Envision 273 Comprehensive Multimodal Corridor Plan

Final Draft Appendix

April 30, 2025

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Appendix A.

Traffic Data Sheets

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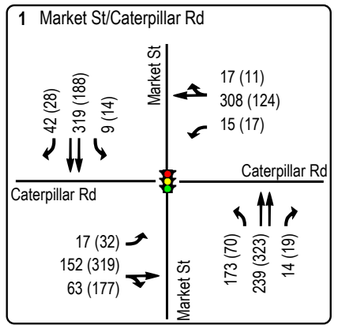
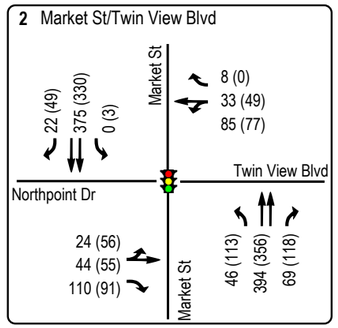
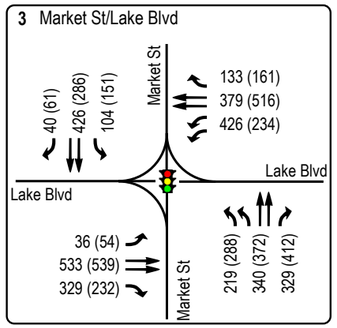
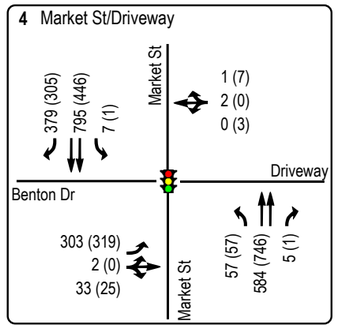
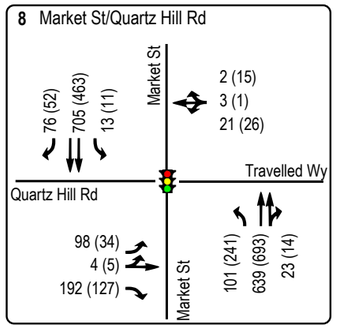
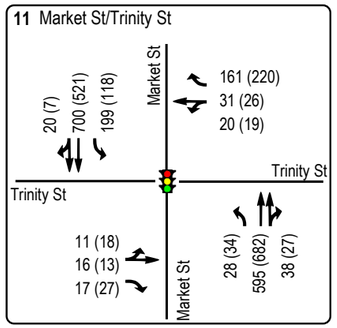


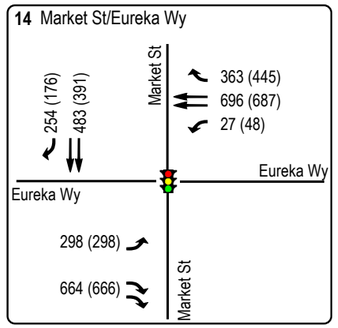


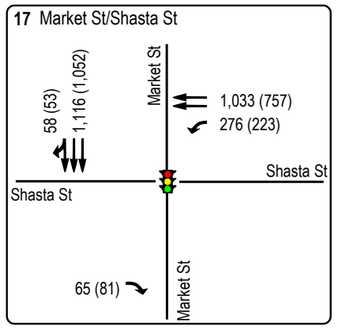


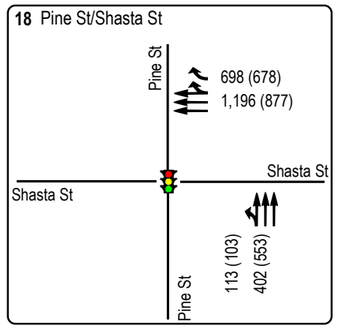


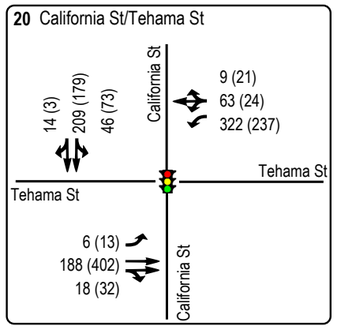


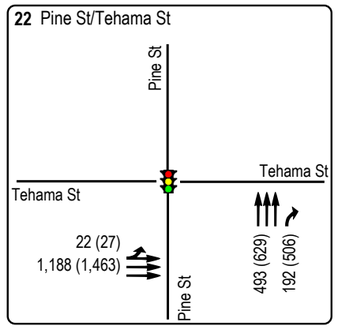


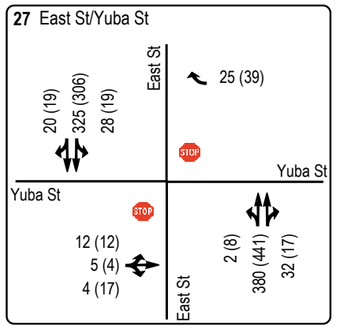


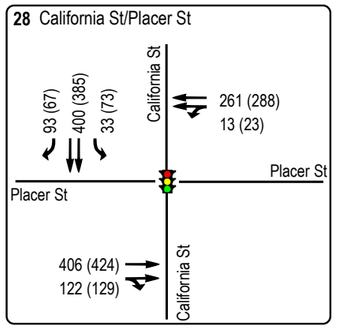


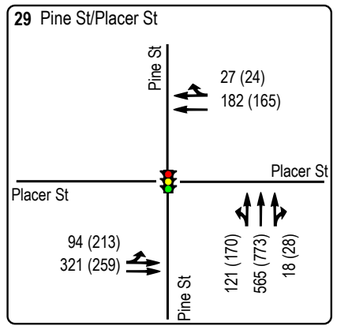


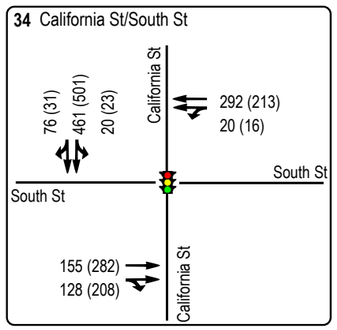


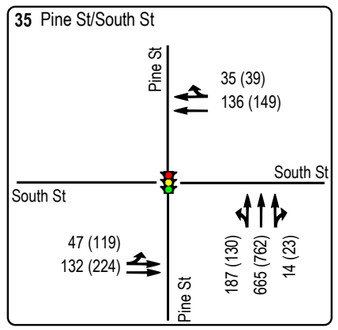


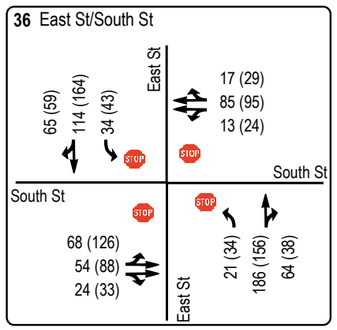


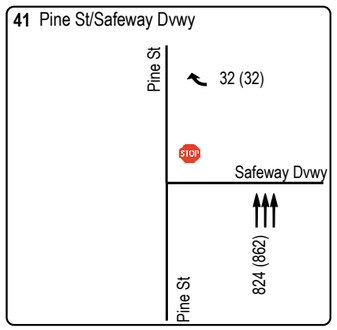


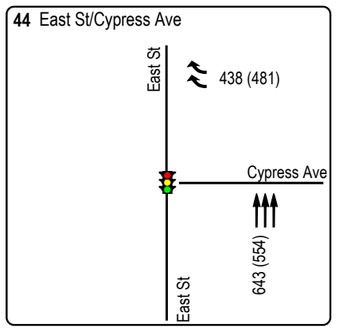


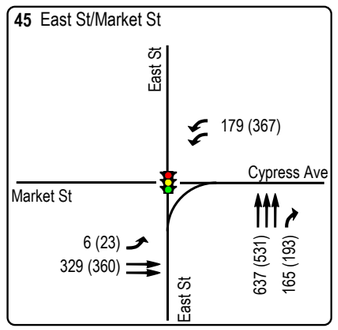


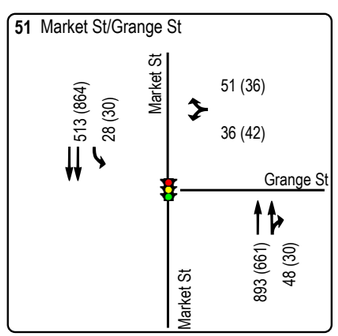


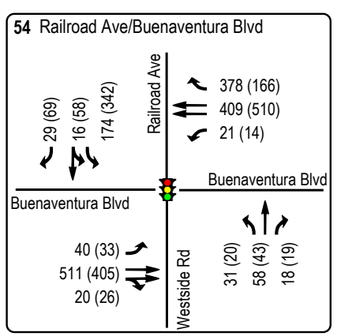


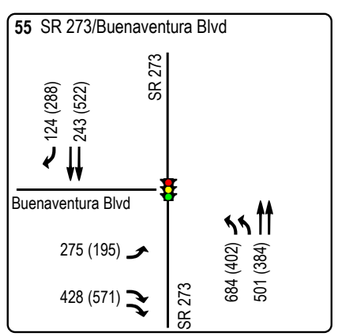


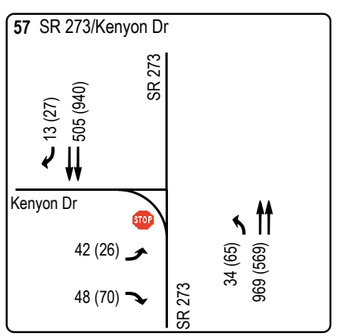


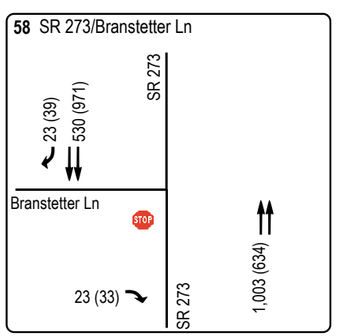


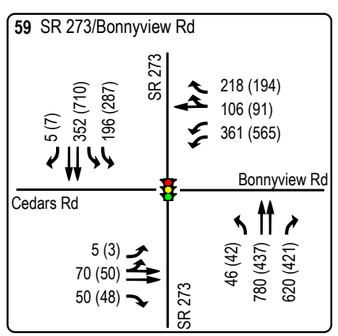












Legend

XX (YY) AM (PM) Peak Hour Volumes

Turn Lane — Stop Sign

Traffic Signal — Roundabout

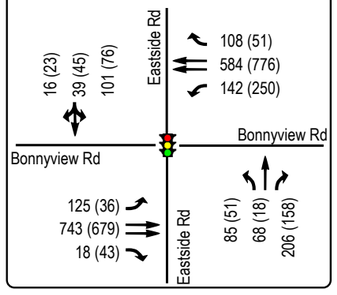
GHD

Shasta Regional Transportation Agency
SR 273 Multimodal Corridor Plan

Existing Conditions
Peak Hour Traffic Volumes,
Lane Geometries & Traffic Control

Project No. **12560002**
Report No. **001**
Date

60 Eastside Rd/Bonnyview Rd



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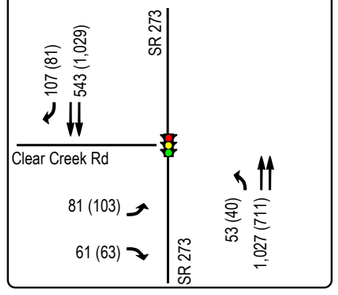

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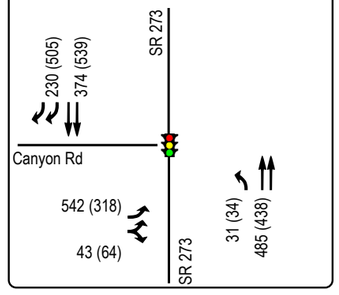

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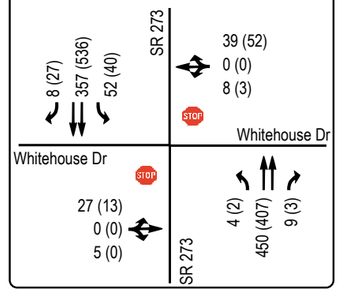

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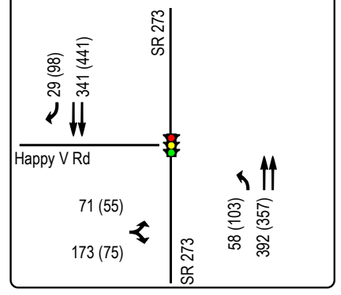

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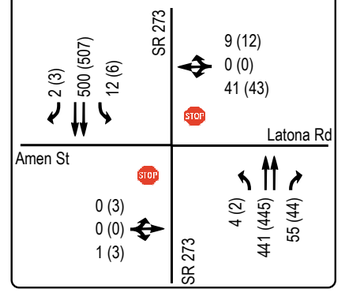

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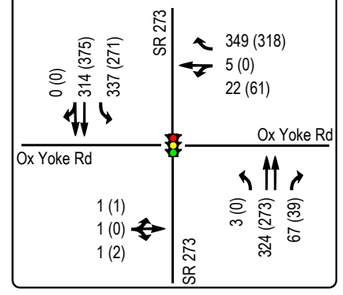
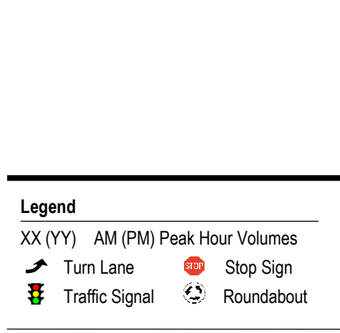


72 SR 273/North St



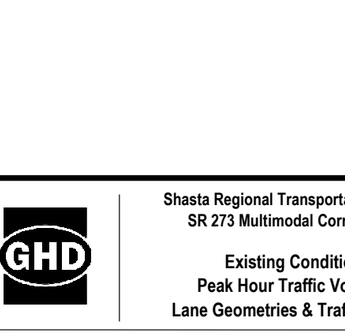
73 SR 273/South St

76 SR 273/Factory Outlets Dr

77 SR 273/Pleasant Hills Dr

78 Westside Rd/Branstetter Ln

79 Redding Rancheria/Canyon Rd



Legend

XX (YY) AM (PM) Peak Hour Volumes

Turn Lane

Stop Sign

Traffic Signal

Roundabout

GHD

Shasta Regional Transportation Agency
SR 273 Multimodal Corridor Plan

Existing Conditions
Peak Hour Traffic Volumes,
Lane Geometries & Traffic Control

Project No. **12560002**
Report No. **001**
Date

Appendix B.

Intersection Operations Reports

Table 1 Level of Service Thresholds

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle	
				Signalized/Roundabout	Side-Street/All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0

1. *Based on Highway Capacity Manual 2000, Transportation Research Board, 20000.*

HCM Signalized Intersection Capacity Analysis
1: Market St & Caterpillar Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	152	63	15	308	17	173	239	14	9	319	42
Future Volume (vph)	17	152	63	15	308	17	173	239	14	9	319	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.9		4.2	4.9		4.2	6.5	6.5	4.2	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1671	1676		1671	1744		1671	3343	1464	1671	3343	1463
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1671	1676		1671	1744		1671	3343	1464	1671	3343	1463
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	19	167	69	16	338	19	190	263	15	10	351	46
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	9	0	0	36
Lane Group Flow (vph)	19	228	0	16	356	0	190	263	6	10	351	10
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	2.6	29.1		3.8	30.3		16.5	35.2	35.2	1.1	19.9	19.9
Effective Green, g (s)	2.6	29.1		3.8	30.3		16.5	35.2	35.2	1.1	19.9	19.9
Actuated g/C Ratio	0.03	0.33		0.04	0.34		0.19	0.40	0.40	0.01	0.22	0.22
Clearance Time (s)	4.2	4.9		4.2	4.9		4.2	6.5	6.5	4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	48	547		71	593		309	1322	579	20	747	327
v/s Ratio Prot	c0.01	0.14		0.01	c0.20		c0.11	0.08		0.01	c0.11	
v/s Ratio Perm									0.00			0.01
v/c Ratio	0.40	0.42		0.23	0.60		0.61	0.20	0.01	0.50	0.47	0.03
Uniform Delay, d1	42.4	23.3		41.2	24.3		33.3	17.6	16.3	43.7	30.0	27.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	0.5		1.6	1.6		3.6	0.1	0.0	18.3	0.5	0.0
Delay (s)	47.7	23.9		42.8	26.0		36.9	17.7	16.3	62.0	30.4	27.1
Level of Service	D	C		D	C		D	B	B	E	C	C
Approach Delay (s)		25.6			26.7			25.5			30.8	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	19.8	
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Market St & Northpoint Dr/Twin View Blvd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	44	110	85	33	8	46	394	69	0	375	22
Future Volume (vph)	24	44	110	85	33	8	46	394	69	0	375	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.2	6.5	6.5		6.5	6.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00		0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)		1795	1553		1763	1534	1736	3471	1553		3471	1553
Flt Permitted		0.98	1.00		0.97	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)		1795	1553		1763	1534	1736	3471	1553		3471	1553
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	26	47	117	90	35	9	49	419	73	0	399	23
RTOR Reduction (vph)	0	0	102	0	0	7	0	0	40	0	0	16
Lane Group Flow (vph)	0	73	15	0	125	2	49	419	33	0	399	7
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			6
Actuated Green, G (s)		8.7	8.7		12.0	12.0	4.8	29.7	29.7		20.7	20.7
Effective Green, g (s)		8.7	8.7		12.0	12.0	4.8	29.7	29.7		20.7	20.7
Actuated g/C Ratio		0.13	0.13		0.18	0.18	0.07	0.45	0.45		0.31	0.31
Clearance Time (s)		4.6	4.6		4.6	4.6	4.2	6.5	6.5		6.5	6.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		236	204		320	278	126	1559	697		1086	486
v/s Ratio Prot		c0.04			c0.07		c0.03	0.12			c0.11	
v/s Ratio Perm			0.01			0.00			0.02			0.00
v/c Ratio		0.31	0.08		0.39	0.01	0.39	0.27	0.05		0.37	0.01
Uniform Delay, d1		26.0	25.2		23.8	22.2	29.3	11.4	10.2		17.6	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.7	0.2		0.8	0.0	2.0	0.1	0.0		0.2	0.0
Delay (s)		26.7	25.3		24.6	22.2	31.2	11.5	10.3		17.8	15.7
Level of Service		C	C		C	C	C	B	B		B	B
Approach Delay (s)		25.9			24.5			13.1			17.7	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	19.9	
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Market St & Lake Blvd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	533	329	426	379	133	219	340	329	104	426	40
Future Volume (vph)	36	533	329	426	379	133	219	340	329	104	426	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1	4.0	4.2	5.8	4.0	4.2	6.2	4.2	4.2	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1549	3400	3505	1548	3400	3505	1568	1752	3505	1547
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	1549	3400	3505	1548	3400	3505	1568	1752	3505	1547
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	586	362	468	416	146	241	374	362	114	468	44
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	90	0	0	35
Lane Group Flow (vph)	40	586	362	468	416	146	241	374	272	114	468	9
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			Free			Free			2			6
Actuated Green, G (s)	6.4	26.8	99.8	19.6	39.3	99.8	13.8	19.7	39.3	14.0	19.9	19.9
Effective Green, g (s)	6.4	26.8	99.8	19.6	39.3	99.8	13.8	19.7	39.3	14.0	19.9	19.9
Actuated g/C Ratio	0.06	0.27	1.00	0.20	0.39	1.00	0.14	0.20	0.39	0.14	0.20	0.20
Clearance Time (s)	4.2	5.1		4.2	5.8		4.2	6.2	4.2	4.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	112	941	1549	667	1380	1548	470	691	617	245	698	308
v/s Ratio Prot	0.02	c0.17		c0.14	0.12		c0.07	0.11	0.09	0.07	c0.13	
v/s Ratio Perm			c0.23			0.09			0.09			0.01
v/c Ratio	0.36	0.62	0.23	0.70	0.30	0.09	0.51	0.54	0.44	0.47	0.67	0.03
Uniform Delay, d1	44.7	32.1	0.0	37.4	20.8	0.0	39.9	36.0	22.2	39.5	36.9	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	1.3	0.4	3.3	0.1	0.1	0.9	0.9	0.5	1.4	2.5	0.0
Delay (s)	46.7	33.4	0.4	40.7	20.9	0.1	40.8	36.9	22.7	40.9	39.5	32.2
Level of Service	D	C	A	D	C	A	D	D	C	D	D	C
Approach Delay (s)		21.8			27.0			32.6			39.2	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	20.4	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Market St & Benton Dr

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	2	33	0	2	1	57	584	5	7	795	379
Future Volume (vph)	303	2	33	0	2	1	57	584	5	7	795	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6			4.2		4.2	6.2	6.2	4.2	6.2	6.2
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1665	1636			1762		1752	3505	1568	1752	3505	1533
Flt Permitted	0.95	0.96			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1665	1636			1762		1752	3505	1568	1752	3505	1533
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	340	2	37	0	2	1	64	656	6	8	893	426
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	2	0	0	168
Lane Group Flow (vph)	190	181	0	0	2	0	64	656	4	8	893	258
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	20.5	20.5			2.0		9.5	86.3	86.3	2.0	78.8	78.8
Effective Green, g (s)	20.5	20.5			2.0		9.5	86.3	86.3	2.0	78.8	78.8
Actuated g/C Ratio	0.16	0.16			0.02		0.07	0.66	0.66	0.02	0.61	0.61
Clearance Time (s)	4.6	4.6			4.2		4.2	6.2	6.2	4.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	262	257			27		128	2326	1040	26	2124	929
v/s Ratio Prot	c0.11	0.11			c0.00		c0.04	0.19		0.00	c0.25	
v/s Ratio Perm									0.00			0.17
v/c Ratio	0.73	0.71			0.07		0.50	0.28	0.00	0.31	0.42	0.28
Uniform Delay, d1	52.1	51.9			63.1		58.0	9.0	7.4	63.3	13.5	12.1
Progression Factor	1.00	1.00			1.00		1.15	0.88	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.6	8.5			1.2		3.0	0.3	0.0	6.6	0.6	0.7
Delay (s)	61.6	60.4			64.3		70.0	8.3	7.4	69.9	14.1	12.9
Level of Service	E	E			E		E	A	A	E	B	B
Approach Delay (s)		61.0			64.3			13.7			14.1	
Approach LOS		E			E			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	59.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Market St & Quartz Hill Rd/Travelled Wy

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	4	192	21	3	2	101	639	23	13	705	76
Future Volume (vph)	98	4	192	21	3	2	101	639	23	13	705	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2		4.2		4.2	5.8		4.2	5.8	5.8
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1675	1546		1753		1752	3483		1752	3505	1568
Flt Permitted	0.95	0.96	1.00		0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1675	1546		1753		1752	3483		1752	3505	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	109	4	213	23	3	2	112	710	26	14	783	84
RTOR Reduction (vph)	0	0	188	0	2	0	0	1	0	0	0	39
Lane Group Flow (vph)	57	56	25	0	26	0	112	735	0	14	783	45
Confl. Peds. (#/hr)						1			1			
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	15.2	15.2	15.2		12.8		13.9	79.6		4.0	69.7	69.7
Effective Green, g (s)	15.2	15.2	15.2		12.8		13.9	79.6		4.0	69.7	69.7
Actuated g/C Ratio	0.12	0.12	0.12		0.10		0.11	0.61		0.03	0.54	0.54
Clearance Time (s)	4.2	4.2	4.2		4.2		4.2	5.8		4.2	5.8	5.8
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	194	195	180		172		187	2132		53	1879	840
v/s Ratio Prot	c0.03	0.03			c0.01		c0.06	0.21		0.01	c0.22	
v/s Ratio Perm			0.02									0.03
v/c Ratio	0.29	0.29	0.14		0.15		0.60	0.34		0.26	0.42	0.05
Uniform Delay, d1	52.5	52.4	51.5		53.6		55.4	12.4		61.6	18.0	14.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.01	1.07	3.56
Incremental Delay, d2	0.8	0.8	0.4		0.4		5.1	0.4		2.6	0.7	0.1
Delay (s)	53.3	53.3	51.9		54.0		60.5	12.8		64.9	19.9	51.4
Level of Service	D	D	D		D		E	B		E	B	D
Approach Delay (s)		52.4			54.0			19.1			23.6	
Approach LOS		D			D			B			C	

Intersection Summary					
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	130.0	Sum of lost time (s)		18.4	
Intersection Capacity Utilization	56.1%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
11: Market St & Trinity St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	16	17	20	31	161	28	595	38	199	700	20
Future Volume (vph)	11	16	17	20	31	161	28	595	38	199	700	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	4.7		4.2	4.2	4.2	4.7		4.1	4.7	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1540		1809	1539	1752	3463		1752	3487	
Flt Permitted		0.98	1.00		0.98	1.00	0.35	1.00		0.32	1.00	
Satd. Flow (perm)		1807	1540		1809	1539	643	3463		588	3487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	17	18	22	34	175	30	647	41	216	761	22
RTOR Reduction (vph)	0	0	17	0	0	157	0	3	0	0	1	0
Lane Group Flow (vph)	0	29	1	0	56	18	30	685	0	216	782	0
Confl. Peds. (#/hr)			2			4			12			3
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		
Actuated Green, G (s)		8.4	8.4		11.6	11.6	65.4	60.6		76.4	67.4	
Effective Green, g (s)		8.4	8.4		11.6	11.6	65.4	60.6		76.4	67.4	
Actuated g/C Ratio		0.08	0.08		0.11	0.11	0.59	0.55		0.69	0.61	
Clearance Time (s)		4.7	4.7		4.2	4.2	4.2	4.7		4.1	4.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		137	117		190	162	430	1907		532	2136	
v/s Ratio Prot		c0.02			c0.03		0.00	0.20		c0.04	0.22	
v/s Ratio Perm			0.00			0.01	0.04			c0.24		
v/c Ratio		0.21	0.01		0.29	0.11	0.07	0.36		0.41	0.37	
Uniform Delay, d1		47.7	47.0		45.4	44.5	9.2	13.8		6.8	10.6	
Progression Factor		1.00	1.00		1.00	1.00	1.52	1.25		1.00	1.00	
Incremental Delay, d2		0.8	0.0		0.9	0.3	0.1	0.5		0.5	0.5	
Delay (s)		48.5	47.0		46.3	44.9	14.1	17.7		7.3	11.1	
Level of Service		D	D		D	D	B	B		A	B	
Approach Delay (s)		47.9			45.2			17.6			10.3	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		17.8	
Intersection Capacity Utilization	50.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
14: Market St & Eureka Wy

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	0	664	27	696	363	0	0	0	0	483	254
Future Volume (vph)	298	0	664	27	696	363	0	0	0	0	483	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7		4.7	4.7	4.7	4.7					4.7	4.7
Lane Util. Factor	1.00		0.88	1.00	0.95	1.00					0.95	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00					1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00					1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85					1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00	1.00					1.00	1.00
Satd. Flow (prot)	1752		2760	1752	3505	1568					3505	1559
Flt Permitted	0.95		1.00	0.95	1.00	1.00					1.00	1.00
Satd. Flow (perm)	1752		2760	1752	3505	1568					3505	1559
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	317	0	706	29	740	386	0	0	0	0	514	270
RTOR Reduction (vph)	0	0	439	21	0	114	0	0	0	0	0	21
Lane Group Flow (vph)	317	0	267	8	740	272	0	0	0	0	514	249
Confl. Peds. (#/hr)			9						12			1
Confl. Bikes (#/hr)									1			6
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot		Prot	Split	NA	custom					NA	pm+ov
Protected Phases	2		2	8	8	1					1	2
Permitted Phases						8						1
Actuated Green, G (s)	41.6		41.6	30.0	30.0	54.3					24.3	65.9
Effective Green, g (s)	41.6		41.6	30.0	30.0	54.3					24.3	65.9
Actuated g/C Ratio	0.38		0.38	0.27	0.27	0.49					0.22	0.60
Clearance Time (s)	4.7		4.7	4.7	4.7	4.7					4.7	4.7
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0					3.0	3.0
Lane Grp Cap (vph)	662		1043	477	955	841					774	1000
v/s Ratio Prot	c0.18		0.10	0.00	c0.21	0.07					c0.15	0.09
v/s Ratio Perm						0.10						0.07
v/c Ratio	0.48		0.26	0.02	0.77	0.32					0.66	0.25
Uniform Delay, d1	26.0		23.5	29.2	36.9	16.8					39.1	10.4
Progression Factor	1.00		1.00	1.30	0.77	0.32					1.39	2.17
Incremental Delay, d2	2.5		0.6	0.0	3.7	0.2					2.1	0.1
Delay (s)	28.4		24.1	38.1	32.1	5.6					56.6	22.7
Level of Service	C		C	D	C	A					E	C
Approach Delay (s)		25.5			23.4			0.0			44.9	
Approach LOS		C			C			A			D	

Intersection Summary					
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		14.1	
Intersection Capacity Utilization	60.7%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
17: Market St & Shasta St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	65	276	1033	0	0	0	0	0	1116	58
Future Volume (vph)	0	0	65	276	1033	0	0	0	0	0	1116	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.7	4.7	4.7						4.7	
Lane Util. Factor			1.00	1.00	0.95						0.91	
Frpb, ped/bikes			0.97	1.00	1.00						1.00	
Flpb, ped/bikes			1.00	1.00	1.00						1.00	
Frt			0.86	1.00	1.00						0.99	
Flt Protected			1.00	0.95	1.00						1.00	
Satd. Flow (prot)			1559	1770	3539						5042	
Flt Permitted			1.00	0.95	1.00						1.00	
Satd. Flow (perm)			1559	1770	3539						5042	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	0	73	310	1161	0	0	0	0	0	1254	65
RTOR Reduction (vph)	0	0	70	35	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	3	275	1161	0	0	0	0	0	1314	0
Confl. Peds. (#/hr)			3			6			5			9
Confl. Bikes (#/hr)												1
Turn Type			Perm	Split	NA						NA	
Protected Phases				8	8						6	
Permitted Phases			7									
Actuated Green, G (s)			4.8	48.1	48.1						43.0	
Effective Green, g (s)			4.8	48.1	48.1						43.0	
Actuated g/C Ratio			0.04	0.44	0.44						0.39	
Clearance Time (s)			4.7	4.7	4.7						4.7	
Vehicle Extension (s)			3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)			68	773	1547						1970	
v/s Ratio Prot				0.16	c0.33						c0.26	
v/s Ratio Perm			c0.00									
v/c Ratio			0.05	0.36	0.75						0.67	
Uniform Delay, d1			50.4	20.6	25.9						27.6	
Progression Factor			1.00	0.78	0.89						0.61	
Incremental Delay, d2			0.3	0.3	1.9						1.6	
Delay (s)			50.7	16.2	24.8						18.5	
Level of Service			D	B	C						B	
Approach Delay (s)		50.7			23.0			0.0			18.5	
Approach LOS		D			C			A			B	

Intersection Summary					
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		14.1	
Intersection Capacity Utilization	59.3%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
18: Shasta St & Pine St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1196	698	113	402	0	0	0	0
Future Volume (vph)	0	0	0	0	1196	698	113	402	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.7	4.7		4.7				
Lane Util. Factor					0.86	0.86		0.91				
Frpb, ped/bikes					1.00	0.98		1.00				
Flpb, ped/bikes					1.00	1.00		1.00				
Frt					0.97	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					4612	1325		4981				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					4612	1325		4981				
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	0	1391	812	131	467	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	59	0	25	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1691	436	0	573	0	0	0	0
Confl. Peds. (#/hr)			4			4			3			3
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					8			2				
Permitted Phases						8	2					
Actuated Green, G (s)					81.0	81.0		19.6				
Effective Green, g (s)					81.0	81.0		19.6				
Actuated g/C Ratio					0.74	0.74		0.18				
Clearance Time (s)					4.7	4.7		4.7				
Vehicle Extension (s)					3.0	3.0		3.0				
Lane Grp Cap (vph)					3396	975		887				
v/s Ratio Prot					c0.37							
v/s Ratio Perm						0.33		0.12				
v/c Ratio					0.50	0.45		0.65				
Uniform Delay, d1					6.0	5.7		42.0				
Progression Factor					1.00	1.00		0.16				
Incremental Delay, d2					0.5	1.5		1.6				
Delay (s)					6.6	7.2		8.3				
Level of Service					A	A		A				
Approach Delay (s)		0.0			6.7			8.3			0.0	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: California St & Tehama St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	188	18	322	63	9	0	0	0	46	209	14
Future Volume (vph)	6	188	18	322	63	9	0	0	0	46	209	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.7	4.7						4.2	
Lane Util. Factor	1.00	0.95		0.95	0.95						0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	
Frt	1.00	0.99		1.00	0.99						0.99	
Flt Protected	0.95	1.00		0.95	0.97						0.99	
Satd. Flow (prot)	1752	3450		1665	1682						3437	
Flt Permitted	0.95	1.00		0.95	0.97						0.99	
Satd. Flow (perm)	1752	3450		1665	1682						3437	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	7	229	22	393	77	11	0	0	0	56	255	17
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	0	0	4	0
Lane Group Flow (vph)	7	243	0	240	240	0	0	0	0	0	324	0
Confl. Peds. (#/hr)			12			17			10			19
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA					Perm	NA	
Protected Phases	5	5		6	6						4	
Permitted Phases										4		
Actuated Green, G (s)	14.6	14.6		64.5	64.5						17.8	
Effective Green, g (s)	14.6	14.6		64.5	64.5						17.8	
Actuated g/C Ratio	0.13	0.13		0.59	0.59						0.16	
Clearance Time (s)	4.2	4.2		4.7	4.7						4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)	232	457		976	986						556	
v/s Ratio Prot	0.00	c0.07		c0.14	0.14							
v/s Ratio Perm											0.09	
v/c Ratio	0.03	0.53		0.25	0.24						0.58	
Uniform Delay, d1	41.5	44.5		11.0	11.0						42.7	
Progression Factor	1.00	1.00		0.66	0.65						1.00	
Incremental Delay, d2	0.1	1.2		0.5	0.5						1.6	
Delay (s)	41.6	45.7		7.8	7.7						44.2	
Level of Service	D	D		A	A						D	
Approach Delay (s)		45.6			7.8			0.0			44.2	
Approach LOS		D			A			A			D	

Intersection Summary				
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.1	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
22: Pine St & Tehama St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1188	0	0	0	0	0	493	192	0	0	0
Future Volume (vph)	22	1188	0	0	0	0	0	493	192	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7						4.7	4.7			
Lane Util. Factor		0.91						0.91	1.00			
Frpb, ped/bikes		1.00						1.00	0.98			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5031						5036	1539			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5031						5036	1539			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	23	1225	0	0	0	0	0	508	198	0	0	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	38	0	0	0
Lane Group Flow (vph)	0	1244	0	0	0	0	0	508	160	0	0	0
Confl. Peds. (#/hr)			3			9			4			8
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA	Perm			
Protected Phases		4						2				
Permitted Phases	4								2			
Actuated Green, G (s)		81.2						19.4	19.4			
Effective Green, g (s)		81.2						19.4	19.4			
Actuated g/C Ratio		0.74						0.18	0.18			
Clearance Time (s)		4.7						4.7	4.7			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		3713						888	271			
v/s Ratio Prot								0.10				
v/s Ratio Perm		0.25							c0.10			
v/c Ratio		0.33						0.57	0.59			
Uniform Delay, d1		5.0						41.5	41.7			
Progression Factor		0.20						1.00	1.00			
Incremental Delay, d2		0.2						0.9	3.4			
Delay (s)		1.2						42.4	45.1			
Level of Service		A						D	D			
Approach Delay (s)		1.2			0.0			43.1			0.0	
Approach LOS		A			A			D			A	

Intersection Summary				
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
27: Yuba St & East St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	5	4	0	0	25	2	380	32	28	325	20
Future Volume (Veh/h)	12	5	4	0	0	25	2	380	32	28	325	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	14	6	5	0	0	29	2	437	37	32	374	23
Pedestrians		4			6			9			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								391			764	
pX, platoon unblocked	0.95	0.95	0.95	0.95	0.95		0.95					
vC, conflicting volume	706	938	212	734	930	244	401			480		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	593	836	75	622	829	244	273			480		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	98	99	100	100	96	100			97		
cM capacity (veh/h)	346	278	918	332	280	755	1229			1080		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	25	29	220	256	219	210
Volume Left	14	0	2	0	32	0
Volume Right	5	29	0	37	0	23
cSH	370	755	1229	1700	1080	1700
Volume to Capacity	0.07	0.04	0.00	0.15	0.03	0.12
Queue Length 95th (ft)	5	3	0	0	2	0
Control Delay (s)	15.4	10.0	0.1	0.0	1.5	0.0
Lane LOS	C	A	A		A	
Approach Delay (s)	15.4	10.0	0.0		0.8	
Approach LOS	C	A				

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
28: California St & Placer St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	406	122	13	261	0	0	0	0	33	400	93
Future Volume (vph)	0	406	122	13	261	0	0	0	0	33	400	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7					4.7	4.7	4.7
Lane Util. Factor		0.95			0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00			1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3402			3531					1770	3539	1549
Flt Permitted		1.00			0.87					0.95	1.00	1.00
Satd. Flow (perm)		3402			3063					1770	3539	1549
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	467	140	15	300	0	0	0	0	38	460	107
RTOR Reduction (vph)	0	38	0	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	569	0	0	315	0	0	0	0	38	460	83
Confl. Peds. (#/hr)			4			5			1			7
Confl. Bikes (#/hr)			1			2						
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Actuated Green, G (s)		25.6			25.6					75.0	75.0	75.0
Effective Green, g (s)		25.6			25.6					75.0	75.0	75.0
Actuated g/C Ratio		0.23			0.23					0.68	0.68	0.68
Clearance Time (s)		4.7			4.7					4.7	4.7	4.7
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		791			712					1206	2412	1056
v/s Ratio Prot		c0.17									c0.13	
v/s Ratio Perm					0.10					0.02		0.05
v/c Ratio		0.72			0.44					0.03	0.19	0.08
Uniform Delay, d1		38.9			36.1					5.7	6.4	5.9
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		3.1			0.4					0.0	0.2	0.1
Delay (s)		42.0			36.5					5.7	6.6	6.0
Level of Service		D			D					A	A	A
Approach Delay (s)		42.0			36.5			0.0			6.4	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	44.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
29: Pine St & Placer St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	321	0	0	182	27	121	565	18	0	0	0
Future Volume (vph)	94	321	0	0	182	27	121	565	18	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7			4.7				
Lane Util. Factor		0.95			0.95			0.91				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			1.00				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3466			3427			4971				
Flt Permitted		0.79			1.00			0.99				
Satd. Flow (perm)		2764			3427			4971				
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	100	341	0	0	194	29	129	601	19	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	441	0	0	206	0	0	748	0	0	0	0
Confl. Peds. (#/hr)			13			6			6			12
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)		23.4			23.4			77.2				
Effective Green, g (s)		23.4			23.4			77.2				
Actuated g/C Ratio		0.21			0.21			0.70				
Clearance Time (s)		4.7			4.7			4.7				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		587			729			3488				
v/s Ratio Prot					0.06							
v/s Ratio Perm		c0.16						0.15				
v/c Ratio		0.75			0.28			0.21				
Uniform Delay, d1		40.6			36.3			5.8				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		5.4			0.2			0.1				
Delay (s)		46.0			36.5			5.9				
Level of Service		D			D			A				
Approach Delay (s)		46.0			36.5			5.9			0.0	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: California St & South St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	155	128	20	292	0	0	0	0	20	461	76
Future Volume (vph)	0	155	128	20	292	0	0	0	0	20	461	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7						4.7	
Lane Util. Factor		0.95			0.95						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.93			1.00						0.98	
Flt Protected		1.00			1.00						1.00	
Satd. Flow (prot)		3279			3528						3453	
Flt Permitted		1.00			0.88						1.00	
Satd. Flow (perm)		3279			3104						3453	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	0	194	160	25	365	0	0	0	0	25	576	95
RTOR Reduction (vph)	0	132	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	222	0	0	390	0	0	0	0	0	691	0
Confl. Peds. (#/hr)			1			4						3
Confl. Bikes (#/hr)						3						1
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		19.1			19.1						81.5	
Effective Green, g (s)		19.1			19.1						81.5	
Actuated g/C Ratio		0.17			0.17						0.74	
Clearance Time (s)		4.7			4.7						4.7	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		569			538						2558	
v/s Ratio Prot		0.07										
v/s Ratio Perm					c0.13						0.20	
v/c Ratio		0.39			0.72						0.27	
Uniform Delay, d1		40.3			43.0						4.6	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.4			4.8						0.3	
Delay (s)		40.7			47.8						4.9	
Level of Service		D			D						A	
Approach Delay (s)		40.7			47.8			0.0			4.9	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	48.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Pine St & South St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	132	0	0	136	35	187	665	14	0	0	0
Future Volume (vph)	47	132	0	0	136	35	187	665	14	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7			4.7				
Lane Util. Factor		0.95			0.95			0.91				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3460			3386			4968				
Flt Permitted		0.78			1.00			0.99				
Satd. Flow (perm)		2743			3386			4968				
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	54	152	0	0	156	40	215	764	16	0	0	0
RTOR Reduction (vph)	0	0	0	0	35	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	206	0	0	161	0	0	995	0	0	0	0
Confl. Peds. (#/hr)			2			3			6			2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)		14.4			14.4			86.2				
Effective Green, g (s)		14.4			14.4			86.2				
Actuated g/C Ratio		0.13			0.13			0.78				
Clearance Time (s)		4.7			4.7			4.7				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		359			443			3893				
v/s Ratio Prot					0.05							
v/s Ratio Perm		c0.08						0.20				
v/c Ratio		0.57			0.36			0.26				
Uniform Delay, d1		44.9			43.6			3.2				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.2			0.5			0.2				
Delay (s)		47.1			44.1			3.4				
Level of Service		D			D			A				
Approach Delay (s)		47.1			44.1			3.4			0.0	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
36: East St & South St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	68	54	24	13	85	17	21	186	64	34	114	65
Future Volume (vph)	68	54	24	13	85	17	21	186	64	34	114	65
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	76	61	27	15	96	19	24	209	72	38	128	73

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	107	58	63	67	24	281	38	201
Volume Left (vph)	76	0	15	0	24	0	38	0
Volume Right (vph)	0	27	0	19	0	72	0	73
Hadj (s)	0.39	-0.29	0.15	-0.16	0.53	-0.15	0.53	-0.22
Departure Headway (s)	6.5	5.8	6.3	6.0	6.2	5.5	6.2	5.5
Degree Utilization, x	0.19	0.09	0.11	0.11	0.04	0.43	0.07	0.31
Capacity (veh/h)	517	574	527	554	558	632	548	627
Control Delay (s)	9.8	8.2	8.9	8.5	8.2	11.4	8.5	9.7
Approach Delay (s)	9.2		8.7		11.1		9.5	
Approach LOS	A		A		B		A	

Intersection Summary					
Delay	9.9				
Level of Service	A				
Intersection Capacity Utilization	37.9%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
38: Gold St & Market St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	22	522	5	0	8	0	0	0	1	35	0
Future Volume (vph)	12	22	522	5	0	8	0	0	0	1	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	4.7	4.7		4.7					4.7	
Lane Util. Factor		0.95	0.95	1.00		1.00					0.95	
Frpb, ped/bikes		0.99	0.99	1.00		0.93					1.00	
Flpb, ped/bikes		1.00	1.00	1.00		1.00					1.00	
Frt		0.87	0.85	1.00		0.85					1.00	
Flt Protected		1.00	1.00	0.95		1.00					1.00	
Satd. Flow (prot)		1515	1484	1770		1472					3535	
Flt Permitted		1.00	1.00	0.95		1.00					1.00	
Satd. Flow (perm)		1515	1484	1770		1472					3535	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	13	23	555	5	0	9	0	0	0	1	37	0
RTOR Reduction (vph)	0	60	67	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	0	237	227	5	0	0	0	0	0	0	38	0
Confl. Peds. (#/hr)			1			3			3			5
Turn Type	Split	NA	Perm	Prot		Perm				Perm	NA	
Protected Phases	6	6		5							4	
Permitted Phases			6			5				4		
Actuated Green, G (s)		84.9	84.9	3.2		3.2					7.8	
Effective Green, g (s)		84.9	84.9	3.2		3.2					7.8	
Actuated g/C Ratio		0.77	0.77	0.03		0.03					0.07	
Clearance Time (s)		4.7	4.7	4.7		4.7					4.7	
Vehicle Extension (s)		3.0	3.0	3.0		3.0					3.0	
Lane Grp Cap (vph)		1169	1145	51		42					250	
v/s Ratio Prot		c0.16		c0.00								
v/s Ratio Perm			0.15			0.00					0.01	
v/c Ratio		0.20	0.20	0.10		0.01					0.15	
Uniform Delay, d1		3.4	3.4	52.0		51.9					48.0	
Progression Factor		3.52	4.49	1.00		1.00					1.00	
Incremental Delay, d2		0.4	0.4	0.8		0.1					0.3	
Delay (s)		12.3	15.6	52.8		51.9					48.3	
Level of Service		B	B	D		D					D	
Approach Delay (s)		13.9			52.2			0.0			48.3	
Approach LOS		B			D			A			D	

Intersection Summary					
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.20				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		14.1	
Intersection Capacity Utilization	45.7%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
45: Market St/Cypress Ave & East St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	WBL	NBT	NBR
Lane Configurations					
Traffic Volume (vph)	6	329	179	637	165
Future Volume (vph)	6	329	179	637	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.6	4.0
Lane Util. Factor	1.00	0.95	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	3400	5036	1545
Flt Permitted	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	3400	5036	1545
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	6	350	190	678	176
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	6	350	190	678	176
Confl. Peds. (#/hr)					8
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	3%	3%	3%	3%	3%
Turn Type	Split	NA	Prot	NA	Free
Protected Phases	3	3	4	6	
Permitted Phases					Free
Actuated Green, G (s)	11.9	11.9	11.4	17.1	60.0
Effective Green, g (s)	11.9	11.9	11.4	17.1	60.0
Actuated g/C Ratio	0.20	0.20	0.19	0.29	1.00
Clearance Time (s)	4.2	4.2	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	347	695	646	1435	1545
v/s Ratio Prot	0.00	c0.10	c0.06	c0.13	
v/s Ratio Perm					c0.11
v/c Ratio	0.02	0.50	0.29	0.47	0.11
Uniform Delay, d1	19.3	21.4	20.8	17.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.6	0.3	0.2	0.1
Delay (s)	19.4	22.0	21.1	18.0	0.1
Level of Service	B	C	C	B	A
Approach Delay (s)		22.0		14.3	
Approach LOS		C		B	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	17.6	
Intersection Capacity Utilization	40.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
51: Market St & Grange St

Timing Plan: EXISTING AM_17

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	36	51	893	48	28	513
Future Volume (vph)	36	51	893	48	28	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		5.4		4.2	5.4
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	0.99		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.92		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1647		3474		1752	3505
Flt Permitted	0.98		1.00		0.95	1.00
Satd. Flow (perm)	1647		3474		1752	3505
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	43	61	1063	57	33	611
RTOR Reduction (vph)	51	0	5	0	0	0
Lane Group Flow (vph)	53	0	1115	0	33	611
Confl. Peds. (#/hr)		9		4		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Perm		NA		Prot	NA
Protected Phases			2		1	6
Permitted Phases	8					
Actuated Green, G (s)	10.1		32.0		3.0	39.2
Effective Green, g (s)	10.1		32.0		3.0	39.2
Actuated g/C Ratio	0.17		0.54		0.05	0.67
Clearance Time (s)	4.2		5.4		4.2	5.4
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	282		1887		89	2332
v/s Ratio Prot			c0.32		0.02	c0.17
v/s Ratio Perm	c0.03					
v/c Ratio	0.19		0.59		0.37	0.26
Uniform Delay, d1	20.9		9.0		27.0	4.0
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.3		0.5		2.6	0.1
Delay (s)	21.2		9.5		29.6	4.1
Level of Service	C		A		C	A
Approach Delay (s)	21.2		9.5			5.4
Approach LOS	C		A			A

Intersection Summary				
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	13.8	
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
54: Westside Rd/Railroad Ave & Buenaventura Blvd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	511	20	21	409	378	31	58	18	174	16	29
Future Volume (vph)	40	511	20	21	409	378	31	58	18	174	16	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3	5.3	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1752	3485		1752	3505	1568	1752	1845	1548	1665	1682	1547
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1752	3485		1752	3505	1568	1752	1845	1548	1665	1682	1547
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	47	601	24	25	481	445	36	68	21	205	19	34
RTOR Reduction (vph)	0	2	0	0	0	300	0	0	18	0	0	28
Lane Group Flow (vph)	47	623	0	25	481	145	36	68	3	111	113	6
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	4.2	21.6		2.3	19.7	19.7	8.1	8.1	8.1	11.3	11.3	11.3
Effective Green, g (s)	4.2	21.6		2.3	19.7	19.7	8.1	8.1	8.1	11.3	11.3	11.3
Actuated g/C Ratio	0.07	0.36		0.04	0.33	0.33	0.13	0.13	0.13	0.19	0.19	0.19
Clearance Time (s)	4.0	5.3		4.0	5.3	5.3	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	121	1242		66	1139	509	234	246	206	310	313	288
v/s Ratio Prot	c0.03	c0.18		0.01	0.14		0.02	c0.04		0.07	c0.07	
v/s Ratio Perm						0.09			0.00			0.00
v/c Ratio	0.39	0.50		0.38	0.42	0.28	0.15	0.28	0.01	0.36	0.36	0.02
Uniform Delay, d1	27.0	15.3		28.5	16.0	15.2	23.2	23.6	22.8	21.5	21.5	20.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.3		3.6	0.3	0.3	0.3	0.6	0.0	0.7	0.7	0.0
Delay (s)	29.0	15.6		32.1	16.3	15.5	23.5	24.2	22.8	22.2	22.2	20.2
Level of Service	C	B		C	B	B	C	C	C	C	C	C
Approach Delay (s)		16.5			16.3			23.8			21.9	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	17.3	
Intersection Capacity Utilization	41.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
55: SR 273 & Buenaventura Blvd

Timing Plan: EXISTING AM_17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	275	428	684	501	243	124
Future Volume (vph)	275	428	684	501	243	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.2	4.2	5.8	5.8	4.6
Lane Util. Factor	1.00	0.88	0.97	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	2787	3433	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	2787	3433	3539	3539	1583
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	331	516	824	604	293	149
RTOR Reduction (vph)	0	196	0	0	0	4
Lane Group Flow (vph)	331	320	824	604	293	145
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	19.3	42.3	23.0	38.5	11.3	30.6
Effective Green, g (s)	19.3	42.3	23.0	38.5	11.3	30.6
Actuated g/C Ratio	0.28	0.62	0.34	0.56	0.17	0.45
Clearance Time (s)	4.6	4.2	4.2	5.8	5.8	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	500	1728	1157	1997	586	710
v/s Ratio Prot	c0.19	0.06	c0.24	0.17	c0.08	0.06
v/s Ratio Perm		0.05				0.03
v/c Ratio	0.66	0.19	0.71	0.30	0.50	0.20
Uniform Delay, d1	21.6	5.6	19.7	7.8	25.9	11.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	0.1	2.1	0.1	0.7	0.1
Delay (s)	24.9	5.6	21.8	7.9	26.6	11.6
Level of Service	C	A	C	A	C	B
Approach Delay (s)	13.1			15.9	21.5	
Approach LOS	B			B	C	

Intersection Summary				
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
57: SR 273 & Kenyon Dr

Timing Plan: EXISTING AM_17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	48	34	969	505	13
Future Volume (Veh/h)	42	48	34	969	505	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	50	57	40	1154	601	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1258	300	616			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1258	300	616			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	92	96			
cM capacity (veh/h)	153	690	946			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	107	40	577	577	300	300	15
Volume Left	50	40	0	0	0	0	0
Volume Right	57	0	0	0	0	0	15
cSH	328	946	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.04	0.34	0.34	0.18	0.18	0.01
Queue Length 95th (ft)	35	3	0	0	0	0	0
Control Delay (s)	24.1	9.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	A					
Approach Delay (s)	24.1	0.3			0.0		
Approach LOS	C						

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	36.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: SR 273 & Branstetter Ln

Timing Plan: EXISTING AM_17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	23	0	1003	530	23
Future Volume (Veh/h)	0	23	0	1003	530	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	27	0	1194	631	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1228	316	658			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1228	316	658			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	100			
cM capacity (veh/h)	168	674	912			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	27	597	597	316	316	27
Volume Left	0	0	0	0	0	0
Volume Right	27	0	0	0	0	27
cSH	674	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.35	0.35	0.19	0.19	0.02
Queue Length 95th (ft)	3	0	0	0	0	0
Control Delay (s)	10.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	10.6	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	31.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
59: SR 273 & Cedars Rd/Bonnyview Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	70	50	361	106	218	46	780	620	196	352	5
Future Volume (vph)	5	70	50	361	106	218	46	780	620	196	352	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.2	6.5	4.9	4.2	6.5	6.5
Lane Util. Factor	0.91	0.91	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3291	1518	3335	1615	1442	1719	3438	1538	3335	3438	1505
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1564	3291	1518	3335	1615	1442	1719	3438	1538	3335	3438	1505
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	80	57	415	122	251	53	897	713	225	405	6
RTOR Reduction (vph)	0	0	48	0	0	0	0	0	158	0	0	4
Lane Group Flow (vph)	5	81	9	415	195	178	53	897	555	225	405	2
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	18.4	18.4	18.4	29.4	29.4	29.4	9.0	39.0	68.4	15.0	45.0	45.0
Effective Green, g (s)	18.4	18.4	18.4	29.4	29.4	29.4	9.0	39.0	68.4	15.0	45.0	45.0
Actuated g/C Ratio	0.15	0.15	0.15	0.24	0.24	0.24	0.07	0.32	0.56	0.12	0.37	0.37
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.2	6.5	4.9	4.2	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	235	496	228	803	389	347	126	1099	862	410	1268	555
v/s Ratio Prot	0.00	c0.02		0.12	0.12		0.03	c0.26	c0.16	c0.07	0.12	
v/s Ratio Perm			0.01			0.12			0.21			0.00
v/c Ratio	0.02	0.16	0.04	0.52	0.50	0.51	0.42	0.82	0.64	0.55	0.32	0.00
Uniform Delay, d1	44.1	45.1	44.2	40.1	40.0	40.1	54.0	38.2	18.4	50.3	27.5	24.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2	0.1	0.6	1.0	1.3	2.3	4.8	1.7	1.5	0.1	0.0
Delay (s)	44.2	45.3	44.3	40.7	41.0	41.4	56.3	43.0	20.1	51.8	27.7	24.3
Level of Service	D	D	D	D	D	D	E	D	C	D	C	C
Approach Delay (s)		44.8			40.9			33.6			36.2	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	20.2	
Intersection Capacity Utilization	72.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
60: Eastside Rd & Bonnyview Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	743	18	142	584	108	85	68	206	101	39	16
Future Volume (vph)	125	743	18	142	584	108	85	68	206	101	39	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.9	4.9	3.5	4.9	4.9	4.2	4.2	4.2		4.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1719	3438	1538	1719	3438	1494	1719	1810	1538		1726	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	1719	3438	1538	1719	3438	1494	1719	1810	1538		1726	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	144	854	21	163	671	124	98	78	237	116	45	18
RTOR Reduction (vph)	0	0	15	0	0	87	0	0	199	0	3	0
Lane Group Flow (vph)	144	854	6	163	671	37	98	78	38	0	176	0
Confl. Peds. (#/hr)						5						5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			
Actuated Green, G (s)	14.0	25.6	25.6	14.3	25.9	25.9	13.9	13.9	13.9		15.5	
Effective Green, g (s)	14.0	25.6	25.6	14.3	25.9	25.9	13.9	13.9	13.9		15.5	
Actuated g/C Ratio	0.16	0.30	0.30	0.17	0.30	0.30	0.16	0.16	0.16		0.18	
Clearance Time (s)	3.5	4.9	4.9	3.5	4.9	4.9	4.2	4.2	4.2		4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	279	1022	457	285	1034	449	277	292	248		310	
v/s Ratio Prot	0.08	c0.25		c0.09	0.20		c0.06	0.04			c0.10	
v/s Ratio Perm			0.00			0.02			0.02			
v/c Ratio	0.52	0.84	0.01	0.57	0.65	0.08	0.35	0.27	0.15		0.57	
Uniform Delay, d1	33.0	28.3	21.3	33.1	26.2	21.6	32.1	31.6	31.0		32.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.6	6.0	0.0	2.8	1.4	0.1	0.8	0.5	0.3		2.4	
Delay (s)	34.6	34.3	21.4	35.8	27.6	21.7	32.9	32.1	31.3		34.6	
Level of Service	C	C	C	D	C	C	C	C	C		C	
Approach Delay (s)		34.1			28.2			31.9			34.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	16.8	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
62: SR 273 & Clear Creek Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	81	61	53	1027	543	107
Future Volume (vph)	81	61	53	1027	543	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	4.2	6.5	6.5	5.1
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1687	1509	1687	3374	3374	1488
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1687	1509	1687	3374	3374	1488
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	90	68	59	1141	603	119
RTOR Reduction (vph)	0	53	0	0	0	42
Lane Group Flow (vph)	90	15	59	1141	603	77
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Turn Type	Prot	Perm	Prot	NA	NA	pm+ov
Protected Phases	7		5	2	6	7
Permitted Phases		7				6
Actuated Green, G (s)	13.3	13.3	5.9	35.9	25.8	39.1
Effective Green, g (s)	13.3	13.3	5.9	35.9	25.8	39.1
Actuated g/C Ratio	0.22	0.22	0.10	0.59	0.42	0.64
Clearance Time (s)	5.1	5.1	4.2	6.5	6.5	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	369	330	163	1992	1431	956
v/s Ratio Prot	c0.05		0.03	c0.34	0.18	0.02
v/s Ratio Perm		0.01				0.03
v/c Ratio	0.24	0.05	0.36	0.57	0.42	0.08
Uniform Delay, d1	19.6	18.7	25.7	7.7	12.3	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	1.4	0.4	0.2	0.0
Delay (s)	19.9	18.8	27.1	8.1	12.5	4.1
Level of Service	B	B	C	A	B	A
Approach Delay (s)	19.5			9.0	11.1	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	15.8	
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
64: SR 273 & Canyon Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	542	43	31	485	374	230
Future Volume (vph)	542	43	31	485	374	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.6	6.5	6.5	6.5
Lane Util. Factor	0.97		1.00	0.95	0.95	0.88
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	0.96		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3312		1719	3438	3438	2707
Flt Permitted	0.96		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3312		1719	3438	3438	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	602	48	34	539	416	256
RTOR Reduction (vph)	4	0	0	0	0	199
Lane Group Flow (vph)	646	0	34	539	416	57
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	Prot		Prot	NA	NA	Perm
Protected Phases	8		5	2	6	
Permitted Phases						6
Actuated Green, G (s)	27.6		10.6	30.8	15.6	15.6
Effective Green, g (s)	27.6		10.6	30.8	15.6	15.6
Actuated g/C Ratio	0.40		0.15	0.44	0.22	0.22
Clearance Time (s)	4.6		4.6	6.5	6.5	6.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1315		262	1523	771	607
v/s Ratio Prot	c0.19		0.02	c0.16	c0.12	
v/s Ratio Perm						0.02
v/c Ratio	0.49		0.13	0.35	0.54	0.09
Uniform Delay, d1	15.7		25.5	12.8	23.8	21.4
Progression Factor	0.77		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		0.2	0.1	0.7	0.1
Delay (s)	12.4		25.7	12.9	24.5	21.4
Level of Service	B		C	B	C	C
Approach Delay (s)	12.4			13.7	23.3	
Approach LOS	B			B	C	

Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	20.3	
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
65: SR 273 & Whitehouse Dr

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	5	8	0	39	4	450	9	52	357	8
Future Volume (Veh/h)	27	0	5	8	0	39	4	450	9	52	357	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	29	0	5	9	0	41	4	479	10	55	380	9
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	780	988	191	792	987	240	390			489		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	780	988	191	792	987	240	390			489		
tC, single (s)	7.7	6.7	7.1	7.7	6.7	7.1	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	88	100	99	96	100	94	100			95		
cM capacity (veh/h)	247	221	796	254	221	741	1115			1023		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	34	50	4	240	240	10	55	190	190	9
Volume Left	29	9	4	0	0	0	55	0	0	0
Volume Right	5	41	0	0	0	10	0	0	0	9
cSH	275	551	1115	1700	1700	1700	1023	1700	1700	1700
Volume to Capacity	0.12	0.09	0.00	0.14	0.14	0.01	0.05	0.11	0.11	0.01
Queue Length 95th (ft)	10	7	0	0	0	0	4	0	0	0
Control Delay (s)	20.0	12.2	8.2	0.0	0.0	0.0	8.7	0.0	0.0	0.0
Lane LOS	C	B	A				A			
Approach Delay (s)	20.0	12.2	0.1				1.1			
Approach LOS	C	B								

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	32.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
66: SR 273 & Happy V Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	71	173	58	392	341	29
Future Volume (vph)	71	173	58	392	341	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	7.0	7.0	7.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.90		1.00	1.00	1.00	0.85
Flt Protected	0.99		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1568		1671	3343	3343	1462
Flt Permitted	0.99		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1568		1671	3343	3343	1462
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	188	63	426	371	32
RTOR Reduction (vph)	92	0	0	0	0	22
Lane Group Flow (vph)	173	0	63	426	371	10
Confl. Peds. (#/hr)						1
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Actuated Green, G (s)	12.7		5.7	25.1	15.2	15.2
Effective Green, g (s)	12.7		5.7	25.1	15.2	15.2
Actuated g/C Ratio	0.26		0.12	0.51	0.31	0.31
Clearance Time (s)	4.6		4.2	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	403		192	1698	1028	449
v/s Ratio Prot			c0.04	0.13	c0.11	
v/s Ratio Perm	c0.11					0.01
v/c Ratio	0.43		0.33	0.25	0.36	0.02
Uniform Delay, d1	15.3		20.1	6.8	13.3	11.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7		1.0	0.1	0.2	0.0
Delay (s)	16.1		21.1	6.9	13.5	11.9
Level of Service	B		C	A	B	B
Approach Delay (s)	16.1			8.8	13.4	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	15.8
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
67: SR 273 & Amen St/Latona Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	41	0	9	4	441	55	12	500	2
Future Volume (Veh/h)	0	0	1	41	0	9	4	441	55	12	500	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	1	45	0	10	4	479	60	13	543	2
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	828	1117	272	786	1059	240	546			539		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	828	1117	272	786	1059	240	546			539		
tC, single (s)	7.7	6.7	7.1	7.7	6.7	7.1	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	100	83	100	99	100			99		
cM capacity (veh/h)	242	189	698	263	205	735	958			965		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	1	55	4	240	240	60	13	272	272	2
Volume Left	0	45	4	0	0	0	13	0	0	0
Volume Right	1	10	0	0	0	60	0	0	0	2
cSH	698	298	958	1700	1700	1700	965	1700	1700	1700
Volume to Capacity	0.00	0.18	0.00	0.14	0.14	0.04	0.01	0.16	0.16	0.00
Queue Length 95th (ft)	0	17	0	0	0	0	1	0	0	0
Control Delay (s)	10.2	19.8	8.8	0.0	0.0	0.0	8.8	0.0	0.0	0.0
Lane LOS	B	C	A				A			
Approach Delay (s)	10.2	19.8	0.1				0.2			
Approach LOS	B	C								

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
69: SR 273 & Ox Yoke Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	1	22	5	349	3	324	67	337	314	0
Future Volume (vph)	1	1	1	22	5	349	3	324	67	337	314	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.4	4.4	4.2	7.0	7.0	4.2	7.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1637			1676	1482	1656	3312	1482	1656	3312	
Flt Permitted		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1637			1676	1482	1656	3312	1482	1656	3312	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	1	1	25	6	401	3	372	77	387	361	0
RTOR Reduction (vph)	0	1	0	0	0	344	0	0	60	0	0	0
Lane Group Flow (vph)	0	2	0	0	31	57	3	372	17	387	361	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases						7			6			
Actuated Green, G (s)		1.7			11.6	11.6	1.2	18.4	18.4	30.1	47.3	
Effective Green, g (s)		1.7			11.6	11.6	1.2	18.4	18.4	30.1	47.3	
Actuated g/C Ratio		0.02			0.14	0.14	0.01	0.23	0.23	0.37	0.58	
Clearance Time (s)		4.2			4.4	4.4	4.2	7.0	7.0	4.2	7.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		34			238	210	24	746	334	610	1919	
v/s Ratio Prot		c0.00			0.02		0.00	c0.11		c0.23	0.11	
v/s Ratio Perm						c0.04			0.01			
v/c Ratio		0.06			0.13	0.27	0.12	0.50	0.05	0.63	0.19	
Uniform Delay, d1		39.2			30.6	31.2	39.7	27.6	24.8	21.2	8.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.7			0.2	0.7	2.3	0.5	0.1	2.2	0.0	
Delay (s)		39.9			30.8	31.9	42.0	28.1	24.8	23.4	8.1	
Level of Service		D			C	C	D	C	C	C	A	
Approach Delay (s)		39.9			31.9			27.6			16.0	
Approach LOS		D			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	19.8	
Intersection Capacity Utilization	53.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
72: SR 273 & North St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	176	33	118	181	52	29	224	163	97	237	10
Future Volume (vph)	12	176	33	118	181	52	29	224	163	97	237	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6	4.6	4.2	5.8	5.8	4.2	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1778		1736	1827	1528	1736	3471	1518	1736	3471	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1778		1736	1827	1528	1736	3471	1518	1736	3471	1553
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	14	207	39	139	213	61	34	264	192	114	279	12
RTOR Reduction (vph)	0	5	0	0	0	49	0	0	155	0	0	9
Lane Group Flow (vph)	14	241	0	139	213	12	34	264	37	114	279	3
Confl. Peds. (#/hr)			11			2			1			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	18.6	18.6		16.5	16.5	16.5	4.7	15.7	15.7	12.0	23.0	23.0
Effective Green, g (s)	18.6	18.6		16.5	16.5	16.5	4.7	15.7	15.7	12.0	23.0	23.0
Actuated g/C Ratio	0.23	0.23		0.20	0.20	0.20	0.06	0.19	0.19	0.15	0.28	0.28
Clearance Time (s)	4.6	4.6		4.6	4.6	4.6	4.2	5.8	5.8	4.2	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	393	403		349	367	307	99	664	290	254	973	435
v/s Ratio Prot	0.01	c0.14		0.08	c0.12		0.02	c0.08		c0.07	0.08	
v/s Ratio Perm						0.01			0.02			0.00
v/c Ratio	0.04	0.60		0.40	0.58	0.04	0.34	0.40	0.13	0.45	0.29	0.01
Uniform Delay, d1	24.7	28.4		28.4	29.6	26.4	37.2	29.0	27.5	32.0	23.1	21.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	2.4		0.7	2.3	0.1	2.1	0.4	0.2	1.3	0.2	0.0
Delay (s)	24.7	30.8		29.2	32.0	26.4	39.2	29.4	27.7	33.2	23.2	21.3
Level of Service	C	C		C	C	C	D	C	C	C	C	C
Approach Delay (s)		30.4			30.2			29.4			26.0	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	55.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
73: SR 273 & South St

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	117	114	40	109	37	137	252	83	50	235	103
Future Volume (vph)	127	117	114	40	109	37	137	252	83	50	235	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6		4.2	5.8	5.8	4.2	5.8	5.8
Lane Util. Factor		0.95		0.95	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3234		1649	1663		1736	3471	1553	1736	3471	1553
Flt Permitted		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3234		1649	1663		1736	3471	1553	1736	3471	1553
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	153	141	137	48	131	45	165	304	100	60	283	124
RTOR Reduction (vph)	0	36	0	0	8	0	0	0	73	0	0	101
Lane Group Flow (vph)	0	395	0	43	173	0	165	304	27	60	283	23
Confl. Peds. (#/hr)			2			1						
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)		18.8		17.5	17.5		15.1	23.0	23.0	7.8	15.7	15.7
Effective Green, g (s)		18.8		17.5	17.5		15.1	23.0	23.0	7.8	15.7	15.7
Actuated g/C Ratio		0.22		0.20	0.20		0.17	0.27	0.27	0.09	0.18	0.18
Clearance Time (s)		4.6		4.6	4.6		4.2	5.8	5.8	4.2	5.8	5.8
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		704		334	337		303	925	413	156	631	282
v/s Ratio Prot		c0.12		0.03	c0.10		c0.10	0.09		0.03	c0.08	
v/s Ratio Perm									0.02			0.01
v/c Ratio		0.56		0.13	0.51		0.54	0.33	0.06	0.38	0.45	0.08
Uniform Delay, d1		30.1		28.2	30.6		32.5	25.4	23.6	37.0	31.4	29.3
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.0		0.2	1.3		2.0	0.2	0.1	1.6	0.5	0.1
Delay (s)		31.1		28.3	31.9		34.5	25.7	23.7	38.6	32.0	29.4
Level of Service		C		C	C		C	C	C	D	C	C
Approach Delay (s)		31.1			31.2			27.9			32.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
76: SR 273 & Factory Outlets Dr

Timing Plan: EXISTING AM_17

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	202	155	240	166	176	282
Future Volume (vph)	202	155	240	166	176	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	6.0	4.6	4.2	6.0
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.97	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.96	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3346	1427	3505	1568	1752	3505
Flt Permitted	0.96	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3346	1427	3505	1568	1752	3505
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	227	174	270	187	198	317
RTOR Reduction (vph)	13	92	0	101	0	0
Lane Group Flow (vph)	263	33	270	86	198	317
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	3		2	3	1	6
Permitted Phases		3		2		
Actuated Green, G (s)	14.0	14.0	10.4	24.4	14.0	28.6
Effective Green, g (s)	14.0	14.0	10.4	24.4	14.0	28.6
Actuated g/C Ratio	0.26	0.26	0.20	0.46	0.26	0.54
Clearance Time (s)	4.6	4.6	6.0	4.6	4.2	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	880	375	685	719	461	1884
v/s Ratio Prot	c0.08		c0.08	0.03	c0.11	0.09
v/s Ratio Perm		0.02		0.02		
v/c Ratio	0.30	0.09	0.39	0.12	0.43	0.17
Uniform Delay, d1	15.7	14.8	18.7	8.2	16.3	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.4	0.1	0.6	0.0
Delay (s)	15.9	14.9	19.0	8.3	16.9	6.3
Level of Service	B	B	B	A	B	A
Approach Delay (s)	15.6		14.6			10.4
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	18.3	
Intersection Capacity Utilization	42.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
77: SR 273 & Pleasant Hills Dr

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	3	60	1	9	4	83	128	8	5	222	257
Future Volume (vph)	274	3	60	1	9	4	83	128	8	5	222	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	7.0	7.0	4.6	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	1845	1568	1752	1845	1568	3400	3505	1568	1752	3505	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	1845	1568	1752	1845	1568	3400	3505	1568	1752	3505	1568
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	282	3	62	1	9	4	86	132	8	5	229	265
RTOR Reduction (vph)	0	0	49	0	0	4	0	0	5	0	0	193
Lane Group Flow (vph)	282	3	13	1	9	0	86	132	3	5	229	72
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.7	12.9	12.9	1.5	1.7	1.7	9.0	23.9	23.9	1.5	16.4	16.4
Effective Green, g (s)	12.7	12.9	12.9	1.5	1.7	1.7	9.0	23.9	23.9	1.5	16.4	16.4
Actuated g/C Ratio	0.21	0.21	0.21	0.02	0.03	0.03	0.15	0.39	0.39	0.02	0.27	0.27
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	7.0	7.0	4.6	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	712	392	333	43	51	43	504	1382	618	43	948	424
v/s Ratio Prot	c0.08	0.00		0.00	c0.00		c0.03	0.04		0.00	c0.07	
v/s Ratio Perm			0.01			0.00			0.00			0.05
v/c Ratio	0.40	0.01	0.04	0.02	0.18	0.00	0.17	0.10	0.01	0.12	0.24	0.17
Uniform Delay, d1	20.6	18.8	18.9	28.8	28.8	28.6	22.5	11.5	11.1	28.9	17.2	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.0	0.2	1.7	0.0	0.2	0.0	0.0	1.2	0.1	0.2
Delay (s)	21.0	18.8	19.0	29.1	30.4	28.7	22.7	11.6	11.1	30.1	17.4	17.1
Level of Service	C	B	B	C	C	C	C	B	B	C	B	B
Approach Delay (s)		20.6			29.8			15.8			17.3	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	48.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
78: Branstetter Ln & Westside Rd

Timing Plan: EXISTING AM_17

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	17	5	4	18	1	14	29	0	6	11	2
Future Volume (Veh/h)	37	17	5	4	18	1	14	29	0	6	11	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	45	21	6	5	22	1	17	35	0	7	13	2
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	23			27			158	147	24	164	150	26
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	23			27			158	147	24	164	150	26
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	97			100			98	95	100	99	98	100
cM capacity (veh/h)	1536			1530			754	705	1027	733	702	1022

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	72	28	52	22
Volume Left	45	5	17	7
Volume Right	6	1	0	2
cSH	1536	1530	720	733
Volume to Capacity	0.03	0.00	0.07	0.03
Queue Length 95th (ft)	2	0	6	2
Control Delay (s)	4.7	1.3	10.4	10.1
Lane LOS	A	A	B	B
Approach Delay (s)	4.7	1.3	10.4	10.1
Approach LOS			B	B

Intersection Summary				
Average Delay	6.5			
Intersection Capacity Utilization	20.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1: Market St & Caterpillar Rd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	319	177	17	124	11	70	323	19	14	188	28
Future Volume (vph)	32	319	177	17	124	11	70	323	19	14	188	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.9		4.2	4.9		4.2	6.5	6.5	4.2	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1721		1736	1803		1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1721		1736	1803		1736	3471	1553	1736	3471	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	36	358	199	19	139	12	79	363	21	16	211	31
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	16	0	0	26
Lane Group Flow (vph)	36	548	0	19	150	0	79	363	5	16	211	5
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	4.5	36.1		4.0	35.6		8.7	21.2	21.2	1.3	13.9	13.9
Effective Green, g (s)	4.5	36.1		4.0	35.6		8.7	21.2	21.2	1.3	13.9	13.9
Actuated g/C Ratio	0.05	0.44		0.05	0.43		0.11	0.26	0.26	0.02	0.17	0.17
Clearance Time (s)	4.2	4.9		4.2	4.9		4.2	6.5	6.5	4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	94	753		84	778		183	893	399	27	585	261
v/s Ratio Prot	c0.02	c0.32		0.01	0.08		c0.05	c0.10		0.01	0.06	
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.38	0.73		0.23	0.19		0.43	0.41	0.01	0.59	0.36	0.02
Uniform Delay, d1	37.6	19.1		37.7	14.5		34.5	25.4	22.8	40.3	30.3	28.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	3.5		1.4	0.1		1.6	0.3	0.0	30.3	0.4	0.0
Delay (s)	40.2	22.6		39.1	14.6		36.2	25.7	22.8	70.6	30.7	28.6
Level of Service	D	C		D	B		D	C	C	E	C	C
Approach Delay (s)		23.7			17.4			27.3			32.9	
Approach LOS		C			B			C			C	

Intersection Summary					
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.61				
Actuated Cycle Length (s)	82.4	Sum of lost time (s)		19.8	
Intersection Capacity Utilization	58.0%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Market St & Northpoint Dr/Twin View Blvd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	55	91	77	49	0	113	356	118	3	330	49
Future Volume (vph)	56	55	91	77	49	0	113	356	118	3	330	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6		4.2	6.5	6.5	4.2	6.5	6.5
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00		0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1835	1599		1825		1787	3574	1563	1787	3574	1564
Flt Permitted		0.98	1.00		0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1835	1599		1825		1787	3574	1563	1787	3574	1564
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	60	59	98	83	53	0	122	383	127	3	355	53
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	85	0	0	41
Lane Group Flow (vph)	0	119	17	0	136	0	122	383	42	3	355	12
Confl. Peds. (#/hr)						4			1			
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			6
Actuated Green, G (s)		12.9	12.9		16.0		9.1	24.4	24.4	1.2	16.5	16.5
Effective Green, g (s)		12.9	12.9		16.0		9.1	24.4	24.4	1.2	16.5	16.5
Actuated g/C Ratio		0.17	0.17		0.22		0.12	0.33	0.33	0.02	0.22	0.22
Clearance Time (s)		4.6	4.6		4.6		4.2	6.5	6.5	4.2	6.5	6.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		318	277		392		218	1172	512	28	792	346
v/s Ratio Prot		c0.06			c0.07		c0.07	0.11		0.00	c0.10	
v/s Ratio Perm			0.01						0.03			0.01
v/c Ratio		0.37	0.06		0.35		0.56	0.33	0.08	0.11	0.45	0.03
Uniform Delay, d1		27.2	25.7		24.8		30.8	18.8	17.3	36.1	25.0	22.7
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1		0.5		3.1	0.2	0.1	1.7	0.4	0.0
Delay (s)		27.9	25.8		25.3		33.9	19.0	17.3	37.8	25.4	22.7
Level of Service		C	C		C		C	B	B	D	C	C
Approach Delay (s)		27.0			25.3			21.5			25.2	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	74.4	Sum of lost time (s)	19.9	
Intersection Capacity Utilization	47.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
3: Market St & Lake Blvd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	539	232	234	516	161	288	372	412	151	286	61
Future Volume (vph)	54	539	232	234	516	161	288	372	412	151	286	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1	5.1	4.2	5.8	5.8	4.2	6.2	4.2	4.2	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1577	3467	3574	1599	3467	3574	1588	1787	3574	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1577	3467	3574	1599	3467	3574	1588	1787	3574	1578
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	56	561	242	244	538	168	300	388	429	157	298	64
RTOR Reduction (vph)	0	0	176	0	0	83	0	0	68	0	0	52
Lane Group Flow (vph)	56	561	66	244	538	85	300	388	361	157	298	12
Confl. Peds. (#/hr)			3						1			
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.5	24.3	24.3	14.7	28.8	28.8	14.2	15.9	30.6	14.5	16.2	16.2
Effective Green, g (s)	9.5	24.3	24.3	14.7	28.8	28.8	14.2	15.9	30.6	14.5	16.2	16.2
Actuated g/C Ratio	0.11	0.27	0.27	0.16	0.32	0.32	0.16	0.18	0.34	0.16	0.18	0.18
Clearance Time (s)	4.2	5.1	5.1	4.2	5.8	5.8	4.2	6.2	4.2	4.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	190	974	430	571	1155	516	552	637	545	290	649	286
v/s Ratio Prot	0.03	c0.16		0.07	0.15		0.09	0.11	c0.11	c0.09	0.08	
v/s Ratio Perm			0.04			0.05			0.12			0.01
v/c Ratio	0.29	0.58	0.15	0.43	0.47	0.16	0.54	0.61	0.66	0.54	0.46	0.04
Uniform Delay, d1	36.7	28.0	24.6	33.4	24.0	21.5	34.5	33.7	24.9	34.2	32.5	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.8	0.2	0.5	0.3	0.2	1.1	1.7	3.0	2.1	0.5	0.1
Delay (s)	37.6	28.8	24.8	33.9	24.3	21.7	35.6	35.4	27.9	36.3	33.1	30.1
Level of Service	D	C	C	C	C	C	D	D	C	D	C	C
Approach Delay (s)		28.2			26.3			32.6			33.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	20.4	
Intersection Capacity Utilization	64.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Market St & Benton Dr

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	0	25	3	0	7	57	746	1	1	446	305
Future Volume (vph)	319	0	25	3	0	7	57	746	1	1	446	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6			4.2		4.2	6.2	6.2	4.2	6.2	6.2
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1676			1678		1787	3574	1565	1787	3574	1543
Flt Permitted	0.95	0.96			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1698	1676			1678		1787	3574	1565	1787	3574	1543
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	339	0	27	3	0	7	61	794	1	1	474	324
RTOR Reduction (vph)	0	113	0	0	10	0	0	0	0	0	0	125
Lane Group Flow (vph)	183	70	0	0	0	0	61	794	1	1	474	199
Confl. Peds. (#/hr)												5
Confl. Bikes (#/hr)									2			4
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	19.7	19.7			2.0		9.4	87.1	87.1	2.0	79.7	79.7
Effective Green, g (s)	19.7	19.7			2.0		9.4	87.1	87.1	2.0	79.7	79.7
Actuated g/C Ratio	0.15	0.15			0.02		0.07	0.67	0.67	0.02	0.61	0.61
Clearance Time (s)	4.6	4.6			4.2		4.2	6.2	6.2	4.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	257	253			25		129	2394	1048	27	2191	945
v/s Ratio Prot	c0.11	0.04			c0.00		c0.03	c0.22		0.00	0.13	
v/s Ratio Perm									0.00			0.13
v/c Ratio	0.71	0.28			0.01		0.47	0.33	0.00	0.04	0.22	0.21
Uniform Delay, d1	52.5	48.8			63.0		57.9	9.1	7.1	63.1	11.2	11.2
Progression Factor	1.00	1.00			1.00		1.11	0.60	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.0	0.6			0.1		2.7	0.4	0.0	0.6	0.2	0.5
Delay (s)	61.4	49.4			63.1		66.8	5.8	7.1	63.6	11.4	11.7
Level of Service	E	D			E		E	A	A	E	B	B
Approach Delay (s)		55.4			63.1			10.2			11.6	
Approach LOS		E			E			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Market St & Quartz Hill Rd/Travelled Wy

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	127	26	1	15	241	693	14	11	463	52
Future Volume (vph)	34	5	127	26	1	15	241	693	14	11	463	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2		4.2		4.2	5.8		4.2	5.8	5.8
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		0.95		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1723	1574		1737		1787	3562		1787	3574	1555
Flt Permitted	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1723	1574		1737		1787	3562		1787	3574	1555
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	39	6	144	30	1	17	274	788	16	12	526	59
RTOR Reduction (vph)	0	0	127	0	16	0	0	1	0	0	0	33
Lane Group Flow (vph)	22	23	17	0	32	0	274	803	0	13	526	26
Confl. Peds. (#/hr)									2			1
Confl. Bikes (#/hr)			2						2			5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	15.0	15.0	15.0		11.2		28.5	81.4		4.0	56.9	56.9
Effective Green, g (s)	15.0	15.0	15.0		11.2		28.5	81.4		4.0	56.9	56.9
Actuated g/C Ratio	0.12	0.12	0.12		0.09		0.22	0.63		0.03	0.44	0.44
Clearance Time (s)	4.2	4.2	4.2		4.2		4.2	5.8		4.2	5.8	5.8
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	195	198	181		149		391	2230		54	1564	680
v/s Ratio Prot	0.01	c0.01			c0.02		c0.15	c0.23		0.01	0.15	
v/s Ratio Perm			0.01									0.02
v/c Ratio	0.11	0.12	0.09		0.22		0.70	0.36		0.24	0.34	0.04
Uniform Delay, d1	51.5	51.6	51.4		55.3		46.8	11.7		61.5	24.1	20.9
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		0.89	0.76	1.00
Incremental Delay, d2	0.3	0.3	0.2		0.7		5.6	0.5		2.3	0.6	0.1
Delay (s)	51.8	51.8	51.6		56.1		52.4	12.2		57.3	18.9	21.0
Level of Service	D	D	D		E		D	B		E	B	C
Approach Delay (s)		51.7			56.1			22.4			19.9	
Approach LOS		D			E			C			B	

Intersection Summary				
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
11: Market St & Trinity St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	13	27	19	26	220	34	682	27	118	521	7
Future Volume (vph)	18	13	27	19	26	220	34	682	27	118	521	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	4.7		4.2	4.2	4.2	4.7		4.1	4.7	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1829	1578		1842	1535	1787	3547		1787	3566	
Flt Permitted		0.97	1.00		0.98	1.00	0.44	1.00		0.29	1.00	
Satd. Flow (perm)		1829	1578		1842	1535	836	3547		540	3566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	14	28	20	27	232	36	718	28	124	548	7
RTOR Reduction (vph)	0	0	25	0	0	203	0	2	0	0	0	0
Lane Group Flow (vph)	0	33	3	0	47	29	36	744	0	124	555	0
Confl. Peds. (#/hr)			1			18			11			2
Confl. Bikes (#/hr)									4			7
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		
Actuated Green, G (s)		10.2	10.2		13.8	13.8	63.2	58.4		72.4	63.4	
Effective Green, g (s)		10.2	10.2		13.8	13.8	63.2	58.4		72.4	63.4	
Actuated g/C Ratio		0.09	0.09		0.13	0.13	0.57	0.53		0.66	0.58	
Clearance Time (s)		4.7	4.7		4.2	4.2	4.2	4.7		4.1	4.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		169	146		231	192	521	1883		467	2055	
v/s Ratio Prot		c0.02			c0.03		0.00	c0.21		c0.02	0.16	
v/s Ratio Perm			0.00			0.02	0.04			0.15		
v/c Ratio		0.20	0.02		0.20	0.15	0.07	0.40		0.27	0.27	
Uniform Delay, d1		46.1	45.3		43.2	42.9	10.2	15.3		8.0	11.7	
Progression Factor		1.00	1.00		1.00	1.00	0.73	0.67		1.00	1.00	
Incremental Delay, d2		0.6	0.0		0.4	0.4	0.1	0.6		0.3	0.3	
Delay (s)		46.7	45.4		43.6	43.2	7.4	10.9		8.3	12.0	
Level of Service		D	D		D	D	A	B		A	B	
Approach Delay (s)		46.1			43.3			10.7			11.3	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.8	
Intersection Capacity Utilization	55.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Market St & Eureka Wy

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	0	666	48	687	445	0	0	0	0	391	176
Future Volume (vph)	298	0	666	48	687	445	0	0	0	0	391	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7		4.7	4.7	4.7	4.7					4.7	4.7
Lane Util. Factor	1.00		0.88	1.00	0.95	1.00					0.95	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00					1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00					1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85					1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00	1.00					1.00	1.00
Satd. Flow (prot)	1770		2787	1770	3539	1583					3539	1575
Flt Permitted	0.95		1.00	0.95	1.00	1.00					1.00	1.00
Satd. Flow (perm)	1770		2787	1770	3539	1583					3539	1575
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	327	0	732	53	755	489	0	0	0	0	430	193
RTOR Reduction (vph)	0	0	423	40	0	169	0	0	0	0	0	7
Lane Group Flow (vph)	327	0	309	13	755	320	0	0	0	0	430	186
Confl. Peds. (#/hr)			7						3			4
Turn Type	Prot		Prot	Split	NA	custom					NA	pm+ov
Protected Phases	2		2	8	8	1					1	2
Permitted Phases						8						1
Actuated Green, G (s)	46.4		46.4	27.1	27.1	49.5					22.4	68.8
Effective Green, g (s)	46.4		46.4	27.1	27.1	49.5					22.4	68.8
Actuated g/C Ratio	0.42		0.42	0.25	0.25	0.45					0.20	0.63
Clearance Time (s)	4.7		4.7	4.7	4.7	4.7					4.7	4.7
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0					3.0	3.0
Lane Grp Cap (vph)	746		1175	436	871	779					720	1052
v/s Ratio Prot	c0.18		0.11	0.01	c0.21	0.08					c0.12	0.07
v/s Ratio Perm						0.12						0.04
v/c Ratio	0.44		0.26	0.03	0.87	0.41					0.60	0.18
Uniform Delay, d1	22.6		20.7	31.5	39.7	20.4					39.7	8.7
Progression Factor	1.00		1.00	2.51	1.27	1.03					1.33	0.49
Incremental Delay, d2	1.9		0.5	0.0	8.8	0.3					1.3	0.1
Delay (s)	24.4		21.2	79.0	59.3	21.3					54.0	4.3
Level of Service	C		C	E	E	C					D	A
Approach Delay (s)		22.2			45.8			0.0			38.6	
Approach LOS		C			D			A			D	

Intersection Summary				
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.1	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Market St & Shasta St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	81	223	757	0	0	0	0	0	1052	53
Future Volume (vph)	0	0	81	223	757	0	0	0	0	0	1052	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.7	4.7	4.7						4.7	
Lane Util. Factor			1.00	1.00	0.95						0.91	
Frpb, ped/bikes			0.92	1.00	1.00						1.00	
Flpb, ped/bikes			1.00	1.00	1.00						1.00	
Frt			0.86	1.00	1.00						0.99	
Flt Protected			1.00	0.95	1.00						1.00	
Satd. Flow (prot)			1502	1787	3574						5093	
Flt Permitted			1.00	0.95	1.00						1.00	
Satd. Flow (perm)			1502	1787	3574						5093	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	84	230	780	0	0	0	0	0	1085	55
RTOR Reduction (vph)	0	0	80	50	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	4	180	780	0	0	0	0	0	1136	0
Confl. Peds. (#/hr)			9			4			9			8
Confl. Bikes (#/hr)			1			2			2			2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type			Perm	Split	NA						NA	
Protected Phases				8	8						6	
Permitted Phases			7									
Actuated Green, G (s)			4.8	32.7	32.7						58.4	
Effective Green, g (s)			4.8	32.7	32.7						58.4	
Actuated g/C Ratio			0.04	0.30	0.30						0.53	
Clearance Time (s)			4.7	4.7	4.7						4.7	
Vehicle Extension (s)			3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)			65	531	1062						2703	
v/s Ratio Prot				0.10	c0.22						c0.22	
v/s Ratio Perm			c0.00									
v/c Ratio			0.06	0.34	0.73						0.42	
Uniform Delay, d1			50.4	30.2	34.7						15.6	
Progression Factor			1.00	0.83	0.91						0.71	
Incremental Delay, d2			0.4	0.4	2.5						0.4	
Delay (s)			50.8	25.3	34.1						11.5	
Level of Service			D	C	C						B	
Approach Delay (s)		50.8			32.1			0.0			11.5	
Approach LOS		D			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.1	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: Shasta St & Pine St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	877	678	103	553	0	0	0	0
Future Volume (vph)	0	0	0	0	877	678	103	553	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.7	4.7		4.7				
Lane Util. Factor					0.86	0.86		0.91				
Frpb, ped/bikes					1.00	0.98		1.00				
Flpb, ped/bikes					1.00	1.00		1.00				
Frt					0.96	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					4634	1351		5096				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					4634	1351		5096				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	923	714	108	582	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	35	42	0	32	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1231	329	0	658	0	0	0	0
Confl. Peds. (#/hr)			2			4			2			4
Confl. Bikes (#/hr)						1			2			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					8			2				
Permitted Phases						8	2					
Actuated Green, G (s)					79.5	79.5		21.1				
Effective Green, g (s)					79.5	79.5		21.1				
Actuated g/C Ratio					0.72	0.72		0.19				
Clearance Time (s)					4.7	4.7		4.7				
Vehicle Extension (s)					3.0	3.0		3.0				
Lane Grp Cap (vph)					3349	976		977				
v/s Ratio Prot					c0.27							
v/s Ratio Perm						0.24		0.13				
v/c Ratio					0.37	0.34		0.67				
Uniform Delay, d1					5.8	5.6		41.3				
Progression Factor					1.00	1.00		0.41				
Incremental Delay, d2					0.3	0.9		1.7				
Delay (s)					6.1	6.5		18.5				
Level of Service					A	A		B				
Approach Delay (s)		0.0			6.2			18.5			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
20: California St & Tehama St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	402	32	237	24	21	0	0	0	73	179	3
Future Volume (vph)	13	402	32	237	24	21	0	0	0	73	179	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.7	4.7						4.2	
Lane Util. Factor	1.00	0.95		0.95	0.95						0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99						1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00						1.00	
Frt	1.00	0.99		1.00	0.98						1.00	
Flt Protected	0.95	1.00		0.95	0.97						0.99	
Satd. Flow (prot)	1770	3494		1681	1660						3482	
Flt Permitted	0.95	1.00		0.95	0.97						0.99	
Satd. Flow (perm)	1770	3494		1681	1660						3482	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	14	432	34	255	26	23	0	0	0	78	192	3
RTOR Reduction (vph)	0	6	0	0	4	0	0	0	0	0	1	0
Lane Group Flow (vph)	14	460	0	153	147	0	0	0	0	0	272	0
Confl. Peds. (#/hr)			10			13			7			12
Confl. Bikes (#/hr)						1						1
Turn Type	Split	NA		Split	NA					Perm	NA	
Protected Phases	5	5		6	6						4	
Permitted Phases										4		
Actuated Green, G (s)	20.4	20.4		61.4	61.4						15.1	
Effective Green, g (s)	20.4	20.4		61.4	61.4						15.1	
Actuated g/C Ratio	0.19	0.19		0.56	0.56						0.14	
Clearance Time (s)	4.2	4.2		4.7	4.7						4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)	328	647		938	926						477	
v/s Ratio Prot	0.01	c0.13		c0.09	0.09							
v/s Ratio Perm											0.08	
v/c Ratio	0.04	0.71		0.16	0.16						0.57	
Uniform Delay, d1	36.8	42.0		11.8	11.8						44.4	
Progression Factor	1.00	1.00		1.09	1.10						1.00	
Incremental Delay, d2	0.1	3.7		0.3	0.3						1.7	
Delay (s)	36.8	45.7		13.3	13.3						46.1	
Level of Service	D	D		B	B						D	
Approach Delay (s)		45.5			13.3			0.0			46.1	
Approach LOS		D			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.1	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
22: Pine St & Tehama St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1463	0	0	0	0	0	629	506	0	0	0
Future Volume (vph)	27	1463	0	0	0	0	0	629	506	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7						4.7	4.7			
Lane Util. Factor		0.91						0.91	1.00			
Frpb, ped/bikes		1.00						1.00	0.98			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5081						5085	1553			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5081						5085	1553			
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	31	1662	0	0	0	0	0	715	575	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	10	0	0	0
Lane Group Flow (vph)	0	1686	0	0	0	0	0	715	565	0	0	0
Confl. Peds. (#/hr)			6			5			5			14
Confl. Bikes (#/hr)			1						2			1
Turn Type	Perm	NA						NA	Perm			
Protected Phases		4						2				
Permitted Phases	4								2			
Actuated Green, G (s)		58.2						42.4	42.4			
Effective Green, g (s)		58.2						42.4	42.4			
Actuated g/C Ratio		0.53						0.39	0.39			
Clearance Time (s)		4.7						4.7	4.7			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		2688						1960	598			
v/s Ratio Prot								0.14				
v/s Ratio Perm		0.33							c0.36			
v/c Ratio		0.63						0.36	0.94			
Uniform Delay, d1		18.3						24.2	32.7			
Progression Factor		0.72						1.00	1.00			
Incremental Delay, d2		1.0						0.1	23.7			
Delay (s)		14.1						24.3	56.3			
Level of Service		B						C	E			
Approach Delay (s)		14.1			0.0			38.6			0.0	
Approach LOS		B			A			D			A	

Intersection Summary				
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	68.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
27: Yuba St & East St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	4	17	0	0	39	8	441	17	19	306	19
Future Volume (Veh/h)	12	4	17	0	0	39	8	441	17	19	306	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	13	4	19	0	0	43	9	485	19	21	336	21
Pedestrians		1			6			5			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								391			764	
pX, platoon unblocked												
vC, conflicting volume	694	918	184	754	918	259	358			510		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	694	918	184	754	918	259	358			510		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	98	98	100	100	94	99			98		
cM capacity (veh/h)	303	263	825	279	263	738	1203			1052		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	43	252	262	189	189
Volume Left	13	0	9	0	21	0
Volume Right	19	43	0	19	0	21
cSH	444	738	1203	1700	1052	1700
Volume to Capacity	0.08	0.06	0.01	0.15	0.02	0.11
Queue Length 95th (ft)	7	5	1	0	2	0
Control Delay (s)	13.8	10.2	0.4	0.0	1.1	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	13.8	10.2	0.2		0.6	
Approach LOS	B	B				

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	39.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
28: California St & Placer St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	424	129	23	288	0	0	0	0	73	385	67
Future Volume (vph)	0	424	129	23	288	0	0	0	0	73	385	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7					4.7	4.7	4.7
Lane Util. Factor		0.95			0.95					1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00					1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3420			3561					1787	3574	1546
Flt Permitted		1.00			0.78					0.95	1.00	1.00
Satd. Flow (perm)		3420			2789					1787	3574	1546
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	456	139	25	310	0	0	0	0	78	414	72
RTOR Reduction (vph)	0	40	0	0	0	0	0	0	0	0	0	17
Lane Group Flow (vph)	0	555	0	0	335	0	0	0	0	78	414	55
Confl. Peds. (#/hr)			16			35			16			15
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Actuated Green, G (s)		24.8			24.8					75.8	75.8	75.8
Effective Green, g (s)		24.8			24.8					75.8	75.8	75.8
Actuated g/C Ratio		0.23			0.23					0.69	0.69	0.69
Clearance Time (s)		4.7			4.7					4.7	4.7	4.7
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		771			628					1231	2462	1065
v/s Ratio Prot		c0.16									c0.12	
v/s Ratio Perm					0.12					0.04		0.04
v/c Ratio		0.72			0.53					0.06	0.17	0.05
Uniform Delay, d1		39.4			37.5					5.6	6.0	5.5
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		3.3			0.9					0.1	0.1	0.1
Delay (s)		42.7			38.4					5.7	6.2	5.6
Level of Service		D			D					A	A	A
Approach Delay (s)		42.7			38.4			0.0			6.0	
Approach LOS		D			D			A			A	

Intersection Summary						
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C			
HCM 2000 Volume to Capacity ratio	0.30					
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4			
Intersection Capacity Utilization	52.5%	ICU Level of Service	A			
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
29: Pine St & Placer St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	259	0	0	165	24	170	773	28	0	0	0
Future Volume (vph)	213	259	0	0	165	24	170	773	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7			4.7				
Lane Util. Factor		0.95			0.95			0.91				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			1.00				
Flt Protected		0.98			1.00			0.99				
Satd. Flow (prot)		3495			3494			5066				
Flt Permitted		0.72			1.00			0.99				
Satd. Flow (perm)		2568			3494			5066				
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	254	308	0	0	196	29	202	920	33	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	562	0	0	209	0	0	1153	0	0	0	0
Confl. Peds. (#/hr)			24			7			6			22
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)		31.8			31.8			68.8				
Effective Green, g (s)		31.8			31.8			68.8				
Actuated g/C Ratio		0.29			0.29			0.63				
Clearance Time (s)		4.7			4.7			4.7				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		742			1010			3168				
v/s Ratio Prot					0.06							
v/s Ratio Perm		c0.22						0.23				
v/c Ratio		0.76			0.21			0.36				
Uniform Delay, d1		35.6			29.6			10.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		4.4			0.1			0.3				
Delay (s)		40.0			29.7			10.3				
Level of Service		D			C			B				
Approach Delay (s)		40.0			29.7			10.3			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
34: California St & South St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	282	208	16	213	0	0	0	0	23	501	31
Future Volume (vph)	0	282	208	16	213	0	0	0	0	23	501	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7						4.7	
Lane Util. Factor		0.95			0.95						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.94			1.00						0.99	
Flt Protected		1.00			1.00						1.00	
Satd. Flow (prot)		3315			3562						3532	
Flt Permitted		1.00			0.75						1.00	
Satd. Flow (perm)		3315			2672						3532	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	310	229	18	234	0	0	0	0	25	551	34
RTOR Reduction (vph)	0	157	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	382	0	0	252	0	0	0	0	0	608	0
Confl. Peds. (#/hr)			5			1			4			8
Confl. Bikes (#/hr)			2			2			2			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		18.8			18.8						81.8	
Effective Green, g (s)		18.8			18.8						81.8	
Actuated g/C Ratio		0.17			0.17						0.74	
Clearance Time (s)		4.7			4.7						4.7	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		566			456						2626	
v/s Ratio Prot		c0.12										
v/s Ratio Perm					0.09						0.17	
v/c Ratio		0.68			0.55						0.23	
Uniform Delay, d1		42.7			41.7						4.4	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		3.2			1.5						0.2	
Delay (s)		45.9			43.2						4.6	
Level of Service		D			D						A	
Approach Delay (s)		45.9			43.2			0.0			4.6	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
35: Pine St & South St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	224	0	0	149	39	130	762	23	0	0	0
Future Volume (vph)	119	224	0	0	149	39	130	762	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7			4.7			4.7				
Lane Util. Factor		0.95			0.95			0.91				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.98			1.00			0.99				
Satd. Flow (prot)		3513			3453			5078				
Flt Permitted		0.75			1.00			0.99				
Satd. Flow (perm)		2682			3453			5078				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	135	255	0	0	169	44	148	866	26	0	0	0
RTOR Reduction (vph)	0	0	0	0	35	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	390	0	0	178	0	0	1039	0	0	0	0
Confl. Peds. (#/hr)			3			2			3			4
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)		21.9			21.9			78.7				
Effective Green, g (s)		21.9			21.9			78.7				
Actuated g/C Ratio		0.20			0.20			0.72				
Clearance Time (s)		4.7			4.7			4.7				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		533			687			3633				
v/s Ratio Prot					0.05							
v/s Ratio Perm		c0.15						0.20				
v/c Ratio		0.73			0.26			0.29				
Uniform Delay, d1		41.3			37.2			5.6				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		5.1			0.2			0.2				
Delay (s)		46.4			37.4			5.8				
Level of Service		D			D			A				
Approach Delay (s)		46.4			37.4			5.8			0.0	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.4	
Intersection Capacity Utilization	49.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
36: East St & South St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	126	88	33	24	95	29	34	156	38	43	164	59
Future Volume (vph)	126	88	33	24	95	29	34	156	38	43	164	59
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	135	95	35	26	102	31	37	168	41	46	176	63

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	183	83	77	82	37	209	46	239
Volume Left (vph)	135	0	26	0	37	0	46	0
Volume Right (vph)	0	35	0	31	0	41	0	63
Hadj (s)	0.39	-0.28	0.19	-0.25	0.52	-0.12	0.52	-0.17
Departure Headway (s)	6.6	5.9	6.6	6.1	6.6	6.0	6.6	5.9
Degree Utilization, x	0.33	0.14	0.14	0.14	0.07	0.35	0.08	0.39
Capacity (veh/h)	516	569	508	543	512	569	517	581
Control Delay (s)	11.7	8.7	9.4	8.9	8.9	11.0	9.0	11.5
Approach Delay (s)	10.7		9.2		10.7		11.1	
Approach LOS	B		A		B		B	

Intersection Summary				
Delay	10.6			
Level of Service	B			
Intersection Capacity Utilization	40.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
38: Gold St & Market St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	35	592	11	0	5	0	0	0	2	115	0
Future Volume (vph)	19	35	592	11	0	5	0	0	0	2	115	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	4.7	4.7		4.7					4.7	
Lane Util. Factor		0.95	0.95	1.00		1.00					0.95	
Frpb, ped/bikes		1.00	1.00	1.00		0.93					1.00	
Flpb, ped/bikes		1.00	1.00	1.00		1.00					1.00	
Frt		0.87	0.85	1.00		0.85					1.00	
Flt Protected		1.00	1.00	0.95		1.00					1.00	
Satd. Flow (prot)		1559	1519	1787		1486					3572	
Flt Permitted		1.00	1.00	0.95		1.00					1.00	
Satd. Flow (perm)		1559	1519	1787		1486					3572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	39	658	12	0	6	0	0	0	2	128	0
RTOR Reduction (vph)	0	80	94	0	0	6	0	0	0	0	0	0
Lane Group Flow (vph)	0	283	261	12	0	0	0	0	0	0	130	0
Confl. Peds. (#/hr)						3			3			2
Confl. Bikes (#/hr)									1			3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	Perm	Prot		Perm				Perm	NA	
Protected Phases	6	6		5							4	
Permitted Phases			6			5				4		
Actuated Green, G (s)		80.9	80.9	3.2		3.2					11.8	
Effective Green, g (s)		80.9	80.9	3.2		3.2					11.8	
Actuated g/C Ratio		0.74	0.74	0.03		0.03					0.11	
Clearance Time (s)		4.7	4.7	4.7		4.7					4.7	
Vehicle Extension (s)		3.0	3.0	3.0		3.0					3.0	
Lane Grp Cap (vph)		1146	1117	51		43					383	
v/s Ratio Prot		c0.18		c0.01								
v/s Ratio Perm			0.17			0.00					0.04	
v/c Ratio		0.25	0.23	0.24		0.00					0.34	
Uniform Delay, d1		4.7	4.6	52.2		51.9					45.5	
Progression Factor		2.91	4.14	1.00		1.00					1.00	
Incremental Delay, d2		0.5	0.5	2.4		0.0					0.5	
Delay (s)		14.2	19.7	54.6		51.9					46.0	
Level of Service		B	B	D		D					D	
Approach Delay (s)		16.9			53.7			0.0			46.0	
Approach LOS		B			D			A			D	

Intersection Summary				
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.1	
Intersection Capacity Utilization	47.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
45: Market St/Cypress Ave & East St

Timing Plan:

Movement	EBL	EBT	WBL	NBT	NBR
Lane Configurations					
Traffic Volume (vph)	23	360	367	531	193
Future Volume (vph)	23	360	367	531	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.6	4.6
Lane Util. Factor	1.00	0.95	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	3467	5136	1570
Flt Permitted	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	3467	5136	1570
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	26	414	422	610	222
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	26	414	422	610	222
Confl. Peds. (#/hr)					8
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	1%	1%	1%	1%	1%
Turn Type	Split	NA	Prot	NA	Perm
Protected Phases	3	3	4	6	
Permitted Phases					6
Actuated Green, G (s)	15.1	15.1	16.6	23.3	23.3
Effective Green, g (s)	15.1	15.1	16.6	23.3	23.3
Actuated g/C Ratio	0.20	0.20	0.22	0.31	0.31
Clearance Time (s)	4.2	4.2	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	359	719	767	1595	487
v/s Ratio Prot	0.01	c0.12	c0.12	0.12	
v/s Ratio Perm					c0.14
v/c Ratio	0.07	0.58	0.55	0.38	0.46
Uniform Delay, d1	24.3	27.1	25.9	20.2	20.8
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.1	0.9	0.2	0.7
Delay (s)	24.4	28.2	26.7	20.4	21.4
Level of Service	C	C	C	C	C
Approach Delay (s)		28.0		20.7	
Approach LOS		C		C	

Intersection Summary				
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.6	
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
51: Market St & Grange St

Timing Plan:

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	36	661	30	30	864
Future Volume (vph)	42	36	661	30	30	864
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		5.4		4.2	5.4
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	0.99		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1703		3546		1787	3574
Flt Permitted	0.97		1.00		0.95	1.00
Satd. Flow (perm)	1703		3546		1787	3574
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	45	38	703	32	32	919
RTOR Reduction (vph)	32	0	4	0	0	0
Lane Group Flow (vph)	51	0	731	0	32	919
Confl. Peds. (#/hr)		14		6		
Confl. Bikes (#/hr)				4		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Perm		NA		Prot	NA
Protected Phases			2		1	6
Permitted Phases	8					
Actuated Green, G (s)	7.7		28.1		1.1	33.4
Effective Green, g (s)	7.7		28.1		1.1	33.4
Actuated g/C Ratio	0.15		0.55		0.02	0.66
Clearance Time (s)	4.2		5.4		4.2	5.4
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	258		1965		38	2354
v/s Ratio Prot			0.21		0.02	c0.26
v/s Ratio Perm	c0.03					
v/c Ratio	0.20		0.37		0.84	0.39
Uniform Delay, d1	18.8		6.3		24.7	4.0
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.4		0.1		85.4	0.1
Delay (s)	19.2		6.5		110.1	4.1
Level of Service	B		A		F	A
Approach Delay (s)	19.2		6.5			7.6
Approach LOS	B		A			A

Intersection Summary				
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	50.7	Sum of lost time (s)	13.8	
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
54: Westside Rd/Railroad Ave & Buenaventura Blvd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	405	26	14	510	166	20	43	19	342	58	69
Future Volume (vph)	33	405	26	14	510	166	20	43	19	342	58	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.3	5.3	3.5	3.5	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1787	3537		1787	3574	1599	1787	1881	1577	1698	1726	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1787	3537		1787	3574	1599	1787	1881	1577	1698	1726	1599
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	38	460	30	16	580	189	23	49	22	389	66	78
RTOR Reduction (vph)	0	3	0	0	0	127	0	0	19	0	0	58
Lane Group Flow (vph)	38	487	0	16	580	62	23	49	3	226	229	20
Confl. Peds. (#/hr)			1						2			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	4.0	24.7		0.9	21.6	21.6	7.7	7.7	7.7	17.1	17.1	17.1
Effective Green, g (s)	4.0	24.7		0.9	21.6	21.6	7.7	7.7	7.7	17.1	17.1	17.1
Actuated g/C Ratio	0.06	0.37		0.01	0.33	0.33	0.12	0.12	0.12	0.26	0.26	0.26
Clearance Time (s)	3.5	5.3		3.5	5.3	5.3	3.5	3.5	3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	107	1319		24	1166	521	207	218	183	438	445	413
v/s Ratio Prot	c0.02	c0.14		0.01	c0.16		0.01	c0.03		c0.13	0.13	
v/s Ratio Perm						0.04			0.00			0.01
v/c Ratio	0.36	0.37		0.67	0.50	0.12	0.11	0.22	0.01	0.52	0.51	0.05
Uniform Delay, d1	29.9	15.1		32.5	17.9	15.6	26.2	26.5	25.9	21.0	21.0	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.2		52.8	0.3	0.1	0.2	0.5	0.0	1.0	1.0	0.0
Delay (s)	31.9	15.3		85.3	18.3	15.7	26.4	27.1	25.9	22.0	22.0	18.5
Level of Service	C	B		F	B	B	C	C	C	C	C	B
Approach Delay (s)		16.5			19.0			26.6			21.5	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	15.8	
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
55: SR 273 & Buenaventura Blvd

Timing Plan:

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	195	571	402	384	522	288
Future Volume (vph)	195	571	402	384	522	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.2	4.2	5.8	5.8	4.6
Lane Util. Factor	1.00	0.88	0.97	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	2786	3467	3574	3574	1587
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	2786	3467	3574	3574	1587
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	621	437	417	567	313
RTOR Reduction (vph)	0	182	0	0	0	40
Lane Group Flow (vph)	212	439	437	417	567	273
Confl. Peds. (#/hr)		1				2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	13.5	28.5	15.0	35.5	16.3	29.8
Effective Green, g (s)	13.5	28.5	15.0	35.5	16.3	29.8
Actuated g/C Ratio	0.23	0.48	0.25	0.60	0.27	0.50
Clearance Time (s)	4.6	4.2	4.2	5.8	5.8	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	406	1336	875	2135	980	796
v/s Ratio Prot	c0.12	0.08	c0.13	0.12	c0.16	0.08
v/s Ratio Perm		0.07				0.09
v/c Ratio	0.52	0.33	0.50	0.20	0.58	0.34
Uniform Delay, d1	20.1	9.5	19.0	5.4	18.6	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	0.5	0.0	0.8	0.3
Delay (s)	21.3	9.7	19.4	5.5	19.4	9.2
Level of Service	C	A	B	A	B	A
Approach Delay (s)	12.7			12.6	15.8	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
57: SR 273 & Kenyon Dr

Timing Plan:

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	70	65	569	940	27
Future Volume (Veh/h)	26	70	65	569	940	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	29	77	71	625	1033	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1488	516	1063			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1488	516	1063			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	85	89			
cM capacity (veh/h)	102	504	651			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	106	71	312	312	516	516	30
Volume Left	29	71	0	0	0	0	0
Volume Right	77	0	0	0	0	0	30
cSH	374	651	1700	1700	1700	1700	1700
Volume to Capacity	0.28	0.11	0.18	0.18	0.30	0.30	0.02
Queue Length 95th (ft)	29	9	0	0	0	0	0
Control Delay (s)	24.4	11.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B					
Approach Delay (s)	24.4	1.1			0.0		
Approach LOS	C						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: SR 273 & Branstetter Ln

Timing Plan:

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	33	0	634	971	39
Future Volume (Veh/h)	0	33	0	634	971	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	36	0	697	1067	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1416	534	1110			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1416	534	1110			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	128	491	625			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	36	348	348	534	534	43
Volume Left	0	0	0	0	0	0
Volume Right	36	0	0	0	0	43
cSH	491	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.20	0.20	0.31	0.31	0.03
Queue Length 95th (ft)	6	0	0	0	0	0
Control Delay (s)	12.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.9	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization	36.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
59: SR 273 & Cedars Rd/Bonnyview Rd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	50	48	565	91	194	42	437	421	287	710	7
Future Volume (vph)	3	50	48	565	91	194	42	437	421	287	710	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.2	6.5	4.9	4.2	6.5	6.5
Lane Util. Factor	0.91	0.91	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3390	1562	3433	1666	1504	1770	3539	1574	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3390	1562	3433	1666	1504	1770	3539	1574	3433	3539	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	3	55	53	621	100	213	46	480	463	315	780	8
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	138	0	0	5
Lane Group Flow (vph)	3	55	7	621	164	149	46	480	325	315	780	3
Confl. Peds. (#/hr)			2						1			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	14.0	14.0	14.0	32.0	32.0	32.0	8.5	26.6	58.6	17.3	35.4	35.4
Effective Green, g (s)	14.0	14.0	14.0	32.0	32.0	32.0	8.5	26.6	58.6	17.3	35.4	35.4
Actuated g/C Ratio	0.13	0.13	0.13	0.29	0.29	0.29	0.08	0.24	0.53	0.16	0.32	0.32
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.2	6.5	4.9	4.2	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	204	431	198	997	484	437	136	855	837	539	1137	508
v/s Ratio Prot	0.00	c0.02		c0.18	0.10		0.03	0.14	0.11	c0.09	c0.22	
v/s Ratio Perm			0.00			0.10			0.09			0.00
v/c Ratio	0.01	0.13	0.03	0.62	0.34	0.34	0.34	0.56	0.39	0.58	0.69	0.01
Uniform Delay, d1	42.0	42.6	42.1	33.8	30.7	30.7	48.1	36.6	15.2	43.1	32.5	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	1.2	0.4	0.5	1.5	0.8	0.3	1.6	1.7	0.0
Delay (s)	42.0	42.8	42.2	35.0	31.1	31.2	49.6	37.5	15.5	44.7	34.2	25.4
Level of Service	D	D	D	D	C	C	D	D	B	D	C	C
Approach Delay (s)		42.5			33.7			27.7			37.2	
Approach LOS		D			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	110.1	Sum of lost time (s)		20.2	
Intersection Capacity Utilization	64.6%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
60: Eastside Rd & Bonnyview Rd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	679	43	250	776	51	51	18	158	76	45	23
Future Volume (vph)	36	679	43	250	776	51	51	18	158	76	45	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.9	4.9	3.5	4.9	4.9	4.2	4.2	4.2		4.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1545	1770	1863	1583		1772	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1545	1770	1863	1583		1772	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	39	730	46	269	834	55	55	19	170	82	48	25
RTOR Reduction (vph)	0	0	33	0	0	32	0	0	145	0	6	0
Lane Group Flow (vph)	39	730	13	269	834	23	55	19	25	0	149	0
Confl. Peds. (#/hr)						2						1
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			
Actuated Green, G (s)	6.9	25.7	25.7	18.5	37.3	37.3	13.1	13.1	13.1		14.5	
Effective Green, g (s)	6.9	25.7	25.7	18.5	37.3	37.3	13.1	13.1	13.1		14.5	
Actuated g/C Ratio	0.08	0.29	0.29	0.21	0.42	0.42	0.15	0.15	0.15		0.16	
Clearance Time (s)	3.5	4.9	4.9	3.5	4.9	4.9	4.2	4.2	4.2		4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	137	1026	459	369	1489	650	261	275	234		290	
v/s Ratio Prot	0.02	c0.21		c0.15	0.24		c0.03	0.01			c0.08	
v/s Ratio Perm			0.01			0.01			0.02			
v/c Ratio	0.28	0.71	0.03	0.73	0.56	0.04	0.21	0.07	0.11		0.51	
Uniform Delay, d1	38.5	28.1	22.5	32.7	19.4	15.1	33.2	32.5	32.7		33.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.1	2.4	0.0	7.0	0.5	0.0	0.4	0.1	0.2		1.5	
Delay (s)	39.7	30.5	22.5	39.8	19.9	15.1	33.6	32.6	32.9		35.4	
Level of Service	D	C	C	D	B	B	C	C	C		D	
Approach Delay (s)		30.5			24.3			33.0			35.4	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	16.8	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
62: SR 273 & Clear Creek Rd

Timing Plan:

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	63	40	711	1029	81
Future Volume (vph)	103	63	40	711	1029	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	4.2	6.5	6.5	5.1
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1752	1568	1752	3505	3505	1544
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1752	1568	1752	3505	3505	1544
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	107	66	42	741	1072	84
RTOR Reduction (vph)	0	50	0	0	0	27
Lane Group Flow (vph)	107	16	42	741	1072	57
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Perm	Prot	NA	NA	pm+ov
Protected Phases	7		5	2	6	7
Permitted Phases		7				6
Actuated Green, G (s)	13.4	13.4	5.3	41.1	31.6	45.0
Effective Green, g (s)	13.4	13.4	5.3	41.1	31.6	45.0
Actuated g/C Ratio	0.20	0.20	0.08	0.62	0.48	0.68
Clearance Time (s)	5.1	5.1	4.2	6.5	6.5	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	355	317	140	2179	1675	1051
v/s Ratio Prot	c0.06		0.02	c0.21	c0.31	0.01
v/s Ratio Perm		0.01				0.03
v/c Ratio	0.30	0.05	0.30	0.34	0.64	0.05
Uniform Delay, d1	22.4	21.2	28.7	6.0	13.0	3.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	1.2	0.1	0.8	0.0
Delay (s)	22.9	21.3	29.9	6.1	13.8	3.5
Level of Service	C	C	C	A	B	A
Approach Delay (s)	22.3			7.4	13.1	
Approach LOS	C			A	B	

Intersection Summary				
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	15.8	
Intersection Capacity Utilization	52.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
64: SR 273 & Canyon Rd

Timing Plan:

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	318	64	34	438	539	505
Future Volume (vph)	318	64	34	438	539	505
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.6	6.5	6.5	6.5
Lane Util. Factor	0.97		1.00	0.95	0.95	0.88
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.96		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3337		1752	3505	3505	2694
Flt Permitted	0.96		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3337		1752	3505	3505	2694
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	335	67	36	461	567	532
RTOR Reduction (vph)	14	0	0	0	0	376
Lane Group Flow (vph)	388	0	36	461	567	156
Confl. Peds. (#/hr)		2				1
Confl. Bikes (#/hr)						2
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot		Prot	NA	NA	Perm
Protected Phases	8		5	2	6	
Permitted Phases						6
Actuated Green, G (s)	26.8		11.5	38.5	22.4	22.4
Effective Green, g (s)	26.8		11.5	38.5	22.4	22.4
Actuated g/C Ratio	0.35		0.15	0.50	0.29	0.29
Clearance Time (s)	4.6		4.6	6.5	6.5	6.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1170		263	1766	1027	789
v/s Ratio Prot	c0.12		0.02	c0.13	c0.16	
v/s Ratio Perm						0.06
v/c Ratio	0.33		0.14	0.26	0.55	0.20
Uniform Delay, d1	18.2		28.1	10.8	22.8	20.3
Progression Factor	0.43		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.2	0.1	0.6	0.1
Delay (s)	7.9		28.4	10.9	23.4	20.4
Level of Service	A		C	B	C	C
Approach Delay (s)	7.9			12.2	21.9	
Approach LOS	A			B	C	

Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	20.3	
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
65: SR 273 & Whitehouse Dr

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	0	0	3	0	52	2	407	3	40	536	27
Future Volume (Veh/h)	13	0	0	3	0	52	2	407	3	40	536	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	0	0	3	0	57	2	442	3	43	583	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	951	1118	292	824	1144	221	612			445		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	951	1118	292	824	1144	221	612			445		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	100	99	100	93	100			96		
cM capacity (veh/h)	190	194	699	254	187	777	950			1097		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	14	60	2	221	221	3	43	292	292	29
Volume Left	14	3	2	0	0	0	43	0	0	0
Volume Right	0	57	0	0	0	3	0	0	0	29
cSH	190	704	950	1700	1700	1700	1097	1700	1700	1700
Volume to Capacity	0.07	0.09	0.00	0.13	0.13	0.00	0.04	0.17	0.17	0.02
Queue Length 95th (ft)	6	7	0	0	0	0	3	0	0	0
Control Delay (s)	25.5	10.6	8.8	0.0	0.0	0.0	8.4	0.0	0.0	0.0
Lane LOS	D	B	A				A			
Approach Delay (s)	25.5	10.6	0.0				0.6			
Approach LOS	D	B								

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
66: SR 273 & Happy V Rd

Timing Plan:

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	75	103	357	441	98
Future Volume (vph)	55	75	103	357	441	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	7.0	7.0	7.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00
Frt	0.92		1.00	1.00	1.00	0.85
Flt Protected	0.98		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1650		1736	3471	3471	1553
Flt Permitted	0.98		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1650		1736	3471	3471	1553
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	79	108	376	464	103
RTOR Reduction (vph)	58	0	0	0	0	67
Lane Group Flow (vph)	79	0	108	376	464	36
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Actuated Green, G (s)	8.2		8.3	29.7	17.2	17.2
Effective Green, g (s)	8.2		8.3	29.7	17.2	17.2
Actuated g/C Ratio	0.17		0.17	0.60	0.35	0.35
Clearance Time (s)	4.6		4.2	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	273		291	2082	1206	539
v/s Ratio Prot			c0.06	0.11	c0.13	
v/s Ratio Perm	c0.05					0.02
v/c Ratio	0.29		0.37	0.18	0.38	0.07
Uniform Delay, d1	18.1		18.3	4.4	12.2	10.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6		0.8	0.0	0.2	0.1
Delay (s)	18.7		19.1	4.5	12.4	10.8
Level of Service	B		B	A	B	B
Approach Delay (s)	18.7			7.7	12.1	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	15.8	
Intersection Capacity Utilization	43.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
67: SR 273 & Amen St/Latona Rd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	43	0	12	2	445	44	6	507	3
Future Volume (Veh/h)	3	0	3	43	0	12	2	445	44	6	507	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	0	3	46	0	13	2	478	47	6	545	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	813	1086	272	770	1042	239	548			525		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	813	1086	272	770	1042	239	548			525		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	84	100	98	100			99		
cM capacity (veh/h)	259	209	716	282	222	753	997			1017		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	6	59	2	239	239	47	6	272	272	3
Volume Left	3	46	2	0	0	0	6	0	0	0
Volume Right	3	13	0	0	0	47	0	0	0	3
cSH	380	327	997	1700	1700	1700	1017	1700	1700	1700
Volume to Capacity	0.02	0.18	0.00	0.14	0.14	0.03	0.01	0.16	0.16	0.00
Queue Length 95th (ft)	1	16	0	0	0	0	0	0	0	0
Control Delay (s)	14.6	18.4	8.6	0.0	0.0	0.0	8.6	0.0	0.0	0.0
Lane LOS	B	C	A				A			
Approach Delay (s)	14.6	18.4	0.0				0.1			
Approach LOS	B	C								

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	25.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
69: SR 273 & Ox Yoke Rd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	2	61	0	318	0	273	39	271	375	0
Future Volume (vph)	1	0	2	61	0	318	0	273	39	271	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.4	4.4		7.0	7.0	4.2	7.0	
Lane Util. Factor		1.00			1.00	1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.98			1.00	1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frt		0.91			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1609			1736	1553		3471	1553	1736	3471	
Flt Permitted		0.98			0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1609			1736	1553		3471	1553	1736	3471	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1	0	2	66	0	342	0	294	42	291	403	0
RTOR Reduction (vph)	0	3	0	0	0	278	0	0	33	0	0	0
Lane Group Flow (vph)	0	0	0	0	66	64	0	294	9	291	403	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases						7			6			
Actuated Green, G (s)		1.5			11.4	11.4		12.5	12.5	15.8	32.5	
Effective Green, g (s)		1.5			11.4	11.4		12.5	12.5	15.8	32.5	
Actuated g/C Ratio		0.02			0.19	0.19		0.20	0.20	0.26	0.53	
Clearance Time (s)		4.2			4.4	4.4		7.0	7.0	4.2	7.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		39			324	290		711	318	449	1849	
v/s Ratio Prot		c0.00			0.04			c0.08		c0.17	0.12	
v/s Ratio Perm						c0.04			0.01			
v/c Ratio		0.00			0.20	0.22		0.41	0.03	0.65	0.22	
Uniform Delay, d1		29.0			21.0	21.0		21.1	19.4	20.1	7.5	
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0			0.3	0.4		0.4	0.0	3.2	0.1	
Delay (s)		29.0			21.3	21.4		21.5	19.4	23.3	7.6	
Level of Service		C			C	C		C	B	C	A	
Approach Delay (s)		29.0			21.4			21.2			14.2	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	19.8	
Intersection Capacity Utilization	51.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
72: SR 273 & North St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	102	43	139	121	71	40	191	127	77	313	18
Future Volume (vph)	17	102	43	139	121	71	40	191	127	77	313	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6	4.6	4.2	5.8	5.8	4.2	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1772		1770	1863	1561	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1772		1770	1863	1561	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	111	47	151	132	77	43	208	138	84	340	20
RTOR Reduction (vph)	0	10	0	0	0	63	0	0	111	0	0	15
Lane Group Flow (vph)	18	148	0	151	132	14	43	208	27	84	340	5
Confl. Peds. (#/hr)			4									
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases						7			6			2
Actuated Green, G (s)	14.7	14.7		12.7	12.7	12.7	4.7	13.3	13.3	7.6	16.2	16.2
Effective Green, g (s)	14.7	14.7		12.7	12.7	12.7	4.7	13.3	13.3	7.6	16.2	16.2
Actuated g/C Ratio	0.22	0.22		0.19	0.19	0.19	0.07	0.20	0.20	0.11	0.24	0.24
Clearance Time (s)	4.6	4.6		4.6	4.6	4.6	4.2	5.8	5.8	4.2	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	385	385		333	350	293	123	697	311	199	849	379
v/s Ratio Prot	0.01	c0.08		c0.09	0.07		0.02	0.06		c0.05	c0.10	
v/s Ratio Perm						0.01			0.02			0.00
v/c Ratio	0.05	0.38		0.45	0.38	0.05	0.35	0.30	0.09	0.42	0.40	0.01
Uniform Delay, d1	20.9	22.5		24.3	23.9	22.5	29.9	23.1	22.1	27.9	21.6	19.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		1.0	0.7	0.1	1.7	0.2	0.1	1.4	0.3	0.0
Delay (s)	20.9	23.2		25.3	24.6	22.5	31.7	23.4	22.3	29.3	21.9	19.6
Level of Service	C	C		C	C	C	C	C	C	C	C	B
Approach Delay (s)		22.9			24.5			23.9			23.2	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	50.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
73: SR 273 & South St

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	90	108	114	126	34	70	233	97	61	328	106
Future Volume (vph)	91	90	108	114	126	34	70	233	97	61	328	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6		4.2	5.8	5.8	4.2	5.8	5.8
Lane Util. Factor		0.95		0.95	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3272		1681	1707		1770	3539	1562	1770	3539	1583
Flt Permitted		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3272		1681	1707		1770	3539	1562	1770	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	96	95	114	120	133	36	74	245	102	64	345	112
RTOR Reduction (vph)	0	58	0	0	5	0	0	0	80	0	0	89
Lane Group Flow (vph)	0	247	0	108	176	0	74	245	22	64	345	23
Confl. Peds. (#/hr)			3			2			1			
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)		15.0		16.6	16.6		8.2	15.7	15.7	7.5	15.0	15.0
Effective Green, g (s)		15.0		16.6	16.6		8.2	15.7	15.7	7.5	15.0	15.0
Actuated g/C Ratio		0.20		0.22	0.22		0.11	0.21	0.21	0.10	0.20	0.20
Clearance Time (s)		4.6		4.6	4.6		4.2	5.8	5.8	4.2	5.8	5.8
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		663		377	382		196	750	331	179	717	320
v/s Ratio Prot		c0.08		0.06	c0.10		c0.04	0.07		0.04	c0.10	
v/s Ratio Perm									0.01			0.01
v/c Ratio		0.37		0.29	0.46		0.38	0.33	0.07	0.36	0.48	0.07
Uniform Delay, d1		25.4		23.8	24.8		30.5	24.7	23.3	31.0	26.1	23.9
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4		0.4	0.9		1.2	0.3	0.1	1.2	0.5	0.1
Delay (s)		25.8		24.2	25.7		31.8	24.9	23.4	32.2	26.6	24.0
Level of Service		C		C	C		C	C	C	C	C	C
Approach Delay (s)		25.8			25.1			25.8			26.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
76: SR 273 & Factory Outlets Dr

Timing Plan:

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	397	219	296	203	178	359
Future Volume (vph)	397	219	296	203	178	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	6.0	4.6	4.2	6.0
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.96	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3418	1441	3539	1567	1770	3539
Flt Permitted	0.96	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3418	1441	3539	1567	1770	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	414	228	308	211	185	374
RTOR Reduction (vph)	4	145	0	101	0	0
Lane Group Flow (vph)	440	53	308	110	185	374
Confl. Peds. (#/hr)				1		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	3		2	3	1	6
Permitted Phases		3		2		
Actuated Green, G (s)	16.0	16.0	15.5	31.5	13.9	33.6
Effective Green, g (s)	16.0	16.0	15.5	31.5	13.9	33.6
Actuated g/C Ratio	0.27	0.27	0.26	0.52	0.23	0.56
Clearance Time (s)	4.6	4.6	6.0	4.6	4.2	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	908	382	911	819	408	1975
v/s Ratio Prot	c0.13		c0.09	0.04	c0.10	0.11
v/s Ratio Perm		0.04		0.03		
v/c Ratio	0.48	0.14	0.34	0.13	0.45	0.19
Uniform Delay, d1	18.6	16.8	18.2	7.4	19.9	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2	0.2	0.1	0.8	0.0
Delay (s)	19.0	17.0	18.4	7.4	20.7	6.6
Level of Service	B	B	B	A	C	A
Approach Delay (s)	18.4		13.9		11.3	
Approach LOS	B		B		B	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	60.2	Sum of lost time (s)	18.3	
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
77: SR 273 & Pleasant Hills Dr

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	25	144	45	25	43	101	108	22	26	276	454
Future Volume (vph)	348	25	144	45	25	43	101	108	22	26	276	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	7.0	7.0	4.6	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1863	1583	3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	387	28	160	50	28	48	112	120	24	29	307	504
RTOR Reduction (vph)	0	0	119	0	0	42	0	0	16	0	0	378
Lane Group Flow (vph)	387	28	41	50	28	6	112	120	8	29	307	126
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.6	18.2	18.2	5.3	8.9	8.9	8.7	23.0	23.0	3.4	17.7	17.7
Effective Green, g (s)	14.6	18.2	18.2	5.3	8.9	8.9	8.7	23.0	23.0	3.4	17.7	17.7
Actuated g/C Ratio	0.21	0.26	0.26	0.07	0.13	0.13	0.12	0.33	0.33	0.05	0.25	0.25
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	7.0	7.0	4.6	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	708	479	407	132	234	199	422	1151	514	85	886	396
v/s Ratio Prot	c0.11	0.02		0.03	0.02		c0.03	0.03		0.02	c0.09	
v/s Ratio Perm			c0.03			0.00			0.00			0.08
v/c Ratio	0.55	0.06	0.10	0.38	0.12	0.03	0.27	0.10	0.02	0.34	0.35	0.32
Uniform Delay, d1	25.1	19.8	20.0	31.1	27.4	27.1	28.1	16.7	16.2	32.6	21.8	21.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	0.1	1.8	0.2	0.1	0.3	0.0	0.0	2.4	0.2	0.5
Delay (s)	26.0	19.8	20.1	33.0	27.7	27.2	28.4	16.7	16.2	35.0	22.0	22.1
Level of Service	C	B	C	C	C	C	C	B	B	C	C	C
Approach Delay (s)		24.0			29.6			21.8			22.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
78: Branstetter Ln & Westside Rd

Timing Plan:

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	17	4	6	33	0	7	12	1	15	12	12
Future Volume (Veh/h)	16	17	4	6	33	0	7	12	1	15	12	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	18	20	5	7	38	0	8	14	1	17	14	14
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	38			25			134	110	22	118	113	41
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	38			25			134	110	22	118	113	41
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	98	100	98	98	99
cM capacity (veh/h)	1566			1583			800	765	1052	832	763	1024

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	45	23	45
Volume Left	18	7	8	17
Volume Right	5	0	1	14
cSH	1566	1583	786	858
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	2	4
Control Delay (s)	3.1	1.2	9.7	9.4
Lane LOS	A	A	A	A
Approach Delay (s)	3.1	1.2	9.7	9.4
Approach LOS			A	A

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix C.

Corridor Segment System Profiles

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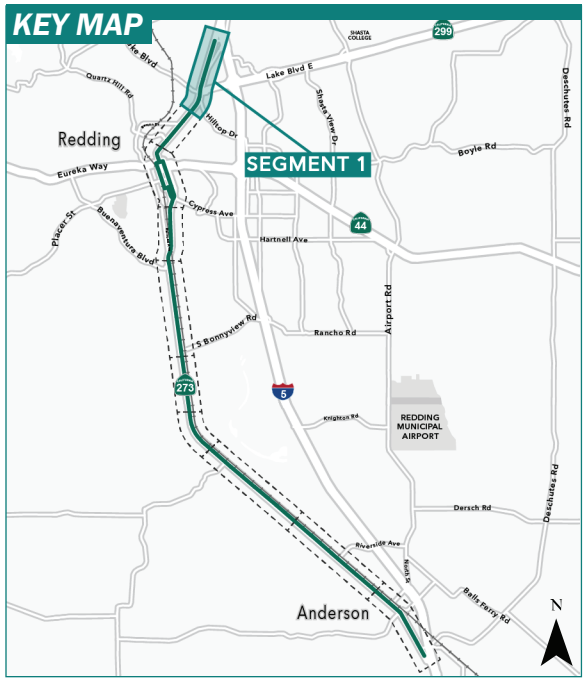
STATE ROUTE (SR) 273 SEGMENT 1

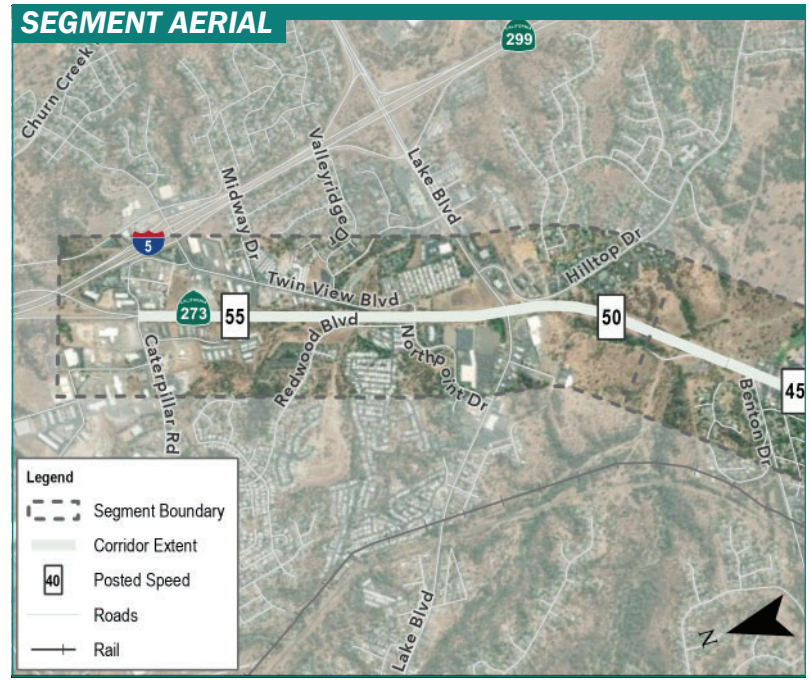
I-5 Ramps to south of Lake Blvd

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



SEGMENT AERIAL

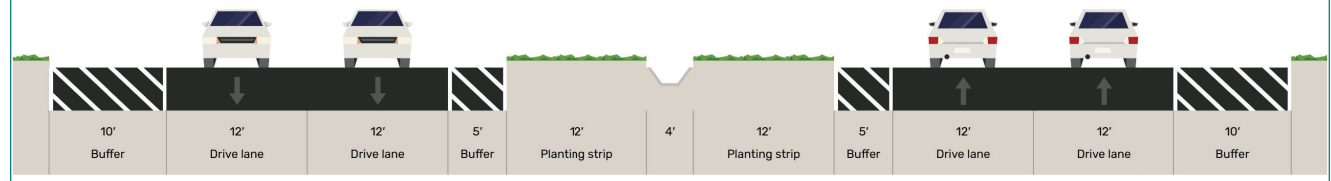


- **Adjacent Land Use:**
  Industrial, residential, commercial
- **Place Type:**
  Transitional Corridor/Suburban Community
- **Key Destinations:**
  North Point and Lake Boulevard Plaza Centers, Masonic Temple, Shasta Opportunity Center, Shasta Head Start, Shasta Early Childhood Services, Shasta Lanes, Water Works Park, Industrial areas off Caterpillar Rd
- **Key Features:**
  Access to I-5 at both north and south segment ends, access to Highway 299 Bikeway Class I Path at Lake Blvd, minimal place-based activities, barriers to pedestrian and bike mobility along corridor

- **Segment Length:**
  1.8 miles
- **Roadway Classification:**
  Freeway/Expressway
- **Jurisdiction of Adjacent Land Use:**
  City of Redding
- **Posted Speed(s):**
  50 to 55 mph
- **Cross-Section:**
  4-lane divided with dirt median and left turn pockets at intersections
- **Daily Traffic Volume:**
  ~ 9,900 vehicles per day

TYPICAL SECTION

Segment 1 (south of Caterpillar Road)

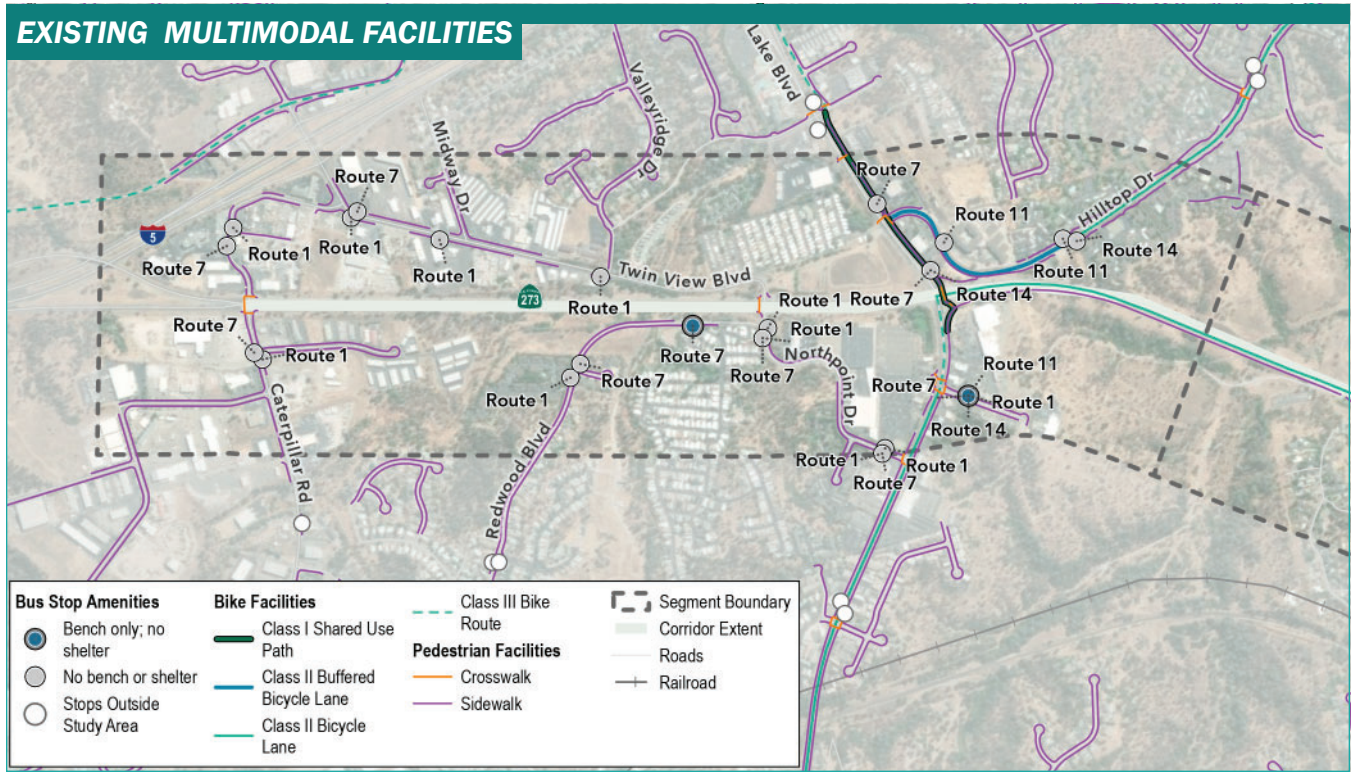


STATE ROUTE (SR) 273 SEGMENT 1

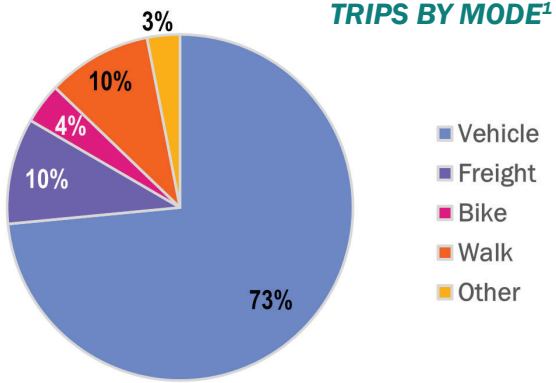
I-5 Ramps to south of Lake Blvd

EXISTING CONDITIONS MOBILITY TRENDS

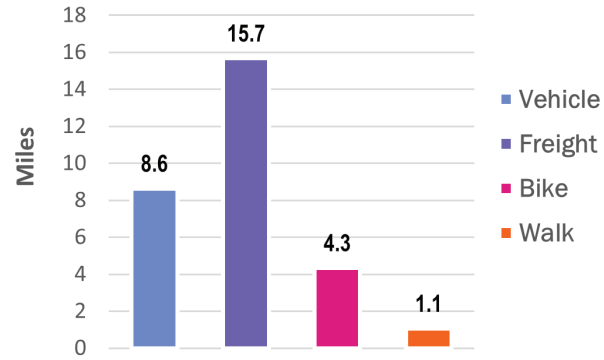
EXISTING MULTIMODAL FACILITIES



TRIPS BY MODE[1]



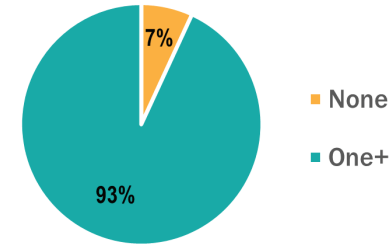
AVERAGE TRIP DISTANCE BY MODE[1]



[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

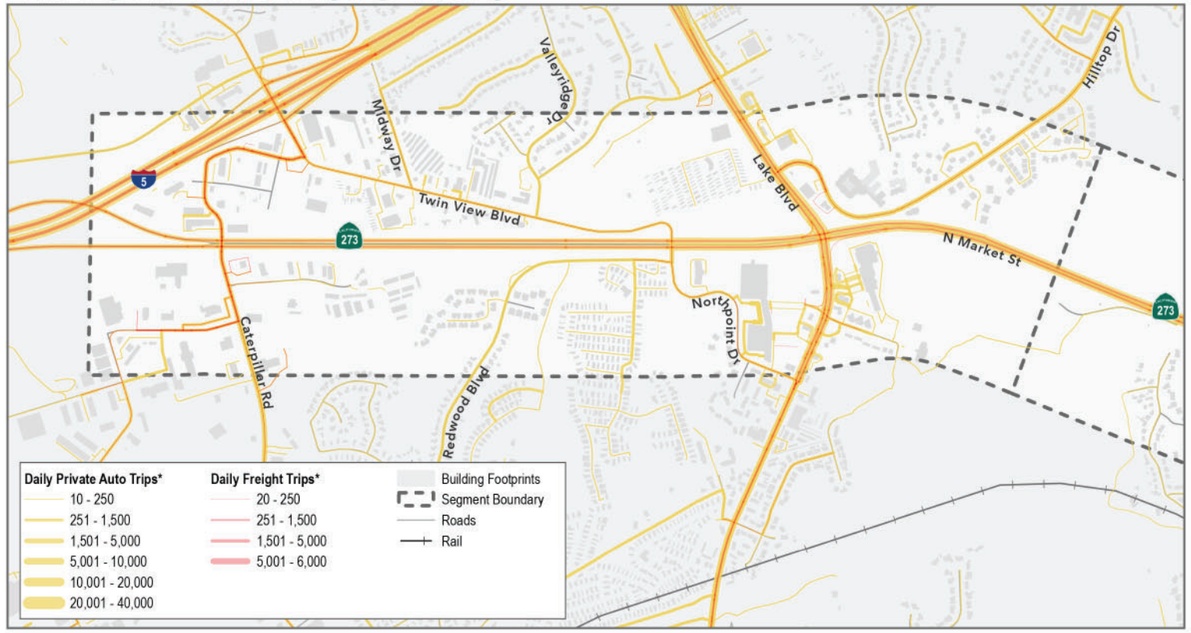
- The most common trip mode is motor vehicles, with 73 percent of all trip types made by a private automobile and 10 percent by a freight vehicle.
- Ten percent of trips within the segment are also made by pedestrians.
- Among all modes, freight vehicles have the highest average trip distance, followed by private vehicles.
- Most people traveling within the segment have access to a car, with 93% of trips made by individuals living in households with access to at least one vehicle.
- Seven percent of trips are made by people without access to a car, and people who do not have access to car are 30 times more likely to bike and 5 times more likely to walk than those who do have access to a car.

PRIVATE AUTO OWNERSHIP

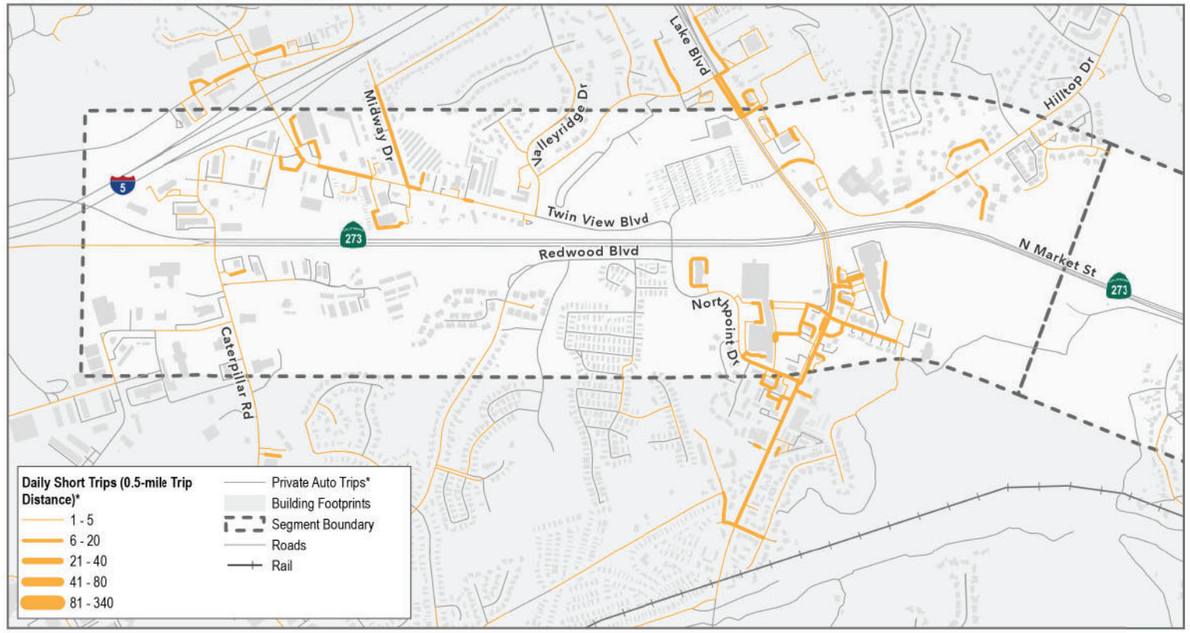


- Bicycle trips traveling along the segment are most concentrated along Lake Blvd and SR 273 east of Lake Blvd.
- Pedestrian trips, and especially walking trips made by those who do not own a car, are also concentrated along Lake Blvd, as well as Twin View Blvd, and Hilltop Dr.
- Transit activity is also highest concentrated near Lake Blvd, with transit boarding and disembarking highest in this location due to the presence of the Masonic Transfer Center.
- Short vehicle trips are concentrated along Lake Blvd near local commercial destinations.
- Freight and private automobile trips are concentrated along I-5 and major roadways intersecting the corridor segment. Of all vehicle trips, 87% are made by private automobiles and 13% by freight vehicles.

FREIGHT AND AUTO TRIPS

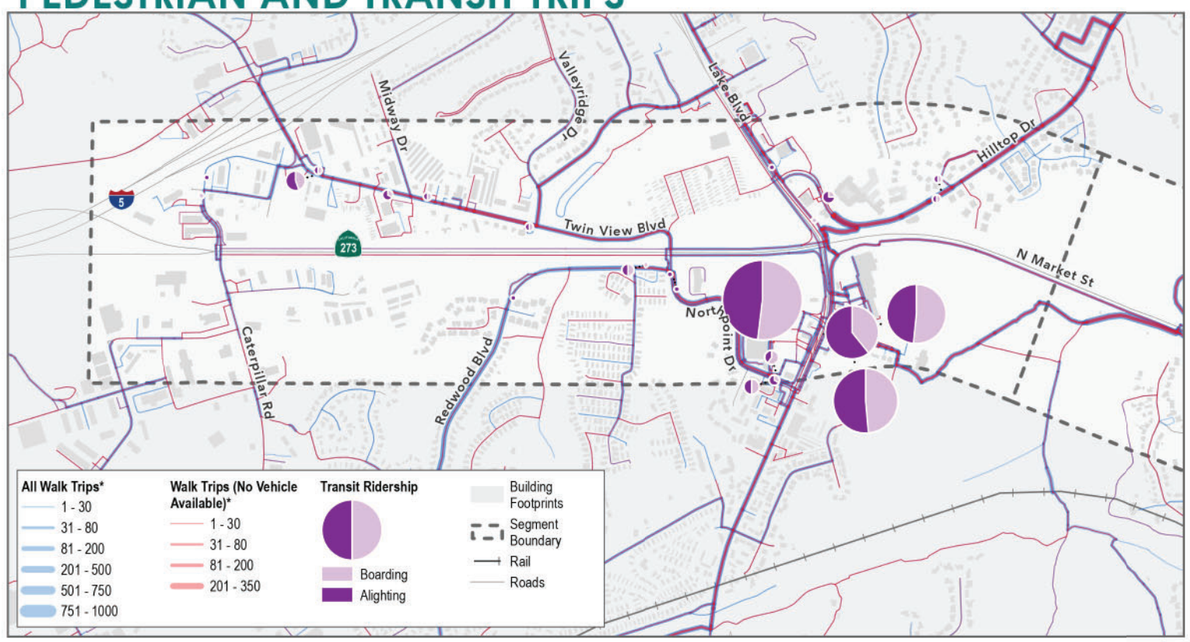


SHORT AUTO TRIPS



BICYCLE TRIPS

PEDESTRIAN AND TRANSIT TRIPS



Data source: Human Geography Base: Esri Community Maps Contributors, City of Redding GIS, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Trip data: Replica; Typical Weekday in Fall 2022; Building Footprints: City of Redding, Shasta County, 2023; Transit Ridership: RABA; City of Redding, GHD, 2023; Roads: Shasta County, 2023; Rail: CA Data Hug, 2023
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Print date: 04 Oct 2023 - 20:32

*Data Disclaimer: Daily trips represent an estimate of a typical weekday in 2022. Volumes are an estimate only with medium certainty of reliability, and actual trip counts may vary from the numbers reported here.

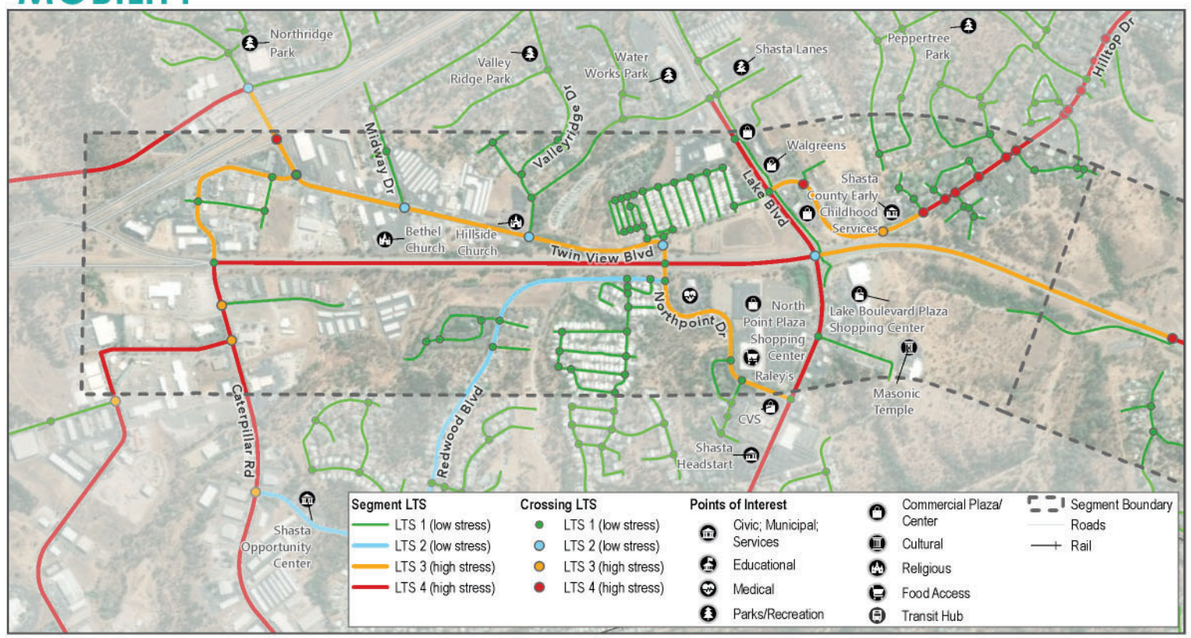
0 500 1,000 1,500
US Feet

STATE ROUTE (SR) 273 SEGMENT 1

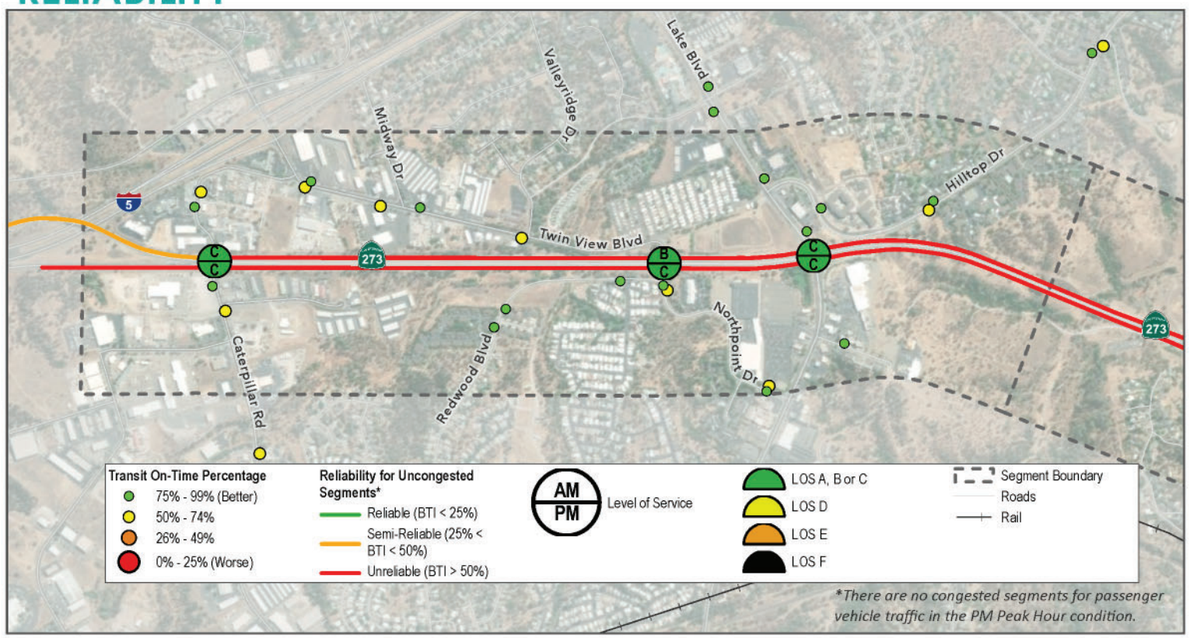
I-5 Ramps to south of Lake Blvd

EXISTING CONDITIONS PERFORMANCE RESULTS

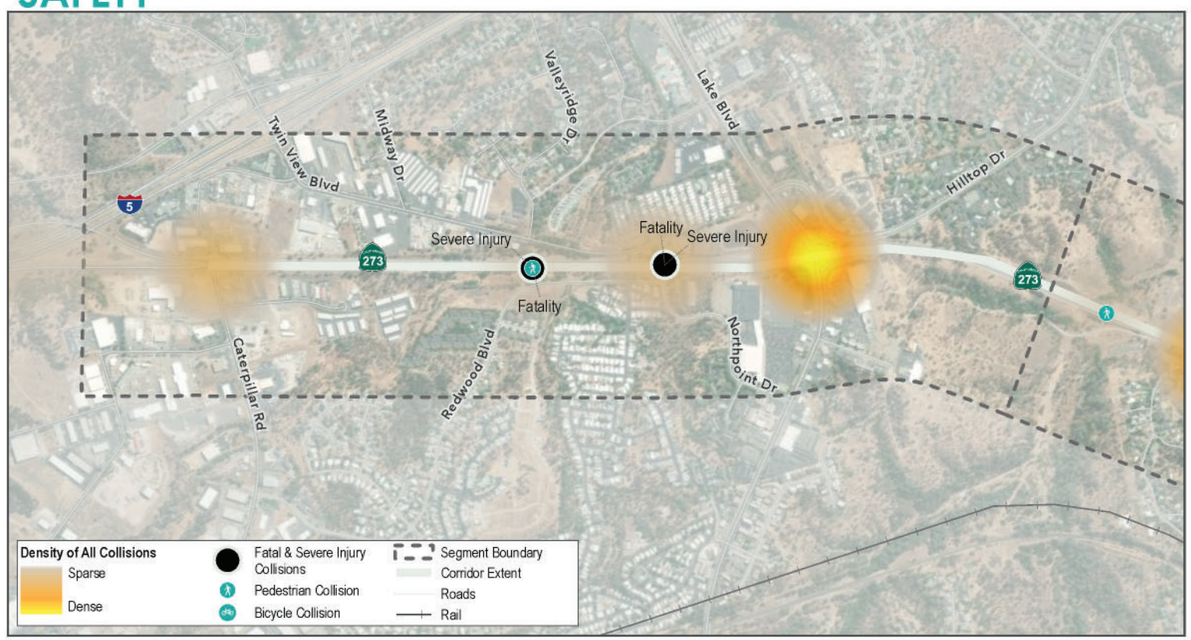
MOBILITY



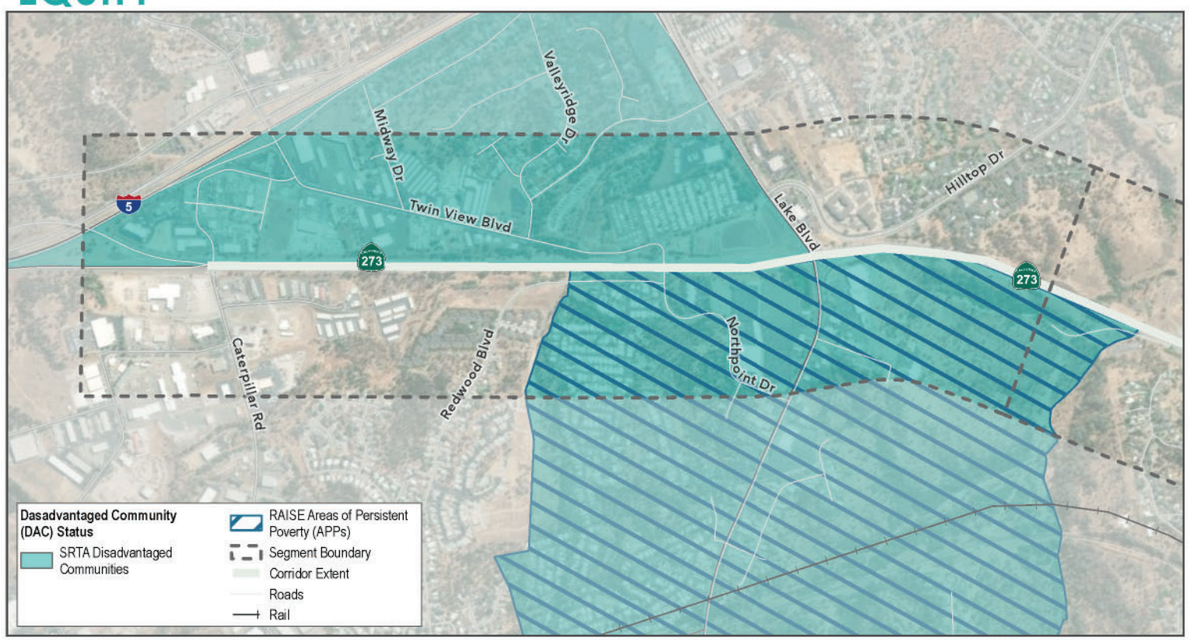
RELIABILITY



SAFETY



EQUITY



Data source: World Imagery (Firefly): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; Transit Stops & Frequency: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Highways: TIGER, 2022; Bikeways: SRTA, 2023; Pedestrian Facilities: City of Redding, 2023; Collisions: SWITRS, 2018-2022; DAC: SRTA RTP-SCS, 2018; POI: GHD, 2023; Congestion & TTR: NPMRDS, GHD, 2023.
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Print date: 22 Feb 2024 - 23:17

0 500 1,000 1,500
US Feet

EXISTING CONDITIONS PERFORMANCE RESULTS SEGMENT 1

MOBILITY & CONNECTIVITY	Result	Score
Transit Stop Conditions	Poor	4
Presence of Amenities (Shelter or Bench) at Transit Stop?	Typically no bench/shelter	4
Sidewalk Connection to Transit Stop? (On SR 273, only)	No stops on SR 273	4
Sidewalk Coverage	Minimal; Connectivity near developed area	3
Bicycle Level of Traffic Stress (LTS)	High Stress	4
Bicycle Connectivity to Destination Types:	# Destinations (% Connected) [1,2]	4
Employment Destinations	3 (0%)	
Education Destinations	1 (1%)	
Community Services and Shopping Destinations	10 (5%)	
Health Care Destinations	1 (0%)	
Food Access	1 (0%)	
Transit Service Destinations (includes Bike Share locations)	41 (9%)	
Civic Service Destinations	1 (1%)	
Parks/Open Space & Recreation Destinations	5 (18%)	
Overall Mobility Score	**Poor**	**4**

[1] The # of destinations reported here are the # of destinations only within the segment. However, low stress connectivity is assessed for connections within and outside of the segment, so long as the location is reachable within a [1.5]-mile biking distance.
[2]. Value of "NA" for the percent connected indicates that there are no connections for that node type in the full stress network within a [1.5]-mile biking distance from the residential origins in that segment to compare low-stress connections against.

SAFETY	Result	Score
Total Crashes	29	-
Total Fatal Crashes	2	4
Total Severe Crashes	-	
Total Crashes Involving a Pedestrian	1	4
Total Pedestrian Fatalities	1	4
Total Crashes Involving a Bicyclist	-	
Total Bicyclists Fatalities	-	
% Occurred at Night (Non-Daylight Crashes)	31%	-
Primary Crash Types	Broadside	-
Primary Crash Cause	Unsafe Speed & Vehicle Driver Error	-
Crash Rate (Bold = Exceeds Statewide average)	**0.89**	3
Statewide Crash Rate	0.94	-
Overall Safety Score	**Poor**	**4**

OPERATIONS & RELIABILITY	Result	Score
Transit Stop Reliability	Results provided by route	3
Travel Time Reliability (TTR)	Unreliable	4
Vehicle - AM Peak Hour	Unreliable	
Vehicle - PM Peak Hour (shown on map)	Unreliable	
Truck - AM Peak Hour	Unreliable	
Truck - PM Peak Hour	Unreliable	
Intersection Level of Service (LOS)	Acceptable	1
Overall Reliability Score	**Poor**	**3**

EQUITY (DAC Status)	Result	Score
SRTA Regional Transportation Plan (RTP) Criteria	Majority	4
RAISE Areas of Persistent Poverty Criteria	Partially	3
Climate & Economic Justice Criteria	Fully	4
SB 535 CalEPA Criteria	No	1
Overall DAC Status	**High DAC**	**3**

PERFORMANCE SUMMARY	Result	Score
MOBILITY	Poor	**4**
SAFETY	Poor	**4**
RELIABILITY	Fair	**2**
EQUITY (DAC Status)	High DAC	**3**
Overall Performance		**3**

SEGMENT ISSUES

- High speeds and minimal bicycle and pedestrian infrastructure along SR 273 results in a high stress barrier to connectivity between destinations to the east and west of the highway.
- The intersection of Lake Blvd and SR 273 is a collision hotspot. With seven percent of collisions resulting in fatality, one of which involved a pedestrian, and a crash rate above the statewide average, safety is a concern.
- Transit service is mostly reliable with many of the routes serving stops in the segment arriving on-time between 75 and 99 percent of the time. Intersections are operating at acceptable levels in the AM and PM peak at LOS B or C. Travel time is considered unreliable.
- Equity is a concern with block groups to the east and west of the corridor meeting the DAC criteria for three of the four measures of DAC status.

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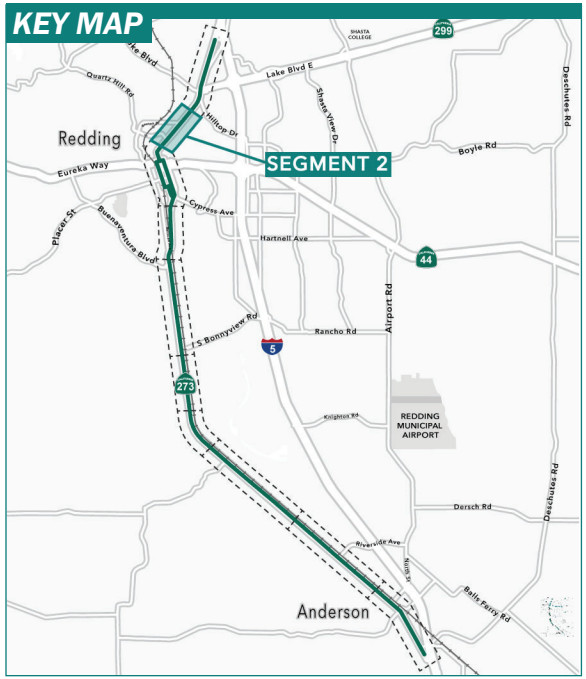
STATE ROUTE (SR) 273 SEGMENT 2

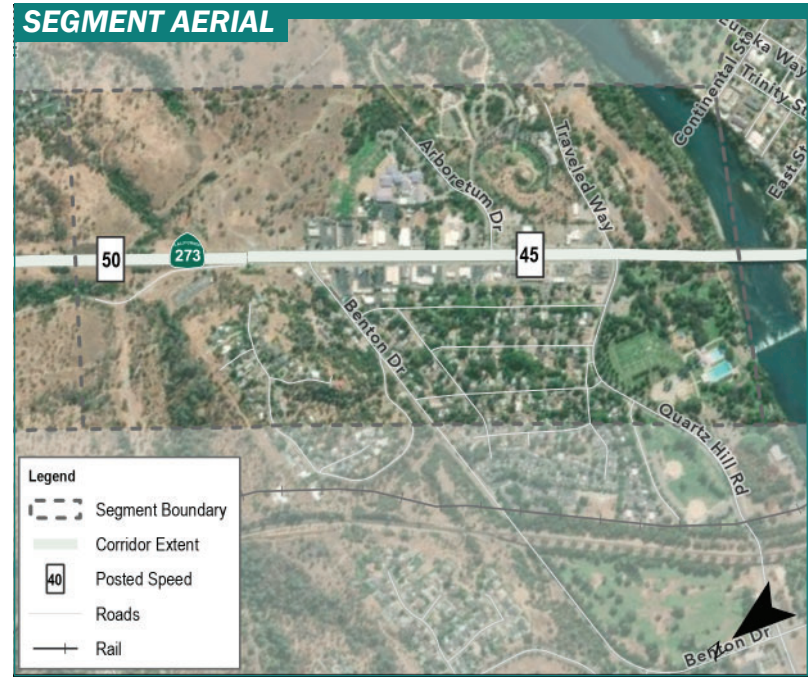
South of Lake Blvd to Sacramento River

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



SEGMENT AERIAL

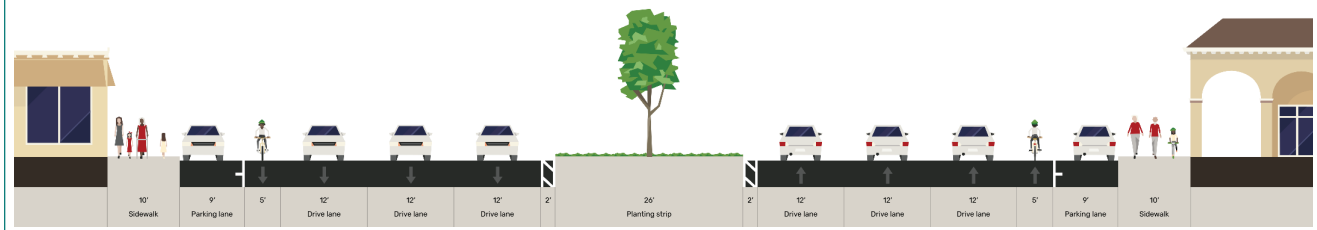


- **Adjacent Land Use:**
  Residential, commercial, public/semi-public, park
- **Place Type:**
  Suburban Corridor/Suburban Neighborhood/Transitional Corridor
- **Key Destinations:**
  Commercial on west side of SR 273, Turtle Bay School, Turtle Bay Exploration Park and Botanical Gardens and Nursery on the east side, Caldwell Park and Redding Aquatic Park at the southwest
- **Key Features:**
  The North River Trail provides east-west connectivity under SR 273 between residential, commercial, and the public and semi-public uses on either side of the corridor, as well as to the River Trail that connects to Downtown Redding southwest of the segment area

- **Segment Length:**
  1.0 miles
- **Roadway Classification:**
  Freeway/Expressway; Principal Arterial
- **Jurisdiction of Adjacent Land Use:**
  City of Redding
- **Posted Speed(s):**
  45 to 50 mph
- **Cross-Section:**
  4 to 5-lane divided with landscaped median and left turn pockets at intersections
- **Daily Traffic Volume:**
  ~ 17,800 vehicles per day

TYPICAL SECTION

Segment 2 (south of Benton Drive)

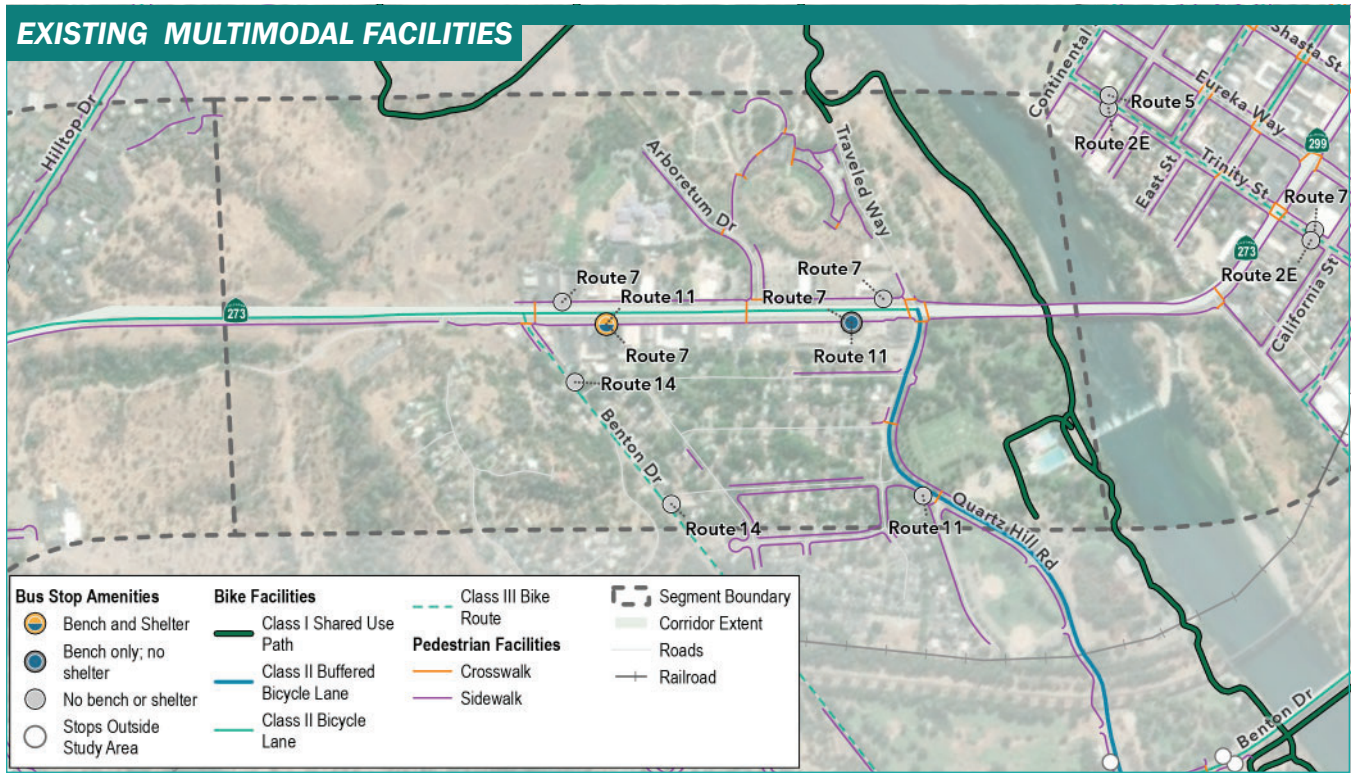


STATE ROUTE (SR) 273 SEGMENT 2

South of Lake Blvd to Sacramento River

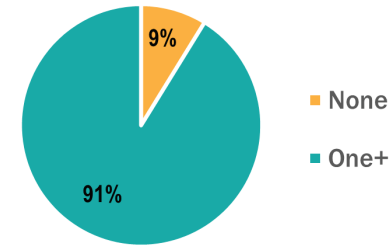
EXISTING CONDITIONS MOBILITY TRENDS

EXISTING MULTIMODAL FACILITIES

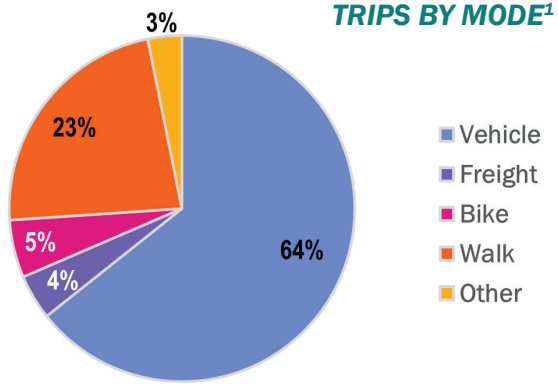


- The most common trip mode is motor vehicles, with 64 percent of trips made by a private automobile, followed by 23 percent of trips made by walking and 5 percent by bike.
- Most people traveling within the segment have access to a car, with 91% of trips made by individuals living in households with access to at least one vehicle.
- Most vehicle and freight trips are concentrated along SR 273, with a smaller share along Benton Dr.
- Short vehicle trips are concentrated near SR 273's commercial and residential uses, and the alley between Travelled Way and Arboretum Dr.
- Nine percent of trips are made by people without access to a car, and people who do not have access to car are 10 times more likely to bike and 4 times more likely to walk than those who do have access to a car.

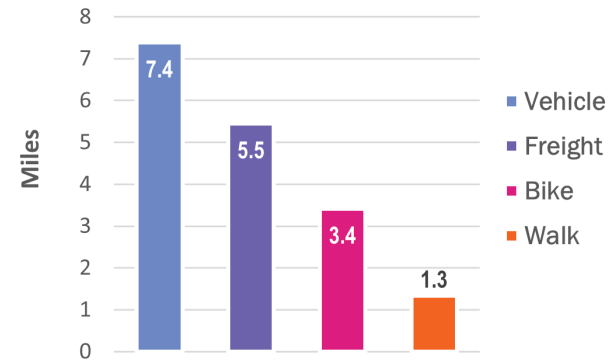
PRIVATE AUTO OWNERSHIP



TRIPS BY MODE[1]



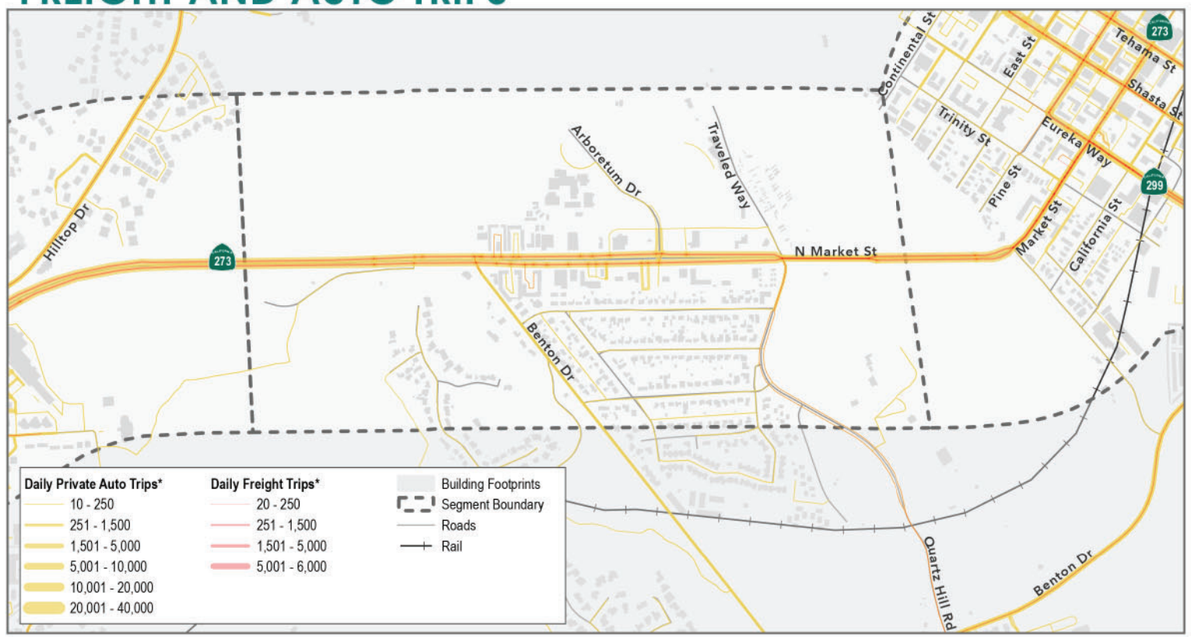
AVERAGE TRIP DISTANCE BY MODE[1]



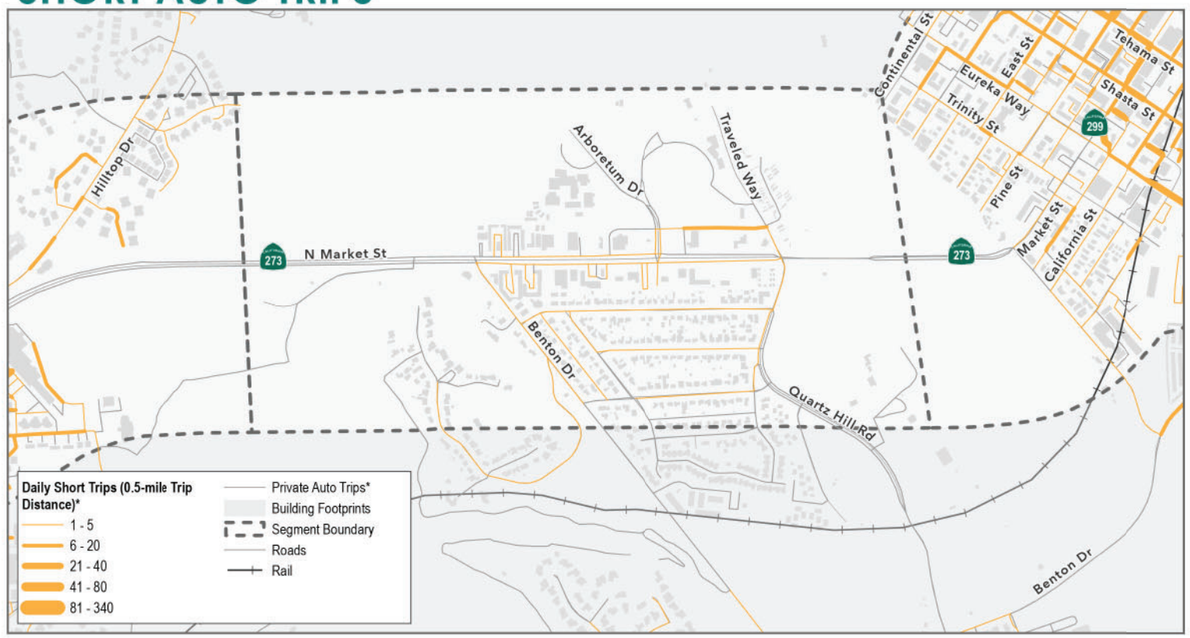
- Bicycle trips traveling along the segment are most concentrated at Benton Dr, Quartz Hill Rd and along Loma St, which is a lower stress roadway parallel to SR 273 on the west side.
- Bike trips made by people without access to a car are less concentrated along the River Trail and Benton Dr south of Loma St.
- Pedestrian trips, and especially walking trips made by those who do not own a car are also concentrated along Loma St, as well as along Sulphur Creek Rd and unmarked footpaths that connect to SR 273 at Sulphur Creek, as well as along SR 273, south of Quartz Hill Rd toward Downtown Redding.
- Transit activity is concentrated near the commercial strip along SR 273, and the stops north of Traveled Way and at Quartz Hill Rd near Caldwell Park.

[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

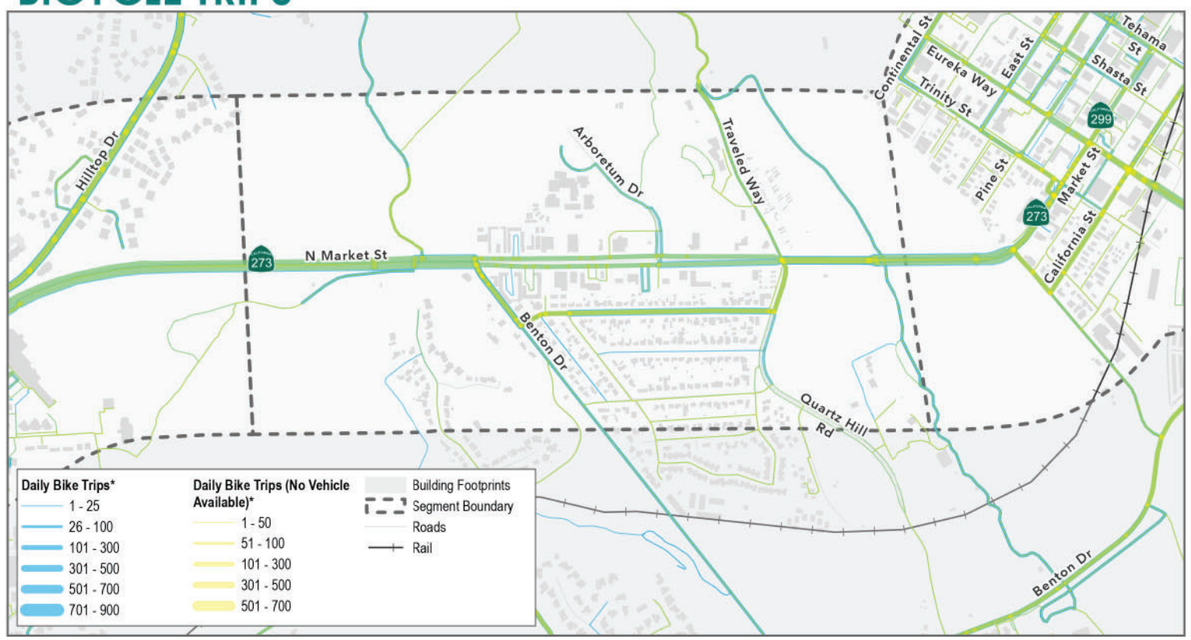
FREIGHT AND AUTO TRIPS



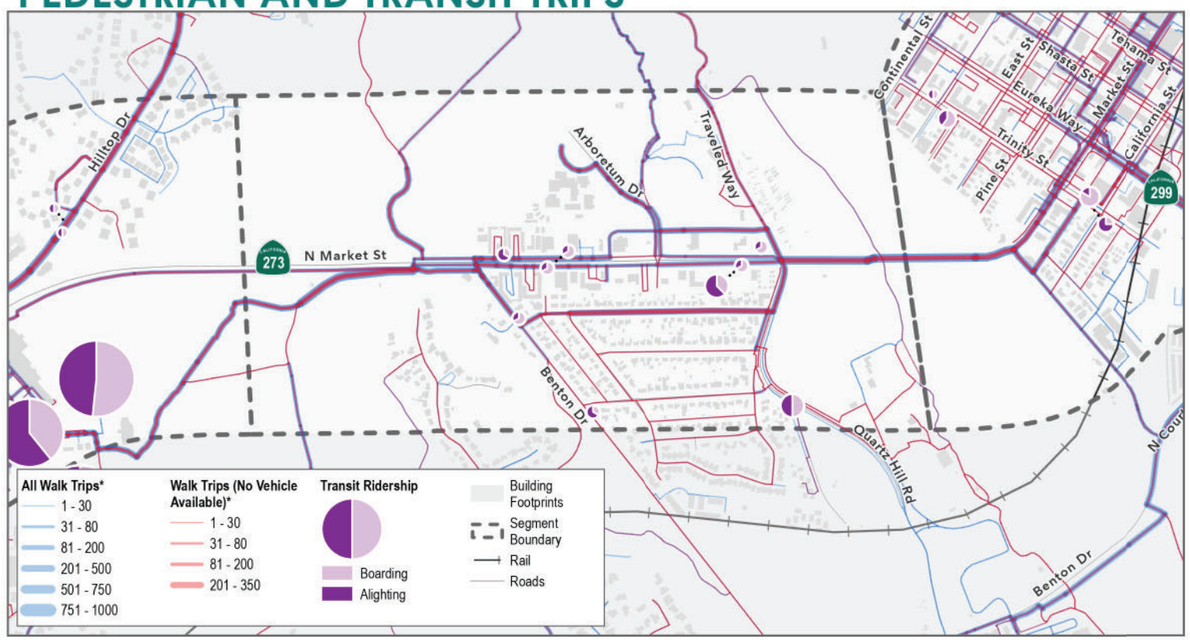
SHORT AUTO TRIPS



BICYCLE TRIPS



PEDESTRIAN AND TRANSIT TRIPS



Data source: Human Geography Base: Esri Community Maps Contributors, City of Redding GIS, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Trip data: Replica; Typical Weekday in Fall 2022; Building Footprints: City of Redding, Shasta County, 2023; Transit Ridership: RABA; City of Redding, GHD, 2023; Roads: Shasta County, 2023; Rail: CA Data Hug, 2023
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Print date: 04 Oct 2023 - 20:34

*Data Disclaimer: Daily trips represent an estimate of a typical weekday in 2022. Volumes are an estimate only with medium certainty of reliability, and actual trip counts may vary from the numbers reported here.

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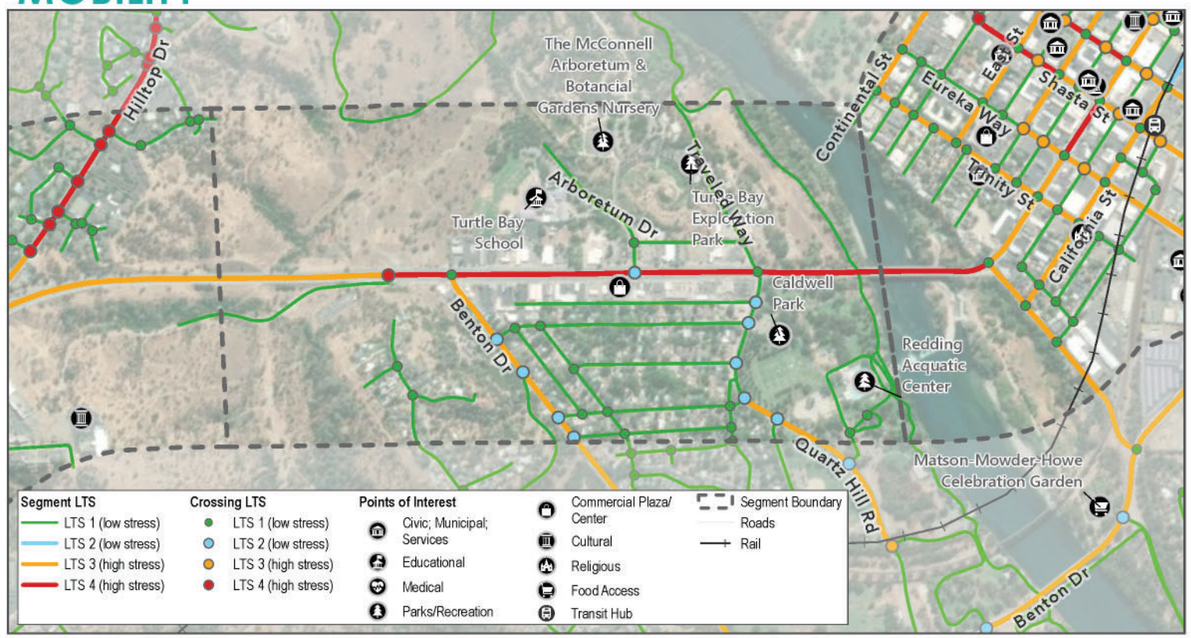
US Feet

STATE ROUTE (SR) 273 SEGMENT 2

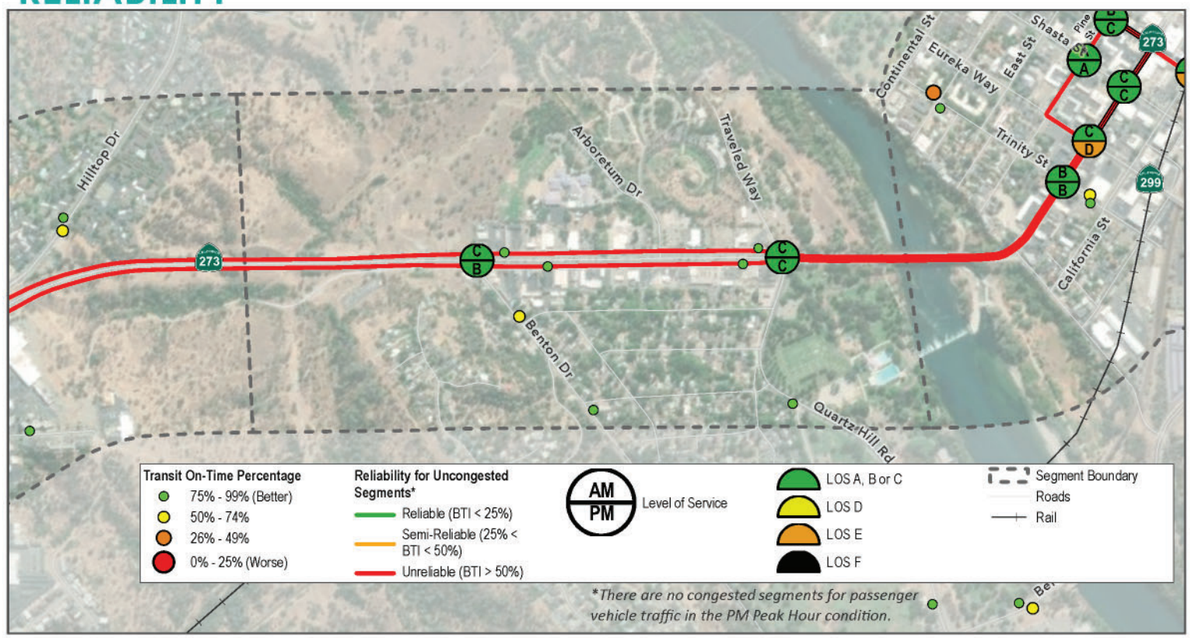
South of Lake Blvd to Sacramento River

EXISTING CONDITIONS PERFORMANCE RESULTS

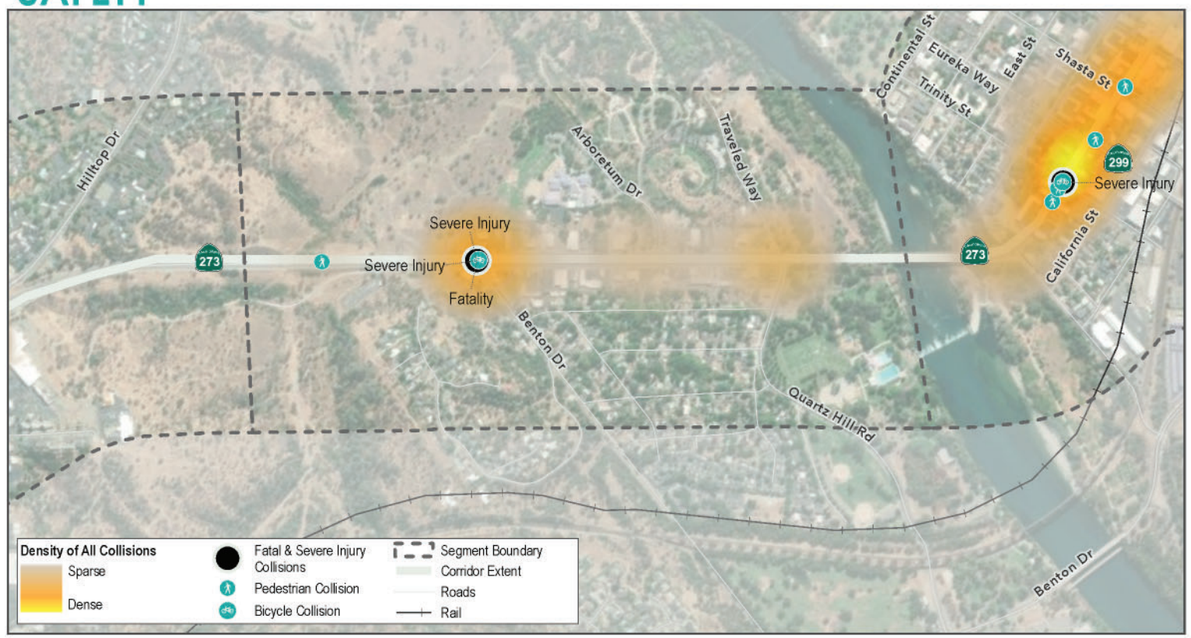
MOBILITY



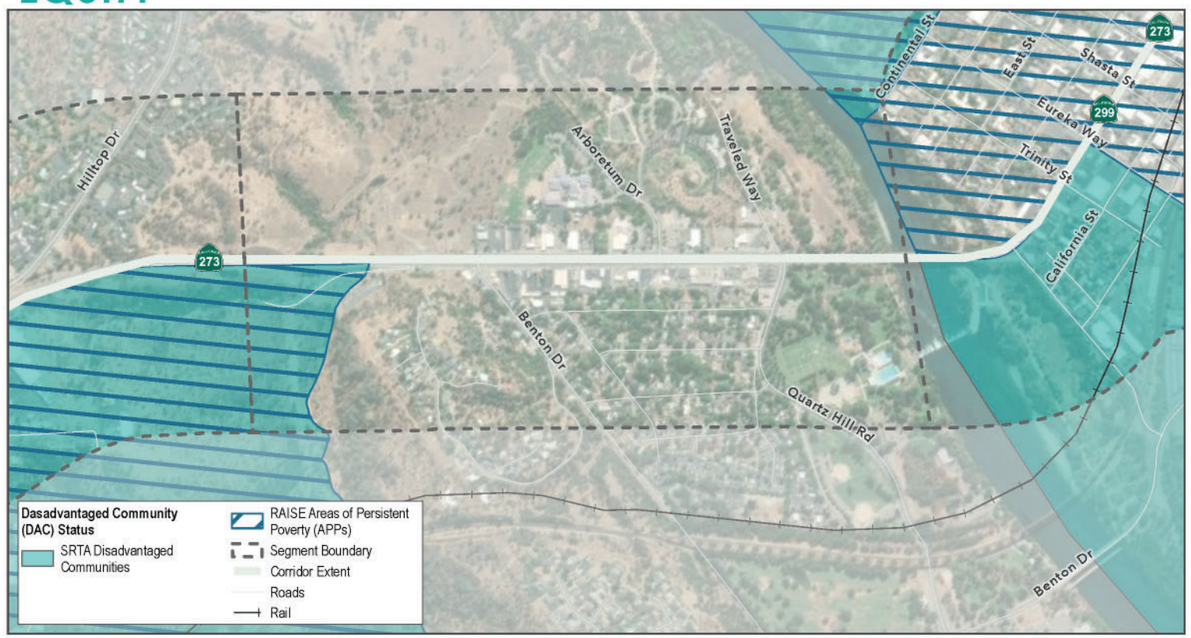
RELIABILITY



SAFETY



EQUITY



Data source: World Imagery (Firefly): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; Transit Stops & Frequency: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Highways: TIGER, 2022; Bikeways: SRTA, 2023; Pedestrian Facilities: City of Redding, 2023; Collisions: SWITRS, 2018-2022; DAC: SRTA RTP-SCS, 2018; POI: GHD, 2023; Congestion & TTR: NPMRDS, GHD, 2023.
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Print date: 22 Feb 2024 - 23:17

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US Feet

EXISTING CONDITIONS PERFORMANCE RESULTS SEGMENT 2

MOBILITY & CONNECTIVITY	Result	Score
Transit Stop Conditions	Fair	0
Presence of Amenities (Shelter or Bench) at Transit Stop?	Typically no bench/shelter	2
Sidewalk Connection to Transit Stop? (On SR 273, only)	Yes, sidewalk at SR 273 stops	2
Sidewalk Coverage	Minimal; Connectivity near developed area	3
Bicycle Level of Traffic Stress (LTS)	High Stress	4
Bicycle Connectivity to Destination Types:	# Destinations (% Connected) [1,2]	4
Employment Destinations	0 (0%)	
Education Destinations	1 (18%)	
Community Services and Shopping Destinations	3 (3%)	
Health Care Destinations	0 (0%)	
Food Access	0 (0%)	
Transit Service Destinations (includes Bike Share locations)	10 (0%)	
Civic Service Destinations	0 (0%)	
Parks/Open Space & Recreation Destinations	4 (34%)	
Overall Mobility Score	**Poor**	**3**

[1] The # of destinations reported here are the # of destinations only within the segment. However, low stress connectivity is assessed for connections within and outside of the segment, so long as the location is reachable within a [1.5]-mile biking distance.
[2]. Value of "NA" for the percent connected indicates that there are no connections for that node type in the full stress network within a [1.5]-mile biking distance from the residential origins in that segment to compare low-stress connections against.

SAFETY	Result	Score
Total Crashes	33	-
Total Fatal Crashes	1	4
Total Severe Crashes	1	
Total Crashes Involving a Pedestrian	2	4
Total Pedestrian Fatalities	-	0
Total Crashes Involving a Bicyclist	1	
Total Bicyclists Fatalities	-	0
% Occurred at Night (Non-Daylight Crashes)	21%	-
Primary Crash Types	Rear End	-
Primary Crash Cause	Unsafe Speed	-
Crash Rate (Bold = Exceeds Statewide average)	**1.02**	4
Statewide Crash Rate	0.94	-
Overall Safety Score	**Poor**	**4**

OPERATIONS & RELIABILITY	Result	Score
Transit Stop Reliability	Results provided by route	3
Travel Time Reliability (TTR)	**Unreliable**	4
Vehicle - AM Peak Hour	Unreliable	
Vehicle - PM Peak Hour (shown on map)	Unreliable	
Truck - AM Peak Hour	Unreliable	
Truck - PM Peak Hour	Unreliable	
Intersection Level of Service (LOS)	**Acceptable**	1
Overall Reliability Score	**Poor**	**3**

EQUITY (DAC Status)	Result	Score
SRTA Regional Transportation Plan (RTP) Criteria	Partially	3
RAISE Areas of Persistent Poverty Criteria	Partially	3
Climate & Economic Justice Criteria	Partially	3
SB 535 CalEPA Criteria	No	1
Overall DAC Status	**High DAC**	**3**

PERFORMANCE SUMMARY	Result	Score
MOBILITY	Poor	**3**
SAFETY	Poor	**4**
RELIABILITY	Fair	**2**
EQUITY (DAC Status)	High DAC	**3**
Overall Performance		**3**

SEGMENT ISSUES

- High speeds along SR 273 results in a high stress barrier to connectivity between destinations to the east and west of the corridor.
- The intersection of Benton Dr and SR 273 is a collision hotspot where fatal and severe injury collisions have occurred. Additionally, the crash rate along the segment exceeds the statewide average, making safety a concern.
- Transit service is mostly reliable with many of the routes serving stops in the segment arriving on-time between 75 and 99 percent of the time. Intersections are operating at acceptable levels in both peaks at LOS B and C. Travel time is considered unreliable.
- Equity is a concern with block groups throughout the segment study area meeting the DAC criteria for three of the four measures of DAC status.

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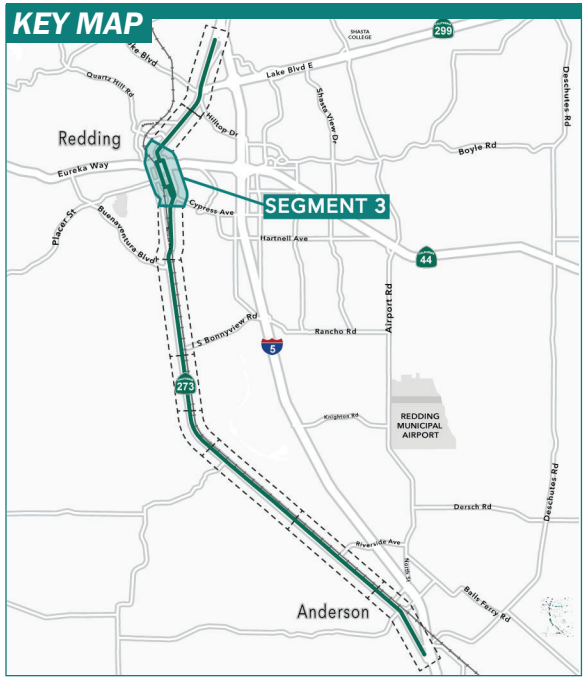
STATE ROUTE (SR) 273 SEGMENT 3

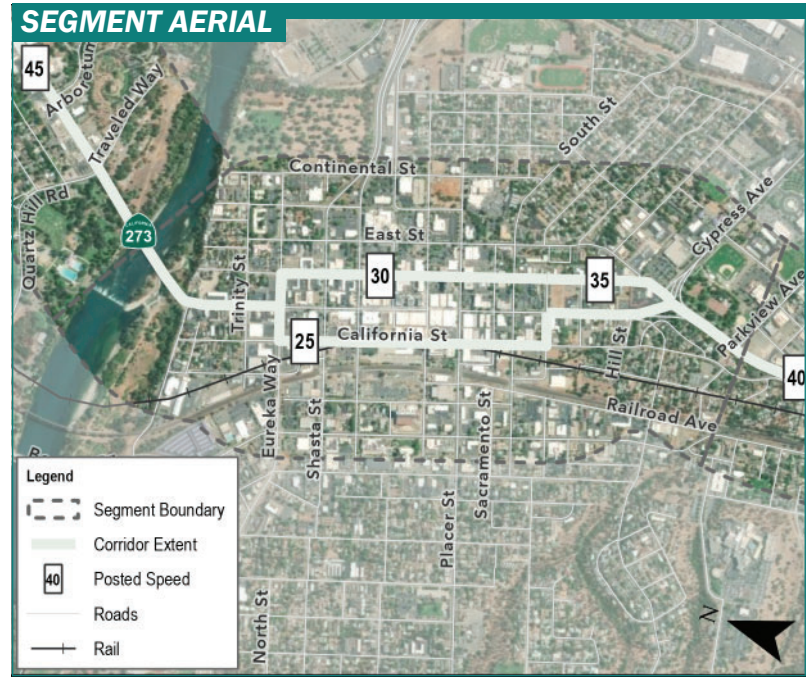
Sacramento River to south of Cypress Ave

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



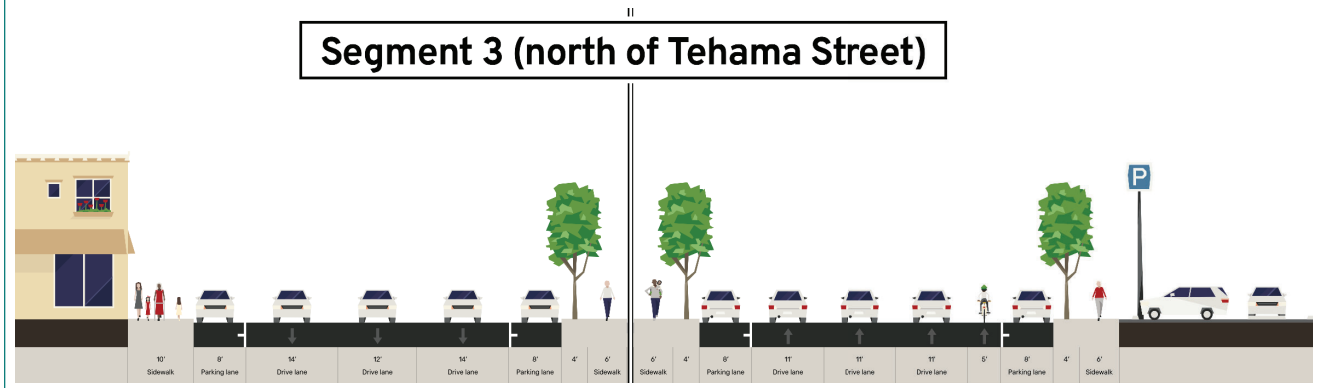
SEGMENT AERIAL



- **Adjacent Land Use:**
  Mixed use, commercial, public/semi-public, park, single family residential
- **Place Type:**
  Urban Center/Suburban Community/ Suburban Corridor
- **Key Destinations:**
  Downtown Transit Center, access to SR 299 and SR 44, variety of commercial destinations, aide/services offices, community organizations, and hospitals/ clinics, Safeway, Redding Library and South City Park at the south end of the segment
- **Key Features:**
  Main urban center for the area, River Trail South connects to across the River to North Redding, streets near Market Center provide bike- and pedestrian-friendly thoroughfares.

- **Segment Length:**
  1.4 miles (2.5 total centerline, including couplets on California and Pine Streets)
- **Roadway Classification:**
  Principal Arterial
- **Jurisdiction of Adjacent Land Use:**
  City of Redding
- **Posted Speed(s):**
  25 to 35 mph
- **Cross-Section:**
  2-3 lane undivided with left turn lanes at some intersections
- **Daily Traffic Volume:**
  ~ 16,200 vehicles per day

TYPICAL SECTION

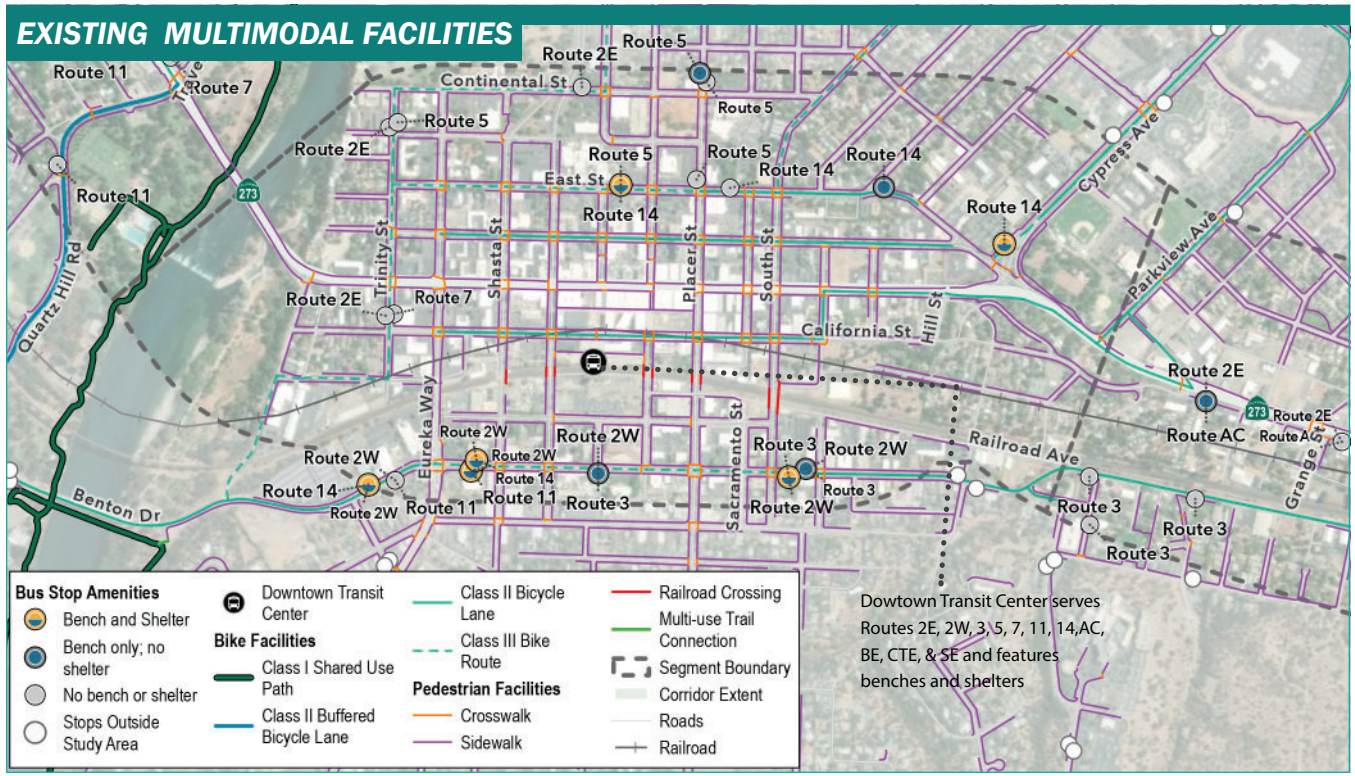


STATE ROUTE (SR) 273 SEGMENT 3

Sacramento River to south of Cypress Ave

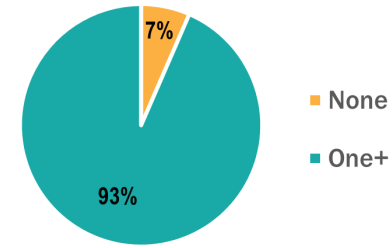
EXISTING CONDITIONS MOBILITY TRENDS

EXISTING MULTIMODAL FACILITIES

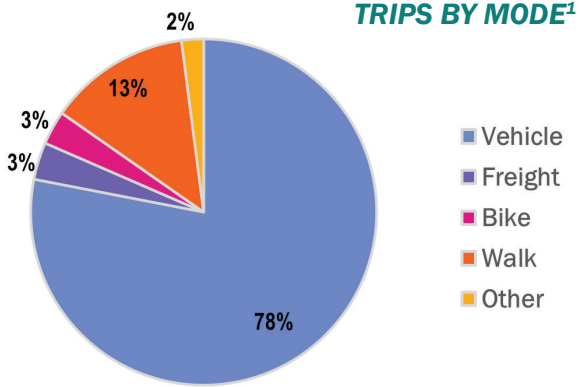


- The most common trip mode is private vehicles, with 78 percent of trips made by a private automobile, followed by 13 percent by walking.
- Among all modes, private vehicles have the highest average trip distance at 8.7 miles, followed by freight vehicles at 5.3 miles and bike trips at 4 miles.
- Most people traveling within the segment have access to a car, with 93 percent of trips made by individuals living in households with access to at least one vehicle. Seven percent of trips are made by people without access to a car, and people who do not have access to car are 48 times more likely to bike and 4 times more likely to walk than those who do have access to a car.
- Short vehicle trips are concentrated throughout the downtown core and on the northwest side of the segment area.

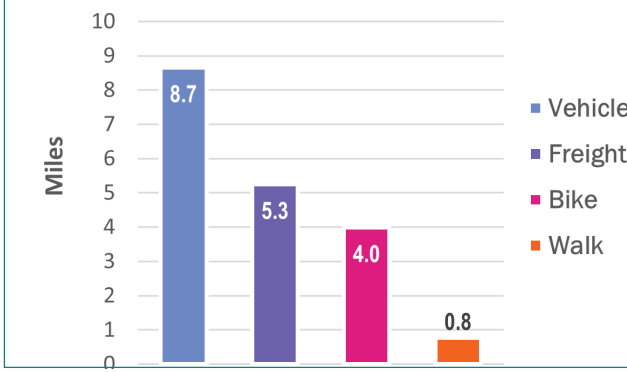
PRIVATE AUTO OWNERSHIP



TRIPS BY MODE[1]



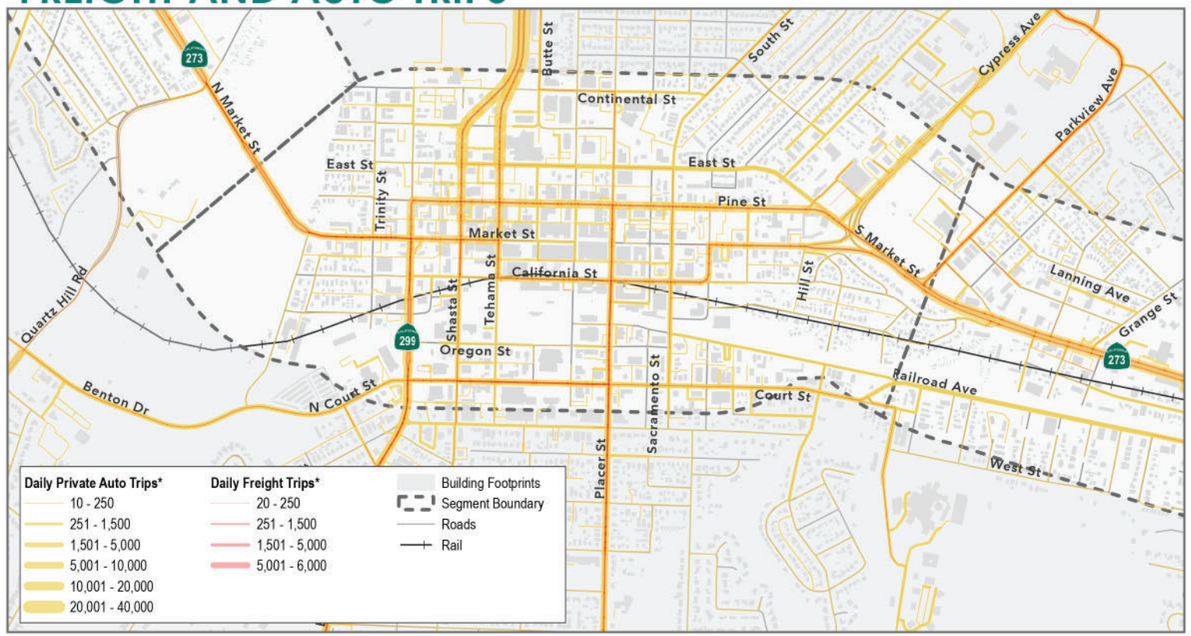
AVERAGE TRIP DISTANCE BY MODE[1]



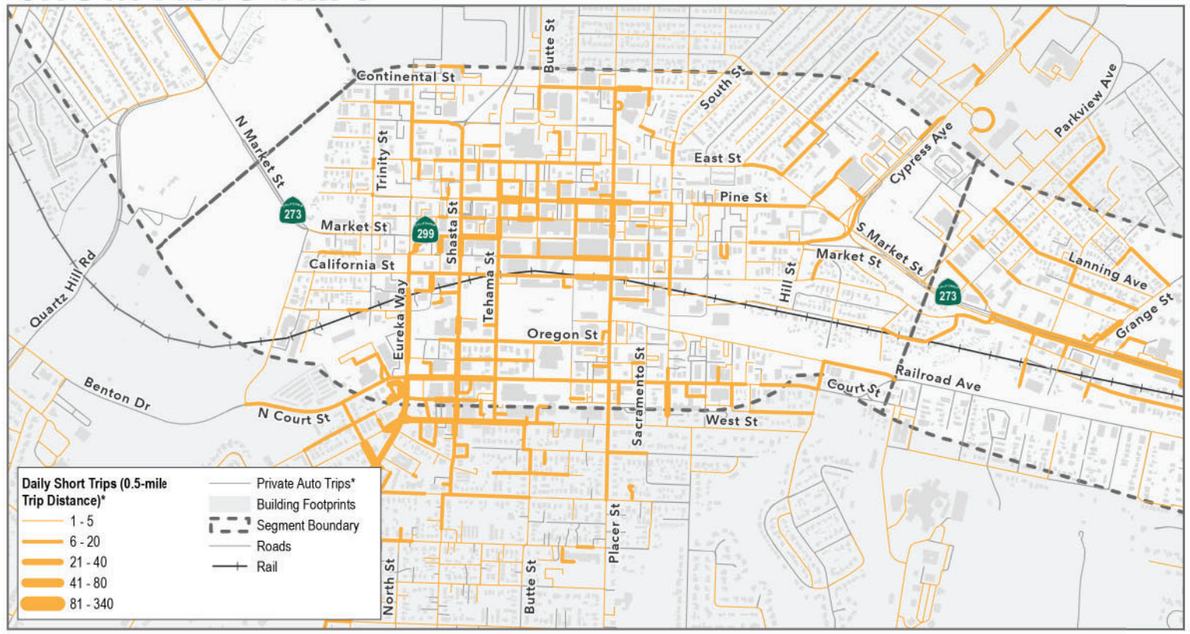
- Both vehicle and freight trips are concentrated along N and S Market Streets, Pine St, Placer St, and Eureka Way (SR 299), while East Street and Cypress Ave feature a concentration of vehicle trips with less concentration of freight trips.
- Bicycle trips traveling within the segment are concentrated similarly to vehicle trips with the exception of Shasta and Tehama Streets, where bike activity runs along Butte, Continental and Trinity Streets instead. Bike activity is also seen along the streets within the Garden Tract neighborhood, and West and Oregon Streets, where vehicle activity is less concentrated
- Pedestrian activity is seen throughout the segment area, but it is most pronounced along N Market Street, Eureka Way and Cypress Ave. Walking trips made by those without access to a vehicle are concentrated similarly, as well as along various alleys and side streets.

[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

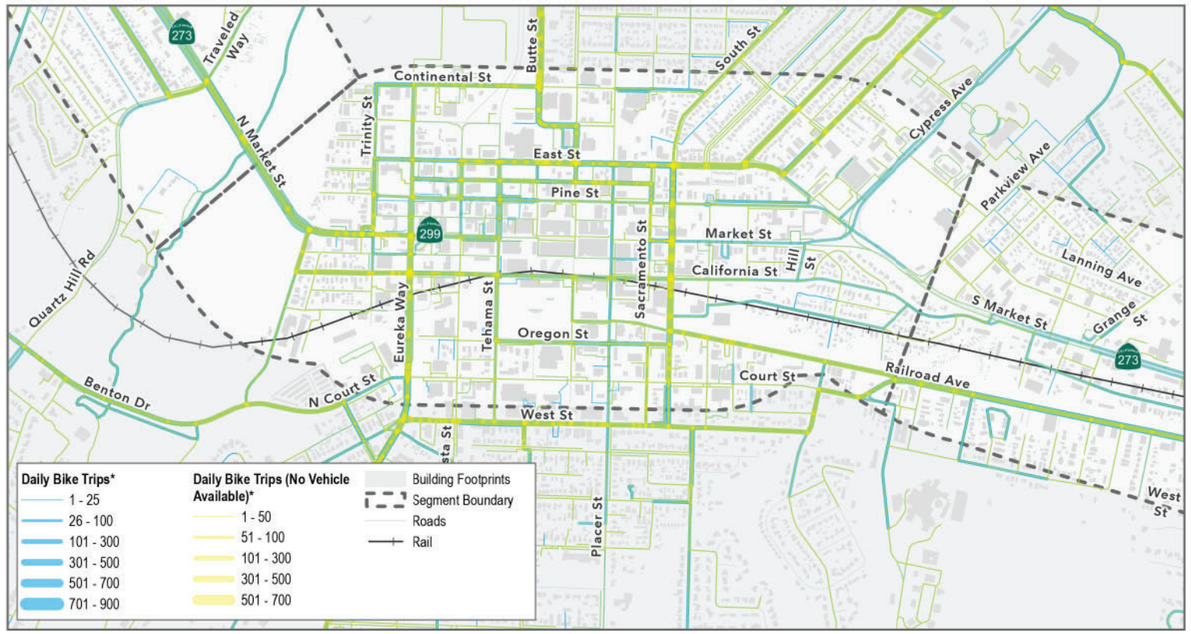
FREIGHT AND AUTO TRIPS



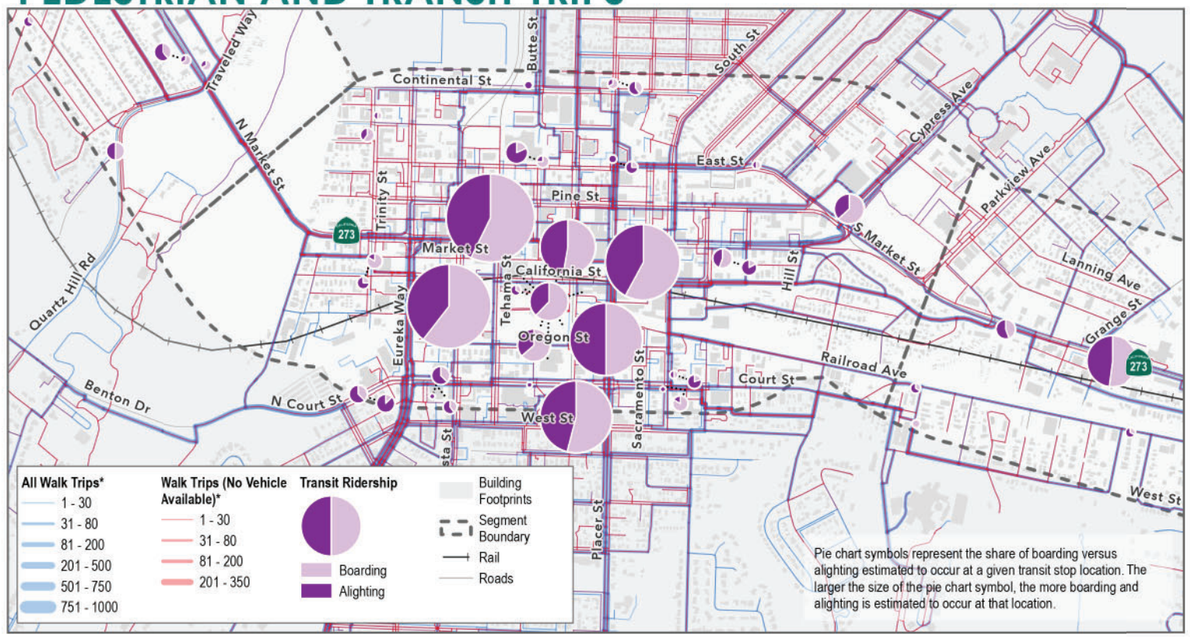
SHORT AUTO TRIPS



BICYCLE TRIPS



PEDESTRIAN AND TRANSIT TRIPS



Data source: Human Geography Base: Esri Community Maps Contributors, City of Redding GIS, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Trip data: Replica; Typical Weekday in Fall 2022; Building Footprints: City of Redding, Shasta County, 2023; Transit Ridership: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Rail: CA Data Hub, 2023
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*Data Disclaimer: Daily trips represent an estimate of a typical weekday in 2022. Volumes are an estimate only with medium certainty of reliability, and actual trip counts may vary from the numbers reported here.

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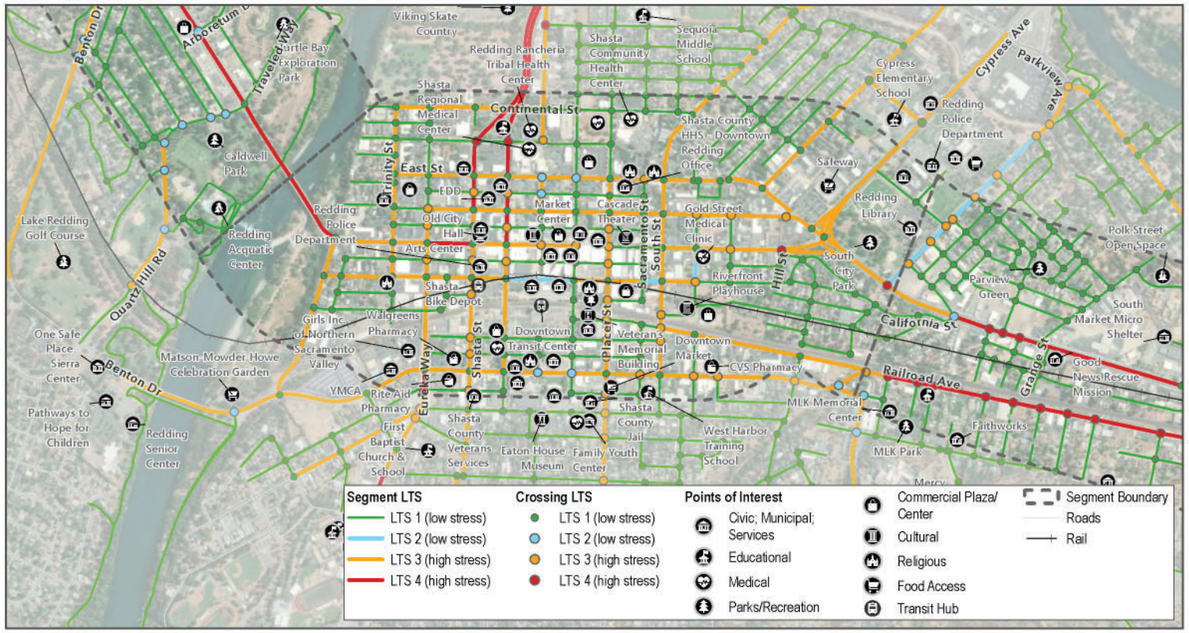
US Feet

STATE ROUTE (SR) 273 SEGMENT 3

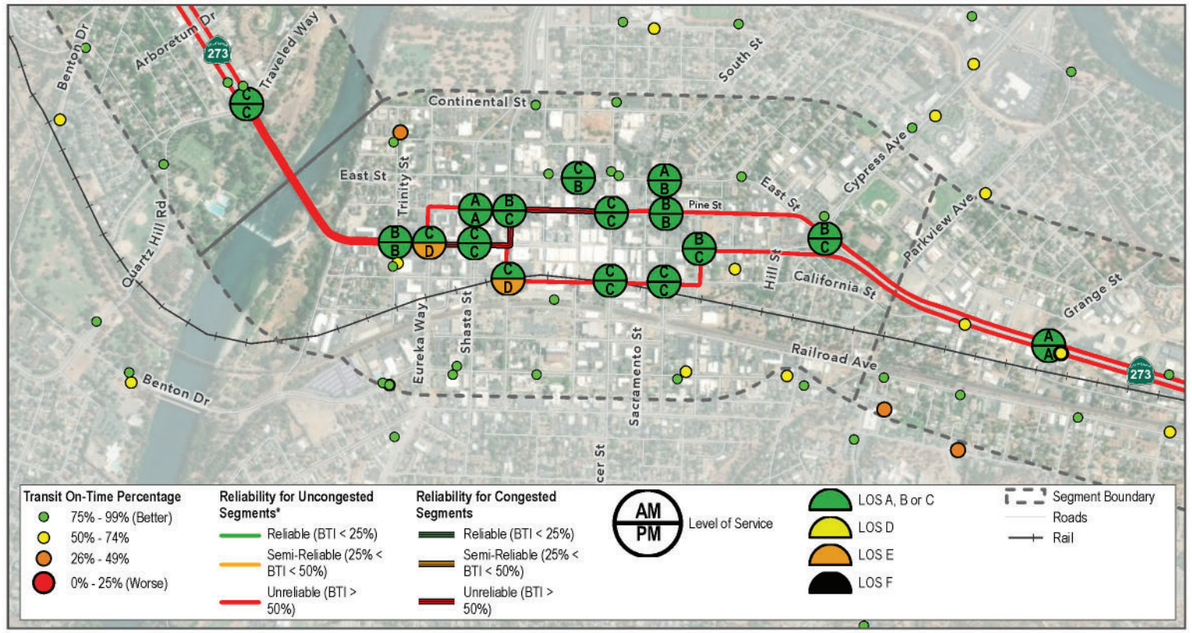
Sacramento River to south of Cypress Ave

EXISTING CONDITIONS PERFORMANCE RESULTS

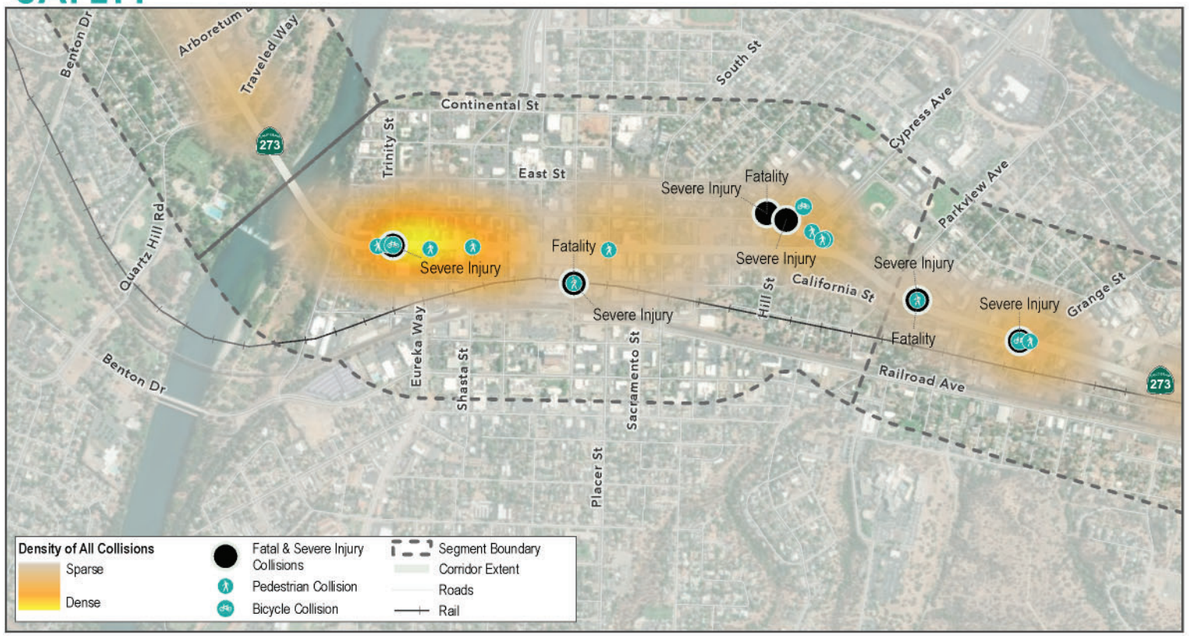
MOBILITY



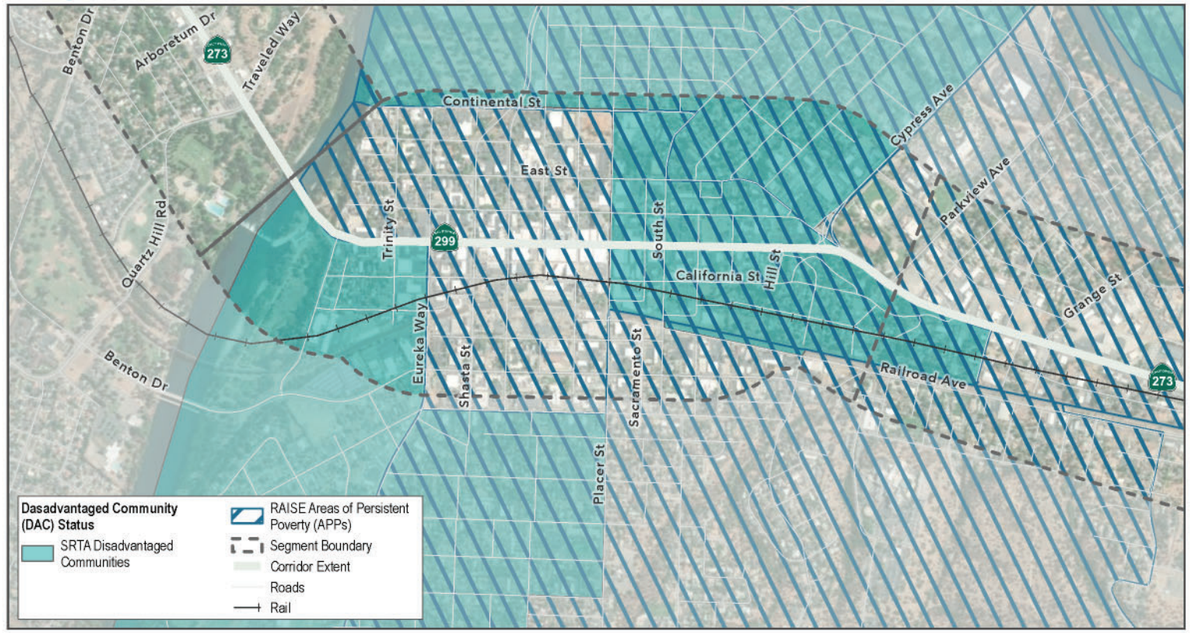
RELIABILITY



SAFETY



EQUITY



Data source: World Imagery (Firefly): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; Transit Stops & Frequency: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Highways: TIGER, 2022; Bikeways: SRTA, 2023; Pedestrian Facilities: City of Redding, 2023; Collisions: SWITR, 2018-2022; DAC: SRTA RTP-SCS, 2019; POI: GHD, 2023; Congestion & TTR: NPMRDS, GHD, 2023.
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Print date: 22 Feb 2024 - 23:20

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US Feet

EXISTING CONDITIONS PERFORMANCE RESULTS SEGMENT 3

MOBILITY & CONNECTIVITY	Result	Score
Transit Stop Conditions	Fair	0
Presence of Amenities (Shelter or Bench) at Transit Stop?	Typically no bench/shelter	2
Sidewalk Connection to Transit Stop? (On SR 273, only)	Yes, sidewalk at SR 273 stops	2
Sidewalk Coverage	High	1
Bicycle Level of Traffic Stress (LTS)	High Stress	4
Bicycle Connectivity to Destination Types:	# Destinations (% Connected) [1,2]	4
Employment Destinations	8 (8%)	
Education Destinations	9 (14%)	
Community Services and Shopping Destinations	71 (13%)	
Health Care Destinations	27 (12%)	
Food Access	4 (0%)	
Transit Service Destinations (includes Bike Share locations)	93 (13%)	
Civic Service Destinations	16 (15%)	
Parks/Open Space & Recreation Destinations	4 (3%)	
Overall Mobility Score	**Poor**	**3**

[1] The # of destinations reported here are the # of destinations only within the segment. However, low stress connectivity is assessed for connections within and outside of the segment, so long as the location is reachable within a [1.5]-mile biking distance.
[2]. Value of "NA" for the percent connected indicates that there are no connections for that node type in the full stress network within a [1.5]-mile biking distance from the residential origins in that segment to compare low-stress connections against.

SAFETY	Result	Score
Total Crashes	100	-
Total Fatal Crashes	2	4
Total Severe Crashes	2	4
Total Crashes Involving a Pedestrian	8	4
Total Pedestrian Fatalities	1	4
Total Crashes Involving a Bicyclist	3	4
Total Bicyclists Fatalities	-	0
% Occurred at Night (Non-Daylight Crashes)	30%	-
Primary Crash Types	Broadside & Rear End	-
Primary Crash Cause	Unsafe Speed & Vehicle Driver Error	-
Crash Rate (Bold = Exceeds Statewide average)	**1.35**	3
Statewide Crash Rate	1.61	-
Overall Safety Score	**Poor**	**4**

OPERATIONS & RELIABILITY	Result	Score
Transit Stop Reliability	Results provided by route	3
Travel Time Reliability (TTR)	**Unreliable**	4
Vehicle - AM Peak Hour	Unreliable	
Vehicle - PM Peak Hour (shown on map)	Unreliable	
Truck - AM Peak Hour	Unreliable	
Truck - PM Peak Hour	Unreliable	
Intersection Level of Service (LOS)	**Acceptable**	1
Overall Reliability Score	**Poor**	**3**

EQUITY (DAC Status)	Result	Score
SRTA Regional Transportation Plan (RTP) Criteria	Majority	4
RAISE Areas of Persistent Poverty Criteria	Majority	4
Climate & Economic Justice Criteria	Majority	4
SB 535 CalEPA Criteria	No	1
Overall DAC Status	**High DAC**	**3**

PERFORMANCE SUMMARY	Result	Score
MOBILITY	Poor	**3**
SAFETY	Poor	**4**
RELIABILITY	Fair	**2**
EQUITY (DAC Status)	High DAC	**3**
Overall Performance		**3**

SEGMENT ISSUES

- Lower speed local streets and alleys provide some low stress connectivity within the segment, however, higher stress streets and crossings associated with arterial roadways result in a high-stress barrier to connectivity between many major destinations.
- Collision hotspots are seen along SR 273 between Trinity and Shasta Streets, as well as Placer Street and Cypress Ave. Ten percent of collisions involved a bicyclist or pedestrian and the crash rate within the segment significantly exceeds the statewide average, making safety a concern.
- Transit service is mostly reliable with many of the routes serving stops in the segment arriving on-time between 75 and 99 percent of the time. Most intersections are operating at acceptable levels in both peaks at LOS A through C, and two locations at LOS D in the PM. Travel time is considered unreliable.
- Equity is a concern throughout the segment area with block groups meeting the DAC criteria for three of the four measures of DAC status.

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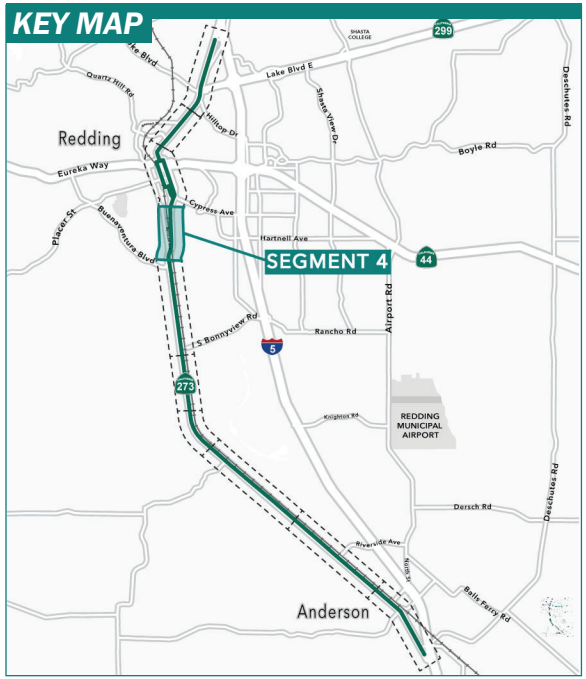
STATE ROUTE (SR) 273 SEGMENT 4

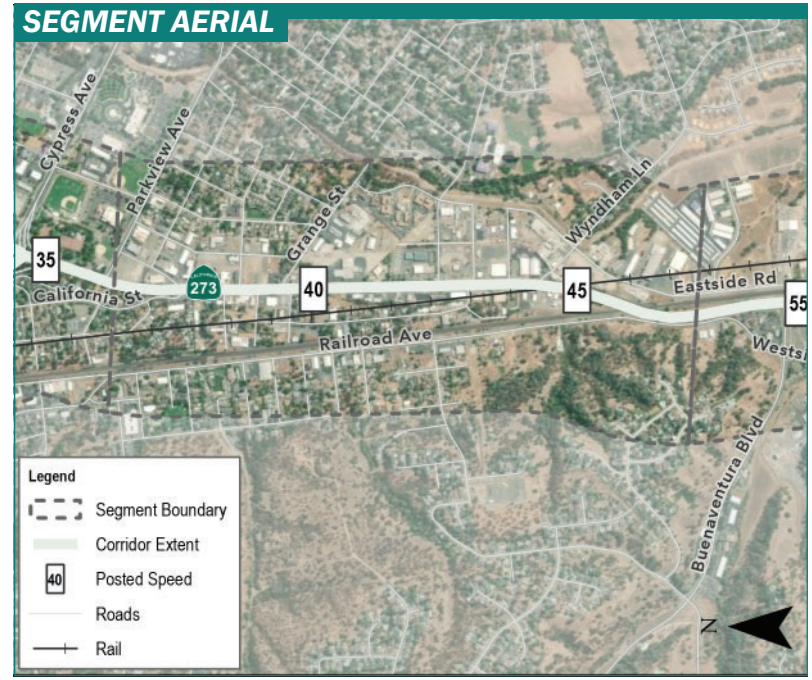
South of Cypress Ave to north of Buenaventura Blvd

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



SEGMENT AERIAL

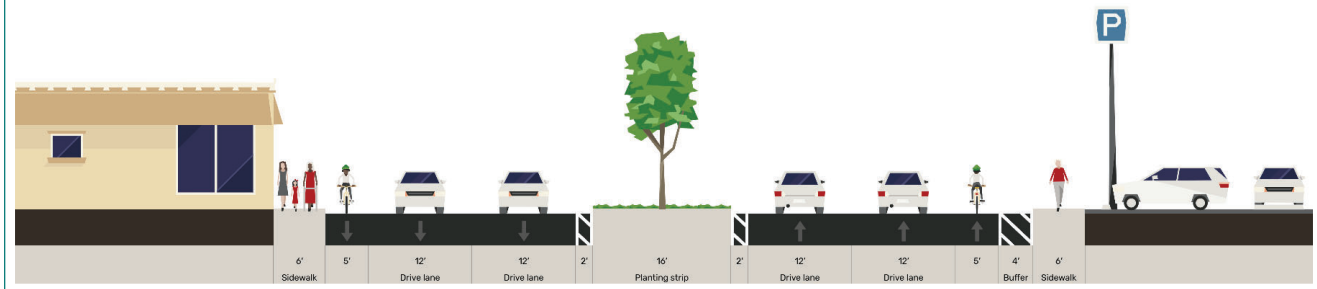


- **Adjacent Land Use:**
  Commercial with close access to residential and railroad
- **Place Type:**
  Suburban Neighborhood/Transitional Corridor
- **Key Destinations:**
  Several community and faith-based aid organizations, including Good News Rescue Mission, MLK Memorial Center and Park, Parkview Green, Polk Street Open Space, Juniper School,
- **Key Features:**
  Close proximity to Downtown Redding urban core and Redding Library just outside of segment area to the north, fairly comprehensive sidewalk network, Pilot Class IV separated bikeway project south of Wyndham Ln, several parks, Mercy Medical Center to the west of the segment area

- **Segment Length:**
  1.0 miles
- **Roadway Classification:**
  Principal Arterial; Freeway/Expressway (South of Wyndham Ln)
- **Jurisdiction of Adjacent Land Use:**
  City of Redding
- **Posted Speed(s):**
  40 to 45 mph
- **Cross-Section:**
  4 to 5 lane undivided with center turn lane with landscaped median and left turn pockets at some intersections
- **Daily Traffic Volume:**
  ~ 14,100 vehicles per day

TYPICAL SECTION

Segment 4 (south of Grange Street)

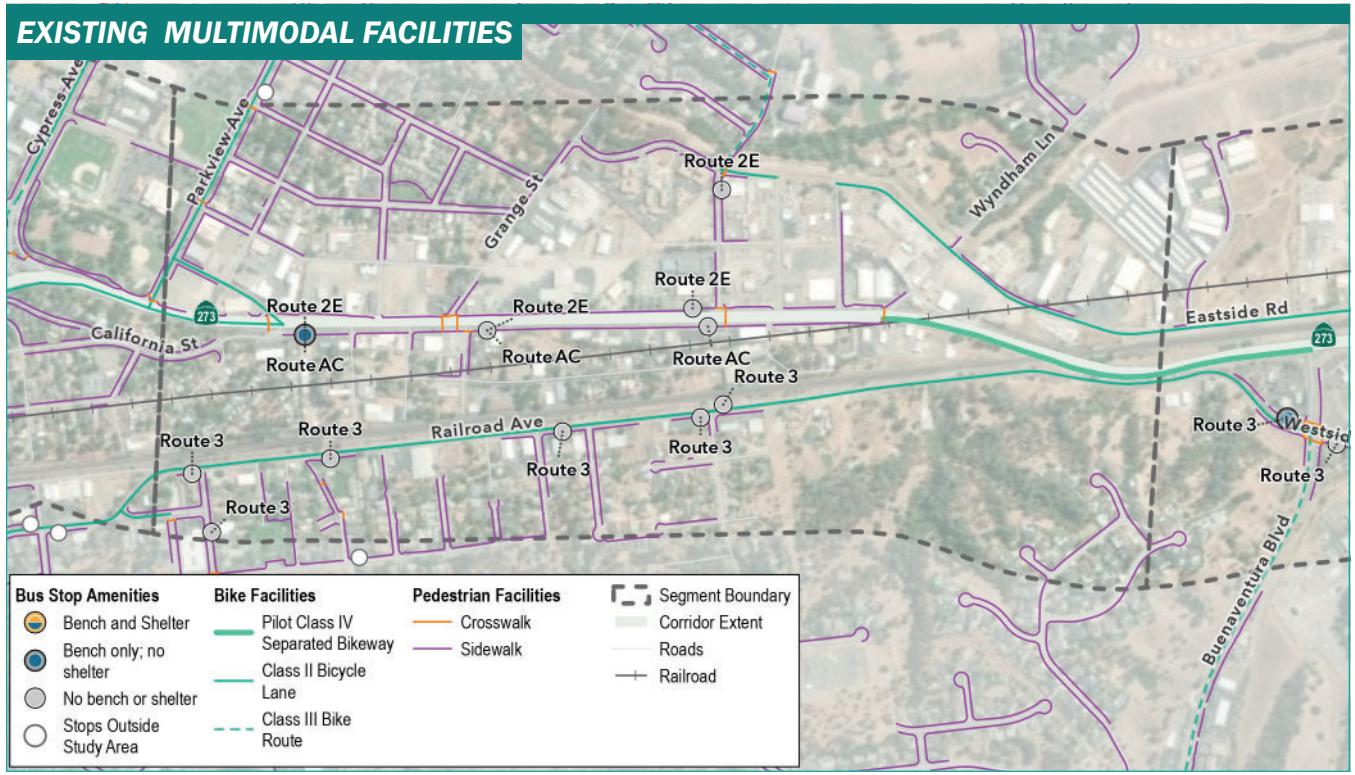


STATE ROUTE (SR) 273 SEGMENT 4

South of Cypress Ave to north of Buenaventura Blvd

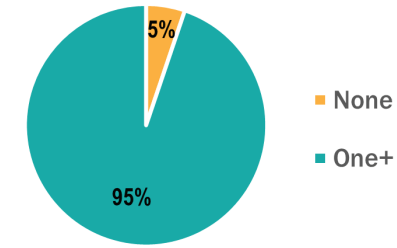
EXISTING CONDITIONS MOBILITY TRENDS

EXISTING MULTIMODAL FACILITIES

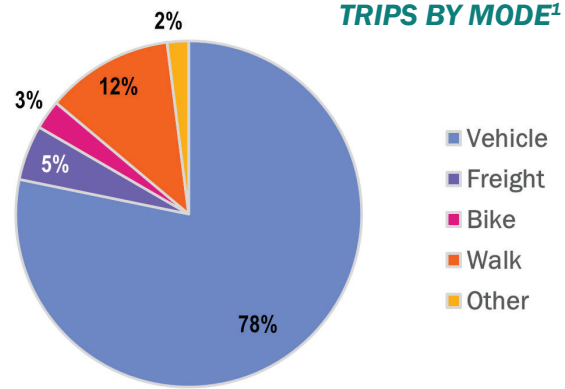


- The most common trip mode is private vehicles, with 78 percent of trips made by a private automobile, followed by 12 percent of trips made by walking.
- Among all modes, freight vehicles have the highest average trip distance, followed by private vehicles.
- Most people traveling within the segment have access to a car, with 95 percent of trips made by individuals living in households with access to at least one vehicle.
- Five percent of trips are made by people without access to a car, and people who do not have access to car are 36 times more likely to bike and 4 times more likely to walk than those who do have access to a car.
- Most private auto trips are concentrated along SR 273. While freight trips are also seen along SR 273, Parkview Ave shows a slightly higher concentration.

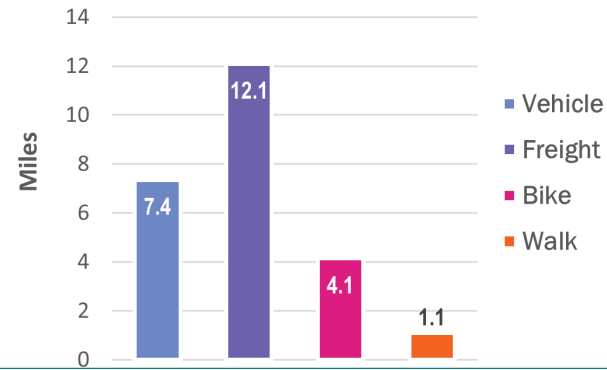
PRIVATE AUTO OWNERSHIP



TRIPS BY MODE[1]



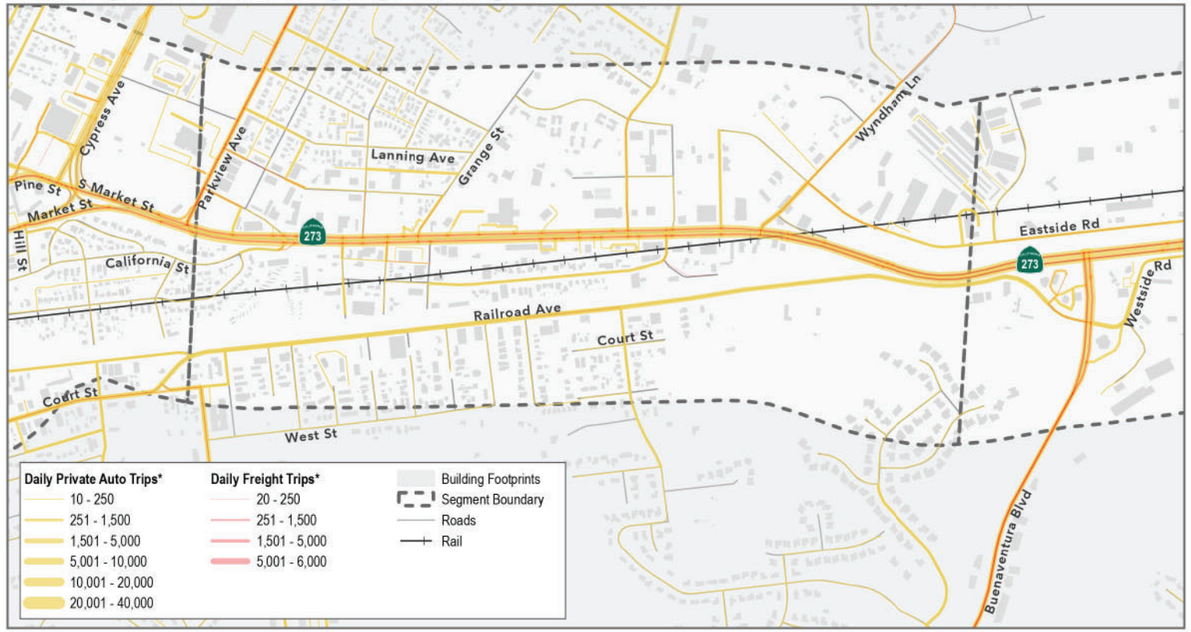
AVERAGE TRIP DISTANCE BY MODE[1]



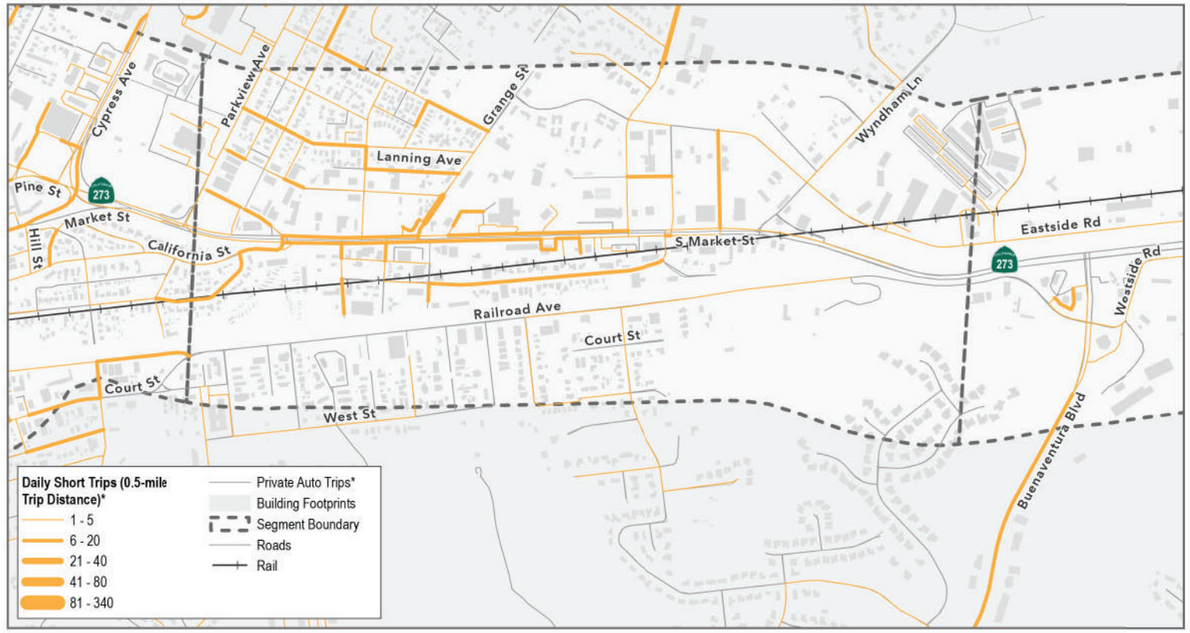
- Bicycle trips traveling within the segment are most concentrated along Railroad Ave and Eastside Rd
- Pedestrian trips, and particular those made by people without access to a car are concentrated along California St, SR 273, and Ellis Street near Juniper Elementary School.
- Transit activity highest concentrated at the S market and Grange St stop, as well as near the high school.
- Short vehicle trips are concentrated along Sr 273 between California and Ellis Street, near local commercial destinations, as well as along Veda Street, which is parallel to SR 273 to the west, and along Lanning and Leland Avenues near the Redding Library and City Hall.

[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

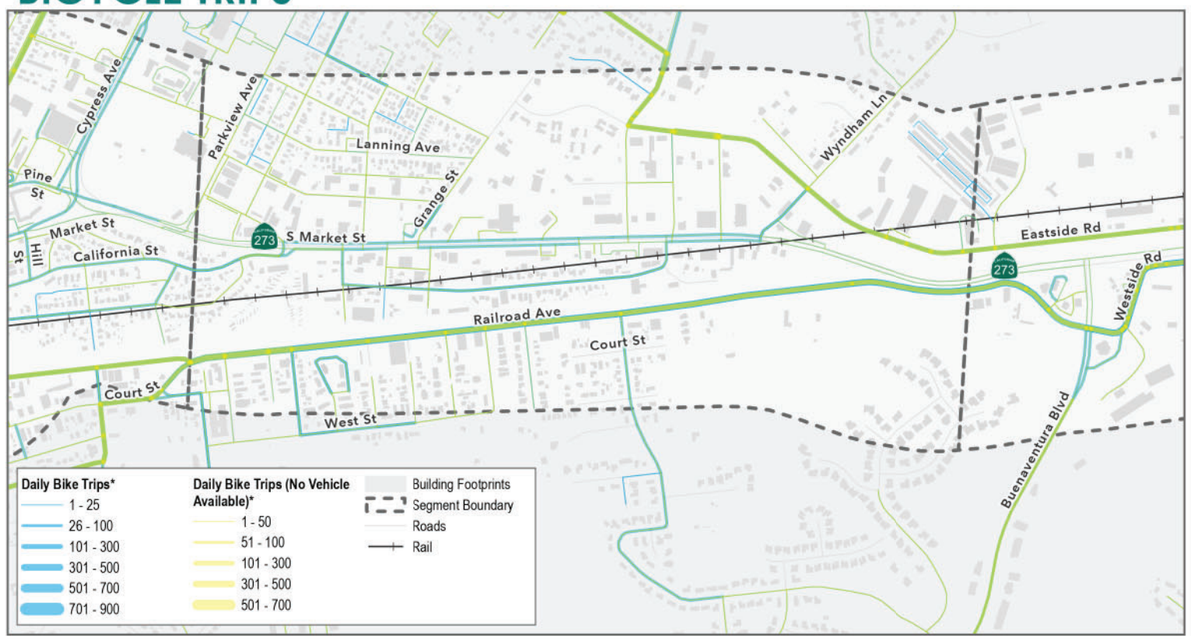
FREIGHT AND AUTO TRIPS



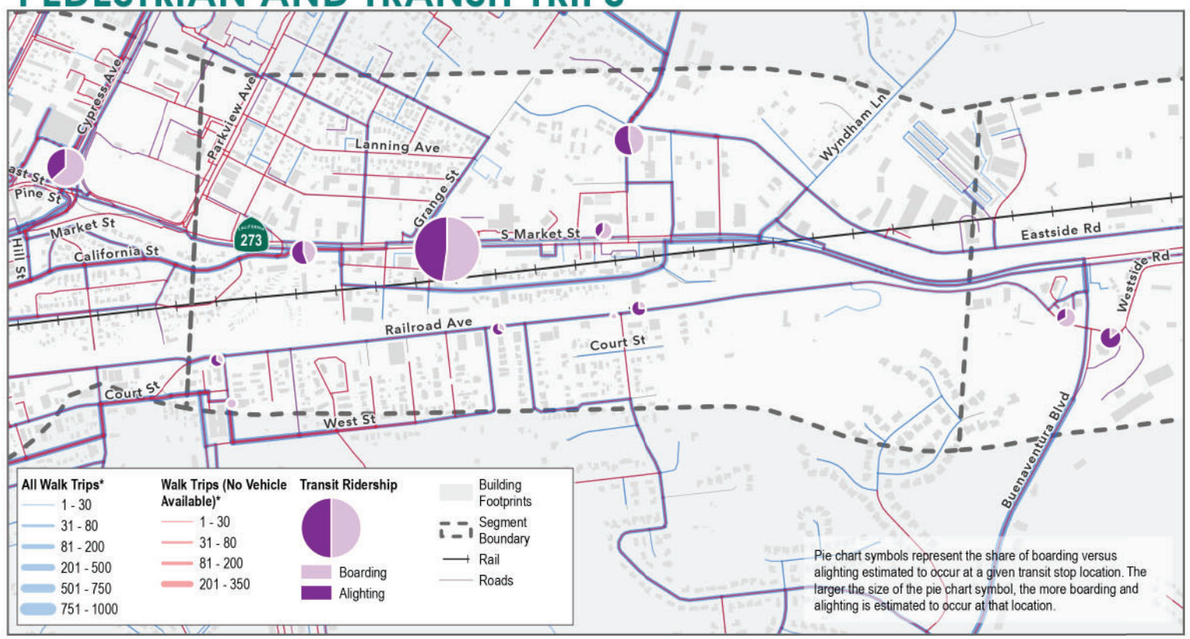
SHORT AUTO TRIPS



BICYCLE TRIPS



PEDESTRIAN AND TRANSIT TRIPS



Data source: Human Geography Base: Esri Community Maps Contributors, City of Redding GIS, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Trip data: Replica; Typical Weekday in Fall 2022; Building Footprints: City of Redding, Shasta County, 2023; Transit Ridership: RABA; City of Redding, GHD, 2023; Roads: Shasta County, 2023; Rail: CA Data Hub, 2023
Created by: ppeel
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Print date: 04 Oct 2023 - 20:38

*Data Disclaimer: Daily trips represent an estimate of a typical weekday in 2022. Volumes are an estimate only with medium certainty of reliability, and actual trip counts may vary from the numbers reported here.

N

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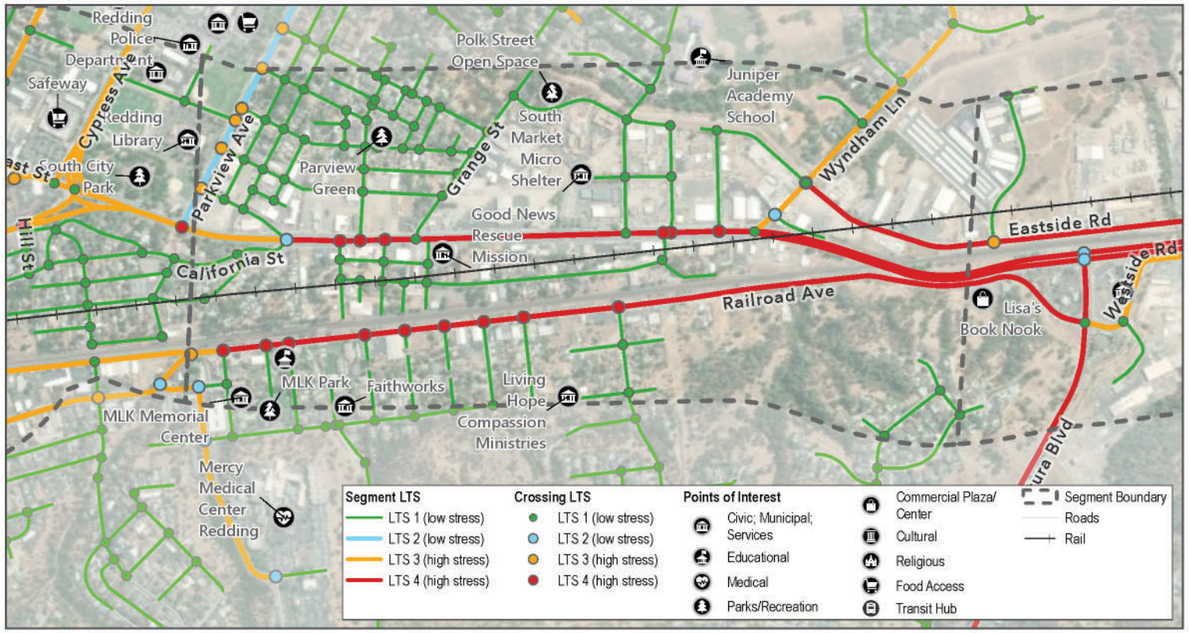
US Feet

STATE ROUTE (SR) 273 SEGMENT 4

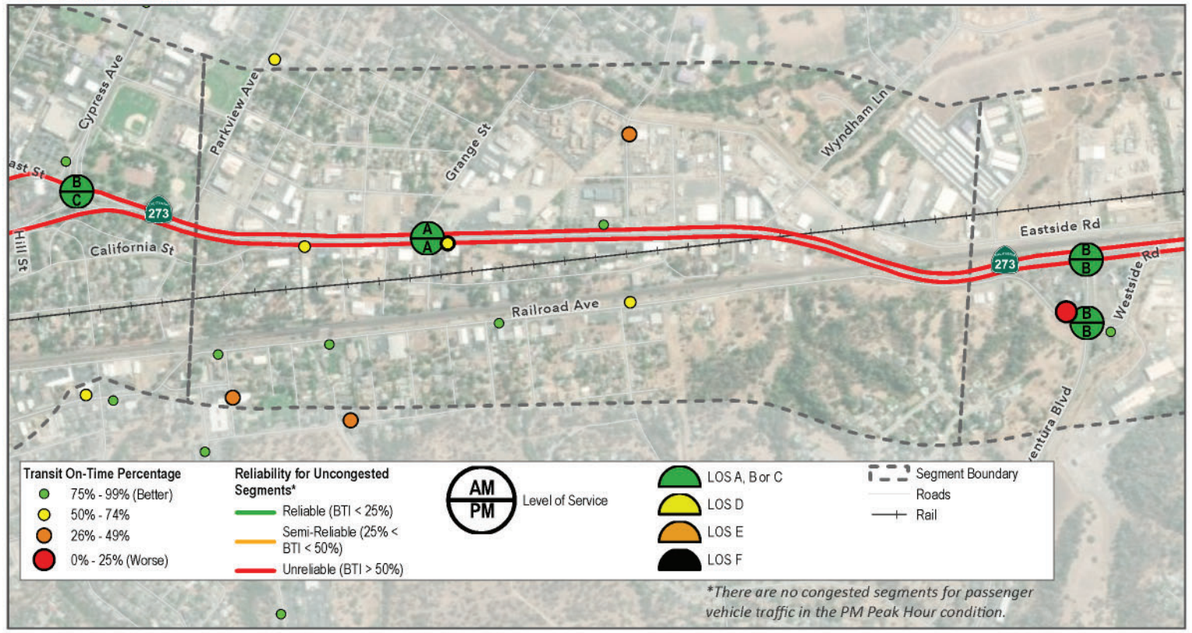
South of Cypress Ave to north of Buenaventura Blvd

EXISTING CONDITIONS PERFORMANCE RESULTS

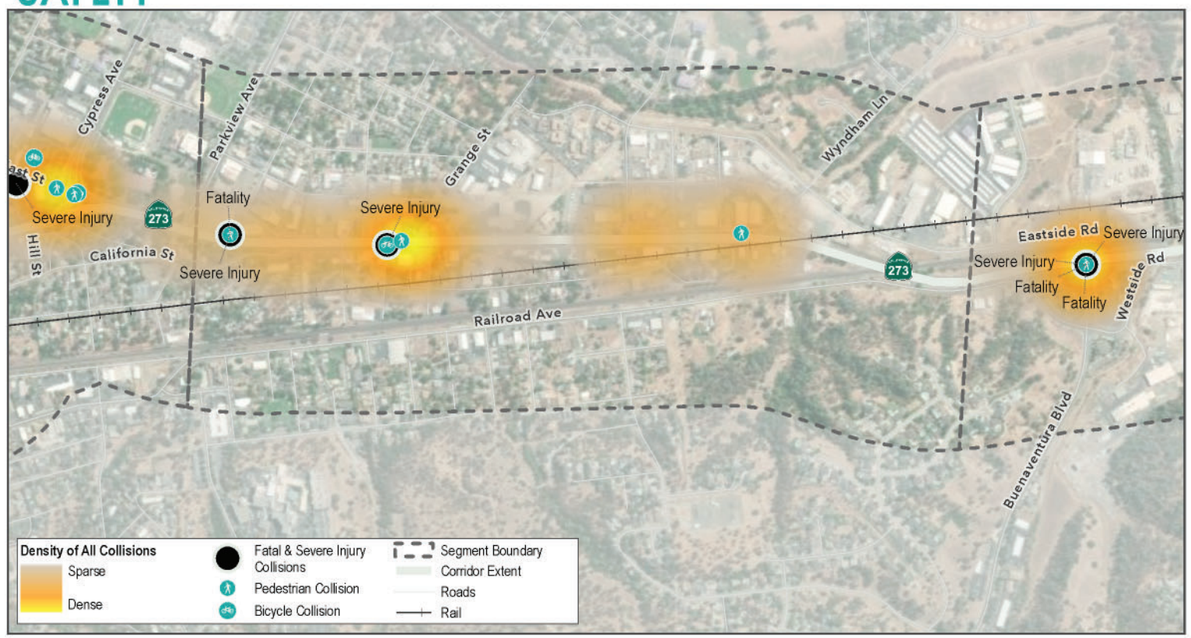
MOBILITY



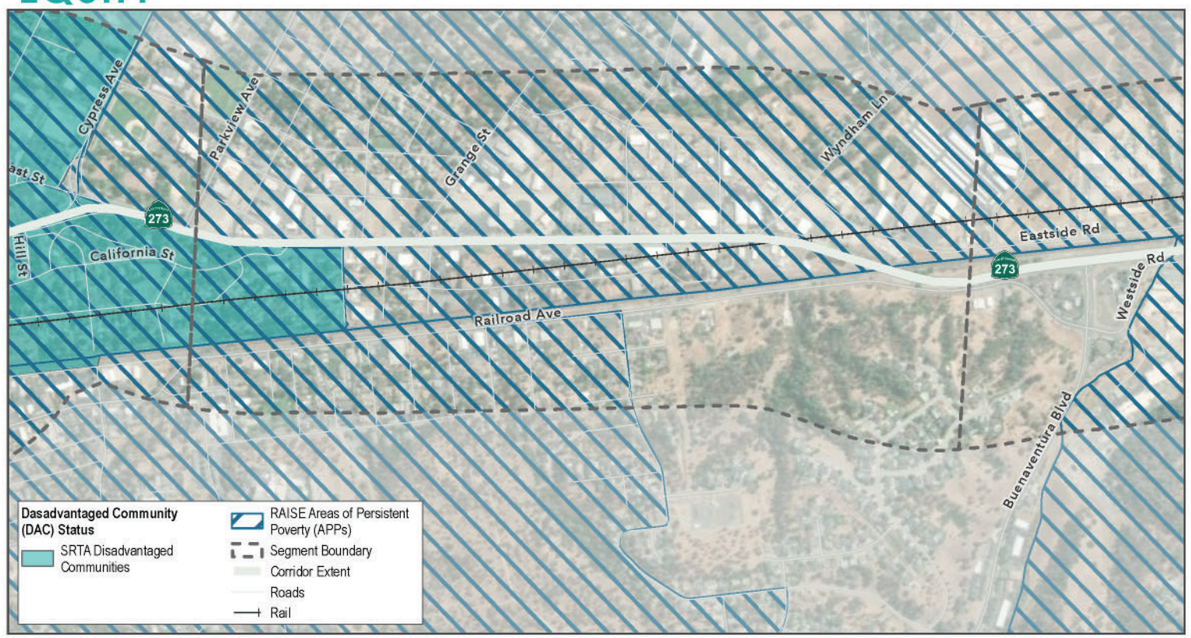
RELIABILITY



SAFETY



EQUITY



Data source: World Imagery (Firefly): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; Transit Stops & Frequency: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Highways: TIGER, 2022; Bikeways: SRTA, 2023; Pedestrian Facilities: City of Redding, 2023; Collisions: SWITR, 2018-2022; DAC: SRTA RTP-SCS, 2018; POI: GHD, 2023; Congestion & TTR: NPMRDS, GHD, 2023.
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Print date: 22 Feb 2024 - 23:21

N

0 500 1,000 1,500
US Feet

EXISTING CONDITIONS PERFORMANCE RESULTS SEGMENT 4

MOBILITY & CONNECTIVITY	Result	Score
Transit Stop Conditions	Fair	0
Presence of Amenities (Shelter or Bench) at Transit Stop?	Some with bench	2
Sidewalk Connection to Transit Stop? (On SR 273, only)	Some sidewalk at SR 273 stops	2
Sidewalk Coverage	Partially connected	3
Bicycle Level of Traffic Stress (LTS)	High Stress	4
Bicycle Connectivity to Destination Types:	# Destinations (% Connected) [1,2]	4
Employment Destinations	1 (0%)	
Education Destinations	2 (14%)	
Community Services and Shopping Destinations	6 (5%)	
Health Care Destinations	4 (4%)	
Food Access	1 (0%)	
Transit Service Destinations (includes Bike Share locations)	20 (3%)	
Civic Service Destinations	2 (5%)	
Parks/Open Space & Recreation Destinations	3 (28%)	
Overall Mobility Score	**Poor**	**3**

[1] The # of destinations reported here are the # of destinations only within the segment. However, low stress connectivity is assessed for connections within and outside of the segment, so long as the location is reachable within a 1.5-mile biking distance.
[2]. Value of "NA" for the percent connected indicates that there are no connections for that node type in the full stress network within a 1.5-mile biking distance from the residential origins in that segment to compare low-stress connections against.

SAFETY	Result	Score
Total Crashes	30	-
Total Fatal Crashes	1	4
Total Severe Crashes	1	4
Total Crashes Involving a Pedestrian	3	4
Total Pedestrian Fatalities	1	4
Total Crashes Involving a Bicyclist	1	4
Total Bicyclists Fatalities	-	0
% Occurred at Night (Non-Daylight Crashes)	33%	-
Primary Crash Types	Broadside	-
Primary Crash Cause	Vehicle Driver Error & Unsafe Speed	-
Crash Rate (Bold = Exceeds Statewide average)	**0.97**	4
Statewide Crash Rate	0.94	-
Overall Safety Score	**Poor**	**4**

OPERATIONS & RELIABILITY	Result	Score
Transit Stop Reliability	Results provided by route	3
Travel Time Reliability (TTR)	**Unreliable**	4
Vehicle - AM Peak Hour	Unreliable	
Vehicle - PM Peak Hour (shown on map)	Unreliable	
Truck - AM Peak Hour	Unreliable	
Truck - PM Peak Hour	Unreliable	
Intersection Level of Service (LOS)	**Acceptable**	1
Overall Reliability Score	**Poor**	**3**

EQUITY (DAC Status)	Result	Score
SRTA Regional Transportation Plan (RTP) Criteria	Partially	3
RAISE Areas of Persistent Poverty Criteria	Majority	4
Climate & Economic Justice Criteria	Partially	3
SB 535 CalEPA Criteria	No	1
Overall DAC Status	**High DAC**	**3**

PERFORMANCE SUMMARY	Result	Score
MOBILITY	Poor	**3**
SAFETY	Poor	**4**
RELIABILITY	Fair	**2**
EQUITY (DAC Status)	High DAC	**3**
Overall Performance		**3**

SEGMENT ISSUES

- High speeds and traffic volumes along SR 273 results in a high stress barrier to connectivity between destinations to the east and west, where pockets of low-stress connectivity exist.
- SR 273 between Parkview Ave and Grange St, as well as between Ellis St and Wyndham Ln are collision hotspots. With seven percent of collisions occurring along the corridor study segment resulting in a fatal or severe injury, and the crash rate slightly above the statewide average, safety is a concern.
- Transit service is somewhat unreliable with most routes serving stops in the segment arriving on-time between 50 and 74 percent of the time. The one study intersection in this segment is operating at acceptable levels in both peak hours at LOS A. Travel time is considered unreliable.
- Equity is a concern with most block groups throughout the study segment area meeting the DAC criteria for three of the four measures of DAC status.

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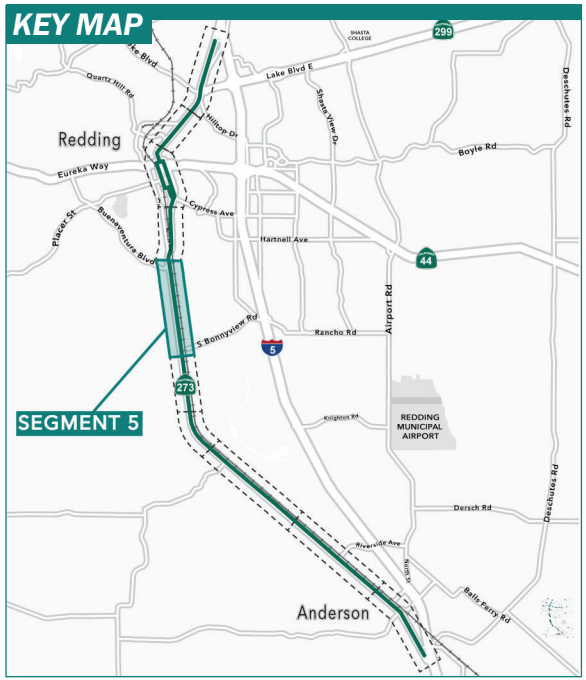
STATE ROUTE (SR) 273 SEGMENT 5

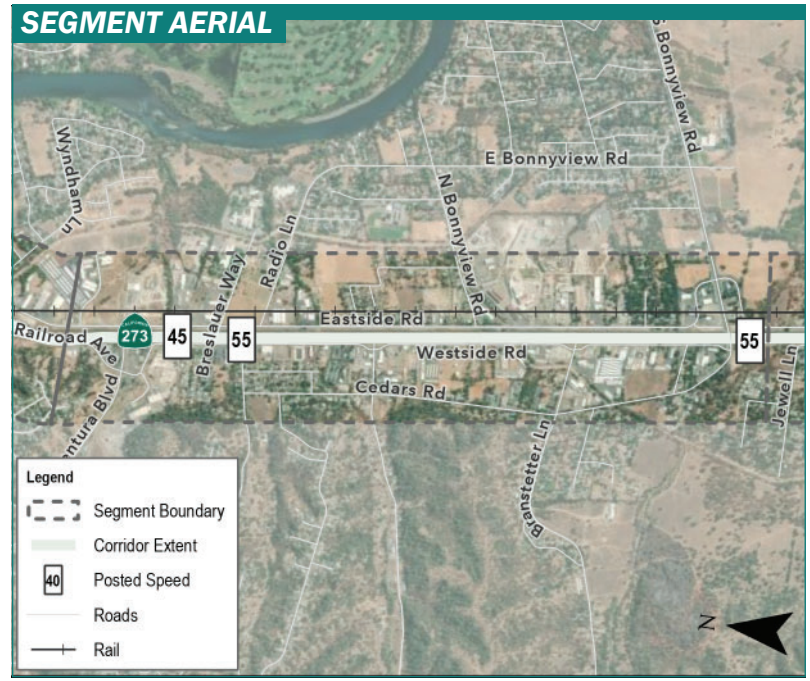
North of Buenaventura Blvd to south of S Bonnyview Rd

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



SEGMENT AERIAL

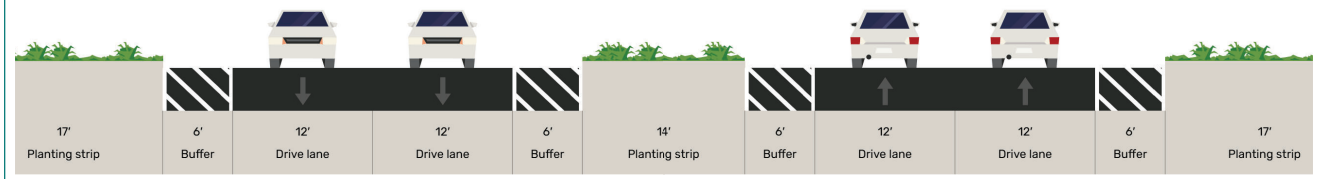


- **Adjacent Land Use:**
  Industrial, smaller-scale commercial with access to single-family and suburban residential areas
- **Place Type:**
  Transitional Corridor/Suburban Corridor
- **Key Destinations:**
  Shasta County Health and Human Services South Redding Office, Shasta-Trinity Regional Occupation Program School, Monarch Learning Center School (Elementary), Bonneyview Elementary
- **Key Features:**
  Critical connection to Downtown Redding and Bonneyview area neighborhoods, barriers to pedestrian mobility and minimal place-based activities make this area less of a destination for non-motorized travelers, however, shared use path connections at the south and pilot projects provide connectivity opportunities

- **Segment Length:**
  2.0 miles
- **Roadway Classification:**
  Freeway/Expressway
- **Jurisdiction of Adjacent Land Use:**
  City of Redding
- **Posted Speed(s):**
  45 to 55 mph
- **Cross-Section:**
  4-lane divided with dirt median and left turn pockets at intersections
- **Daily Traffic Volume:**
  ~ 15,600 vehicles per day

TYPICAL SECTION

Segment 5 (south of Buenaventura Boulevard)

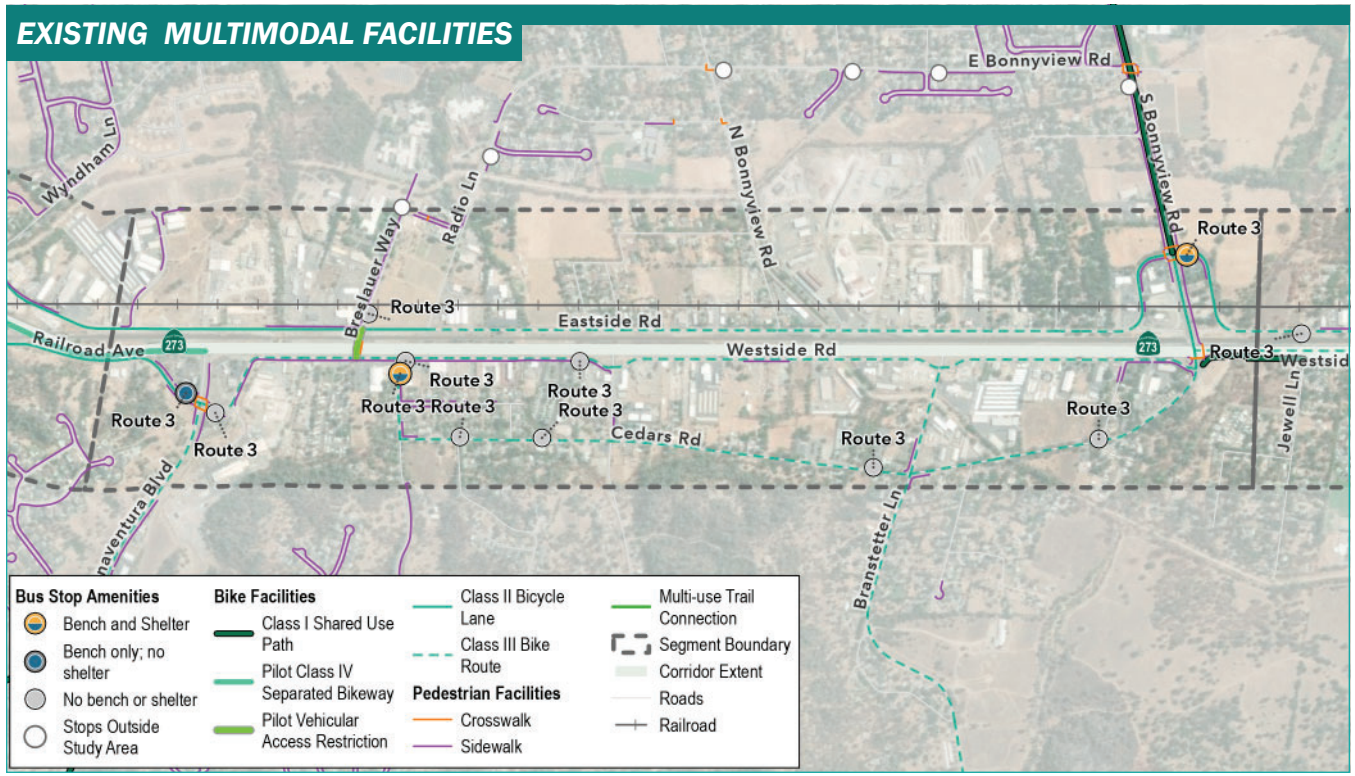


STATE ROUTE (SR) 273 SEGMENT 5

North of Buenaventura Blvd to south of S Bonnyview Rd

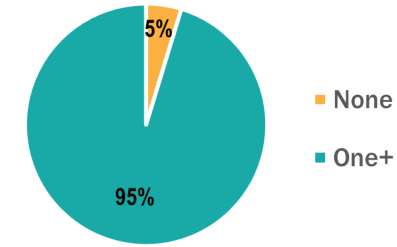
EXISTING CONDITIONS MOBILITY TRENDS

EXISTING MULTIMODAL FACILITIES

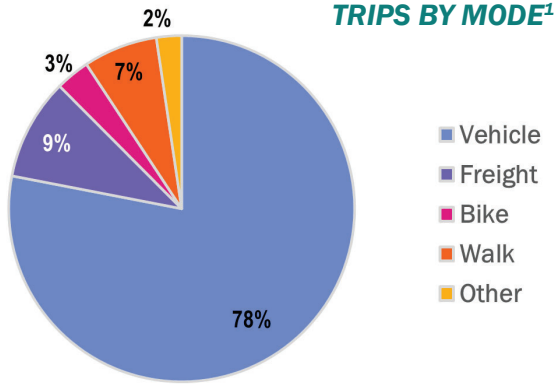


- The most common trip mode is motor vehicles, with 78 percent of trips made by a private automobile and 9 percent by a freight vehicle.
- Among all modes, freight vehicles have the highest average trip distance at 10.2 miles, followed by private vehicles at 8.2 miles, and bikes at 4.7 miles.
- Most people traveling within the segment have access to a car, with 95 percent of trips made by individuals living in households with access to at least one vehicle.
- Five percent of trips are made by people without access to a car, and people who do not have access to car are 44 times more likely to bike and 4 times more likely to walk than those who do have access to a car.

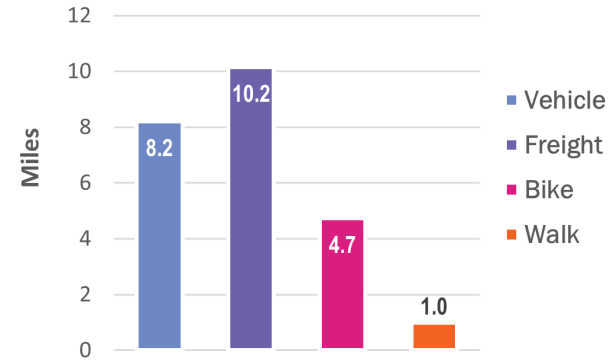
PRIVATE AUTO OWNERSHIP



TRIPS BY MODE[1]



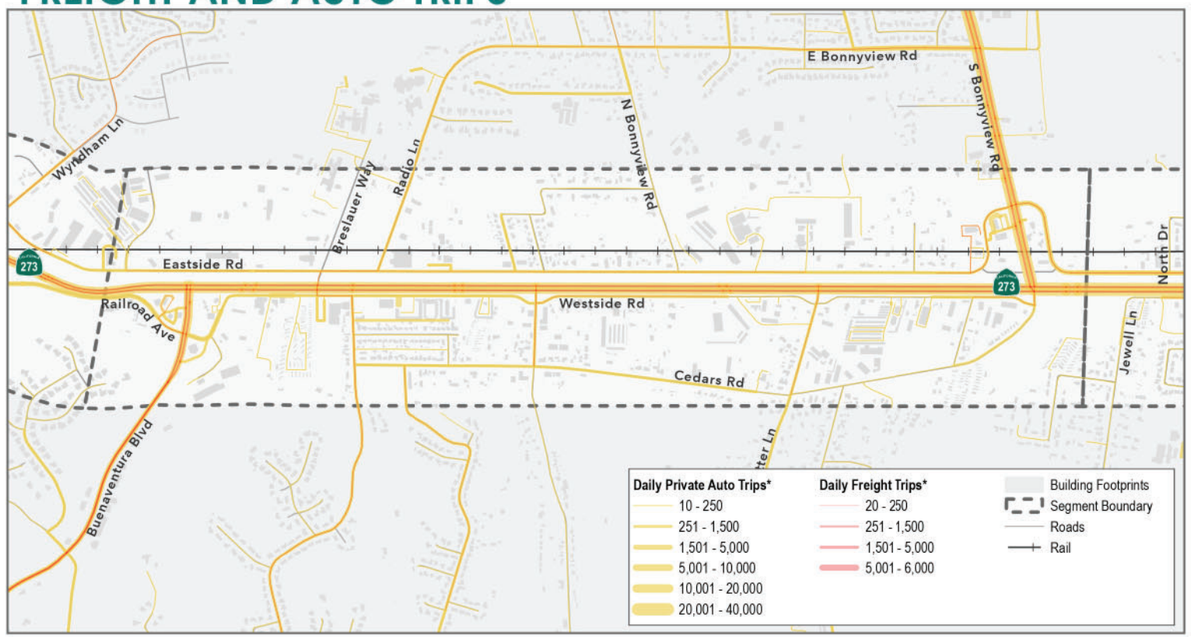
AVERAGE TRIP DISTANCE BY MODE[1]



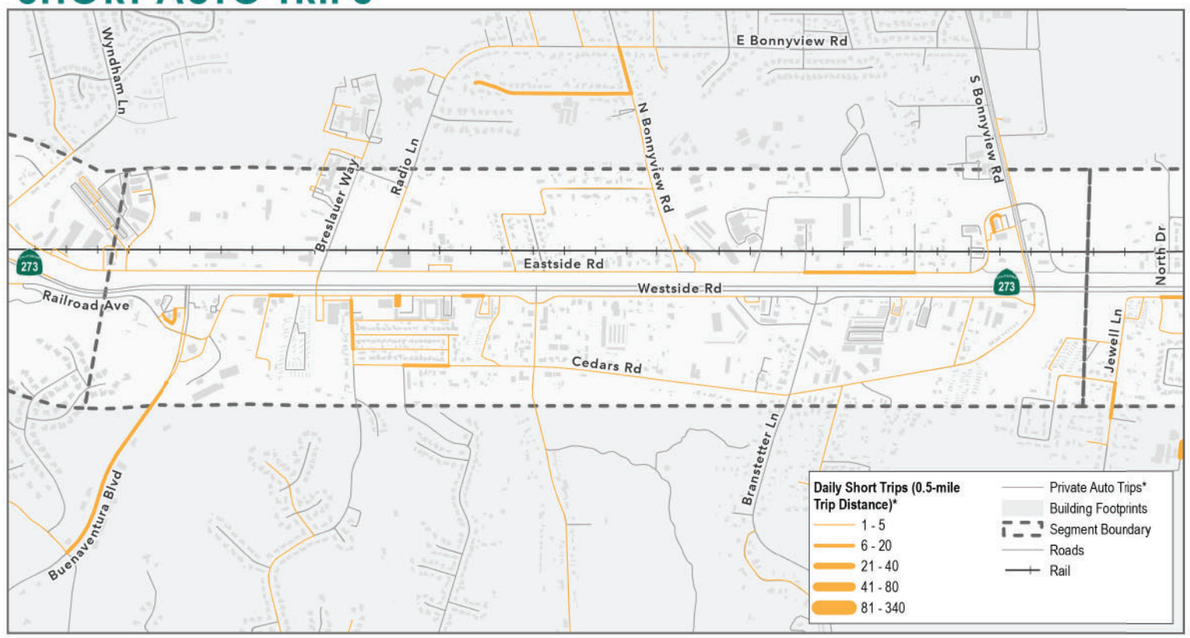
- Both private auto and freight travel is concentrated along SR 273, S Bonneyview Rd, and Buenaventura Blvd.
- Among all bicycle trips along the segment, most concentrated along Railroad Ave and Westside Rd, as well as Radio Ln and S Bonneyview Rd. Trips made by those without access to a vehicle are concentrated similarly, as well as along Eastside Rd.
- Few pedestrian trips are seen within this segment, although Cedars Rd, Railroad Ave, and S Bonneyview Rd west of Eastside Rd show the most trips.
- Transit activity is concentrated at the stops near SR 273 and Radio Ln
- Short vehicle trips are also less concentrated in this segment area, although some can be seen between the commercial and residential areas on the west side of SR 273.

[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

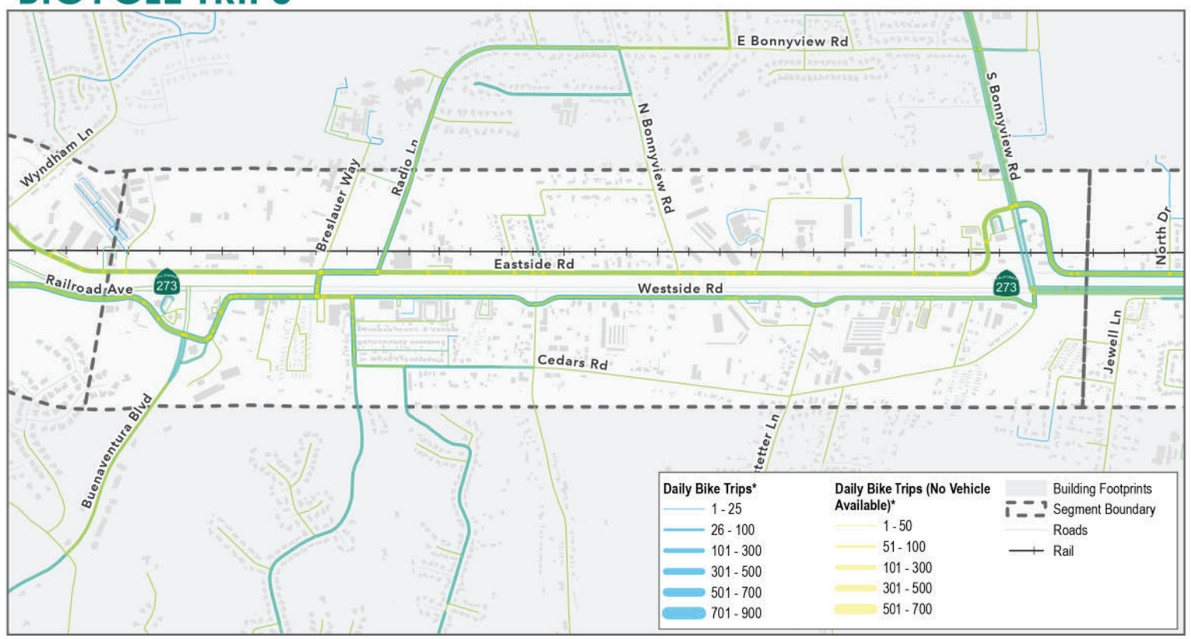
FREIGHT AND AUTO TRIPS



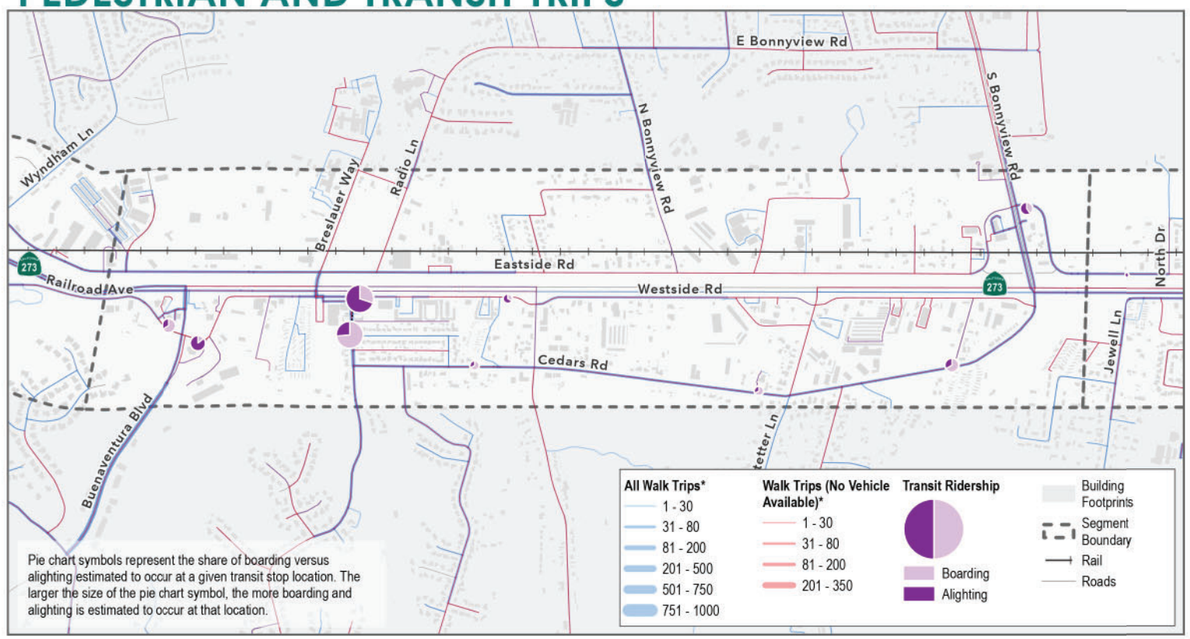
SHORT AUTO TRIPS



BICYCLE TRIPS



PEDESTRIAN AND TRANSIT TRIPS



Data source: Human Geography Base: City of Redding GIS, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Trip data: Replica; Typical Weekday in Fall 2022; Building Footprints: City of Redding, Shasta County, 2023; Transit Ridership: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Rail: CA Data Hub, 2023
Created by: ppeel
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Print date: 06 Oct 2023 - 07:52

*Data Disclaimer: Daily trips represent an estimate of a typical weekday in 2022. Volumes are an estimate only with medium certainty of reliability, and actual trip counts may vary from the numbers reported here.

N

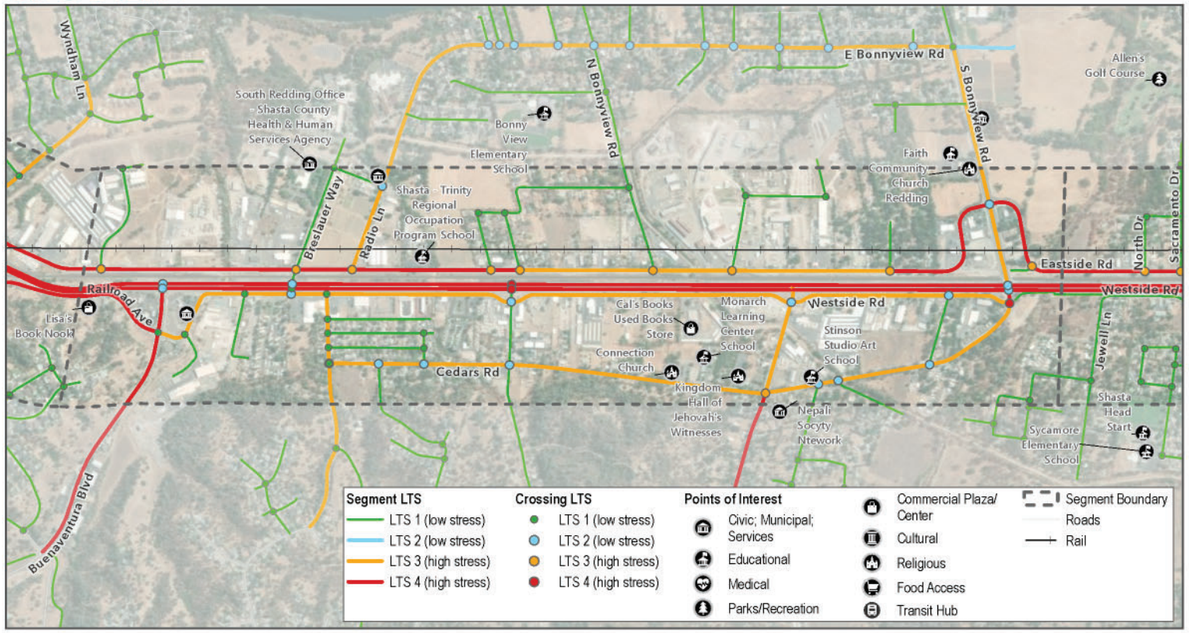
0 500 1,000 1,500
US Feet

STATE ROUTE (SR) 273 SEGMENT 5

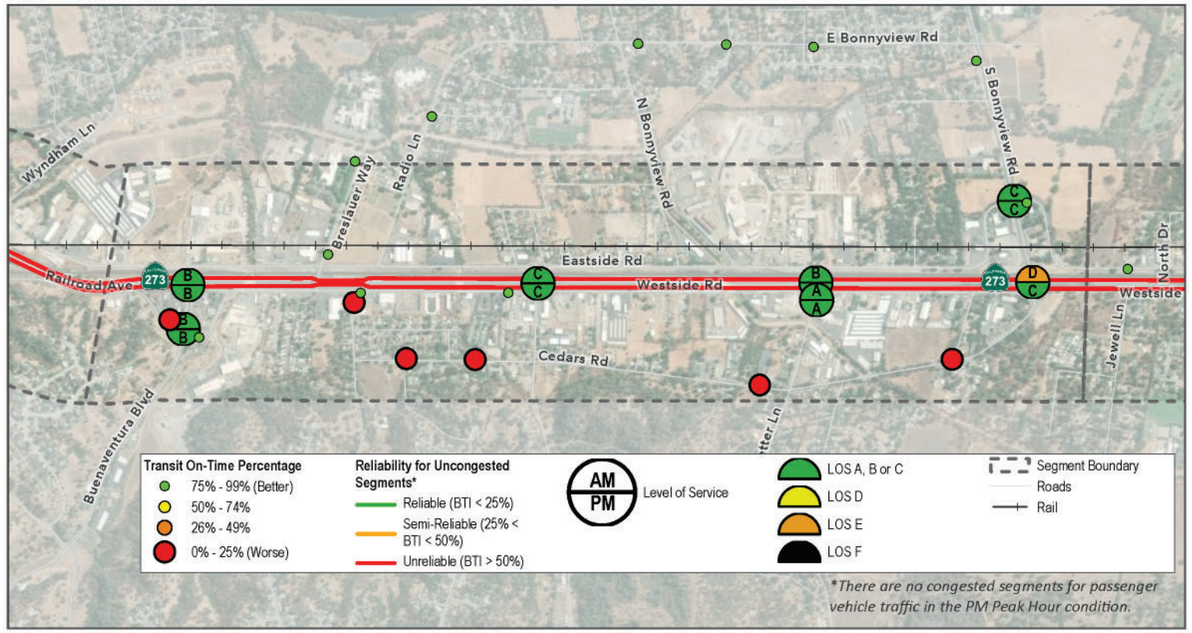
North of Buenaventura Blvd to south of S Bonnyview Rd

EXISTING CONDITIONS PERFORMANCE RESULTS

MOBILITY

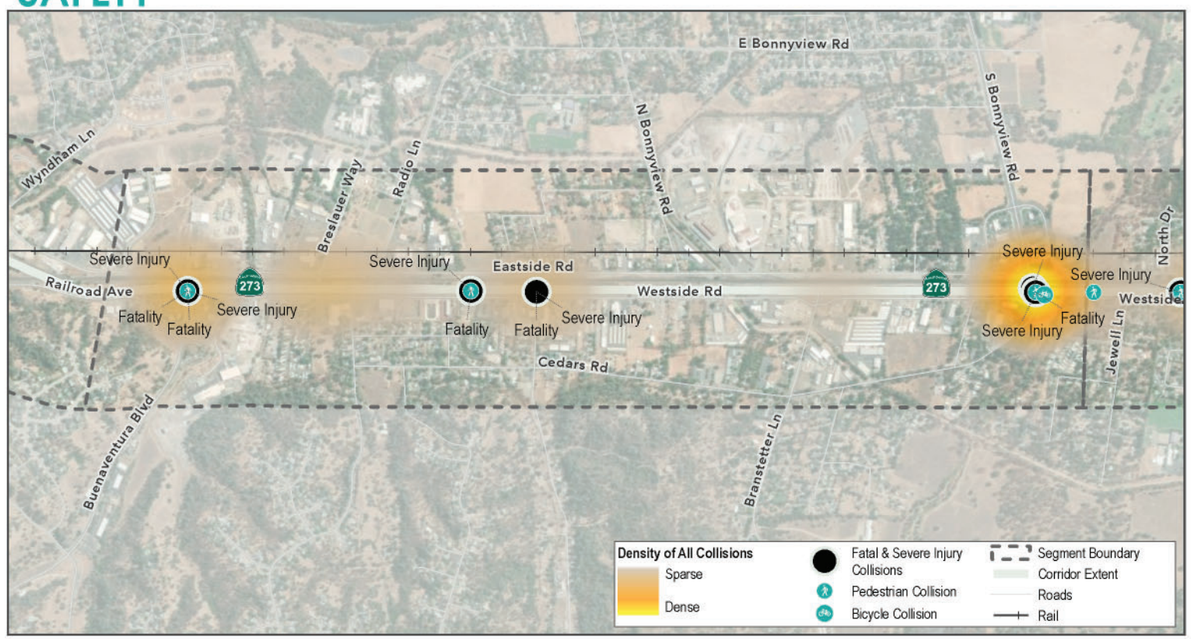


RELIABILITY

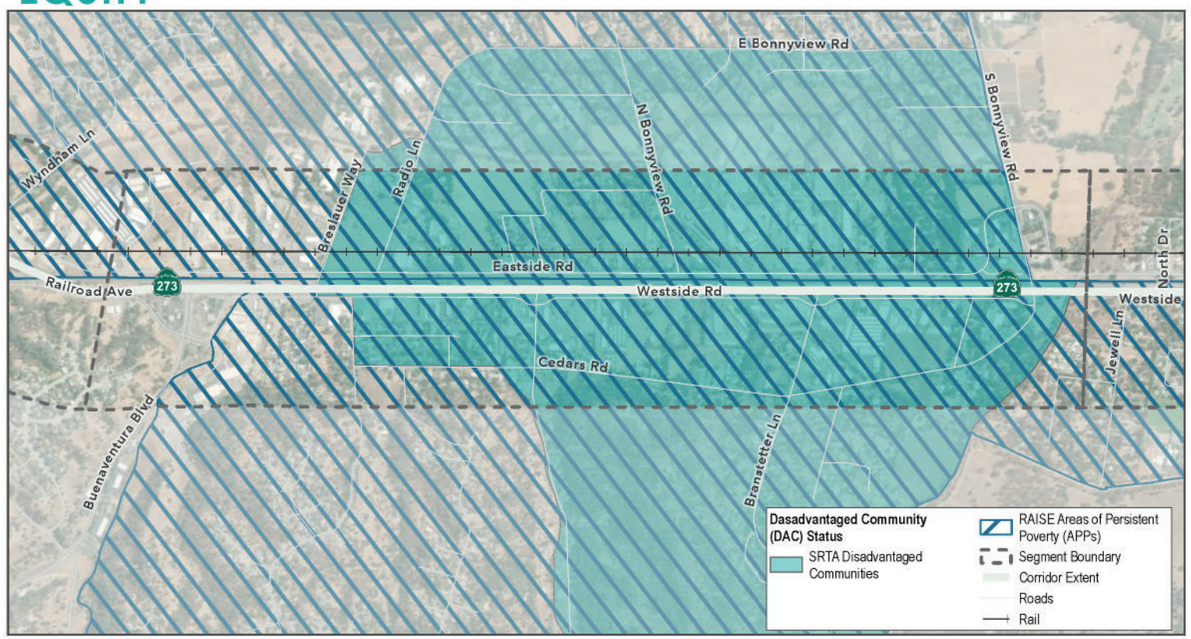


**There are no congested segments for passenger vehicle traffic in the PM Peak Hour condition.*

SAFETY



EQUITY



Data source: World Imagery (Firefly): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; Transit Stops & Frequency: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Highways: TIGER, 2022; Bikeways: SRTA, 2023; Pedestrian Facilities: City of Redding, 2023; Collisions: SWITRS, 2018-2022; DAC: SRTA RTP-SCS, 2018; POI: GHD, 2023; Congestion & TTR: NPMRDS, GHD, 2023.
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Print date: 22 Feb 2024 - 23:22

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US Feet

EXISTING CONDITIONS PERFORMANCE RESULTS SEGMENT 5

MOBILITY & CONNECTIVITY	Result	Score
Transit Stop Conditions	Poor	4
Presence of Amenities (Shelter or Bench) at Transit Stop?	Typically no bench/shelter	4
Sidewalk Connection to Transit Stop? (On SR 273, only)	No stops on SR 273	4
Sidewalk Coverage	Minimal to None	4
Bicycle Level of Traffic Stress (LTS)	High Stress	4
Bicycle Connectivity to Destination Types:	# Destinations (% Connected) [1,2]	4
Employment Destinations	1 (0%)	
Education Destinations	6 (4%)	
Community Services and Shopping Destinations	9 (1%)	
Health Care Destinations	1 (0%)	
Food Access	0 (7%)	
Transit Service Destinations (includes Bike Share locations)	17 (0%)	
Civic Service Destinations	0 (0%)	
Parks/Open Space & Recreation Destinations	0 (0%)	
Overall Mobility Score	**Poor**	**4**

[1] The # of destinations reported here are the # of destinations only within the segment. However, low stress connectivity is assessed for connections within and outside of the segment, so long as the location is reachable within a 1.5-mile biking distance.
[2]. Value of "NA" for the percent connected indicates that there are no connections for that node type in the full stress network within a 1.5-mile biking distance from the residential origins in that segment to compare low-stress connections against.

SAFETY	Result	Score
Total Crashes	59	-
Total Fatal Crashes	5	4
Total Severe Crashes	1	4
Total Crashes Involving a Pedestrian	5	4
Total Pedestrian Fatalities	4	4
Total Crashes Involving a Bicyclist	1	4
Total Bicyclists Fatalities	-	0
% Occurred at Night (Non-Daylight Crashes)	34%	-
Primary Crash Types	Rear End	-
Primary Crash Cause	Unsafe Speed	-
Crash Rate (Bold = Exceeds Statewide average)	**1.04**	4
Statewide Crash Rate	0.94	-
Overall Safety Score	**Poor**	**4**

OPERATIONS & RELIABILITY	Result	Score
Transit Stop Reliability	Results provided by route	3
Travel Time Reliability (TTR)	**Unreliable**	4
Vehicle - AM Peak Hour	Unreliable	
Vehicle - PM Peak Hour (shown on map)	Unreliable	
Truck - AM Peak Hour	Unreliable	
Truck - PM Peak Hour	Unreliable	
Intersection Level of Service (LOS)	**Acceptable**	1
Overall Reliability Score	**Poor**	**3**

EQUITY (DAC Status)	Result	Score
SRTA Regional Transportation Plan (RTP) Criteria	Majority	4
RAISE Areas of Persistent Poverty Criteria	Majority	4
Climate & Economic Justice Criteria	No	1
SB 535 CalEPA Criteria	No	1
Overall DAC Status	**High DAC**	**3**

PERFORMANCE SUMMARY	Result	Score
MOBILITY	Poor	**4**
SAFETY	Poor	**3**
RELIABILITY	Fair	**2**
EQUITY (DAC Status)	High DAC	**3**
Overall Performance		**3**

SEGMENT ISSUES

- High speeds and a lack of low-stress crossing opportunities along the SR 273 corridor result in a high stress barrier to connectivity between destinations to the east and west.
- SR 273 at Buenaventura Blvd, Breslauer Way and Kenyon Dr are collision hotspots. Ten percent of collisions resulted in a fatal or severe injury, and ten percent of all collisions involved a bicyclist or pedestrian. Additionally, with the crash rate along the segment exceeding the statewide average, safety is a concern.
- Transit service reliability is an issue, with many of the stops within the segment area arriving on-time between 0 and 25 percent of the time. Study intersections are operating at acceptable levels in both peak hours at LOS A, B or C, with one location operating at LOS D in the AM peak hour. Travel time is considered unreliable.
- Equity is also a concern with most areas within the segment meeting the DAC criteria for two of the four measures of DAC status.

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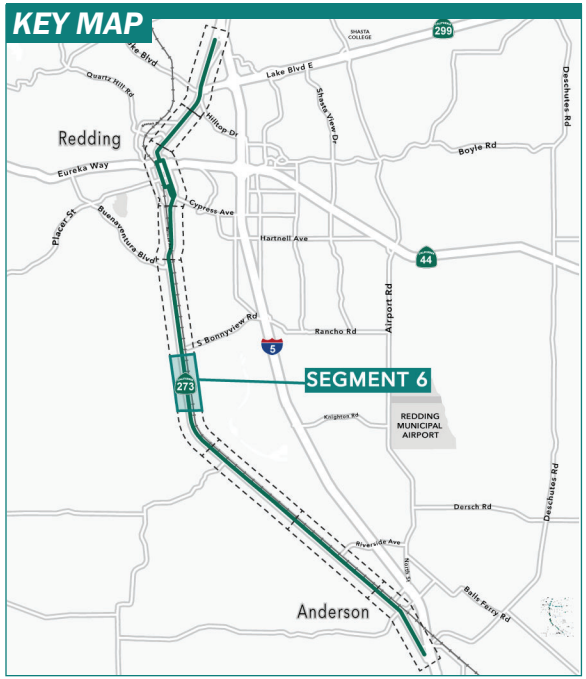
STATE ROUTE (SR) 273 SEGMENT 6

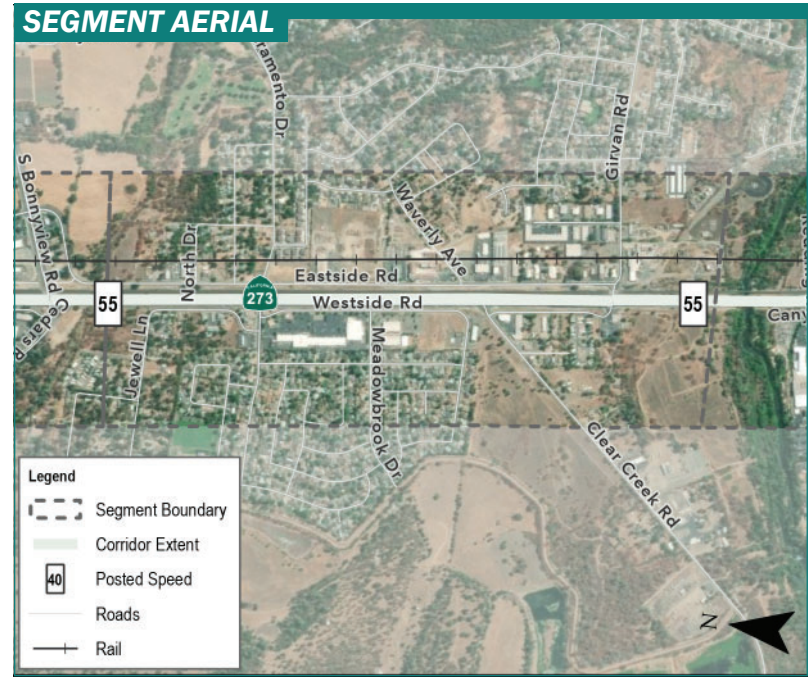
South of S Bonnyview Rd to south of Girvan Rd

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



SEGMENT AERIAL

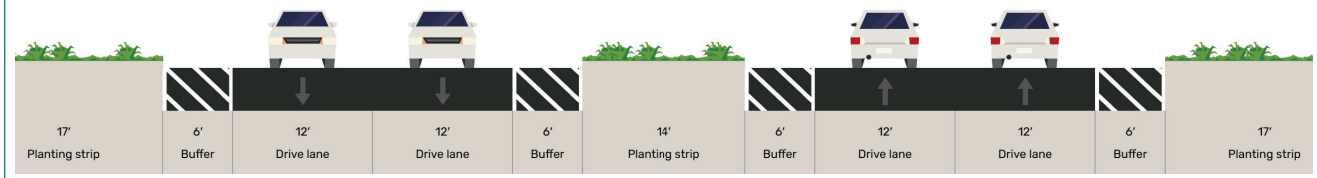


- **Adjacent Land Use:**
  Neighborhood commercial with access to single-family and undeveloped multi-family residential
- **Place Type:**
  Suburban Community/Transitional Corridor
- **Key Destinations:**
  Clear Creek Grocery and Market; Westwood Village shopping center featuring Rite-Aid and SAV-MOR Foods; Northstate Recycling; Shasta Head Start and Sycamore Elementary School to the west of segment area
- **Key Features:**
  Highway 273 Bikeway at the north of study area and proximity to S Bonneyview shared-use path; potential for place-based activities, frontage opportunities, and proximity to regional amenities

- **Segment Length:**
  1.2 miles
- **Roadway Classification:**
  Freeway/Expressway
- **Jurisdiction of Adjacent Land Use:**
  City of Redding; unincorporated Shasta County
- **Posted Speed(s):**
  45 mph
- **Cross-Section:**
  mostly 4 to 5-lane divided with separate right and left turn pockets at intersections
- **Daily Traffic Volume:**
  ~ 18,600 vehicles per day

TYPICAL SECTION

Segment 6 (north of S Bonnyview Road)

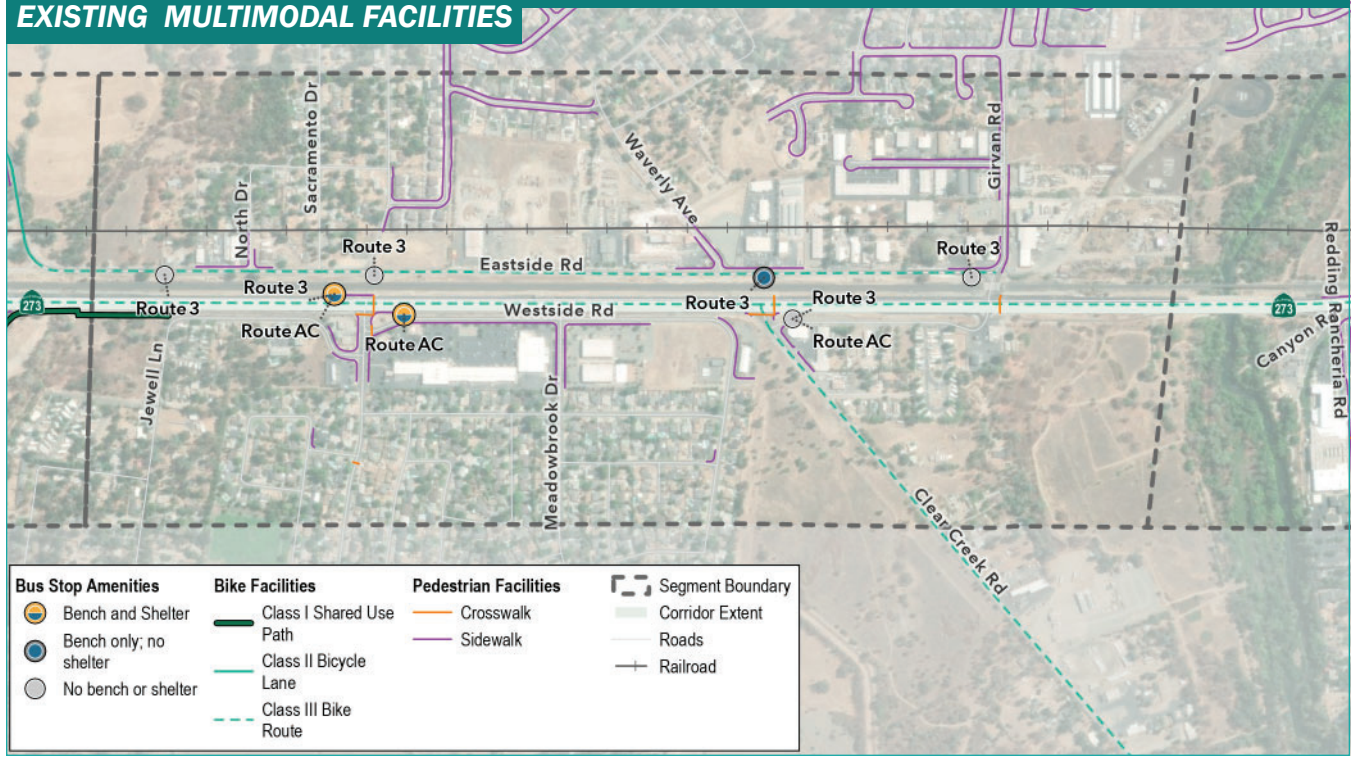


STATE ROUTE (SR) 273 SEGMENT 6

South of S Bonnyview Rd to south of Girvan Rd

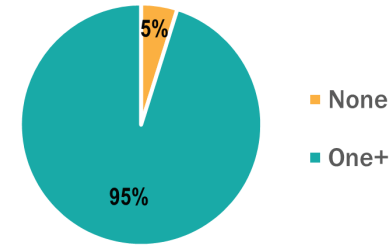
EXISTING CONDITIONS MOBILITY TRENDS

EXISTING MULTIMODAL FACILITIES

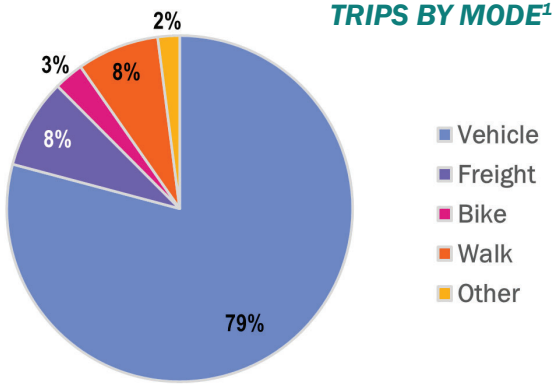


- The most common trip mode is motor vehicles, with 79 percent of trips made by a private automobile and 8 percent by a freight vehicle, followed by 8 percent by walking.
- Among all modes, private auto and freight vehicles show similar average trip lengths, at 9.7 and 9.6 miles, respectively. Average bike trip lengths are some of the longest across the corridor's study segments at 5.6 miles.
- Most people traveling within the segment have access to a car, with 95% of trips made by individuals living in households with access to at least one vehicle.

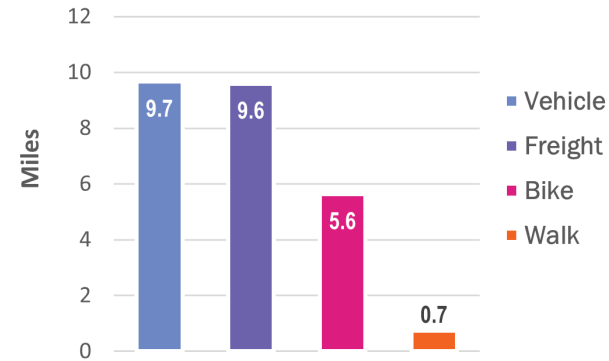
PRIVATE AUTO OWNERSHIP



TRIPS BY MODE[1]



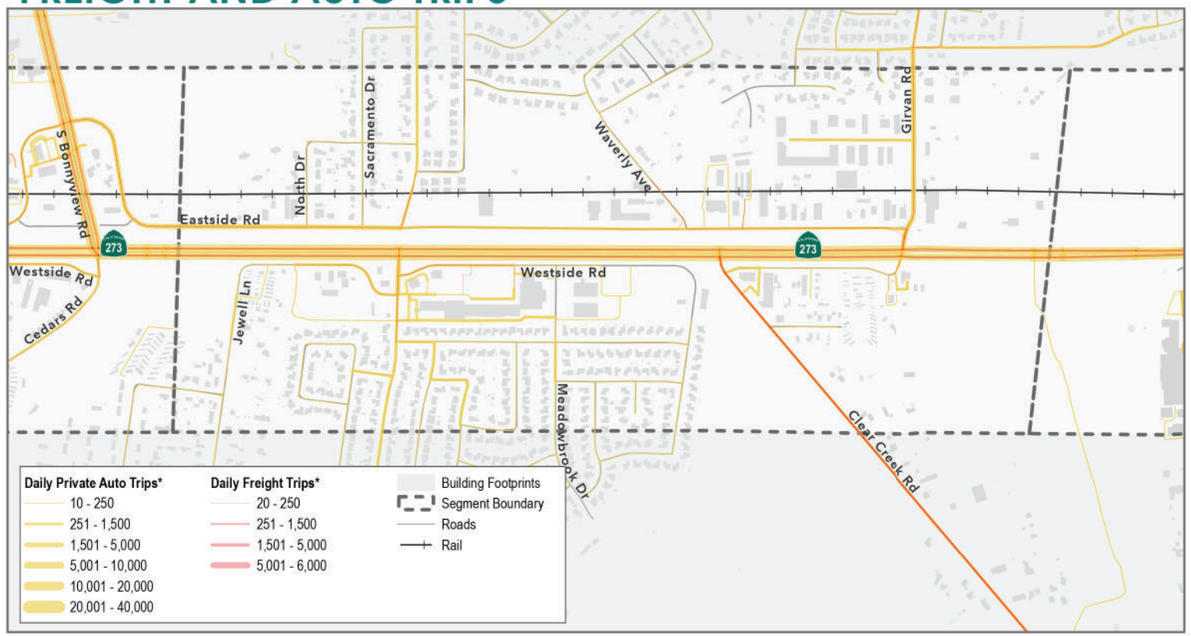
AVERAGE TRIP DISTANCE BY MODE[1]



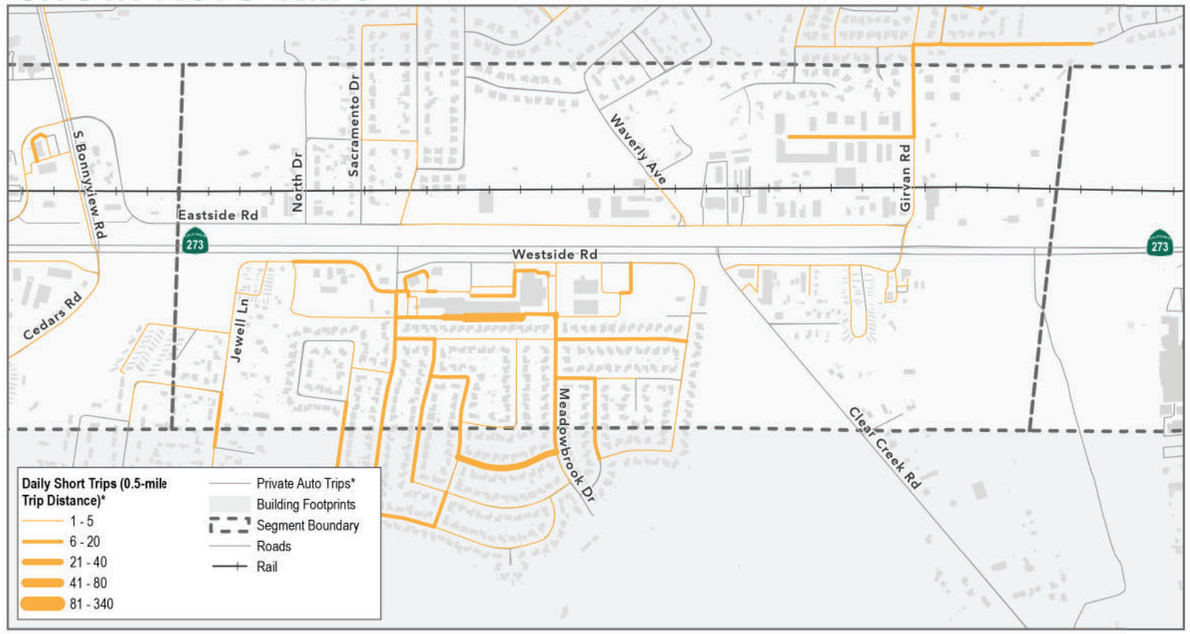
- Five percent of trips are made by people without access to a car, and people who do not have access to car are 67 times more likely to bike and 3 times more likely to walk than those who do have access to a car
- Bicycle trips traveling along the segment are most concentrated along Eastside and Westside Roads, as well as SR 273 south of Girvan Rd.
- Pedestrian trips, transit trips, as well as short vehicle trips are concentrated along Westside Rd and SR 273 near commercial and residential destinations.
- Freight and private automobile trips are concentrated along SR 273 and Girvan Rd.
- Clear Creek Rd shows more freight than vehicle trips.

[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

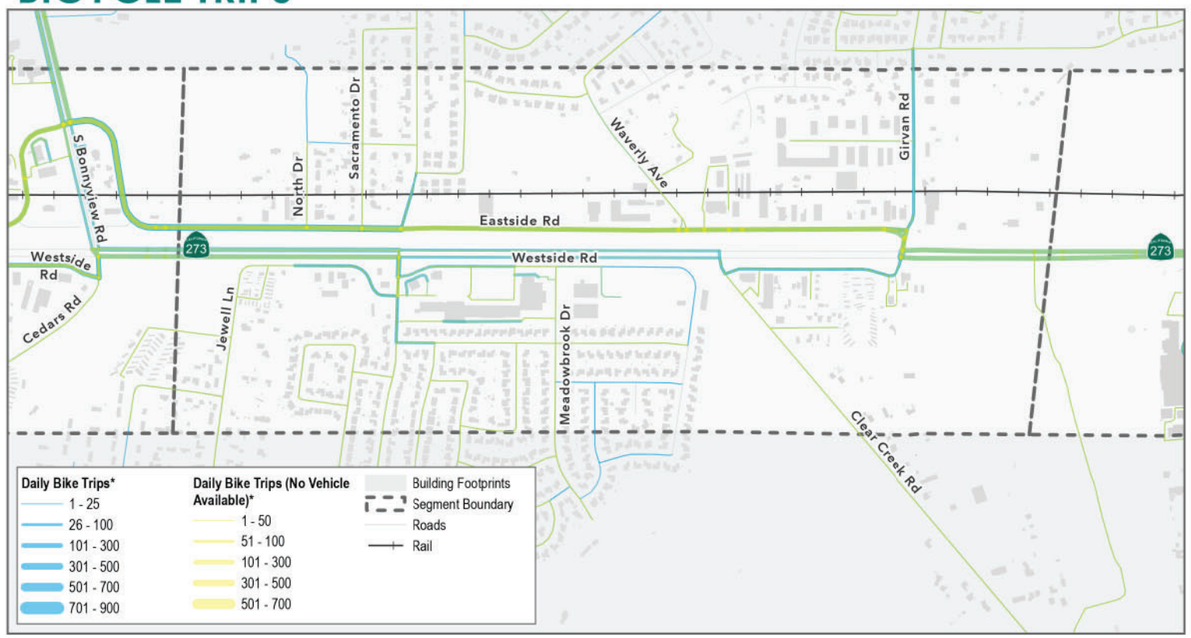
FREIGHT AND AUTO TRIPS



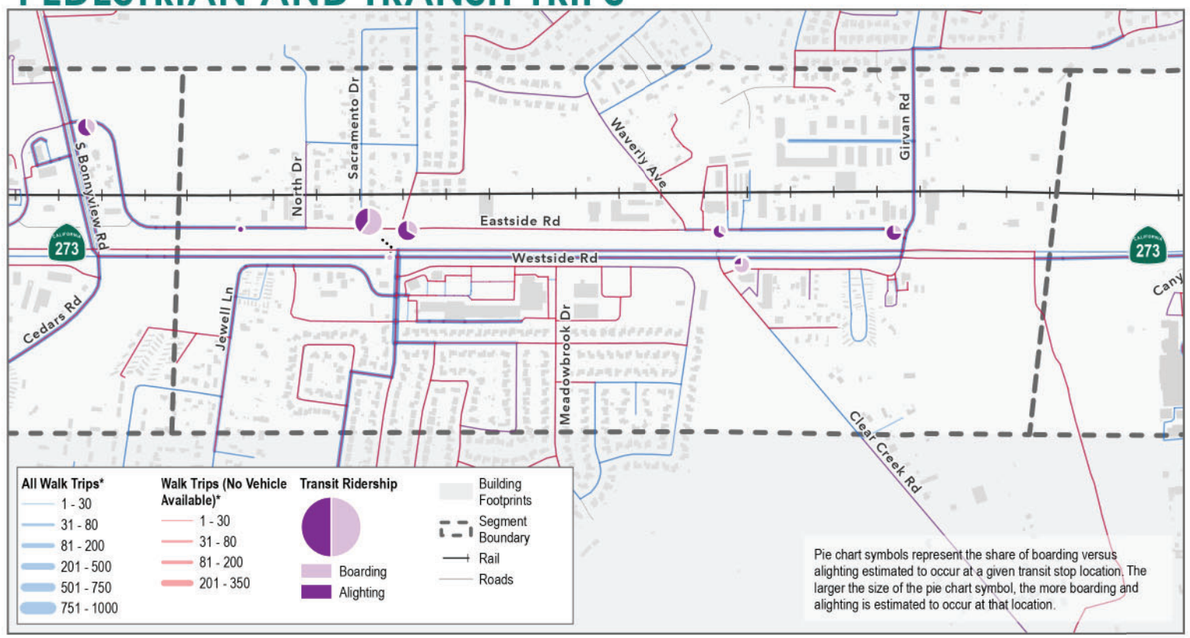
SHORT AUTO TRIPS



BICYCLE TRIPS



PEDESTRIAN AND TRANSIT TRIPS



Data source: Human Geography Base: Esri Community Maps Contributors, City of Redding GIS, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Trip data: Replica, Typical Weekday in Fall 2022; Building Footprints: City of Redding, Shasta County, 2023; Transit Ridership: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Rail: CA Data Hub, 2023
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Print date: 04 Oct 2023 - 20:40

*Data Disclaimer: Daily trips represent an estimate of a typical weekday in 2022. Volumes are an estimate only with medium certainty of reliability, and actual trip counts may vary from the numbers reported here.

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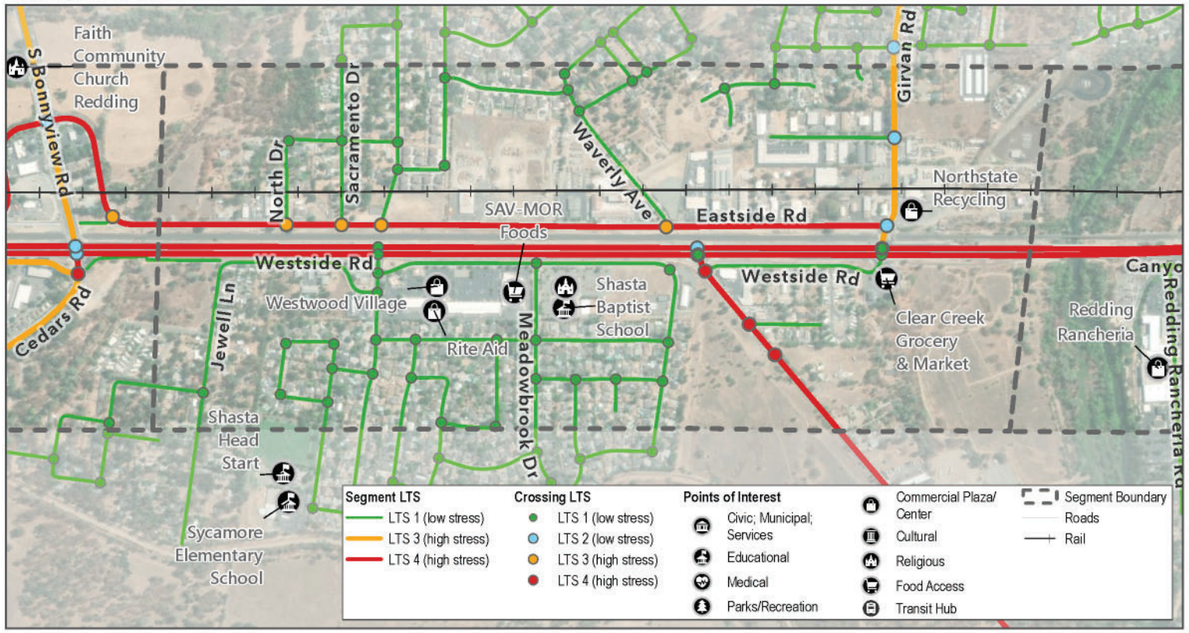
US Feet

STATE ROUTE (SR) 273 SEGMENT 6

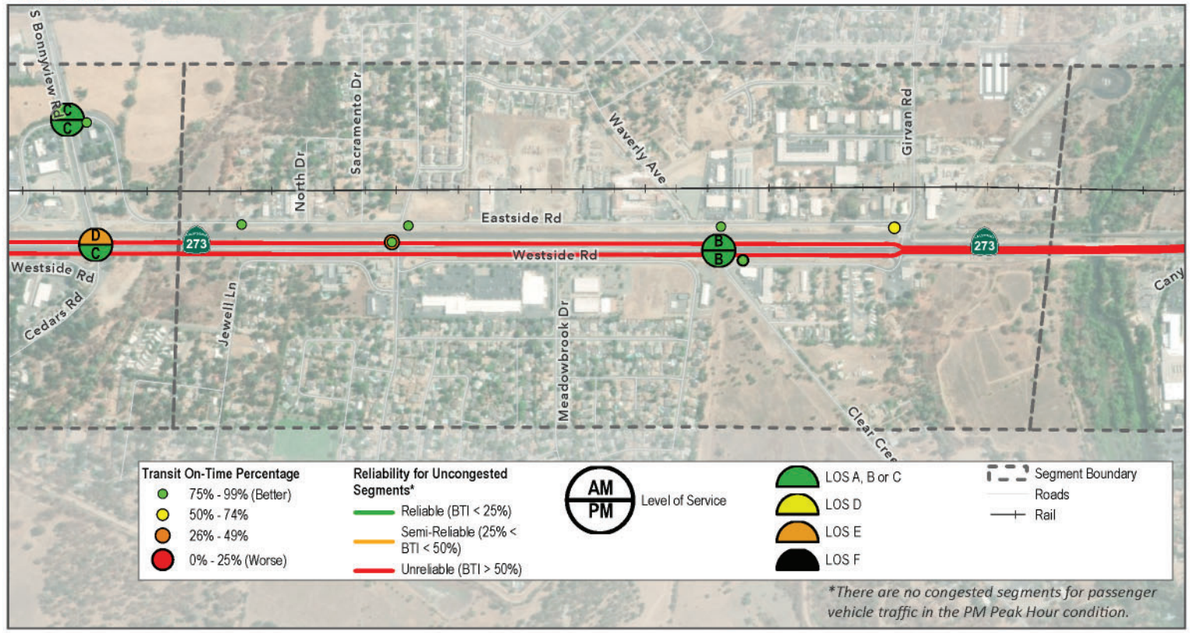
South of S Bonnyview Rd to south of Girvan Rd

EXISTING CONDITIONS PERFORMANCE RESULTS

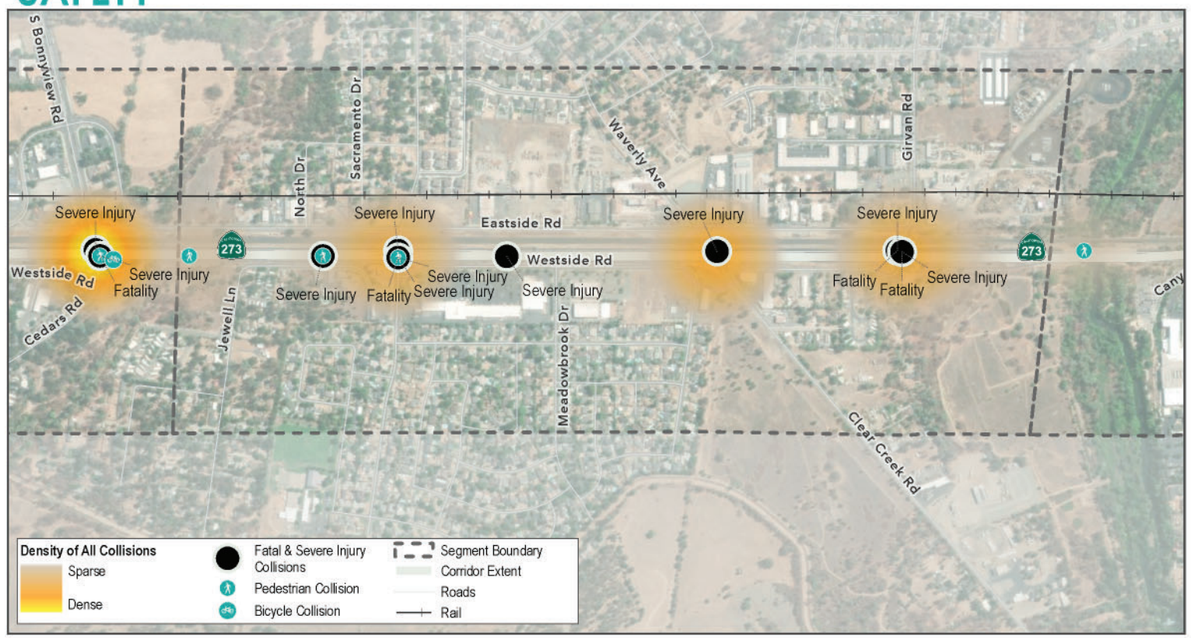
MOBILITY



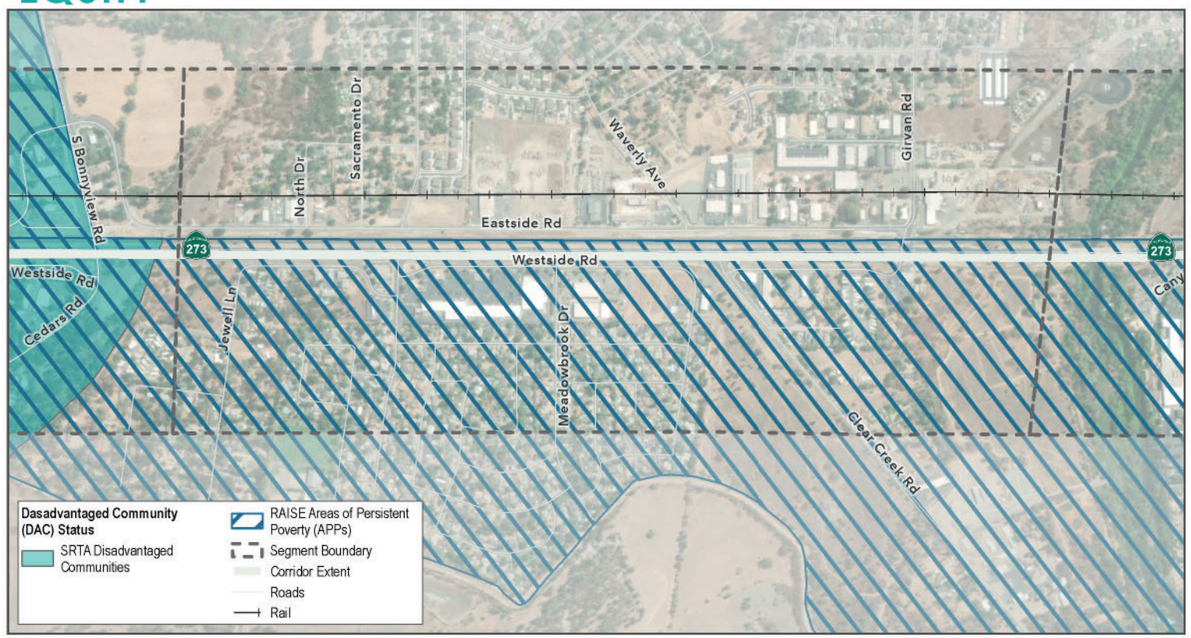
RELIABILITY



SAFETY



EQUITY



Data source: World Imagery (Firefly): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; Transit Stops & Frequency: RABA, City of Redding, GHD, 2023; Roads: Shasta County, 2023; Highways: TIGER, 2022; Bikeways: SRTA, 2023; Pedestrian Facilities: City of Redding, 2023; Collisions: SWITR, 2018-2022; DAC: SRTA RTP-SCS, 2019; POI: GHD, 2023; Congestion & TTR: NPMRDS, GHD, 2023.
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Print date: 22 Feb 2024 - 23:26

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EXISTING CONDITIONS PERFORMANCE RESULTS SEGMENT 6

MOBILITY & CONNECTIVITY	Result	Score
Transit Stop Conditions	Fair	0
Presence of Amenities (Shelter or Bench) at Transit Stop?	Some with bench/shelter	3
Sidewalk Connection to Transit Stop? (On SR 273, only)	Yes, sidewalk at SR 273 stops	3
Sidewalk Coverage	Minimal to None	4
Bicycle Level of Traffic Stress (LTS)	High Stress	4
Bicycle Connectivity to Destination Types:	# Destinations (% Connected) [1,2]	4
Employment Destinations	0 (0%)	
Education Destinations	3 (46%)	
Community Services and Shopping Destinations	4 (17%)	
Health Care Destinations	0 (NA)	
Food Access	2 (26%)	
Transit Service Destinations (includes Bike Share locations)	9 (0%)	
Civic Service Destinations	0 (0%)	
Parks/Open Space & Recreation Destinations	2 (74%)	
Overall Mobility Score	**Poor**	**4**

[1] The # of destinations reported here are the # of destinations only within the segment. However, low stress connectivity is assessed for connections within and outside of the segment, so long as the location is reachable within a 1.5-mile biking distance.
[2]. Value of "NA" for the percent connected indicates that there are no connections for that node type in the full stress network within a 1.5-mile biking distance from the residential origins in that segment to compare low-stress connections against.

SAFETY	Result	Score
Total Crashes	55	-
Total Fatal Crashes	3	4
Total Severe Crashes	5	4
Total Crashes Involving a Pedestrian	2	4
Total Pedestrian Fatalities	1	4
Total Crashes Involving a Bicyclist	-	0
Total Bicyclists Fatalities	-	0
% Occurred at Night (Non-Daylight Crashes)	47%	-
Primary Crash Types	Rear End	-
Primary Crash Cause	Unsafe Speed	-
Crash Rate (Bold = Exceeds Statewide average)	**1.35**	4
Statewide Crash Rate	0.94	-
Overall Safety Score	**Poor**	**4**

OPERATIONS & RELIABILITY	Result	Score
Transit Stop Reliability	Results provided by route	3
Travel Time Reliability (TTR)	**Unreliable**	4
Vehicle - AM Peak Hour	Unreliable	
Vehicle - PM Peak Hour (shown on map)	Unreliable	
Truck - AM Peak Hour	Unreliable	
Truck - PM Peak Hour	Unreliable	
Intersection Level of Service (LOS)	**Acceptable**	1
Overall Reliability Score	**Poor**	**3**

EQUITY (DAC Status)	Result	Score
SRTA Regional Transportation Plan (RTP) Criteria	No	1
RAISE Areas of Persistent Poverty Criteria	Majority	4
Climate & Economic Justice Criteria	No	1
SB 535 CalEPA Criteria	Partially	3
Overall DAC Status	**Moderate DAC**	**2**

PERFORMANCE SUMMARY	Result	Score
MOBILITY	Poor	**4**
SAFETY	Poor	**4**
RELIABILITY	Fair	**2**
EQUITY (DAC Status)	Moderate DAC	**2**
Overall Performance		**3**

SEGMENT ISSUES

- High speeds, minimal bicycle and pedestrian facilities and a lack of low-stress crossing opportunities along SR 273 results in a high stress barrier to connectivity between the low-stress residential streets to the east and west.
- Collision hotspots are seen at Westwood Ave, Clear Creek Rd and Girvan Rd. With 15 percent of collisions resulting in fatality and a crash rate significantly above the statewide average, safety is a concern.
- Transit service is mostly reliable with many of the routes serving stops in the segment arriving on-time between 75 and 99 percent of the time. The one study intersection in this segment is operating at acceptable levels in both peak hours at LOS B. Travel time is considered unreliable.
- Equity is a concern, mostly in the areas to the west of the state highway, with a majority of the area designated as a Area of Persistent Poverty, per RAISE grant criteria definitions.

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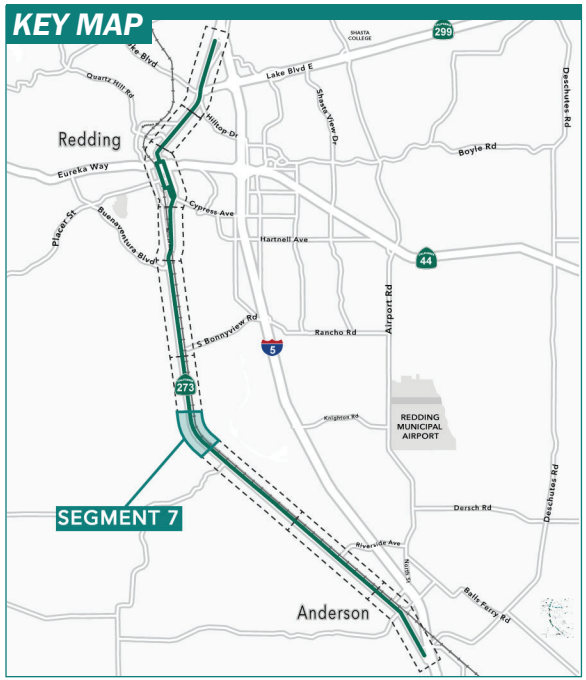
STATE ROUTE (SR) 273 SEGMENT 7

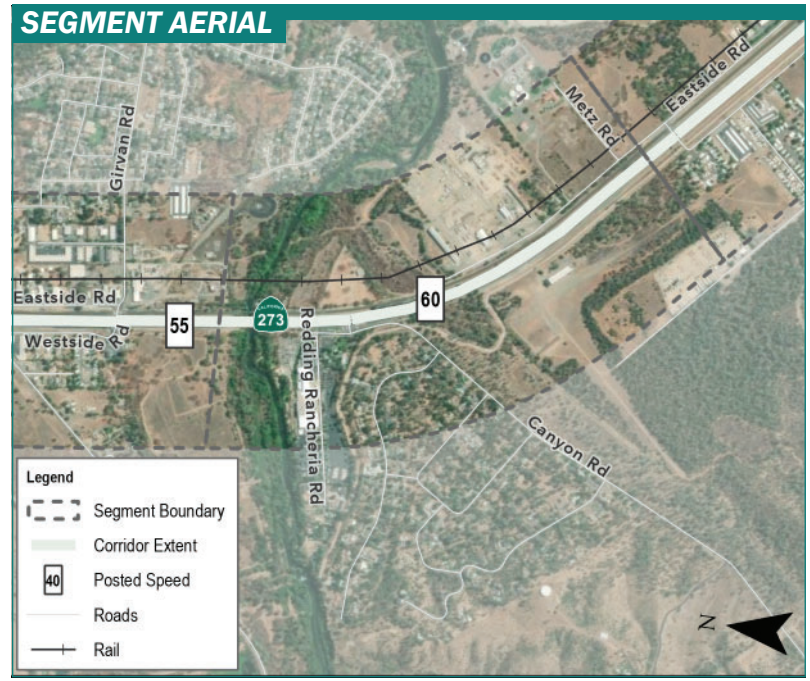
South of Girvan Rd to north of Happy Valley Rd

EXISTING CONDITIONS SEGMENT OVERVIEW

KEY MAP



SEGMENT AERIAL



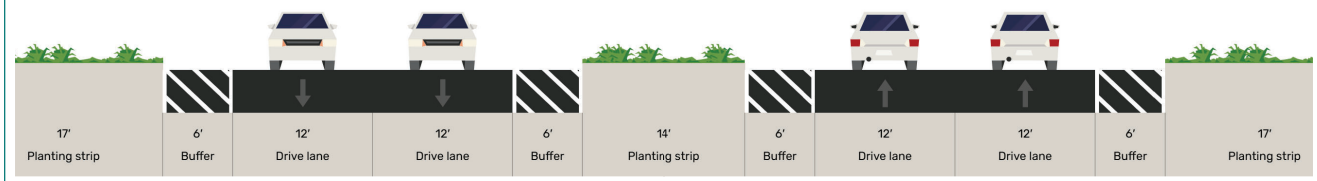
- **Adjacent Land Use:**
  Commercial and residential tribal lands, industrial, single-family residential
- **Place Type:**
  Transitional Corridor/Undeveloped Corridor (Rural)
- **Key Destinations:**
  Redding Rancheria Tribal Lands, Win-River Resort & Casino

Key Features:
Transitional and rural corridor connecting to the Rancheria and unincorporated Shasta County to the south

- **Segment Length:**
  0.9 miles
- **Roadway Classification:**
  Freeway/Expressway
- **Jurisdiction of Adjacent Land Use:**
  City of Redding, Redding Rancheria, Shasta County
- **Posted Speed(s):**
  60 mph
- **Cross-Section:**
  4-lane undivided with left turn pockets at intersections
- **Daily Traffic Volume:**
  ~ 10,700 vehicles per day

TYPICAL SECTION

Segment 7 (south of Canyon Road)

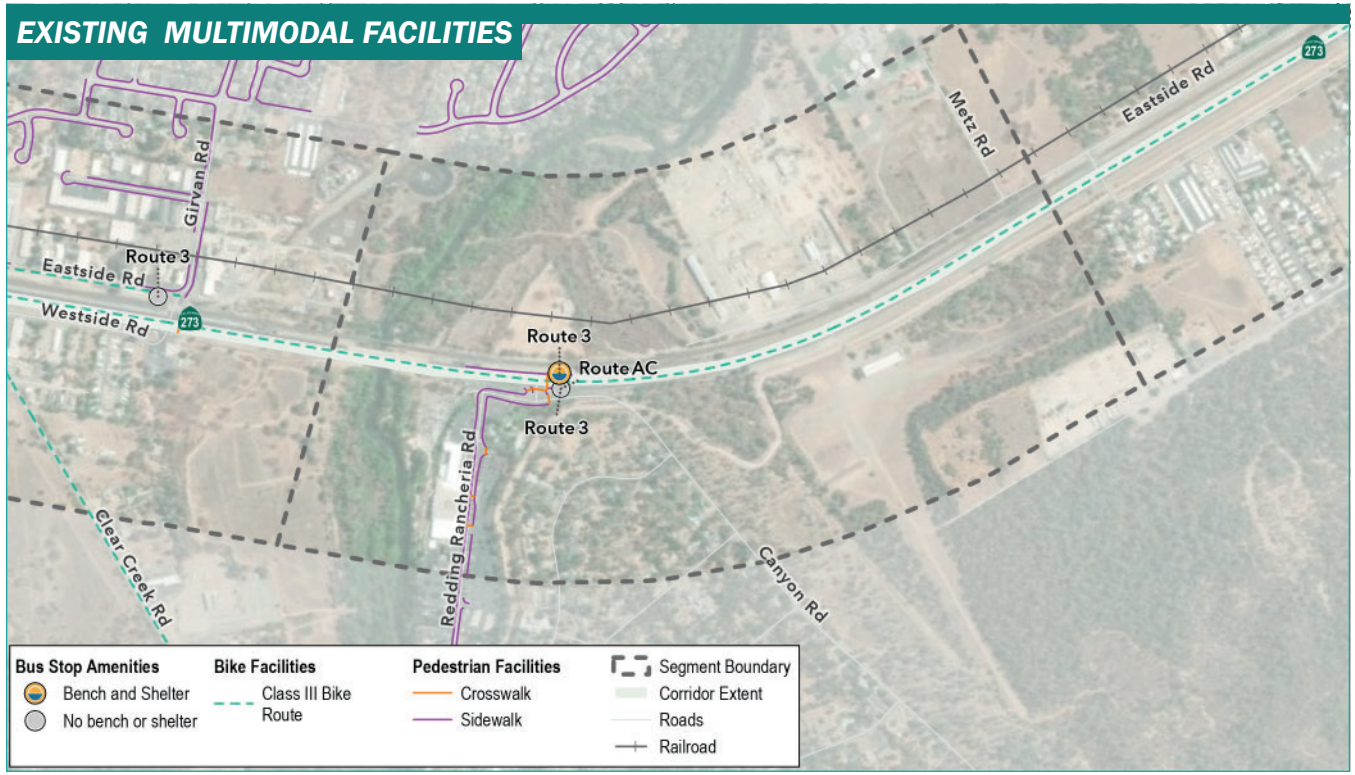


STATE ROUTE (SR) 273 SEGMENT 7

South of Girvan Rd to north of Happy Valley Rd

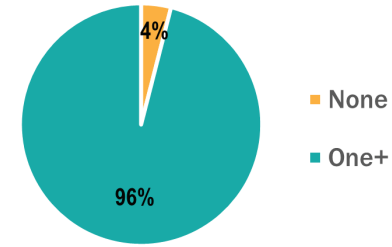
EXISTING CONDITIONS MOBILITY TRENDS

EXISTING MULTIMODAL FACILITIES

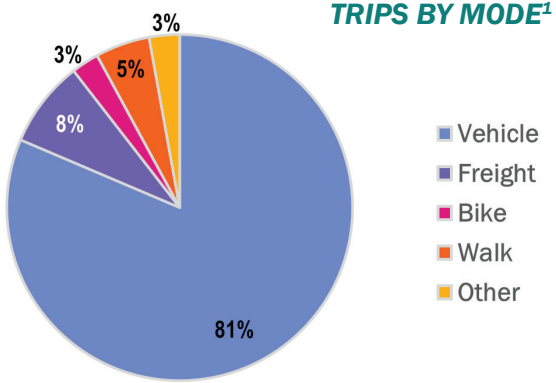


- The most common trip mode is motor vehicles, with 81 percent of trips made by a private automobile and 9 percent by a freight vehicles.
- Among all modes, freight vehicles have the highest average trip distance at 10.4 miles, followed by private vehicles.
- Bike trip lengths are relatively high at 7.2 miles.
- Most people traveling within the segment have access to a car, with 96 percent of trips made by individuals living in households with access to at least one vehicle.
- Four percent of trips are made by people without access to a car, and people who do not have access to car are 49 times more likely to bike than those who do have access to a car.

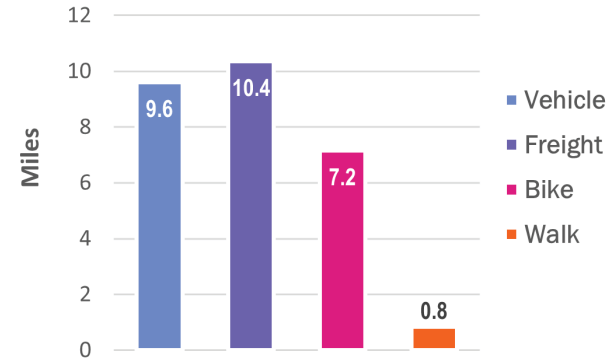
PRIVATE AUTO OWNERSHIP



TRIPS BY MODE[1]



AVERAGE TRIP DISTANCE BY MODE[1]



- Bicycle trips traveling along the segment are most concentrated along SR 273 and along Canyon Rd.
- Pedestrian activity is low within this segment, although some activity can be seen along SR 273, Canyon Rd, and unpaved roads south of Canyon Rd.
- Short vehicle trips are virtually non-existent due to proximity to minimal place-based activities
- The only location with transit stops is at Redding Rancheria Rd.
- Most freight and private auto trips are concentrated along SR 273, with some activity on the unpaved road south of Canyon Rd.

[1] Replica, Fall 2022 Typical Thursday. Data estimates shown in the charts/graphs on this page represent trips originating in the segment. Trip estimates do not include transit data. Other includes trips made by taxi, TNCs, and other non-identified trips. Trip data shown in the maps on the page to the right include all trips to show the overall distribution of trips. These trips include trips that begin, end, or pass through a link within the segment area.

Appendix D.

Public Outreach Summary

Visioning Event Summary

Envision 273

Comprehensive Multimodal Corridor Plan

INTRODUCTION

In August 2024, a Blue Zones active transportation team collaborated with neighborhood, community, governmental staff, and other leaders to create a future for State Route (SR) 273 that prioritizes multimodal transportation. This effort promotes a built environment focused on safety, health, and the well-being and livability of residents, and honors the unique character of the Cities of Redding and Anderson and the Shasta region.

The Shasta Regional Transportation Agency (SRTA) and California Department of Transportation (Caltrans) engaged Blue Zones consultants Dan Burden and Michael Williams to assess issues related to travel, traffic management, walkability, active transportation, and improved comfort and transportation for the 16.23-mile SR 273 corridor.
SR 273 serves as a business loop of Interstate 5 that travels directly through the downtown districts of Anderson and Redding in Shasta County. SR 273 was part of former U.S. Route 99. It's role as a bypass should not be for regional speed (expressway business route) but as a community-serving access route focused on safety-first. This approach will set a tone and operation to achieve successful business, multimodal, social and healthy living connections.

Dan Burden serves as an inspirational facilitator on building multimodal, equity, Safe Systems Approach, and Walkable Communities corridors. In this process, Dan and Michael used consensus-building activities with SRTA and Caltrans staff, local experts, property owners, and

the broader community to create a roadmap for how to design and operate the SR 273 corridor and other streets, to create and update operations procedures, and improve communications and outreach with the objective of improving safety, access, and comfort for all. Four area walking audits (Downtown Anderson, Miracle Mile, Downtown Redding, and Cypress Avenue) were featured in the discovery, and enhanced through two evening informed consent workshops where ideas, community preferences, and priorities were set.

STUDY TEAM

Dan Burden is widely recognized as a thought-leader and implementation-focused practitioner in urban design, walkability, active transportation, traffic calming, safe routes to school, placemaking, and street design. He brings diverse teams together, integrating transportation planning with land use and health programming to build inclusive and vibrant communities. His expertise is in helping communities envision and implement streets that promote walking, bicycling, and social engagement.

Michael Williams is a transportation consultant specializing in active transportation and the rural environment. With more than ten years of experience as a licensed general contractor on public works projects from roads and bridges to schools, allows him to see the entire picture – from planning to construction. His experience in the active transportation field has taught him how to work with the public and government agencies to reach consensus, obtain grants and bring projects to fruition.

FORMAT

In advance of the on-site work carried out in August 2024, the study team reviewed past materials, including previous plans and studies, surveys, traffic crash reports, and communications. The team met with Envision 273 SRTA and Caltrans leads and the GHD consultant to get needed background.

Walking audits and workshops: Over 100 people were engaged/providing feedback through 4 walking audits (Downtown Anderson, Miracle Mile, Downtown Redding, and Cypress Avenue), a nighttime walking audit, and 2 afternoon focused workshops. The team also received communications through surveys and emails.

This document provides a summary of common themes and observations on transportation and livability issues for Envision 273. From these observations and comments, we developed recommendations for enhancing and supporting the positive aspects of SR 273, as well as tools to address problem areas. Recommendations are based on national and California specific best practices (research and proven experiences from elsewhere), focused on what is most relevant to the Shasta region context.

KEY FINDINGS

Overall, we heard "Less is More." This applies to the number of lanes, street width, and uncontrolled commercial driveways. The overriding message we heard from the community (including staff, property owners, and the public) is that people love and want to protect and restore Redding and Shasta County's rural character and lifestyle, with added walkability and livability. Additional findings:

- There is appreciation for place-restoring, maintaining and supporting multimodal planning, and active transportation features for people of all ages and abilities.

- There is general recognition that overly-wide road sections, unnecessary travel lanes, and nonessential or long auxiliary right or left turn lanes are increasing vehicle speeds. These high speeds deny access to vulnerable road users, and they further erode quality of life by contributing to high levels of noise, and creating unsafe conditions. This over-emphasis on speed and excess vehicular capacity at the cost of community reduces the multi-function and livability qualities desired in this corridor. A multimodal system is desired. "Pedestrian and bicyclist safety and convenience should also be considered when adding turn lanes at an intersection. Specifically, offset left- and right-turn lanes will lengthen crossing distances for pedestrians." FHWA. In addition, turn lanes often require adjusted signal timing to provide green time specifically for the turning movements, which increases the delay for pedestrians and bicyclists waiting to cross the road. WSDOT

- There is no engineering or capacity basis for having so many lanes on SR 273. Much of the roadway infrastructure throughout the corridor has been built (or overbuilt) to carry vastly more traffic than it does. According to the FHWA, "Typically, a Road Diet is implemented on a roadway with a current and future average daily traffic of 25,000 or less." Even by today's engineering standards, there is no reason this roadway needs so many lanes, and certainly no excuse to further widen them.

- The biggest impacts negatively affecting people's sense of community, safety, access, and comfort come from motor vehicles:
    - Many more motor vehicle trips in general, and vehicles being used in ways that are not acceptable
    - Parks, commercial districts, and schools are hard to reach
    - Getting across the street by foot or bicycle is difficult and unsafe
    - Extremes in weather/climate warrant significant new approaches to greening and shade
    - Night lighting of key streets and crossings needs a higher focus

- Despite significant recent work, the transit system is not living up to its potential. A further study is recommended.

- There are ways in which the street network and design are not functioning optimally:
    - Some of the one-way streets make travel unnecessarily inconvenient and induce unsafe speeds.
    - Posted speed limits through downtown and commercial other areas are too high. Safe and reasonable target speeds of 20-25 mph are appropriate.
    - In addition to excessive motor vehicle traffic generally, some important locations are particularly impacted, such as:

        - Downtown Anderson
        - Downtown Redding
        - Miracle Mile

- There is a desire for more central community spaces where people can gather.

KEY RECOMMENDATIONS

Please see the two Power Point reports for illustrated recommendations

- Slow traffic speeds through design and operations to safer, more compatible levels
    - Apply default lane widths of 10 to 11 feet, and storage lanes of 10 feet
    - Eliminate unwarranted turn lanes
    - Provide urban street trees to provide scale, enclosure and traffic calming

- Apply safer, more compact intersections:
    - Consider roundabouts for all intersections. Prioritize the urban areas, such as Redding, Anderson, and Miracle Mile.
    - Intersections
        - Use curb extensions to maintain sight lines, and to reduce crossing exposure and turning speeds. Aprons can help with larger vehicles.
        - Ensure that there are no sight obstructions/restrict all vehicles being stopped/parked within 25’ of each intersection.
        - Use median noses and short medians in future rebuilds of intersections
        - For each major intersection, consider creative ideas for ensuring that people slow down/operate carefully
        - Provide crosswalks on all legs of intersections

- Provide shade and green the corridor with trees, ground cover, and boulevards. Place the highest emphasis on Anderson, Miracle Mile and Redding. Consider policies to incentivize or require business to provide canopies or vegetative cover at their storefronts.

- Celebrate streets as public spaces through an ongoing community-engagement effort.

RECOMMENDATIONS FOR IMMEDIATE/SHORT-TERM ACTION

OVERALL THEMES

The overriding message we heard is that people love and want to protect and restore Redding and Shasta County's rural character and lifestyle, with added walkability and livability. Overall themes included the following:

1. Route 273 provides a poor welcome, unsafe speeds, and unpleasant conditions. It is difficult to identify the entrance to any commercial area i.e. Anderson, the Miracle Mile, or downtown Redding. Gateway entries are needed.

2. A 20-25 mph target speed should be considered to bring out the social and commercial life of these areas, along with crossing islands, trees, sidewalks, protected bike lanes, parking, and book-end gateway features on each approach, such as roundabouts or chicanes.

3. Lighting. There are many areas throughout the corridor that are poorly lit and need better lighting. There are many ways of doing this that are compatible with "dark skies" goals, e.g., pedestrian-scale lighting, downlighting. Lighting improvements should be prioritized, as it is a safety issue for all road users. **Streetlights help keep pedestrians and cyclists safe —** Even when cyclists wear reflective gear and cross at marked crosswalks, they can be hard to see in the dark. If there's no nearby streetlight to illuminate them, the risk of an accident increases even further. These dangers are heightened even more for pedestrians, as they have a smaller visual profile than cyclists and can be harder to see if they're wearing dark clothing. When the streetlights go on, motorists can more easily spot vulnerable road users like pedestrians and cyclists.

4. Maintenance. Support for regular road and path maintenance, especially to avoid trip hazards.

5. Consider a high frequency bus service on the SR 273 corridor. This would reduce the vehicular volumes on SR 273 and provide additional connectivity for all, but especially for lower income populations.

APPENDIX

Notes on Envision 273 Nighttime Tour

Attendees:
Michael Kuker (SRTA), Todd Tregenza (GHD), Dan Burden (Blue Zones), Michael Williams (Blue Zones).

Observations & Received Comments:

- The group toured the SR 273 corridor at night.
- We spoke to a homeless man that was walking from the park on Cypress Avenue to a friend's home south of the Goodwill store where he was going to spend the night. He was articulate and talked about his experience while homeless. He told us that he just received a ticket for loitering in a Redding park.
- We stopped at the section near the Goodwill store and observed a dark clothes pedestrian that was nearly invisible.
- At that section there was a crosswalk on only one side of the SR 273 intersection.
- We noted poor lighting levels and the presence of a streetlight directly over the crosswalk.
- Streetlights should be located away from the crosswalk to produce angled light which highlights pedestrians better.
- Generally, there were no lights along SR 273 except at the intersections and few on the frontage roads.
- Few lights for the railroad crossings.
- There were no lights on the shared use path on the west of SR 273 near the southern end.
- There were lights on the shared use path near the Rancheria.
- There was discussion as to whether a woman that was seen walking in the median earlier in the day about how she could be seen at night with the low lighting levels.

- We stopped at a market along SR 273 and asked the proprietor how many pedestrians and cyclists he saw. His response was that he saw 10 to 15 pedestrians and cyclists per day using his store. His count was a bit suspect since there was almost no visibility from the store counter to the front of the store. It wasn't clear how he could see whether someone had arrived by car, by foot, or by bike. It was noted that the driveway leading from the store to SR 273 had some access issues.

Deficits:

- Poor lighting along SR 273 and the frontage roads
- Lack of sidewalks makes walking along SR 273 and frontage roads at night an intimidating task

Resources (Strengths and Opportunities):

- Sidewalks do exist along some sections of SR 273
- There is some lighting along SR 273 and it appears to be concentrated at intersections where much of the pedestrian and bicycle crossing activity would occur

Notes on Envision 273 Cypress Avenue Walk Audit

Attendees:
Michael Kuker (SRTA), Sean Tiedgen (SRTA), Todd Tregenza (GHD), a representative from Senator Dahle's office, a large group of government staff from Caltrans, the City of Redding, and Shasta County, GHD staff, Dan Burden (Blue Zones), Michael Williams (Blue Zones), and residents and business owners.

Observations & Received Comments:

- The group toured the section of SR 273 from the intersection with Cypress Avenue to California Street.
- We discussed the South City Park and the difficulties accessing the park for nearby residents. Alternatives for creating access between the park and the neighborhood to the north/west, such as a flyover bridge or switchbacks down to a grade crossing, were discussed.
- Description of the difference between attached and detached sidewalk.

- At the Cypress Avenue intersection we noted that the signals had borders on them making them more visible. The grade of the crosswalk caused by the super elevation of the corner presented problems to people with mobility challenges and those using personal mobility devices. We talked about the difference between requiring pedestrians to always push the button (i.e., the big button versus automatic recall). We looked at the number of crossings to go south to north at Cypress Avenue and the incentive to cross against a red light or to cross at a location without a crosswalk. We talked about the lack of eyes on the park because of the way it was surrounded by streets and no homes. Michael Kuker talked about the history of SRs 44 and 99 meeting there and the layout of the intersection reflecting what had existed in order to make car travel comfortable. Caltrans informed us that leading pedestrian intervals are used at some of the signals along the SR 273 corridor.
- At the intersection of Parkview Avenue and Market Street, we saw an interruption of bike facilities. We were told that Parkview Avenue was the site of the first four lane to three lane road diet in Redding.
- At the Hermanos Restaurant north of California Avenue, there was a large undeveloped lot next to Parkview Avenue that may be developed into multi-use with residential above.
- At the beginning of our tour, we noticed two parents with strollers. There was a discussion of threat prioritization by pedestrians where tripping and near-term hazards tended to be more important to pedestrians than watching out for cars.
- Some residents talked about the unhoused folks traveling between the park and the neighborhood to the north/west. This use was stopped by installing fencing.
- At the termination of our walk at the intersection of California Street, we talked about the high percentage of fatalities that occur at intersections. The use of media noses at intersections can be a large help reducing those fatalities and slowing motorists. The intersection looked to be a good location for a gateway treatment

During the end-of-audit debrief, we heard:

- The high number of lanes at the intersections, how important it is to walk a street when looking at possible solutions, seeing the interactions in real life, how unpleasant it is to walk in this area, lack of crash data doesn't always indicate problem areas, The two things people hate - the way things are and change, development opportunities in this area, the diversity of perspectives available from different road users, including elderly and children, the lack of crashes on SWITRS for this area not showing the hostility of the corridor to pedestrians, the interest in roundabouts that is growing in the city.

Notes on Envision 273 Downtown Anderson Walk Audit

Attendees:
Michael Kuker (SRTA), Sean Tiedgen (SRTA), Todd Tregenza (GHD), a large group of government staff from Caltrans and the City of Anderson, GHD staff, Dan Burden (Blue Zones), Michael Williams (Blue Zones), and residents.

Observations & Received Comments:

The group toured SR 273 and the downtown area of the City of Anderson. The tour started at Anderson City Hall, then moved east across SR 273, north along East Center Street, west across SR 273, and south along West Center Street back to Anderson City Hall.

- SR 273 splits Anderson in two. Schools are located on one side but homes are located on the other side.
- The emphasis should be to focus on people and place. Reverse past mistakes that caused us to overemphasize automobility. Parking is overdone in this area.
- At the intersection of Howard and Douglas Streets, we looked at the street width and how it was far too wide for the uses that we saw.
- At the crossing of SR 273 on South Street, we noticed the use of leading pedestrian interval (LPI) at that signal. Shared use paths on both sides of SR 273 to the south of this intersection we're identified. The old 99 Trail is located on the east side of SR 273 to the south of this intersection. The crosswalk grade was pointed out as making it tough for people using personal Mobility devices. This intersection was identified as a good location for a gateway treatment. Discussion of the importance and benefit of gateway treatments was held.
- As we walked north on East Center Street, we noted the amenities added during the Reconstruction in 2014. There was seating available on the sidewalk. But still the street was too wide. We measured it at 68 ft in width. This width can provide room for diagonal or back in parking and other amenities such as bicycle lanes or wider sidewalks. We noted some trip hazards

in this corridor in the need to make them visible. When driveway into a business was overly wide - 14 ft is a good width for a single direction driveway. We talked about the three sidewalk zones, the importance of tight corner radii, high visibility crosswalk markings.

- At the Veterans Walk of Honor Plaza, we rested and enjoyed the place created there.
- At Club 49, we noticed the awning which provided shade. Dan talked about the five things necessary for a successful downtown: transparency, enclosure, complexity, imageability, and human scale. Discussion was had on how to incentivize these five factors for developers.
- At the intersection of North Street and West Center Street, we talked about Target Speed versus Design Speed, land use and how that influences the speeds of people drive at, median noses, lack of shade as a pedestrian barrier, and the fact that walkability is desired by many but provided only by a few cities. Reference to AARP surveys showing older people strongly desiring walkable neighborhoods. We talked about how the levels of noise are related to vehicle speed and speed limit setting procedures in the State of California.

During the end-of-audit debrief, we heard:

- The importance of shade, the fact that Howard Street is 60 ft wide and provides room for medians or bump outs Etc., the importance of connectivity to vulnerable road user networks, the trail to Walmart that exists but some people were not aware of, the need for more residents to get involved, the fact that pedestrian crossings of SR 273 are incomplete and the need for crosswalks on all legs of intersections, how motor vehicle speed drives noise in the corridor, the importance of place making, walkability and the need to design for what you want, public space being as good as and or complementary to private space, the importance of grade for personal mobility device users, the importance of field visits, and the importance of commercial buildings with windows fronting sidewalks.

Notes on Envision 273 Miracle Mile Walk Audit

Attendees:
Michael Kuker (SRTA), Todd Tregenza (GHD), a large group of government staff from Caltrans, the City of Redding, and Shasta County, GHD staff, Dan Burden (Blue Zones), Michael Williams (Blue Zones), and residents.

Observations & Received Comments:

- The group toured a portion of SR 273 known as Miracle Mile. We began at Caldwell Park, traveled north along SR 273, crossed 273 at Arboretum Drive, traveled south along 273 back to Caldwell Park. Prior to the walk, we drove through the well-established, single-family neighborhood to the west of SR 273. It featured large mature trees. The street was well canopied. The homes were smaller and likely built in the post-World War II period. Sidewalks were intermittent and the neighborhood had experience problems with cut through traffic between Quartz Hill Road and Benton Drive. These streets are too wide for their use.
- Near the park, we measured Quartz Hill Road as 73 ft in width from curb to curb and featuring a 17 ft wide two-way left-turn lane (TWLTL). We had discussion about attached versus detached sidewalks.
- At the intersection of Quartz Hill Road and Market Street, we discussed the concept of conflict points and how roundabouts reduce those. We talked about the possibility of a gateway at that location. We noted a right turn lane that was 15 ft wide and discussion was had about the necessity of that width. The width of Market Street at the southern leg of that intersection was 92 ft. We learned that a mountain bike park was being built nearby. Regular crashes were said to occur on the south side of the bridge where Market Street takes a left turn. Driver's heading south failed to navigate the turn and crash into the building there.
- While walking north along Market Street, we stop near the advanced power store and discovered there was 50 ft of width provided for the northbound lanes alone.
- Next to the SJ Denham auto dealership, we saw an older woman jogging in the bike lane. We were told that the intersection with Arboretum Drive can experience backed up traffic due to pick up and drop off at the Turtle Bay School located to the east along Arboretum Drive.
- At the northernmost crosswalk of SR 273 at the intersection with Arboretum Drive, we measured the street as being 120 ft wide. At this location, we saw a person with a stroller crossing at mid-

back without a crosswalk and a couple of other pedestrians safely crossing mid-block without a crosswalk.

During the end-of-audit debrief, we heard:

- Unnecessary road width, what amenities could be provided with that road width, the noise levels we had experience during the walk audit, and the benefits provided by countdown timers.

Notes on Envision 273 Downtown Redding Walk Audit

Attendees:
Michael Kuker (SRTA), Todd Tregenza (GHD), a large group of government staff from Caltrans, the City of Redding, and Shasta County, GHD staff, Dan Burden (Blue Zones), Michael Williams (Blue Zones).

Observations & Received Comments:

- The group toured a portion of SR 273 in the downtown Redding area. The walk audit started at Theory Coffee Roasters at the intersection of California Street and Division Street. We walked north along California Street to SR 299, traveled east along SR 299 to Pine Street, traveled south along Pine Street to Tehama Street, traveled west along Tehama Street, north along Market Street, and return to Theory Coffee Roasters.
- At the beginning of our walk audit, we noticed the new two-way cycle track on Division Street. We saw some motorists driving in the cycle track for a very short distance. We measured the travel lanes on Division Street as 11 ft wide.
- At the intersection of Eureka Way and California Street, we estimated the corner radius at the southwest corner as 48 ft while the southeast corner had only a 15 ft corner radius. Discussion was had about the benefits of smaller Corner radii and the options available to street designers to accommodate larger vehicles while maintaining small corner radii for small vehicles.
- At the intersection of Eureka Way and Market Street, we noticed a missing crosswalk on the northern leg of that intersection. Discussion was had about the number of conflicts created by omission of crosswalks on legs of intersections.
- At the intersection of Eureka Way and Pine Street, we observed a planter placed between the sidewalk in the parking lot and the mature sycamore trees in Red Oak in that area. Discussion was had about the importance of shade, separation of the sidewalk from parking lots and streets, and the atmosphere created by the presence of a mature canopy.
- At the intersection of Pine and Shasta Streets, we all noted the noise levels created by the traffic and the accelerating vehicles, we noted the presence of plentiful shade, we talked about the possibilities for traffic signal equipment control boxes being used for maps or public art, and we

discussed the advantages and disadvantages of the dual right turn lanes leading from Shasta Street to Pine Street for westbound drivers. Further discussion was had here about the issues of leading pedestrian intervals and the importance of synchronized signals to motorist mobility. This provoked discussion of a clash of values, notably those of providing mobility to motorists versus those of creating a pleasant and walkable downtown.

- At the intersection of Pine and Tehama Streets, we noticed a long, continuous awning along Tehama Street. The clear benefit of the shade and the enclosure was discussed. The three sidewalk zones were described. The five factors that help create a vital downtown were discussed: being seen, enclosure, complexity, imageability, human scale.
- At the Tehama and Market Streets intersection, we observed the three left-hand turn lanes leading from Market Street to Tehama Street. Dan Norris of Caltrans stated that there were approximately 21,000 vehicles per day counted on Tehama Street. The number of vehicles turning and accelerating made for high noise levels. A notable contrast was seen along Market Street south of Tehama Street.
- At the intersection of Shasta Street and Market Street, we observed the presence of bulb outs, talked more about the importance of small corner radii, and the options of using aprons to create tight radii for most vehicles but allow for turning movements of larger vehicles.

During the end-of-audit debrief, we heard:

- Mentions of the importance of shade, the high levels of noise experienced, the importance of the five factors to create a great downtown, the amount of truck traffic and the size of those trucks, the fact that pedestrians need to be hyper aware in this setting, the incidence of speeding by motorists, the fact that people disappear from this downtown area after 5:00 p.m., the soon-to-be-built two-way cycle track on California Street, and the public backlash around that facility.

Interactive Map Comments

ID	Type	Comment	Primary Themes	Sub-themes	Sentiment
1	Ideas and Suggestions	Why is this street blocked most of the way in this section? Ove never seen a blockade in the middle of a street...If we could move the blockade over at least a little I could get my mobility scooter through this street, make my commute to work and home not as long, and I wouldn't need to go out of my way to 273 instead. This is the difference between it taking me 45 to get to work to 25. Please help if you can. Doesn't seem fair that only walker can get through but big mobility scooters can't.	Multimodal Transportation	Access/Blocked Roads; Accessibility; Pedestrian Paths	NEGATIVE
2	Ideas and Suggestions	Unblocking this street would create a less high trafficked and safer 273. Everyone not looking for a fast highway can go all the way through this street instead of detouring to 273 just for this section of the street. This causes unnecessary traffic on 273 especially things too big to go through the blockade like mobility scooters that don't need to be there because it's actually out of the way and making their already long commute longer and is a less safe route.	Roadway	Access/Blocked Roads Accessibility; Congestion; Pedestrian	NEGATIVE
3	Ideas and Suggestions	Why is this section blocked off?	Roadway	Access/Blocked Roads	NEGATIVE
4	Ideas and Suggestions	Very busy intersection. We have used it daily for 33 years. It has pot holes and is very unattrMultimodal. Some trees or landscaping would be nice on the eastern edge of it. Also, transients cross this busy intersection to get to and from the Jack in the Box area and back over the railroad tracks, maybe a fence could block them as it's very dangerous.	Placemaking	Pedestrian; Placemaking	NEGATIVE
5	Ideas and Suggestions	Clear Creek Wastewater Treatment Plant could be a source for drought proof reclaimed water for landscaping and beautification of the corridor.	Placemaking	Placemaking	NEUTRAL
6	Ideas and Suggestions	Continuation of bike line on court street to MLK park and Mercy Medical Ctr	Multimodal Transportation	Bicycle Lanes/Paths	NEGATIVE
7	Ideas and Suggestions	Maybe an amphitheater/park area to hold bigger events and draw more people to the area! Like movies in the park and concerts!	Placemaking	Placemaking	NEGATIVE
8	Ideas and Suggestions	Eliminate outside 3rd lanes and convert to parking. Install Class IV bike lanes in current parking with hard median between bike lane and parking, whether landscaped, storm drain improvement, or both.	Multimodal Transportation	Bicycle Lanes/Paths	NEUTRAL
9	Ideas and Suggestions	Widen bridge to add Class I, multiuse paths on both sides of bridge. Connect these with Sacramento River Trail.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths; Recreation	POSITIVE
10	Ideas and Suggestions	Elevate railroad tracks over S. Bonnyview Road.	Freight	Freight	POSITIVE
11	Ideas and Suggestions	Very inconvenient to have this blocked. Why? It relieves traffic on 273	Roadway	Access/Blocked Roads; Congestion	POSITIVE
12	Ideas and Suggestions	Agreed that this street being open relieves 273 traffic congestion	Roadway	Access/Blocked Roads; Congestion	NEUTRAL
13	Ideas and Suggestions	Eliminate the jump for the railroad track and Widen the railroad crossing.	Freight	Freight; Roadway	NEGATIVE
14	Ideas and Suggestions	Eliminate the hump.	Freight	Freight; Roadway	POSITIVE
15	Ideas and Suggestions	Straighten curves and change northbound speed approaching the curve.	Roadway	Straighten Curves	NEUTRAL
16	Ideas and Suggestions	Pushing through a connection here to Sundial bridge would allow people working downtown to cross the 44 bridge via rivertrail without travelling on busy roads.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths; Recreation	NEUTRAL
17	Ideas and Suggestions	upgrade all traffic lights in downtown to be sensitive to bicycle traffic. I'm tired of having to get up on curb to press pedestrian crossing button.	Multimodal Transportation	Bicycle Crossings; Traffic Control	NEUTRAL
18	Ideas and Suggestions	Could the two separate Eastside Roads link up to become one Eastside road that the bikeway could be placed on?	Multimodal Transportation	Bicycling Lanes/Paths	NEUTRAL
19	Ideas and Suggestions	Create elevated crossing for bikes and pedestrians so they can access Eastside and Westside roads while avoiding highway and railroad crossings. Incorporate vegetation for aesthetics, cooling, and shade OR create a solar panel roof over the walkway to power part of the 273 corridor while shading the walkway.	Multimodal Transportation	Bicycle Lanes/Paths; Landscaping; Pedestrian Paths; Shade/C	NEUTRAL
20	Ideas and Suggestions	Construct roundabout(s) to promote lower driving speeds on Eastside Road. This would disrupt the straight alignment of Eastside, which may reduce temptation for some drivers to use as a high speed frontage road. Traffic delays would be minimal if installed at relatively small intersections.	Traffic Calming	Roadway; Traffic Calming; Traffic Control	POSITIVE
21	Ideas and Suggestions	Between Highway 273 and Westside Road there is a strip of unpaved surface where a power line exists. Use this to make a bike & pedestrian pathway. Plant shade trees to make the corridor safer, more aesthetic, and significantly cooler on hot summer days. Install bike racks and benches under shaded areas. Include lighted crosswalks across intersections.	Multimodal Transportation	Bicycle Lanes/Paths; Landscaping; Pedestrian Paths; Shade/C	NEGATIVE
22	Ideas and Suggestions	Improve bus stop here. 1) Add secure bike racks so people can bike from nearby neighborhoods to bus stop and then continue commute to Redding on bus. 2) Designate this small parking lot as a Park & Ride for commuters between Anderson/Tehama County and Redding. 3) Improve shade structure to make it more appealing, safer in summertime.	Transit	Bicycling; Placemaking; Transit	MIXED
23	Ideas and Suggestions	Improve RABA bus stop here. Add secure bike racks so people can bike from nearby neighborhoods to bus stop and then continue commute to Redding/Anderson on bus. Improve shade structure to make it more appealing, safer in summertime.	Transit	Transit; Bicycling; Placemaking	NEUTRAL
24	Ideas and Suggestions	Improve sidewalk in Anderson between South Street and Walmart/Gateway Shopping Center to provide pedestrian access to stores, bus stops	Multimodal Transportation	Pedestrian Paths; Transit	NEUTRAL
25	Ideas and Suggestions	Convert part of Barney Road to a designated bike and pedestrian trail. This could link pedestrian access throughout Anderson, since Barney provides connectivity between South Street and the bike path that starts near Pinon Avenue. As part of this, add an illuminated crosswalk to the Pinon Avenue x 273 intersection.	Multimodal Transportation	Bicycling Lanes/Paths; Pedestrian Paths; Pedestrian Crossings	POSITIVE
26	Ideas and Suggestions	Grants might be available for this from CA Department of Water Resources https://water.ca.gov/work-with-us/grants-and-loans	Funding and Programs	Funding and Programs	NEGATIVE
27	Ideas and Suggestions	Grants could be available for this from CA Department of Water Resources https://water.ca.gov/work-with-us/grants-and-loans	Funding and Programs	Funding and Programs	NEGATIVE
28	Ideas and Suggestions	https://water.ca.gov/work-with-us/grants-and-loans	Funding and Programs	Funding and Programs	NEUTRAL
29	Ideas and Suggestions	https://water.ca.gov/work-with-us/grants-and-loans	Funding and Programs	Funding and Programs	NEUTRAL
30	Ideas and Suggestions	Add a separate pedestrian walkway on the north bound lanes just like the one installed on the south bound lanes. There are several homeless people going back and forth.	Multimodal Transportation	Pedestrian Paths	NEGATIVE

31	Ideas and Suggestions	Not homeless. Bums and Junkies. Till crime is punishable in California we will waste working people tax dollars on serving and enabling bums and junkies.	Funding and Programs	Funding and Programs	NEUTRAL
32	Ideas and Suggestions	Not homeless. Bums and Junkies. Till crime is punishable in California we will waste working people tax dollars on serving and enabling bums and junkies.	Funding and Programs	Funding and Programs	NEGATIVE
33	Ideas and Suggestions	Bums and junkies make driving in this area very dangerous. Criminalize crime again in California and pit tide who steal, deal and use drugs, burglarize and Rob in prison. Get them off the streets. Stop wasting taxpayer dollars to enable bad behaviors.	Funding and Programs	Funding and Programs	NEUTRAL
34	Ideas and Suggestions	100% agree! I moved to Anderson recently and it was odd to me that the bike path does not continue into the "downtown" part of Anderson.	Multimodal Transportation	Bicycle Lanes/Paths	NEGATIVE
35	Ideas and Suggestions	The idea of a park-and-ride isn't terrible, but I think it would only be useful if the RABA Anderson Commuter service was more like a bus rapid transit service with frequent service.	Transit	Transit	NEGATIVE
36	Ideas and Suggestions	Honestly, a protected, separated walk/bike way would be great because I always noticed not just homeless people but also people trying to walk to the bus stops on 273 that unfortunately have to walk on the shoulder of a very busy road.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths; Transit	NEUTRAL
37	Ideas and Suggestions	1000% agree with this comment. It would be great to help provide shade to this area for not just the summer months, but even spring and fall when it heats up pretty quickly as well. Native trees and plants would be even better to improve the biodiversity in our area.	Placemaking	Placemaking	NEUTRAL
38	Ideas and Suggestions	Totally concur with a connection to the river trail. I believe the river trail has great potential for an increase in use for leisure and commuter trips if it is better connected to other walking/bike infrastructure.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths	POSITIVE
39	Ideas and Suggestions	I agree. Over the years, there were several semis that got stuck (high centered) on that hump. A collision between a train and a semi truck transporting a large Caterpillar tractor took place on 10/4/23. Breslauer Way is still closed almost a week later due to the extensive damage to the railroad arm control equipment.	Freight	Freight; Roadway	NEGATIVE
40	Ideas and Suggestions	Reopen the left turn from Branstetter Lane on to SR 273 northbound lane. The northbound auto traffic is now using Westside Rd from Branstetter to Kenyon to get on SR 273	Roadway	Turn Lanes	NEUTRAL
41	Ideas and Suggestions	Create elevated crossing for bikes and pedestrians so they can access bus stops while avoiding highway and railroad crossings. Incorporate vegetation for aesthetics, cooling, and shade AND/OR create a solar panel roof over the walkway to power part of the 273 corridor while shading the walkway.	Multimodal Transportation	Bicycle Crossings; Landscaping; Pedestrian Crossings; Shade	MIXED
42	Ideas and Suggestions	Create a left turn lane here so people can go straight through without waiting for a signal to clear traffic.	Traffic Control	Turning	MIXED
43	Ideas and Suggestions	Need different access to freeway rather then Bonnieview or Riverside. This would take thousands of vehicles off bonnieview and 273	Roadway	Access/Blocked Roads	NEUTRAL
44	Ideas and Suggestions	Need a access point over the tracks to 273 right here	Freight	Acccess; Freight; Roadway	NEUTRAL
45	Ideas and Suggestions	The whole stretch between downtown and the casino looks like 1950's industrial gone seedy. It needs a serious overhaul with landscaping, bike paths & walking paths as well as safety improvements. 273 does not have enough space for roundabouts, but Westside and Eastside have some intersections where small ones could be included. Trains: Maybe some intersections (I'm thinking about Girvan and S. Bonnyview) could have lowered tracks so cars don't have to stop for the train.	Placemaking	Bicycling; Freight; Pedestrian; Placemaking; Traffic Control	NEUTRAL
46	Ideas and Suggestions	One-way streets (especially 3 lane one-ways) in downtown urban areas provide a speedway for drivers to go too fast, making them unsafe for pedestrians and cyclists. They also unequally distribute economic activity (this is pretty clear when one looks at this part of Market St vs Pine St to the east. Make Market St and Pine St 2-way traffic. Easy, effective way to naturally calm traffic speeds.	Traffic Calming	Traffic Calming	NEUTRAL
47	Ideas and Suggestions	One-way streets (especially 3 lane one-ways) in downtown urban areas provide a speedway for drivers to go too fast, making them unsafe for pedestrians and cyclists. They also unequally distribute economic activity (this is pretty clear when one looks at this part of Market St vs Pine St to the east. Make Market St and Pine St 2-way traffic. Easy, effective way to naturally calm traffic speeds.	Traffic Calming	Traffic Calming	NEUTRAL
48	Ideas and Suggestions	Why do we have to have traffic lights at every intersection on Pine and Market? Smaller intersections like Pine and Yuba could just be stop signs. Traffic lights cost taxpayers tens of thousands of dollars to install and maintain! And they aren't necessary everywhere. Save money, be smarter.	Traffic Control	Traffic Signal	NEUTRAL
49	Ideas and Suggestions	The Fall River Brewery off of Eastside Rd has become a very popular spot (I love going there), but the crossing here is terrible. I ride my bike down Buenaventura and the bike lane here (which does not feel very safe with cars going 50+ past you).	Multimodal Transportation	Bicycle Crossings	NEUTRAL
50	Ideas and Suggestions	The "complete streets" program was evaluated by the City several years ago for Cypress which would reduce lanes here. Is this program being used in design planning for 273 and related high volume intersections/streets that feed 273?	Traffic Calming	Traffic Calming	NEUTRAL
51	Ideas and Suggestions	Move the bus stops off busy 273. Not safe to access them.	Transit	Transit	NEUTRAL
52	Ideas and Suggestions	Suggest a reimagined 273/Eastside road that utilizes Eastside road with pedestrian/cycle class 1 lane. This would provide a good separation from traffic on 273 (which is a state highway) and peds/bikes. This could run the entire length from the city to Girvan. There will need to be installation of ped/bike overpass locations (as we see in Davis and other cities) at critical intersections as ped/vehicle conflicts will not be resolved with lights/lanes here.	Multimodal Transportation	Bicycle Lanes/Paths; Bicycle Crossings; Pedestrian Paths; Ped	NEUTRAL
53	Ideas and Suggestions	With the volume of people on the Westside of 273, there should be two pedestrian/bike paths. One on westside road and one on Eastside road as it would be very difficult to channel people across 273 at multiple locations. Perhaps sending peds/bikes to common crossing points would utilize money better and provide for a more cohesive infrastructure that could be maintained more efficiently and would provide quicker learning by the motorists.	Multimodal Transportation	Bicycle Lanes/Paths; Bicycle Crossings; Pedestrian Paths; Ped	NEUTRAL
54	Ideas and Suggestions	RABA bus stops are on ongoing issue. While I understand they are on the public highway, they accept and dispense people along a very busy highway that requires them to cross the highway. There needs to be some thought about removing or relocating the bus stops in this edition of 273.	Transit	Transit	NEUTRAL

55	Ideas and Suggestions	How about relocating the RABA stops to the casino? This would reduce foot traffic crossings on 273	Transit	Transit; Pedestrian	NEUTRAL
56	Ideas and Suggestions	Yes!! I have thought of this. We can do this envision 273!	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths; Pedestrian Crossings	NEUTRAL
57	Ideas and Suggestions	Probably not because the recycling center in in the way. But I think that Eastside could curve around and meet girvan in that field. Then it would be Eastside/ Girvan Rd until Eastside joins up again.	Roadway	Access/Blocked Roads	POSITIVE
58	Ideas and Suggestions	Why!? They just did a big project flattening the railroad tracks on girvan	Freight	Freight	NEGATIVE
59	Ideas and Suggestions	I agree with it having bad aesthetics But all you would have to do is weed The place regularly and clean up the trash from those who are walking across that area, better Yet bring those people who are walking around on our streets littering to clean up their own mess daily if they want to stay in our city.	Placemaking	Placemaking	NEGATIVE
60	Ideas and Suggestions	I travel this corridor and adjacent streets everyday aND many NIGHTs. Walkers and bikers are very careless no bright clothes, no helmets . Maybe simples solution is to put up white posts every 4 feet. mAJOR hwy way work is not necessary - taxes accomADATING unsafe behavior.	Multimodal Transportation	Bicyclist and Pedestrian Behavior	NEGATIVE
61	Ideas and Suggestions	Adjust the timing/coordination between lights for different trips from Eureka Way besides going through downtown. Right now it seems that Shasta and Tehama are timed to provide preference to people commuting from 44 to Mercy Hospital or the courts, which is still needed. Yet it would be good to see other movements included. Coming Eastbound on Eureka Way its faster to go Eureka Way, Market, Shasta, California, Gold, and Market to get to Cypress despite how windy and convoluted that route is.	Traffic Control	Traffic Signal	NEUTRAL
62	Ideas and Suggestions	Encourage trucks to use Buenaventura to access I-5 rather than through downtown with all it's tight turns and narrow streets.	Traffic Calming	Freight; Traffic Calming	NEGATIVE
63	Ideas and Suggestions	There was a study long ago about elevating this entire intersection above the RR tracks to alleviate waiting for trains. This would look very out of place here. Instead, it would be better to change the elevations of the tracks, or maybe change both the track and road elevation (split the difference) so the impact isn't as noticeable.	Freight	Freight	NEGATIVE
64	Ideas and Suggestions	Punch Happy Valley Rd across the river to Knighton Rd. This would allow more direct access for people in Happy Valley and would help alleviate traffic on Canyon Road and South Bonnyview Road.	Roadway	Access/Blocked Roads; Congestion	NEUTRAL
65	Ideas and Suggestions	Can we repave California St? It's so rough!	Roadway	Maintenance	NEGATIVE
66	Ideas and Suggestions	The city and Caltrans should have worked together to repave Eastside. The city did not pave bike lanes. They painted Bike Lane is what is unrideable on the South bound side. 273 is unsuitable for bikes from Cypress south. Too many businesses with traffic turning and entering. We use Eastside to Breslauer. Then Westside since there is less traffic. The bike path from Cedar to Westwood needs to be improved. There needs to be a clear path from Westside Rd Glengary across Clear Creek Rd.	Multimodal Transportation	Bicycle Lanes/Paths	NEGATIVE
67	Ideas and Suggestions	Traffic gets hectic here with the people turning right to get on 44. It'd be nice if there was a better route of some sort?	Roadway	Congestion; Turn Lanes	NEGATIVE
68	Ideas and Suggestions	We need a lot more street lights all along 273 from Buenaventura to Anderson.	Placemaking	Lighting	POSITIVE
69	Ideas and Suggestions	Better signage for trucks who are getting into the left lane to make the right turn onto Market Street. Drivers can not tell that the right lane goes into the center and right lanes after the turn until after they have committed to the left lane.	Traffic Control	Signage	MIXED
70	Ideas and Suggestions	Long straight empty roads encourages higher speeds for traffic often making them ignore speed limits, a simple solutions to this would be a install chicanes along the route (narrow road with slight curves back and forth). This would decrease drivers speed and encourage them to be more attentive, thus making the roadway safer for not only other drivers but cyclist and pedestrians too. Picture is for example but would need to be scaled up for the faster speed limit of 273.	Traffic Calming	Traffic Calming	NEUTRAL
71	Make a Comment	Can't wait to check out how this will help people that bike scooter, walk, and wheel around in other ways. This is seriously lacking here. It's sad. Downtown and beyond is full of non existent sidewalks, sideways sidewalks that are impossible to wheel on, potholed sidewalks, and heavily cracked that also make it difficult. Having some smooth level sidewalks would make so many peoples commutes less long and less unsafe. wheel chairs etc are very hard to commute on without smooth level sidewalks.	Multimodal Transportation	Accessibility; Pedestrian Paths	POSITIVE
72	Make a Comment	Are you planning on moving the train tracks? It's difficult to imagine south 273 being anything more than industrial buildings and transient camps due to the fact that most customer centric businesses don't want to be near them. From the rescue mission to Branstetter is a very good example of this. What will be done to address this?	Freight	Freight	POSITIVE
73	Make a Comment	Way too many highways, intersections, highway congesting a small area in Downtown.	Roadway	Congestion	POSITIVE
74	Make a Comment	It would be spectacular to use some of this right of way for a protected (separate from the highway) path for use by cyclists, scooters, pedestrians, etc. What a lovely way to connect the downtown areas of Anderson and Redding to each other and to the areas in between. Emphasis, however, on separate and protected from the highway. We will always need the light industrial infrastructure in this area, and walking/cycling/wheelchairing near the heavy trucks is terrifying. Lets find a way to share!	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths	POSITIVE
75	Make a Comment	The proposal for a roundabout here is a great idea!	Traffic Control	Roundabout	NEUTRAL
76	Make a Comment	Southside Park could be a great starting point for a bike or walking path to Anderson. It could also provide bike or walking access to the several open spaces and parks along the way. Imagine being able to get around this area without needing a car!	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths; Recreation	NEGATIVE
77	Make a Comment	The 273-Buenaventura intersection would be a good location for a pedestrian overpass	Multimodal Transportation	Pedestrian Crossings	NEUTRAL
78	Make a Comment	Need to decrease the number of one-way streets and reduce the number of lanes. Pine Street is 3 lanes, 40 feet wide, and if all the lights are green it is essentially a speedway. The same can be said for numerous other stroads in the area. The bike lane on Pine is completely unsafe as a result. Can we make this two-way and devote more area to physically separated Multimodal transportation infrastructure please?	Multimodal Transportation	Bicycle Lanes/paths, Traffic Calming	NEGATIVE
79	Make a Comment	A roundabout would be perfect for this location. Please make sure it includes safe entry and exit points for pedestrians and bikes.	Traffic Control	Bicycle Crossings; Pedestrias Crossings; Roundabout	NEUTRAL
80	Make a Comment	Worried about wheelchair crossings at Breslauer.	Multimodal Transportation	Accessibility; Pedestrian Crossings	NEUTRAL
81	Make a Comment	Would like improved crossing at Latona Road.	Multimodal Transportation	Pedestrian Crossings	POSITIVE

82	Make a Comment	Would like improved crossings at the Rancheria/Canyon Road.	Multimodal Transportation	Pedestrian Crossings	NEUTRAL
83	Make a Comment	Prefers perpendicular curb ramps to diagonals.	Multimodal Transportation	Accessibility; Pedestrian Crossings	NEUTRAL
84	Make a Comment	Bury the railroad in a tunnel, widen westside and eastside roads. Turn former 273 right of way into green space.	Freight	Freight; Placemaking; Roadway	NEGATIVE
85	Make a Comment	Dangerous sharp turns that cars speed through.	Traffic Calming	Roadway; Traffic Calming	NEGATIVE
86	Make a Comment	Please widen the intersection and add a signal. Number of cars using this intersection has outgrown the design and made it dangerous at all hours.	Traffic Control	Traffic Signal	POSITIVE
87	Make a Comment	Put a pedestrian Bridge here over the railroad track and 273 for safe passage to shopping for the neighborhood.	Multimodal Transportation	Pedestrian Crossings	NEUTRAL
88	Make a Comment	This undercrossing is extremely dangerous and improvement should be considered. Get railroad on board early to widen span so that a separate ped/bike lane can be accommodated.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths	NEGATIVE
89	Make a Comment	Perhaps another idea would be to leave Pine Street as is, but close nearby streets to through-traffic, effectively making them bike/ped corridors. Concentrate the cars in one area and the bikes/peds in another.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths; Traffic Calming	NEUTRAL
90	Make a Comment	Another access point from 273 to Eastside would be great for the thousands of homes in the Sacramento Dr neighborhoods	Roadway	Access/Blocked Roads	NEUTRAL
91	Make a Comment	Roundabouts are not a universal solution for all intersection. They are a nightmare for bikers and pedestrians	Traffic Control	Roundabout	POSITIVE
92	Make a Comment	I have seen almost three auto accidents due to this new "improvement" while merging into this underground bridge passing. Not a great idea, should have come up with something else. It seems this plan was a quick fix and should've been done after more planning and more funds were available.	Roadway	Collisions	MIXED
93	Make a Comment	three "almost" accidents during the initial days of a new traffic pattern isn't exactly novel. many people have died at this undercrossing over the years. give the new traffic pattern some time, people will get used to it. Plenty of occurrences of 2 lanes safely reducing to 1 throughout Redding and many other cities.	Roadway	Collisions	NEGATIVE
94	Make a Comment	New crosswalks and/or curb ramps should be installed at this corner now that the SB lane has been taken beneath the railroad crossing. Ideally it would be easy for bikes/peds to get to eastside and/or westside roads OR have a dedicated bike lane along shoulder of SB 273.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Crossings	NEGATIVE
95	Make a Comment	Between Highway 273 and Westside Road there is a strip of unpaved surface where a power line exists. Use this to make a bike & pedestrian pathway. Plant shade trees to make the corridor safer, more aesthetic, and significantly cooler on hot summer days. Install bike racks and benches under shaded areas.	Multimodal Transportation	Bicycle Lanes/Paths; Bicycle Parking Landscaping; Pedestrian	MIXED
96	Make a Comment	Grants for recycling water for urban use could be available from CA Department of Water Resources, and I am sure there are other state/federal sources. https://water.ca.gov/work-with-us/grants-and-loans	Funding and Programs	Funding and Programs	POSITIVE
97	Make a Comment	This stop sign leading to the traffic light causes back ups. Also, the limit line at the light feels very close to highway traffic	Traffic Control	Congestion; Traffic Signal	NEGATIVE
98	Make a Comment	I understand the concerns, but closing a whole lane to cars for pedestrians was a huge problem as 273 already become so congested during the week. I use this road daily and rarely see pedestrians on it, maybe 5 since this implementation. I hope this is a temporary fix until something better can be done.	Roadway	Congestion; Lane Closure; Pedestrians Paths	NEUTRAL
99	Make a Comment	Instead of taking away an entire lane for pedestrians, can't a pedestrian bridge be created on the Eastside of the road?	Multimodal Transportation	Pedestrian Crossings	NEUTRAL
100	Make a Comment	I commute daily on 273 between Kenyon Dr and Angelo Ave. Not once have I seen a pedestrian or a bicyclist using the newly designated bike lane under the railroad tracks. Blocking an entire lane of a major highway in Redding for a handful of potential users is a terrible idea. Widening the highway and redoing the undercrossing should be considered as the best solution for the needs of the bicyclists and pedestrians. It also looks like tens of cars have ran over the white divider posts…	Roadway	Bicyclists; Lane Closure	NEGATIVE
101	Make a Comment	Several years ago the left turn from Branstetter unto 273 northbound was closed due to a couple of fatal accidents. Unfortunately, the drivers that want to go North are now taking Westside to Kenyon and then turn left on 273 northbound. Same risks of crossing the 273 southbound lanes as at Branstetter but Caltrans kicked the can up the road to the next intersection. Also, the diverted traffic due to the closure of the left turn Branstetter is causing the extra wear/tear of Westside, a city road.	Roadway	Collisions; Congestion	NEGATIVE
102	Make a Comment	Have there been any studies to see how many pedestrians and bicyclists are using the newly designated lane that was assigned to them? A traffic camera installed under the railroad bridge can easily help with that. Another camera near Wyndham could be used to count how many cars ran over the white plastic posts that separate the two lanes.	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths	NEGATIVE
103	Make a Comment	To add, maybe a green space that doubles as a part of a dedicated protected pedestrian/bike path separate from 273 that runs from Anderson to Redding. I think giving people the opportunity and option to travel between Redding and Anderson by bike or on foot would be a great addition to our location community.	Multimodal Transportation	Bicycle Lanes/Paths; Landscaping Pedestrian Paths;	NEGATIVE
104	Make a Comment	Love this! It would be amazing for there to be a mixed-use protected path for travel to and from Redding to Anderson. I strongly believe it would be used on a regular basis year-round because of the weather we have here!	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths	MIXED
105	Make a Comment	The railroad crossing at Breslauer Way and 273 has seen quite a few accidents where the trais hit semi-trucks high centered on the tracks. The last accident from 10/4/2023 closed the access to Breslauer Way for days due to the significant damage to the railroad crossing arm controls. Please fix the ramp off of SR 273 to Breslauer Way in order to prevent the semi-trucks from getting high centered on the tracks.	Freight	Freight	NEUTRAL
106	Make a Comment	Vehicles turning right (southbound) from Quartz on to Market St do not yield for cyclists who have green light/right of way who are turning left (southbound) from traveled Way. I cycle here every morning and its a 50/50 shot that a vehicle will cut me off	Multimodal Transportation	Bicycle Crossings	NEGATIVE
107	Make a Comment	Lots of pedestrian traffic from bus stop towards casino and homeless camp under the bridge. They often j-walk to save time making it very precarious for them and drivers who don't expect pedestrians outside of the intersections. Especially at night.	Multimodal Transportation	Bicyclist and Pedestrian Behavior	POSITIVE

108	Make a Comment	Better street lights between Westwood & Happy Valley Road would be helpful so pedestrians are easier to spot at night.	Multimodal Transportation	Lighting	POSITIVE
109	Make a Comment	Better pedestrian trails or a paved path would help to keep pedestrians safe and away from fast moving traffic.	Multimodal Transportation	Pedestrian Paths	NEGATIVE
110	Make a Comment	Additional street parking to access shops.	Placemaking	Economy; Parking	NEGATIVE
111	Make a Comment	This bottle-neck is dangerous. An elementary school, two neighborhoods, an entire shopping hub, and a church use ONE access point. Peak hours cause backup onto 273. One uncontrolled fire in the surrounding vegetation, causing an emergent evacuation, would be chaos. There needs to be another access/exit point for Westwood.	Roadway	Congestion; Evacuation	MIXED
112	Make a Comment	Wouldn't just a paved pathway be sufficient? Like any sidewalk that crosses the tracks at an intersection.	Multimodal Transportation	Pedestrian Paths	NEGATIVE
113	Make a Comment	When traveling southbound it is really easy to run up on people turning onto Sacramento Dr because most people turn on Star drive. Suggestion is either widen the road and provide turn lane or make it so you can't turn left onto Sacramento from Eastside.	Traffic Control	Turning	NEGATIVE
114	Make a Comment	Why is it "No Turn on Red" here anyway?	Traffic Control	Traffic Signal; Turning	MIXED
115	Make a Comment	Clear Creek Road is ROUGH and needs to be repaved up past the all the asphalt and concrete businesses (for about three miles).	Roadway	Maintenance	NEGATIVE
116	Make a Comment	The entire 273 corridor should be more appealing and inviting to walkers and bikers. Landscaping, signage, lighting, wide sidewalks, consistent bike lanes, safe connections to trails for bikers and pedestrians.	Multimodal Transportation	Bicycle Lanes/Paths; Landscaping; Pedestrian Paths; Recreati	NEUTRAL
117	Make a Comment	The roundabout at costco is a mess. I avoid it constantly. Going anywhere else if i can or leaving and entering costco a different way if possible. Regular lights are MUCH safer in my opinion and several others I have talked to. I would not want more roundabouts in Redding.	Traffic Control	Roundabout; Traffic Signal	NEGATIVE
118	Make a Comment	I avoid roundabouts at all costs, they are a nightmare for many reasons!,	Traffic Control	Roundabout	NEGATIVE
119	Make a Comment	I drive this every day. I've only seen one pedestrian in the area - He was walking on the top of the K line wall in the middle of all lanes. NOT the new access lane provided for them. This lane reduction was stupid and accomplished nothing.	Roadway	Lane Reduction; Pedestrian Paths	NEUTRAL
120	Make a Comment	I lived in Europe for a few years and have a preference for roundabouts. They are safer and more efficient; but have unfortunately been designed incorrectly in many areas in the US. The Costco roundabout is sadly an example of a poor roundabout. Signage and driver education is important thought too..	Traffic Control	Funding and Programs; Signage; Roundabout	MIXED
121	Make a Comment	needs more lighting at night	Placemaking	Placemaking	NEUTRAL
122	Make a Comment	I get what the lane was taken away under the railroad. I feel like it is more dangerous going past the gas stations now. I have seen road rage of people trying to get ahead before the lane ends. I have seen accidents when people hit the car in front of them. I understand there needing a safe place for people walking but it still not safe. People walking in that lane still walk all the way over on the edge of the road.	Roadway	Bicycle Lanes/Paths; Collisions; Pedestrian/Paths	NEUTRAL
123	Make a Comment	There has to be a better answer for this area! I hate driving home every. I barely see anyone use this area and when I do they are on the side of the road and not in the lane provided. This one lane area is stupid! There has to be a better way. Maybe open the area during high traffic times and have set hours it is used for a bike lane. My understanding for the change had to do with the Multimodal bike community redding has that go to the town hall meeting advocating for this lane closure.	Roadway	Bicycle Lanes/Paths; Lane Reduction	NEGATIVE
124	Make a Comment	Intersection improvements. Anytime there is an event at the fairgrounds, or the fairgrounds is used as a command post by CalFire, there in increased traffic at this intersection, often resulting in back-ups and congestion. Maybe a dedicated turnlane for S/B traffic onto W/B Briggs. Now there is no right turn permitted on a red light because of intersection with frontage road that also ties into this intersection.	Traffic Control	Congestion; Turning	NEUTRAL
125	Make a Comment	I've been nearly struck by a vehicle so many times. Would love to see a traffic light or at least a flashing crosswalk here.	Traffic Control	Collisions; Traffic Signal; Pedestrian Crossings	NEUTRAL
126	Make a Comment	Left turn lane is a solution. Those of us that live on this end of Sacramento Dr don't want to go to Star. Pay attention and/or slow down. Reduce the speed on eastside might cut down on the the north bound traffic from 273 that is avoiding the lights on 273 and avoiding the right turn on S Bonneyview (all the morning UPS trucks as an example). People drive 50+ mph on wayside now. Stops signs or speed bumps would sort that out	Traffic Calming	Traffic Calming; Traffic Control	POSITIVE
127	Make a Comment	The comment below opining that traffic lights are safer than roundabouts is patently false. The Insurance Institute for Highway Safety (among a ton of broad traffic research) shows that roundabouts actually reduce traffic collisions. This would be a good spot for a roundabout.	Traffic Control	Roundabout	NEUTRAL
128	Make a Comment	Definitely need flashing yellow walk signs and/or mid-street sign reminding drivers it is the law to stop for pedestrians.	Multimodal Transportation	Pedestrian Crossings	NEUTRAL
129	Make a Comment	Closing cross streets seems like a cool idea on its face, but in the US it just doesn't work very well unless you have a lot of pedestrian activity already, which Redding does not. Calming traffic where it is too fast and unsafe should be the priority.	Traffic Calming	Pedestrian; Roadway; Traffic Calming	NEGATIVE
130	Make a Comment	I imagine this whole mess here will change during this process and whatever takes its place needs to have bike lanes. I cycle down Market St on my route to work and it feels pretty unsafe with cars whizzing by at 45 mph. It doesn't matter what the speed limit is if the road was designed to let drivers drive 45+.	Multimodal Transportation	Bicycle Lanes/Paths; Traffic Calming	NEGATIVE
131	Make a Comment	Some people DO actually use this lane for cycling, myself included, but I can tell you no one feels at all safe using it. It's not hard to understand why it doesn't get more use - the barriers are cheap plastic that provide only visual "protection" while cars zip by at 50+ mph, and there is no good bike infrastructure to the north or south of this lane. Calm traffic speeds and created physically separated cycling infrastructure from Eureka to Buenaventura? Branstetter? Bonnyview?	Multimodal Transportation	Bicycle Lanes/Paths;	NEGATIVE

132	Make a Comment	This corridor was designed like a freeway. It is 125 feet across, one-way, and three lanes with devoted turn lanes…is it a mystery why there is no pedestrian activity and the economic activity that comes with it? It's not a place for people. This could (and should) literally be 2-way, 2-lane (1 lane each direction) street with center turn lane and on-street parking. You could make bike lanes with the removed lanes. Lets make this corridor economically viable and pleasant please.	Roadway	Bicycle Lanes/Paths; Economy; Traffic Calming	NEGATIVE
133	Make a Comment	Move the bus stops off of 273. It is unsafe to have people walking across the railroad track and highway to access bus stops. This area is too heavily traveled to have bus stops on a highway.	Transit	Pedestrian; Transit	MIXED
134	Make a Comment	I agree with the majority here that the conversion of one of the east bound lanes to a pedestrian lane has made it far more dangerous for vehicles traveling east. Road races occur as one approaches the merge point. In addition this will be a bottleneck nightmare during an evacuation for a major fire.Why not acrosswalk at the junction of 273 and Buenaventura with bike pedestrian path running parallel to 273 west that goes up over tracks and onward. With caution signs at tracks. 5 trainsvs100scars	Roadway	Evacuation; Pedestrian Paths; Traffic Calming;	NEGATIVE
135	Make a Comment	Allow turn on red using green arrow synchronized with other lights. There becomes a back up on red lights into 273 at times.	Traffic Control	Congestion; Turning	NEUTRAL
136	Make a Comment	Allow turn on red with green arrow to indicate safe time in coordination with other traffic.	Traffic Control	Turning	NEGATIVE
137	Make a Comment	100%agree	Multimodal Transportation	Lighting	NEGATIVE
138	Make a Comment	I drive this home every day at 5pm and it is a cluster. I don't know how there is not more accidents. They merge the lane right at the signal where lots of people are turning left! Everyone is slamming on their brakes. I've just learned to stay way back from everyone, so I don't get in an accident. Someone did not think this out...	Roadway	Collisions	NEGATIVE
139	Make a Comment	This intersection always makes me feel like there could be a wreck here if someone was not easily paying attention.	Traffic Control	Collisions	NEUTRAL
140	Make a Comment	The bike lane that was put up on 273 just before the bridge that took our 2nd driving lane is continually empty. Give us bank or lane please. It's about 300 cars to an Occasional walker.	Multimodal Transportation	Bicycle Lanes/Paths	MIXED
141	Make a Comment	I drive through this intersection almost twice per day, and I've never felt unsafe. I don't understand why Caltrans wants to block this off. And the public meeting about it (2024may29) isn't posted on the envision273.org website, almost like they were trying to hide something.	Traffic Control	Access/Blocked Roads	NEUTRAL
142	Make a Comment	cant turn left - star blends ino scramento - first left goes north	Traffic Control	Turning	NEGATIVE
143	Make a Comment	Do not remove this intersection	Traffic Control	Access/Blocked Roads	NEUTRAL
144	Make a Comment	Do not remove this intersection	Traffic Control	Access/Blocked Roads	NEUTRAL
145	Make a Comment	I know it's not fully Caltrans, but time signals to encourage more traffic to use Court and Tehama rather than Placer and Pine to get to 44 would help alleviate traffic on Pine. This ideally would allow traffic counts to drop so a lane could be removed allowing for buffer space between parking and travel lanes, provide a wider bike lane, and provide dual right turns for northbound Pine onto Tehama/44.	Traffic Control	Bicycle Lanes/Paths; Traffic Signal	NEUTRAL
146	Make a Comment	Have a connection from Glengary Dr to Clear Creek Road to provide secondary access to the Westwood area.	Roadway	Access/Blocked Roads	NEGATIVE
147	Make a Comment	There is a "no turn on red" for Northbound 273 for two reasons. 1st is so cars don't try to cross when a train is coming and the gates are coming down. 2nd is to allow traffic waiting at the stop sign on Girvan a chance to get to the light. A stop sign for Eastbound traffic on Girvan can't be placed here as traffic would backup onto the RR crossing. Without some form of stop there is an unbroken stream of traffic from 273 continuing up Eastside road hindering Girvan road traffic from moving.	Traffic Control	Congestion; Turning	POSITIVE
148	Make a Comment	This bike lane here is awful. It slows down traffic all the way back to eat express as now generally people are hesitant to use the right lane.	Roadway	Bicycle Lanes/Paths; Congestion	NEGATIVE
149	Make a Comment	The more roundabouts the better. They're efficient, safer and less antiquated than traffic lights. I also LOVE the roundabout at Costco!!!	Traffic Control	Roundabout	NEGATIVE
150	Make a Comment	Please alow for better walking and bicycle path ect. But do it without more light pollution between Canyon road and. Ox Yoke rd we don't need more light pollution and near Canyon rd and Happy Vally rd maybe put a walking bridge over it to end the pedestrian crossing accidents without adding a ton of lights and could add a couple at the street crossing areas on south from there	Multimodal Transportation	Bicycle Lanes/Paths; Lighting; Pedestrian Paths; Pedestrian C	MIXED
151	Make a Comment	The traffic light here is not responding to bikes. Modern bikes are mostly Carbon fiber and may not contain enough metal to trip the sensor. In both directions crossing 273 the pedestrian button in dangerous to get too from the stop line. We have had 4 bikes on the square and still can't get a light.	Multimodal Transportation	Bicycle Crossings; Traffic Control	NEGATIVE
152	Make a Comment	I'll second this. Traffic moves at 65mph. Many are distracted. Too much debris causing flats. There is no good alternative to get from Redding to Anderson. Churn Creek Bottom has no shoulder. Airport traffic is heavy and fast. Much of it with no shoulder.	Roadway	Congestion; Traffic Calming	NEGATIVE
153	Make a Comment	What will this cost and how much and who will fit the bill???	Funding and Programs	Funding and Programs	NEGATIVE
154	Make a Comment	A bike lane and sidewalk should be added from Caterpillar Rd to Lake Blvd and from lake Blvd to Quartz Hill Rd, this would allow walking and biking access to those staying at any of the hotels on Caterpillar, to stores, restaurants and Waterworks on Lake Blvd and to Caldwell Park on Quartz Hill.	Multimodal Transportation	Access; Bicycle Lanes/Paths; Pedestrian Paths	NEUTRAL
155	Make a Comment	Lake Blvd should have better bike lanes and sidewalk for encouraging those who live in the surrounding neighborhood to walk and bike rather than drive to the nearby stores.	Multimodal Transportation	Bicycle Lanes/Paths; Access; Pedestrian Paths	NEUTRAL
156	Make a Comment	Ox Yoke/Riverside would benefit from having a bike lane and sidewalk installed especially over the highway as the bridge forces bikes and pedestrians into traffic.	Multimodal Transportation	Bicycle Lanes/Paths; Bicycle Crossings; Pedestrian Paths; Ped	NEGATIVE
157	Make a Comment	Making pedestrian crossing for neighborhoods along 273 would encourage more bike and walking usage along the route reducing the traffic.	Multimodal Transportation	Bicycle Crossings; Pedestrian Crossings	NEUTRAL
158	Make a Comment	At any crossing the road should narrow by adding Curb Extensions to reduce traffic speed before the crossing and include light posts for better Pedestrian visibility and a Pedestrian island.	Multimodal Transportation	Pedestrian Crossings; Traffic Calming	NEGATIVE
159	Make a Comment	This lane was made to accommodate vehicle traffic. To accommodate bicycle traffic on 273 add a short bypass connecting 273 to Railroad Ave.	Multimodal Transportation	Bicycle Lanes/Paths	NEUTRAL

160	Something I Like	Best roundabout in the area by far. Large and easy to navigate. Any proposed roundabouts should be modeled after this one. City of Redding's roundabouts are too small which make them hard to navigate.	Traffic Control	Roundabout	NEUTRAL
161	Something I Like	The aesthetics of landscaping and water feature are nice here. Retain these and plant more trees along the Hwy 273 corridor.	Placemaking	Placemaking	NEUTRAL
162	Something I Like	Only if they are something other than palm trees. We don't need to look like southern CA....Hilltop Drive!	Placemaking	Placemaking	NEUTRAL
163	Something I Like	More trees and landscaping would be a great look and enhancement...maybe a park or two on the way into Redding or Anderson, additional street lighting along the corridor would be good for the seniors for safety at night. Smart Deco or attrMultimodal fencing along the highway would also keep more animals off the hit list. Cameras to monitor any out of the way activity for security and safety for citizens.	Placemaking	Placemaking	NEUTRAL

Ideas Wall Comments

ID	Type	Comment	Up Votes	Down Votes	Primary Themes	Sub-themes	Sentiment
1	Ideas and Suggestions	A bike lane the entire length of the corridor would be a plus to the City. I believe this was suggested a while back and the suggestion said there would be a protective barrier of some kind to protect bikers from traffic.	11	1	Multimodal Transportation	Bicycle Lanes/Paths	MIXED
2	Ideas and Suggestions	Long term, 273 would be a great mass transit corridor between Anderson and Redding. A Bus Rapid Transit (BRT) system with bus only lanes could be beneficial, whether in the median or on the shoulders. Currently, 273 does not likely have the density to support a BRT system, but as development continues, and density increases along the corridor, a BRT system may help mobility and commuters into the downtowns.	6	1	Transit	Transit	POSITIVE
3	Ideas and Suggestions	More landscaping, trees/shade, and general beautification of the corridor is desperately needed. Consider using reclaimed water from Clear Creek Wastewater Treatment Plant along 273 to provide greenery even during drought years. This reclaimed water system could potentially be utilized by nearby developments as well.	13	2	Placemaking	Environment; Landscaping	NEUTRAL
4	Ideas and Suggestions	Class I or Class IV bike lanes are needed along the length of 273. These generate the most ridership. Very few people, especially in Redding and Anderson, are comfortable in Class II or Class III bike lanes. This can also serve as a backbone for bike facilities to branch off from.	9	2	Multimodal Transportation	Bicycle Lanes/Paths	NEUTRAL
5	Ideas and Suggestions	Yes, yes, yes to the protected bicycle/walking/wheelchair path! Also: a pedestrian overpass or SOME sort of safe way to cross the corridor for bikes, pedestrians or wheelchairs.	8	2	Multimodal Transportation	Accessibility; Bicycle Crossings; Pedestrian Crossings	NEUTRAL
6	Ideas and Suggestions	Maybe starpaths along 273 would encourage more people to use them! A Starpath is a spray-on coating that can be used on any solid surface and works by absorbing UV rays during the day and then expelling them at night. A lot of cities are doing this now and it's cost effective! (There are more pictures online but it can be painted straightforward as shown or more artistically)	18	1	Multimodal Transportation	Beautification; Bicycle Lanes/paths; Pedestrian Paths; Shade/Cooling;	POSITIVE
7	Ideas and Suggestions	Solar powered bike/scooter stations/depots would be nice!	7	5	Multimodal Transportation	Bicycle Amenities	NEUTRAL
8	Ideas and Suggestions	We need some more art installations in general but maybe we can get some artistic bike racks!	4	6	Placemaking	Placemaking	MIXED
9	Ideas and Suggestions	I think a major re-envisioning of the intersection at Cypress & 273 is a must. The vehicle turn going north from 273 directly on to Cypress is unnecessary. It encourages vehicles to go faster through that area and is a blind turn where it's unsafe for pedestrians to cross and get to the park. This intersection is not safe because it's confusing for people driving, which leads to people running lights and not paying attention to pedestrians and bicycles.	3	1	Roadway	Pedestrian; Traffic Calming; Traffic Control	NEGATIVE
10	Ideas and Suggestions	The sidewalk along 273 adjacent to South City Park is not wide enough for more than 1 person at a time. I have seen many people in wheelchairs needing to wait for other people coming the opposite direction to either step off of the sidewalk to let them pass or go into the little cut out section where you used to be able to walk down to the park. That passageway is gated now.	3	1	Multimodal Transportation	Accessibility; Pedestrian Paths	NEUTRAL
11	Ideas and Suggestions	Bulb outs are needed at every intersection in Downtown Redding.	3	3	Multimodal Transportation	Pedestrian Crossings; Traffic Calming	MIXED
12	Ideas and Suggestions	I would like to support the idea to continue pedestrian and bike lane from Court St. to 273 via Railroad Ave. I agree this route is used by many and is currently not safe. For those coming off the bottom of the Blue Gravel Mine Trail ; this would create a safe return route to Downtown.	7	1	Multimodal Transportation	Bicycling Lanes/Paths; Pedestrian Paths	NEGATIVE
13	Ideas and Suggestions	Happy Valley Road connects to 273 and has a high amount of bicycle traffic, but the road is rather narrow and has many blind turns. It may encourage use of the 273 corridor if Happy Valley Road was widened/straightened.	2	2	Roadway	Bicycling; Roadway	MIXED
14	Ideas and Suggestions	This is a stretch and would take a lot of cooperation, but what if the path went alongside the railway in places? If the rail could be diverted somewhat, the old railway could be used as a bikeway. Perhaps grant funding related to railway/infrastructure improvements could pay for doing this.	4	4	Freight	Bicycling; Freight; Fundging and Programs	POSITIVE
15	Ideas and Suggestions	Regarding transit, what about catenary transit system from Redding to Anderson.	2	1	Transit	Transit	NEUTRAL
16	Ideas and Suggestions	I walk Railroad Ave every day, it becomes 273. There are chock points and abandoned house and growth on the corners. These obstructions force me to walk out in the street	3	2	Multimodal Transportation	Pedestrian Paths	NEUTRAL
17	Ideas and Suggestions	More access points from the Westwood and Girvan neighborhoods to 273. Jewel Lane neighborhood residents should be able to get to Cedars Road without needing to go through the Westwood light and then the Bonnyview crossing. Star Drive neighborhood residents shouldn't have to go up to the Bonnyview crossing or down to the Girvan crossing just to get to the pharmacy, grocery store, and school right across the way. It creates traffic at Bonnyview and 273 and creates a bottleneck at Westwood.	5	3	Roadway	Access; Congestion	NEUTRAL
18	Ideas and Suggestions	273 needs street lights. It gets very dark and you cannot see pedestrians until you are right up on them. Very dangerous and scary.	3	0	Placemaking	Placemaking; Safety	NEUTRAL
19	Ideas and Suggestions	Teach the homeless people to use the sidewalks and crosswalks. Keep them out of the road and you've solved the problem.	2	3	Multimodal Transportation	Bicyclist and Pedestrian Behavior	MIXED
20	Make a Comment	A couple of things jump right out at me. First, The language sustainability and resiliency and compatibility between land use and corridor design sound a lot like the language used in United Nations Agenda 21/2030 sustainable development goals. The second thing that makes me suspicious is the mention of being able to compete for federal and state grant funds. Who is funding the grants? Again, is it tied to UN agenda 21/2030? The public has a right to know this and it's implications.	1	14	Funding and Programs	Funding and Programs	NEGATIVE
21	Make a Comment	A SEPARATED BIKEWAY along the entire route is required. The SRTA board should also reopen planning for the Salmon Runner Bus to Sacramento/Vacaville. The route should begin at the 273/I5 interchange, exactly where the "Envision 273" local route ends. https://www.srta.ca.gov/DocumentCenter/View/4099/North-State-Intercity-Bus-System-Business-Plan-June-2018 Car-less travel all the way from Sacramento, to and from the station and throughout the region, using passenger owned and rental bikes.	4	0	Multimodal Transportation	Bicycle Lanes/Paths; Transit	MIXED
22	Make a Comment	A separated path from Redding to Anderson is desperately needed. I don't think it needs to be on 273, as the route is noisy and unattractive. Let's utilize side streets (and develop class IV facilities) or the ACID Canal as much as possible and fill in with separated paths where needed. I am an avid cyclist but nothing appeals to me about riding 273 in a separate bike path along the road way.	7	2	Multimodal Transportation	Bicycle Lane/Paths	MIXED

23	Make a Comment	Would like to see signal lights replaced with roundabouts in many locations. This would slow down the corridor and prevent fatalities that have happened at many intersections (difficult to come to a stop at a red light when you are going 65 mph). More lighting along the corridor is needed. Beautify the corridor.	13	4	Traffic Control	Placemaking; Safety; Traffic Calming; Traffic Control;	NEGATIVE
24	Make a Comment	Please provide pedestrian/bicyclist counts in this plan. I have lived in downtown Redding for 12 years and can barely recall individuals who actually use their bike for transportation. The few bicyclists I do see in Redding do it for recreation up in the trails or in city parks. I am not entirely sure why there is such a large push for bike lanes/bike facilities around 273 when no one even bikes around there. There are many pedestrians around 273 though.	7	6	Multimodal Transportation	Bicycle Lanes/Paths; Bicyclist and Pedestrian Behavior	MIXED
25	Make a Comment	I regularly commute from China Gulch to Redding via 273. Traffic management on 273 is marginal. The speed limit is 55 mph to 60 mph. However, traffic along 273 is often in perpetual stop and go mode being stopped by lights for one or two cars on the side streets. How is that environmentally friendly? Can some traffic light synchronization be planned like downtown Redding has?	10	1	Traffic Control	Congestion; Environment; Traffic Control	MIXED
26	Make a Comment	Redding has been pushing ebikes through incentives and rebates. Planning around 273 should be in line with that effort including security for the rather expensive ebikes given the very real theft concerns.	6	2	Multimodal Transportation	Bicycle Amenities	POSITIVE
27	Make a Comment	To the person in the comments asking why the push for bike lanes. Having been a bicycle commuter myself for years I agree there aren't many folks using bikes along the route - or in Redding in general. The reason why is safety in many instances. It is extremely hazardous riding your bike along the corridor. Class 3 ebikes and above push about 30 mph. With $4 to $5 a gallon gas it is a viable option to the car. Our disabled son uses one. Safety is our primary concern.	5	2	Multimodal Transportation	Accessibility; Bicycle Lanes/Paths; Traffic Calming	MIXED
28	Make a Comment	Getting the railroad onboard early to deal with the undercrossing south of The Mission is critical to safe ped/bike movement through that part of the corridor. It seems that no matter the viability of routing people around this bottleneck, there will still be some that use it (often our community members experiencing homelessness and other underrepresented groups). Ideally, a separate bike/ped facility would be installed. This seemingly would necessitate a wider span railroad overcrossing.	2	1	Multimodal Transportation	Bicycle Lanes/Paths; Pedestrian Paths	NEGATIVE
29	Make a Comment	To the person who commented on "Why the push for more bicycle lanes and facilities in Redding"-many people, including me, limit bike riding in town because it's dangerous. Lack of bike lanes, rough and unrepaired roads, and drivers under the influence of drugs and alcohol make for dangerous riding. Bike lanes and routes help mitigate these threats. Want to improve and decrease traffic in town? Make walking and biking more accessible.	8	5	Multimodal Transportation	Bicycle Lanes/Paths	POSITIVE
30	Make a Comment	I'd like to see some measures to reduce vehicle traffic speed along 273 to the north and (especially) south of Cypress Ave. Vehicles go way too fast south of the 273 and Cypress Ave intersection. We also need a crosswalk at the corner of 273 and Lincoln St. It's a popular coffee shop and there's no safe way to cross 273 from Lincoln.	8	6	Traffic Calming	Pedestrian; Traffic Calming	NEUTRAL
31	Make a Comment	Make the path so that the rider feels comfortable, even on the hottest days. Shade. Cooling areas. Color of pavement. Something. The Redding area is ripe for bicycling due to how few days of the year have rainy/icy/snowy conditions. The problem is that a good portion of those days might be considered to be unrideable due to the incredible heat for 2-3 months of the year.	6	3	Placemaking	Bicycling; Environment	MIXED
32	Make a Comment	Bike lanes in Redding seem to be underserved by street sweepers. Plenty of things are puncturing our tires. Some obstacles have not been swept up for months! If there is a 273 corridor, please allocate some budget to keep it clean from puncture-causing debris.	8	5	Multimodal Transportation	Maintenance	POSITIVE
33	Make a Comment	The idea of closing an entire South bound lane going under the train trusses is absurd...build a walk/bike bridge to go over the tracks if crossing the train tracks is the issue...I have two businesses south of that area off Girvan road and I have clients that complain about that all the time especially around 5pm...not sure who's bright idea that was but it certainly wasn't thought through...go back to the drawing board and build a walk bridge and open the lane back up...motorists pay way more	6	8	Roadway	Bicycling; Freight; Pedestrian; Roadway	NEGATIVE
34	Make a Comment	I live off the Girvan area, and the North State Recycling and Win-River make it such a high transit and dumping area. Regardless, homeless are going to be in these areas. It would be helpful to have benches with shade or something for them while they wait for recycling. It's such a high traffic area full of people walking and bike riding. But no lanes for bikers/walkers.	8	2	Placemaking	Placemaking	NEUTRAL
35	Make a Comment	Encountering pedestrians along the 273 at night is terrifying (speaking as a driver). Most of them are wearing black and they are very difficult to see until you're right beside them. Better lighting and a designated walking trail particularly in the higher speed areas would put both pedestrian and drivers minds at ease. Safer and well-lit pedestrian crossings would be wonderful too though high traffic speeds make tradition cross-walks difficult as cars will need to stop too quickly.	6	1	Multimodal Transportation	Bicyclist and Pedestrian Behavior; Lighting; Pedestrian Crossings; Pedestrian Paths; Traffic Calming	NEGATIVE
36	Make a Comment	Some beautiful landscaping along the 273 between Westwood and the Anderson Fair Grounds would help to elevate the overall feel of that stretch & make it more appealing for commuters and home owners who frequent that stretch. Some grants or incentives for business owners to improve on their store fronts and property appearances would be nice as well. Many structures along this stretch appear to be abandoned & it would be nice to see them demo'd so the land can be re-purposed with something new.	4	2	Placemaking	Beautification; Placemaking	NEGATIVE
37	Make a Comment	There needs to be more street lights between Redding Rancheria Rd where Win-River is and Spring Gulch. That whole stretch is so hard to see at night. I also saw someone comment that there should be crosswalks for pedestrians and I 100% agree. People will cross 273 nonchalantly which is super dangerous especially at night. Also there have been many wrecks and accidents by Spring Gulch Rd and people who run the light. I've almost been hit multiple times turning left onto Spring Gulch.	2	0	Roadway	Lighting; Pedestrian; Safety	NEUTRAL
38	Make a Comment	I have an ebike and love riding it for pleasure and would use it to commute to work if there was a safe route, but currently there is not a safe way. We live near downtown Redding and getting to the River Trail safely is challenging. We drove around and studied maps until we found a circuitous route through the downtown area that felt safe to take to get to the River Trail. I believe this is why we do not see many people using the bike lanes in the car heavy roadways, it doesn't feel safe.	4	0	Multimodal Transportation	Bicycle Lanes/Paths	NEGATIVE
39	Make a Comment	significant safety issue is pedestrian-auto accidents during night/poor weather periods.	2	0	Multimodal Transportation	Collisions	POSITIVE

40	Make a Comment	Put in bike paths because it seems to be a popular idea. But please solve this homeless issue. They are the ones using bikes the most right now. And, either walking or riding they are the ones who I've had to break for as they walk right out into traffic to cross the road, just a few yards from a crosswalk. They are not in their right mind. I'm afraid this effort is just a way to handle homless people rather than sincerely improving our community. By all means let's improve this corridor.	1	0	Multimodal Transportation	Bicycle Lanes/Paths; Bicyclist and Pedestrian Behavior	MIXED
41	Make a Comment	Drivers should be able to make a right turn on red from South Bonneyview onto 273. For many years we were allowed to do that. Traffic is backed up waiting for the green light causing congestion and increasing pollution. I call BS on Caltrans that is unsafe, have them show you the data.	0	0	Traffic Control	Traffic Control	NEGATIVE
42	Make a Comment	Please coordinate the timing of stoplights from South Bonneyview to Canyon Road; these lights are not coordinated and I have seen too many vehicles run red lights due to this lack of coordination.	0	0	Traffic Control	Traffic Control	NEGATIVE
43	Make a Comment	It would be beneficial to have an indicator sign for train delays on South Bonneyview prior to the intersection with Eastside Road so that drivers can make choices earlier on for alternate routes.	2	0	Traffic Control	Traffic Control	NEUTRAL

Public Input Survey Responses

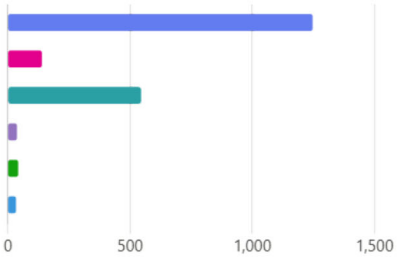
Responses Overview

Closed

Responses	Average Time	Duration
1312	08:27	314 Days

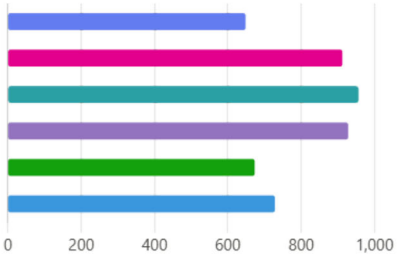
1. I am a _____ in Shasta County. *Select all that apply.*

Resident	1245
Business Owner	137
Property Owner	543
Commerical Truck Driver	35
Student	40
Other	31



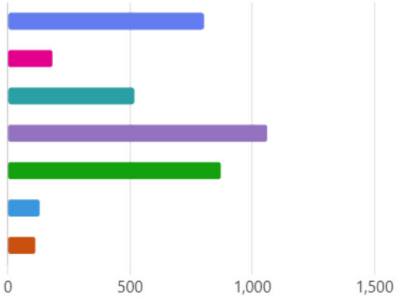
2. What portions of SR 273 do you use regularly. *Select all that apply.*

Miracle Mile (North Market Street, north of Downtown Redding)	647
Downtown Redding (California Street, Pine Street)	911
South Market Street (Cypress to Buenaventura)	955
South Redding (Buenaventura to Rancheria)	927
County Segment (Rancheria to County Fairgrounds)	672
Anderson (County Fairgrounds to Outlet Malls/Walmart)	727



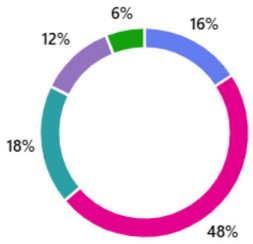
3. What types of trips do you typically utilize SR 273 for? *Select all that apply.*

Work	801
School	180
Medical	516
Groceries/Errands	1059
Recreation (parks, restaurants, entertainment, etc.)	869
Place of worship	128
Other	110



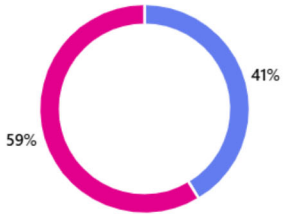
4. Would you support improved crossing locations on SR 273? (particularly outside of downtown Redding / Anderson)

Yes, it would make me feel safer crossing the road	205
Yes, it would make me feel safer as a driver	625
No	240
No opinion	152
I don't know	78



5. Would you use a paved trail between Redding and Anderson?

Yes	536
No	759



6. Explain your answer to the question above.

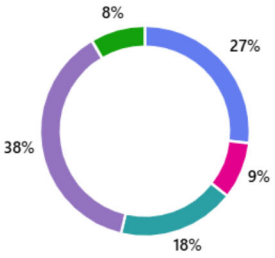
1049
Responses

Latest Responses
"Safe way to ride my bike"

242 respondents (23%) answered Bike for this question.

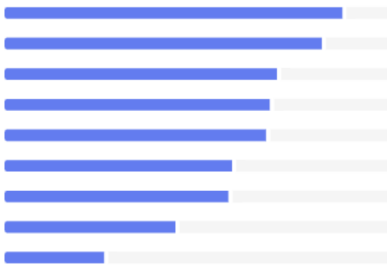
7. Would you support improved bus (transit) service on SR 273? (more frequent and reliable)

Yes, it would take other cars off the road	349
Yes, I would use it if it were more convenient	114
No	236
No opinion	493
I don't know	110

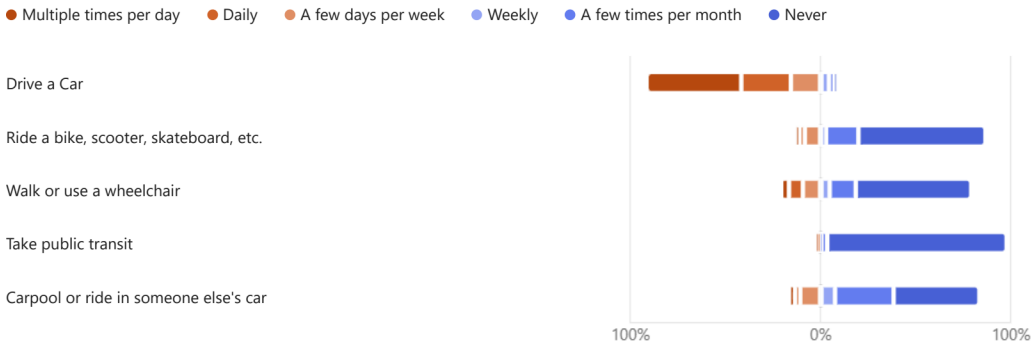


8. How would you prioritize changes to SR 273? *Rank options from most to least important by dragging each option or using the arrows to the right.*

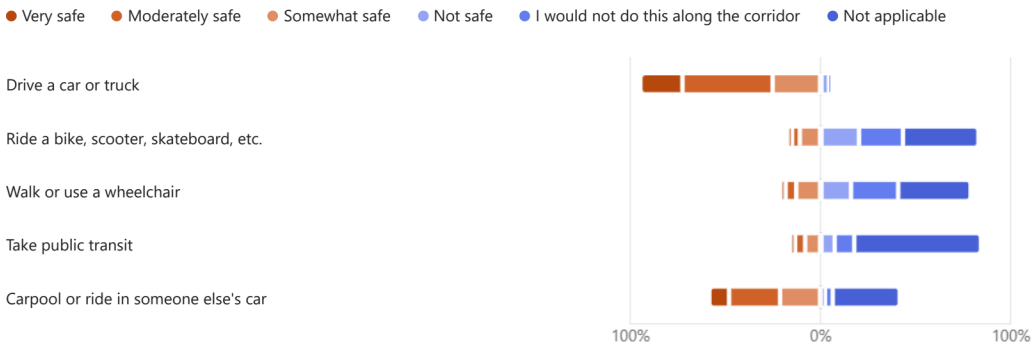
1	Modifying intersections to reduce crash risks (lighting, visibility, signs)
2	Adding / improving sidewalks in downtown Redding and Anderson
3	Adding / improving bike lanes in downtown Redding and Anderson
4	Expanding trail system between Redding, Anderson, and existing trails
5	Improving the appearance of the corridor (landscaping, street design)
6	Improving access to bus stops (sidewalks, crosswalks)
7	Reducing travel time for trucks and cars
8	Narrowing lanes or road width to calm traffic
9	Other



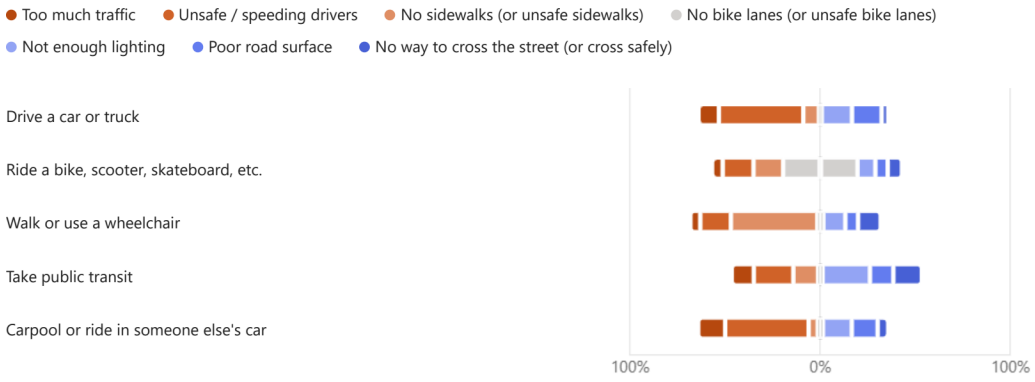
9. On this segment, how often do you _____? *Select all that apply.*



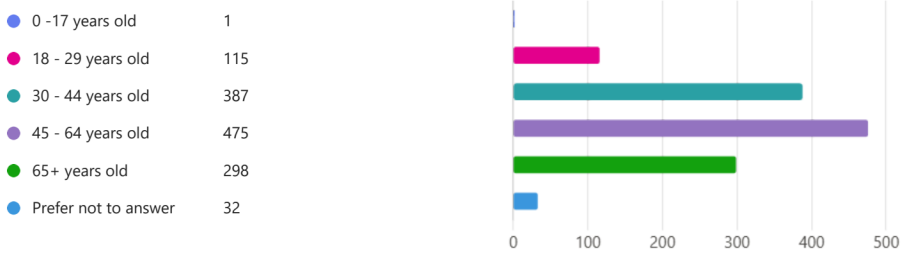
10. On this segment, how safe do you feel when you _____? *Select all that apply.*



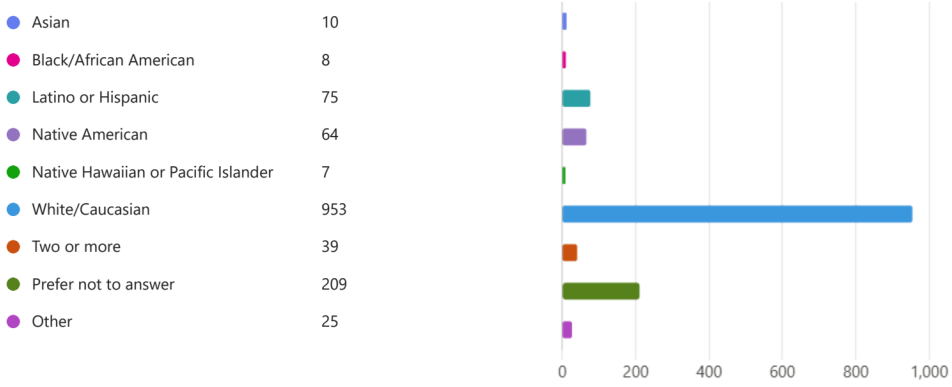
11. If you answered, 'Somewhat unsafe' or 'Not safe,' on the prior question, what makes you feel unsafe? *Select the main reason you feel uns afe.*



12. What is your age?



13. Please select the race/ethnicity with which you identify. *Select all that apply.*



14. Zip code

1294
Responses

Latest Responses
"96001"
"96001"
"96007"
...

559 respondents (43%) answered 96001 for this question.

15. Thank you for your interest in the SR 273 Multimodal Corridor Plan. Please enter your email. Your contact information will not be shared and will be used to ensure only one response is submitted per person.

1019
Responses

Latest Responses
"birdcentral365@gmail.com"
"Bestbuddygorilla@gmail.com"
...

2 respondents (0%) answered highway for this question.

Appendix E.

Planned and Programmed Projects

Table E-1: Planned and Programmed Projects

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
1	Arterial	City of Redding 2016 Downtown Redding Community Based Transportation Plan	Redding	Vehicular Action Plan	Downtown Redding	Road Diet: Shasta St (Court St to Pine St) and South St (Court St to East St) Signal Timing: Coordinate for Less than 25 MPH Improve Cypress Ave / Pine St / Market St Intersection (Additional Study Required): Modern Roundabout	Operations & Reliability	Road Diet: $2,250,000 Signal Timing: No capital cost Improve Cypress Ave / Pine St / Market St Intersection (Additional Study Required): $ 4,000,000	Not Listed
2	Arterial	City of Redding 2022-2027 CIP	Redding	Westside Rd Bridge over Canyon Hollow Creek	Westside Rd Bridge	Replace the bridge on Westside Rd over Canyon Hollow Creek.	Operations & Reliability	$3,900,000.00	2023-2024
3	Arterial	City of Redding 2022-2027 CIP	Redding	Eastside Rd Bridge over Canyon Hollow Creek	Eastside Rd Bridge	Replace the bridge on Eastside Rd over Canyon Hollow Creek.	Operations & Reliability	$3,865,000.00	2023-2024
4	Arterial	City of Redding 2022-2027 CIP	Redding	Eastside Rd Bridge over Olney Creek	Eastside Rd Bridge	Replace the bridge on Eastside Road over Olney Creek.	Operations & Reliability	$4,655,676.00	2022-2023
5	Arterial	SRTA 2022 RTP	Redding	Railroad Ave (Sheridan St to Grandview Ave) - Widening (including class II bike lanes)	Railroad Ave	Railroad Ave (Sheridan St to Grandview Ave) - Widening (including class II bike lanes)	Operations & Reliability	$2,308,000.00	2033-2042
6	Arterial	SRTA 2022 RTP	Redding	Westside Rd (Glengary Dr to Clear Creek Rd) - Extension	Westside Rd	Westside Rd (Glengary Dr to Clear Creek Rd) - Extension	Operations & Reliability	$1,669,000.00	2033-2042
7	Arterial	SRTA 2022 RTP	Redding	Cedars Rd (El Reno Ln to Buenaventura Blvd) - Extension	Cedars Rd	Cedars Rd (El Reno Ln to Buenaventura Blvd) - Extension	Operations & Reliability	$1,152,000.00	2033-2042
8	Arterial	SRTA 2022 RTP	Redding	Eastside Rd (Girvan Rd to Southern City Limits) - Extension	Eastside Rd	Eastside Rd (Girvan Rd to Southern City Limits) - Extension	Operations & Reliability	$7,232,000.00	2033-2042
9	Arterial	SRTA 2022 RTP	Redding	George Dr (North Terminus to Oasis Rd) - Extension	George Dr	George Dr (North Terminus to Oasis Rd) - Extension	Operations & Reliability	$1,280,000.00	2033-2042
10	Freight	SRTA 2022 RTP	Redding	South St Railroad Crossing - Grade Separation	South St	South St Railroad Crossing - Grade Separation	Operations & Reliability	$12,097,000.00	2033-2042
11	Arterial	SRTA 2022 RTP	Anderson	East St (North of Willow Glen Dr) - Extension	East St	East St (North of Willow Glen Dr) - Extension	Operations & Reliability	$2,128,000.00	2033-2042
12	Arterial	SRTA 2022 RTP	Anderson	Rhonda Rd (Factory Outlets Dr to Pleasant Hills) - Intersection Reconstruction	Rhonda Rd	Rhonda Rd (Factory Outlets Dr to Pleasant Hills) - Intersection Reconstruction	Operations & Reliability	$2,927,000.00	2033-2042
13	Arterial	SRTA 2022 RTP	Anderson	Anderson Hills Pkwy (Rhonda Rd to Locust St) - Construct 4 lane road	Anderson Hills Pkwy	Anderson Hills Pkwy (Rhonda Rd to Locust St) - Construct 4 lane road	Operations & Reliability	$3,404,000.00	2033-2042
14	Arterial	SRTA 2022 RTP	Anderson	South St (SR 273 west to City Limits) - Widening	South St	South St (SR 273 west to City Limits) - Widening	Operations & Reliability	$4,800,000.00	2033-2042
15	Arterial	SRTA 2022 RTP	Anderson	Fairgrounds Dr (1st St to 3rd St) - Widening	Fairgrounds Dr	Fairgrounds Dr (1st St to 3rd St) - Widening	Operations & Reliability	$1,408,000.00	2033-2042
16	Arterial	SRTA 2022 RTP	Anderson	3rd Street (SR 273 to Fairgrounds Dr) - Widening	3rd St	3rd Street (SR 273 to Fairgrounds Dr) - Widening	Operations & Reliability	$2,304,000.00	2033-2042
17	Arterial	SRTA 2022 RTP	Anderson	SR 273 @ North St - Intersection Improvements	SR 273/North St	SR 273 @ North St - Intersection Improvements	Safety	$1,500,000.00	2022-2032

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
18	Arterial	SRTA 2022 RTP	Anderson	SR 273 @ South St - Intersection Improvements	SR 273/South St	SR 273 @ South St - Intersection Improvements	Safety	$1,920,000.00	2033-2042
19	Arterial	SRTA 2022 RTP	Shasta County	Whitehouse Dr @ ACID Canal - Replace Bridge	Whitehouse Dr/ACID Canal	Whitehouse Dr @ ACID Canal - Replace Bridge	Operations & Reliability	$456,049.00	2022-2032
20	Arterial	SRTA 2022 RTP	Redding	State Bridge # 06C0070, Westside Rd @ Oregon Gulch - Bridge Rehabilitation	Westside Rd/Oregon Gulch	State Bridge # 06C0070, Westside Rd @ Oregon Gulch - Bridge Rehabilitation	Operations & Reliability	$1,379,000.00	2033-2042
21	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Safety Fences CCEP	SR 44	Install Fencing. In Construction Phase. EA: 3J650. Route 44. Post Miles R0.70/R1.20. Program: State. Project Manager: Molz, Kerry A	Safety	$1,321,001.00	8/22/2023 - 6/24/2024
22	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Safety Fences CCEP	SR 273	Install Fencing. In Construction Phase. EA: 3J650. Route 273. Post Miles 17.04/17.09. Program: State. Project Manager: Molz, Kerry A	Safety	$13,201,004.00	8/22/2023 - 6/24/2024
23	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Lake Blvd Pavement	SR 273	Pavement Rehabilitation. In Construction Phase. EA: 4H050. Post Miles 18.50/18.70. Program: SHOPP. Project Manager: Timmons, Kelly B.	Operations & Reliability	$34,720,000.00	12/19/2023 - 12/9/2024
24	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Westside Closure (Westside at Breslauer Improvements)	SR 273	Improvements. In Project Development Phase. EA: 0K820. Post Miles 0.00/0.00. Program: MINOR-A. Project Manager: Molz, Kerry A.	Mobility & Connectivity	$1,250,000.00	9/30/2027 - 1/13/2028
25	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Buena Wyndam Lighting	SR 273	Pedestrian and Bicycle Lighting. In Project Development Phase. EA: 0K800. Post Miles 14.47/15.00. Program: MINOR-A. Project Manager: Molz, Kerry A.	Safety	$1,250,000.00	10/31/2031 - 12/3/2035
26	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	SR 273 MMBN 16.833/20.03	SR 273	Install Broadband. In Project Development Phase. EA: 4J560. Post Miles 16.83/20.03. Program: LOCAL. Project Manager: Buist, Austin V.	Social Equity	$1,120,000.00	11/28/2024 - 6/30/2026
27	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	SR 273 Median Barrier Safety	SR 273	Safety Improvement. In Planning Phase. EA: 0K210. Post Mile 12.85/14.10. Program: SHOPP. Project Manager: Molz, Kerry A.	Safety	Not Listed	4/6/2027 - 1/20/2028
28	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Downtown Redding CAPM	SR 44	Pavement Preservation. In Planning Phase. EA: 2J600. Post Miles L0.00/L0.54. Program: PLANNING. Project Manager: Timmons, Kelly B.	Operations & Reliability	$63,070.00	9/5/2028 - 1/19/2031
29	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	Downtown Redding CAPM	SR 273	Pavement Preservation. In Planning Phase. EA: 2J600. Post Miles: 14.50/20.03. Program: PLANNING. Project Manager: Timmons, Kelly B.	Operations & Reliability	$63,070.00	9/5/2028 - 1/19/2031

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
30	Highway	Caltrans District 2 Current Projects (https://dot.ca.gov/caltrans-near-me/district-2/d2-projects, Accessed 03/11/24)	Caltrans	NE Redding Multi Modal Connector	SR 299	Construct Bicycle and Pedestrian Path. In Planning Phase. EA: 0K280. Post Miles 25.00/27.20. Program: LOCAL. Project Manager: Timmons, Kelly B.	Mobility & Connectivity	Not Listed	9/9/2031 - 10/10/2035
31	Complete Streets	City of Redding 2018 ATP	Caltrans	Intersection Improvement: W Cypress Ave and Pine St	W Cypress Ave/Pine St	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity; Safety	$312,576.00	2026-2040
32	Complete Streets	City of Redding 2018 ATP	Caltrans	Intersection Improvement: Eureka Way and Walnut Ave	Eureka Way/Walnut Ave	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity	$312,576.00	2026-2040
33	Complete Streets	City of Redding 2018 ATP	Caltrans	Intersection Improvement: SR 273 and Breslauer Way	SR 273/Breslauer Way	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity	$312,576.00	2026-2040
34	Complete Streets	City of Redding 2018 ATP	Caltrans	Intersection Improvement: Sundial Bridge Dr and SR 44	Sundial Bridge Dr/SR 44	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity	$312,576.00	2026-2040
35	Complete Streets	SRTA 2018 GoShasta Regional ATP	Caltrans	Intersection Improvement: SR 273 and South St	SR 273/South St	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity	$94,927.00	2026-2040
36	Complete Streets	SRTA 2018 GoShasta Regional ATP	Caltrans	Intersection Improvement: SR 273 and Factory Outlet Dr	SR 273/Factory Outlet Dr	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity	$94,927.00	2026-2040
37	Complete Streets	SRTA 2018 GoShasta Regional ATP	Caltrans	Intersection Improvement: SR 273 and North St	SR 273/North St	Bicycle and Pedestrian Intersection Improvement	Mobility & Connectivity	$94,927.00	2026-2040
38	Highway	SRTA 2022 RTP	Caltrans	SR 299 (PM 24.1 to 30.3), Lake Blvd Pavement	SR 299, Lake Blvd	Pavement Overlay, Lane Mile(s)	Operations & Reliability	$35,580,000.00	2022-2032
39	Highway	SRTA 2022 RTP	Caltrans	SR 299, Mitigation	SR 299	Mitigation	Operations & Reliability	$1,300,000.00	2022-2032
40	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 4.1 to 5.9), Anderson Quarter Century Signals	SR 273	Signal Replacement	Operations & Reliability	$9,075,000.00	2022-2032
41	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 14.5 to 18.5), Downtown Redding CAPM	SR 273	Pavement Overlay	Operations & Reliability	$52,124,000.00	2022-2032
42	Highway	SRTA 2022 RTP	Caltrans	SR 44 (PM 0.0 to 71.39), Shoulder Widening	SR 44	Widen Shoulders	Operations & Reliability	$26,000,000.00	2033-2042
43	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 17.031), Caltrans D2 Office	SR 273	Facilities - Caltrans District Office	Operations & Reliability	$36,800,000.00	2033-2042
44	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 17.0), Caltrans D2 Redding Materials Lab	SR 273	Facilities - Caltrans Redding Materials Lab	Operations & Reliability	$15,413,000.00	2033-2042
45	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 14.1 to 19.8), Redding Quarter Century Signals	SR 273	Signal Replacement	Operations & Reliability	$8,556,000.00	2033-2042
46	Highway	SRTA 2022 RTP	Caltrans	SR 299 (PM 75.7), Burney Fuel Island Canopy; SR 273 (PM 9.8), Redding Fuel Island Canopy	SR 273, SR 299	Facilities	Operations & Reliability	$3,825,000.00	2033-2042
47	Highway	SRTA 2022 RTP	Caltrans	SR 44, Remove STAA Barriers	SR 44	Remove STAA Barriers	Operations & Reliability	$20,000,000.00	2030-2042
48	Highway	SRTA 2022 RTP	Caltrans	SR 273/SR 299, Redding Signal Upgrades and Synchronization on SR 299 between Lake Blvd and I-5	SR 273/SR 299	Intelligent Transportation Systems	Operations & Reliability	$210,000.00	2022-2032

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
49	Highway	SRTA 2022 RTP	Caltrans	SR 44/SR 299, Shasta County, Connect I-5 Fiber Backbone to the District Office	SR 44/SR299	Intelligent Transportation Systems	Operations & Reliability	$4,482,000.00	2022-2032
50	Highway	SRTA 2022 RTP	Caltrans	SR 44/SR 299, Redding, Redding Local TMS Fiber Spurs	SR 44/SR299	Intelligent Transportation Systems	Operations & Reliability	$1,377,000.00	2022-2032
51	Highway	SRTA 2022 RTP	Caltrans	I-5/SR 273, Redding Northern Redding TMS Fiber	I-5/SR 273	Intelligent Transportation Systems	Operations & Reliability	$345,000.00	2022-2032
52	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 12.68), Bonnyview Rd, 1 CCTV at S. Bonnyview Rd on SR 273	SR 273	Intelligent Transportation Systems	Operations & Reliability	$237,000.00	2022-2032
53	Highway	SRTA 2022 RTP	Caltrans	SR 273, Redding, South Redding TMS Fiber Loop	SR 273	Intelligent Transportation Systems	Operations & Reliability	$54,000.00	2022-2032
54	Highway	SRTA 2022 RTP	Caltrans	SR 273, Redding, Redding Rural TMS	SR 273	Intelligent Transportation Systems	Operations & Reliability	$1,357,000.00	2022-2032
55	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 16.0R to 16.833), Pine Street	SR 273	Intelligent Transportation Systems	Operations & Reliability	$6,600,000.00	2033-2042
56	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 12.0), South Bonnyview Rd, CMS FNBT	SR 273	Intelligent Transportation Systems	Operations & Reliability	$1,024,000.00	2033-2042
57	Highway	SRTA 2022 RTP	Caltrans	SR 273 (PM 13.5), South Bonnyview Rd, CMS FSBT	SR 273	Intelligent Transportation Systems	Operations & Reliability	$1,024,000.00	2033-2042
58	Highway	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Traffic Signals: SR 273	SR 273 (Multiple Locations)	Replace existing traffic signals at 25 intersections.	Operations & Reliability	$63,070,000 (Capital Const--All Projects)	2027/2028
59	Highway	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Culverts: SR 274	SR 273 (Multiple Locations)	Replace 20 culvert segments and repair 4 culvert segments	Sustainability	$63,070,000 (Capital Const--All Projects)	2027/2028
60	Highway	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Bridge: SR 299 (at Bridge No. 06-0035)	SR 299 (at Bridge No. 06-0035) (w/o California St)	Replace 3,115 linear feet of MBGR with MGS with steel posts and install 4 bridge transition anchor blocks on Redding OH Bridge No. 06-0035.	Safety	$63,070,000 (Capital Const--All Projects)	2027/2028
61	Highway	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Crash Cushions: SR 273 (n/o Buenaventura Blvd and s/o Wyndham Ln)	SR 273 (n/o Buenaventura Blvd and s/o Wyndham Ln)	Replace two crash cushions at terminals of existing concrete barriers located n/o Buenaventura Blvd and s/o Wyndham Ln.	Safety	$63,070,000 (Capital Const--All Projects)	2027/2028
62	Highway; Arterial	Caltrans 2023 HSIP Implementation Plan	Caltrans; Redding	Safety Improvements	6 intersections in Redding	4 Focus Areas including 6 Intersections: Continental St/Butte St; Placer St/Continental St; Placer St/East St; Court St/Tehama St; South St/California St; South St/Market St. Provide left turn lanes and left turn protected phasing where none exists at selected intersections. Install striping between intersections to facilitate intersection modifications.	Safety	$890,000.00	Not Listed
63	Transit	City of Redding 2016 Downtown Redding Community Based Transportation Plan	Redding	Transit Action Plan	Downtown Redding	Bus Stop Improvements: Provide Shelters & Seating, and Improve ADA Access & Lighting	Mobility & Connectivity	Bus Stop Improvements: $660,000	Not Listed
64	Transit	RABA 2023 SRTP	Redding	Route 1	SR 273 (N. Redding & Downtown Redding)	Route 1 will be extended to the Downtown Transit Center (via Market St), eliminating service to the Masonic Transit Center. To improve travel times between Downtown Redding and Shasta Lake, service around the Northpoint Dr/Redwood	Operations & Reliability	Not Listed	July 2024 or Later

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
						Blvd/Caterpillar Rd/Twin View Blvd loop will be eliminated.			
65	Transit	RABA 2023 SRTP	Redding	Route 2E/2W	SR 273 (Downtown Redding)	Route 2E/2W will be eliminated and replaced with Microtransit Service (Central Service Area).	Operations & Reliability	Not Listed	July 2024 or Later
66	Transit	RABA 2023 SRTP	Redding	Route 3	SR 273 (Downtown Redding & S. Redding)	In Downtown Redding, Route 3 will be streamlined by traveling along S. Market St rather than Court St, West St, and Railroad Ave. Route 3 will terminate at the Girvan Rd/Eastside Rd intersection, in consideration of the Route 9 extension to Downtown Transit Center.	Operations & Reliability	Not Listed	July 2024 or Later
67	Transit	RABA 2023 SRTP	Redding	Route 7	SR 273 (N. Redding)	Route 7 will continue to serve Shasta College and the Northpoint Dr/Redwood Blvd/Caterpillar Rd/Twin View Blvd loop but will be revised to connect with the Canby Transit Center rather than the Downtown Transit Center.	Operations & Reliability	Not Listed	July 2024 or Later
68	Transit	RABA 2023 SRTP	Redding; Anderson	Route 9	SR 273 (Redding & Anderson)	Route 9 will be extended to the Downtown Transit Center. Service will largely follow SR 273, eliminating City of Anderson segments east of SR 273 (North St, Stingy Ln, and Balls Ferry Rd).	Operations & Reliability	Not Listed	July 2024 or Later
69	Transit	RABA 2023 SRTP	Redding	Routes 11 and 14	SR 273 (N. Redding)	Routes 11 and 14 largely will be unchanged. Rather than traveling along Masonic Ave to serve Masonic Transit Center, both routes will instead travel a clockwise loop around Lake Blvd, Northpoint Dr, and N. Market St.	Operations & Reliability	Not Listed	July 2024 or Later
70	Transit	RABA 2023 SRTP	Redding; Shasta County	Route 15	SR 273 (Downtown Redding)	New Route 15 (initial 1-year pilot) will connect the Downtown Transit Center and Canby Transit Center (via SR 44) with the Redding Regional Airport. This route will replace Crosstown Express.	Operations & Reliability	Not Listed	July 2024 or Later
71	Transit	RABA 2023 SRTP	Redding; Anderson	Anderson Commuter	SR 273 (Redding & Anderson)	The Anderson Commuter will be eliminated and replaced with Route 9	Operations & Reliability	Not Listed	July 2024 or Later
72	Transit	RABA 2023 SRTP	Anderson	Microtransit Service: Anderson Service Area	Anderson	This service area encompasses the City of Anderson. Microtransit service (9:00 AM to 4:00 PM on weekdays and 9:20 AM to 5:15 PM on Saturdays) will supplement Route 9.	Operations & Reliability	Not Listed	July 2024 or Later
73	Transit	RABA 2023 SRTP	Redding	Microtransit Service: Central Service Area	Downtown Redding	This service area encompasses Downtown Redding and adjacent areas, including Turtle Bay, Redding City Hall, and hospitals. It is bounded by the Sacramento River to the north and east, Ridge Rd to the west, and roughly Parkview Ave on the southeast and Placer St, Airpark Dr, and Laurel Dr to the southwest. Microtransit service (6:20 AM to 6:00 PM on weekdays and 9:20 AM to 5:15 PM on Saturdays) will replace Route 2.	Operations & Reliability	Not Listed	July 2024 or Later
74	Transit	RABA 2023 SRTP	Redding; Anderson; Shasta County	Microtransit Service: Weekday Evenings	Redding; Anderson; Shasta County	A weekday evening microtransit service will be initiated throughout the entire RABA paratransit service area from 6:00 PM to 9:00 PM.	Operations & Reliability	Not Listed	July 2024 or Later
75	Complete Streets	City of Anderson 2011 Pedestrian Accessibility and Safety Master Plan	Anderson	SR 273 Bike/Ped Trail (North)	SR 273 (Briggs St and Spring Gulch Rd)	New hot mix asphalt (HMA) path along west side of SR 273 (similar to new path to Walmart Shopping Center)	Mobility & Connectivity	$1,000,000+	Not Listed

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
76	Complete Streets	City of Redding 2016 Downtown Redding Community Based Transportation Plan	Redding	Pedestrian Action Plan	Downtown Redding	Intersection Safety & Traffic Calming: Intersection Enhancements Improve Cypress Ave / Pine St / Market St Intersection (Additional Study Required): Pedestrian Access Improvements	Mobility & Connectivity; Safety	Intersection Safety & Traffic Calming: $ 5,000,000 Improve Cypress Ave / Pine St / Market St Intersection: $ 1,000,000 (Pedestrian Access Improvements)	Not Listed
77	Complete Streets	City of Redding 2016 Downtown Redding Community Based Transportation Plan	Redding	Bicycle Action Plan	Downtown Redding	Area-wide Design Elements: Signing, Intersection Markings, Crossing Signals, Bike Parking	Mobility & Connectivity; Safety	Area-wide Design Elements: $1,150,000	Not Listed
78	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Class IV Bikeway: California St (Division St to Yuba St)	California St	Separated Bike Lane, 0.27 miles	Mobility & Connectivity	$550,000.00	2018-2025
79	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Class IV Bikeway: California St (Yuba St to Placer St)	California St	Separated Bike Lane, 0.07 miles	Mobility & Connectivity	$10,043.32	2026-2040
80	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Class II Bike Lane: California St; Gold St; S Market St (California St/Placer St to S Market St/Cypress Ave)	California St; Gold St; S Market St	Buffered Bike Lane, 0.60 miles	Mobility & Connectivity	$38,293.02	2026-2040
81	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Class II Bike Lane: S Market St (Trinity St to Quartz Hill Rd)	S Market St	Bike Lane, 0.47 miles	Mobility & Connectivity	$18,424.71	2026-2040
82	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Class II Bike Lane: N Market St (Sulphur Creek Rd to Benton Dr)	N Market St	Bike Lane, 0.09 miles	Mobility & Connectivity	$3,686.82	2026-2040
83	Complete Streets	City of Redding 2018 ATP	Redding	Class I Bike Path: Westside Rd (Buenaventura Blvd to Canyon Rd)	Westside Rd	Shared-Use Path, 3.55 miles	Mobility & Connectivity	$3,152,907.53	2026-2040
84	Complete Streets	City of Redding 2018 ATP	Redding	Class I Bike Path: Eastside Rd (N Bonnyview Rd to S Bonnyview Rd)	Eastside Rd	Shared-Use Path, 1.02 miles	Mobility & Connectivity	$901,135.75	2026-2040
85	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Sidewalk: California St (Gold St to SR 273)	California St	Sidewalk, 1.14 miles	Mobility & Connectivity	$644,656.97	2026-2045
86	Complete Streets	City of Redding 2018 ATP	Redding	Sidewalk: Westside Rd (El Reno Ln to Cedars Rd)	Westside Rd	Sidewalk, 1.15 miles	Mobility & Connectivity	$652,204.01	2026-2045
87	Complete Streets	City of Redding 2018 ATP	Caltrans; Redding	Sidewalk: Eureka Way (Buenaventura Blvd to e/o Overhill Dr)	Eureka Way	Sidewalk, 1.23 miles	Mobility & Connectivity	$698,204.28	2026-2045
88	Complete Streets	City of Redding 2018 ATP	Redding	Sidewalk: Waverly Ave; Eastside Rd (Waverly Ave/Beretta Ln to Eastside Rd/Girvan Rd)	Waverly Ave; Eastside Rd	Sidewalk, 1.07 miles	Mobility & Connectivity	$608,020.99	2026-2045
89	Complete Streets	City of Redding 2018 ATP	Redding	Class II Bike Lane: Placer St (Pleasant St to Court St)	Placer St	Buffered Bike Lane, 0.95 miles	Mobility & Connectivity	$60,578.99	2026-2040
90	Complete Streets	City of Redding 2022-2027 CIP	Redding	Turtle Bay to Downtown	Turtle Bay area	Turtle Bay to Downtown multi-use trail connecting Dana to Downtown and Turtle Bay boat ramp to Continental. Includes a tunnel; shared use path; and pedestrian safety lighting.	Mobility & Connectivity	$6,550,000.00	2024-2025
91	Complete Streets	City of Redding 2022-2027 CIP	Redding	California St Bikeway Project	California St	Construction of a two-way Class IV bikeway along California St, between Yuba St and Tehama St.	Mobility & Connectivity	$4,140,000.00	2023-2024

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
						Improvements of pedestrian access by rebuilding curb ramps, creating bulb-outs, and increasing crossing visibility.			
92	Complete Streets	SRTA 2018 GoShasta Regional ATP	Caltrans; Anderson; Shasta County	Class IV Bikeway: SR 273 (Pleasant Hills Dr to City of Redding Boundary)	SR 273 (Anderson to Redding)	Separated Bike Lane, 11.77 miles	Mobility & Connectivity	$11,786,458.00	2026-2040
93	Complete Streets	SRTA 2018 GoShasta Regional ATP	Anderson; Shasta County	Class II Bike Lane: Rhonda Rd/Pleasant Hills Dr (SR 273 to Cremia Pl)	Rhonda Rd/Pleasant Hills Dr	Bike Lane, 0.05 miles	Mobility & Connectivity	$474,873.00	2026-2040
94	Complete Streets	SRTA 2022 RTP	Caltrans; Redding; Shasta County	Known as the North Redding Active Transportation Trunkline, a partnership project to construct Complete Street Elements from sections of Lake Blvd west of SR 273, along 273, on College View Drive in Redding to Old Oregon Trail	SR 273	Complete Street Elements	Mobility & Connectivity	$20,000,000.00	2022-2032
95	Complete Streets	SRTA 2022 RTP	Caltrans	As part of Caltrans South Market ADA – SR 273 add a bike lane in City of Redding	SR 273	Construct a class II bike lane between postmiles 14.9 -15.7	Mobility & Connectivity	$1,500,000.00	2022-2032
96	Complete Streets	SRTA 2022 RTP	Caltrans	Entire length of SR 273, multi-modal facility	SR 273	Complete Street Elements	Mobility & Connectivity	$30,000,000.00	2033-2042
97	Complete Streets	SRTA 2022 RTP	Caltrans	SR 273 (PM 3.812 to 11.1), various locations in high pedestrian areas, Pedestrian Facilities - Consistent with ADA and Caltrans Design Standards	SR 273	Pedestrian facilities	Mobility & Connectivity; Safety	$8,961,000.00	2033-2042
98	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Crosswalk: SR 273 (at California St)	SR 273 (at California St) (PM 15.653)	Crosses California St. Requires installing bulb out sidewalk, removing and replacing existing accessible ramp, removing existing valley gutter and fixing any potential drainage issues.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
99	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Crosswalk: SR 273 (at SR 299)	SR 273 (at SR 299) (PM 18.62)	Crosses SR 299 (Lake Blvd). Requires modification to existing concrete island and sidewalk curbs. Existing striping will need to be modified to accommodate new crosswalks. Traffic signal is being replaced and will accommodate new crossings.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
100	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Crosswalk: SR 273 (at Twin View Blvd)	SR 273 (at Twin View Blvd) (PM 18.92)	Crosses Twin View Blvd. Requires sidewalk/curb modifications and/or partial rebuild and installing 2 new accessible ramps. Existing striping will need to be modified and traffic signal is being replaced and will accommodate new crossings.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
101	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Crosswalk: SR 273 (at Northpoint Dr)	SR 273 (at Northpoint Dr) (PM 18.92)	Crosses Northpoint Dr. Requires sidewalk/curb modifications and/or partial rebuild and installing 2 new accessible ramps. Existing striping will need to be modified and traffic signal is being replaced and will accommodate new crossings.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
102	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Enhanced Crosswalk: SR 273 (near Lincoln St)	SR 273 (near Lincoln St) (PM 16.184)	The enhanced crosswalk at Lincoln St is to be installed before the construction of this project. The Downtown Redding CAPM will connect RRFB across Pine St to power.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
103	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Enhanced Crosswalk: SR 44 (Eureka and Pine)	SR 44 (Eureka and Pine) (PM L0.079L)	Requires installing solar power RRFB across Pine St and high visibility crosswalk marking/striping across Eureka Wy.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
104	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Class I Bike Path: SR 273 (Lake Blvd to Northpoint Dr)	SR 273 (Lake Blvd to Northpoint Dr) (PM 18.64 to 18.9)	Requires cutting into the median approximately 6', includes a new structural section in the median with curb and gutter, shifting the existing highway geometry, and installing a 5'-wide unpaved buffer, 8'-wide class I bike path with 2' shoulders. A soldier pile wall approximately 8' x 339' will be required in existing fill section adjacent to pond. Median may require irrigation for future landscaping. If no modifications are made to the existing median, additional retaining walls may be necessary and construction may include significant earthwork due to varied terrain* (*If a Class I path on this side is not feasible, a Class I path on the east side or Class II bike lanes on each shoulder are possible options.)	Mobility & Connectivity; Safety	$63,070,000 (Capital Const--All Projects)	2027/2028
105	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Class II Bike Lane: SR 273 (Hill St to California St)	SR 273 (Hill St to California St) (PM 15.66 to 16.04)	Requires removing existing southbound #2 lane on SR 273, installing a Class II bike lane with buffered striping.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
106	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Class II Bike Lane: SR 273 (Fell St to East St)	SR 273 (Fell St to East St) (PM 15.53 to 16.06)	Requires removing free right on Angelo Ave by adding "STOP" striping and installing "STOP" signage at existing crosswalk. Requires removing free right from Parkview Ave by regrading, installing new accessible ramp and restriping. Requires significant concrete removal and replacement or reconfiguring lanes at Cypress Ave from 12'-0" to 11'-0" wide in order to fit new 5'-0" wide bike lane.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
107	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Class II Bike Lane: SR 273/Pine St (Cypress Ave to Eureka Wy)	SR 273/Pine St (Cypress Ave to Eureka Wy) (PM 16.01R to L–0.078)	Requires lane reduction or elimination of on-street parking and installing striping for buffered bike lane. (This element is dependent on results of a traffic study during the PA&ED phase.)	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
108	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Class II Bike Lane: SR 273 (Northpoint Dr to Caterpillar Dr)	SR 273 (Northpoint Dr to Caterpillar Dr) (PM 17.8 to 18.6)	Requires removing traffic signals from original locations, highway widening for right turn lanes on Twin view Dr and Caterpillar Dr, additional minor concrete/sidewalk repair to accommodate for widening existing highway and installing buffered striping for bike lanes.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
109	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Sidewalk: SR 273 (Angelo Ave to Parkview Ave)	SR 273 (Angelo Ave to Parkview Ave) (PM 15.72 to 15.8)	Complete segment between Angelo Ave and Parkview Ave; current sidewalk ends mid-block. Future development of empty lot adjacent to SR 273 could impact need.	Mobility & Connectivity; Safety	$63,070,000 (Capital Const--All Projects)	2027/2028
110	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Sidewalk: SR 273 (Hill St to California St)	SR 273 (Hill St to California St) (PM15.66 to 16.04)	Requires removing existing southbound #2 lane on SR 273, installing retaining wall, curb and gutter, buffered striping for bike lane, retaining wall structure, drain inlets and removing and replacing accessible ramps.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
111	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Sidewalk: SR 273 (at Benton Dr)	SR 273 (at Benton Dr) (PM 17.8)	Constructing new bulbout east of the intersection of SR 273 and Benton Dr. Construction requires removing existing right turn lane, installing new sidewalk, and removing and replacing accessible ramp. Bulbout will improve pedestrian walking	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
						conditions by shortening walking distance within crosswalk.			
112	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Sidewalk: SR 273 (at Lake Blvd)	SR 273 (at Lake Blvd) (PM 17.8)	Requires constructing 10'-0" wide sidewalk east of SR 273 from existing sidewalk at Lake Blvd to existing continental crosswalk and accessible ramp on Hilltop Dr.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
113	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A1	Caltrans	Curb Ramps: SR 273	SR 273 (Multiple Locations)	Reconstruct 96 curb ramps and install 10 new curb ramps to accommodate newly installed crosswalks.	Mobility & Connectivity	$63,070,000 (Capital Const--All Projects)	2027/2028
114	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A2	Caltrans	Multiuse Path: SR 273 (Buenaventura Blvd to Wyndham Ln)	SR 273 (Buenaventura Blvd to Wyndham Ln) (PM 14.5 to 15.0)	Requires repurposing the 2nd southbound lane on SR 273 from Buenaventura Blvd to Wyndham Ln from a traffic lane to a multi-use path. Requires installing a concrete barrier and striping for multiuse path. Complete streets item will require a trial run with plastic delineators to determine if multiuse path will have a significant impact on traffic flow/safety. Trial run was installed by maintenance on June 11, 2023 and will determine feasibility of Multi-Use Path at this location.	Mobility & Connectivity; Safety	Unknown	2027/2028
115	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A2	Caltrans	Sidewalk: SR 273 (Benton Dr to Lake Blvd)	SR 273 (Benton Dr to Lake Blvd) (PM 17.8 to 18.6)	Requires constructing a 6'-wide sidewalk with curb and gutter adjacent to existing highway from Benton Dr to Lake Blvd. Construction will require additional retaining walls and lighting.	Mobility & Connectivity	Unknown	2027/2028
116	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A2	Caltrans	Class I Bike Path: SR 273 (Lake Blvd to Northpoint Dr)	SR 273 (Lake Blvd to Northpoint Dr) (PM 18.62 to 18.92)	Second design option for #104. Requires constructing new Class I Bike Path on east side of SR 273.	Mobility & Connectivity; Safety	Unknown	2027/2028
117	Complete Streets	Caltrans Downtown Redding CAPM PIR: Alternative A2	Caltrans	Class II Bike Lane: SR 273 (Lake Blvd to Northpoint/Twinview Dr)	SR 273 (Lake Blvd to Northpoint Dr/Twinview Dr) (PM 18.62 to 18.92)	Third design option for #104. Requires widening southbound travel way with a retaining system and installing striping for bike lanes.	Mobility & Connectivity	Unknown	2027/2028
118	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Bridge: Bridge Number 06 0006	SR 273 (crossing Spring Gulch) at PM 7.1	Priority Bridge: Riverine Flooding	Sustainability	Not Listed	Not Listed
119	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Large Culvert: Bridge Number 06 0007	SR 273 (crossing China Gulch) at PM 10.97	Priority Large Culvert: Riverine Flooding	Sustainability	Not Listed	Not Listed
120	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 11.816 to 12.674)	SR 273 (PM 11.816 to 12.674)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
121	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 16.834 to 17.381)	SR 273 (PM 16.834 to 17.381)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
122	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 17.385 to 17.809)	SR 273 (PM 17.385 to 17.809)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
123	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 3.825 to 4.493)	SR 273 (PM 3.825 to 4.493)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
124	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 5.053 to 5.441)	SR 273 (PM 5.053 to 5.441)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
125	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 6.398 to 7.419)	SR 273 (PM 6.398 to 7.419)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
126	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 9.427 to 11.096)	SR 273 (PM 9.427 to 11.096)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
127	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 11.819 to 12.671)	SR 273 (PM 11.819 to 12.671)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
128	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 16.834 to 17.382)	SR 273 (PM 16.834 to 17.382)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
129	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 17.561 to 17.819)	SR 273 (PM 17.561 to 17.819)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
130	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 3.812 to 4.589)	SR 273 (PM 3.812 to 4.589)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
131	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 5.052 to 5.439)	SR 273 (PM 5.052 to 5.439)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
132	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 6.395 to 7.458)	SR 273 (PM 6.395 to 7.458)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
133	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM 9.424 to 11.095)	SR 273 (PM 9.424 to 11.095)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
134	Climate Change Adaptation and Resiliency	Caltrans 2020 D2 Adaptation Priorities Report	Caltrans	Priority Roadway: SR 273 (PM R16.659R to R16.73R)	SR 273 (PM R16.659R to R16.73R)	Priority Roadway: Temperature Change Pavement Performance	Sustainability	Not Listed	Not Listed
135	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class IV Separated Bikeway	Trinity Street: Center Street to Continental	Complete Streets Elements	Mobility & Connectivity	$59,894.92	2018-2025
136	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class IV Separated Bikeway	Continental Street: Trinity St to Butte St	Complete Streets Elements	Mobility & Connectivity	$43,456.38	2018-2025
137	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Pine St: Trinity St to Eureka Way	Complete Streets Elements. Extends Caltrans CAPM recommended Class II Buffered Bike Lane north of Eureka Way to Trinity St	Mobility & Connectivity	Full Segment cost (S Market St to Trinity St): $64,624.67	2026-2040
138	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Bike Lane	East St: Trinity St to Placer St	Complete Streets Elements	Mobility & Connectivity	$17,988.78	2026-2040
139	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class IV Separated Bikeway	Butte St: Continental St to Yuba St	Complete Streets Elements	Mobility & Connectivity	$19,484.10	2026-2040
140	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class IV Separated Bikeway	Yuba St: Continental St to California St	Complete Streets Elements	Mobility & Connectivity	$50,461.63	2026-2040

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
141	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding; Caltrans	Class II Bike Lane	Eureka Way (SR 299): Buenaventura Blvd to Court St	Complete Streets Elements. Subject to Caltrans Process Bike Lane	Mobility & Connectivity	$63,355.57	2026-2040
142	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	Shasta St (Court St to Walnut Ave)	Complete Streets Elements	Mobility & Connectivity	$585,817.80	2018-2025
143	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Court St (South to Court St/Schley Ave); Schley Ave (Court St to Sheridan St)	Complete Streets Elements	Mobility & Connectivity	$115,263.65	2026-2040
144	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Bike Lane	Court St (Eureka Way to South St)	Complete Streets Elements	Mobility & Connectivity	$32,375.91	2026-2040
145	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	West St; Gold St; Airpark Dr (West St/Eureka Way to Airpark Dr/Placer St)	Complete Streets Elements	Mobility & Connectivity	$490,624.46	2026-2040
146	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	South St (West St to Court St)	Complete Streets Elements	Mobility & Connectivity	$33,133.60	2026-2040
147	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Route	Tehama St (Court St to California St)	Complete Streets Elements	Mobility & Connectivity	$10,942.18	2026-2040
148	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Route	Yuba St (Court St to California St)	Complete Streets Elements	Mobility & Connectivity	$7,705.73	2026-2040
149	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	Continental St (Butte St to South St)	Complete Streets Elements	Mobility & Connectivity	$126,183.42	2026-2040
150	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	Placer St (Continental St to terminus of proposed Class I e/o Sequoia St)	Complete Streets Elements	Mobility & Connectivity	$124,498.34	2026-2040
151	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Route	Market St (Placer St to South St)	Complete Streets Elements	Mobility & Connectivity	$4,442.02	2026-2040
152	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding; Caltrans	Class I Shared Use Path	Placer Street (Off-Street): (Placer St (East End) to Park Marina Dr	Complete Streets Elements. Subject to Caltrans Process Shared Use Path	Mobility & Connectivity	$72,044.33	2026-2040
153	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Railroad Ave (Grandview Ave to Buenaventura Blvd)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
154	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Bike Lane	Twinview Blvd (Mountain View Dr to N Market St(SR 273)); Northpoint Dr (N Market St(SR 273)) to Lake Blvd	Complete Streets Elements	Mobility & Connectivity	$54,597.09	2026-2040

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
155	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Lake Blvd (Northpoint Dr to SR 273)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
156	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Adjacent to SR 273 in Sulphur Creek Hill Area, connecting from s/o Lake Blvd at SR 273, Benton Dr at SR 273 and SR 273 near Sulphur Creek	Complete Streets Elements	Mobility & Connectivity	$295,577.90	2026-2040
157	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Bike Lane	Benton Dr (SR 273 to Quartz Hill Rd)	Complete Streets Elements	Mobility & Connectivity	$58,026.91 (Cost in ATP is for N Court/Riverside Dr to N Market St - N Court to Quartz Hill Rd already constructed)	2026-2040
158	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Route	Locust St / Civic Center Dr (SR 273 to Cypress Ave)	Complete Streets Elements	Mobility & Connectivity	$18,177.29	2026-2040
159	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Bike Lane	East St (Locust St to Pine St)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
160	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Cypress Ave (S Market St to Athens Ave)	Complete Streets Elements	Mobility & Connectivity	Cost only listed in ATP for segment from Pine St to Grape Ave ($11,766.96)	2026-2040
161	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	South City Park, Tiger Field Perimeter at west side; along Parkview Ave; along Cypress Ave to Cottonwood Canal	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
162	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Cottonwood Canal (Cypress Ave to Parkview Ave)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
163	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Cottonwood Canal (Parkview Ave to N Bonnyview Rd / Eastside Rd)	Complete Streets Elements. ACID Canal Trail	Mobility & Connectivity	$1,986,569.01	2026-2040
164	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path, New Sidewalk	Railroad Ave (South St to Buenaventura Blvd)	Complete Streets Elements	Mobility & Connectivity	$1,599,192.21 (Class I Path); 2,001,463.13 (Sidewalk)	2018-2025
165	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Buenaventura Blvd (S Market St to Existing Class I Path terminus at Canyon Creek Rd)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
166	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Buenaventura Blvd (S Market St to Placer St)	Complete Streets Elements	Mobility & Connectivity	Not Listed	

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
167	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Turtle Bay Boat Launch Area (Existing Class I terminus near Riverfront Park to Proposed Class I along north side of SR 299)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not listed
168	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	S Bonnyview Rd (S Market/273 to Bechelli Ln)	Complete Streets Elements	Mobility & Connectivity	$108,584.62	2026-2040
169	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Bike Lane	Girvan Rd (SR 273 to Creekside St)	Complete Streets Elements	Mobility & Connectivity	Not Listed	Not Listed
170	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Butte St (Continental Dr to Sundial Bridge Dr)	Complete Streets Elements	Mobility & Connectivity	$25,233.99	2018-2025
171	Complete Streets	City of Redding 2018 ATP	City of Redding	Class II Bike Lane	N Market St (Sulphur Creek Rd Proposed Class I to Benton Dr)	Complete Streets Elements	Mobility & Connectivity	$3,686.82	2026-2040
172	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class II Buffered Bike Lane	Buenaventura Blvd (Placer St to Eureka Way)	Complete Streets Elements	Mobility & Connectivity	$52,853.48	2026-2040
173	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Buenaventura Blvd (Placer St to Eureka Way) (Already constructed between Foothill Blvd and Eureka Way)	Complete Streets Elements	Mobility & Connectivity	$731,506.22	2026-2040
174	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding; Caltrans	Class I Shared Use Path	State Highway 44 Crossing (Park Marina Dr to WB State Highway 44 On- and Off-Ramps)	Complete Streets Elements. Subject to Caltrans Process Shared-Use Path	Mobility & Connectivity	$72,044.33	2026-2040
~~175*~~	~~Complete Streets~~	~~City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP~~	~~City of Redding~~	~~Class I Shared Use Path~~	~~Adjacent to SR 273 in Sulphur Creek Hill Area, connecting from s/o Lake Blvd at SR 273, Benton Dr at SR 273 and SR 273 near Sulphur Creek~~	~~Complete Streets Elements~~	~~Mobility & Connectivity~~	~~$1,299,051.37~~	~~2026-2040~~
176	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	New Sidewalk	Oregon St (Shasta St to Yuba St)	Complete Streets Elements	Mobility & Connectivity	$244,853.46	2026-2040
177	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	Walnut Ave (Eureka Way to Shasta St)	Complete Streets Elements	Mobility & Connectivity	$90,400.74	2026-2040
178	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	LAKESIDE DR; FOOTHILL BLVD; LAS ANIMAS DR; MONTE BELLO DR; MANZANITA HILLS AVE (MANZANITA	Complete Streets Elements	Mobility & Connectivity	$376,944.94	2026-2040

Project #	Type of Project	Source	Jurisdiction	Name	Location	Scope	Purpose and Need	Estimated Total Cost (Capital and Support)	Time
					HILLS AVE/SHASTA ST to LAKESIDE DR/ BUENAVENTURA BLVD)				
179	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	New Sidewalk	Continental St (Trinity St to SR 44 Overcrossing)	Complete Streets Elements	Mobility & Connectivity	$242,232.20	2026-2045
180	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Buenaventura Blvd (east side): Placer St to Starlight Blvd	Complete Streets Elements	Mobility & Connectivity	$1,617,962.31	2026-2045
181	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class I Shared Use Path	Off Street (Linden Creek): Buenaventura Blvd to West St	Complete Streets Elements	Mobility & Connectivity	$810,952.41	2026-2040
182	Complete Streets	City of Redding 2045 General Plan Transportation Element; City of Redding 2018 ATP	City of Redding	Class III Bike Blvd	West St; Logan St (West St / Linden Ave to Logan St / Railroad Ave	Complete Streets Elements	Mobility & Connectivity	$7,400.23	2026-2040
183	Complete Streets	Caltrans High-Cost Safety Projects Tier 4 Fact Sheet	Caltrans	Pedestrian Safety Corridor Lighting Project (Brighter 273 Safety)	PM 5.206/14.47 (South St intersection in Anderson to Buenaventura Blvd in Redding)	Provide continuous lighting for both northbound and southbound SR 273 that meets Caltrans conventional highway lighting standards. Install buried conduit in the median from PM 5.206 to 11.1. Install conduit in the median concrete barrier (Type 60M and 60MC) from PM 11.1 to 14.47. Install luminaires and pull boxes every 180'. Update all existing intersection/crosswalk lighting to meet American National Standards Institute / Illuminating Engineering Society (ANSI/IES) standards. Install service connections throughout the project (about 13). Potentially consider combining median concrete barrier project 02-0K210 for construction to add luminaires and electrical components (PM 12.68 to 14.18).	Safety	$48,800,000	2030

*Project 175 was removed as it is a duplicate of Project 156.

Appendix F.

Feasibility Studies

Technical Memorandum

November 19, 2024

To	Michael Kuker, SRTA; Laurent Beauregard, SRTA	**Contact No.**	
Copy to	Natalie Kinney, Caltrans; Aaron Casas, Caltrans; Christina Prosperi, Caltrans; Sergio Amezquita, Caltrans;	**Email**	Todd.tregenza@ghd.com
From	Todd Tregenza, GHD	**Project No.**	12560002
Project Name	Envision 273 Comprehensive Multimodal Corridor Plan		
Subject	Task 6 Technical Memorandum: Feasibility Study #1 (One-way Couplet Reversion)		

1. Introduction

The Task 6 Technical Memorandums (TMs) will evaluate potential projects that may support corridor solutions, as described in the Task 5 TM.

Each Task 6 TM presents the feasibility of a potential project or group of projects. Task 6 includes six feasibility studies (FSs):

1. One-way Couplet Reversion
2. Cypress Avenue Roundabout
3. Downtown Redding Gateways
4. Class I/IV from Redding to Anderson
5. Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation
6. Redding (SR 273/Breslauer Way) Grade Crossing Relocation

This TM presents *FS #1: One-way Couplet Reversion.*

The TMs will be combined or summarized in the draft/final report, as appropriate.

2. Scope

This TM evaluates the feasibility of converting the State Route (SR) 273 One-way Couplet in Downtown Redding from one-way streets to two-way streets. As shown in Figure 1, in the southbound direction, SR 273 consists of Market Street (from Eureka Way to Tehama Street), Tehama Street (from Market Street to California Street), California Street (from Tehama Street to Gold Street), Gold Street (from California Street to Market Street), and Market Street (from Gold Street to Cypress Avenue). In the northbound direction, SR 273 consist of Pine Street (from Cypress Avenue to Eureka Way) and Eureka Way (from Pine Street to Market Street).

This TM considered two alternatives:

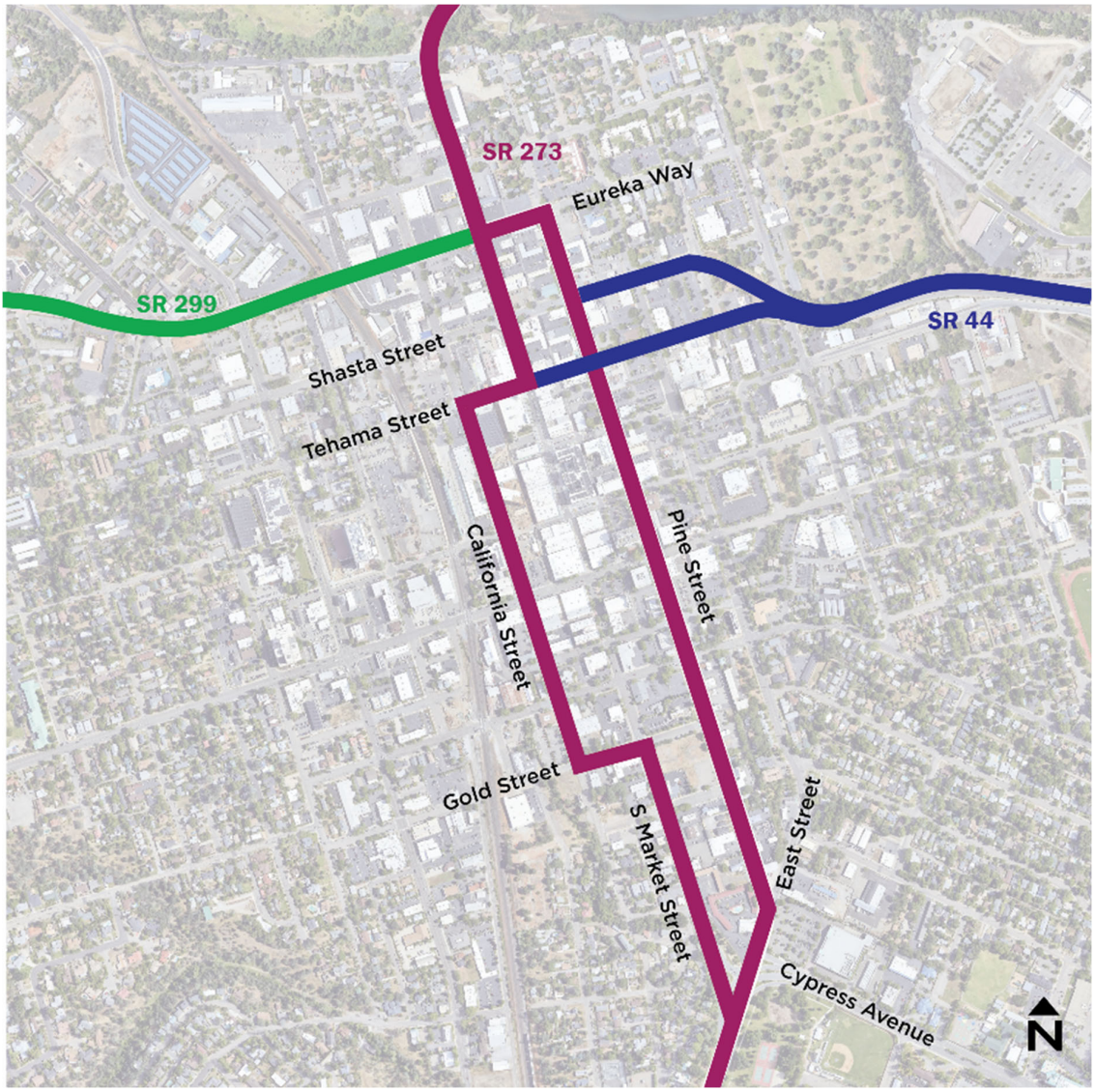
1) Partial Conversion (the streets south of Tehama Street)
2) Full Conversion (all of the streets listed above).

The partial conversion avoids the two adjacent highways that start/end at SR 273: SR 299 (west of the Market St/Eureka Way intersection) and SR 44 (east of both the Pine Street/Tehama Street and Pine Street/Shasta Street intersections).

Within the corridor, Downtown Redding is unique in that it contains the primary urban core, with recently constructed high-density, mixed-use development. Downtown Redding also is unique in that it is bisected by multiple highways—SR 273 in the north-south direction, which supports mostly intraregional trips, and both SR 44 and SR 299 in the east-west direction, which support (but are not limited to) interregional trips (e.g., freight trucks). Downtown Redding has been primarily designed for private motorized vehicles since the 1950s, when the first autos came to town.

Downtown Redding needs streets that help the people and the community thrive, including promoting non-vehicular modes of travel (e.g., walking and bicycling). The City of Redding vision is to “create a revitalized Downtown Redding that is attractive, safe, and economically vibrant” with a mix of “pedestrian- and bicycle-oriented shops, housing, workplaces, parks, and civic facilities, inviting to residents and visitors alike” (City of Redding Downtown Specific Plan Update, 2018).

Figure 1 *SR 273 One-Way Couplet in Downtown Redding*



3. Data Collection and Analysis Approach

The following section presents the data collection process and analysis approach used to determine the traffic conditions within the study area.

3.1 Data Collection

Weekday AM (7-9 AM) and PM (4-6 PM) peak period turning movement counts were collected in October 2023. The turning movement counts included autos, trucks, pedestrians, and bicyclists. For signalized study intersections, signal timing sheets were provided by either the City of Redding, City of Anderson, Caltrans, or Shasta County. Field observations of AM and PM peak hour traffic conditions were performed in early November 2023.

3.2 Analysis Approach

The traffic analysis software, Synchro 11, was used to model the two-way conversion with existing (2023) and future year (2040) traffic volumes. A planning-level analysis (delay and level of service) for the AM and PM peak hour was performed at 37 intersections, including major intersections within the Downtown Redding area and along the entire SR 273 corridor (from Interstate 5 (I-5) on the north to I-5 on the south). Although only the intersections within the Downtown Redding area would be expected to be impacted by the one-way to two-way street conversion, the planning-level analysis includes a much larger study area to provide a traffic operations baseline for the other feasibility studies.

Level of service (LOS) is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver as presented in the Transportation Research Board's *Highway Capacity Manual*. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions), with LOS B to E representing decreasing desirable conditions. The City of Redding and City of Anderson generally strive to maintain LOS D or better for intersection operations, while Shasta County generally strives to maintain LOS C or better for intersection operations.

4. Existing Conditions

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the LOS for the study intersections during each peak hour, as presented in Table 1. Observed peak hour factors were used at all intersections for the existing conditions analysis. Trucks and pedestrian/bicycle activity also were factored into the analysis.

A brief summary of the existing conditions analysis is presented below.

- The majority of study intersections operate at acceptable LOS C or better conditions
- None of the study intersections operate at unacceptable LOS E or F conditions
- Three locations are operating at LOS D conditions (approaching capacity conditions)
    - Market Street/Eureka Way (PM Peak)
    - California Street/Tehama Street (PM Peak)
    - SR 273/S. Bonnyview Road (AM Peak)

Table 1 *FS #1 Existing Intersection Level of Service*

Intersection	Local Jurisdiction / LOS Threshold	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
Market St & Caterpillar Rd	City of Redding / D	Signal	27	C	26	C
Market St & Northpoint Dr/Twin View Blvd	City of Redding / D	Signal	18	B	24	C
Market St & Lake Blvd	City of Redding / D	Signal	29	C	30	C
Market St & Benton Dr	City of Redding / D	Signal	21	C	19	B
Market St & Quartz Hill Rd/Travelled Wy	City of Redding / D	Signal	27	C	25	C
Market St & Trinity St	City of Redding / D	Signal	18	B	17	B
Market St & Eureka Wy	City of Redding / D	Signal	30	C	36	D
Market St & Shasta St	City of Redding / D	Signal	22	C	22	C
Shasta St & Pine St	City of Redding / D	Signal	7	A	10	A
California St & Tehama St	City of Redding / D	Signal	28	C	36	D
Pine St & Tehama St	City of Redding / D	Signal	16	B	25	C
Yuba St & East St	City of Redding / D	Side-Street Stop	15	C	14	B
California St & Placer St	City of Redding / D	Signal	27	C	28	C
Pine St & Placer St	City of Redding / D	Signal	23	C	21	C
California St & South St	City of Redding / D	Signal	25	C	27	C
Pine St & South St	City of Redding / D	Signal	16	B	20	B
East St & South St	City of Redding / D	All-Way Stop	10	A	11	B
Gold St & Market St	City of Redding / D	Signal	17	B	22	C
East St & Market St/Cypress Ave	City of Redding / D	Signal	17	B	21	C
Market St & Grange St	City of Redding / D	Signal	9	A	8	A
Westside Rd/Railroad Ave & Buenaventura Blvd	City of Redding / D	Signal	18	B	19	B
SR 273 & Buenaventura Blvd	City of Redding / D	Signal	16	B	14	B
SR 273 & Kenyon Dr	City of Redding / D	Side-Street Stop	24	C	24	C
SR 273 & Branstetter Ln	City of Redding / D	Side-Street Stop	11	B	13	B
SR 273 & Cedars Rd/ Bonnyview Rd	City of Redding / D	Signal	36	D	33	C
Eastside Rd & Bonnyview Rd	City of Redding / D	Signal	32	C	28	C
SR 273 & Clear Creek Rd	City of Redding / D	Signal	11	B	12	B
SR 273 & Canyon Rd / Redding Rancheria	City of Redding / D	Signal	21	C	21	C
SR 273 & Whitehouse Dr	City of Redding / D	Side-Street Stop	20	C	26	D
SR 273 & Happy V Rd	Shasta County / C	Signal	12	B	11	B
SR 273 & Amen St/Latona Rd	Shasta County / C	Side-Street Stop	20	C	18	C
SR 273 & Ox Yoke Rd	City of Anderson / D	Signal	24	C	18	B
SR 273 & North St	City of Anderson / D	Signal	29	C	24	C
SR 273 & South St	City of Anderson / D	Signal	30	C	26	C

Intersection	Local Jurisdiction / LOS Threshold	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
SR 273 & Factory Outlets Dr	City of Anderson / D	Signal	13	B	15	B
SR 273 & Pleasant Hills Dr	City of Anderson / D	Signal	18	B	23	C
Branstetter Ln & Westside Rd	City of Redding / D	Side-Street Stop	10	A	10	A

Note: LOS results based on the 2000 *Highway Capacity Manual*.

5. Alternative Assumptions

The two alternatives under consideration are Partial Conversion and Full Conversion. The preliminary geometric design of the alternatives is on-going; however, the following are the assumptions used in the traffic analysis:

- One-left turn lane on every approach where the street is being converted from one-way to two-way
- One through lane in each direction
- No dedicated right-turn lanes

Partial Conversion Alternative Assumptions

The following are the specific roadway conversion assumptions:

- California Street: Convert to two-way between Tehama Street & Gold Street
- Gold Street: Convert to two-way between California Street & Market Street
- Market Street: Convert to two-way between Gold Street and the Market Street/Cypress Avenue Intersection
- Reconfigure Market Street/Cypress Avenue intersection to a standard compact four-legged intersection (all movements in all directions allowed)
- Pine Street: Convert to two-way between Cypress Avenue and Tehama Street

Full Conversion Alternative Assumptions

- Same assumptions as the Partial Conversion Alternative
- Market Street: Convert to two-way between Butte Street and Eureka Way
- Pine Street: Convert to two-way between Tehama Street and Trinity Street
- Tehama Street: Convert to two-way between Market Street and Liberty Street
- Shasta Street: Convert to two-way between Pine Street and Liberty Street
- Eureka Way: Convert to two-way between Market Street and Pine Street

Volume Redistribution Assumptions

The following assumptions were used to redistribute the traffic under both alternatives:

- Total traffic volume into and out of the study area remains constant
- Traffic volume redistributed based on:
    - Available origin-destination data (source: Replica)
    - Engineering judgement (assume drivers would choose faster/more direct travel route)

6. Alternatives Evaluation

The two alternatives were evaluated under existing (2023) traffic volumes and future year (2040) traffic volumes. Future year (2040) traffic volumes were developed based on the Shasta County Activity-Based Travel Model 2.0. In general, traffic volumes are anticipated to grow by about 0.5 percent per year during the AM and PM peak hour.

6.1 Existing Traffic Volumes

Table 2 presents the LOS for the AM peak hour, while Table 3 presents the LOS for the PM peak hour under various roadway configurations (Existing, Partial Conversion, and Full Conversion).

AM Peak Hour

Under the Partial Conversion Alternative, the intersection LOS during the AM Peak hour is anticipated to remain the same as the Existing Configuration at all of the study intersections except at the East Street/Market Street/Cypress Avenue intersection, where the LOS would degrade from LOS B to LOS C.

Under the Full Conversion Alternative, the intersection LOS during the AM Peak hour is anticipated to worsen compared to the Existing Configuration at several of the study intersections including:

- Market Street/Eureka Way (from LOS C to LOS F)
- Market Street/Shasta Street (from LOS C to LOS D)
- Shasta Street/Pine Street (from LOS A to LOS F)
- Pine Street/Tehama Street (from LOS B to LOS F)
- East Street/Market Street/Cypress Avenue (from LOS B to LOS C)

As shown in Table 2, several of the study intersections are expected to operate at LOS F under the Full Conversion Alternative. The AM peak hour traffic volumes on Market Street, Shasta Street, and Tehama Street exceed the capacity of a single through lane at the intersections and cannot accommodate two-way travel.

PM Peak Hour

Under the Partial Conversion Alternative, all of the study intersections are anticipated to operate at acceptable service levels during the PM peak hour. However, there are a couple of locations where the LOS would degrade and they are:

- Shasta Street/Pine Street (from LOS A to LOS B)
- East Street/Market Street/Cypress Avenue (from LOS C to LOS D)

Under the Full Conversion Alternative, the intersection LOS during the PM Peak hour is anticipated to worsen compared to the Existing Configuration at several of the study intersections including:

- Market Street/Eureka Way (from LOS D to LOS F)
- Shasta Street/Pine Street (from LOS A to LOS F)
- Pine Street/Tehama Street (from LOS C to LOS F)
- East Street/Market Street/Cypress Avenue (from LOS C to LOS D)

As shown in Table 3, several of the study intersections are expected to operate at LOS F under the Full Conversion Alternative. Similar to the AM peak hour, the PM peak hour traffic volumes on Market Street, Shasta Street, and Tehama Street exceed the capacity of a single through lane at the intersections and cannot accommodate two-way travel.

Table 2 *FS #1 AM Peak Hour LOS Under Various Roadway Configurations With Existing Traffic Volumes*

Intersection	Traffic Control	Existing Configuration		Partial Conversion		Full Conversion	
		Delay	LOS	Delay	LOS	Delay	LOS
Market St & Caterpillar Rd	Signal	27	C	27	C	27	C
Market St & Northpoint Dr/Twin View Blvd	Signal	18	B	18	B	18	B
Market St & Lake Blvd	Signal	29	C	29	C	29	C
Market St & Benton Dr	Signal	21	C	21	C	21	C
Market St & Quartz Hill Rd/Travelled Wy	Signal	27	C	27	C	27	C
Market St & Trinity St	Signal	18	B	17	B	16	B
Market St & Eureka Wy	Signal	30	C	30	C	**125**	**F**
Market St & Shasta St	Signal	22	C	22	C	38	D
Shasta St & Pine St	Signal	7	A	8	A	**265**	**F**
California St & Tehama St	Signal	28	C	32	C	34	C
Pine St & Tehama St	Signal	16	B	15	B	**96**	**F**
Yuba St & East St	Side-Street Stop	15	C	16	C	15	C
California St & Placer St	Signal	27	C	26	C	27	C
Pine St & Placer St	Signal	23	C	26	C	25	C
California St & South St	Signal	25	C	23	C	24	C
Pine St & South St	Signal	16	B	18	B	17	B
East St & South St	All-Way Stop	10	A	10	A	10	A
Gold St & Market St	Signal	17	B	8	A	8	A
East St & Market St/Cypress Ave	Signal	17	B	31	C	32	C
Market St & Grange St	Signal	9	A	9	A	9	A
Westside Rd/Railroad Ave & Buenaventura Blvd	Signal	18	B	18	B	18	B
SR 273 & Buenaventura Blvd	Signal	16	B	16	B	16	B
SR 273 & Kenyon Dr	Side-Street Stop	24	C	24	C	24	C
SR 273 & Branstetter Ln	Side-Street Stop	11	B	11	B	11	B
SR 273 & Cedars Rd/Bonnyview Rd	Signal	36	D	36	D	36	D
Eastside Rd & Bonnyview Rd	Signal	32	C	32	C	32	C
SR 273 & Clear Creek Rd	Signal	11	B	11	B	11	B
SR 273 & Canyon Rd / Redding Rancheria	Signal	21	C	21	C	21	C
SR 273 & Whitehouse Dr	Side-Street Stop	20	C	20	C	20	C
SR 273 & Happy V Rd	Signal	12	B	12	B	12	B
SR 273 & Amen St/Latona Rd	Side-Street Stop	20	C	20	C	20	C
SR 273 & Ox Yoke Rd	Signal	24	C	24	C	24	C
SR 273 & North St	Signal	29	C	29	C	29	C
SR 273 & South St	Signal	30	C	30	C	30	C
SR 273 & Factory Outlets Dr	Signal	13	B	13	B	13	B
SR 273 & Pleasant Hills Dr	Signal	18	B	18	B	18	B

Intersection	Traffic Control	Existing Configuration		Partial Conversion		Full Conversion	
		Delay	LOS	Delay	LOS	Delay	LOS
Branstetter Ln & Westside Rd	Side-Street Stop	10	A	10	A	10	A

Table 3 FS #1 PM Peak Hour LOS Under Various Roadway Configurations With Existing Traffic Volumes

Intersection	Traffic Control	Existing Configuration		Partial Conversion		Full Conversion	
		Delay	LOS	Delay	LOS	Delay	LOS
Market St & Caterpillar Rd	Signal	26	C	26	C	26	C
Market St & Northpoint Dr/Twin View Blvd	Signal	24	C	24	C	24	C
Market St & Lake Blvd	Signal	30	C	30	C	30	C
Market St & Benton Dr	Signal	19	B	19	B	19	B
Market St & Quartz Hill Rd/Travelled Wy	Signal	25	C	25	C	25	C
Market St & Trinity St	Signal	17	B	18	B	19	B
Market St & Eureka Wy	Signal	36	D	34	C	**147**	**F**
Market St & Shasta St	Signal	22	C	22	C	26	C
Shasta St & Pine St	Signal	10	A	11	B	**115**	**F**
California St & Tehama St	Signal	36	D	40	D	41	D
Pine St & Tehama St	Signal	25	C	24	C	**394**	**F**
Yuba St & East St	Side-Street Stop	14	B	14	B	14	B
California St & Placer St	Signal	28	C	25	C	26	C
Pine St & Placer St	Signal	21	C	26	C	25	C
California St & South St	Signal	27	C	24	C	25	C
Pine St & South St	Signal	20	C	23	C	22	C
East St & South St	All-Way Stop	11	B	11	B	11	B
Gold St & Market St	Signal	22	C	9	A	9	A
East St & Market St/Cypress Ave	Signal	20	C	36	D	36	D
Market St & Grange St	Signal	8	A	8	A	8	A
Westside Rd/Railroad Ave & Buenaventura Blvd	Signal	19	B	19	B	19	B
SR 273 & Buenaventura Blvd	Signal	14	B	14	B	14	B
SR 273 & Kenyon Dr	Side-Street Stop	24	C	24	C	24	C
SR 273 & Branstetter Ln	Side-Street Stop	13	B	13	B	13	B
SR 273 & Cedars Rd/Bonnyview Rd	Signal	33	C	33	C	33	C
Eastside Rd & Bonnyview Rd	Signal	28	C	28	C	28	C
SR 273 & Clear Creek Rd	Signal	12	B	12	B	12	B
SR 273 & Canyon Rd / Redding Rancheria	Signal	21	C	21	C	21	C
SR 273 & Whitehouse Dr	Side-Street Stop	26	C	26	C	26	C
SR 273 & Happy V Rd	Signal	11	B	11	B	11	B

Intersection	Traffic Control	Existing Configuration		Partial Conversion		Full Conversion	
		Delay	LOS	Delay	LOS	Delay	LOS
SR 273 & Amen St/Latona Rd	Side-Street Stop	18	B	18	B	18	B
SR 273 & Ox Yoke Rd	Signal	18	B	18	B	18	B
SR 273 & North St	Signal	24	C	24	C	24	C
SR 273 & South St	Signal	26	C	26	C	26	C
SR 273 & Factory Outlets Dr	Signal	15	B	15	B	15	B
SR 273 & Pleasant Hills Dr	Signal	23	C	23	C	23	C
Branstetter Ln & Westside Rd	Side-Street Stop	10	A	10	A	10	A

6.2 Future Year (2040) Traffic Volumes

Based on the results presented in Table 2 and Table 3, the Full Conversion Alternative was not advanced for further evaluation under future year (2040) traffic volumes given that the alternative severely degrades operations at the intersections of Market St & Eureka Way, Shasta St & Pine St, and Pine St & Tehama St with Existing traffic volumes.

Under the Partial Conversion Alternative, the intersection LOS during the AM Peak hour is anticipated to remain the same as the Existing Configuration at all of the study intersections except at the East Street/Market Street/Cypress Avenue intersection, where the LOS would degrade from LOS B to LOS C.

Under the Partial Conversion Alternative, all of the study intersections are anticipated to operate at acceptable service levels during the PM peak hour. However, there are a couple of locations where the LOS would degrade and they are:

- Shasta Street/Pine Street (from LOS A to LOS B)
- East Street/Market Street/Cypress Avenue (from LOS C to LOS D)

Table 4 FS #1 AM Peak Hour LOS Under Various Roadway Configurations With Year 2040 Traffic Volumes

Intersection	Traffic Control	Existing Configuration		Partial Conversion	
		Delay	LOS	Delay	LOS
Market St & Caterpillar Rd	Signal	30	C	30	C
Market St & Northpoint Dr/Twin View Blvd	Signal	22	C	22	C
Market St & Lake Blvd	Signal	31	C	31	C
Market St & Benton Dr	Signal	25	C	25	C
Market St & Quartz Hill Rd/Travelled Wy	Signal	31	C	31	C
Market St & Trinity St	Signal	20	B	20	B
Market St & Eureka Wy	Signal	30	C	30	C
Market St & Shasta St	Signal	22	C	22	C
Shasta St & Pine St	Signal	8	A	8	A
California St & Tehama St	Signal	29	C	33	C
Pine St & Tehama St	Signal	16	B	15	B
Yuba St & East St	Side-Street Stop	18	C	21	C
California St & Placer St	Signal	27	C	26	C
Pine St & Placer St	Signal	23	C	27	C
California St & South St	Signal	25	C	24	C
Pine St & South St	Signal	17	B	19	B
East St & South St	All-Way Stop	11	B	11	B
Gold St & Market St	Signal	20	B	9	A
East St & Market St/Cypress Ave	Signal	18	B	34	C
Market St & Grange St	Signal	9	A	9	A
Westside Rd/Railroad Ave & Buenaventura Blvd	Signal	19	B	19	B
SR 273 & Buenaventura Blvd	Signal	16	B	16	B
SR 273 & Kenyon Dr	Side-Street Stop	38	E	38	E
SR 273 & Branstetter Ln	Side-Street Stop	11	B	11	B
SR 273 & Cedars Rd/Bonnyview Rd	Signal	39	D	39	D
Eastside Rd & Bonnyview Rd	Signal	37	D	37	D
SR 273 & Clear Creek Rd	Signal	13	B	13	B
SR 273 & Canyon Rd / Redding Rancheria	Signal	22	C	22	C
SR 273 & Whitehouse Dr	Side-Street Stop	23	C	23	C
SR 273 & Happy V Rd	Signal	12	B	12	B
SR 273 & Amen St/Latona Rd	Side-Street Stop	28	D	28	D
SR 273 & Ox Yoke Rd	Signal	29	C	29	C
SR 273 & North St	Signal	31	C	31	C
SR 273 & South St	Signal	36	D	36	D
SR 273 & Factory Outlets Dr	Signal	14	B	14	B
SR 273 & Pleasant Hills Dr	Signal	20	C	20	C
Branstetter Ln & Westside Rd	Side-Street Stop	11	B	11	B

Table 5 FS #1 PM Peak Hour LOS Under Various Roadway Configurations With Year 2040 Traffic Volumes

Intersection	Traffic Control	Existing Configuration		Partial Conversion	
		Delay	LOS	Delay	LOS
Market St & Caterpillar Rd	Signal	26	C	26	C
Market St & Northpoint Dr/Twin View Blvd	Signal	25	C	25	C
Market St & Lake Blvd	Signal	31	C	31	C
Market St & Benton Dr	Signal	21	B	21	B
Market St & Quartz Hill Rd/Travelled Wy	Signal	28	C	28	C
Market St & Trinity St	Signal	18	B	18	B
Market St & Eureka Wy	Signal	36	D	33	C
Market St & Shasta St	Signal	22	C	22	C
Shasta St & Pine St	Signal	10	A	11	B
California St & Tehama St	Signal	36	D	41	D
Pine St & Tehama St	Signal	25	C	25	C
Yuba St & East St	Side-Street Stop	17	C	17	C
California St & Placer St	Signal	28	C	25	C
Pine St & Placer St	Signal	21	C	26	C
California St & South St	Signal	27	C	24	C
Pine St & South St	Signal	20	B	23	C
East St & South St	All-Way Stop	11	B	11	B
Gold St & Market St	Signal	25	C	10	A
East St & Market St/Cypress Ave	Signal	20	C	37	D
Market St & Grange St	Signal	8	A	8	A
Westside Rd/Railroad Ave & Buenaventura Blvd	Signal	20	C	20	C
SR 273 & Buenaventura Blvd	Signal	14	B	14	B
SR 273 & Kenyon Dr	Side-Street Stop	36	E	36	E
SR 273 & Branstetter Ln	Side-Street Stop	13	B	13	B
SR 273 & Cedars Rd/Bonnyview Rd	Signal	37	D	37	D
Eastside Rd & Bonnyview Rd	Signal	32	C	32	C
SR 273 & Clear Creek Rd	Signal	15	B	15	B
SR 273 & Canyon Rd / Redding Rancheria	Signal	22	C	22	C
SR 273 & Whitehouse Dr	Side-Street Stop	38	E	38	E
SR 273 & Happy V Rd	Signal	12	B	12	B
SR 273 & Amen St/Latona Rd	Side-Street Stop	23	C	23	C
SR 273 & Ox Yoke Rd	Signal	24	C	24	C
SR 273 & North St	Signal	27	C	27	C
SR 273 & South St	Signal	29	C	29	C
SR 273 & Factory Outlets Dr	Signal	15	B	15	B
SR 273 & Pleasant Hills Dr	Signal	24	C	24	C
Branstetter Ln & Westside Rd	Side-Street Stop	10	A	10	A

6.3 Conclusion

After evaluating the Existing Traffic Volumes conditions, the Partial Conversion Alternative will have less of an impact on the intersections within the one-way couplet area over the Full Conversion Alternative. While a few locations do see a degradation of the LOS from existing conditions, the overall system will operate at the same or slightly better delay with Partial Conversion Alternative in both peak hours. The Full Conversion Alternative severely degrades operations at the intersections of Market St & Eureka Way, Shasta St & Pine St, and Pine St & Tehama St. These three intersections are vital connections between SR 273, SR 44, and SR 299 and see high traffic volumes that a two-way system cannot handle without roadway widening. Therefore, to maintain the integrity of these intersections and the connections to these corridors, it is recommended that the Partial Conversion Alternative be considered over the Full Conversion Alternative.

7. Summary

As evaluated in this TM, which provides a planning-level feasibility analysis, the SR 273 One-way Couplet in Downtown Redding could be converted from one-way streets to two-way streets, with the Partial Conversion Alternative having an acceptable impact on vehicular traffic flows (LOS D or better, per the City of Redding) in the one-way couplet area (i.e., Downtown Redding—"Market Street and Eureka Way" to "East Street and Market Street/Cypress Avenue"), as described in Section 6.

Technical Memorandum

November 19, 2024

To	Michael Kuker, SRTA; Laurent Beauregard, SRTA	**Contact No.**	
Copy to	Natalie Kinney, Caltrans; Aaron Casas, Caltrans; Christina Prosperi, Caltrans; Sergio Amezquita, Caltrans;	**Email**	Todd.tregenza@ghd.com
From	Todd Tregenza, GHD	**Project No.**	12560002
Project Name	Envision 273 Comprehensive Multimodal Corridor Plan		
Subject	Task 6 Technical Memorandum: Feasibility Study #3 (Downtown Redding Gateways) and Feasibility Study #2 (Cypress Avenue Roundabout)		

1. Introduction

The Task 6 Technical Memorandums (TMs) will evaluate potential projects that may support corridor solutions, as described in the Task 5 TM.

Each Task 6 TM presents the feasibility of a potential project or group of projects. Task 6 includes six feasibility studies (FSs):

1. One-way Couplet Reversion
2. Cypress Avenue Roundabout
3. Downtown Redding Gateways
4. Class I/IV from Redding to Anderson
5. Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation
6. Redding (SR 273/Breslauer Way) Grade Crossing Relocation

This TM presents *FS #3 Downtown Redding Gateways*, which incorporates *FS #2 Cypress Avenue Roundabout* (located in the Southern Downtown Redding Gateway).

The TMs will be combined or summarized in the draft/final report, as appropriate.

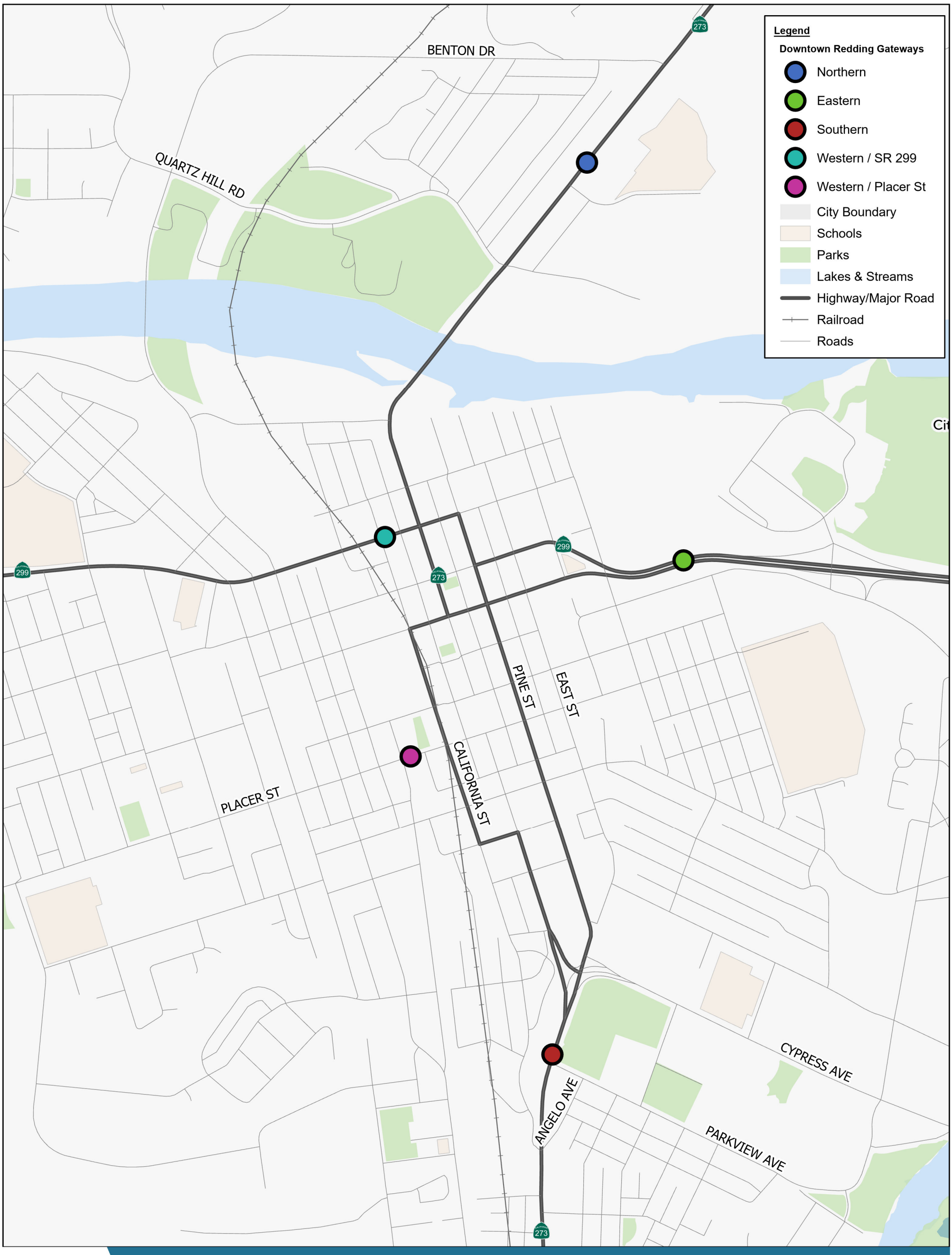
2. Scope

This TM evaluates the feasibility of implementing traffic calming measures in Downtown Redding transition zones or gateways. As shown in Figure 1, the following Downtown Redding Gateways will be evaluated:

- **Northern Downtown Redding Gateway**. State Route (SR) 273, from Quartz Hill Road to Benton Drive. This area is known as “Miracle Mile.”
- **Eastern Downtown Redding Gateway**. SR 44, from SR 273 to Sundial Bridge Drive.
- **Southern Downtown Redding Gateway**. SR 273, from Cypress Avenue to Angelo Avenue. This area is referred to as the “South City Park Micro-Corridor.”
- **Western Downtown Redding Gateway**. SR 299 and Placer Street, immediately west of SR 273.

Within the corridor, Downtown Redding is unique in that it contains the primary urban core, with recently constructed high-density, mixed-use development. Downtown Redding also is unique in that it is bisected by multiple highways—SR 273 in the north-south direction, which supports mostly intraregional trips, and both SR 44 and SR 299 in the east-west direction, which support (but are not limited to) interregional trips (e.g., freight trucks). Downtown Redding has been primarily designed for private motorized vehicles since the 1950s, when the first autos came to town.

Downtown Redding needs streets that will help the people and the community thrive, including promoting non-vehicular modes of travel (e.g., walking and bicycling) and creating a sense of place. The City of Redding vision is to “create a revitalized Downtown Redding that is attractive, safe, and economically vibrant” with a mix of “pedestrian- and bicycle-oriented shops, housing, workplaces, parks, and civic facilities, inviting to residents and visitors alike” (City of Redding Downtown Specific Plan Update, 2018).



Envision 273: SR 273 Multimodal Corridor Plan

DOWNTOWN REDDING GATEWAYS PROJECTS

Paper Size ANSI B

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US Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

Project No. **12560002**
Revision No. **-**
Date **November 2024**

FIGURE 1

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Print date: 08 Nov 2024 - 15:45

Data source: Esri Community Maps Contributors, City of Redding GIS, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS. Created by: ppeel

3. Guidance

For guidance regarding traffic calming measures in transition zones, state and federal highway documents were referenced, as noted in this section.

3.1 Caltrans Main Street

Caltrans Main Street, California: A Guide for Fostering People-Centered State Highway Main Streets (Main Street) highlights the special importance of State Highways that are functioning as community main streets. “People-centered” main streets are those that are sustained in ways that elevate the needs of people who use main street. They are fostered with an understanding that supporting travel of all modes is essential, and that main streets are also community places that people value. People-centered main streets improve multimodal access, equity, economic prosperity, and environmental quality through partnerships and engagement.

3.2 Caltrans Traffic Calming Guide

Caltrans Traffic Calming Guide offers strategies to reduce vehicle speeds and traffic volumes in the following categories: Signings and Markings, Physical Intersection Modifications, Roadway Narrowing, Vertical Roadway Elements, Physical Roadway Segment Modifications, and Others. Example strategies relevant to this study on gateways include in-street pedestrian crossing signs and high-visibility crosswalk markings near schools; road diets to accommodate bicyclists, pedestrians, and transit users; and street trees which have been shown to reduce the rate of crashes.

3.3 Caltrans Design Information Bulletin 94

Caltrans Design Information Bulletin-94 (DIB-94*)* provides contextual design guidance for complete streets and identifies place types to describe urban, suburban, and rural areas. Assessing place types along corridor segments and gateways can assist planners and community members with developing projects that best address the challenges, opportunities, and priorities unique to each place. Modal priority, including pedestrian, bicyclist, transit users, freight, and personal vehicles, is shown by place type to suggest relative priority and relative anticipated users.

3.4 FHWA Small Town and Rural Multimodal Networks

Federal Highway Administration (FHWA) Small Town and Rural Multimodal Networks guide builds upon existing design guidance for bicycle and pedestrian facilities and highlights designs that promote safe and accessible travel for all users. Health disparities, income disparities, and higher crash rates are a few of the issues that rural communities experience, which further the need for a safe multimodal network. The guide provides examples of projects in rural communities depending on the following contextual factors: speed and volume, existing roadway network, and land use types. Example designs relevant to this study include bicycle boulevards with traffic calming measures, shared use paths, and separated bike lanes.

3.5 Caltrans Project Development Procedures Manual

*Caltrans Project Development Procedures Manual (*PDPM) provides the functional framework of policies and essential procedures for developing State Highway System improvement projects. It is intended primarily as a resource for the project engineer and the project manager, or other professionals, as appropriate, in the various functional areas responsible for or involved in project development. Part 2 of the Caltrans PDPM discusses the project development process.

4. Projects

4.1 Existing Planned Projects

As detailed in the Task 5 TM, there are a number of existing planned projects in the corridor. In the Downtown Redding Gateways, this includes operational maintenance projects, as well as projects to calm traffic, increase safety, and promote non-vehicular modes of travel.

Northern Downtown Redding Gateway

- Project #41. Pavement Rehabilitation: SR 273 (PM 14.5 to 18.5). Pavement Overlay.
- Project #45. Signal Timing Corridor: SR 273 (PM 14.1 to 19.8). Redding Quarter Century Signals. Signal Replacement.
- Project #58. Replace Existing Traffic Signals: SR 273 (Multiple Locations). Replace existing traffic signals at 25 intersections.
- Project #111. Pedestrian Access Improvements: SR 273 (at Benton Drive). Constructing new bulbout east of the intersection. Requires removing existing right turn lane, installing new sidewalk, and removing and replacing accessible ramp.
- Project #122. Pavement Rehabilitation: SR 273 (PM 17.385 to 17.809). Priority Roadway: Temperature Change Pavement Performance.
- Project #129. Pavement Rehabilitation: SR 273 (PM 17.561 to 17.819). Priority Roadway: Temperature Change Pavement Performance.
- Project #171. Class II Bike Lane: N. Market Street (Sulphur Creek Road Proposed Class I to Benton Drive). Complete Streets Elements.

Eastern Downtown Redding Gateway

- Project #28. Pavement Rehabilitation: SR 44 (PM L0.00 to L0.54). Pavement Preservation.
- Project #42. Shoulder Widening: SR 44 (PM 0.0 to 71.39). Widen Shoulders.
- Project #58. Replace Existing Traffic Signals. SR 273 (Multiple Locations). Replace existing traffic signals at 25 intersections.

Southern Downtown Redding Gateway

- Project #1. Modern Roundabout: Cypress Avenue / Pine Street / Market Street.
- Project #31. Intersection Improvement: Cypress Avenue and Pine Street.
- Project #41. Pavement Rehabilitation: SR 273 (PM 14.5 to 18.5). Pavement Overlay.
- Project #45. Signal Timing Corridor: SR 273 (PM 14.1 to 19.8). Redding Quarter Century Signals. Signal Replacement.
- Project #58. Replace Existing Traffic Signals, SR 273 (Multiple Locations). Replace existing traffic signals at 25 intersections.
- Project #98. New Crosswalk: SR 273 (at California Street, PM 15.653). Crosses California Street. Requires installing bulb out sidewalk, removing and replacing existing accessible ramp, removing existing valley gutter and fixing any potential drainage issues.
- Project #105. Class II Bike Lane: SR 273 (Hill Street to California Street, PM 15.66 to 16.04). Requires removing existing southbound (SB) #2 lane on SR 273, installing a Class II bike lane with buffered striping.
- Project #106. Class II Bike Lane: SR 273 (Fell Street to East Street, PM 15.53 to 16.06). Requires removing free right on Angelo Avenue by adding "STOP" striping and installing "STOP" signage at existing crosswalk. Requires removing free right from Parkview Avenue by regrading, installing new accessible

ramp and restriping. Requires significant concrete removal and replacement or reconfiguring lanes at Cypress Avenue from 12'-0" to 11'-0" wide in order to fit new 5'-0" wide bike lane.

- Project #109. New Sidewalk: SR 273 (Angelo Avenue to Parkview Avenue, PM 15.72 to 15.8). Complete segment between Angelo Avenue and Parkview Avenue; current sidewalk ends mid-block. Future development of empty lot adjacent to SR 273 could impact need.
- Project #110. New Sidewalk: SR 273 (Hill Street to California Street, PM15.66 to 16.04). Requires removing existing SB #2 lane on SR 273, installing retaining wall, curb and gutter, buffered striping for bike lane, retaining wall structure, drain inlets and removing and replacing accessible ramps.
- Project #161. Class 1 Shared Use Path: South City Park, Tiger Field Perimeter at west side, along Parkview Avenue, along Cypress Avenue to Cottonwood Canal. Complete Streets Elements.

Western Downtown Redding Gateway

- Project #32. Intersection Improvement: Eureka Way and Walnut Avenue.
- Project #58. Replace Existing Traffic Signals, SR 273 (Multiple Locations). Replace existing traffic signals at 25 intersections.
- Project #60. Bridge Rehabilitation: SR 299 (at Bridge No.06-0035, west of California Street). Replace 3,115 linear feet of metal beam guardrail (MBGR) with Midwest Guardrail System (MGS) with steel posts and install four bridge transition anchor blocks on Redding OH Bridge No. 06-0035.
- Project #87. New Sidewalk: Eureka Way (Buenaventura Boulevard to east of Overhill Drive). Sidewalk, 1.23 miles.
- Project #141. Class II Bike Lane: Eureka Way/SR 299 (Buenaventura Boulevard to Court Street). Complete Streets Elements. Subject to Caltrans Process Bike Lane.
- Project #78. Class IV Bikeway: California Street (Division Street to Yuba Street).
- Project #79. Class IV Bikeway: California Street (Yuba Street to Placer Street).

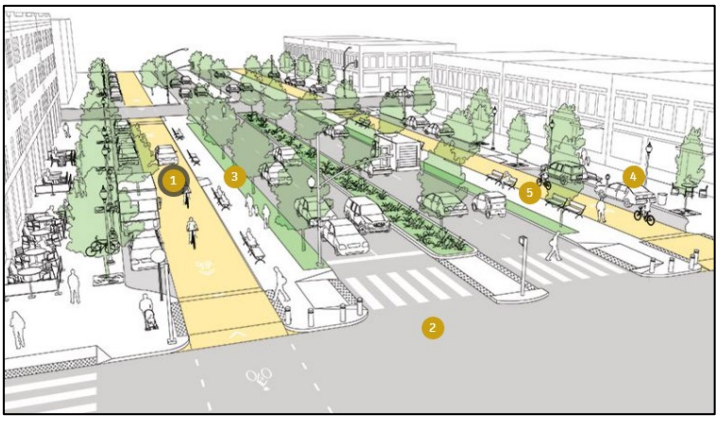
4.2 Other Project Ideas

In addition to the existing planned projects (i.e., projects documented in publicly available plans), other potential project ideas have been discussed amongst project stakeholders.

One potential project idea (in the Eastern Downtown Redding Gateway) is the SR 44 Boulevard, from approximately the Sacramento River to Continental Street. As noted in the National Association of City Transportation Officials (NACTO) *Urban Street Design Guide*:

> *Boulevards separate very large streets into parallel urban realms, buffering the commercial or residential street edge from the high speed throughway by means of multi-way operations and frontage roads…The frontage road, especially in a residential context, benefits from traffic calming at intersections and midblock as well as pedestrian-scale lighting and street trees. These enhancements preserve safe speeds for bicyclists and pedestrians, and encourage recreational and commercial activity.*

The SR 44 Boulevard could slow SR 44 traffic prior to entering Downtown Redding, with potential active transportation and land use benefits.



Source: NACTO Urban Street Design Guide

Another potential project idea (in the Southern Downtown Redding Gateway) is a pedestrian and/or bicycle connection on Parkview Avenue, from SR 273 to California Street. The project is envisioned to be constructed on an undeveloped parcel immediately west of SR 273/Parkview Avenue. In this area, the California Street residential neighborhood is separated from city services along Parkview Avenue, including South City Park, Redding Library, and Redding City Hall. In the area, sidewalk gaps are prevalent, as well as limited and/or non-direct pedestrian crossings at SR 273 intersections (e.g., SR 273/Cypress Avenue and SR 273/Angelo Street). The connection could promote active transportation mobility and connectivity.

Source: Google Earth

5. List of Alternatives

To determine the alternatives for each Downtown Redding Gateway, the following traffic calming measures, consistent with state and federal highway documents, were considered.

5.1 Roadway Cross-section

Road Diets and Number of Lanes

Road diets reduce the number of travel lanes to reduce driver speeds and improve safety. A typical road diet converts four lane roadways into a two-lane road with a center turn lane. By reducing the perceived roadways width, a road diet may reduce speeds by one to two miles per hour, according to the Caltrans Traffic Calming Guide. Providing separation between opposing directions of traffic reduces the risk of head-on collisions. Center turn lanes provide a dedicated space for turning vehicles separate from the driving lane, reducing the risk of rear end and head on collisions with turning drivers. Road diets also make space for other transportation infrastructure, such as bicycle or transit lanes, and can reduce the level of stress for bicyclists.

According to the Caltrans Traffic Calming Guide, road diets have minimal impact on emergency response times, though they should be assessed if the road diet is located along an emergency response route.

Raised Median Islands

Raised median islands can be used as a traffic calming measure – installing a raised curb adjacent to vehicle traffic narrows the perceived road width and slows drivers. Raised median islands also provide an opportunity for trees and landscaping. When located at intersections, raised median allow pedestrians to cross one lane of traffic at a time, shortening crossing distances and improving safety.

Raised median islands may be implemented on their own or as a part of a road diet in junction with a center turn lane. The Caltrans Traffic Calming Guide cites that raised median islands can reduce speeds up to 8 mph and are appropriate on minor arterials, collectors, and local roads. The impacts of raised median islands on emergency response but may be reviewed for impacts on evacuation routes.

Traffic Lane Width

Travel lane width contributes to a roadway's operating speed. Reducing travel lane width can be an effective method for reducing driver speeds by reducing the perceived roadway width of the roadway. Travel lane widths may be reduced alone or as a part of a road diet; the Caltrans Traffic Calming Design Guide states that road diets or lane narrowing can reduce vehicle speeds between one and two miles per hour.

Caltrans DIB-94 provides appropriate lane widths for varying place types and operating speeds, shown below.

Place Type	Lane Type	Suggested Minimum Lane Widths by Proposed Operating Speed					
		20 mph	25 mph	30 mph	35 mph	40 mph	45 mph
Urban Area – City Center	Through	10.5 ft	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft
	L/R Turn	10.5 ft	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft
	TWLTL	10.5 ft	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft
Urban Area – Urban Community	Through	10.5 ft	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft
	L/R Turn	10.5 ft	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft
	TWLTL	10.5 ft	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft
Suburban Area	Through	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	11-12 ft	11-12 ft
	L/R Turn	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	11-12 ft	11-12 ft
	TWLTL	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft	11-12 ft
Rural Main Street	Through	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft	11-12 ft	11-12 ft
	L/R Turn	10.5 ft	10.5 ft	10.5-11 ft	10.5-11 ft	11-12 ft	11-12 ft
	TWLTL	10.5 ft	10.5 ft	10.5 ft	10.5-11 ft	10.5 ft	10.5 ft

Note: Cells shaded in gray are outside the range of proposed operating speeds recommended

Source: Caltrans DIB-94

Mid-Block Crossings

Mid-block crossings provide designated crossing locations where intersections are infrequent or where additional pedestrian access is needed at key destinations, like shopping centers, libraries, and transit stops. Flashing beacons, high visibility crosswalks, advanced stop bars and yield markings should be considered to alert drivers who may not anticipate an upcoming midblock crossing. Traffic calming measures such as curb extensions and raised crosswalks may also be used to slow approach drivers.

5.2 Intersections

Bulb-outs

Bulb-outs, or curb extensions, are effective at improving intersection safety and slow driver speeds. Where on-street parking is present, bulb-outs can extend the sidewalk into the roadway, shortening crossing distances for pedestrians, improving pedestrian visibility to drivers and bicyclists, and allowing pedestrians an improved view of on-coming traffic. By narrowing the roadway width and increase turn radii, blub-outs slow oncoming traffic.

The Caltrans Traffic Calming Guide states that bulb-outs reduce speeds by 1 to 3 mph, reducing turning speeds more significantly. Bulb-outs are appropriate along minor arterials, collectors, and local roadways with posted speeds of 35 mph or less.

Source: GHD

Source: Caltrans Traffic Calming Guide

Roundabouts

Roundabouts are circular, yield control intersections comprised of a center island, a circulatory roadway, and splitter islands on each approach. Roundabouts have fewer potential conflict points and slow driver speeds, leading to a reduction in fatal and severe injury collisions compared to stop controlled and signalized intersections. Roundabouts may also be implemented to alleviate congestion.

Roundabouts can effectively lower driver speeds and should be designed with a maximum entry speed of 25 mph (30 mph for a multi lane roundabout). Roundabout placement is generally flexible. Roundabouts can be appropriate at any urban operating speed, traffic volume (up to 60,000 ADT), and on emergency, transit, and access routes.

High-Visibility Crosswalks

High visibility crosswalks use parallel ladder markings to improve visibility compared to standard transverse crosswalks. High-visibility crosswalks are recommended at mid-block crossings and uncontrolled intersections and are appropriate at stop controlled or signalized intersections.

Source: Caltrans Main Street Guide

5.3 Signals, Beacons, and Signs

Traffic Signals

Traffic signals control the flow of traffic through intersections. When coordinated, traffic signals have the potential to reduce travel time and delays. According to the Caltrans Main Street Guide, traffic signals can be used to reduce unsafe speeding by aligning green signal timing with traffic flow moving at the speed limit.

Leading Pedestrian Intervals

Leading Pedestrian Intervals (LPIs) alter signal timing to reduce the risk of right hook collisions with pedestrians. LPIs show walk signal several seconds before drivers are given the green light, allowing pedestrians to travel further into the intersection where they are more visible to drivers and bicyclists.

Vehicle Speed Feedback Signs

Vehicle Speed Feedback Signs (SFS) provide real-time feedback of driver speeds. Placed below a speed limit sign, SFS remind motorists of the posted speed limit and encourage slower driving speeds.

SFS effectively reduce driver speeds by 2 to 7 mph. SFS are appropriate on most roadway classifications, including principal arterials, minor arterials, collectors, and local roads. However, SFS can only provide speed feedback for one vehicle at a time and are therefore more effective on roadways with one lane of traffic in each direction and gaps between drivers. According to the Caltrans Traffic Calming Guide, SFS can be effective when “appropriately complemented with police enforcement.”

6. Signalized Intersection Analysis

This section evaluates the operational feasibility of traffic signals at Downtown Redding Gateways.

Traffic signals (i.e., new and modified) were considered in the Southern Downtown Redding Gateway at the following three consecutive intersections: SR 273/Cypress Avenue, SR 273/Parkview Avenue, and SR 273/California Street. Two alternatives were considered, as described in this section.

6.1 Target Level of Service (LOS)

City of Redding Level of Service (LOS) thresholds will be applied to all intersections for which the feasibility of signalized intersections is analyzed. For the purposes of the signalized intersection feasibility analysis, study intersections will be analyzed at a threshold of LOS D in accordance with City of Redding Guidelines. LOS criteria are presented below in Table 1.

Table 1 Intersection Level of Service Criteria

LOS	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (seconds)	
				Signalized/ Roundabout	Side-Street/All Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0

		Individual cycle failures are noticeable.			
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative or poor progression, long cycle lengths, and high volume-to-capacity ratio. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0

6.2 Alternative 1

6.2.1 Proposed Intersection Geometry

Alternative 1 evaluated one lane in each direction (plus turn lanes). At the SR 273/Cypress Avenue intersection, the SB SR 273 slip lane was removed. Additionally, at the SR 273/California Street intersection, the Angelo Avenue leg was removed. The intersection geometry is shown in

Figure 2 to Figure 4.

Figure 2 *Alternative 1 – SR 273/Cypress Avenue Intersection Geometry*

Figure 3 *Alternative 1 – SR 273/Parkview Avenue Intersection Geometry*

Figure 4 *Alternative 1 – SR 273/California Street Intersection Geometry*

6.2.2 Cumulative Condition Traffic Operations

To assess the feasibility of Alternative 1 improvements, cumulative volumes were determined using the ShastaSim Travel Deman Model to compare 2020 volumes to 2040 along each roadway segment.

Table 3 presents 95th percentile queues for the study intersection under cumulative volume conditions for Alternative 1. The queue exceeds storage for the SR 273 and Cypress Avenue intersection for northbound right during AM peak hours and eastbound left during PM peak hours. SR 273 and Parkview Avenue queues also exceed storage for the northbound right during AM peak hours and southbound left for PM peak hours.

Table 3 presents intersection operations under cumulative volumes conditions for Alternative 1 improvements. As shown below. all three study intersections operate under within acceptable level of service.

Table 2 Alternative 1 – Cumulative LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
45	SR 273/Cypress Ave	Signal	D	33.6	C	39.3	D
49	SR 273/Parkview Ave	Signal	D	12.5	B	11.9	B
50	SR 273/California St	Signal	D	9.7	A	8.2	A

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

Table 3 presents 95th percentile queues for the study intersection under cumulative volume conditions for Alternative 1. The queue exceeds storage for the SR 273 and Cypress Avenue intersection for northbound right during AM peak hours and eastbound left during PM peak hours. SR 273 and Parkview Avenue queues also exceed storage for the northbound right during AM peak hours and southbound left for PM peak hours.

Table 3 *Alternative 1 – Cumulative 95th Percentile Queues*

Int. #	Intersection/Approach	Control Type	Cumulative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
45	*SR 273/Cypress Ave*				
	EB Left	Signal	25	**110**	80
	EB Thru		245	350	
	EB Right		105	170	
	WB Left		180	400	
	WB Right		200	255	
	NB Thru		630	430	
	NB Right		**385**	235	300
49	*SR 273/Parkview Ave*				
	WB Left		100	120	150
	WB Right		55	55	
	NB Thru		440	265	
	NB Right		**220**	35	200
	SB Left		80	**105**	100
	SB Thru		120	295	
50	*SR 273/California St*				
	EB Left	Signal	55	50	
	EB Right		45	45	75
	NB Left		45	45	
	NB Thru		300	100	
	SB Thru		140	170	
	SB Right		35	35	200

Note: **Bold** text indicates queues that exceed available storage

6.3 Alternative 2

6.3.1 Proposed Intersection Geometry

Alternative 2 evaluated one SB lane and two northbound (NB) lanes (plus turn lanes). Similar to Alternative 1, the SB SR 273 slip lane was removed, and the Angelo Avenue leg was removed.

The intersection geometry for Alternative 2 is shown in Figure 5 to Figure 7.

Figure 5 Alternative 2 – SR 273/Cypress Avenue Intersection Geometry

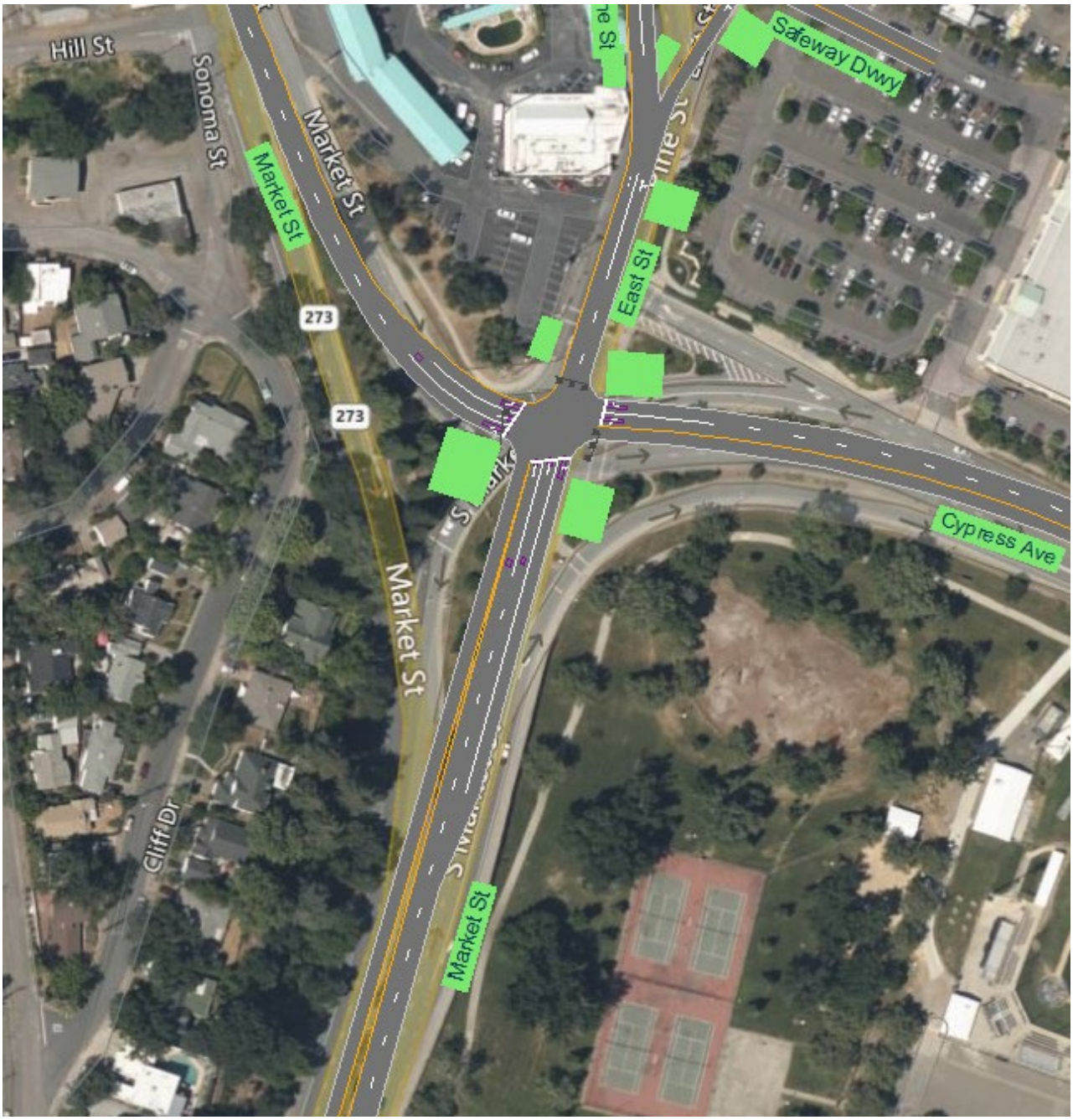
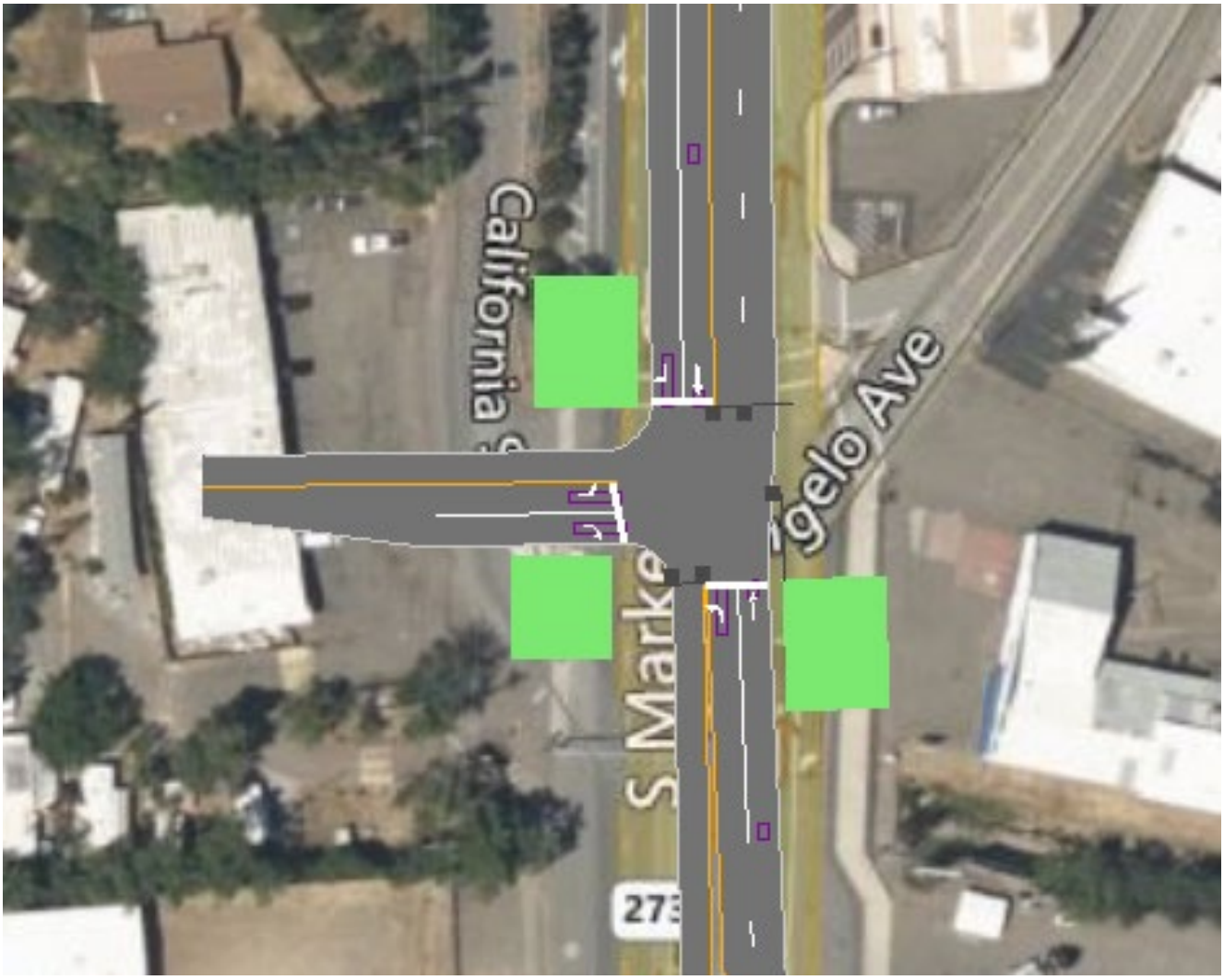


Figure 6 *Alternative 2 – SR 273/Parkview Avenue Intersection Geometry*

Figure 7 *Alternative 2 – SR 273/California Street Intersection Geometry*



6.3.2 Cumulative Condition Traffic Operations

To assess the feasibility of Alternative 1 improvements, cumulative volumes were determined using the ShastaSim Travel Demand Model to compare 2020 volumes to 2040 along each roadway segment.

Table 4 presents intersection operations under cumulative volumes conditions for Alternative 2 improvements. As shown below, all three study intersections operate under within acceptable level of service.

Table 4 Alternative 2 – Cumulative LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
45	SR 273/Cypress Ave	Signal	D	21.2	C	27.2	C
49	SR 273/Parkview Ave	Signal	D	6.5	A	9.5	A
50	SR 273/California St	Signal	D	9.7	A	8.2	A

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

Table 5 presents 95th percentile queues under cumulative volume conditions for Alternative 2 improvements. The queue exceeds the available storage for the SR 273 and Cypress Avenue for the eastbound left for the PM peak hours and for SR 273 and Parkview Avenue southbound left for PM peak hours, similarly to Alternative 1. The queue storage deficiencies found in AM peak hours for Alternative 1 are not present for Alternative 2.

Table 5 *Alternative 2 – Cumulative 95th Percentile Queues*

Int. #	Intersection/Approach	Control Type	Cumulative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
45	***SR 273/Cypress Ave***				
	EB Left	Signal	45	*115*	80
	EB Thru		230	285	
	EB Right		90	190	
	WB Left		155	295	
	WB Right		180	170	
	NB Thru		195	185	
	NB Right		85	110	300
49	***SR 273/Parkview Ave***				
	WB Left	Signal	95	115	150
	WB Right		45	45	
	NB Thru		110	120	
	NB Right		65	40	200
	SB Left		75	*105*	100
	SB Thru		115	270	
50	***SR 273/California St***				
	EB Left	Signal	50	50	
	EB Right		45	50	75
	NB Left		50	40	
	NB Thru		245	110	
	SB Thru		145	160	
	SB Right		35	25	200

Note: **Bold** text indicates queues that exceed available storage

7. Roundabout Analysis

Roundabouts can lower driver speeds and help to create a sense of place. As such, roundabouts should be considered at appropriate Downtown Redding Gateways.

This section evaluates the operational feasibility of roundabouts.

7.1 Introduction

The roundabout analysis was conducted using SIDRA, a traffic modelling software that employs traffic counts and anticipated growth rate to produce intersection LOS. Intersection LOS criteria were used to determine the feasibility of the roundabouts.

For the Downtown Redding Gateways, four roundabouts were evaluated:

– SR 273/Benton Drive
– SR 273/Arboretum Drive
– SR 273/Quartz Hill Road
– SR 273/Cypress Avenue

Additionally, beyond the Downtown Redding Gateways, 12 roundabouts were evaluated:

– SR 273/Grange Street
– SR 273/Buenaventura Boulevard
– SR 273/Kenyon Drive
– SR 273/Branstetter Lane
– SR 273/Whitehouse Drive
– SR 273/Happy Valley Road
– SR 273/Latona Road
– SR 273/Ox Yoke Road
– SR 273/North Street
– SR 273/South Street
– SR 273/Factory Outlets Drive
– SR 273/Pleasant Hills Drive

7.2 Assumptions

The roundabout analysis included the following assumptions:

– For Existing and Opening Year Conditions, existing Peak Hour Factor (PHF) is used.
– For Opening and Design Year Conditions, PHF is 0.89 and 0.92, respectively.
– Peak hour heavy vehicle percentages for the study intersection are estimated from the existing traffic counts with a minimum heavy vehicle percentage of 1 percent.
– Flow scale used for future conditions is 1.3 to test roundabout feasibility with a 30 percent growth in traffic volumes. (Note: the 30 percent growth represents stress testing, not traffic growth forecast.)

7.3 Target LOS

To determine the target LOS, the Traffic Impact Analysis Guidelines for the City of Redding, which outline LOS standards consistent with the City of Redding General Plan, were considered, including the following:

- LOS D for streets within the State highway system and interchanges
- Caltrans strives to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities

Additionally, use of SR 273 as an evacuation route also was considered. For the roundabout analysis, the target LOS used was LOS C. For more information regarding intersection level of service criteria, refer to City of Redding Level of Service (LOS) thresholds will be applied to all intersections for which the feasibility of signalized intersections is analyzed. For the purposes of the signalized intersection feasibility analysis, study intersections will be analyzed at a threshold of LOS D in accordance with City of Redding Guidelines. LOS criteria are presented below in Table 1.

Table 1.

7.4 Downtown Gateway Roundabout Analysis

7.4.1 Proposed Roundabout Geometry

Roundabout geometry for each location is shown below. All roundabouts are single lane or hybrid roundabouts with turn pockets or slip lanes when necessary to accommodate for higher traffic volumes.

Benton Drive

Figure 8 illustrates the proposed Benton Drive roundabout geometry, a single lane roundabout with a 145-foot right turn pocket on the SR 273 SB leg to accommodate for high right turn volumes.

Arboretum Drive

Figure 9 illustrates the proposed Arboretum Drive roundabout geometry, a single lane roundabout.

Quartz Hill Road

Figure 10 illustrates the proposed roundabout geometry for Quartz Hill, a single lane roundabout with a 145-foot right turn pocket on the eastbound (EB) leg of Quartz Hill to accommodate for high right-turn volumes.

Cypress Avenue

Figure 11 illustrates the proposed roundabout geometry for Cypress Avenue. The roundabout has a single lane configuration and includes two slip lanes on the EB leg of Market Street, and the westbound (WB) left of Cypress Avenue, as well as a 145-foot right-turn pocket on the NB leg of SR 273 to accommodate for high right-turn volumes. The roundabout maintains Pine Street as a one way and does not include an approach on the SB leg. The design also maintains the existing four lanes on Cypress Avenue.

Figure 8 *Benton Drive Roundabout Geometry*

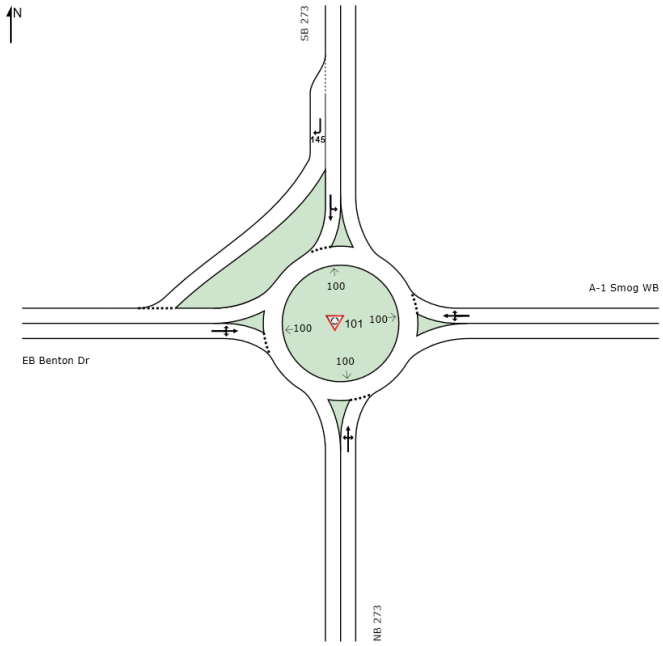


Figure 9 *Arboretum Drive Roundabout Geometry*

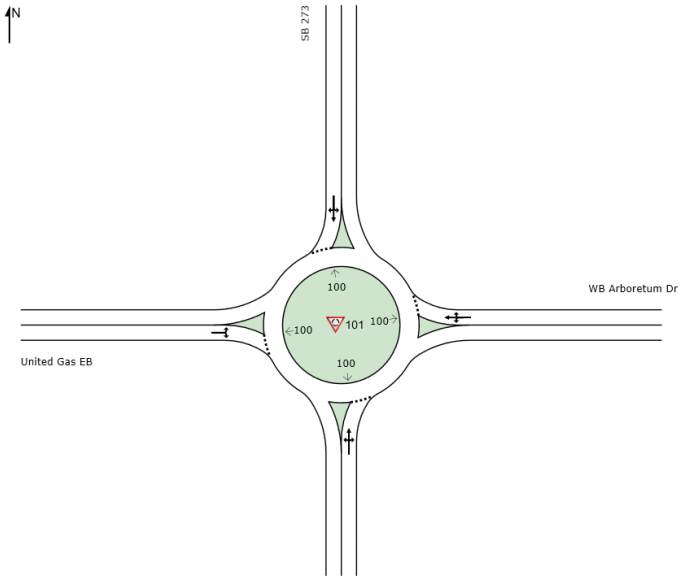


Figure 10 *Quartz Hill Road Roundabout Geometry*

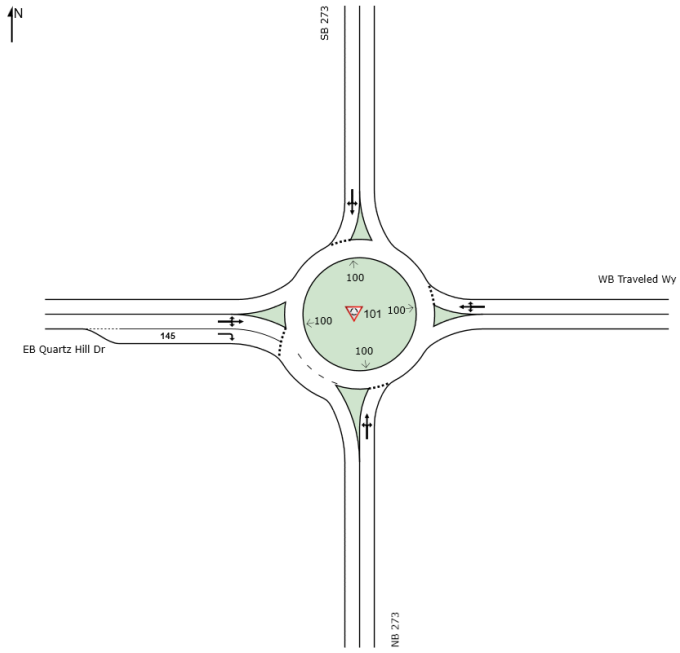
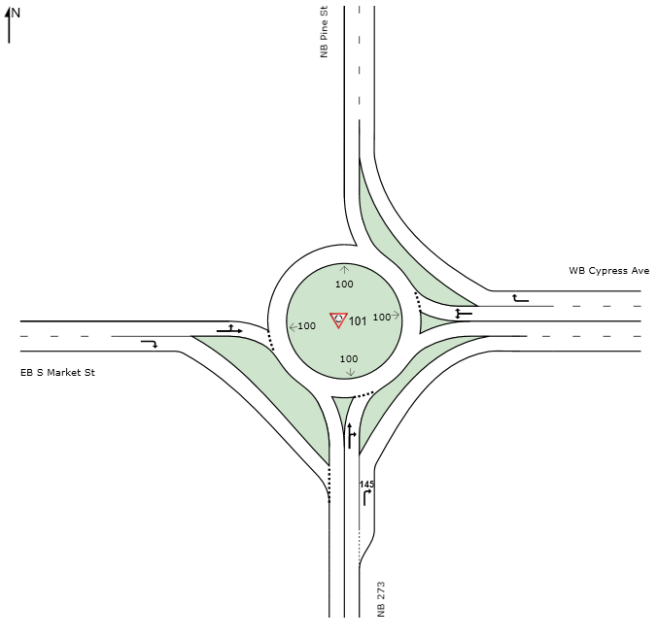


Figure 11 *Cypress Avenue Roundabout Geometry*



7.4.2 Cumulative Traffic Operations

Table 6 shows intersection operations for the future conditions with the proposed roundabouts. The analysis utilizes a Flow Scale constant of 1.3, assuming a 30% increase in traffic volumes. All intersections operate above the target LOS except for Benton Drive, which operates at an LOS D during PM peak hours.

Table 6 Downtown Gateway Roundabouts – Cumulative LOS

#	Intersection	Control	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
4	SR 273/Benton Drive	Roundabout	C	31	C	43	**D**
6	SR 273/Arboretum Drive	Roundabout	C	4	A	4	A
8	SR 273/Quartz Hill Road	Roundabout	C	12	B	8	A
45	East Street/Cypress Avenue	Roundabout	C	7	A	9	A

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds
6. At SR 273/Arboretum Drive, additional counts needed to understand the impacts of eastbound and westbound traffic

Table 7 presents the 95th percentile queues for the downtown gateways in cumulative traffic volume conditions. The queues exceed available storage for the SR 273 and Benton Drive intersection for the eastbound through in AM peak hours and northbound through in PM peak hours.

Table 7 *Downtown Gateway Roundabouts – Cumulative 95th Percentile Queues*

#	Intersection/Approach	Control Type	Cumulative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
4	SR 273/Benton Drive				
	Northbound Left/Thru/Right	Roundabout	652	**1838**	1270
	Westbound Left/Thru/Right		4	12	100
	Southbound Left/Thru		253	86	400
	Southbound Right		94	62	145
	Eastbound Left/Thru/Right		**1035**	144	500
6	SR 273/Arboretum Dr				
	Northbound Left/Thru/Right	Roundabout	172	167	835
	Westbound Left/Thru/Right		1	25	412
	Southbound Left/Thru/Right		236	83	1270
	Eastbound Left/Thru/Right		1	12	100
8	SR 273/Quartz Hill Rd				
	Northbound Left/Thru/Right	Roundabout	389	546	
	Westbound Left/Thru/Right		23	50	
	Southbound Left/Thru/Right		493	235	
	Eastbound Left/Thru/Right		279	47	
	Eastbound Right		29	7	145
45	SR 273/Cypress Ave				
	Northbound Left/Thru	Roundabout	292	239	800
	Northbound Right		0	0	145
	Westbound Left/Right		89	211	
	Westbound Right		0	0	
	Eastbound Left/Thru		70	119	985
	Eastbound Right		44	98	145

Note: **Bold** text indicates queues that exceed available storage

Benton Drive

Table 8 and Table 9 provide LOS for all legs of the Benton Drive roundabout. As shown, the EB Benton Drive approach operates at an LOS F during AM peak hours, and the NB SR 273 approach operates at an LOS F during PM peak hours.

Table 8 Benton Drive – AM LOS Lane Summary

Lane Use and Performance													
	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB 273													
Lane 1[d]	913	3.0	963	0.948	100	23.7	LOS C	25.5	652.3	Full	1270	0.0	0.0
Approach	913	3.0		0.948		23.7	LOS C	25.5	652.3				
East: A-1 Smog WB													
Lane 1[d]	6	3.0	282	0.020	100	18.6	LOS B	0.2	3.8	Full	100	0.0	0.0
Approach	6	3.0		0.020		18.6	LOS B	0.2	3.8				
North: SB 273													
Lane 1[d]	1133	3.0	1589	0.713	100	4.6	LOS A	9.9	253.3	Full	400	0.0	0.0
Lane 2	536	3.0	1244	0.431	100	4.7	LOS A	3.7	94.2	Short	145	0.0	NA
Approach	1669	3.0		0.713		4.6	LOS A	9.9	253.3				
West: EB Benton Dr													
Lane 1[d]	478	3.0	413	1.156	100	133.9	LOS F	40.4	1035.5	Full	500	0.0	34.5
Approach	478	3.0		1.156		133.9	LOS F	40.4	1035.5				
Intersection	3065	3.0		1.156		30.5	LOS C	40.4	1035.5				

Table 9 Benton Drive – PM LOS Lane Summary

Lane Use and Performance													
	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB 273													
Lane 1[d]	1112	1.0	960	1.159	100	89.7	LOS F	72.9	1838.2	Full	1270	0.0	17.3
Approach	1112	1.0		1.159		89.7	LOS F	72.9	1838.2				
East: A-1 Smog WB													
Lane 1[d]	15	1.0	217	0.070	100	25.5	LOS C	0.5	13.2	Full	100	0.0	0.0
Approach	15	1.0		0.070		25.5	LOS C	0.5	13.2				
North: SB 273													
Lane 1[d]	618	1.0	1585	0.390	100	4.2	LOS A	3.4	85.7	Full	400	0.0	0.0
Lane 2	422	1.0	1327	0.318	100	4.5	LOS A	2.5	61.7	Short	145	0.0	NA
Approach	1040	1.0		0.390		4.3	LOS A	3.4	85.7				
West: EB Benton Dr													
Lane 1[d]	477	1.0	799	0.597	100	16.9	LOS B	5.7	144.2	Full	500	0.0	0.0
Approach	477	1.0		0.597		16.9	LOS B	5.7	144.2				
Intersection	2644	1.0		1.159		42.6	LOS D	72.9	1838.2				

Two-Lane Roundabout Alternative

To address the LOS deficiency produced by the Benton Drive hybrid roundabout concept, a two-lane roundabout is proposed. As shown in

Figure 12, the two-lane roundabout includes a right turn and right exit pocket on the south leg and maintains the existing two travel lanes in each direction on the north leg. East and west legs include one left/through/right lane in each direction.

Figure 12 Benton Drive Alternative Two-Lane Roundabout

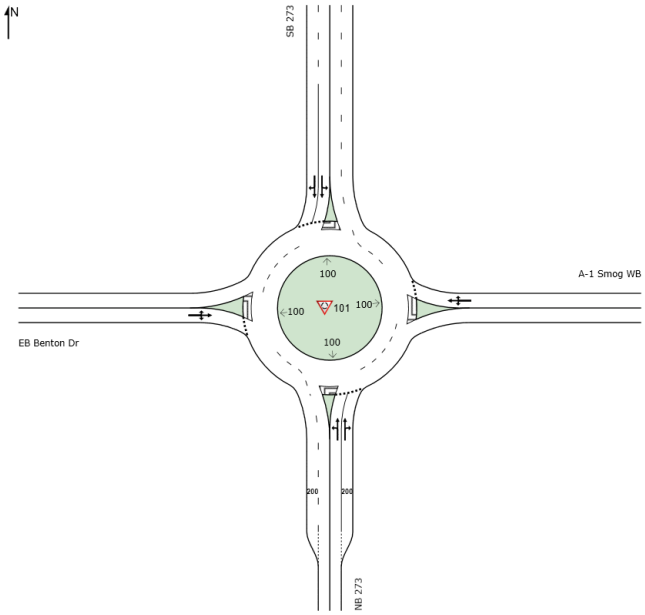


Table 10 provides LOS for cumulative traffic volumes. LOS is acceptable during both AM and PM peak hour conditions with the two-lane roundabout alternative.

Table 10 Benton Drive Two-Lane Roundabout – Cumulative LOS

#			Intersection	Control	Target LOS	AM Peak Hour		PM Peak Hour	
						Delay	LOS	Delay	LOS
4			SR 273/Benton Drive	Signal	C	22	C	10	A

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

Table 11 presents 95th percentile queues for the two-lane roundabout. EB Benton Drive queues exceed the available storage during AM peak hours.

Table 11 Benton Drive Two-Lane Roundabout – Cumulative 95th Percentile Queues

#	Intersection/Approach	Control Type	Cumulative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
4	**SR 273/Benton Drive**				
	Northbound Left/Thru	Roundabout	97	274	1270
	Northbound Thru/Right		106	67	200
	Westbound Left/Thru/Right		3	14	100
	Southbound Left/Thru		266	91	400
	Southbound Thru/Right		101	67	400
	Eastbound Left/Thru/Right		**862**	121	500

Note: **Bold** text indicates queues that exceed available storage

7.5 Additional Roundabout Analysis

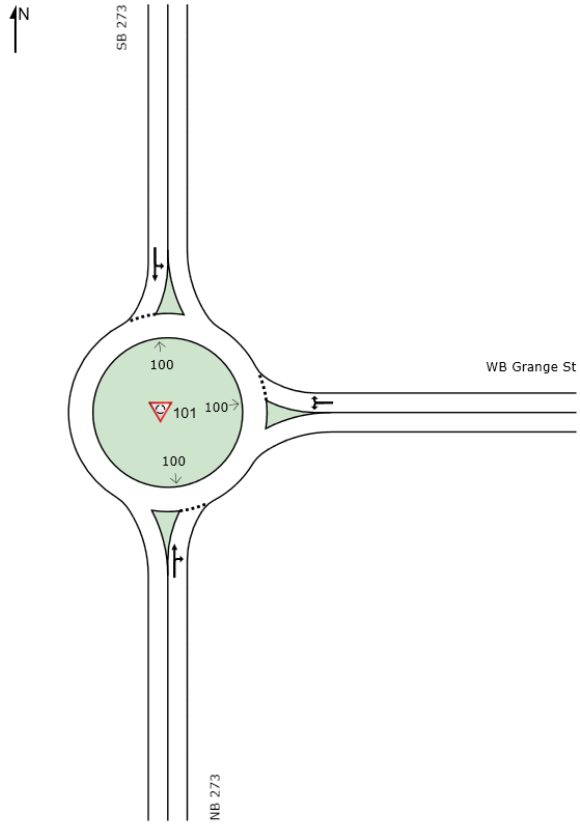
7.5.1 Proposed Roundabout Geometry

Roundabout geometry for each location is shown below. All roundabouts are single lane or hybrid roundabouts with turn pockets or slip lanes when necessary to accommodate for higher traffic volumes.

Grange Street

Figure 13 illustrates the proposed Grange Street roundabout geometry, a single lane roundabout without a west leg.

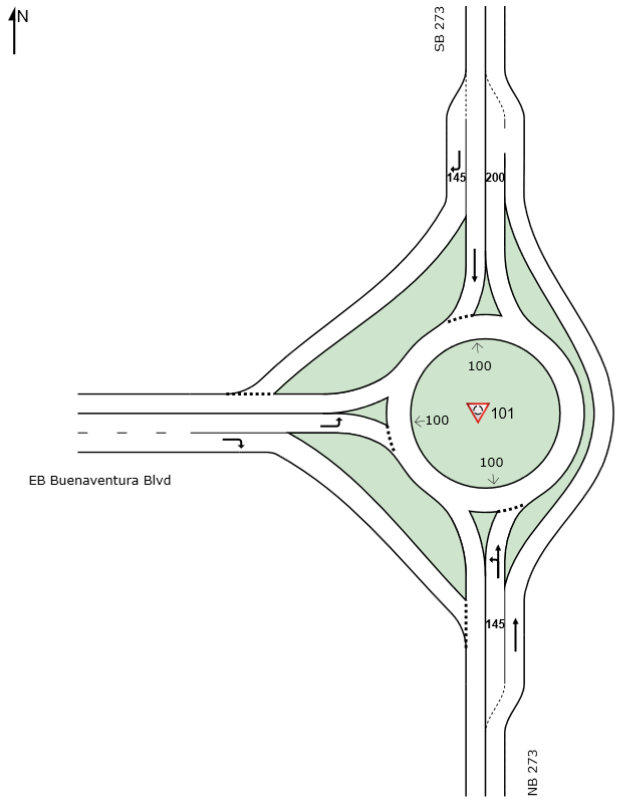
Figure 13 Grange Street Proposed Roundabout Geometry



Buenaventura Boulevard

Figure 14 illustrates the proposed roundabout geometry for Buenaventura Boulevard. The NB leg of SR 273 includes a through and right turn lane, as well as a separate through lane that circumvents the roundabout. The SB leg of SR 273 includes a through lane and a 145-foot right turn pocket and a slip lane. The EB le of Buenaventura Boulevard includes two approach lanes, a through lane and a right turn slip lane. There is no WB leg.

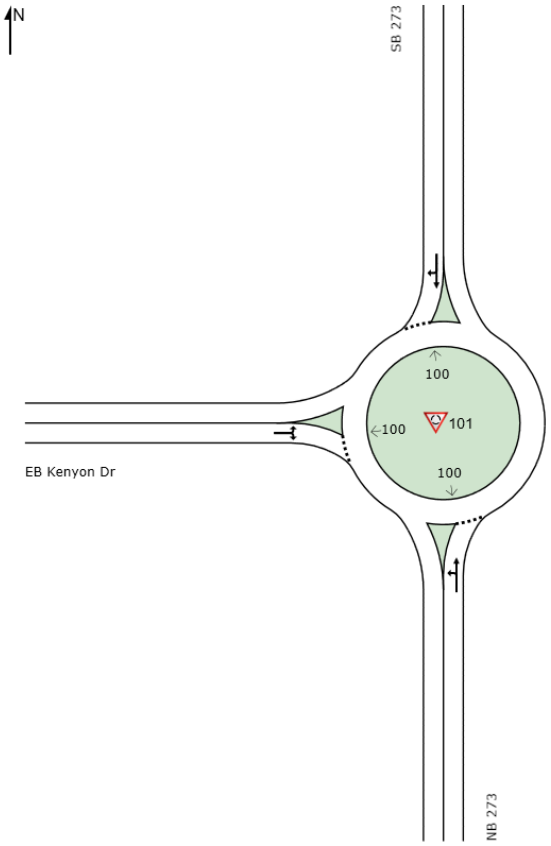
Figure 14 Buenaventura Boulevard Proposed Roundabout Geometry



Kenyon Drive

Figure 15 illustrates the proposed roundabout geometry for Kenyon Drive, a three-lane, single lane roundabout without a west leg. Sixty-five feet west of the intersection, Kenyon Drive is intersected by Westside Road. Further analysis of the EB leg of Kenyon Drive should be considered.

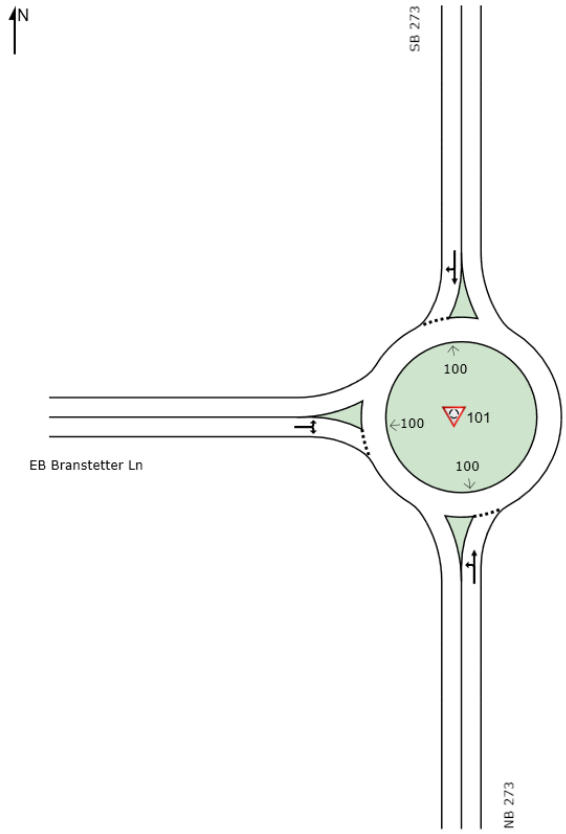
Figure 15 Kenyon Drive Proposed Roundabout Geometry



Branstetter Lane

Figure 16 illustrates the proposed roundabout geometry for Branstetter Lane, and three-leg single lane roundabout without an east leg. Sixty-five feet west of the intersection, Branstetter Lane is intersected by Westside Road. Further analysis of the EB leg of Branstetter Lane should be considered.

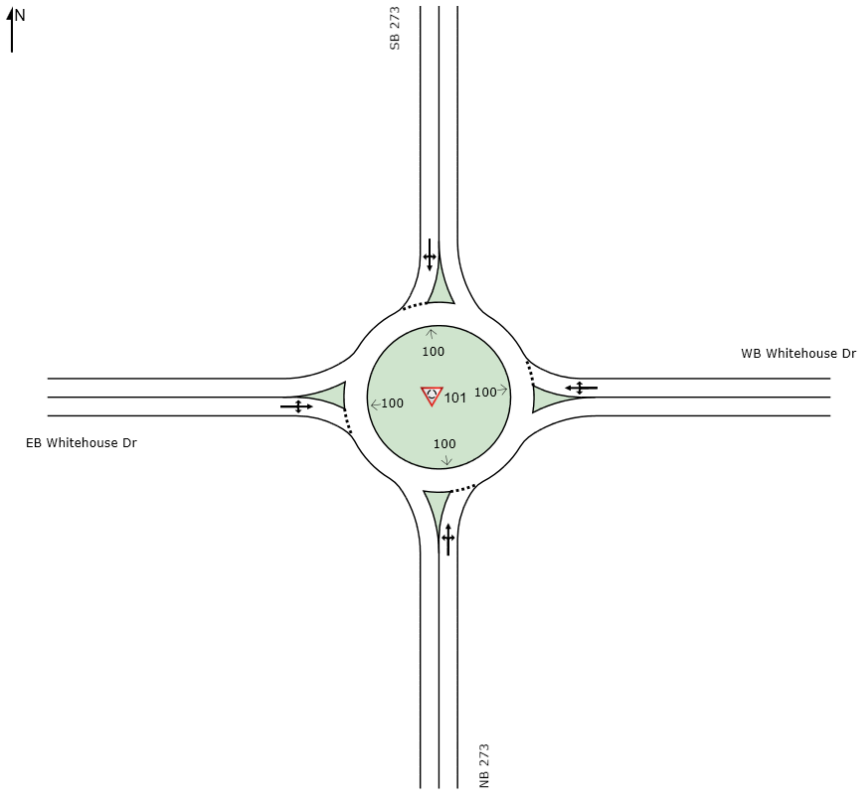
Figure 16 Branstetter Lane Proposed Roundabout Geometry



Whitehouse Drive

Figure 17 illustrates the proposed roundabout geometry for Whitehouse Drive, a four-leg, single lane roundabout.

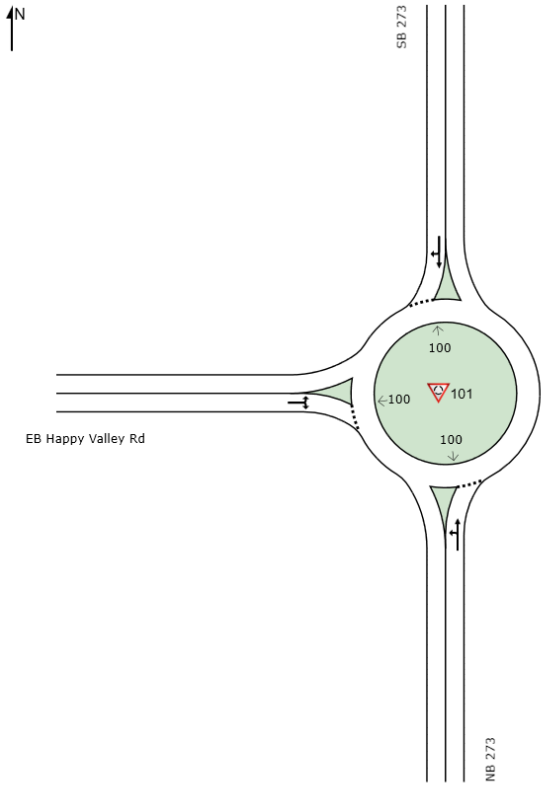
Figure 17 Whitehouse Drive Proposed Roundabout Geometry



Happy Valley Road

Figure 18 illustrates the proposed roundabout geometry for Happy Valley Road, a three-leg, single lane roundabout without an east leg.

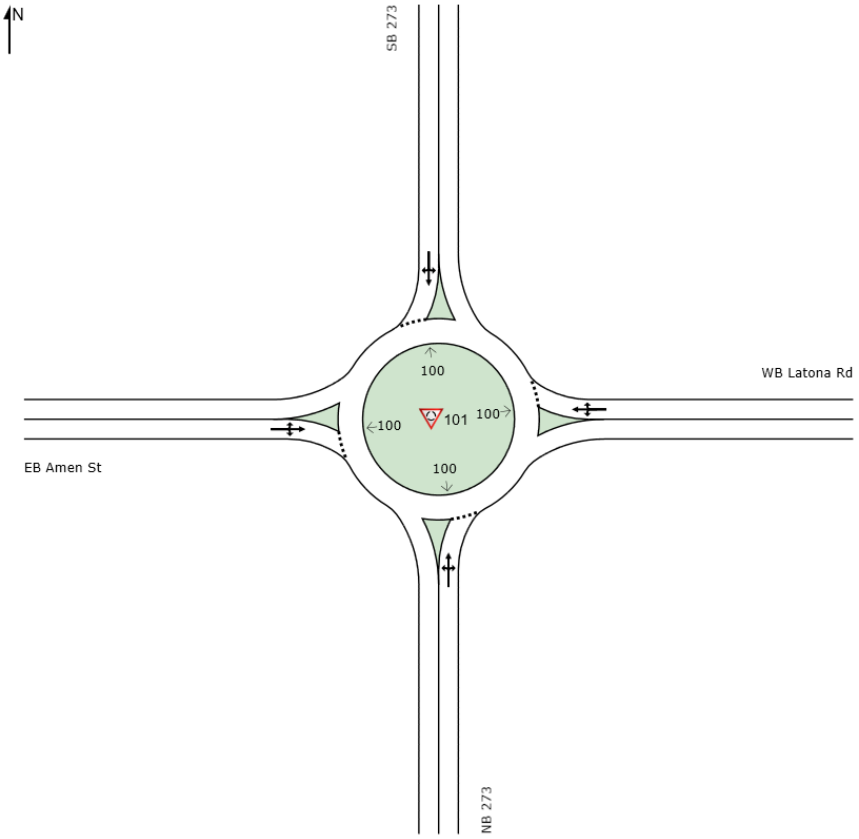
Figure 18 Happy Valley Road Proposed Roundabout Geometry



Latona Road

Figure 19 illustrates the proposed roundabout geometry for Latona Road, a four-way, single lane roundabout.

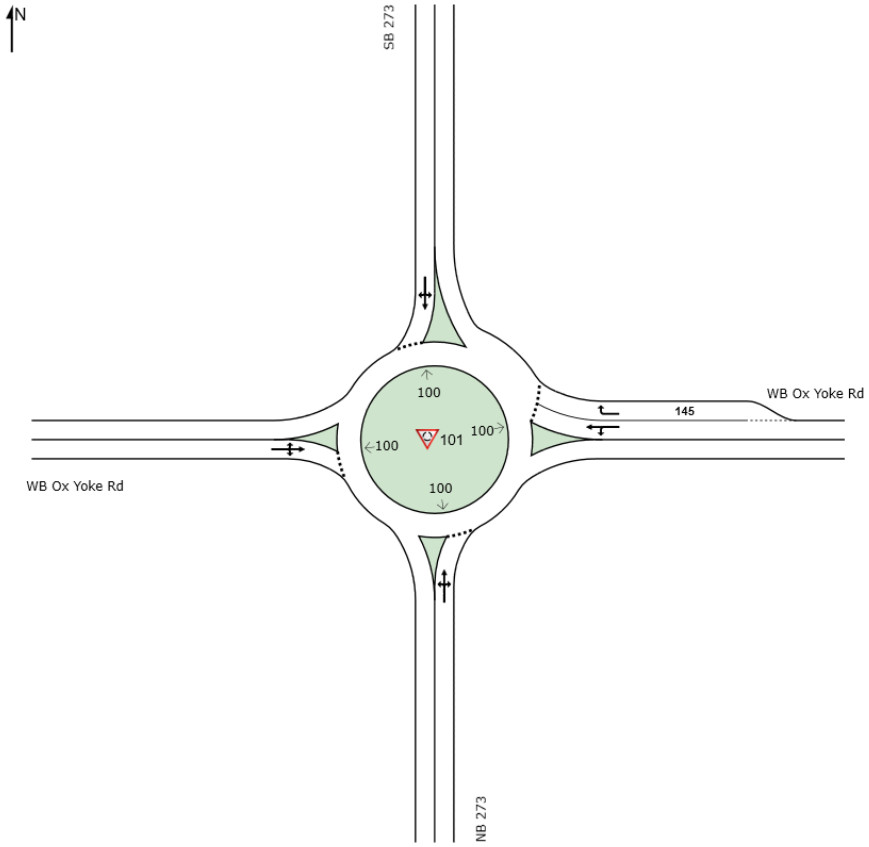
Figure 19 Latona Road Proposed Roundabout Geometry



Ox Yoke Road

Figure 20 illustrates the propose roundabout geometry for Ox Yoke Road. A four-way, single lane roundabout. The roundabout includes a 145-foot right turn pocket on the WB leg of Ox Yoke Road to accommodate for high right-turn volumes.

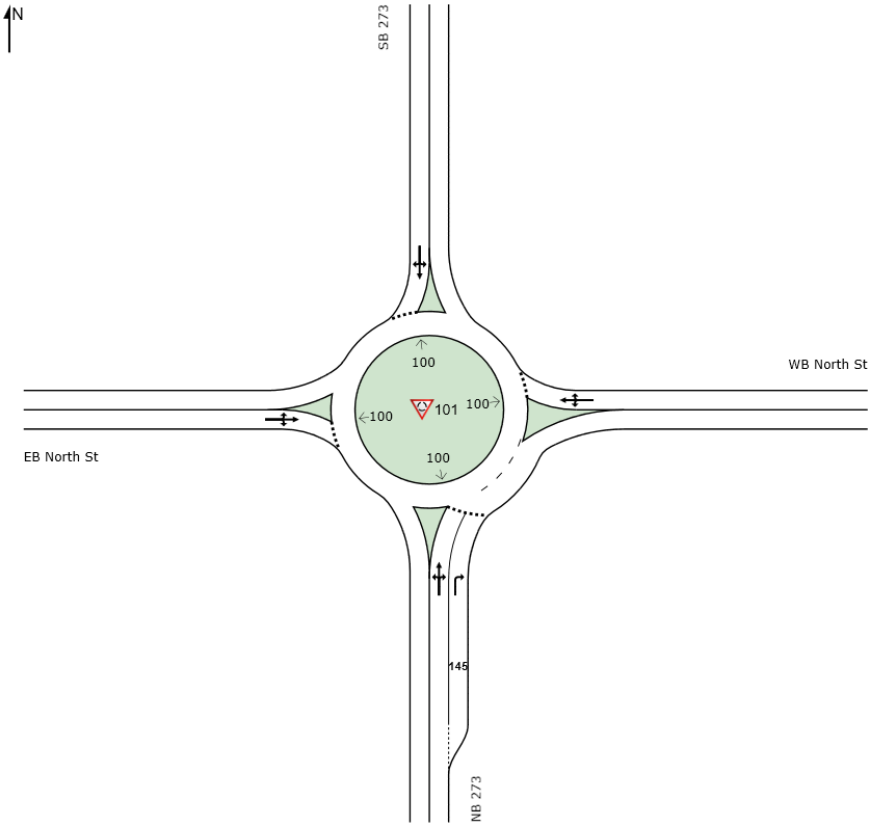
Figure 20 Ox Yoke Road Proposed Roundabout Geometry



North Street

Figure 21 illustrates the proposed roundabout geometry for North Street, a four-way single lane roundabout. The roundabout includes a 145-foot right turn pocket on the NB leg of SR 273 to accommodate for high right-turn volumes.

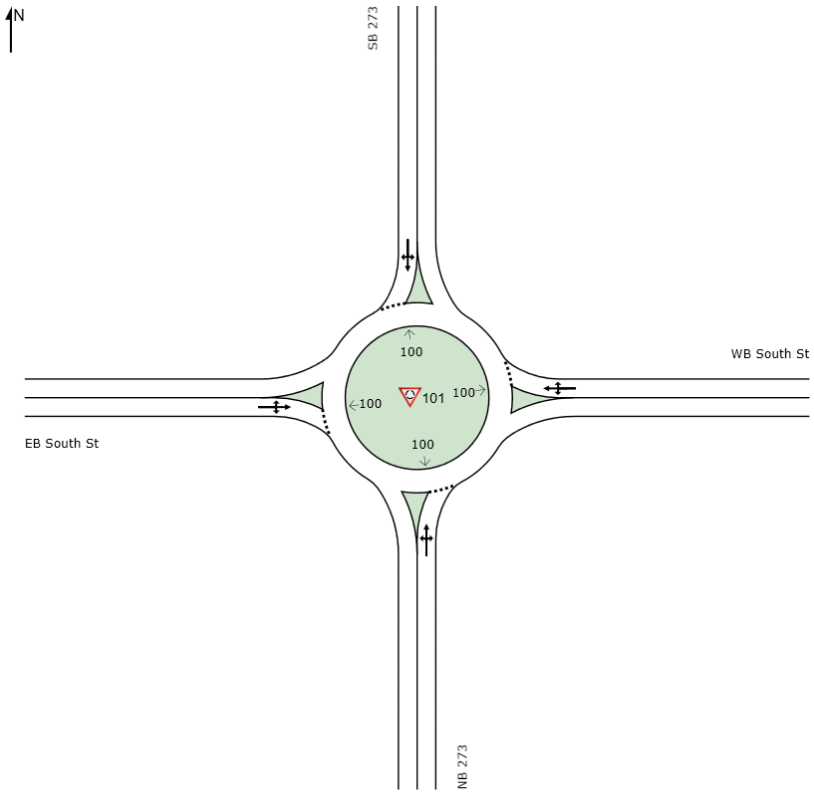
Figure 21 North Street Proposed Roundabout Geometry



South Street

Figure 22 illustrates the proposed roundabout geometry for South Street, a four-way, single lane roundabout.

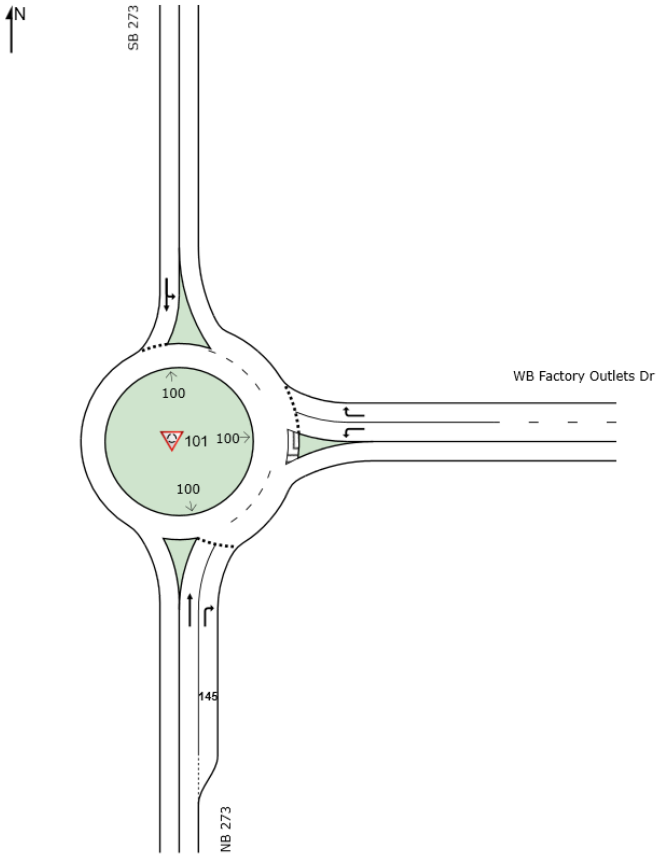
Figure 22 South Street Proposed Roundabout Geometry



Factory Outlets Drive

Figure 23 illustrates the proposed roundabout geometry for Factory Outlets Drive, a three-way, hybrid roundabout. The NB leg of SR 273 includes a 145-foot turn pocket to accommodate for heavy right-turn volumes. The WB leg of Factory Outlets Drive includes two approach lanes that permit right and left turning movements, to accommodate for high traffic volumes exiting the outlets and I-5, while reducing the number of lanes.

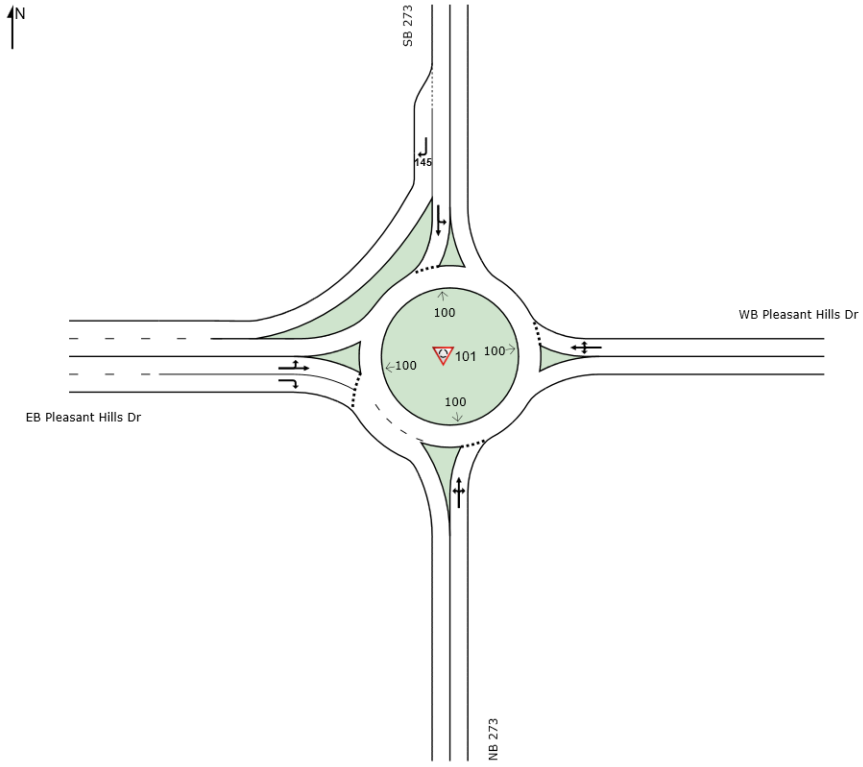
Figure 23 Factory Outlets Drive Proposed Roundabout Geometry



Pleasant Hills Drive

Figure 24 illustrates the proposed roundabout geometry for Pleasant Hills Drive. The SB leg of SR 273 includes a 145-foot right turn pocket and slip lane to accommodate for high right-turn traffic volumes. The design maintains the existing number of lanes approaching and existing the intersection, providing a right-turn pocket to accommodate for heavy right-turn traffic volumes.

Figure 24 Pleasant Hills Drive Proposed Roundabout Geometry



7.5.2 Cumulative Traffic Operations

Table 12 presents intersection operations for the proposed roundabouts under a 30% traffic volume increase. This analysis was prepared concurrently with the traffic analysis, prior to a growth rate being established. Therefore, a conservative 30% growth estimate was applied to assess sensitivity to future development and population growth. A shown below, all roundabouts operate acceptably above the target LOS.

Table 12 Additional Roundabouts – Cumulative LOS

#	Intersection	Control Type	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
51	SR 273/Grange St	Roundabout	C	5.6	A	4.2	A
55	SR 273/Buenaventura Blvd	Roundabout	C	10.8	A	7.4	A
57	SR 273/Kenyon Dr	Roundabout	C	5.5	A	23.1	B
58	SR 273/Branstetter Ln	Roundabout	C	3.9	A	4.2	A
65	SR 273/Whitehouse Dr	Roundabout	C	5.2	A	4.5	A
66	SR 273/Happy Valley Rd	Roundabout	C	5.5	A	5.6	A
67	SR 273/Latona Rd	Roundabout	C	4.7	A	4.5	A
69	SR 273/Ox Yoke Rd	Roundabout	C	8.5	A	7	A
72	SR 273/North St	Roundabout	C	7.9	A	7.4	A
73	SR 273/South St	Roundabout	C	9.5	A	9	A
76	SR 273/Factory Outlets Dr	Roundabout	C	7.5	A	5.9	A
77	SR 273/Pleasant Hills Dr	Roundabout	C	6.9	A	7.5	A

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

Table 13 provides 95th percentile queues for the additional roundabouts under cumulative volume conditions. The following queues exceed available storage:

- SR 273 and Kenyon Drive: eastbound left/right during PM peak hours
- SR 273 and North Street
- SR 273 and Soth Street

Table 13 Additional Roundabouts – Cumulative 95th Percentile Queues

#	Intersection/Approach	Control Type	Cumulative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
51	**SR 273/Grange St**				
	Northbound Thru/Right	Roundabout	464	171	1530
	Westbound Left/Right		74	27	
	Southbound Left/Thru		138	386	156
55	**SR 273/Buenaventura Blvd**				
	Northbound Left/Thru	Roundabout	302	83	145
	Northbound Thru		96	0	1300
	Southbound Thru		171	19	
	Southbound Right		68	69	145
	Eastbound Left		62	66	430
	Eastbound Right		110	0	430
57	**SR 273/Kenyon Dr**				
	Northbound Left/Thru	Roundabout	940	164	
	Southbound Thru/Right		131	586	
	Eastbound Left/Right		27	**150**	75
58	**Sr 273/Branstetter Ln**				
	Northbound Left/Thru	Roundabout	679	157	
	Southbound Thru/Right		93	485	
	Eastbound Left/Right		7	26	65
65	**SR 273/Whitehouse Dr**				
	Northbound Left/Thru/Right	Roundabout	106	76	
	Westbound Left/Thru/Right		15	14	96
	Southbound Left/Thru/Right		80	125	
	Eastbound Left/Thru/Right		8	4	815
66	**SR 273/Happy Valley Rd**				
	Northbound Left/Thru	Roundabout	116	100	
	Southbound Thru/Right		78	129	
	Eastbound Left/Right		71	37	124

67	**SR 273/Latona Rd**				
	Northbound Left/Thru/Right	Roundabout	109	87	
	Westbound Left/Thru/Right		15	14	75
	Southbound Left/Thru/Right		142	121	655
	Eastbound Left/Thru/Right		1	2	300
69	**SR 273/Ox Yoke Rd**				
	Northbound Left/Thru/Right	Roundabout	188	82	
	Westbound Left/Thru		9	16	350
	Westbound Right		113	72	145
	Southbound Left/Thru/Right		201	185	785
	Eastbound Left/Thru/Right		1	2	130
72	**SR 273/North St**				
	Northbound Left/Thru/Right	Roundabout	87	58	1140
	Northbound Right		12	9	145
	Westbound Left/Thru/Right		105	83	130
	Southbound Left/Thru/Right		154	144	1240
	Eastbound Left/Thru/Right		**90**	**60**	35
73	**SR 273/South St**				
	Northbound Left/Thru/Right	Roundabout	224	107	1280
	Westbound Left/Thru/Right		76	79	116
	Southbound Left/Thru/Right		129	210	1140
	Eastbound Left/Thru/Right		**134**	**128**	15
76	**SR 273/Factory Outlets Dr**				
	Northbound Thru	Roundabout	44	57	736
	Northbound Right		34	43	145
	Westbound Left		37	85	
	Westbound Right		32	51	550
	Southbound Left/Thru		130	371	640

77	**SR 273/Pleasant Hills Dr**				
	Northbound Left/Thru/Right	Roundabout	48	72	
	Westbound Left/Thru/Right		3	39	60
	Southbound Left/Thru		33	52	732
	Southbound Right		0	0	145
	Eastbound Left/Thru		46	88	425
	Eastbound Right		12	37	425

Note: **Bold** text indicates queues that exceed available storage

8. Evaluation of Alternatives

This section provides a planning-level evaluation of projects to calm traffic, increase safety, and promote non-vehicular modes of travel in Downtown Redding Gateways. For some projects, the evaluation includes the analyses presented in Section 6 and Section 7 of this TM.

8.1 Northern Downtown Redding Gateway

Roundabouts

As detailed in Section 7 of this TM, roundabouts were assessed and deemed feasible at the following intersections: SR 273/Benton Drive, SR 273/Arboretum Drive, and SR 273/Quartz Hill Road. At SR 273/Benton Drive, a hybrid roundabout was initially assessed but failed to obtain an acceptable LOS; therefore, a two-lane roundabout was assessed. At SR 273/Arboretum Drive, traffic counts are needed to better understand the traffic impacts of Turtle Bay Elementary School on the proposed roundabout.

The roundabouts perform at or better than the target LOS C, consistent with the City of Redding LOS standards. The proposed roundabouts are compatible with a road diet, which, in this portion of the corridor, would allow opportunity to reallocate the roadway right-of-way to other uses, such as bicycle facilities or angled parking, which could further serve to slow vehicle speeds and create a sense of place.

8.2 Eastern Downtown Redding Gateway

SR 44 Boulevard

On SR 44, a boulevard, from the Sacramento River to Continental Street was assessed.

FHWA Responsibility

Part 2, Chapter 8, Section 7, Article 8 of the Caltrans PDPM discusses Federal Highway Administration (FHWA) Coordination related to the project development process, including where project actions are stewarded/assumed by Caltrans and where project actions are retained by the FHWA. Article 8 notes the following:

> The main factor for determining if the responsibility for project actions is assumed by Caltrans or retained by FHWA is whether or not a project is on the National Highway System [NHS]…FHWA retains their responsibility for project actions for projects on the Interstate System that have been determined to be in a high risk category.

The NHS consists of roadways important to the nation's economy, defense, and mobility. The NHS includes the following subsystems of roadways: Interstate, Other Principal Arterial, Strategic Highway Network (STRAHNET), Major Strategic Highway Network Connectors, and Intermodal Connectors. Requests for adding and deleting a segment from the NHS requires formal submission to the FHWA.

STRAHNET includes routes and connectors to major US Department of Defense (DOD) installations or seaports important for national defense mobility. In addition to the general guidelines/guidance for NHS modification submittals, STRAHNET changes require added coordination with the DOD Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA). The FHWA coordinates with the SDDCTEA to approve all STRAHNET changes.[1]

As classified by the FHWA, the SR 299/SR 44 corridor (from Interstate 5 to Highway 101) is part of STRAHNET (i.e., "Non-Interstate STRAHNET Route").[2]

[1] https://www.fhwa.dot.gov/planning/national_highway_system/update/index.cfm
[2] https://www.fhwa.dot.gov/planning/national_highway_system/

State Responsibility

The regulations for modifying (i.e., adding, deleting, or relocating) routes and intermodal connectors on the NHS are located in 23 CFR 470, Federal-aid Highway Systems, and in Appendix D to Subpart A, "Guidance Criteria for Evaluating Requests for Modifications to the NHS."

Requests for adding and deleting a segment from the NHS requires formal submission to the FHWA. States are responsible for submitting requests. For modification proposals originating with Metropolitan Planning Organizations (MPO), the MPO would transmit the request and approval documentation through the State. All requests should be put in writing to the FHWA Division Office.

Summary

In accordance with the above, the state and/or MPO should coordinate with the FHWA for any and all potential STRAHNET changes, including for projects or project actions where FHWA responsibility is retained. At this time, as coordination has not occurred, the SR 44 Boulevard is not considered feasible.

8.3 Southern Downtown Redding Gateway

Signalized Intersections

As detailed in Section 6 of this TM, two signalization and lane configuration alternatives were developed for the following intersections: SR 273/Cypress Avenue, SR 273/Parkview Avenue, and SR 273/California Street. The signal warrant was met for both peak hours. The signals perform at or better than the target LOS C, consistent with the City of Redding LOS standards.

Although both alternatives are feasible, Alternative 2 is preferred, as it has better LOS and queues, with less of a road diet required.

Conceptual Layout

Exhibits 1 to 3 illustrate the signal and lane configuration for Alternative 2.

As shown in Exhibit 1, at SR 273/Cypress Avenue, the intersection has been reconfigured to a four-way perpendicular intersection that includes the removal of the following: the WB Cypress Avenue to NB SR 273 two right turn lanes and the NB SR 273 to EB Cypress Avenue free right lane. Crosswalks have been designed on all legs, including adding crosswalks on the south and west sides. Also, on the east side, three crosswalks have been replaced with one crosswalk. Along SB 273, a two-way Class I facility has been designed. Also, NB SR 273 through the intersection, a Class II facility has been designed.

As shown in Exhibit 2, at SR 273/Parkview Avenue, a new signal has been designed in addition to lane reconfigurations for all approaches. As part of the reconfigurations, the WB Parkview Avenue to NB SR 273 free right lane was removed. Along NB and SB 273, continuation of the bike facilities described has been continued. Also, EB and WB Parkview Avenue, Class II facilities have been designed. For crosswalks, a crosswalk was added on the north side and the crosswalk was improved on the east side (i.e., from two crosswalks to one crosswalk).

As shown in Exhibit 3, at SR 273/California Street, the intersection has been reconfigured to a three-way perpendicular intersection that includes two new curb ramps/bulb-out in addition to lane reconfigurations for all approaches (i.e., pushing traffic lanes to the far right/east). To close the Angelo Avenue at SR 273, a cul-de-sac was initially considered but determined to be infeasible based on City of Redding Street Standards. Instead, bollards were used to close vehicular access to/from Angelo Avenue, allowing pedestrian, bicyclist, and emergency access only. In the City of Redding, bollards are used to close vehicular access to/from Riverside Drive (e.g., at N. Court Street/Riverside Drive); as such, the use of bollards is assumed to be feasible. SB SR 273, the two-way Class I facility terminates prior to intersection; after the intersection, a Class II facility commences. NB SR 273 through the intersection, a Class II facility has been designed.

KEY: (ALL ALTERNATIVE 2 EXHIBITS)

- NEW BIKE LANE SYMBOL WITH PERSON
- NEW TYPE IV ARROW
- NEW TYPE I (10 FT) ARROW
- NEW TYPE I (18 FT) ARROW
- NEW TYPE III ARROW
- NEW TYPE VI ARROW
- NEW PEDESTRIAN SIGNAL HEAD
- NEW SIGNAL POLE AND MAST ARM

N

0 50' 100'

GHD

CITY OF REDDING
DOWNTOWN REDDING GATEWAYS

SR 273 & CYPRESS AVENUE

SIGNAL - ALTERNATIVE 2

Project No. **12560002**
Date **NOVEMBER 2024**

EXHIBIT 1

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0 10' 20' 40'

GHD

CITY OF REDDING
DOWNTOWN REDDING GATEWAYS

SR 273 & PARKVIEW AVENUE

SIGNAL - ALTERNATIVE 2

Project No. 12560002
Date NOVEMBER 2024

EXHIBIT 2

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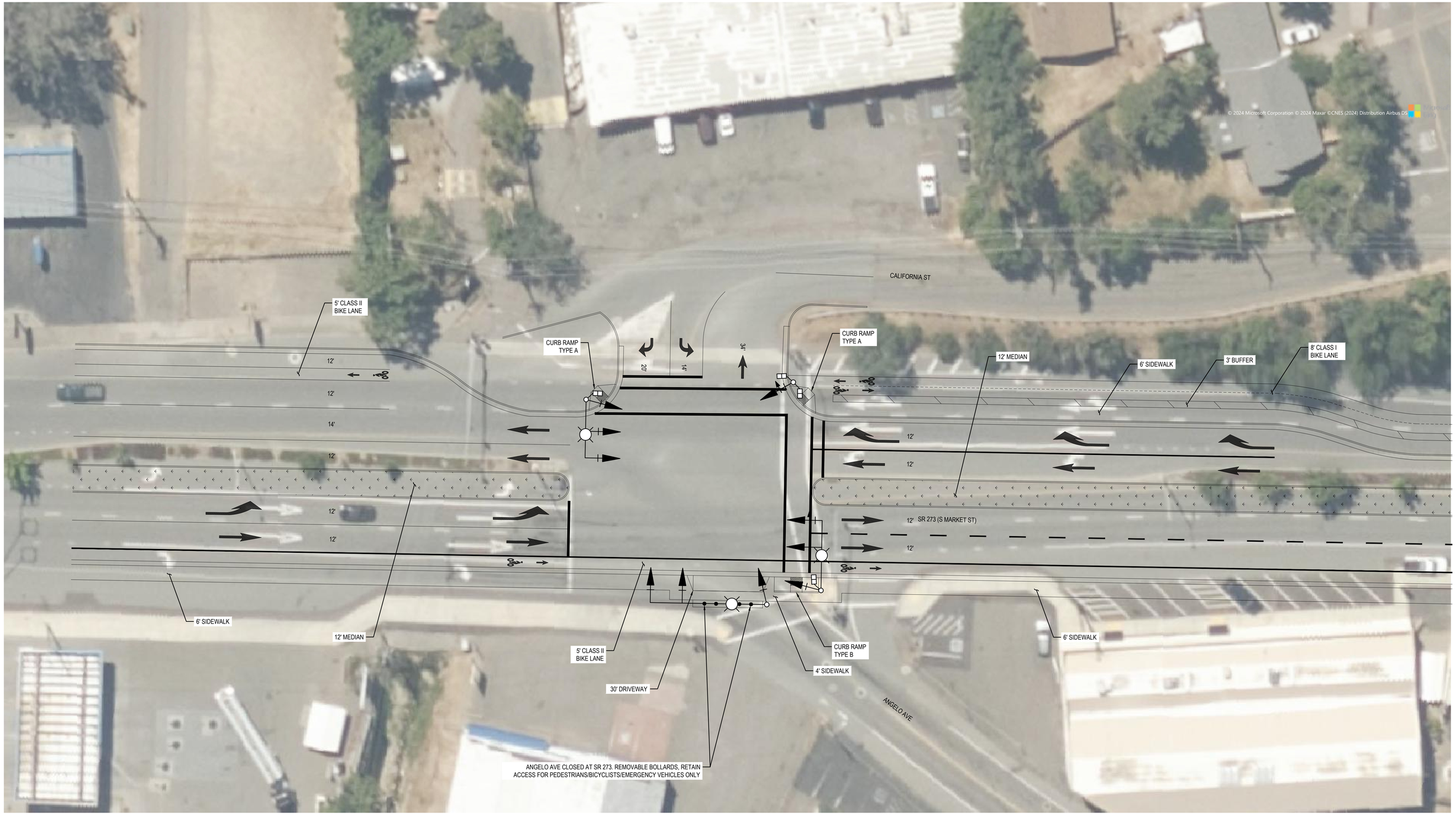

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GHD

CITY OF REDDING
DOWNTOWN REDDING GATEWAYS

SR 273 & ANGELO AVENUE

SIGNAL - ALTERNATIVE 2

Project No. **12560002**
Date **NOVEMBER 2024**

EXHIBIT 3

Filename: \\ghdnet\ghd\US\Sacramento - 2200 21st\Projects\561\12560002\Digital_Design\ACAD\Figures\12560002_SR273 and Cypress Ave-Alt 1.dwg
Plot Date: 19 November 2024 1:48 PM

Roundabout

At SR 273/Cypress Avenue, a roundabout was assessed and deemed feasible, as detailed in Section 7 of this TM. The roundabout operates at an acceptable LOS in compliance with City of Redding LOS standards. The proposed roundabout is compatible with a road diet, as mentioned above.

Although both a roundabout and a signal are feasible, a signal is preferred, as it standardizes and simplifies operations. As noted in Section 7.4.1, the SR 273/Cypress Avenue roundabout includes slip lanes and turn pockets to accommodate high traffic volumes. Additionally, the SR 273/Cypress Avenue roundabout must consider the one-way legs of the existing SR 273 one-way couplet (i.e., NB Pine Street and SB Market Street).

Pedestrian/Bicycle Connection

A pedestrian/bicycle connection on Parkview Avenue, from SR 273 to California Street, was assessed.

Conceptual Layout

As shown in Figure 25, a pedestrian/bicycle connection can be accommodated and is feasible. To meet the grade difference between SR 273 and California Street (approximately 23 feet), a 30-foot wide switchback structure was used. As shown in the figure, a 5-foot-wide pathway with allowances for walls and handrails is possible.

Figure 25 *Pedestrian/Bicycle Connection: Parkview Avenue*

8.4 Western Downtown Redding Gateway

Enhanced Crosswalks

Enhanced crosswalks were assessed at the following intersections: SR 273/SR 299 and SR 273 (California Street)/Placer Street.

Crosswalk Needs

On August 28-29, 2024, a project walk audit was conducted. At the SR 273/SR 299 intersection, the following was observed:

– Large vehicle turning radii from EB SR 299 to SB SR 273, taking two lanes on SR 273
– No crosswalk on the north side of the intersection

At the SR 273/SR 299 intersection, high-visibility crosswalks were discussed. As noted in Caltrans Main Street:

> Crosswalk Visibility Enhancements are listed as an FHWA Proven Safety Countermeasure: Three main crosswalk visibility enhancements help make crosswalks and the pedestrians, bicyclists, wheelchair and other mobility device users, and transit users using them more visible to drivers. These include high-visibility crosswalks, lighting, and signing and pavement markings. These enhancements can also assist users in deciding where to cross. Agencies can implement these features as standalone or combination enhancements to indicate the preferred location for users to cross.

Enhanced Crosswalk Considerations and Approvals

As noted in Caltrans DIB-94, potential locations to consider a new or enhanced crosswalk include at "a roundabout or traffic signal where engineering judgement indicates crosswalks are needed to delineate pedestrian paths through these intersections," as well as at crossing gaps or needs identified in the District Active Transportation Plan, District Roadway Safety Infrastructure Plan, local plans, and by community engagement (e.g., consultation with law enforcement agencies, local agencies, local communities including senior and school communities, and transit agencies). Caltrans DIB-94 also notes that the District Pedestrian and Bicyclist Traffic Safety Engineer provides approval of crosswalk markings or enhancements.

Summary

In accordance with Caltrans DIB-94, the District Pedestrian and Bicyclist Traffic Safety Engineer shall approve crosswalk marking or enhancements. In the Western Downtown Redding Gateway, this could include high-visibility crosswalks at SR 273/SR 299 (east, west, and south sides) and SR 273 (California Street)/Placer Street (all sides). Additionally, this could include a potential new crosswalk at SR 273/SR 299 (north side), should Caltrans determine need of the crosswalk. Also, at SR 273 (California St)/Placer Street, green colored pavement for bicycle facilities (to accommodate Project #78 and #79) also could be considered. Except for the new crosswalk at SR 273/SR 299 (north side), which may require Caltrans study and/or approval, the crosswalk improvements discussed are considered feasible.

8.5 Additional Roundabouts

South of the Southern Downtown Redding Gateway, the feasibility of an additional 12 roundabouts was assessed at the following intersections: SR 273/Grange Street, SR 23/Buenaventura Boulevard, SR 273/Kenyon Drive, SR 273/Branstetter Lane, SR 273/Whitehouse Drive, SR 273/Happy Valley Road, SR 273/Latona Road, SR 273/Ox Yoke Road, SR 273/North Street, SR 273/South Street, SR 273/Factory Outlets Drive, and SR 273/Pleasant Hills Drive. All roundabouts are feasible and perform at or better than the target LOS C, consistent with the City of Redding LOS standards. The proposed roundabouts are compatible with a road diet, as mentioned above.

The feasibility of the proposed intersection improvements is based off traffic counts only, but future design should consider SR 273 right-of-way limits and Union Pacific (UP) Railroad design requirements. Between Buenaventura Boulevard and S. Bonnyview Road, Westside Road runs parallel to SR 273 on the west side of the corridor, potentially impacting available vehicle storage at Kenyon Drive and Branstetter Lane, as shown in Table 13. Similarly, between Buenaventura Boulevard and South Street, the UP Railroad runs parallel to SR 273 on the east side of the corridor, potentially impacting available vehicle storage at Laton Road, Ox Yoke Road, North Street, and South Street.

9. Summary

As evaluated this TM, which provides a planning-level feasibility analysis, projects to calm traffic, increase safety, and promote non-vehicular modes of travel in Downtown Redding Gateways could be accommodated.

The corridor performance improvements of the potential projects are described below.

Corridor Performance Improvements

In the Northern Downtown Redding Gateway (Segment 2), along Miracle Mile, roundabouts could slow speeds, which could improve safety (e.g., reduce collisions and fatalities).

In the Western Downtown Redding Gateway (Segment 3), crosswalk improvements, including high-visibility crosswalks and green colored pavement for bicycle facilities, could improve mobility and connectivity and safety (e.g., reduce collisions and fatalities).

In the Southern Downtown Redding Gateway (Segments 3/4), a modified signal and lane configuration at SR 273/Cypress Avenue, a new signal and lane configuration at SR 273/Parkview Avenue, a pedestrian/bicycle connection on Parkview Avenue (from SR 273 to California Street), and a modified signal and lane configuration (e.g., closure of vehicular access to/from Angleo Avenue) could improve mobility and connectivity and safety (e.g., reduce collisions and fatalities). Also, operations and reliability could be improved, as active transportation facilities would be provided, allowing possibilities for two new additional modes of travel (i.e., walking and bicycling) to and through the gateway.

– Mobility & Connectivity. Pedestrian mobility and connectivity would be improved by adding pedestrian facilities, where pedestrian facilities currently do not exist. Bicycle and pedestrian level of traffic stress would be reduced, as safer and separated facilities would be provided. Also, walking and bicycling mode share could increase with the availability of walking and bicycling facilities (e.g., where such facilities currently do not exist).
– Operations and Reliability. With a potential walking and bicycling mode share shift (i.e., from vehicles to walking or bicycling), vehicle miles traveled and vehicular congestion would decrease.
– Safety. With safer and separated walking and bicycling facilities, bicycle and pedestrian collisions and fatalities could be reduced.

Table 14 Feasibility Study #3 Corridor Performance Improvements

Performance Measure	Segment		
	2	3	4
Mobility & Connectivity		X	X
Operations & Reliability			X
Safety	X	X	X

Technical Memorandum

October 18, 2024

To	Michael Kuker, SRTA; Laurent Beauregard, SRTA	**Contact No.**	
Copy to	Natalie Kinney, Caltrans; Aaron Casas, Caltrans; Christina Prosperi, Caltrans; Sergio Amezquita, Caltrans;	**Email**	Todd.tregenza@ghd.com
From	Todd Tregenza, GHD	**Project. No.**	12560002
Project Name	Envision 273 Comprehensive Multimodal Corridor Plan		
Subject	Task 6 Technical Memorandum: Feasibility Study #4 (Class I/IV from Redding to Anderson)		

1. Introduction

The Task 6 Technical Memorandums (TMs) will evaluate potential projects that may support corridor solutions, as described in the Task 5 TM.

Each Task 6 TM presents the feasibility of a potential project or group of projects. Task 6 includes six feasibility studies (FSs):

1. One-way Couplet Reversion
2. Cypress Avenue Roundabout
3. Downtown Redding Gateways
4. Class I/IV from Redding to Anderson
5. Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation
6. Redding (SR 273/Breslauer Way) Grade Crossing Relocation

This TM presents *FS #4: Class I/IV from Redding to Anderson*.

The TMs will be combined or summarized in the draft/final report, as appropriate.

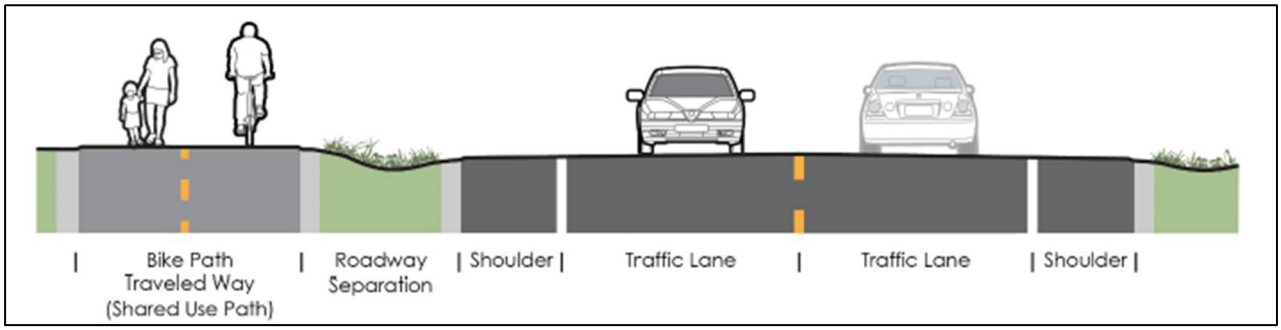
2. Scope

This TM evaluates the feasibility of a Class I or Class IV facility along the entire length of the corridor, from Redding to Anderson. Where a Class IV facility is considered, a sidewalk also will be considered.

As shown in Figure 1, a Class I facility is shared amongst bicyclists, pedestrians, and others. It is located outside and adjacent to the roadway and it includes both horizontal and vertical separation from motor vehicle traffic. A Class I facility is known by many names, including a shared use path, multi-use path, and bike path.

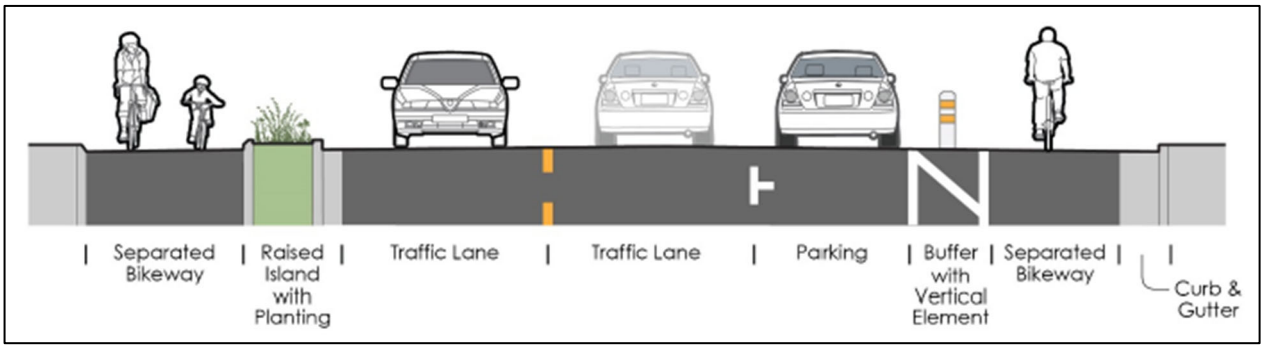
As shown in Figure 2, a Class IV facility is an exclusive facility for bicyclists. It is located within the roadway, and it includes vertical separation from motor vehicle traffic. Vertical separation can include curbs, raised islands with planting, on-street parking, and flex posts. A Class IV facility is known by many names, including a separated bikeway and cycle track.

Figure 1 Class I Facility



Source: Caltrans DIB-94

Figure 2 Class IV Facility



Source: Caltrans DIB-94

3. Existing Conditions

Caltrans Right-of-Way

To the extent possible, potential projects should be located within the California Department of Transportation (Caltrans) right-of-way (ROW). State Route (SR) 273 is within the Caltrans ROW.

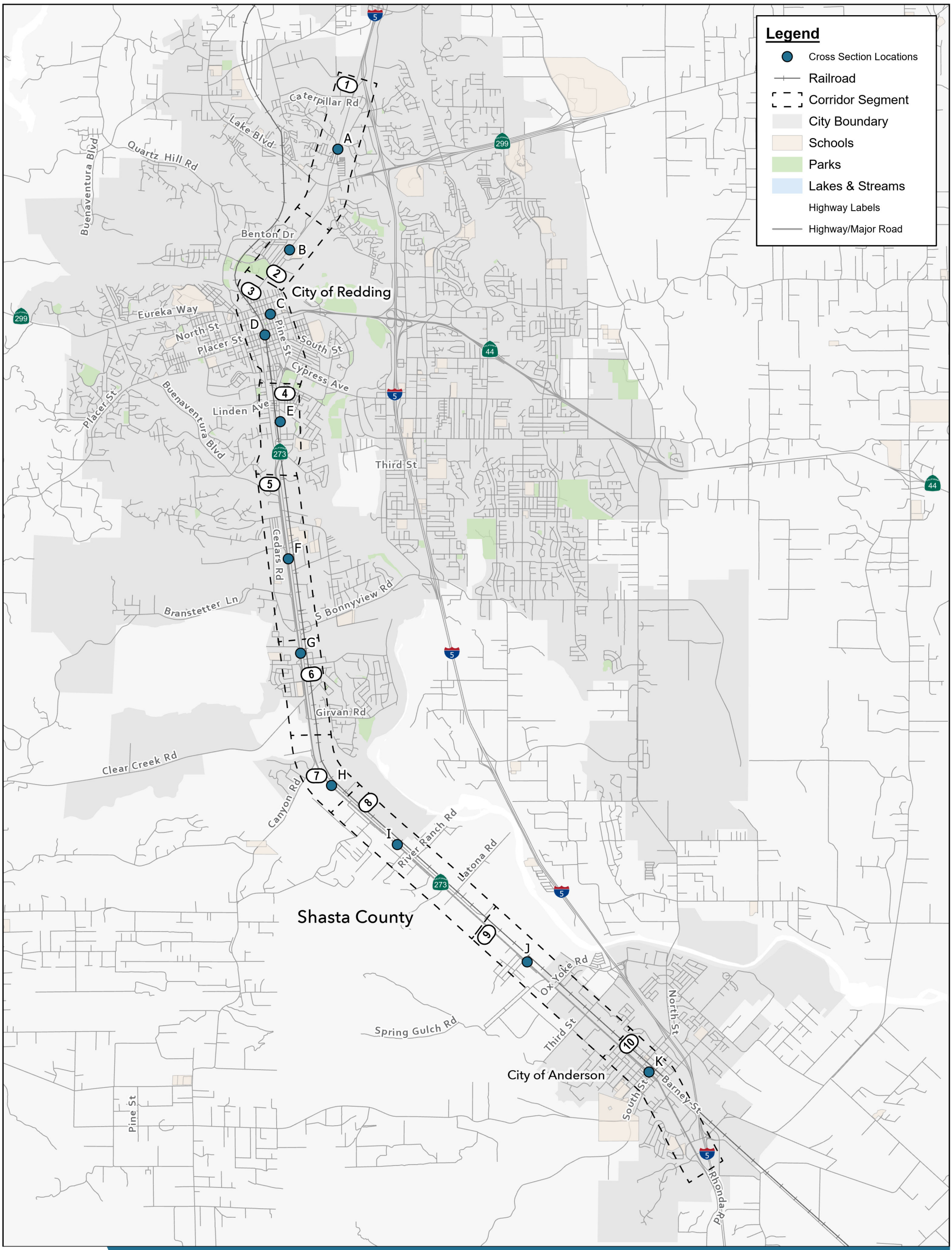
To better understand the Caltrans ROW, representative cross sections were established for the entire length of the corridor (i.e., Segment ID 1 to 10), as described in Table 1 and shown in As detailed in Table 2, the total width of the Caltrans ROW ranges from 77 feet (Cross Section ID C) to 214 feet (Cross Section ID A). In seven of the eleven representative cross sections, there exists unpaved areas outside of the roadway, specifically in the southbound direction, where potential projects could be located.

Figure 3. For Segment ID 3 (Downtown Redding), two representative cross sections were established consistent with the SR 273 one-way couplet (i.e., northbound Pine Street and southbound California Street).

Table 1 Representative Cross Sections

Segment ID	Cross Section ID	Cross Section Location
1	A	N Market Street (SR 273), 0.5 miles north of Lake Boulevard
2	B	N Market Street (SR 273) between Arboretum Drive and Benton Drive
3	C	Pine Street (SR 273 NB) between Tehama Street (SR 44 EB) and Shasta Street (SR 44 WB)
3	D	California Street (SR 273 SB) between Yuba Street and Sacramento Street
4	E	S Market Street (SR 273) between Grange Street and Ellis Street
5	F	S Market Street (SR 273) between Kenyon Drive and N Bonnyview Road
6	G	S Market Street (SR 273), 650 feet north of Westwood Avenue
7	H	S Market Street (SR 273), 1,000 feet north of Metz Road
8	I	S Market Street (SR 273), 1,500 feet north of River Ranch Road
9	J	S Market Street (SR 273), 2,500 feet north of Ox Yoke Road
10	K	SR 273 between North and South Streets

As detailed in Table 2, the total width of the Caltrans ROW ranges from 77 feet (Cross Section ID C) to 214 feet (Cross Section ID A). In seven of the eleven representative cross sections, there exists unpaved areas outside of the roadway, specifically in the southbound direction, where potential projects could be located.



Envision 273: SR 273 Multimodal Corridor Plan

REPRESENTATIVE CROSS SECTION LOCATIONS

Paper Size ANSI B

0 2,000 4,000 6,000

US Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

Project No. **12560002**
Revision No. **-**
Date **October 2024**

FIGURE 3

N:\US\Azure\EastUS\12560002\GIS\Maps\Working\12560002_Class_I_IV_Feasibility\12560002_Class_I_IV_Feasibility.aprx - 12560002_003_Representative Cross Section Locations
Print date: 18 Oct 2024 - 12:28

Data source: City of Redding GIS, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS. Created by: ppeel

Table 2 *Caltrans Right-of-Way by Representative Cross Section*

Segment ID	Cross Section ID	Caltrans Right-of-Way																			
		Outside Roadway		Within Roadway															Outside Roadway		Total (Ft)
		SB Other (Ft)	SB Sidewalk (Ft)	SB Other (Ft)	SB Right Shoulder [1] (Ft)	SB Parking [1] (Ft)	SB Bike Lane [1] (Ft)	SB Travel Lane 3 (Ft)	SB Travel Lane 2 (Ft)	SB Travel Lane 1 (Ft)	Median, including Turn Lanes and Left Shoulders [1] (Ft)	NB Travel Lane 1 (Ft)	NB Travel Lane 2 (Ft)	NB Travel Lane 3 (Ft)	NB Bike Lane [1] (Ft)	NB Parking [1] (Ft)	NB Right Shoulder [1] (Ft)	NB Other (Ft)	NB Sidewalk (Ft)	NB Other (Ft) [2]	
1	A	58](unpaved area)	-	-	12	-	-	-	12	12	38 (28 ft median, 5 ft left shoulder on NB and SB)	12	12		-	-	10	-	-	48 (unpaved area)	214
2	B	-	11	-	-	8	5	12	12	12	30 (26 ft median, 2 ft left shoulder on NB and SB)	12	12	12	5	8	-	-	12	-	151
3	C	-	10	-	-	8	-	-	-	-	-	11	11	11	5	8	-	-	13	-	77
3	D	-	12	-	-	12 (parking lane or turn lane)	6	12	12	14 (turn lane or parking lane)	-	-	-	-	-	-	-	-	12	-	80
4	E	-	6	-	-	-	7	-	12	12	20 (16 ft median, 2 ft left shoulder on NB and SB)	12	12	-	8	-	-	-	6	-	95
5	F	36 (unpaved area)	-	-	2	-	-	-	12	12	24 (22 ft median, 2 ft left shoulder on NB and SB)	12	12	-	-	-	6	-	-	-	118
6	G	33 (unpaved area)	-	-	8	-	-	-	12	12	28 (24 ft median, 2 ft left shoulder on NB and SB)	12	12	-	-	-	8	-	-	-	125
7	H	20 (unpaved area)	-	-	8	-	-	-	12	12	26 (22 ft median, 2 ft left shoulder on NB and SB)	12	12	-	-	-	8	-	-	-	110
8	I	15 (unpaved area)	-	-	12	-	-	-	12	12	30 (24 ft median, 3 ft left shoulder on NB and SB)	12	12	-	-	-	5	-	-	-	103
9	J	20 (unpaved area)	-	-	6	-	-	-	12	12	32 (24 ft median, 4 ft left shoulder on NB and SB)	12	12	-	-	-	6	-	-	-	112
10	K	30 (unpaved area)	-	-	8	-	-	-	12	12	20 ft median	12	12	-	-	-	8	-	-	-	114

[1] See Caltrans Highway Design Manual, Chapter 300 – Geometric Cross Section. For shoulder widths, see Table 302.1 (Boldface Standards for Paved Shoulder Widths on Highways) in Topic 302 – Highway Shoulder Standards. For Class II widths, see section 301.2 of Topic 301 – Traveled Way Standards. Where Class II facilities are present, these may be included as part of the required shoulder width. Where on-street parking is allowed and a Class II facility is present, minimum shoulder width shall be 8 feet where on-street parking is provided plus the minimum required width for the bike lane.
[2] Where the railroad exists adjacent to the northbound travel lanes, 50 feet from the rail line is included in the railroad easement/ROW and is thus not included in the ROW estimates reported here.

Planned Projects

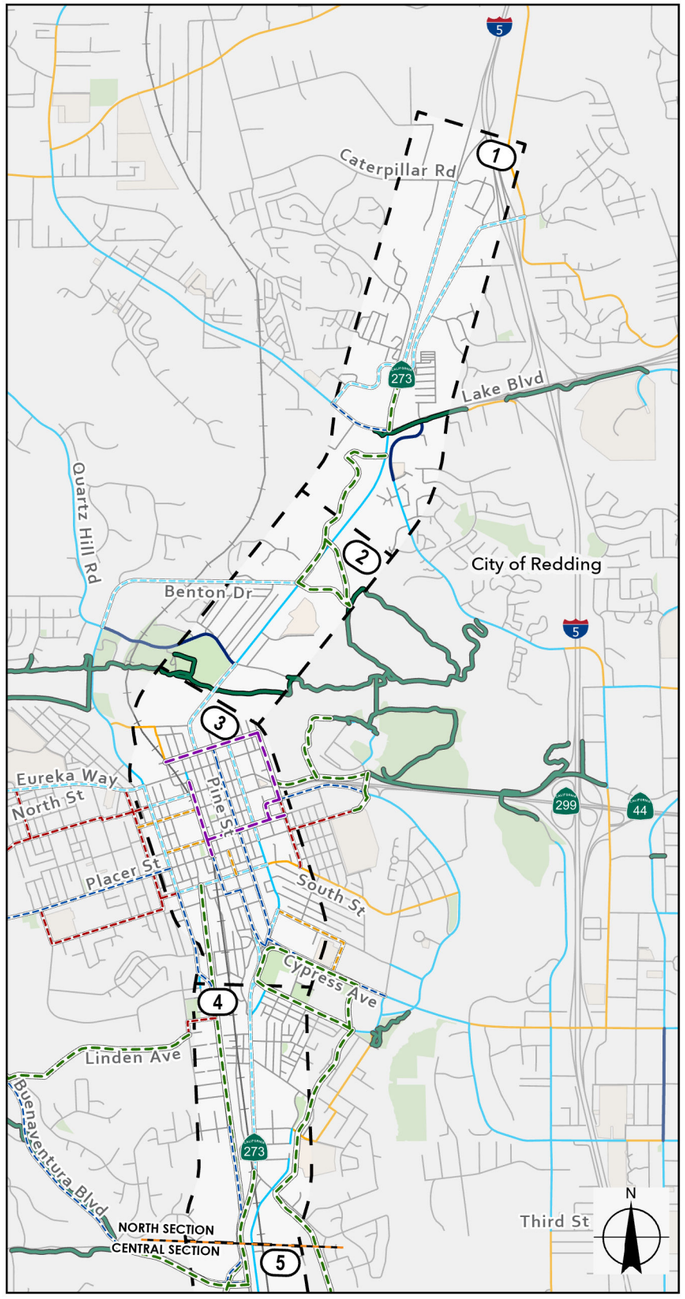
As detailed in the Task 5 TM, there are a number of existing planned projects in or adjacent to the corridor, including a number of bikeways. As shown in Figure 4, these bikeways include Class I and Class IV facilities.

For areas of the corridor with limited to no available Caltrans ROW (see Table 2 of this TM), a Class I or Class IV facility may be considered consistent with Caltrans existing planned projects (i.e., projects that expand or modify the Caltrans ROW). Examples include the following (see Table 2 of the Task 5 TM):

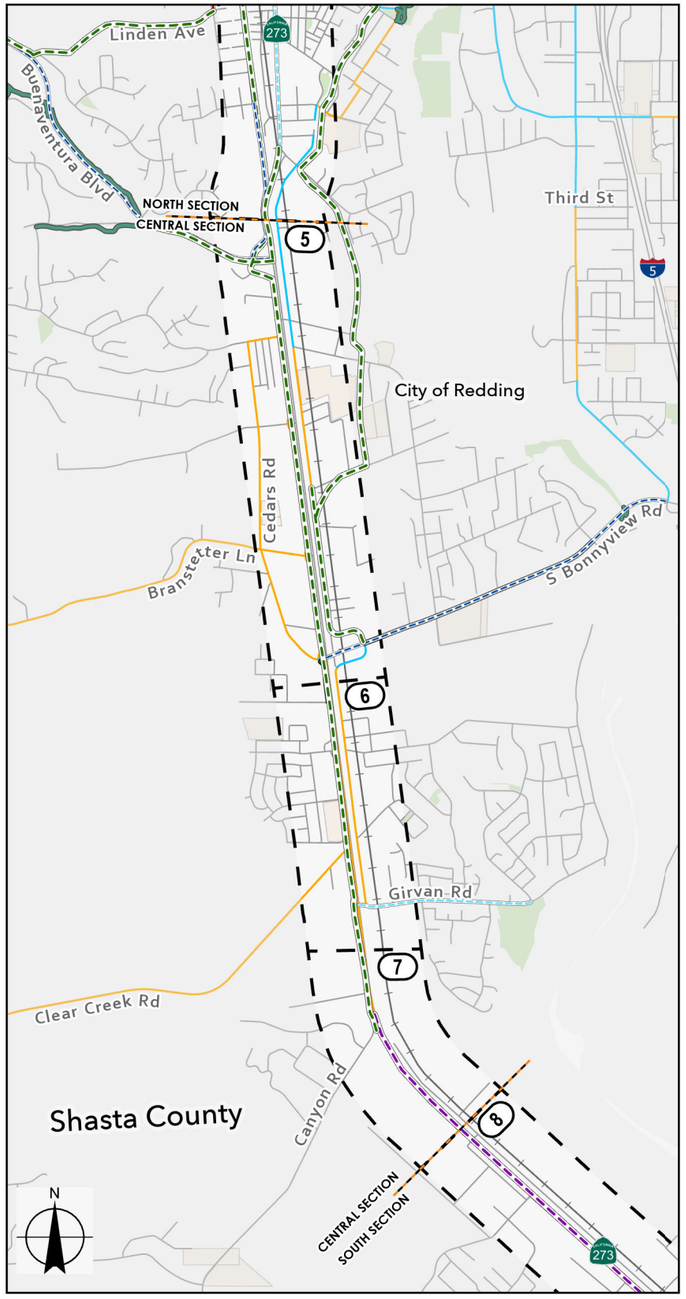
- **Project #114, Multiuse Path: SR 273 (Buenaventura Boulevard to Wyndham Lane)**. Requires repurposing a southbound traffic lane—from a traffic lane to a multiuse path (Class I facility).
- **Project #104, Class I Bike Path: SR 273 (Lake Boulevard to Northpoint Drive)**. Requires cutting into the median and shifting the highway geometry and/or adding retaining walls.

Additionally, a Class I or Class IV facility may be considered consistent with City of Redding or City of Anderson existing planned projects (e.g., on frontage roads, such as Westside Road), with opportunities for partnership and potential project modification evaluated.

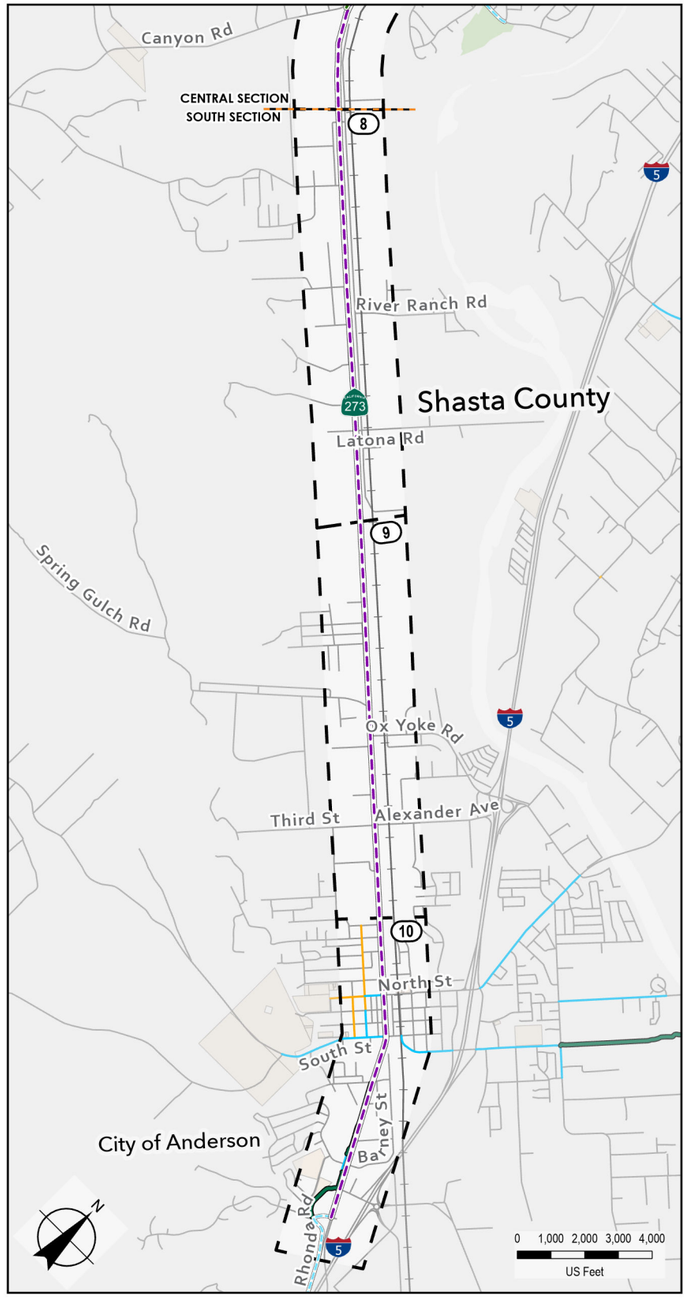
NORTH SECTION



CENTRAL SECTION



SOUTH SECTION



Legend

Planned Bikeway Projects

Separated Facilities
- Class I Shared Use Path
- Class IV Separated Bikeway

On Street Facilities
- Class II Buffered Bike Lane
- Class II Bike Lane
- Class III Bike Route
- Class III Bike Blvd

Existing Bikeways

Separated Facilities
- Class I Shared Use Path
- Pilot Class IV Separated Bikeway

On Street Facilities
- Class II Buffered Bicycle Lane
- Class II Bicycle Lane
- Class III Bike Route
- Railroad
- Corridor Segment
- Schools
- Parks
- Lakes & Streams

LOCATOR MAP

ENVISION 273 MULTIMODAL CORRIDOR PLAN

Envision 273: SR 273 Multimodal Corridor Plan

PLANNED BIKEWAY PROJECTS

Paper Size ANSI B

0 875 1,750 2,625 3,500

US Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

GHD | Caltrans | Shasta Regional Transportation Agency

Project No. **12560002**
Revision No. **-**
Date **October 2024**

FIGURE 4

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Print date: 18 Oct 2024 - 12:29

Data source: City of Redding GIS, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, City of Redding GIS, California State Parks, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS. Created by: ppeel

4. Guidance

For guidance regarding Class I and Class IV facilities, *Caltrans Design Information Bulletin - 94 Complete Streets: Contextual Design Guidance* (DIB-94) was referenced, as noted in this section.

Bicycle Facility Type

Section 5.1 (Bicycle Facilities) of Caltrans DIB-94 notes that bicycle facility selection is an important step in creating a connected, convenient, and comfortable bicycle network. Factors to consider include:

- Place type, including Urban Areas, Suburban Areas, and Rural Areas.
- Environment, including unique climate conditions like snow or heat, topography, and landscape.
- Equity, community desires, and identity.
- Physical constraints, including ROW width.
- Average daily traffic (ADT), speed, and volume of users.
- Maintenance considerations.
- Barriers, such as railroads and waterways.

Section 5.1 (Bicycle Facilities) of Caltrans DIB-94 notes that bicycle facility selection should begin by identifying opportunities to provide the most physical separation for bicyclists, with Class I and IV being the first considerations to maximize the benefit of horizonal and vertical separation, whenever feasible. Where constraints do not allow Class I and IV, Class II buffered bike lanes then Class II bike lanes should be considered (in order of priority).

Figure 5-A of Caltrans DIB-94 recommends bicycle facilities by ADT and miles per hour (MPH). Generally, Caltrans DIB-94 recommends Class I or IV where roadways are both at/over 7,000 ADT and at/over 40 MPH.

Caltrans DIB-94 place types (PTs) provide project context and insight into land use, density, and transportation options and issues. PTs help to identify types of modal users, intensity of use, and modal priority for the State Highway System (SHS). The three PTs are Urban Area, Suburban Area, and Rural Area.

Section 5.1.2 (Class I Bike Path) of Caltrans DIB-94 provides Contextual Guidance and Considerations for Class I, noting that, in Urban Areas, Class I may not be a feasible option due to constrained space. Additionally, separated bicycle and pedestrian facilities (e.g., Class IV) are generally more desirable in urban settings because of higher volumes of users.

Section 5.1.5 (Class IV Separated Bikeway) of Caltrans DIB-94 provides Contextual Guidance and Considerations for Class IV. For Urban Areas, this section notes the following:

> *Urban environments generally have lower vehicle speeds yet much higher traffic volumes which makes selecting a Class IV separated bikeway very desirable. On-street parking is commonly allowed in Urban Area place types. In these locations, the parking lane may be used as the vertical separator between the traffic lane and bikeway. Selecting vertical elements with more separation will provide a higher level of perceived safety and comfort thereby encouraging bicyclists of all competencies to utilize the bikeway. If a particular Urban Area already has or is expected to have high volumes of pedestrians and/or commuters, providing this type of Class IV separated bikeway may potentially help relieve congested pedestrian traffic.*

Section 3.2.2 (Modal Priority in Rural Areas) of Caltrans DIB-94 notes the following:

> *Rural Areas can be particularly challenging locations to incorporate Complete Streets facilities… Along these corridors, consider providing a bicycle and pedestrian facility separate from the roadway and shoulder. Often, this will consist of a Class I bikeway along one side of the highway.*

Bicycle Facility Design

Section 5.0 (Roadway Cross Section Development) of Caltrans DIB-94 provides guidance for the design of roadways that serve all users, with standards that are reflective of a constrained highway environment. Caltrans DIB-94 provides standard Class I and Class IV widths, as summarized in Table 3.

Table 3 Caltrans DIB-94 Class I and Class IV Widths

Bicycle Facility Type	Bicycle Facility Placement	Bicycle Facility Width		
		Minimum (ft)	Preferred (ft)	Practical Maximum (ft)
Class I	One Way	6-7	7	8
	Two Way	10-12	10-12	12-15
	On structures between railings and in tunnels (one or two way)	10-14	10-14	15
	At sidewalk level	12-16	12-16	20
Class IV (One Way) *	Between curbs if a raised island is the separation	6-9	7-9	10
	Between curb and buffer	5-8	6-8	9**
	Between curb and parking buffer	5-8	6-8	9**
	Between edge of pavement and buffer, curb, or parking buffer	4-7	5-7	8**
	Between through traffic lane and right turn lane	4-7	5-7	8
Class IV (Two Way) *	Between curb	10-14	12-14	16
	Between curb and buffer	9-12	10-12	14**
	Between curb and parking buffer	9-14	10-14	16**
	Between edge of pavement and buffer, curb, or parking buffer	8-11	9-11	14**

Source: Caltrans DIB-94

* Widths are exclusive of the gutter.

** If additional pavement width is available, consider a wider traveled way for high bicycle volumes (above 400 in the peak hour) or wider buffer or parking separation width for average bicycle volumes (below 400 in the peak hour).

Note: For horizontal buffer and vertical separation guidance, refer to Caltrans DIB-89.

5. Alternatives

To determine whether a Class I or Class IV facility should be evaluated, a three-step alternatives development process was used, as described below.

– Step 1. Applying Caltrans DIB-94 (see Section 4), corridor PTs were overlayed on corridor segments, with Class IV selected for Urban Areas and Suburban Areas and Class I selected for Rural Areas. Bridges are not PTs, but can be considered transitional areas; therefore, Class I was selected for bridges. Corridor PTs are presented in the *Existing Conditions Report* and detailed in Table 4.

– Step 2. Caltrans existing planned projects (see Table 2 of the Task 5 TM) were considered, adjusting bicycle facility type, as appropriate. *Note: For PT IDs 5 and 6 (Downtown Redding), where the SR 273 one-way couplets exist, Class IV is planned for Southbound SR 273/California Street and Class II is planned for Northbound SR 273/Pine Street.*

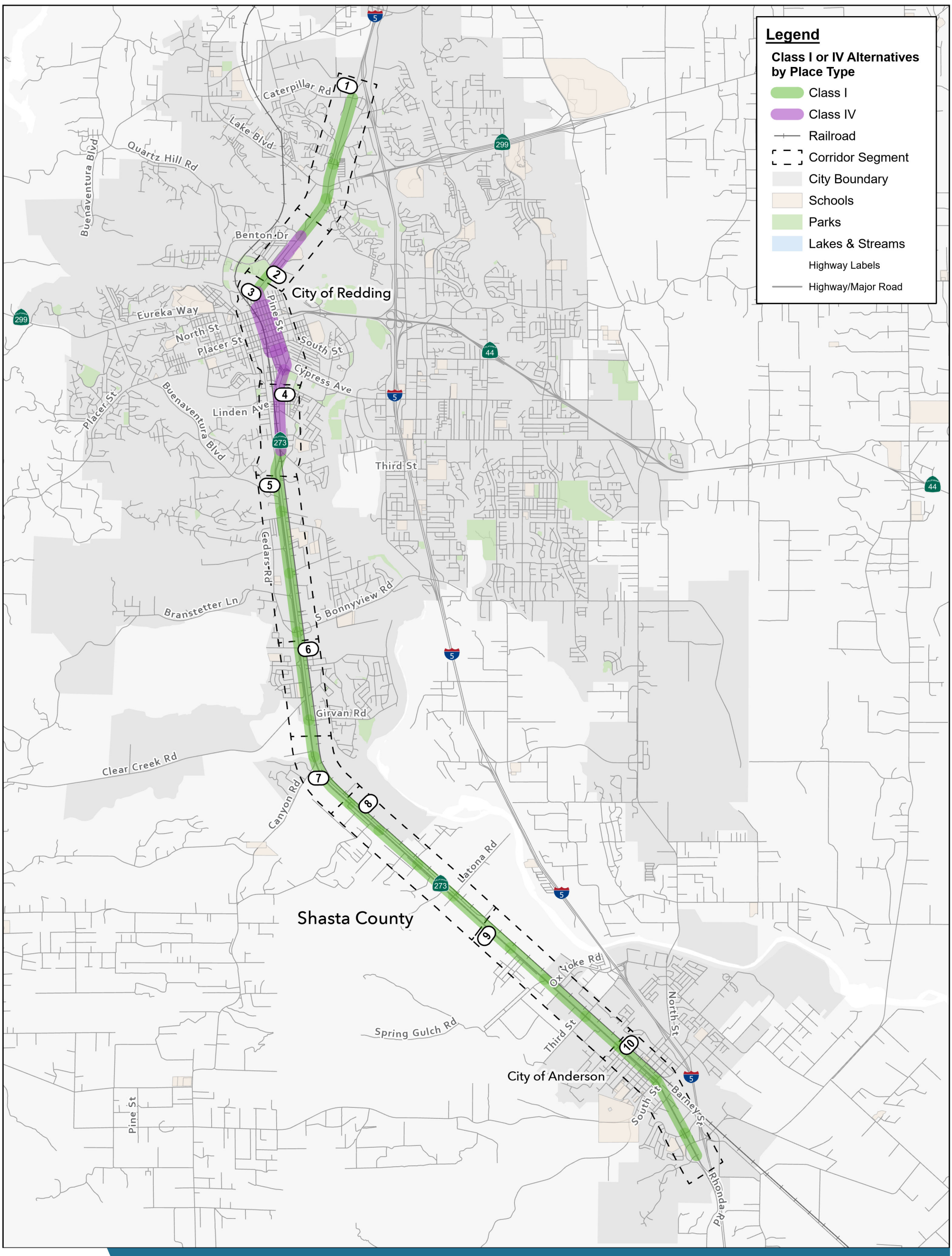
– Step 3. Physical constraints and barriers were considered, adjusting bicycle facility type, as appropriate. Mostly, the portion of the corridor immediately adjacent to the railroad (i.e., Segment IDs 4 to 10) was considered. In this area, due to the railroad easement/ROW, very limited Caltrans ROW exists outside of the roadway adjacent to the northbound travel lanes. PT IDs 10-12 were adjusted from Class IV to Class I, establishing consistency with adjacent PTs. Also, a small portion of PT ID 12 features an existing Class I.

The Class I and IV alternatives selected for evaluation are listed in Table 4 (see Step 3 column) and shown in Figure 5.

Table 4 Alternatives Development Process

Segment ID	Place Type (PT)			DIB-94 PT Designation	Alternative		
	PT ID	From	To		Step 1	Step 2	Step 3
1	1	Caterpillar Rd	Twin View Blvd	Rural Area	Class I	***Class II***	***Class I***
1	2	Twin View Blvd	s/o Lake Blvd	Suburban Area	Class IV	***Class I***	Class I
1/2	3	s/o Lake Blvd	Sulphur Creek Rd	Rural Area	Class I		Class I
2	4	Sulphur Creek Rd	Quartz Hill Rd	Suburban Area	Class IV		Class IV
2/3	-	Quartz Hill Rd	Riverside Dr	N/A (Bridge)	Class I		Class I
3	5	Riverside Dr	Gold St	Urban Area	Class IV	***Class IV; Class II***	***Class IV***
3	6	Gold St	Cypress Ave	Urban Area	Class IV	***Class IV; Class II***	***Class IV***
3/4	7	Cypress Ave	California St/ Angelo Ave	Suburban Area	Class IV		Class IV
4	8	California St/ Angelo Ave	Wyndham Ln	Suburban Area	Class IV		Class IV
4/5	9	Wyndham Ln	Breslauer Way	Rural Area	Class I	Class I	Class I
5	10	Breslauer Way	N Bonnyview Rd	Suburban Area	Class IV		***Class I***
5	11	N Bonnyview Rd	Bonnyview Rd	Suburban Area	Class IV		***Class I***
6	12	Bonnyview Rd	Girvan Rd	Suburban Area	Class IV		***Class I***
6/7	-	Girvan Rd	n/o Canyon Rd	N/A (Bridge)	Class I		Class I
7	13	n/o Canyon Rd	n/o Happy Valley Rd	Rural Area	Class I		Class I
8	14	n/o Happy Valley Rd	Latona Rd	Rural Area	Class I		Class I
8	15	Latona Rd	Rona Ln	Rural Area	Class I		Class I
9	16	Rona Ln	Briggs St	Rural Area	Class I		Class I
10	17	Briggs St	South St	Rural Area	Class I		Class I
10	18	South St	Pinon Ave	Rural Area	Class I		Class I
10	19	Pinon Ave	Pleasant Hills Dr	Rural Area	Class I		Class I

Notes:
- Italic bold text indicates modified facility type (i.e., modified from prior step(s)).



Envision 273: SR 273 Multimodal Corridor Plan

CLASS I OR IV ALTERNATIVES BY PLACE TYPE

Paper Size ANSI B

0 2,000 4,000 6,000

US Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Project No. **12560002**
Revision No. **-**
Date **October 2024**

FIGURE 5

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Print date: 18 Oct 2024 - 12:29

Data source: City of Redding GIS, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS. Created by: ppeel

6. Evaluation of Alternatives

This section provides a planning-level evaluation of the Class I and IV alternatives.

The evaluation assesses the feasibility of adding the Class I or IV facilities, within the Caltrans ROW (i.e., at the representative cross section locations), following Caltrans guidance (e.g., bicycle facility widths), as described in previous sections of this TM.

The cross sections presented in this TM illustrate our understanding of the available Caltrans ROW. It is assumed that further study would entail more detailed analysis (e.g., confirmation of the Caltrans ROW).

Segment 1

Cross Section ID A

The Caltrans Downtown Redding CAPM Project Initiation Report (PIR) proposes a Class II Buffered Bike Lane from Northpoint Drive to Caterpillar Drive. The PIR notes that this would require additional minor concrete/sidewalk repair for widening the existing highway and installing buffered striping for bike lanes.

Alternatively, as shown in Figure 6, an 8-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway. However, the existing Boulder Creek culvert (near Sweetgum Trail/Redwood Boulevard), as well as other grade issues, would require accommodation and additional study/design. The Class I facility could be accommodated within the landscaped area on either side of the roadway; however, for consistency with Caltrans existing planned projects (i.e., Project #104, Class I from Lake Boulevard to Northpoint Drive), west side of the roadway is presented.

Segment 2

Cross Section ID B

As shown in Figure 7, an 8-foot directional Class IV facility could be accommodated within the existing Caltrans ROW on each side of the roadway. To accommodate these facilities, the through lanes would need to be reduced from three to two lanes per direction. In each direction, parking lanes would remain, doubling as shoulders to satisfy shoulder requirements for state highways, and sidewalks would remain. The wide median would remain, contributing to a pedestrian-scale environment that is comfortable for users of all ages and abilities.

This cross section is considered feasible between Benton Drive and Quartz Hill Road. South of Quartz Hill Road, the cross section begins to narrow as the roadway approaches the N. Market Street bridge over the Sacramento River.

Segment 3

Cross Section ID C

The Caltrans Downtown Redding CAPM PIR proposes a Class II Buffered Bike Lane on Pine Street from Cypress Avenue to Eureka Way. The PIR notes that this would be accommodated by removing a lane or eliminating on-street parking.

Figure 8 shows the Class II facility, accommodated by removing an 11-foot lane. Alternatively, a directional Class IV facility could be accommodated by removing both a lane and on-street parking. Along this portion of the corridor, SR 273 is a one-way couplet, with Pine Street being one-way northbound.

Cross Section ID D

At the time this TM, construction of a bi-directional Class IV facility on California Street from Division Street to Yuba Street is expected Fall 2024. The 2018 City of Reddig Active Transportation Plan (ATP) proposes to

extend the Class IV facility on California Street from Yuba Street to Placer Street. The 2018 City of Redding ATP also proposes a Class II Buffered Bike Lane on California Street from Placer Street to Cypress Avenue. For continuity, a bi-directional Class IV facility was evaluated for Cross Section ID D.

As shown in Figure 9, a 10-foot bi-directional Class IV facility could be accommodated within the existing Caltrans ROW. This would require removing on-street parking on the west side of the roadway. Along this portion of the corridor, SR 273 is a one-way couplet, with California Street being one-way southbound.

Segment 4

Cross Section ID E

As shown in Figure 10, a 7-foot directional Class IV facility, as well as a sidewalk, could be accommodated within the existing Caltrans ROW on each side of the roadway. This would require reducing lane widths from 12 feet to 11 feet and the median width from 16 feet to 14 feet.

Segment 5

Cross Section ID F

As shown in Figure 11, a 10-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway (i.e., to avoid the railroad easement/ROW on the east side of the roadway). As noted in Table 2, within the Caltrans ROW, available space exists outside of the roadway (approximately 36 feet). As the potential project could be accommodated within this available space, roadway width or geometry changes were not evaluated. However, as shown in the figure, by using the available space outside of the roadway, the southbound shoulder could be increased from existing 2 feet to 8 feet.

This cross section is considered feasible for Segment 5. However, at several locations along the segment, there are culverts or bridges over waterways, including at Canyon Creek, Oregon Gulch, Anderson-Cottonwood Canal, and Olney Creek. Implementation of a Class I facility at these locations would require additional study/design, including potential coordination with the City of Redding for utilization of available space east of Westside Road and accommodation of culverts, bridges, and other grade issues.

Segment 6

Cross Section ID G

As shown in Figure 12, a 10-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway (i.e., to avoid the railroad easement/ROW on the east side of the roadway). As noted in Table 2, within the Caltrans ROW, available space exists outside of the roadway (approximately 33 feet). As the potential project could be accommodated within this available space, roadway width or geometry changes were not evaluated.

This cross section is considered feasible for Segment 6. Implementation of a Class I facility at these locations would require additional study/design, including potential coordination with the City of Redding for utilization of available space east of Westside Road and accommodation of culverts, bridges, and other grade issues.

Segment 7

Cross Section ID H

As shown in Figure 13, a 10-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway (i.e., to avoid the railroad easement/ROW on the east side of the roadway). As noted in Table 2, within the Caltrans ROW, available space exists outside of the roadway (approximately 20 feet) and in the median (approximately 22 feet). To accommodate the Class I facility, the median would be reduced from 22 feet to 18 feet.

Although this cross section is considered feasible for the majority of Segment 7, immediately north of Cross Section ID H, there are bridges over waterways (e.g., Clear Creek) and constrained sloped areas (e.g., approximately 620 feet south of Canyon Road) that would require roadway widening to accommodate a Class I facility.

Segment 8

Cross Section ID I

As shown in Figure 14, a 10-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway (i.e., to avoid the railroad easement/ROW on the east side of the roadway). As noted in Table 2, available space exists outside the roadway (approximately 15 feet) and in the median (approximately 24 feet). To accommodate the Class I facility, the median would be reduced from 24 feet to 14 feet. Also, shoulders would be modified in both directions of travel (to 8 feet), from existing 5 feet in northbound direction and 12 feet in southbound direction.

Segment 9

Cross Section ID J

As shown in Figure 15, a 10-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway (i.e., to avoid the railroad easement/ROW on the east side of the roadway). As noted in Table 2, available space exists outside the roadway (approximately 20 feet) and in the median (approximately 24 feet). To accommodate the Class I facility, the median would be reduced from 24 feet to 20 feet. Also, shoulders would be modified in both directions of travel (to 8 feet), from existing 6 feet in northbound direction and 6 feet in southbound direction.

Segment 10

Cross Section ID K

As shown in Figure 16, a 10-foot Class I facility could be accommodated within the existing Caltrans ROW on the west side of the roadway (i.e., to avoid the railroad easement/ROW on the east side of the roadway). As noted in Table 2, available space exists outside the roadway (approximately 30 feet) and in the median (approximately 20 feet). To accommodate the Class I facility, the median would be reduced from 20 feet to 16 feet. Also, shoulders would be modified in both directions of travel (to 8 feet), from existing 6 feet in northbound direction and 6 feet in southbound direction.

Figure 6 *Cross Section ID A*

Figure 7 *Cross Section ID B*

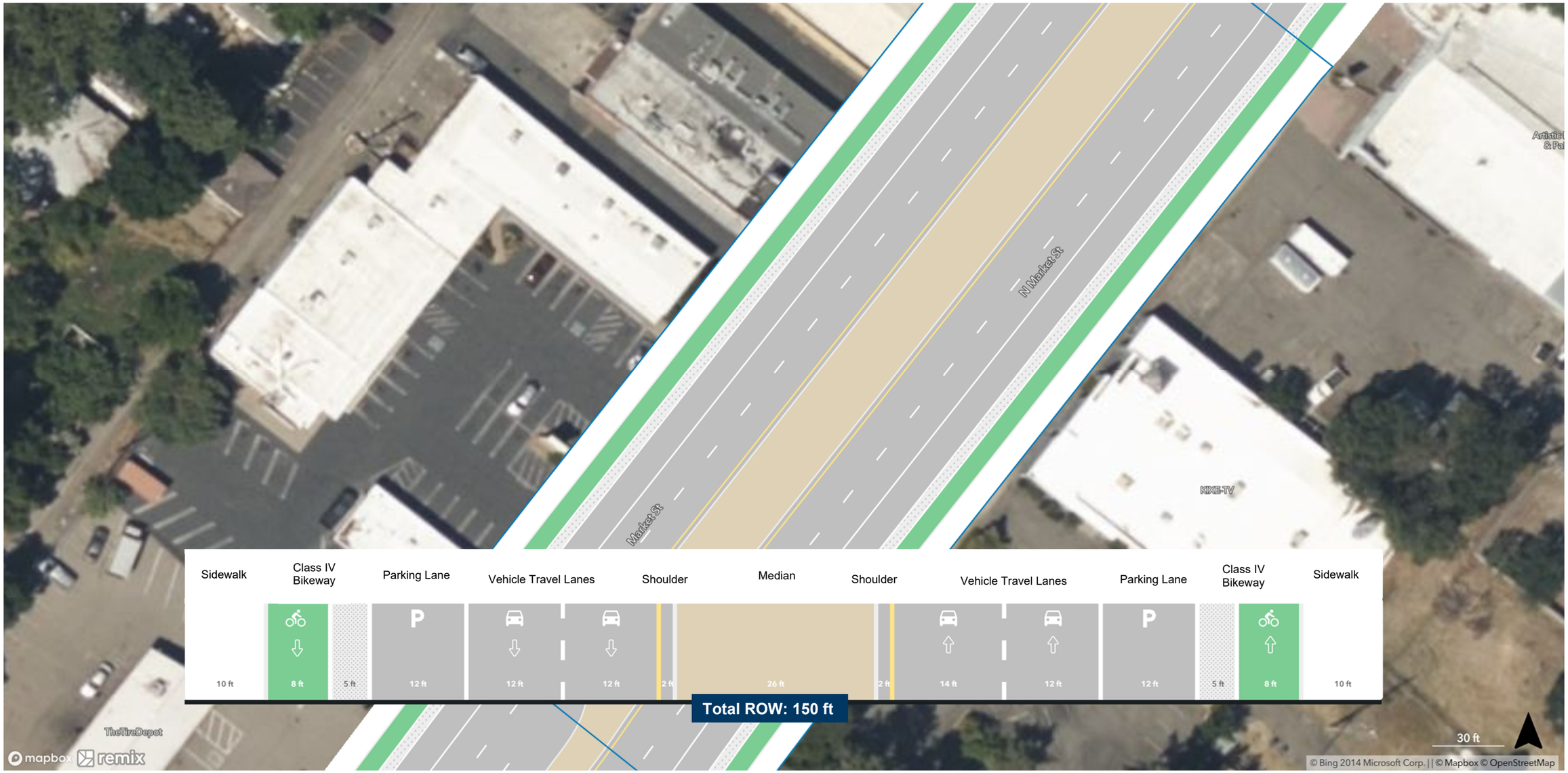


Figure 8 *Cross Section ID C*

Figure 9 *Cross Section ID D*

Figure 10 *Cross Section ID E*

Figure 11 *Cross Section ID F*

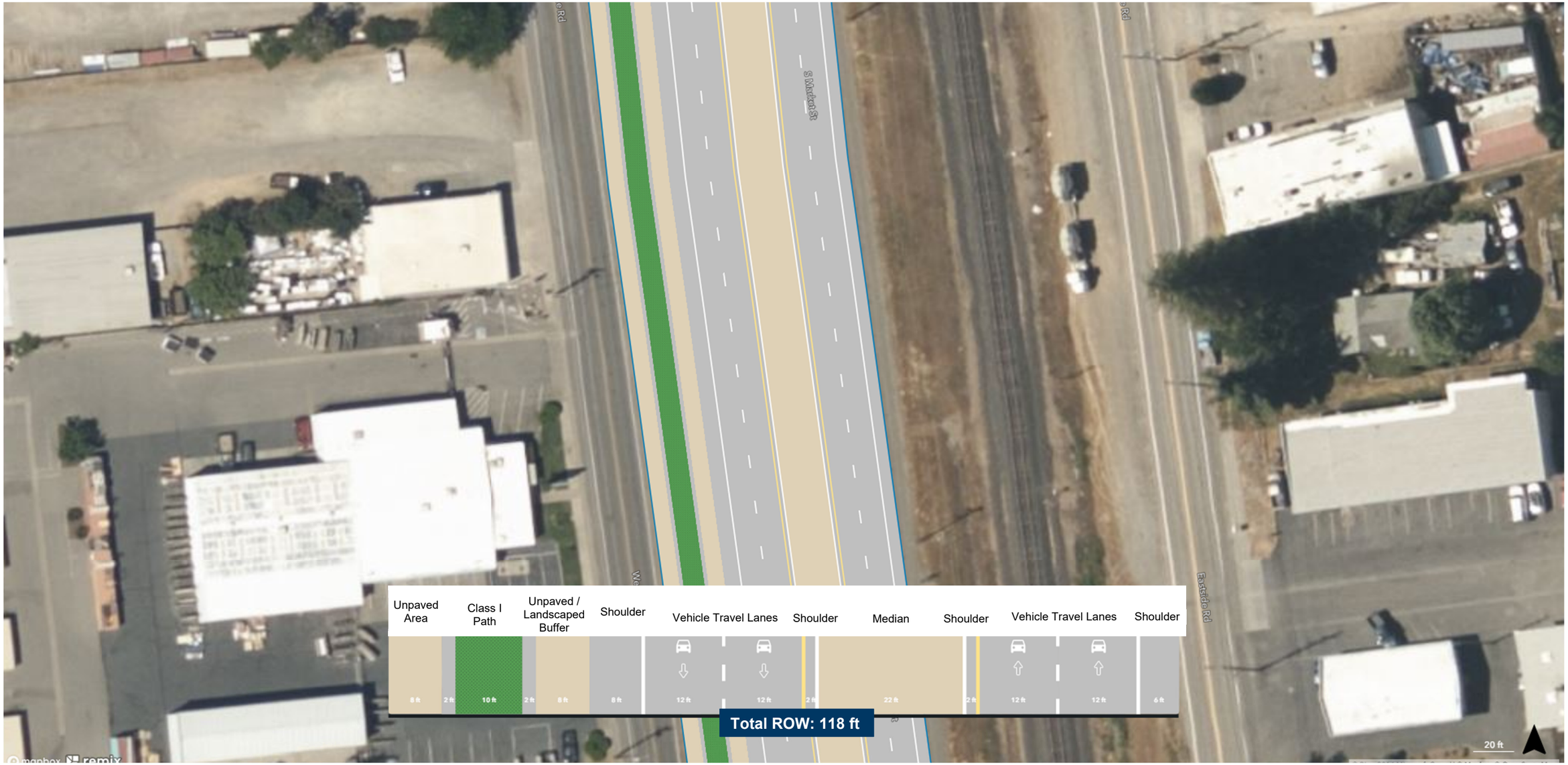


Figure 12 *Cross Section ID G*

Figure 13 *Cross Section ID H*

Figure 14 *Cross Section ID I*

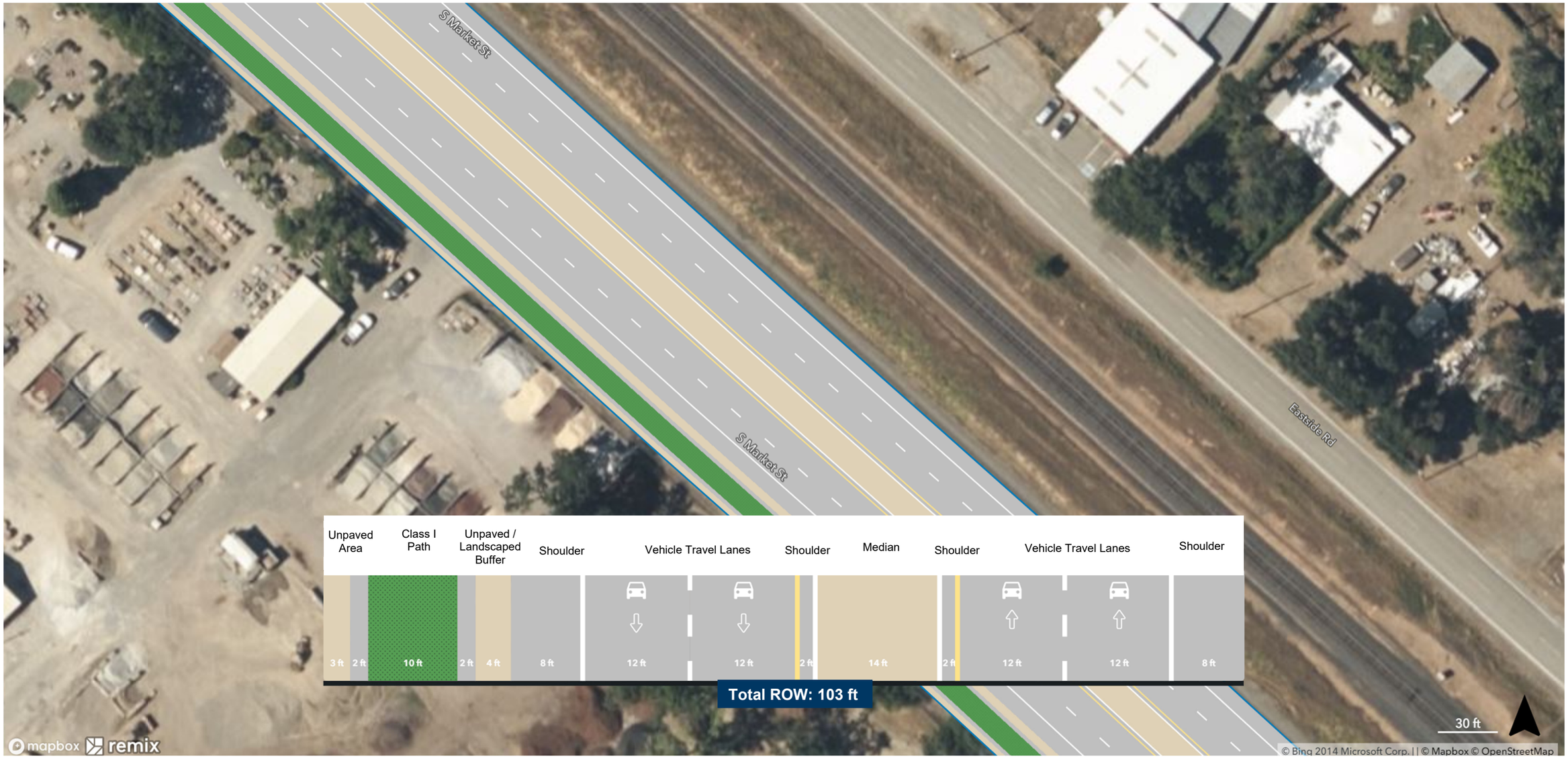


Figure 15 *Cross Section ID J*

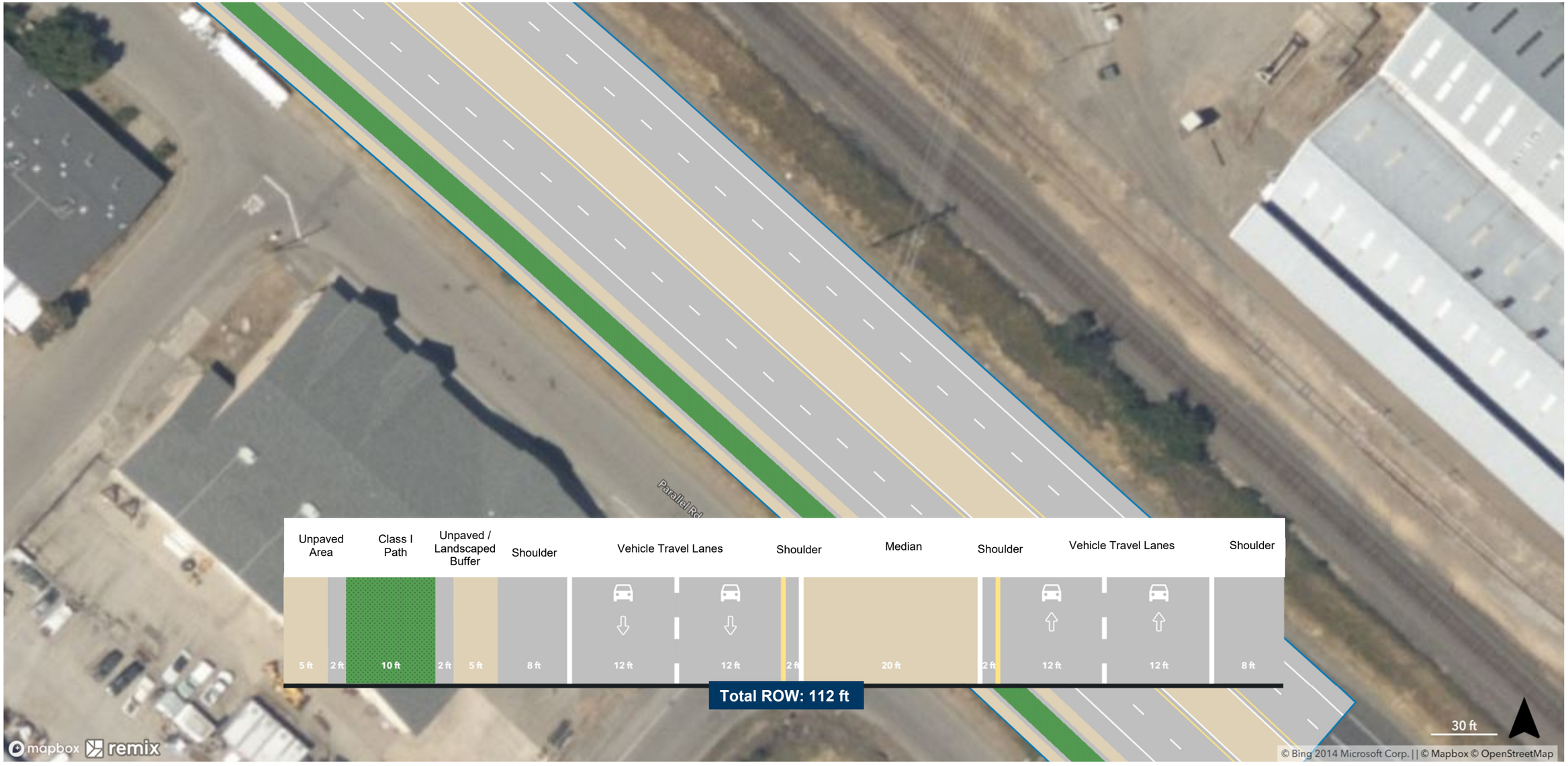
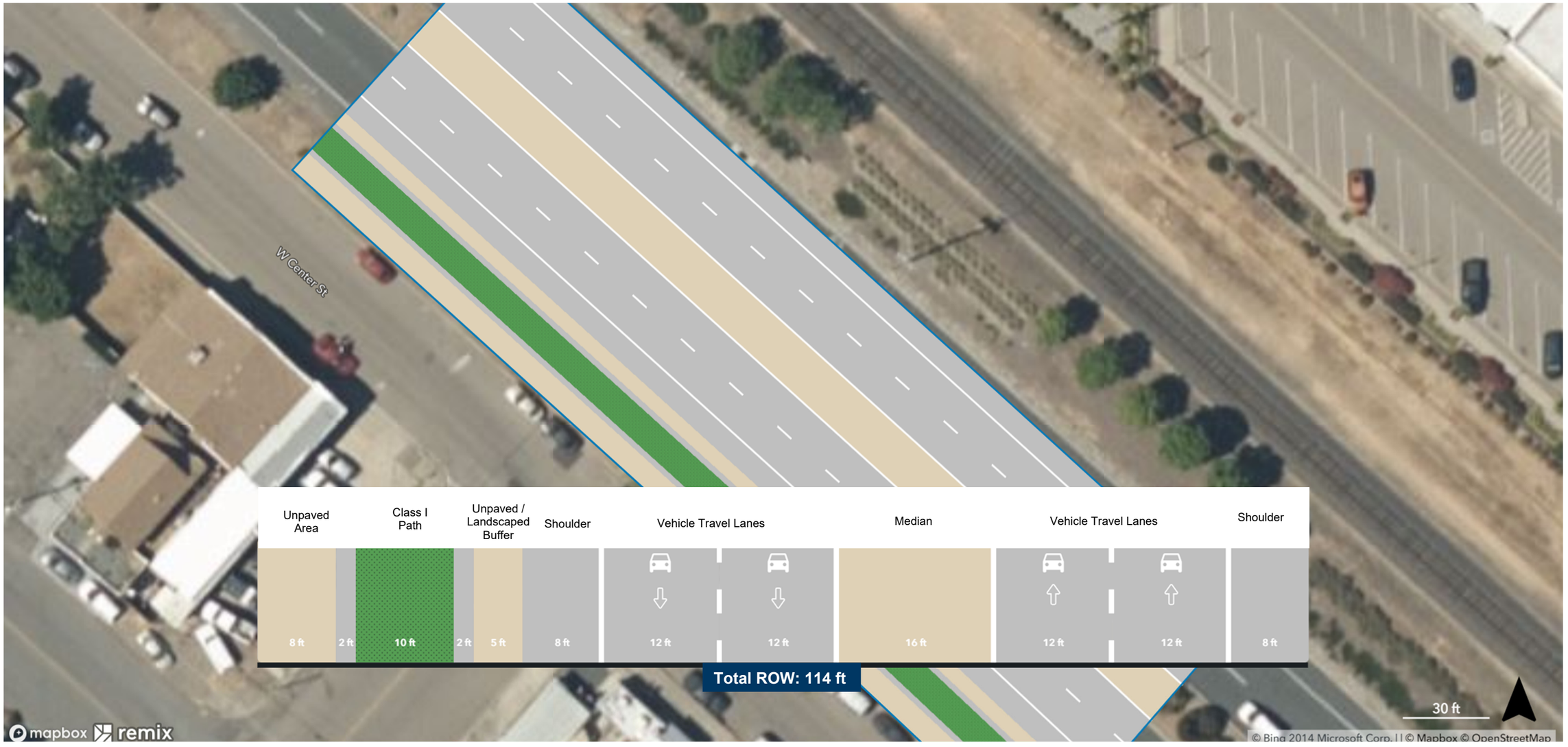


Figure 16 *Cross Section ID K*



7. Summary

As evaluated this TM, which provides a planning-level feasibility analysis, Class I and IV facilities could be accommodated along the entire length of the corridor within the Caltrans ROW. Whereas Class IV facilities are best suited for the urbanized areas of the City of Redding, Class I facilities are best suited for other areas of the corridor. As noted in Table 2 of this TM, in six of ten corridor segments, available space exists outside of the roadway (i.e., 15 to 58 feet on the west side of the roadway), where potential projects could be located.

This TM evaluated representative cross section locations. Further study/design is needed to confirm ROW, address bridges and culverts, grade issues, and other issues.

Corridor Performance Improvements

It is anticipated that Class I/Class IV projects along the entire length of the corridor (Segments 1 to 10) would improve all performance measure categories, as indicated in Table 5 and summarized below.

– Mobility & Connectivity. Pedestrian mobility and connectivity would be improved by adding pedestrian facilities (i.e., Class I or sidewalks), where pedestrian facilities currently do not exist. Bicycle and pedestrian level of traffic stress would be reduced, as safer and separated facilities would be provided. Also, walking and bicycling mode share could increase with the availability of walking and bicycling facilities (e.g., where such facilities currently do not exist).
– Operations and Reliability. With a potential walking and bicycling mode share shift (i.e., from vehicles to walking or bicycling), vehicle miles traveled and vehicular congestion would decrease.
– Safety. With safer and separated walking and bicycling facilities, bicycle and pedestrian collisions could be reduced.

Table 5 FS #4 Corridor Performance Improvements

Performance Measure	Segment									
	1	2	3	4	5	6	7	8	9	10
Mobility & Connectivity	X	X	X	X	X	X	X	X	X	X
Operations & Reliability	X	X	X	X	X	X	X	X	X	X
Safety	X	X	X	X	X	X	X	X	X	X

Technical Memorandum

November 7, 2024

To	Michael Kuker, SRTA; Laurent Beauregard, SRTA	**Contact No.**	
Copy to	Natalie Kinney, Caltrans; Aaron Casas, Caltrans; Christina Prosperi, Caltrans; Sergio Amezquita, Caltrans;	**Email**	Todd.tregenza@ghd.com
From	Todd Tregenza, GHD	**Project No.**	12560002
Project Name	Envision 273 Comprehensive Multimodal Corridor Plan		
Subject	Task 6 Technical Memorandum: Feasibility Study #5 (Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation)		

1. Introduction

The Task 6 Technical Memorandums (TMs) will evaluate potential projects that may support corridor solutions, as described in the Task 5 TM.

Each Task 6 TM presents the feasibility of a potential project or group of projects. Task 6 includes six feasibility studies (FSs):

1. One-way Couplet Reversion
2. Cypress Avenue Roundabout
3. Downtown Redding Gateways
4. Class I/IV from Redding to Anderson
5. Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation
6. Redding (SR 273/Breslauer Way) Grade Crossing Relocation

This TM presents *FS #5: Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation.*

The TMs will be combined or summarized in the draft/final report, as appropriate.

2. Scope

This TM evaluates the feasibility of relocating a grade crossing in Shasta County, from Whitehouse Drive (existing at-grade crossing) to Happy Valley Road (proposed new at-grade crossing).

As shown in Figure 1, the existing at-grade crossing is located immediately east of the State Route (SR) 273/Whitehouse Drive Intersection and immediately west of the Eastside Road/Whitehouse Drive Intersection. There are four parallel transportation facilities in the vicinity of the existing at-grade crossing—Whitehouse Drive, SR 273, the Union Pacific (UP) Railroad, and Eastside Road—all within a constrained area (approximately 400 feet). Additionally, the Anderson-Cottonwood Irrigation District (ACID) Canal is located between Whitehouse Drive and SR 273. At the existing at-grade crossing, there are no pedestrian facilities (i.e., sidewalks) and no bicycle facilities.

The grade crossing relocation could promote safety and reduce crash rates, including pedestrian/bicyclist fatalities due to vehicle and train collisions.

Figure 1 Existing At-Grade Crossing: Whitehouse Drive

3. Guidance

For projects involving UP Railroad property, the *2021 Union Pacific Railroad Public Projects Manual* (Manual) was referenced, as noted in this section.

Disclaimers

The Manual is intended to be used as reference only to instruct and guide communities, highway agencies, and other authorities, industries, or private entities, referred to as Applicants, in progressing their public projects prior to initiating contact with the UP Public Projects Team. A public project is defined as any roadway, bridge, commercial development, parallel corridor, or utility project that is owned or used by the public or by a private entity and that encroaches within UP Railroad property.

The Manual includes the following disclaimer:

> *This Union Pacific Railroad Public Projects Manual should not be considered an all-inclusive reference document; rather, it is intended to be a guidance document used as a general resource. Nothing identified in this Union Pacific Railroad Public Projects Manual can be taken as authority to construct on or near the Union Pacific Railroad property. This manual is provided for reference only and is subject to revision without notice.*

Additionally, the Manual notes that all new public projects shall be designed in accordance with the most current UP policies, requirements, and standards.

Grade Crossings

Section 4 (Grade Crossings) of the Manual defines a grade crossing as any public or private roadway that is within UP Railroad property and crosses the UP Railroad track. The section describes various types of grade crossing projects, including crossing surface (planking) or pavement replacements, roadway widening or reconstruction, new grade crossings, temporary grade crossings grade crossing closures, and conversions from private crossings to public crossings.

For roadway widening or reconstruction, which may require geometric modifications, the Manual lists important items to consider when designing the grade crossing. One such item is as follows: “A major roadway reconfiguration or change in use will be reviewed as a new crossing by UP.”

For new crossings, the Manual states that UP, other railroads, the U.S. Department of Transportation (USDOT), and most states encourage communities to carefully consider all alternatives, including grade separations, as opposed to requests to create new at-grade crossings. The cost of grade separation projects should not outweigh the enhanced safety they would provide to the public. Every effort must be made to obtain alternative access using grade separations, parallel or other roads leading to existing crossings, and access from other directions. UP endorses the Federal Highway Administration (FHWA) goal of reducing the number of grade crossings per 23 Code of Federal Regulations 646.214(c) and the Manual on Uniform Traffic Control Devices (MUTCD) Section 8A.05. Proposals for establishing a new at-grade crossing shall identify three or more existing crossings for closure for each proposed new crossing. The crossings identified shall have the same characteristics as the proposed new at-grade crossing (i.e., similar average daily traffic / train counts, etc.). In addition, there may be specific engineering or rail operation considerations that would prevent the establishment of a new crossing. UP policy is not to permit private or public parallel roadways within the UP Railroad right-of-way (see Section 7 of the Manual). UP believes that the safest crossing is no crossing.

As noted in Section 4.4 of the Manual, UP endorses the USDOT/FHWA/Federal Railroad Administration (FRA) goal of reducing the number of at-grade crossings through consolidation, elimination, grade separation, and restriction of the number of new crossings installed. UP may participate in funding for crossing closures and consolidation.

Sidewalks and Pathways

Section 6 (Sidewalks and Pathways) of the Manual discusses sidewalks and bicycle/pedestrian pathways.

For sidewalks, only sidewalk grade crossings immediately adjacent to an existing public highway-rail grade crossing equipped with an active grade crossing warning system will be considered. If a sidewalk is 25 feet or more away from the edge of travelled way of the roadway, it is considered a separate crossing. The Manual notes that warning device placement should be designed per the MUTCD, with the exception of sidewalks (as noted in Section 6.1 of the Manual). The Manual also provides design guidance in Appendix E (Guidance for Sidewalk Improvements).

For bicycle/pedestrian pathways, the Manual notes that UP does not allow new at-grade pathway grade crossings. Similar to sidewalks, the addition of a bicycle lane or separate pedestrian pathway should be reviewed for inclusion only if immediately adjacent to an existing public highway-rail grade crossing.

UP does not and will not permit any multi-use or recreational pathways to either cross the railroad tracks or be located within the UP Railroad right-of-way.

Parallel Roadways

Section 7 (Parallel Corridor and Other Projects) of the Manual discusses Applicant projects on or adjacent to the UP Railroad, including parallel roadways. In the interest of public safety, parallel roadways shall be located off the UP Railroad right-of-way. Parallel roads involving intersections with existing or proposed roadways, where grade crossings are present, should be aligned to provide sufficient distance from the grade crossing for the largest vehicle (Design Vehicle) permitted to use the road. The Design Vehicle shall be able to stop between the railroad and the parallel road traffic control signs, markings, and other traffic control devices without interfering with railroad operations, obstructing or preventing the operation of traffic control devices, or obstructing the grade crossing in any manner.

Grade Crossing Plan Sheet

Appendix F (Sample Grade Crossing Plan Sheet Rural) of the Manual provides a roadway grade crossing example, including crossing detail with dimensions of lanes, curb types, medians, sidewalk, right-of-way, track centers, warning devices, and other features.

4. Existing Conditions

This section presents the existing conditions of the existing and proposed new at-grade crossings, specifically, the traffic characteristics requested by the Manual.

Average Daily Traffic

Table 1 lists the average daily traffic (ADT) and annual average daily traffic (AADT) for locations adjacent to the existing at-grade crossing (Whitehouse Drive) and the proposed new at-grade crossing (Happy Valley Road). Per Caltrans AADT data, the AADT north of SR 273/Happy Valley Road is 11,500 AADT. Per the traffic counts collected as part of the project, the PM peak hour volume for this corresponding segment is between 929 and 951, representing a roughly 8 percent peak-to-daily ratio.

Absent daily volume field data on the Whitehouse Drive and Happy Valley Road segments, this same peak-to-daily ratio was applied to estimate ADT. Being immediately adjacent to each other, the ADT at a relocated crossing at Happy Valley Road is assumed to be similar to the ADT at the existing crossing at Whitehouse Drive.

Table 1 Crossings ADT

Location Description	PM Peak Hour	Caltrans AADT	Estimated ADT
SR 273, north of Happy Valley Road	929	11,500	
Whitehouse Drive, west of SR 273	42		520
Whitehouse Drive, east of SR 273	98		1,213
Happy Valley Road, west of SR 273	320		4,060

Source: Caltrans 2020 AADT; Counts Unlimited 2023 Traffic Counts

As noted in Chapter 3 (Corridor Conditions) of the *Existing Conditions Technical Report*, in 2020, corridor traffic volumes range from just under 10,000 average daily traffic (ADT) at the southern and northern ends of the corridor to 17,800 ADT north of Downtown Redding (Segment 2) and 18,600 ADT near S. Bonnyview Road (Segment 6).

Train Counts

Train counts are the same for the existing at-grade crossing (Whitehouse Drive) and the proposed new at-grade crossing (Happy Valley Road). The two crossings are approximately 1,900 feet (0.36 miles) apart, with no spur sidings to private property in between.

5. Alternative Assumptions

This section describes the assumptions used for the proposed new at-grade crossing at Happy Valley Road.

UP Requirement: Crossing Closure Study

As noted in Section 4.3 of the Manual, UP expects communities to engage in a study to identify crossings for closure, exhausting all options (e.g., construction of new grade separated overpass crossing and use of roads leading to existing grade separated crossings, other grade crossings, and access from other directions) as opposed to requesting a new at-grade crossing.

This TM assumes that the Shasta Regional Transportation Agency (SRTA) and/or Caltrans will perform the required study, as well as other detailed analysis/design, prior to requesting any new at-grade crossing.

UP Requirement: New Crossing Engineering Considerations

As noted in Section 4.3 of the Manual, there may be specific engineering or rail operation considerations that would prevent the establishment of a new crossing. This could include limited available public roadway right-of-way in the vicinity of the new at-grade crossing. This is an important consideration, as UP policy is not to permit private or public parallel roadways within the UP Railroad right-of-way.

Considering this UP requirement, the focused scope of this TM is to evaluate any planning-level engineering considerations that would render the proposed new at-grade crossing at Happy Valley Road infeasible.

New Crossing Design Guidance

This TM presents a conceptual layout of the proposed new at-grade crossing at Happy Valley Road. Mostly, UP guidance listed in the Manual was referenced, including the following:

– Appendix E (Guidance for Sidewalk Improvements)
– Appendix F (Sample Grade Crossing Plan Sheet Rural)
– Accommodation of the largest vehicle (Design Vehicle) permitted (Section 7 of the Manual).

California Public Utilities Commission (CPUC) General Order No. 26-D (Regulations governing clearances on railroads and street railroads with reference to side and overhead structures, parallel tracks, crossing of public roads, highways, and streets) was referenced for the required railroad minimum side clearance.

Additionally, a typical 100-foot railroad right-of-way width was assumed. Based on aerial research, this width currently exists in the corridor at UP Railroad/Girvan Road (public sidewalk on the east to public sidewalk on the west) and at the proposed new at-grade crossing (roadway striping on the east to public sidewalk on the west).

On parallel roadways (i.e., SR 273 and Eastside Road) design was limited to Design Vehicle requirements (Section 7 of the Manual), where possible.

6. Alternative Evaluation

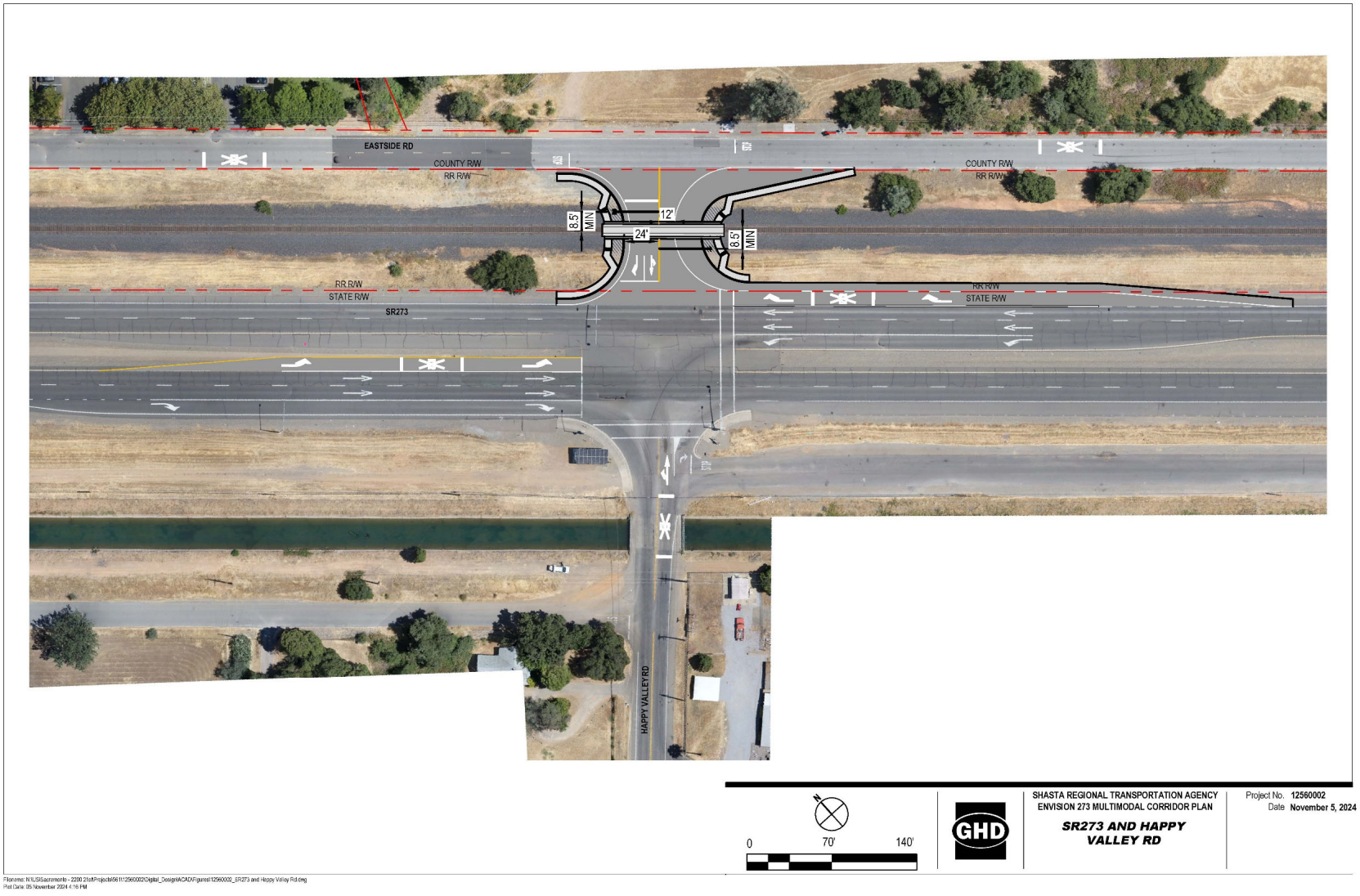
This section provides a planning-level evaluation of the proposed new at-grade crossing at Happy Valley Road. The evaluation includes the assumptions listed in Section 5 of this TM.

Conceptual Layout

Figure 2 illustrates the proposed new at-grade crossing at Happy Valley Road. As shown, at the grade crossing, three 12-foot lanes (one eastbound and two westbound) can be accommodated, as well as sidewalks on both the north and the south (adjacent to and within 25 feet of the edge of travelled way of the new roadway). The required railroad minimum side clearance of 8.5-feet (from the railroad center line) also can be accommodated. However, at the proposed new at grade crossing, the Design Vehicle cannot be accommodated within the existing Eastside Road right-of-way without interfering with local roadway and railroad operations. As stated in Section 7 of the Manual, “the Design Vehicle shall be able to stop between the railroad and the parallel road traffic control signs, markings, and other traffic control devices without interfering with railroad operations, obstructing or preventing the operation of traffic control devices, or obstructing the grade crossing in any manner.” In this instance, a right turn lane (from Southbound Eastside Road to Westbound Happy Valley Road) and a left turn lane (from Northbound Eastside Road to Westbound Happy Valley Road) to store the Design Vehicle is needed.

For future study, the Eastside Road right-of-way limits should be clearly understood, as it appears there is no additional public roadway right-of-way on which to accommodate the Design Vehicle. This suggests that additional right-of-way would need to be acquired. As noted in the Manual, UP policy is not to permit private or public parallel roadways within the UP Railroad right-of-way. The inability to accommodate the Design Vehicle is a potential engineering constraint to be considered.

Figure 2 *Proposed New At-Grade Crossing: Happy Valley Road*



7. Summary

To enhance grade crossing safety, UP endorses the USDOT/FHWA/FRA goal of reducing the number of at-grade crossings, through consolidation, elimination, grade separation, and restriction of the number of new crossings installed. UP believes the safest crossing is no crossing. UP insists that all other options—including new grade separated overpass crossings—be exhausted before applying for a new grade crossing.

At this time, other options/projects have yet to be exhausted. Therefore, from the perspective of UP and other federal transportation agencies, the new at-grade crossing at Happy Valley Road currently is infeasible, as it is not the preferred project to promote safety. As the project currently is infeasible, corridor performance improvements (i.e., in Segment 8, where the two crossings are located) were not assessed.

This TM recommends the completion of a corridor wide crossing closure study, where the full range of grade crossing options/projects can be explored, including new grade separated overpass crossings and the use of roads leading to existing grade separated crossings, other grade crossings, and access from other directions, as well as the Whitehouse Drive grade crossing closure. For any viable proposed new at-grade crossings, existing crossing closures (using the most recent UP ratio) should be identified. As noted in the Manual, UP may participate in funding for crossing closures and consolidation. Additionally, there exists the opportunity to pursue grant funds from federal transportation agencies for more costly projects, such as grade separated overpass crossings.

Technical Memorandum

November 7, 2024

To	Michael Kuker, SRTA; Laurent Beauregard, SRTA	**Contact No.**	
Copy to	Natalie Kinney, Caltrans; Aaron Casas, Caltrans; Christina Prosperi, Caltrans; Sergio Amezquita, Caltrans;	**Email**	Todd.tregenza@ghd.com
From	Todd Tregenza, GHD	**Project No.**	12560002
Project Name	Envision 273 Comprehensive Multimodal Corridor Plan		
Subject	Task 6 Technical Memorandum: Feasibility Study #6 (Redding Grade (SR 273/Breslauer Way) Crossing Relocation)		

1. Introduction

The Task 6 Technical Memorandums (TMs) will evaluate potential projects that may support corridor solutions, as described in the Task 5 TM.

Each Task 6 TM presents the feasibility of a potential project or group of projects. Task 6 includes six feasibility studies (FSs):

1. One-way Couplet Reversion
2. Cypress Avenue Roundabout
3. Downtown Redding Gateways
4. Class I/IV from Redding to Anderson
5. Shasta County (SR 273/Whitehouse Drive) Grade Crossing Relocation
6. Redding (SR 273/Breslauer Way) Grade Crossing Relocation

This TM presents *FS #6: Redding (SR 273/Breslauer Way) Grade Crossing Relocation.*

The TMs will be combined or summarized in the draft/final report, as appropriate.

2. Scope

This TM evaluates the feasibility of relocating a grade crossing in the City of Redding, from Breslauer Way (existing at-grade crossing) to Buenaventura Boulevard (proposed new at-grade crossing).

As shown in Figure 1, the existing at-grade crossing is located immediately east of the State Route (SR) 273/Breslauer Way Intersection and immediately west of the Eastside Road/Breslauer Way Intersection. There are four parallel transportation facilities in the vicinity of the existing at-grade crossing—Westside Road, SR 273, the Union Pacific (UP) Railroad, and Eastside Road—all within a constrained area (approximately 300 feet). Additionally, at the existing at-grade crossing, there are no pedestrian facilities (i.e., sidewalks) and no bicycle facilities.

The grade crossing relocation could promote safety and reduce crash rates, including pedestrian/bicyclist fatalities due to vehicle and train collisions.

Figure 1 *Existing At-Grade Crossing: Breslauer Way*

3. Guidance

For projects involving UP Railroad property, the *2021 Union Pacific Railroad Public Projects Manual* (Manual) was referenced, as noted in this section.

Disclaimers

The Manual is intended to be used as reference only to instruct and guide communities, highway agencies, and other authorities, industries, or private entities, referred to as Applicants, in progressing their public projects prior to initiating contact with the UP Public Projects Team. A public project is defined as any roadway, bridge, commercial development, parallel corridor, or utility project that is owned or used by the public or by a private entity and that encroaches within UP Railroad property.

The Manual includes the following disclaimer:

> *This Union Pacific Railroad Public Projects Manual should not be considered an all-inclusive reference document; rather, it is intended to be a guidance document used as a general resource. Nothing identified in this Union Pacific Railroad Public Projects Manual can be taken as authority to construct on or near the Union Pacific Railroad property. This manual is provided for reference only and is subject to revision without notice.*

Additionally, the Manual notes that all new public projects shall be designed in accordance with the most current UP policies, requirements, and standards.

Grade Crossings

Section 4 (Grade Crossings) of the Manual defines a grade crossing as any public or private roadway that is within UP Railroad property and crosses the UP Railroad track. The section describes various types of grade crossing projects, including crossing surface (planking) or pavement replacements, roadway widening or reconstruction, new grade crossings, temporary grade crossings grade crossing closures, and conversions from private crossings to public crossings.

For roadway widening or reconstruction, which may require geometric modifications, the Manual lists important items to consider when designing the grade crossing. One such item is as follows: “A major roadway reconfiguration or change in use will be reviewed as a new crossing by UP.”

For new crossings, the Manual states that UP, other railroads, the U.S. Department of Transportation (USDOT), and most states encourage communities to carefully consider all alternatives, including grade separations, as opposed to requests to create new at-grade crossings. The cost of grade separation projects should not outweigh the enhanced safety they would provide to the public. Every effort must be made to obtain alternative access using grade separations, parallel or other roads leading to existing crossings, and access from other directions. UP endorses the Federal Highway Administration (FHWA) goal of reducing the number of grade crossings per 23 Code of Federal Regulations 646.214(c) and the Manual on Uniform Traffic Control Devices (MUTCD) Section 8A.05. Proposals for establishing a new at-grade crossing shall identify three or more existing crossings for closure for each proposed new crossing. The crossings identified shall have the same characteristics as the proposed new at-grade crossing (i.e., similar average daily traffic / train counts, etc.). In addition, there may be specific engineering or rail operation considerations that would prevent the establishment of a new crossing. UP policy is not to permit private or public parallel roadways within the UP Railroad right-of-way (see Section 7 of the Manual). UP believes that the safest crossing is no crossing.

As noted in Section 4.4 of the Manual, UP endorses the USDOT/FHWA/Federal Railroad Administration (FRA) goal of reducing the number of at-grade crossings through consolidation, elimination, grade separation, and restriction of the number of new crossings installed. UP may participate in funding for crossing closures and consolidation.

Sidewalks and Pathways

Section 6 (Sidewalks and Pathways) of the Manual discusses sidewalks and bicycle/pedestrian pathways.

For sidewalks, only sidewalk grade crossings immediately adjacent to an existing public highway-rail grade crossing equipped with an active grade crossing warning system will be considered. If a sidewalk is 25 feet or more away from the edge of travelled way of the roadway, it is considered a separate crossing. The Manual notes that warning device placement should be designed per the MUTCD, with the exception of sidewalks (as noted in Section 6.1 of the Manual). The Manual also provides design guidance in Appendix E (Guidance for Sidewalk Improvements).

For bicycle/pedestrian pathways, the Manual notes that UP does not allow new at-grade pathway grade crossings. Similar to sidewalks, the addition of a bicycle lane or separate pedestrian pathway should be reviewed for inclusion only if immediately adjacent to an existing public highway-rail grade crossing.

UP does not and will not permit any multi-use or recreational pathways to either cross the railroad tracks or be located within the UP Railroad right-of-way.

Parallel Roadways

Section 7 (Parallel Corridor and Other Projects) of the Manual discusses Applicant projects on or adjacent to the UP Railroad, including parallel roadways. In the interest of public safety, parallel roadways shall be located off the UP Railroad right-of-way. Parallel roads involving intersections with existing or proposed roadways, where grade crossings are present, should be aligned to provide sufficient distance from the grade crossing for the largest vehicle (Design Vehicle) permitted to use the road. The Design Vehicle shall be able to stop between the railroad and the parallel road traffic control signs, markings, and other traffic control devices without interfering with railroad operations, obstructing or preventing the operation of traffic control devices, or obstructing the grade crossing in any manner.

Grade Crossing Plan Sheet

Appendix F (Sample Grade Crossing Plan Sheet Rural) of the Manual provides a roadway grade crossing example, including crossing detail with dimensions of lanes, curb types, medians, sidewalk, right-of-way, track centers, warning devices, and other features.

4. Existing Conditions

This section presents the existing conditions of the existing and proposed new at-grade crossings, specifically, the traffic characteristics requested by the Manual.

Average Daily Traffic

Table 1 lists the 2020 California Department of Transportation (Caltrans) annual average daily traffic (AADT) for the existing at-grade crossing (Breslauer Way) and the proposed new at-grade crossing (Buenaventura Boulevard). Generally, AADT is similar at the existing and proposed crossing locations.

Table 1 Crossings AADT

ROUTE	PM	LOCATION DESCRIPTION	BACK			AHEAD		
			PEAK HOUR	PEAK MADT	AADT	PEAK HOUR	PEAK MADT	AADT
273	14.184	Breslauer Way	1,500	17,700	14,100	1,900	20,800	18,500
273	14.470	Buenaventura Blvd	1,900	20,800	18,500	1,500	16,200	15,500

Source: Caltrans 2020 AADT

As noted in Chapter 3 (Corridor Conditions) of the *Existing Conditions Technical Report*, in 2020, corridor traffic volumes range from just under 10,000 average daily traffic (ADT) at the southern and northern ends of the corridor to 17,800 ADT north of Downtown Redding (Segment 2) and 18,600 ADT near S. Bonnyview Road (Segment 6).

Train Counts

Train counts are the same for the existing at-grade crossing (Breslauer Way) and the proposed new at-grade crossing (Buenaventura Boulevard). The two crossings are approximately 1,500 feet (0.28 miles) apart, with no spur sidings to private property in between.

5. Alternative Assumptions

This section describes the assumptions used for the proposed new at-grade crossing at Buenaventura Boulevard.

UP Requirement: Crossing Closure Study

As noted in Section 4.3 of the Manual, UP expects communities to engage in a study to identify crossings for closure, exhausting all options (e.g., construction of new grade separated overpass crossing and use of roads leading to existing grade separated crossings, other grade crossings, and access from other directions) as opposed to requesting a new at-grade crossing.

This TM assumes that the Shasta Regional Transportation Agency (SRTA) and/or Caltrans will perform the required study, as well as other detailed analysis/design, prior to requesting any new at-grade crossing.

UP Requirement: New Crossing Engineering Considerations

As noted in Section 4.3 of the Manual, there may be specific engineering or rail operation considerations that would prevent the establishment of a new crossing. This could include limited available public roadway right-of-way in the vicinity of the new at-grade crossing. This is an important consideration, as UP policy is not to permit private or public parallel roadways within the UP Railroad right-of-way.

Considering this UP requirement, the focused scope of this TM is to evaluate any planning-level engineering considerations that would render the proposed new at-grade crossing at Buenaventura Boulevard infeasible.

New Crossing Design Guidance

This TM presents a conceptual layout of the proposed new at-grade crossing at Buenaventura Boulevard. Mostly, UP guidance listed in the Manual was referenced, including the following:

– Appendix E (Guidance for Sidewalk Improvements)
– Appendix F (Sample Grade Crossing Plan Sheet Rural)
– Accommodation of the largest vehicle (Design Vehicle) permitted (Section 7 of the Manual).

California Public Utilities Commission (CPUC) General Order No. 26-D (Regulations governing clearances on railroads and street railroads with reference to side and overhead structures, parallel tracks, crossing of public roads, highways, and streets) was referenced for the required railroad minimum side clearance.

Additionally, a typical 100-foot railroad right-of-way width was assumed. Based on aerial research, this width currently exists in the corridor at UP Railroad/Girvan Road (public sidewalk on the east to public sidewalk on the west) and approximately 200 feet north of the proposed new at-grade crossing (fire hydrant on the east to utility pole on the west).

On parallel roadways (i.e., SR 273 and Eastside Road) design was limited to Design Vehicle requirements (Section 7 of the Manual), where possible.

6. Alternative Evaluation

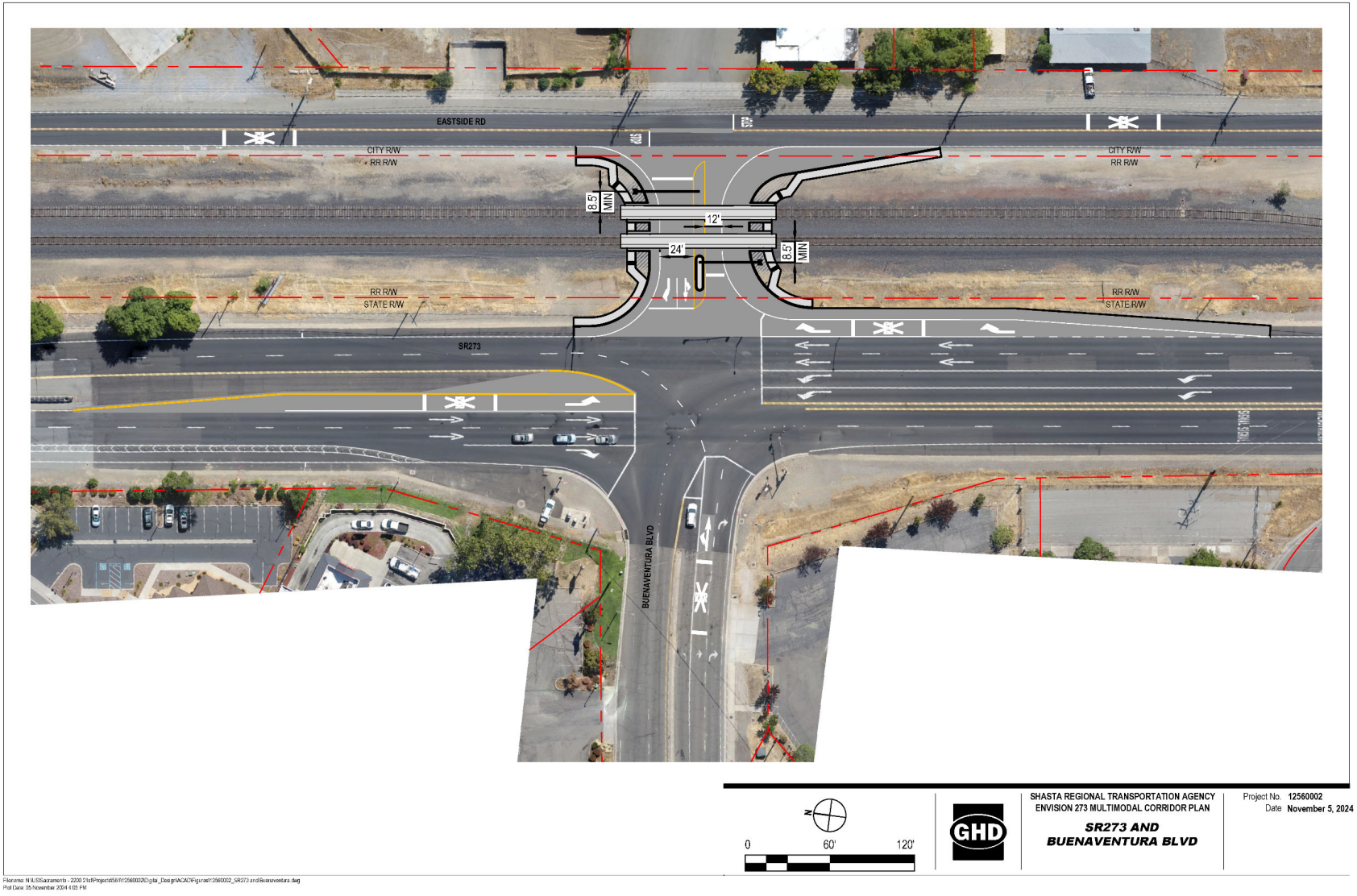
This section provides a planning-level evaluation of the proposed new at-grade crossing at Buenaventura Boulevard. The evaluation includes the assumptions listed in Section 5 of this TM.

Conceptual Layout

Figure 2 illustrates the proposed new at-grade crossing at Buenaventura Boulevard. As shown, at the grade crossing, three 12-foot lanes (one eastbound and two westbound) can be accommodated, as well as sidewalks on both the north and the south (adjacent to and within 25 feet of the edge of travelled way of the new roadway). The required railroad minimum side clearance of 8.5-feet (from the railroad center line) also can be accommodated. However, at the proposed new at grade crossing, the Design Vehicle cannot be accommodated within the existing Eastside Road right-of-way and/or geometry without interfering with local roadway and railroad operations. As stated in Section 7 of the Manual, “the Design Vehicle shall be able to stop between the railroad and the parallel road traffic control signs, markings, and other traffic control devices without interfering with railroad operations, obstructing or preventing the operation of traffic control devices, or obstructing the grade crossing in any manner.” In this instance, a right turn lane (from Southbound Eastside Road to Westbound Buenaventura Boulevard) and a left turn lane (from Northbound Eastside Road to Westbound Buenaventura Boulevard) to store the Design Vehicle is needed.

For future study, the Eastside Road right-of-way limits should be clearly understood, as well as any potential to modify the Eastside Road geometry, to accommodate the Design Vehicle. The inability to accommodate the Design Vehicle is a potential engineering constraint to be considered.

Figure 2 *Proposed New At-Grade Crossing: Buenaventura Blvd*



7. Summary

To enhance grade crossing safety, UP endorses the USDOT/FHWA/FRA goal of reducing the number of at-grade crossings, through consolidation, elimination, grade separation, and restriction of the number of new crossings installed. UP believes the safest crossing is no crossing. UP insists that all other options—including new grade separated overpass crossings—be exhausted before applying for a new grade crossing.

At this time, other options/projects have yet to be exhausted (e.g., accessing Breslauer Way from Wyndham Lane and Eastside Road). Therefore, from the perspective of UP and other federal transportation agencies, the new at-grade crossing at Buenaventura Boulevard currently is infeasible, as it is not the preferred project to promote safety. As the project currently is infeasible, corridor performance improvements (i.e., in Segment 5, where the two crossings are located) were not assessed.

This TM recommends the completion of a corridor wide crossing closure study, where the full range of grade crossing options/projects can be explored, including new grade separated overpass crossings and the use of roads leading to existing grade separated crossings, other grade crossings, and access from other directions, as well as the Breslauer Way grade crossing closure. For any viable proposed new at-grade crossings, existing crossing closures (using the most recent UP ratio) should be identified. As noted in the Manual, UP may participate in funding for crossing closures and consolidation. Additionally, there exists the opportunity to pursue grant funds from federal transportation agencies for more costly projects, such as grade separated overpass crossings.

Appendix G.

Induced Bicycling Demand and Bicycle Mode Shift Benefits

Induced Bicycling Demand and Bicycle Mode Shift Benefits

Methodology

Based on research cited in the National Cooperative Highway Research Program (NCHRP) Report 552, Guidelines for Analysis of Investment in Bicycle Facilities, bicycle facilities proposed in the Plan may result in induced bicycling demand for new facilities among both existing and new bicyclists. The NCHRP 552 methodology describes an approach for estimating the induced demand associated with a given bicycle facility and translates the demand to the monetized benefit categories described below.

- **Mobility Benefits** represent the time cost associated with a shift to a new bicycle facility based on the time bicycle commuters are willing to spend to access an improved facility.
- **Health Benefits** represent the annual per-capita health cost savings from physical activity benefits associated with a new bicycle facility.
- **Recreation Benefits** represent the time cost that new bicyclists induced by a new bicycle facility are willing to spend on a typical recreation day.
- **Decreased Auto Use Benefits** represent the user cost savings associated with reduced congestion and air pollution.

This analysis quantifies the induced bicycling demand expected to be associated with the proposed improvements and monetizes the annualized mobility, health, recreation and decreased auto use benefits provided by the projected induced bicycling demand at high, moderate, and low estimates based on Census population and commuter pattern data and average bicycling trip length estimates from Fall 2022 Replica data. The methodology is based on several assumptions:

- Existing bicyclists near a new facility will shift from the existing nearby facility to the new facility.
- The new facility will result in an induced number of bicyclists as a function of the number of existing bicyclists, relative to the attractiveness of the proposed facility (i.e., Class I shared-use path vs. Class II bicycle lanes).
- People are more likely to ride a bicycle if they live within 1.5 miles of a facility than if they live outside that distance.

The NCHRP 552 methodology suggests that existing bicycle commute mode share can be utilized to estimate the number of existing and future bicycle ridership based on low, moderate, and high likelihood multipliers and the population within 1.5-mile, 1-mile, and 0.5-mile buffers that surround a given bicycle facility. According to the NCHRP 522 research, the total rate of adult bicycling ranges from a low estimate, based on the Census bicycling commute mode share, to a high estimate, based on 0.6 percent plus three times the Census commute share.[1]

Moreover, the highest likelihood of a member of the population using the facility exists if they live within a 0.5-mile buffer around the facility. Thus, demand is calculated at low, medium, and high estimates for the populations at each buffer distance. Each buffer area—at 0.5-, 1- and 1.5-mile distances from a proposed bicycle improvement is created using a network-based analysis in a GIS environment.

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1 U.S. Census Bicycle Commute Mode Share Estimates, American Community Survey (ACS) 2021 5-Year Estimates, Table S0801 Commuting Characteristics by Sex

Induced Bicycling Demand

Based on the medium estimate likelihood multiplier, it is estimated that new bicycling trips induced by bicycle improvements along the corridor could include more than 15,000 commute trips, over 250,000 adult non-commute trips and almost 90,000 trips by children annually.

Vehicle Miles Traveled Reduction

It is estimated that the bicycle improvements along the corridor could result in a daily Vehicle Miles Traveled (VMT) reduction of nearly 1,000 VMT. This could translate to over 230,000 VMT annually.

Estimated Bicycle Benefits

The following sections provide an overview of the benefits provided from the bicycle improvements of each alternative, as detailed in Table 1 through Table 5 below.

Mobility Benefits

The recommended facilities would provide an annual mobility benefit of $1 million.

Health Benefits

The recommended facilities would provide health benefits annually at the moderate estimate of $140,000.

Recreation Benefits

The recommended facilities would provide nearly $1.3 million in recreation benefits annually in the moderate case.

Decreased Auto Use Benefits

The recommended facilities would provide an annual reduced auto use benefit of about $2,300.

Total Bicycling Benefits

A moderate estimate of total benefits from the recommended facilities is $3.1 million.

Table 1 Induced Bicycling Demand Mobility Benefits

Segment Location Recommended Facility	Segment 1 - 190 Class 1 Path	Segment 2 - 191 Class 1 Path	Segment 2 - 183 Class IV Bikeway	Segment 2 - 184 Class 1 Path	Segment 3 - 189 Class 1 Path	Segment 3 - 185 Class 1 Path	Segment 4 - 188 Class IV Bikeway	Segment 4 - 193 Class I Path	Segment 5 - 187 Class I Path	Segment 6 - 192 Class I Path	Segment 7 - 196 Class I Path	Segment 8 - 197 Class I Path	Segment 9 - 194 Class I Path	Segment 10 - 186 Class I Path	Total Corridor
Mobility Benefits															
Existing Bike Commuters	24	17	24	22	23	41	31	19	29	16	10	5	19	25	202
New Bike Commuters	5	6	8	6	5	5	7	5	7	3	2	1	3	4	46
Value of Time (V) [1]															$ 16.20
# Minutes Commuter Willing to Spend to Access Facility (Separated Facility) [2]															20.38
# Minutes Commuter Willing to Spend to Access Facility (On Street, no parking Facility) [2]															18.02
Weeks per Year [3]															48
Days per Week [4]															5
Trips per Day [5]															2
Per Trip Benefit (Separated Facility) [6]															$ 5.50
Per Trip Benefit (On Street, no parking Facility) [6]															$ 4.87
Annual Mobility Benefit	**$ 76,918**	**$ 61,772**	**$ 85,673**	**$ 71,946**	**$ 73,185**	**$ 121,759**	**$ 99,607**	**$ 61,855**	**$ 94,811**	**$ 50,567**	**$ 32,306**	**$ 16,586**	**$ 59,295**	**$ 75,890**	**$ 982,169**
20-Year Mobility Benefit	**$ 1,144,348**	**$ 919,010**	**$ 1,274,591**	**$ 1,070,373**	**$ 1,088,806**	**$ 1,811,468**	**$ 1,481,899**	**$ 920,240**	**$ 1,410,553**	**$ 752,303**	**$ 480,629**	**$ 246,762**	**$ 882,167**	**$ 1,129,047**	**$ 14,612,197**

Source:
1. Value of travel time (VOT), Caltrans Cal B/C Parameter Guide, Version 8.1, March 2022.
2. NCHRP 552, Chapter 4; Appendix D., Translating Demand and Benefits Research into Guidelines White Paper.
3. Assumes 48 working weeks per year to accommodate vacation, sick time,etc. and to be conservative in estimate.
4. Assumes value of time (V) of $16.20 per hour, 20.38 (M) as the time a bicyclist is willing to spend to access a separated facility and 18.02 (M) as the time a bicyclist is willing to spend to access an on-street bike lane with no parking. Per trip benefit is calculated by using this equation M * V/60. V is divided by 60 because the M is in minutes and V is in hours; dividing V by 60 converts it to minutes so that the result can easily be multiplied by the minutes.
5. Annual Mobility Benefit is calculated using the following equation: Annual mobility benefit = M * V/60 * (existing commuters + new commuters) * 48 * 5 * 2

Table 2 Induced Bicycling Demand Health Benefits

Segment Location	Segment 1 - 190	Segment 2 - 191	Segment 2 - 183	Segment 2 - 184	Segment 3 - 189	Segment 3 - 185	Segment 4 - 188	Segment 4 - 193	Segment 5 - 187	Segment 6 - 192	Segment 7 - 196	Segment 8 - 197	Segment 9 - 194	Segment 10 - 186	Total Corridor
Recommended Facility	**Class 1 Path**	**Class 1 Path**	**Class IV Bikeway**	**Class 1 Path**	**Class 1 Path**	**Class 1 Path**	**Class IV Bikeway**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	
Health Benefits															
Total New Cyclists, High	140	102	151	139	150	266	198	117	181	99	61	31	122	157	1263
Total New Cyclists, Moderate	78	57	85	79	86	151	113	66	103	56	35	18	69	89	714
Total New Cyclists, Low	57	41	63	58	63	112	83	49	76	41	25	13	51	66	526
Annual per capita cost Savings from Physical Activity [1]															$ 128.00
Annual Health Benefit, High	**$ 17,935**	**$ 13,048**	**$ 19,275**	**$ 17,760**	**$ 19,263**	**$ 33,999**	**$ 25,383**	**$ 15,030**	**$ 23,215**	**$ 12,694**	**$ 7,845**	**$ 4,029**	**$ 15,599**	**$ 20,062**	**$ 245,138**
Annual Health Benefit, Moderate	**$ 9,962**	**$ 7,271**	**$ 10,875**	**$ 10,080**	**$ 10,959**	**$ 19,343**	**$ 14,400**	**$ 8,502**	**$ 13,142**	**$ 7,169**	**$ 4,424**	**$ 2,280**	**$ 8,844**	**$ 11,380**	**$ 138,632**
Annual Health Benefit, Low	**$ 7,240**	**$ 5,298**	**$ 8,007**	**$ 7,457**	**$ 8,123**	**$ 14,339**	**$ 10,650**	**$ 6,273**	**$ 9,702**	**$ 5,282**	**$ 3,255**	**$ 1,683**	**$ 6,538**	**$ 8,416**	**$ 102,264**
20-Year Health Benefit, High	**$ 266,833**	**$ 194,126**	**$ 286,760**	**$ 264,223**	**$ 286,583**	**$ 505,823**	**$ 377,634**	**$ 223,613**	**$ 345,387**	**$ 188,849**	**$ 116,711**	**$ 59,942**	**$ 232,076**	**$ 298,476**	**$ 3,647,035**
20-Year Health Benefit, Moderate	**$ 148,216**	**$ 108,175**	**$ 161,793**	**$ 149,961**	**$ 163,041**	**$ 287,780**	**$ 214,239**	**$ 126,492**	**$ 195,522**	**$ 106,655**	**$ 65,812**	**$ 33,921**	**$ 131,580**	**$ 169,308**	**$ 2,062,494**
20-Year Health Benefit, Low	**$ 107,713**	**$ 78,825**	**$ 119,121**	**$ 110,945**	**$ 120,857**	**$ 213,326**	**$ 158,445**	**$ 93,328**	**$ 144,348**	**$ 78,589**	**$ 48,432**	**$ 25,036**	**$ 97,264**	**$ 125,202**	**$ 1,521,432**

Source:
1. NCHRP 552, Appendix E.

Table 3 Induced Bicycling Demand Recreation Benefits

Segment Location	Segment 1 - 190	Segment 2 - 191	Segment 2 - 183	Segment 2 - 184	Segment 3 - 189	Segment 3 - 185	Segment 4 - 188	Segment 4 - 193	Segment 5 - 187	Segment 6 - 192	Segment 7 - 196	Segment 8 - 197	Segment 9 - 194	Segment 10 - 186	Total Corridor
Recommended Facility	**Class 1 Path**	**Class 1 Path**	**Class IV Bikeway**	**Class 1 Path**	**Class 1 Path**	**Class 1 Path**	**Class IV Bikeway**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	
Recreation Benefits															
Total New Adult Cyclists, High	114	83	120	110	119	209	157	93	144	79	49	25	97	124	1005
Total New Adult Cyclists, Moderate	52	37	54	50	54	95	71	42	65	36	22	11	44	56	455
Total New Adult Cyclists, Low	30	22	32	29	32	56	42	25	38	21	13	7	26	33	268
Total New Commuter Cyclists	12	9	12	11	12	21	16	10	15	8	5	3	10	13	103
Total New Recreation Cyclists, High	101	70	108	97	106	197	145	81	132	67	36	13	84	112	905
Total New Recreation Cyclists, Moderate	39	25	42	37	41	83	59	30	53	23	10	-1	31	44	356
Total New Recreation Cyclists, Low	18	10	20	17	19	43	29	12	26	9	1	-6	13	21	168
Value of Typical Day of Recreation Time [1]															$ 10.00
Days Per Year [2]															365
Annual Recreation Benefit, High	**$ 370,461**	**$ 255,932**	**$ 392,727**	**$ 355,193**	**$ 387,728**	**$ 719,065**	**$ 527,462**	**$ 295,095**	**$ 480,023**	**$ 242,757**	**$ 133,032**	**$ 45,804**	**$ 306,927**	**$ 407,455**	**$ 3,303,663**
Annual Recreation Benefit, Moderate	**$ 143,109**	**$ 91,189**	**$ 153,203**	**$ 136,187**	**$ 150,936**	**$ 301,143**	**$ 214,283**	**$ 108,943**	**$ 192,777**	**$ 85,216**	**$ 35,474**	**$ (4,069)**	**$ 114,307**	**$ 159,879**	**$ 1,298,992**
Annual Recreation Benefit, Low	**$ 65,476**	**$ 34,935**	**$ 71,414**	**$ 61,405**	**$ 70,081**	**$ 158,437**	**$ 107,343**	**$ 45,379**	**$ 94,693**	**$ 31,422**	**$ 2,162**	**$ (21,099)**	**$ 48,534**	**$ 75,341**	**$ 614,470**
20-Year Recreation Benefit, High	**$ 5,511,527**	**$ 3,807,619**	**$ 5,842,784**	**$ 5,284,374**	**$ 5,768,408**	**$ 10,697,877**	**$ 7,847,308**	**$ 4,390,262**	**$ 7,141,531**	**$ 3,611,613**	**$ 1,979,176**	**$ 681,451**	**$ 4,566,294**	**$ 6,061,899**	**$ 49,150,160**
20-Year Recreation Benefit, Moderate	**$ 2,129,098**	**$ 1,356,660**	**$ 2,279,268**	**$ 2,026,122**	**$ 2,245,551**	**$ 4,480,243**	**$ 3,187,985**	**$ 1,620,791**	**$ 2,868,033**	**$ 1,267,803**	**$ 527,766**	**$ (60,536)**	**$ 1,700,592**	**$ 2,378,600**	**$ 19,325,718**
20-Year Recreation Benefit, Low	**$ 974,122**	**$ 519,747**	**$ 1,062,457**	**$ 913,548**	**$ 1,042,624**	**$ 2,357,149**	**$ 1,596,997**	**$ 675,118**	**$ 1,408,790**	**$ 467,478**	**$ 32,162**	**$ (313,898)**	**$ 722,060**	**$ 1,120,888**	**$ 9,141,762**

Source:
1,2. NCHRP 552, Appendix G.

Table 4 Induced Bicycling Demand Reduced Auto Use Benefits

Segment Location	Segment 1 - 190	Segment 2 - 191	Segment 2 - 183	Segment 2 - 184	Segment 3 - 189	Segment 3 - 185	Segment 4 - 188	Segment 4 - 193	Segment 5 - 187	Segment 6 - 192	Segment 7 - 196	Segment 8 - 197	Segment 9 - 194	Segment 10 - 186	Total Corridor
Recommended Facility	**Class 1 Path**	**Class 1 Path**	**Class IV Bikeway**	**Class 1 Path**	**Class 1 Path**	**Class 1 Path**	**Class IV Bikeway**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	**Class I Path**	
Reduced Auto Use Benefits															
Total New Bicyclist Commuters	12	9	12	11	12	21	16	10	15	8	5	3	10	13	103
Average Round Trip Length [1]															6.2
Congestion savings per mile in urban areas															$ 0.13
Congestion savings per mile in suburban areas [2]															$ 0.08
Congestion savings per mile in small towns and rural areas															$ 0.01
Weeks per Year [3]															48
Days per Week															5
Annual Reduced Auto Use Benefit	**$ 185**	**$ 133**	**$ 184**	**$ 164**	**$ 176**	**$ 310**	**$ 235**	**$ 142**	**$ 218**	**$ 121**	**$ 75**	**$ 38**	**$ 145**	**$ 186**	**$ 2,313**
20-Year Reduced Auto Use Benefit	**$ 2,755**	**$ 1,974**	**$ 2,739**	**$ 2,445**	**$ 2,618**	**$ 4,619**	**$ 3,503**	**$ 2,107**	**$ 3,241**	**$ 1,794**	**$ 1,118**	**$ 563**	**$ 2,160**	**$ 2,770**	**$ 34,407**
Daily VMT Reduction	**77**	**55**	**77**	**68**	**73**	**129**	**98**	**59**	**91**	**50**	**31**	**16**	**60**	**78**	**964**
Annual VMT Reduction	**18,519**	**13,268**	**18,409**	**16,436**	**17,594**	**31,049**	**23,544**	**14,160**	**21,785**	**12,061**	**7,515**	**3,787**	**14,517**	**18,622**	**231,266**

Source:
1. Replica 2023 average trip length for one-way bicycling trips starting or ending along the corridor is 3.1 miles.
2. We assume small town and rural area for congestion savings, due to the unincorporated nature of the corridor.
3. Assumes 48 working weeks per year to accommodate vacation, sick time,etc.

Table 5 Total Induced Bicycling Demand Benefits

Segment Location	Segment 1 - 190	Segment 2 - 191	Segment 2 - 183	Segment 2 - 184	Segment 3 - 189	Segment 3 - 185	Segment 4 - 188	Segment 4 - 193	Segment 5 - 187	Segment 6 - 192	Segment 7 - 196	Segment 8 - 197	Segment 9 - 194	Segment 10 - 186	Total Corridor
Recommended Facility	Class 1 Path	Class 1 Path	Class IV Bikeway	Class 1 Path	Class 1 Path	Class 1 Path	Class IV Bikeway	Class I Path	Class I Path	Class I Path	Class I Path	Class I Path	Class I Path	Class I Path	
Total Benefits, High Estimate	$ 465,500	$ 346,084	$ 489,105	$ 450,056	$ 484,094	$ 830,168	$ 629,949	$ 387,228	$ 580,342	$ 332,554	$ 217,980	$ 126,937	$ 399,629	$ 504,620	$ 6,244,246
Total Benefits, Moderate Estimate	$ 230,175	$ 175,563	$ 241,181	$ 223,370	$ 238,999	$ 397,589	$ 305,786	$ 194,548	$ 283,022	$ 169,489	$ 117,001	$ 75,314	$ 200,254	$ 248,363	$ 3,100,655
Total Benefits, Low Estimate	$ 149,820	$ 117,337	$ 156,524	$ 145,965	$ 155,308	$ 249,880	$ 195,097	$ 128,755	$ 181,499	$ 113,808	$ 82,521	$ 57,687	$ 132,175	$160,860	$ 2,027,234
20-Year Total Benefits, High Estimate	$ 6,925,464	$ 5,148,849	$ 7,276,647	$ 6,695,701	$ 7,202,095	$ 12,350,804	$ 9,372,046	$ 5,760,979	$ 8,634,022	$ 4,947,565	$ 3,242,991	$ 1,888,497	$ 5,945,473	$ 7,507,478	$ 92,898,610
20-Year Total Benefits, Moderate Estimate	$ 3,424,418	$ 2,611,938	$ 3,588,164	$ 3,323,186	$ 3,555,696	$ 5,915,127	$ 4,549,328	$ 2,894,387	$ 4,210,658	$ 2,521,562	$ 1,740,682	$ 1,120,489	$ 2,979,276	$ 3,695,012	$ 46,129,921
20-Year Total Benefits, Low Estimate	$ 2,228,939	$ 1,745,676	$ 2,328,682	$ 2,171,596	$ 2,310,584	$ 3,717,579	$ 2,902,546	$ 1,915,550	$ 2,700,242	$ 1,693,171	$ 1,227,698	$ 858,242	$ 1,966,428	$ 2,393,194	$ 30,160,124

Appendix H.

Planning Level Costs Estimates

Project Type / Description		Construction Cost Estimate	Estimated Total Cost (Capital and Support)
Class I - General	Per Foot	$ 1,000.00	$ 1,300.00
Class I - Caterpillar to Northpoint	Length	$ 6,500,000.00	$ 8,450,000.00
Class I - Lake to Benton	Length	$ 6,000,000.00	$ 7,800,000.00
Class IV - Downtown	Length	$ 15,000,000.00	$ 19,500,000.00
Class I - Buenaventura to S. Bonnyview	Length	$ 9,500,000.00	$ 12,350,000.00
Class I - S. Bonnyview to Girvan	Length	$ 5,900,000.00	$ 7,670,000.00
Class I - Girvan to Happy Valley	Length	$ 5,880,000.00	$ 7,600,000.00
Class I - Happy Valley to Latona	Length	$ 7,400,000.00	$ 9,620,000.00
Class I - Latona to Briggs	Length	$ 14,700,000.00	$ 19,110,000.00
Class I - Briggs to Pleasant Hills	Length	$ 9,000,000.00	$ 11,700,000.00
Pedestrian Fencing	Per Mile	$ 150,000.00	$ 195,000.00
Pedestrian Crossings (Curb Ramps, Crosswalk, Signal Mods)	Per Location	$ 80,000.00	$ 104,000.00
Pedestrian Signal Modifications (Push Buttons + LPI)	Per Location	$ 40,000.00	$ 52,000.00
Roadway Lighting - Caterpillar to Quartz Hill	Length	$ 12,800,000.00	$ 16,640,000.00
Roadway Lighting - Buenaventura to South	Length	$ 10,000,000.00	$ 13,000,000.00
Roadway Lighting - General	Per Foot	$ 500.00	$ 650.00
Intersection Lighting	Per Location	$ 150,000.00	$ 195,000.00
Variable Speed Warning Signs (x2)	Per Location	$ 40,000.00	$ 52,000.00
Flashing Beacons (x2)	Per Location	$ 40,000.00	$ 52,000.00
Rumble Strips: SR 273	Per Mile	$ 15,000.00	$ 19,500.00
Directional Median Openings (Does Not Include New Signalization)	Per Location	$ 100,000.00	$ 130,000.00
Traffic Signal Installation	Per Location	$ 2,000,000.00	$ 2,600,000.00
Traffic Signal Timing	Per Location	$ 10,000.00	$ 13,000.00
Hybrid Roundabout	Per Location	$ 12,000,000.00	$ 15,600,000.00
Single-Lane Roundabout	Per Location	$ 8,000,000.00	$ 10,400,000.00
Transit Amenities / New Transit Stop	Per Location	$ 40,000.00	$ 52,000.00
Roadway Reconfiguration (Road Diet)	Per Foot	$ 1,200.00	$ 1,560.00