Preliminary Traffic Analysis of Shoreline Development

Shoreline Development CAC
February 17, 2010
Reh-Lin Chen
Engineering and Transportation Department

WALNUT DR
NEPTUNE DR
MARINA BLVD
WEST AVENUE 133RD
WEST AVENUE 134TH
WEST AVENUE 135TH
WEST AVENUE 136TH
DOOLITTLE DR
AURORA DR
FAIRWAY DR
JIBIRD
SAUSALITO RD
JAMAICA WAY
TAHITI RD
SAMOA RD
TORTUGA RD
FIJI WAY
SANTIAGO RD
MULFORD POINT DR
PESCADOR POINT DR
MONARCH BAY DR
BLUE WHALE ST
OUTRIGGER DR
SEAGATE DR
BERMUDA AVE
ACAPULCO RD
NASSAU RD
TRINIDAD RD
FLAGSHIP ST
BELVEDERE AVE
N
0 250 500 750 1,000 Feet
Development Opportunity Site

Traffic Impact Analysis

- Four-step Transportation Planning Analysis
  - Trip Generation
  - Trip Distribution
  - Mode Choice
  - Trip Assignment
- Roadway System Impact Analysis
  - Roadway Handling Capacities
  - Intersection Capacities and Operations
  - Mitigation Measures

Trip Generation – Phase 3 (2017)

Trip Generation Estimates for Shoreline Development (Phase 3)

						AM Peak Hour				PM Peak Hour				Saturday Peak Hour				Sunday Peak Hour			
Land Use	ITE Code	Size		Daily Rate	Daily Trips	Peak Hour Rate	In	Out	Total	Peak Hour Rate	In	Out	Total	Peak Hour Rate	In	Out	Total	Peak Hour Rate	In	Out	Total
Horatio's																					
Restaurant	931	10.0	ksf	89.95	900	0.81	4	4	8	7.49	50	25	75	10.82	64	44	108	8.38	42	42	84
Marina Inn																					
Hotel	310	131.0	rooms	8.17	1,070	0.56	45	28	73	0.59	41	36	77	0.72	53	41	94	0.56	34	39	73
Marina																					
Marina	420	137.0	berths	2.96	406	0.08	4	7	11	0.19	16	10	26	0.27	16	21	37	0.27	16	21	37
Marina																					
Park	412 415	30.0	acres	4.57	137	0.48	8	6	14	1.3	11	28	39	1.18	16	19	35	1.54	23	23	46
Golf Course																					
Golf Course	430	193.0	acres	5.04	973	0.21	30	11	41	0.3	20	38	58	0.64	64	60	124	0.58	58	54	112
Building 1																					
Office	710	96.9	ksf	11.01	1,067	1.55	132	18	150	1.49	24	120	144	0.41	22	18	40	0.14	8	6	14
Building 2																					
Office	710	96.9	ksf	11.01	1,067	1.55	132	18	150	1.49	24	120	144	0.41	22	18	40	0.14	8	6	14
Building 3																					
Office	710	96.9	ksf	11.01	1,067	1.55	132	18	150	1.49	24	120	144	0.41	22	18	40	0.14	8	6	14
Building 4																					
Office	710	30.6	ksf	11.01	337	1.55	41	6	47	1.49	8	38	46	0.41	7	6	13	0.14	2	2	4
Building 5																					
Restaurant	931	8.5	ksf	89.95	765	0.81	4	4	7	7.49	43	21	64	10.82	54	38	92	8.38	36	36	71
Building 6																					
Restaurant	931	6.8	ksf	89.95	612	0.81	3	3	6	7.49	34	17	51	10.82	44	30	74	8.38	29	29	57
Building 7																					
Cultural Center	495	6.8	ksf	22.88	156	1.62	7	4	11	1.45	4	6	10	1.07	4	3	7	1.48	6	4	10
Rec. Community Ctr.																					
Building 8																					
Yacht Club	495	2.9	ksf	22.88	66	1.62	3	2	5	1.45	1	3	4	1.07	2	1	3	1.48	2	2	4
Rec. Community Ctr.																					
Building 9																					
Hotel	310	175.0	rooms	8.17	1,430	0.56	60	38	98	0.59	55	48	103	0.72	71	55	126	0.56	45	53	98
Banquet Area	N/A	12.7	ksf	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Residential																					
Townhouses	230	68.0	units	5.81	395	0.44	5	25	30	0.52	23	12	35	0.47	17	15	32	0.45	15	16	31
Flats	220	96.0	units	6.65	638	0.51	10	39	49	0.62	39	21	60	0.52	27	24	50	0.51	26	23	49
Total Trips					11,086		620	231	850		417	663	1,080		505	411	915		358	362	718
Reduced 15% because of Mixed Uses					9,423		527	196	723		354	564	918		429	349	778		304	308	610

Incremental Phasing Trip Generation Summaries

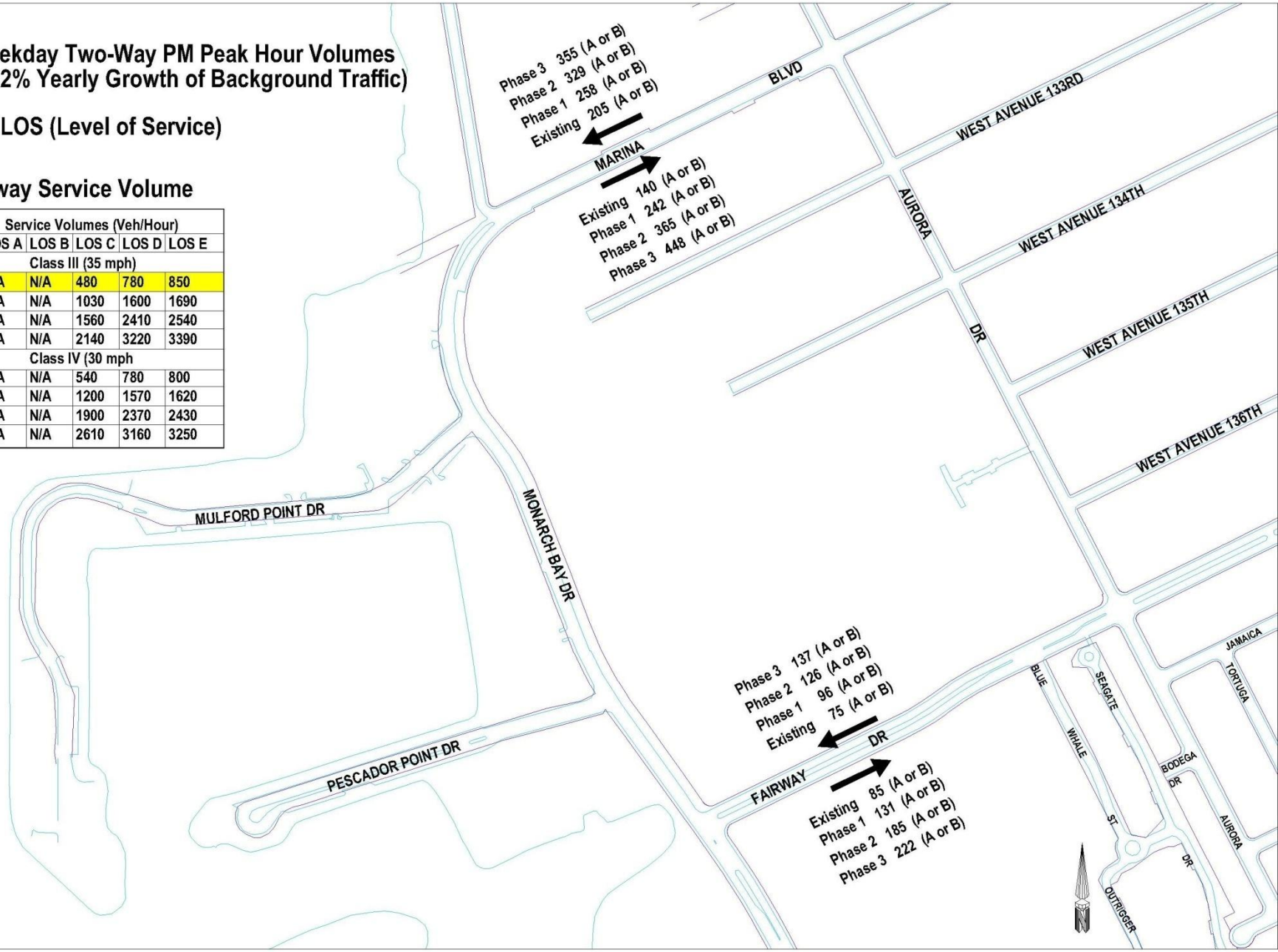
Trips Increased from Existing 2009															
		Week Day Daily			AM Peak Hour			PM Peak Hour			Saturday Peak Hour			Sunday Peak Hour		
				Daily	WB	EB		WB	EB		WB	EB		WB	EB	
Land Use		In	Out	Trips	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Existing 2009		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Marina				0	0		0	0		0	0		0	0	
	Fairway				0	0		0	0		0	0		0	0	
Phase 1 - 2013		772	772	1,544	160	55	214	51	129	179	52	29	82	20	18	37
	Marina				112	39		36	90		36	20		14	13	
	Fairway				48	16		15	39		16	9		6	5	
Phase 2 - 2015		1,900	1,899	3,799	318	111	428	140	296	435	137	96	232	76	69	143
	Marina				223	78		98	207		96	67		53	48	
	Fairway				95	33		42	89		41	29		23	21	
Phase 3 - 2017		2,448	2,447	4,895	439	131	570	164	406	569	161	114	275	89	79	166
	Marina				307	92		115	284		113	80		62	55	
	Fairway				132	39		49	122		48	34		27	24	

← = Weekday Two-Way PM Peak Hour Volumes
(With 2% Yearly Growth of Background Traffic)

(X) = LOS (Level of Service)

Roadway Service Volume

Lane	Service Volumes (Veh/Hour)				
	LOS A	LOS B	LOS C	LOS D	LOS E
Class III (35 mph)					
1	N/A	N/A	480	780	850
2	N/A	N/A	1030	1600	1690
3	N/A	N/A	1560	2410	2540
4	N/A	N/A	2140	3220	3390
Class IV (30 mph					
1	N/A	N/A	540	780	800
2	N/A	N/A	1200	1570	1620
3	N/A	N/A	1900	2370	2430
4	N/A	N/A	2610	3160	3250

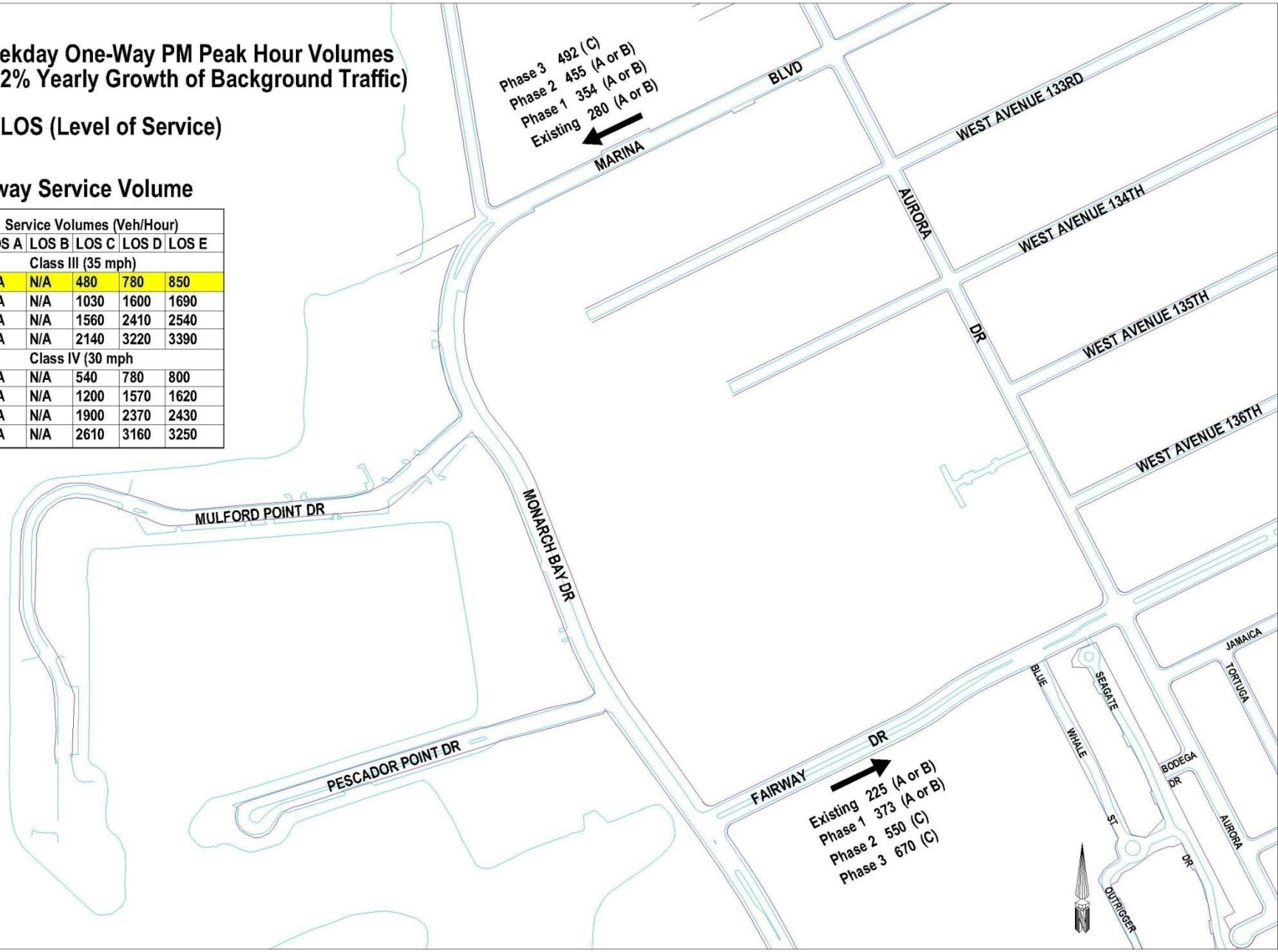


= Weekday One-Way PM Peak Hour Volumes
(With 2% Yearly Growth of Background Traffic)

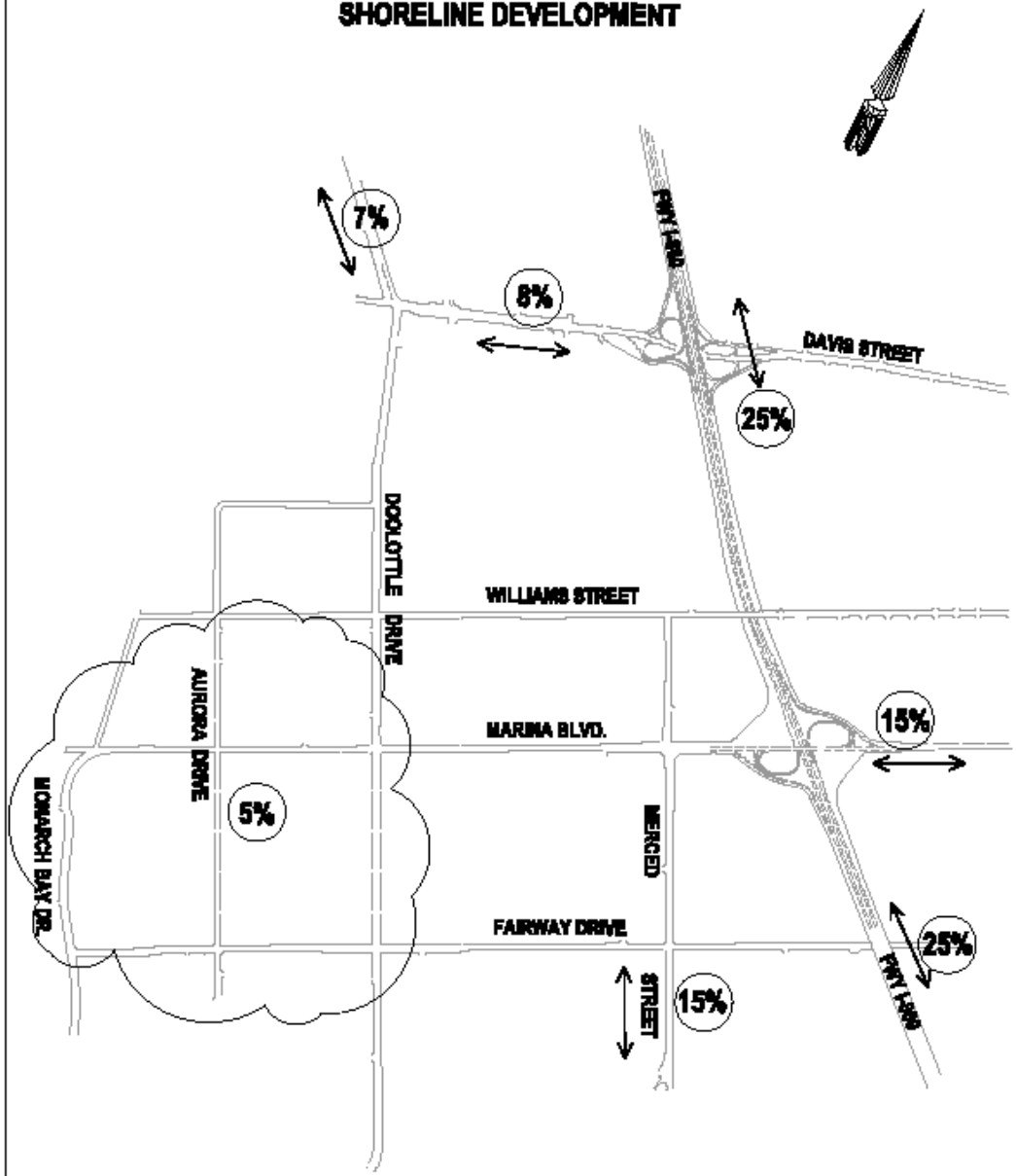
(X) = LOS (Level of Service)

Roadway Service Volume

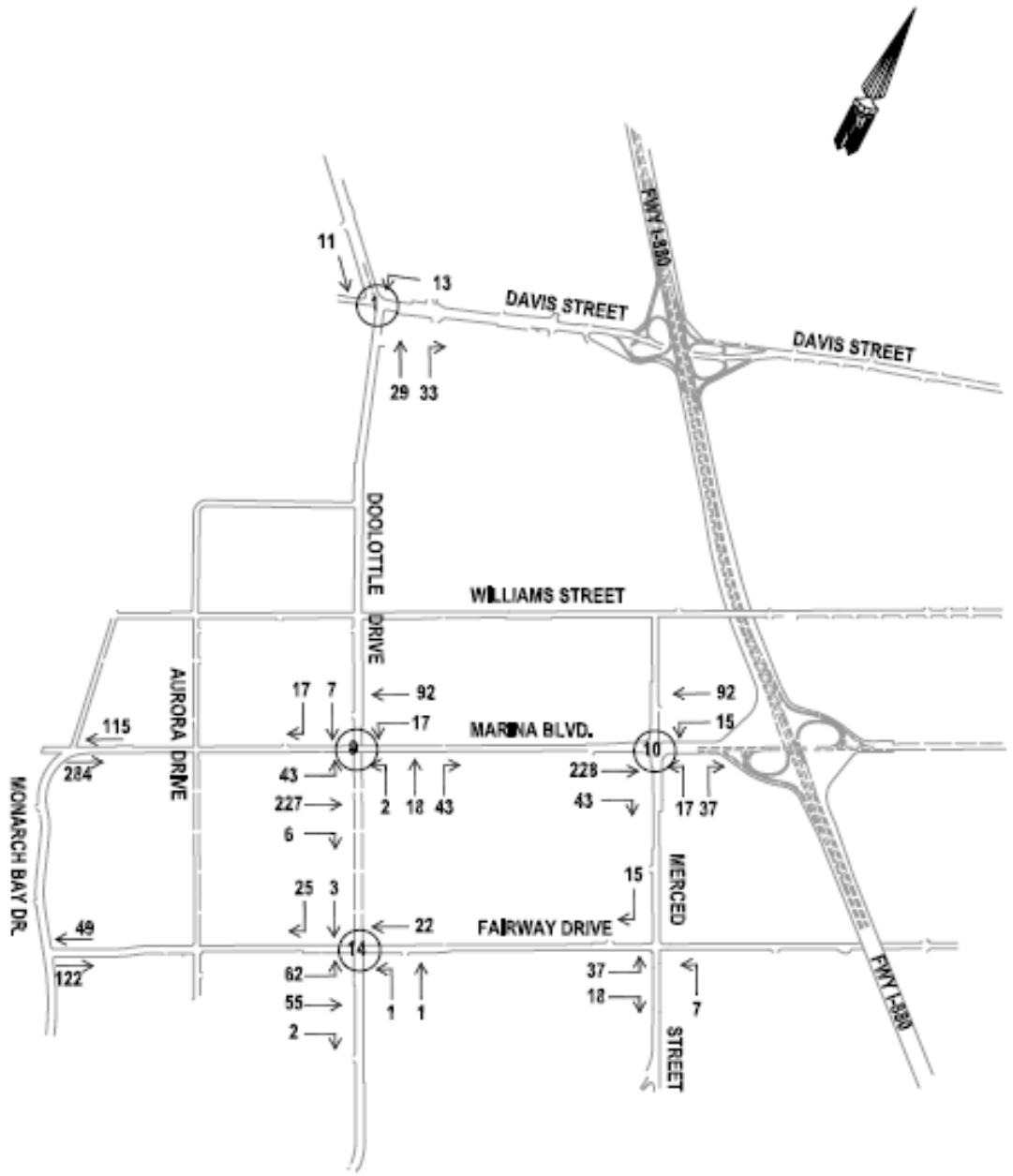
Lane	Service Volumes (Veh/Hour)				
	LOS A	LOS B	LOS C	LOS D	LOS E
Class III (35 mph)					
1	N/A	N/A	480	780	850
2	N/A	N/A	1030	1600	1690
3	N/A	N/A	1560	2410	2540
4	N/A	N/A	2140	3220	3390
Class IV (30 mph					
1	N/A	N/A	540	780	800
2	N/A	N/A	1200	1570	1620
3	N/A	N/A	1900	2370	2430
4	N/A	N/A	2610	3160	3250



TRIP DISTRIBUTION OF SHORELINE DEVELOPMENT



PHASE 3 - 2030 PM PEAK HOUR



2015 - Phase 2 plus Kaiser

- Davis/Doolittle
  - Reconfigure Westbound Davis from (Two Left-turn, One Thru and One Right-turn Lanes) to (<u>One Left-turn, One Thru and Two Right-turn Lanes</u>) [Mitigation Measure #1]
  - Shoreline Fair Share is 1.5 %

Phase 2 plus Kaiser plus Retail

- Davis/Doolittle
  - Reconfigure Westbound Davis (Mitigation Measure #1)
  - Shoreline Development Fair Share is 1.5 %

- Marina/Merced
  - Reconfigure Westbound Marina by adding One Left-turn lane to Triple Left-turn Lanes (Mitigation 2)
  - Shoreline Fair Share is 6.5%

Phase 3 Shoreline plus Kaiser plus Retail

- Davis/Doolittle
  - Reconfigure Westbound Davis (Mitigation Measure #1) plus Add One Southbound Left-turn Lane and Reduce One Thru Lane (Mitigation Measure #3)
  - Shoreline Development Fair Share is 1.5 %

- Marina/Merced
  - Reconfigure Westbound Marina (Mitigation 2) plus Add One Northbound Left-turn Lane to Two Left-turn Lanes (Mitigation Measure #4)
  - Shoreline Development Fair Share is 6.5%

Phase 3 Shoreline plus Kaiser Build-out plus Retail

- Davis/Doolittle
  - Reconfigure Westbound Davis (Mitigation Measure #1) plus Add One Southbound Left-turn Lane (Mitigation Measure #3)
  - Shoreline Development Fair Share is 1.5 %
- Doolittle/Marina
  - Add One Southbound Left-Turn Lane on Doolittle to Two Left-turn Lanes (Mitigation Measure #5)
  - Shoreline Development Fair Share is 13.5 %
- Marina/Merced
  - Reconfigure Westbound Marina (Mitigation 2) plus Add One Northbound Left-turn Lane (Mitigation Measure #4) plus Add one Northbound Through Lane (Mitigation Measure #6)
  - Shoreline Development Fair Share is 7.5%

Questions

- Reh-Lin Chen
  - rchen@ci.san-leandro.ca.us
  - 510-577-3438

Additional Traffic Fees

- A Development Fee for Street Improvement (DFSI) is imposed on all new development

- A Highway 880/Marina Boulevard Interchange Improvement Fee to pay fair share of specific improvements

Calculation of Traffic Fees

	DFSI	I-880/Marina	Total
Phase I	627,600	317,750	945,350
Phase II	656,350	227,150	883,500
Phase III	387,800	145,450	533,250
	Cumulative Total		$2,362,100

Roadway Capacities

Two-Way Traffic Volumes & LOS (with 2% yearly growth of background traffic)

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Weekday AM	Marina	WB	80	A or B	199	A or B	313	A or B	401	A or B
Weekday AM	Marina	EB	70	A or B	115	A or B	157	A or B	174	A or B
Weekday AM	Fairway	WB	60	A or B	113	A or B	163	A or B	202	A or B
Weekday AM	Fairway	EB	50	A or B	70	A or B	89	A or B	98	A or B

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Weekday PM	Marina	WB	205	A or B	258	A or B	329	A or B	355	A or B
Weekday PM	Marina	EB	140	A or B	242	A or B	365	A or B	448	A or B
Weekday PM	Fairway	WB	75	A or B	96	A or B	126	A or B	137	A or B
Weekday PM	Fairway	EB	85	A or B	131	A or B	185	A or B	222	A or B

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Saturday Peak	Marina	WB	280	A or B	339	A or B	411	A or B	441	A or B
Saturday Peak	Marina	EB	360	A or B	410	A or B	472	A or B	502	C
Saturday Peak	Fairway	WB	100	A or B	124	A or B	154	A or B	165	A or B
Saturday Peak	Fairway	EB	250	A or B	280	A or B	311	A or B	327	A or B

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Sunday Peak	Marina	WB	375	A or B	420	A or B	475	A or B	501	C
Sunday Peak	Marina	EB	405	A or B	451	A or B	504	C	530	C
Sunday Peak	Fairway	WB	15	A or B	22	A or B	40	A or B	45	A or B
Sunday Peak	Fairway	EB	170	A or B	189	A or B	212	A or B	223	A or B

Roadway Capacities

One-Way Traffic Volumes & LOS (with 2% yearly growth of background traffic)

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Weekday AM	Marina	WB	140	A or B	312	A or B	476	A or B	603	C
Weekday AM	Marina	EB								
Weekday AM	Fairway	WB								
Weekday AM	Fairway	EB	120	A or B	185	A or B	246	A or B	272	A or B

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Weekday PM	Marina	WB	280	A or B	354	A or B	455	A or B	492	C
Weekday PM	Marina	EB								
Weekday PM	Fairway	WB								
Weekday PM	Fairway	EB	225	A or B	373	A or B	550	C	670	C

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Saturday Peak	Marina	WB	380	A or B	463	A or B	565	C	606	C
Saturday Peak	Marina	EB								
Saturday Peak	Fairway	WB								
Saturday Peak	Fairway	EB	610	C	690	C	783	D	829	D

			Existing		Phase 1		Phase 2		Phase 3	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Sunday Peak	Marina	WB	390	A or B	442	A or B	515	C	546	C
Sunday Peak	Marina	EB								
Sunday Peak	Fairway	WB								
Sunday Peak	Fairway	EB	575	C	640	C	716	C	753	C