MARCH 20, 2018

SANTA BARBARA COUNTY ASSOCIATION OF GOVERNMENTS GOLETA RAMP METERING STUDY

PRESENTATION TO GOLETA CITY COUNCIL



Overview

- Purpose of study
- Data and observations
- Existing conditions
- Ramp metering alternatives
- Evaluation of regional and local effects



Purpose of Study

- Explore feasibility and potential impacts of ramp meters
- On-ramps to US 101
 and SR 217
- Freeway congestion
- Ramp queues
- Local street impacts





Study Area



US 101SR 217

- Parallel city streets
- Cathedral Oaks to Turnpike



Data Collection Locations





Data Collection: Physical Features

- Freeway lanes
- Merge/diverge areas
- Ramp lanes
- Available vehicle storage





Data Collection: Traffic Counts

- Freeway radar counts
- Freeway detectors
- Every ramp (hoses)
- Street intersections (from city of Goleta)







Data Collection: Travel Times

- "Floating car" surveys
- GPS tracking
- Three different days
- Drivers leave every 15
 minutes







Data Collection: Other

- Vehicle occupancy manual counts
 SR 217 at Sandspit
- Accident records from Caltrans
- Transit routes
- Visual observations

OTM22130 03/19/2017 12:56 PM	Calif Table B -	California Department of Transportation le B - Selective Accident Rate Calculation											Page# 1 Event ID: 3902433				
Rate No. of Accidents / Significance Pers ADT Tota Group Multi Kid Main MV+							Total MV+ or		Actual	Accident Rates Average							
Location Description	(RUS)	Tot	Fat	Inj	F+I	Veh	Wet	Dark	Inj	X-St	MVM	Fat	F+I	Tot	Fat	F+I	Tot
05 SB 101 020.062 - 05 SB 101 022.803 0001-0001 2012-04-01 2015-03-31	2.742 MIH 61 36 mo. S	175	0	44	44	125	13	44	0 62	96.0	288.26	0.000	.15	.61	0.004	.21	.64
05 SB 101 022.804 - 05 SB 101 026.907 0001-0001 2012-04-01 2015-03-31	4.104 MIH 60 36 <i>то</i> . S	112	0	41	41	66	4	39	0 58	49.2	221.14	0.000	.19	.51	0.006	.15	.46



Existing Conditions: Freeway Speeds

Green	Greater than 55 mph
Yellow	45 to 55 mph
Orange	35 to 45 mph
Red	Less than 35 mph

Time	Cathedral Oaks Rd Off-ramp to Cathedral Oaks Rd On-ramp	Cathedral Qais Rd On-ramp to Storke Road Off-ramp	Storke Road Off-ramp to Storke Road On-ramp	Storke Road On-ramp to Los Carneros Road Off-ramp	Los Cameros Road Off-ramp to Los Cameros Road On-ramp	Los Carneros Road On-ramp to Fairview Ave Off-ramp	Falrview Ave Off-ramp to Fairview Ave On-ramp	Fairview Ave On-ramp to Patterson Ave Off-ramp	Patterson Ave Off-ramp to SR 217 On-ramp	SR 217 On-ramp to Patterson Ave On-ramp	Patterson Ave On-ramp to Turnpike Road Off-ram p	
Tuesday,	October 04, 2016											
16:00	64.8	66.4	65.8	66.3	65.8	65.4	68.0	67.6	65.5	64.2	61.7	
16:15	67.3	65.1	59.9	59.8	61.0	60.7	59.6	60.7	61.3	58.0	56.8	
16:30	67.5	72.4	72.6	66.7	68.4	61.2	64.6	62.0	64.4	62.7	48.0	
16:45	65.5	67.7	69.0	68.1	67.3	58.6	59.9	53.7	20.8	29.7	29.9	
17:00	66.0	65.1	66.7	66.9	63.7	59.8	58.0	54.2	15.9	15.8	26.6	
17:15	67.8	68.3	67.5	69.3	67.3	53.0	34.1	16.8	14.3	17.8	28.4	
17:30	67.1	67.9	67.0	66.2	65.0	62.4	61.4	39.7	10.8	20.9	31.2	
17:45	66.8	67.7	66.9	67.1	66.0	59.6	63.9	26.2	15.3	18.9	25.0	
18:00	66.1	67.7	64.9	65.9	62.6	60.4	62.9	62.0	59.8	38.3	36.7	
18:15	65.5	66.7	68.7	66.0	56.6	53.3	65.7	65.3	63.7	56.9	58.7	
18:30	65.6	65.8	67.6	68.3	65.4	62.4	61.2	63.4	64.5	60.3	52.5	
18:45	63.2	65.4	62.9	60.8	65.4	69.7	66.1	63.0	61.9	61.2	57.0	
Wednesd	ay, October 05, 2016											
16:00	74.5	82.4	79.5	78.8	78.4	81.4	72.4	44.2	12.5	10.3	25.4	
16:15	66.5	69.1	69.3	68.4	65.2	60.7	58.9	27.6	9.9	15.9	32.2	
16:30	70.1	70.6	67.8	61.0	61.1	57.8	60.7	62.9	17.6	17.7	28.9	
16:45	73.1	71.5	75.7	74.2	71.5	56.4	61.9	32.9	27.1	14.9	27.6	
17:00	65.9	69.3	67.3	67.4	66.7	60.9	51.4	35.8	12.3	18.9	31.0	
17:15	70.2	73.1	72.3	70.6	32.2	33.4	22.0	20.3	16.2	21.0	28.8	
17:30	68.7	76.2	73.5	73.5	69.1	63.8	59.1	23.2	16.0	18.5	33.2	
17:45	67.0	66.2	66.6	69.4	68.0	62.5	59.6	52.5	18.4	13.6	34.3	
18:00	73.8	69.3	66.9	68.9	67.6	63.8	62.7	60.7	62.6	55.7	48.1	
18:15	69.0	75.9	75.9	69.2	67.5	66.1	68.0	68.3	66.0	67.0	65.6	
18:30	66.2	71.2	69.8	66.7	63.4	61.2	59.8	61.8	61.8	64.7	65.6	
18:45	66.5	70.2	67.4	73.1	75.2	72.1	67.5	63.6	59.0	56.0	54.5	
Thursday,	October 06, 2016											
16:00	69.1	73.8	73.0	63.5	64.5	64.2	68.8	68.1	55.4	16.3	33.6	
16:15	64.7	67.8	69.0	68.5	67.7	63.6	63.2	49.4	11.5	14.6	29.3	
16:30	67.2	69.6	64.5	66.0	64.9	64.6	64.0	61.0	36.8	18.5	27.4	
16:45	75.7	78.7	83.0	80.5	77.7	72.9	70.8	27.7	10.7	17.6	27.3	
17:00	66.9	69.3	66.0	70.2	60.6	53.5	59.9	32.6	10.8	18.8	31.4	
17:15	62.5	68.4	65.7	60.3	48.9	22.1	25.2	21.9	9.9	14.4	34.0	
17:30	74.4	80.3	83.8	76.0	16.5	29.6	28.2	31.5	27.8	16.8	27.3	
17:45	67.2	70.2	70.4	69.1	21.2	25.9	46.4	25.1	9.6	18.2	31.1	
18:00	64.8	68.1	67.2	62.9	65.1	62.3	64.6	29.7	13.0	25.4	37.6	
18:15	/1.1	74.4	70.9	70.6	73.0	71.8	73.5	70.2	66.5	47.8	41.0	1
18:30	67.2	66.2	66.8	65.4	62.5	59.0	61.0	63.0	66.7	59.4	58.3	
18:45	66.5	67.6	63.7	66.7	65.4	65.2	64.5	63.6	61.9	56.6	60.8	



Existing Conditions: Freeway Congestion





Existing Conditions: Vehicle Occupancies on SR 217





Existing Conditions: Local Street Intersection Level of Service





Existing Conditions: Transit Routes

• 3 providers, several routes use on-ramps





Ramp Metering Alternatives





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Evaluation Tools

- US 101 Freeway Operations Model (FREQ)
- City of Goleta General Plan Forecast Model (Visum)





Evaluation – Base Year: Freeway Speeds



- Ramp metering would increase
 PM peak
 freeway speeds
- All ramps (Alt 3) slightly better than 2 ramps (Alt 2)



Evaluation – Base Year: Total Hours of Travel



- Delays on onramps largely cancel freeway gains
- Diversion on local streets can increase intersection delays



Evaluation – Future Year (2035): Freeway Speeds



- Significant congestion with growth and no improvements
- Beyond level where ramp metering can significantly help



Evaluation – Future Year (2035): Total Hours of Travel



- Delays on onramps with few freeway gains
- May be diversion on local streets



Evaluation: Other Considerations

- HOV bypass needed at ramp meters, at minimum where transit routes use the on-ramps
- Ramp metering may have effects on freeway operations beyond study area (beyond Turnpike)
- Ramp metering can have beneficial safety effects
- Cost-benefit analysis not included in this study
 - Goods movement on freeway may be highly valued



Conclusions

- Ramp metering could provide benefits to the US 101 freeway
- Within the limits of this study, ramp metering would not provide overall net benefits to the transportation system in the Goleta study area
- A combination of measures should be considered to reduce future congestion:
 - Metering
 - Intelligent Transportation Systems (ITS)
 - Transportation Demand Management (TDM)
 - Increased transit
 - Telecommuting & alternative work schedules



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