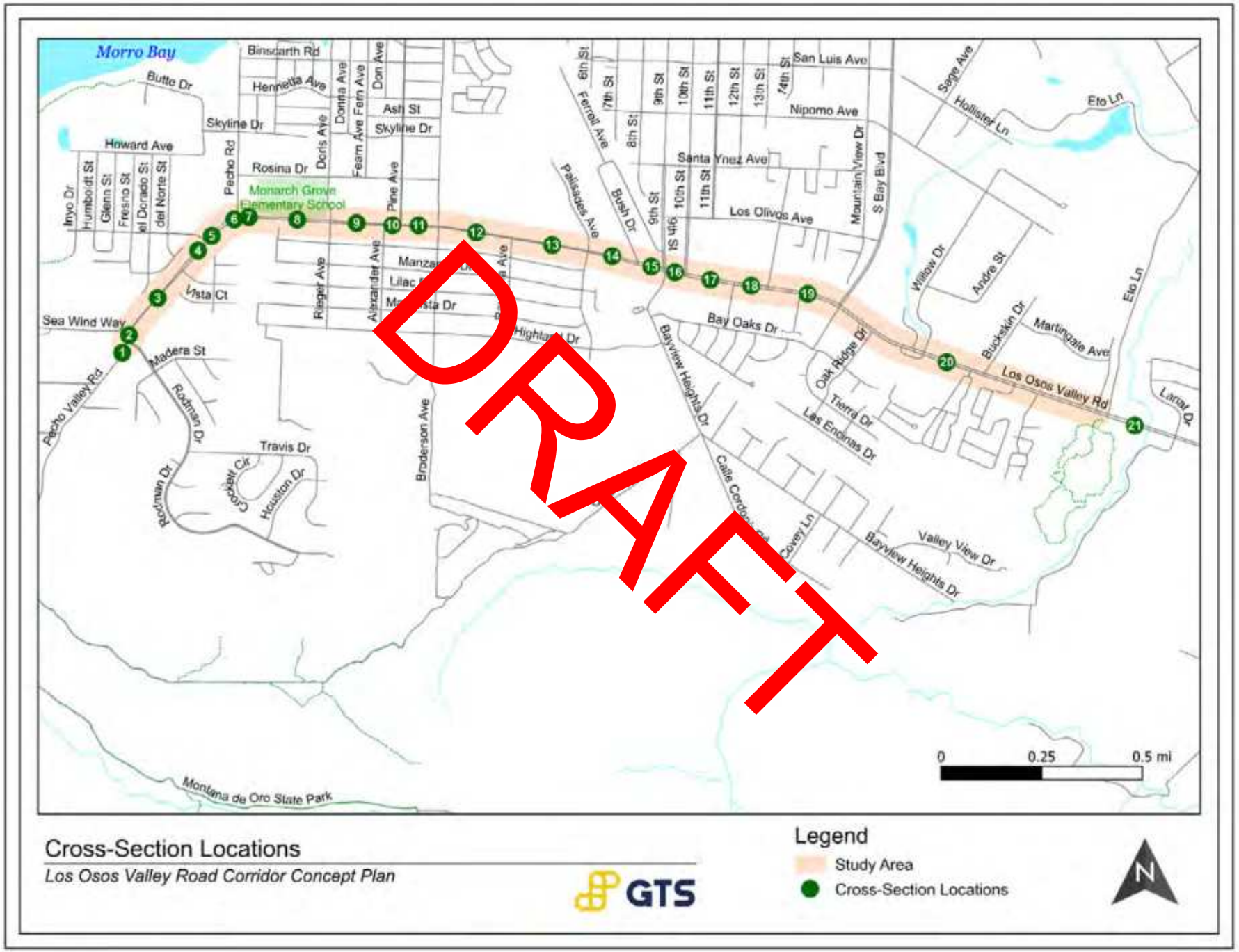

Exhibit 66. Cross section locations

Section 1. Pecho Valley Road, West of Rodman Drive

The Bikeways Plan recommends Class II bike lanes along this section. The cross-section below illustrates the hypothetical addition of bike lanes. This would present challenges including removal of large trees and modification of steep topography. Due to the magnitude of these challenges, the Corridor Concept Plan does not include a proposed design for this section. An alternative option could be to pave and develop the existing trails that provide a connection between Sea Wind Way and Montaña De Oro State Park.

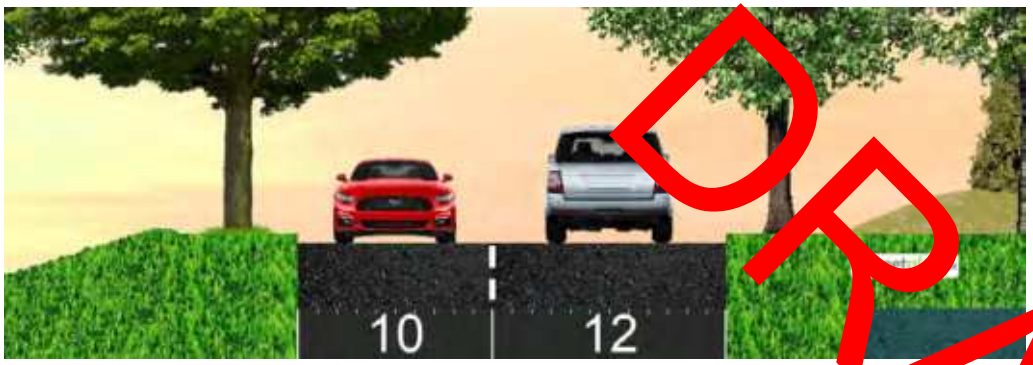

Exhibit 67. Existing Conditions: PVR West of Rodman Drive, looking east

Exhibit 68. Illustrative section with bike lanes: PVR West of Rodman Drive, looking east

Section 2. Pecho Valley Road between Rodman Drive and Sea Wind Way

The previous plans that are consolidated under this plan do not recommend any improvements for this segment. However, for the purpose of providing continuous and improved multimodal facilities along the corridor, the Corridor Concept Plan extends the existing shared-use path to Rodman Drive and right-sizes the westbound vehicular lane, using the extra space to widen and buffer the bike lane.

Exhibit 69. Existing Conditions: PVR between Rodman Drive and Sea Wind Way, looking east

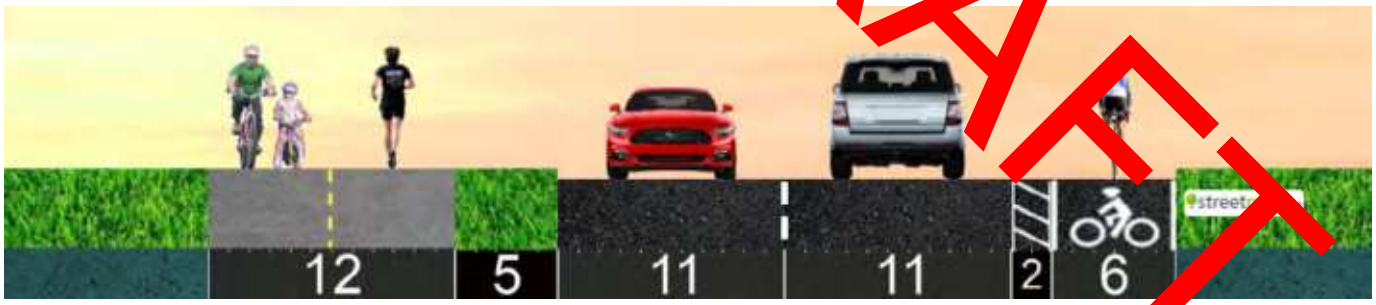

Exhibit 70. Concept: PVR between Rodman Drive and Sea Wind Way, looking east

Section 3. Pecho Valley Road between Sea Wind Way and Montana Way

The previous plans that are consolidated under this plan do not recommend any improvements for this segment. However, for the purpose of providing continuous and improved multimodal facilities along the corridor, the Corridor Concept Plan right-sizes the westbound vehicular lane, using the extra space to widen and buffer the bike lane.

Exhibit 71. Existing Conditions: PVR between Sea Wind Way and Montana Way, looking east

Exhibit 72. Concept: PVR at Sea Wind Way/Montana Way Mid-Block, looking east

Section 4. Pecho Valley Road between Montana Way and Monarch Lane

The previous plans that are consolidated under this plan do not recommend any improvements for this segment. However, for the purpose of providing continuous and improved multimodal facilities along the corridor, the Corridor Concept Plan right-sizes the westbound vehicular lane, using the extra space to widen and buffer the bike lane.

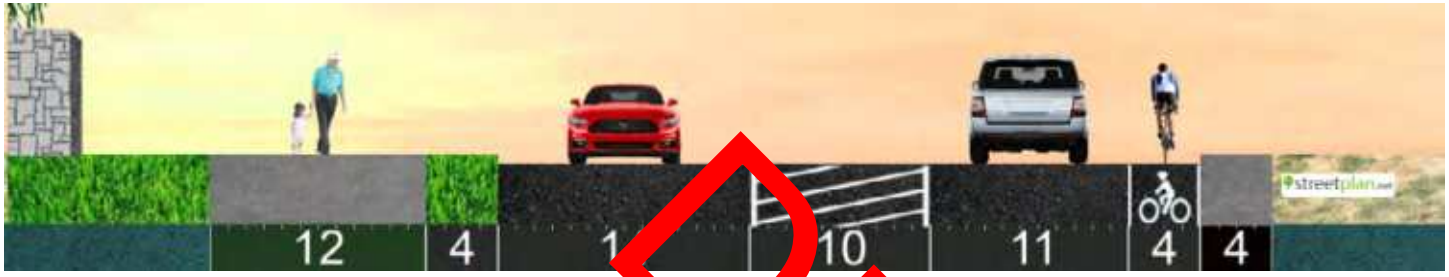

Exhibit 73. Existing Conditions: PVR between Montana Way and Monarch Lane, looking east

Exhibit 74. Concept: PVR between Montana Way and Monarch Lane, looking east

Section 5. Pecho Valley Road east of Monarch Lane (with right turn lane)

The previous plans that are consolidated under this plan do not recommend any improvements for this segment. However, for the purpose of providing continuous and improved multimodal facilities along the corridor, the Corridor Concept Plan right-sizes the right turn lane and continues the shared-use path. The westbound vehicular lane and median are right-sized and the extra space is used to widen and buffer the westbound bike lane. A buffer is added to the eastbound bike lane to make its division from the vehicular lane more prominent.

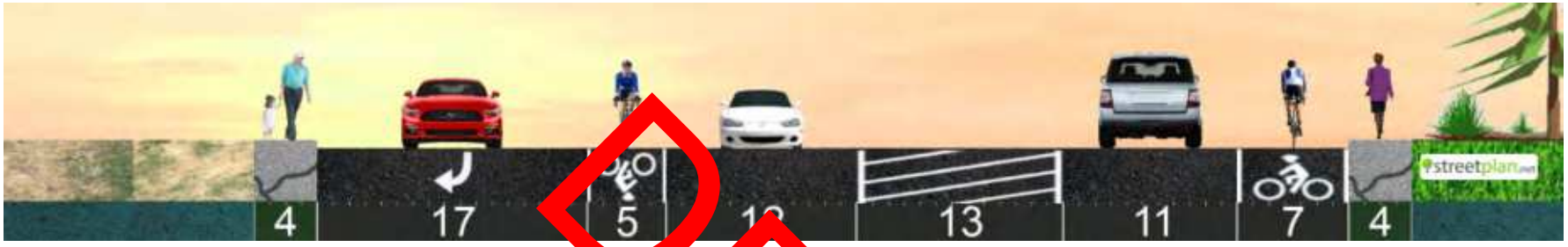

Exhibit 75. Existing Conditions: PVR east of Monarch Lane, looking east

Exhibit 76. Concept: PVR at Monarch Lane/Pecho Road Mid-Block, looking east

Section 6. Pecho Valley Road west of Pecho Road (right turn lane shortened)

The previous plans that are consolidated under this plan do not recommend any improvements for this segment. However, for the purpose of providing continuous and improved multimodal facilities along the corridor, the Corridor Concept Plan reduces the 17-foot-wide right turn lane, which currently runs the entire length of the block, to an appropriate length and width. The curb is brought out and a shared-use path is added, extending the existing path.

Exhibit 77. Existing Conditions: PVR west of Pecho Road, looking ea

Exhibit 78. Concept: PVR west of Pecho Road, looking east

Section 7: Los Osos Valley Road between Pecho Road and Monarch Grove Elementary School (with right turn lane)

The previous plans that are consolidated under this plan do not recommend any improvements for this segment. However, for the purpose of providing continuous and improved multimodal facilities along the corridor, the Corridor Concept Plan reduces the right turn lane for Pecho Road to an appropriate width. The curb is brought out and a shared-use path is added, extending the existing path.

Exhibit 79. Existing Conditions: LOVR between Pecho Road and Monarch Grove Elementary School, looking east

Exhibit 80. Concept: LOVR between Pecho Road and Monarch Grove Elementary School, looking east