



**DIVISION OF TRAFFIC OPERATIONS
CALIFORNIA DEPARTMENT
OF TRANSPORTATION**



Traffic Operations Manual

Chapter 215 Ramp Metering Systems

Part 4 Ramp Metering Operations Appendices

April 2025

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Appendix 215 A Sample Forms

The following pages have the following forms:

- Proactive Surveillance and Adjustment of Existing Ramp Metering Locations.
- Ramp Metering Operations Surveillance Log.
- Check List – Proactive Trac Ticket.
- Reactive Surveillance and Adjustment of Existing Ramp Metering Locations.
- Traffic Responsive Worksheet.

Figure A-1 Proactive Surveillance and Adjustment of Existing Ramp Metering Location

Proactive Surveillance and Adjustment of Existing Ramp Metering Location					
Rte/Dir			Post Mile		Engineer
Ramp Meter Name				Date(s)	
1	Monitor ramp meter functionality through a central system in the office				
2	Review and adjust corridor ramp metering hours (am, pm, or all day for both weekdays and weekends)				
3	Inspect firmware and hardware in the field				
4	Repair or report to TMC support, Electrical maintenance and TMS support, hardware or communication problems				
5	Conduct inventory to review and update the office folder and cabinet file with the latest timing chart, reference files, and pictures from the field conditions				
6	Onramp	On Loop volume count (ATMS)			
7		Queue back-up report (ATMS)			
8		Analyze traffic data and outcome			
9	Mainline	Volume count (ATMS)			
10		Occupancy rate (ATMS)			
11		Speed plot (ATMS)			
12		Freeway delay (ATMS, if needed)			
13		Analyze traffic data and outcome			
14	Document before and after conditions				
15	Adjust ramp meter equipment such as detector settings				
16	Adjust metering parameters (rate, traffic responsive thresholds, holiday timing plans, etc.)				
17	Maintain log of ramp metering changes (including meter timing)				
18	Efforts and coordination with maintenance and other internal/external offices to restore the knock-downs and malfunctions				
19	Obtain additional data from ATMS, PEMS, or other sources				

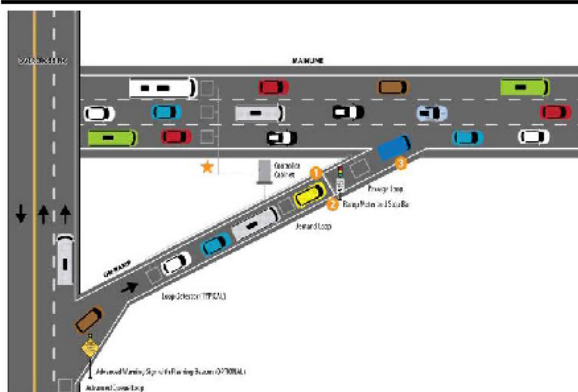
Figure A-2 Ramp Metering Operations Surveillance Log



District 6
Ramp Metering Operations Surveillance Log

COUNTY		ROUTE		RAMP	
DATE		WEATHER		REVIEWER	
Annual Review		Complaint			
Mode					

	M	Tu	W	Th	F
AM					
PM					



OBSERVATIONS and REMARKS:

ITEMS OBSERVED

L3	L2	L1	LL	RL

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DETECTION

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	ML1	ML2	ML3	ML4	ML5	ML6	ML7	ML8	NC	D1/P1	Q1	D2/P2	Q2	D3/P3
IU														
IL														
JU														
JL														

Acronyms:

X : Compliant
 NFF: No Fault Found
 NTC: No Timing Changes
 NA : Not Applicable

Limit Line OK	<input type="checkbox"/> YES	<input type="checkbox"/> NO	Striping OK	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Vegetation Interference:	<input type="checkbox"/> YES	<input type="checkbox"/> NO			

Figure A-3 Check List - Proactive Trac Ticket Form

CHECK LIST - PROACTIVE TRAC TICKET

Check by:

Date:

County	Route	Direction	Location	Post mile

CABINET

Make	Power		E #	DT#	TV#	CCTV	
	Yes	No					

CONTROLLER

Software Ver.	Configuration	Drop

STRIPING / SIGNS

Striping		Limit Line		HOV Diamonds		Hov Signs	
Yes	No	Yes	No	Yes	No	Yes	No

MODEM

Phone #	IP Address	ID	Antenna		C2 Harness		Transformer	
			Yes	No	Yes	No	Yes	No

OUTPUT FILE

Auxiliary File		# of Load Switches	# of Ped Head "Meter On"	# of EMS "Meter On"	# of EMS "Prepare to Stop"	# of W41 Flasher
Yes	No					

Left Signal Head

Upper	Yes	No
Lower	Yes	No
Enforcement	Yes	No
R89	Yes	No
R10-6	Yes	No

Right Signal Head

Upper	Yes	No
Lower	Yes	No
Enforcement	Yes	No
R89	Yes	No
R10-6	Yes	No

Mast Arm

Left	Yes	No
Center	Yes	No
Right	Yes	No
Enforcement	Yes	No
R89	Yes	No

INPUT FILE

Chanel	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1														
2														
HOV?														

RAMP GEOMETRICS

# of SOV Lane	# of HOV Lane	SOV Ramp Length	Street Storage Length	HOV Ramp Length
		Ft.	Ft.	Ft.

COMMENTS:

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Figure A-4 Reactive Surveillance and Adjustment of Existing Ramp Metering Location

Reactive Surveillance and Adjustment of Existing Ramp Metering Location				
Rte/Dir		Post Mile		Engineer
Ramp Meter Name			Date(s)	
1	Acknowledge the complaint via email and archive to maintain a record			
2	Monitor ramp meter functionality through a central system in the office			
3	Review & adjust corridor ramp metering hours (a.m., p.m., or all day for both weekdays & weekends)			
4	Inspect firmware and hardware in the field			
5	Repair or report hardware or communication problems to TMC support, electrical maintenance, and TMS support			
6	Conduct inventory to review and update the office folder and cabinet file with the latest timing chart, reference files, and pictures from the field conditions			
7	Onramp	On loop volume count (ATMS)		
8		Queue back-up report (ATMS)		
9		Analyze traffic data and outcome		
10	Mainline	Volume count (ATMS)		
11		Occupancy rate (ATMS)		
12		Speed plot (ATMS)		
13		Freeway delay (ATMS, if needed)		
14		Analyze traffic data and outcome		
15	Document before and after conditions			
16	Adjust ramp meter equipment, such as detector settings			
17	Adjust metering parameters (rate, traffic-responsive thresholds, holiday timing plans, etc.)			
18	Maintain log of ramp metering changes (including meter timing)			
19	Efforts and coordination with maintenance and other internal/external offices to restore the knock-downs and malfunctions			
20	Obtain additional data from ATMS, PEMS, or other sources			
21	Investigate inquiries/complaints, specifically for complaint duration (internal and external)			
22	Respond to inquiries (internal and external)			
23	Closeout the complaint and archive to maintain a record			

Figure A-5 Traffic-Responsive Worksheet

Traffic-Responsive Worksheet				
Rte/Dir	Post Mile	Engineer	EXAMPLE	
Ramp Meter Name	EXAMPLE	Date(s)		
1	LDS number			
2	VDS number for the metered lane(s)			
3	VDS number for the mainline lanes			
4	Number of metered lanes			
5	Number of mainline lanes			
6	Mainline design speed limit			
7	Maximum number of vehicles entering the freeway from the onramp, in VPH per lane.			
8	Maximum VPH per lane that the section of freeway can support			
9	LOS C volume for design speed limit, in VPH per lane			
10	Occupancy on mainline when LOS C is reached			
11	Time of day that the section of freeway enters LOS C from LOS B			
12	Time of day that the section of freeway leaves LOS C to LOS B			
13	Determine the metering rate for when the freeway enters LOS C, in VPH per lane			
14	LOS D volume for design speed limit, in VPH per lane			
15	Occupancy on mainline adjacent to merge point when LOS D is reached			
16	Occupancy, when the occupancy-to-volume ratio is no longer linearly proportional (break down occupancy)			
17	Calculate Critical Mainline Volume = ((mainline volume * number of mainline lanes) – (metered lane volume * number of metered lanes)) ÷ number of mainline lanes)			
Metering Rates During Peak Hours based on LOS C				
	Discharge rate/per lane		Occupancy	
Highest discharge rate				
Slowest discharge rate				
Start time		Stop time		
Metering Rates During Off-Peak Hours based on LOS D				
	Discharge rate/per lane		Occupancy	
Highest discharge rate				
Slowest discharge rate				
Start time		Stop time		