

**Transportation Authority of Marin  
Board Meeting October 23, 2014**

**Ramp Metering  
Background and Informational  
Presentation**



## Overview of Presentation

- Existing Traffic Congestion on Highway 101
  - ✓ Southbound AM
  - ✓ Northbound PM
- Background information about the Freeway Performance Initiative including ramp metering
- Case Study
- Ramp Metering in Marin – Phase 1 Scope & Schedule
- Outreach Efforts

# Highway 101 Marin County Traffic – AM Commute Congestion



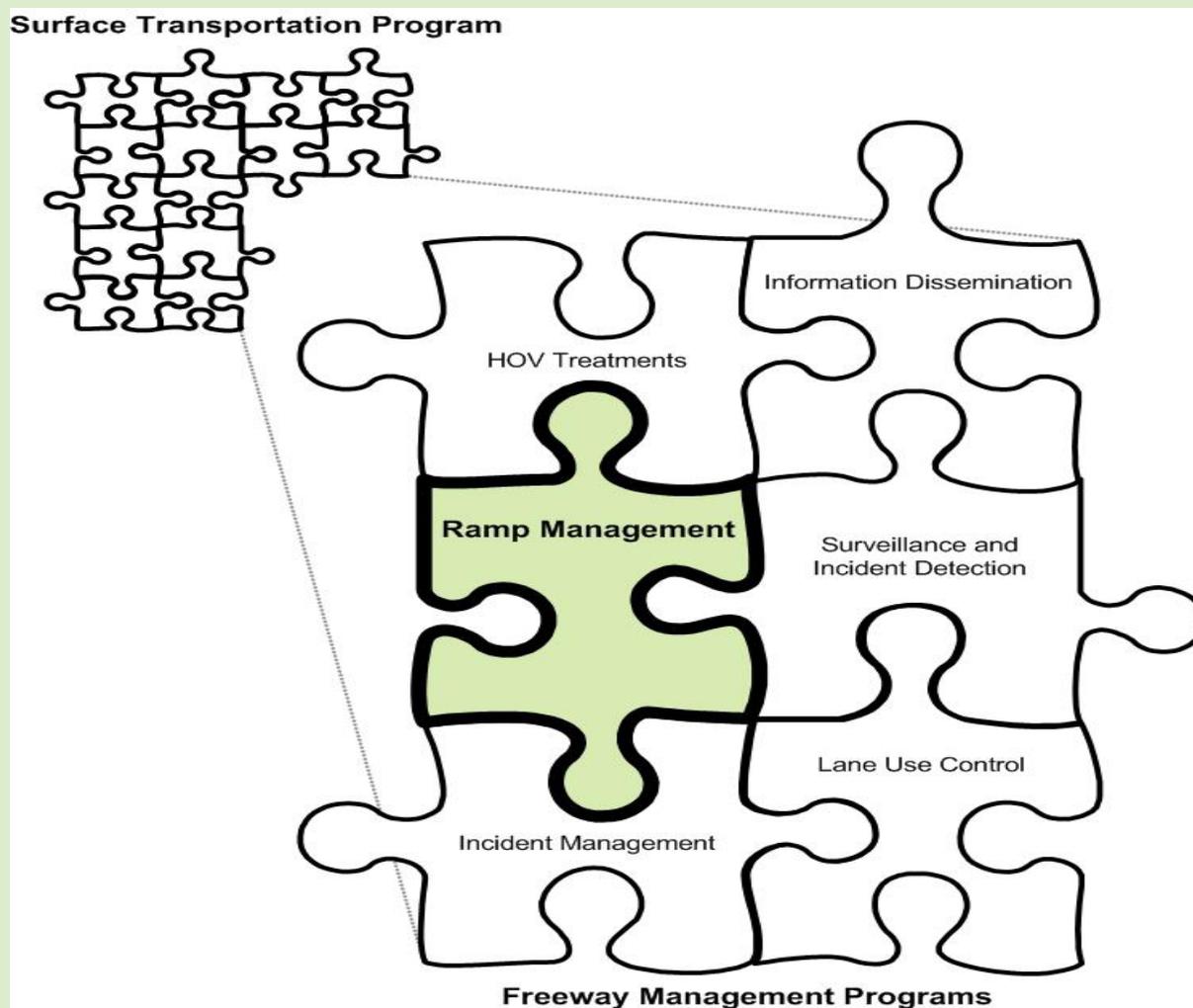
# Highway 101 Marin County Traffic – PM Commute Cogestion



## Philosophy to Improve Mobility has Shifted

*“Our efforts to satisfy public demand for improved travel have shifted from a philosophy of providing additional capacity to one of improving the operations of our existing transportation infrastructure”*

# Metering is Only One Piece of the Puzzle to Manage Congestion



# Traffic Operation Systems (TOS)

TOS elements, such as traffic monitoring stations, closed circuit television cameras (CCTV), and changeable message signs (CMS) are used to improve mobility.

- Traffic Monitoring Stations – Used to monitor traffic flow and detect incidents.
- CCTV– Used to identify/verify incidents & aid in response activities.
- CMS – Are used to provide critical real-time traffic advisories to the motorist.



## Ramp Metering Goals

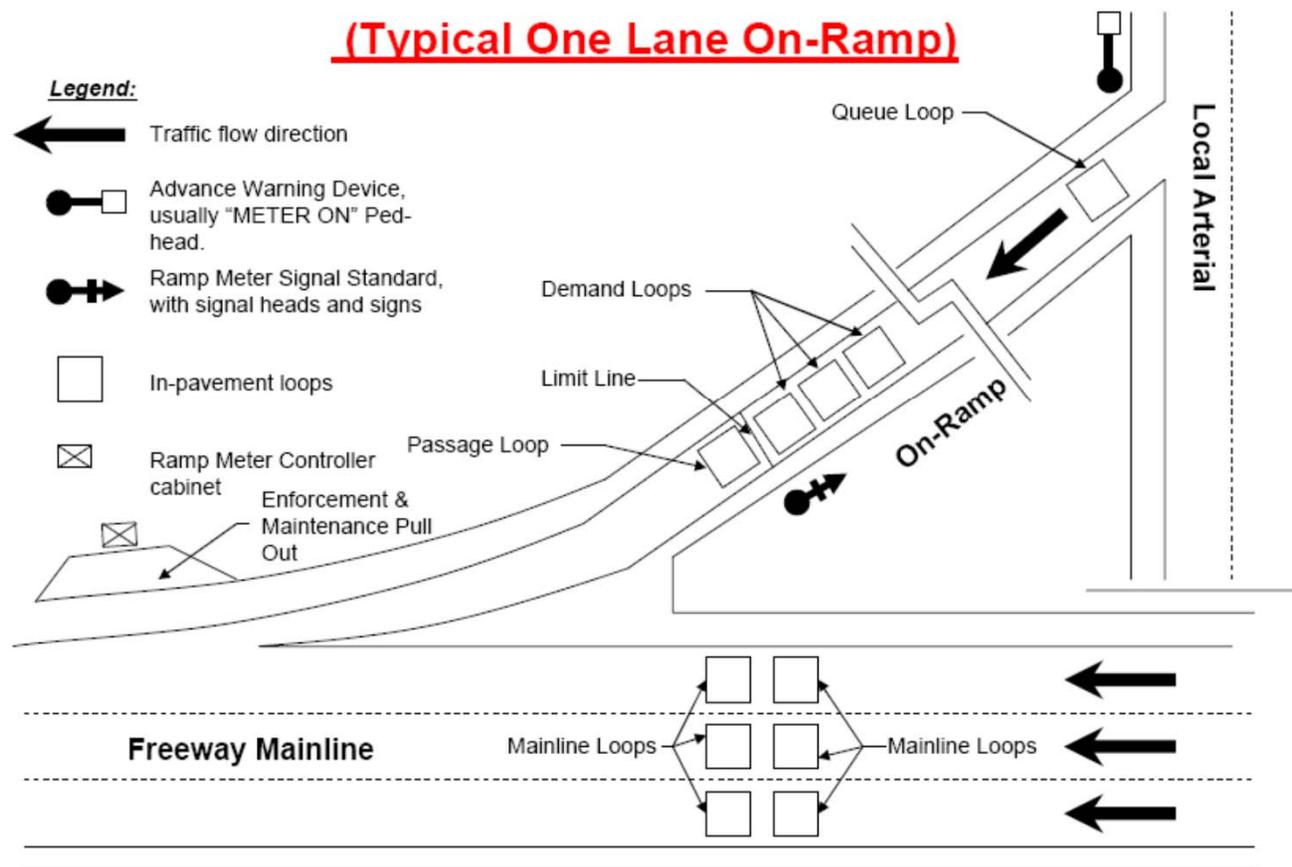
- Reduces total travel delay
- Provides consistent travel times
- Provides HOV Incentives with HOV Bypass Lanes.
- Breaks up Platoons of Vehicles, Making Merging Safer
- Improves Vehicle Throughput
- Reduces Emissions



# How Ramp Metering Works Thru The Use of Technology

## Ramp Metering Hardware Example

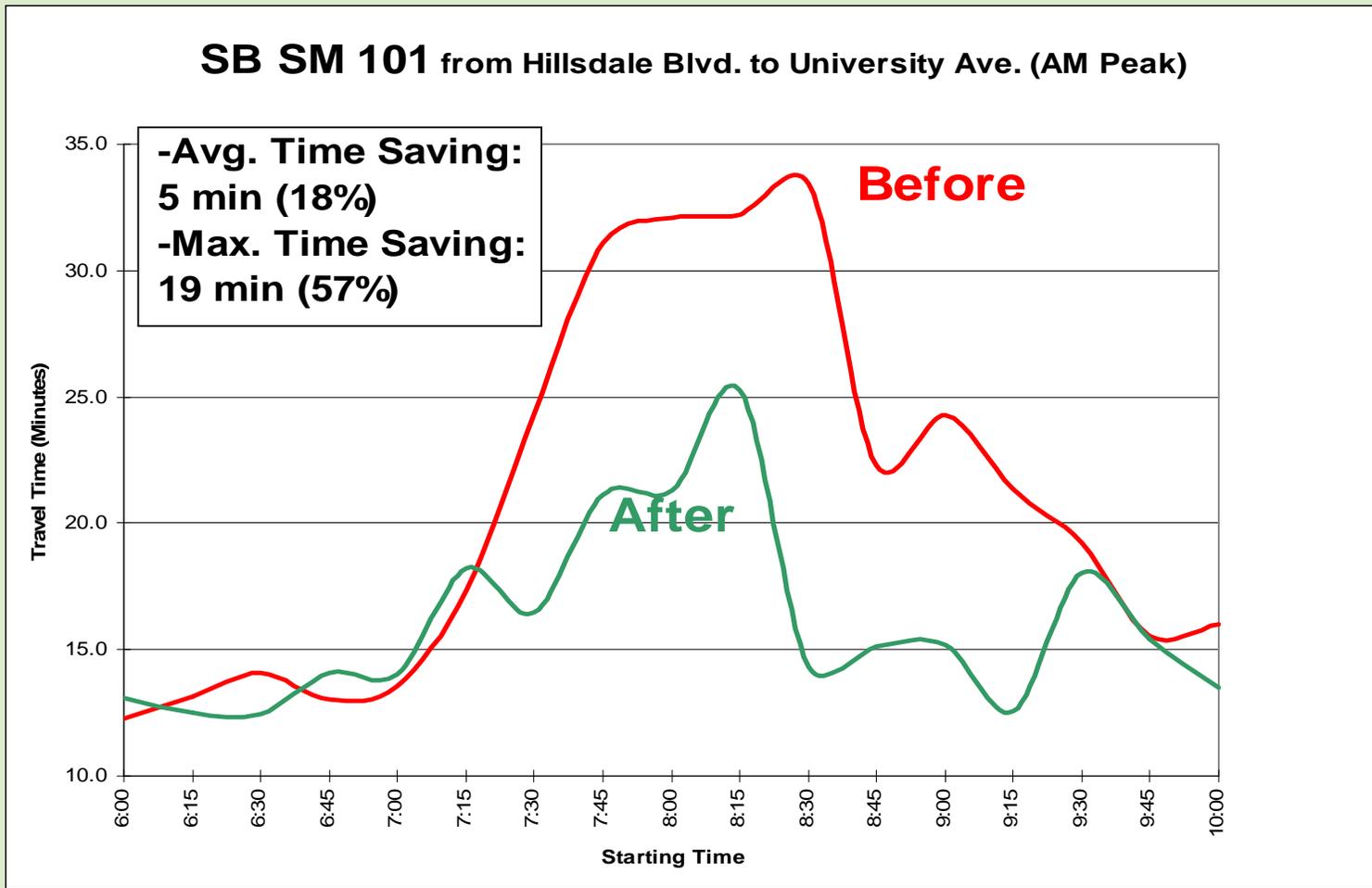
### (Typical One Lane On-Ramp)



## Case Study: Why Ramp Metering Worked in San Mateo County

- Corridor Approach
- Local Engagement
- Local Sensitivity
- On-going Communication

# Case Study – AM Time Savings (approx. 10 mile)



# Marin County's Ramp Metering Program

## Roles

- MTC – Project Sponsor and Funding Agency
- Caltrans – Implementing Agency, Owner and Operator
- TAM – Supporter, Facilitator, Develop FAQ's, Outreach
- County/Cities – Participate/ Advisor in Ramp Metering TAC

## Marin County's Ramp Metering Program

- Form a Ramp Metering Technical Advisory Committee
  - RMTAC Membership: Cities, Towns, County, Marin Transit, Golden Gate Transit, Caltrans, MTC
- RMTAC extensively involved prior to activation to ensure no impact on local streets and roads
- Identified Northbound Highway 101 as Phase 1 Project

# US 101 Northbound Preliminary Ramp Metering Assessment Study

1. Bridgeway / Gate 6
2. Highway 1/Pohono
3. Redwood Highway / Seminary
4. Blithedale Loop
5. Tiburon Diagonal
6. Tamalpais Loop
7. Tamalpais Diagonal
8. Sir Francis Drake Blvd

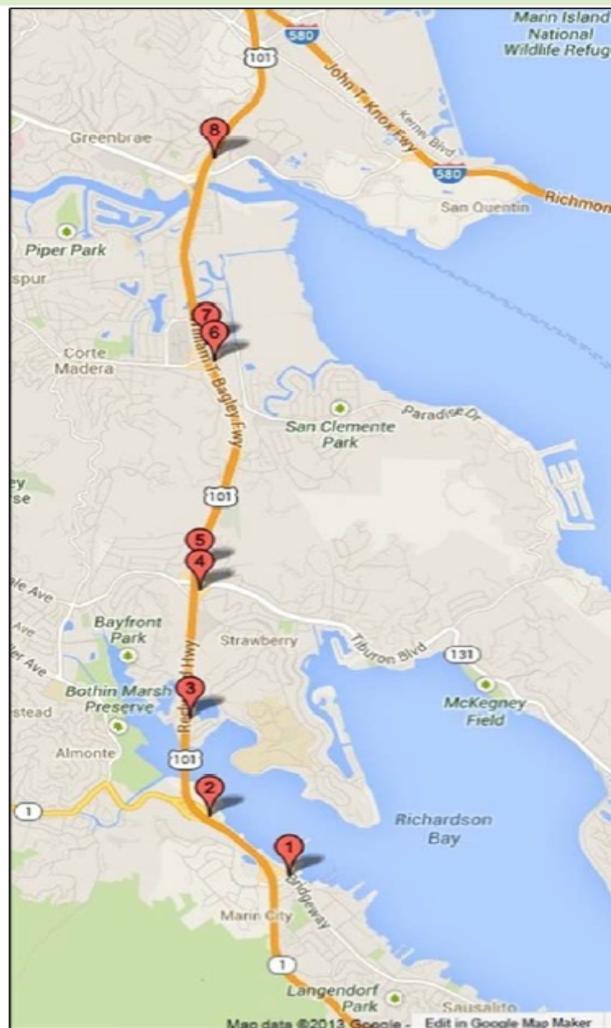
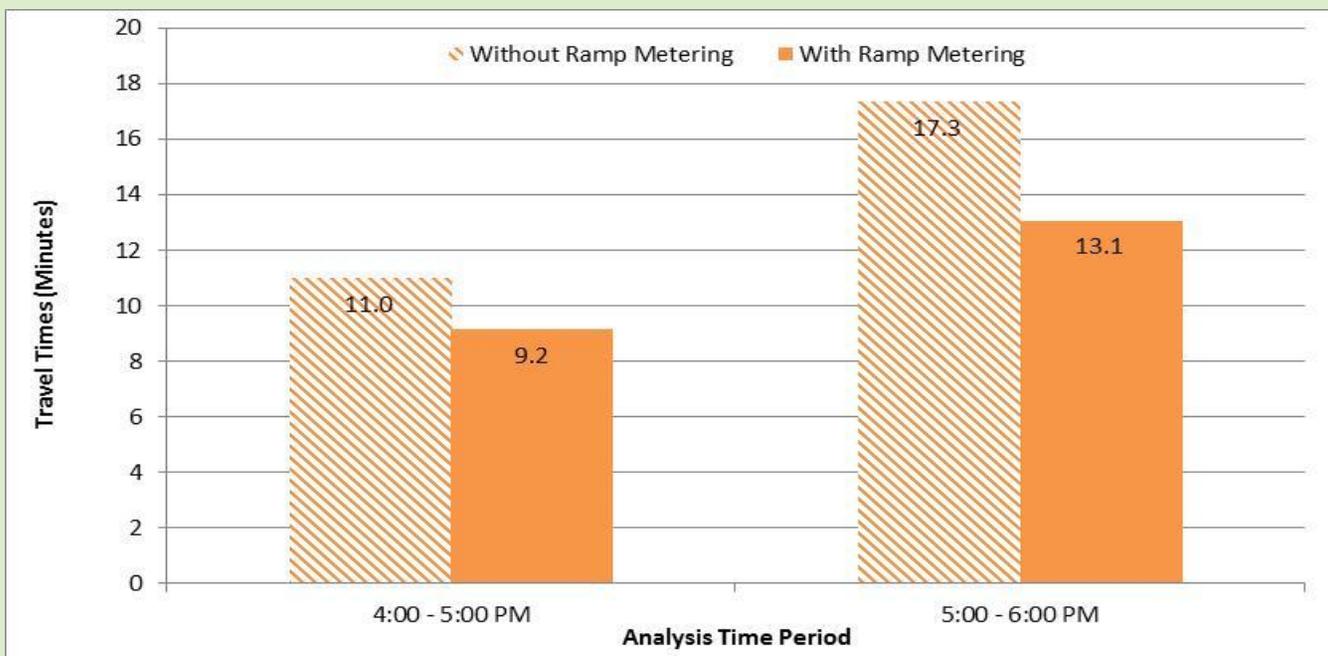


Figure 1: Study Area Showing Ramp Locations

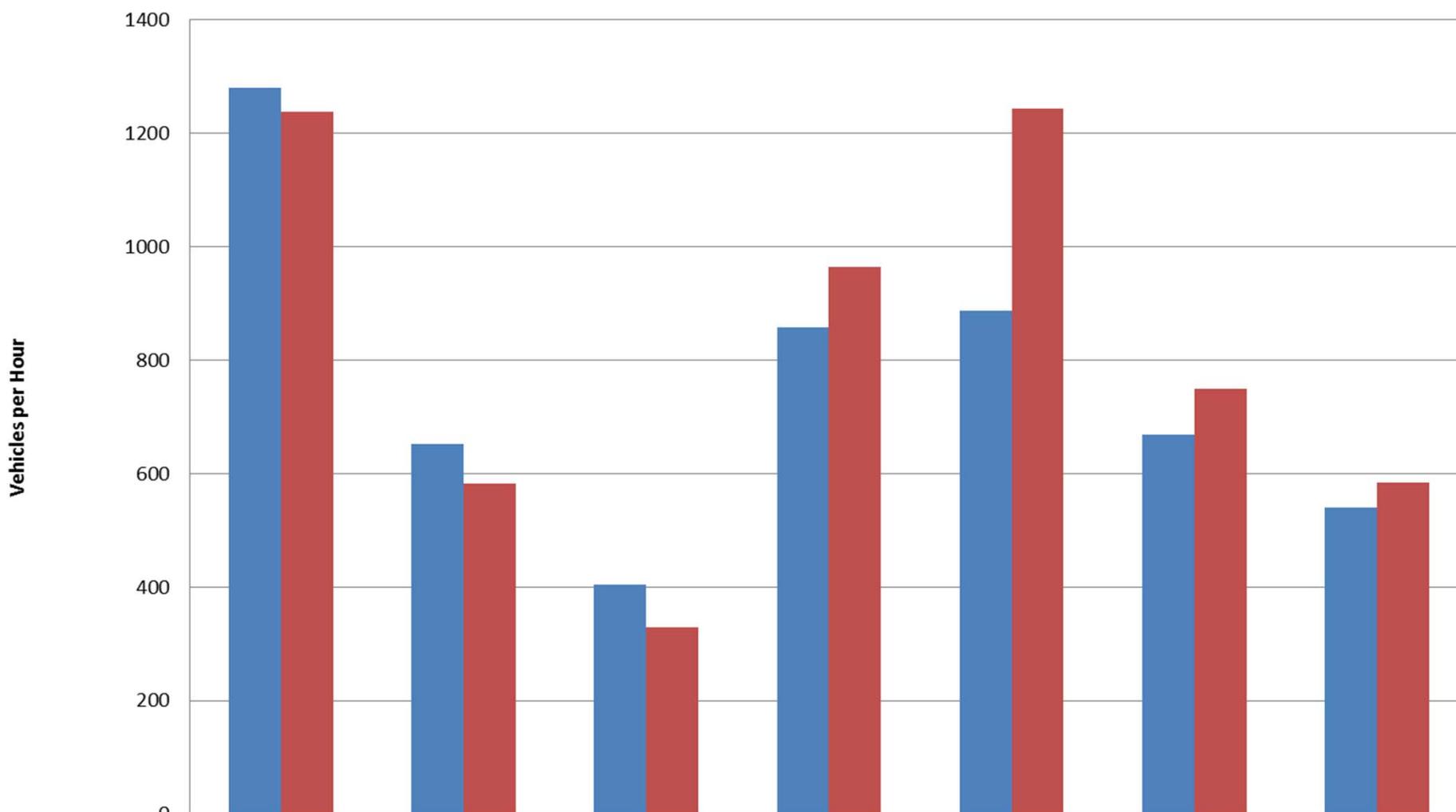
# Travel Time Savings



Analysis Time Period	Without Ramp Metering	With Ramp Metering	Difference	
	Minutes	Minutes	Minutes	Percent
4:00 – 5:00 PM	11.0	9.2	-1.8	-16%
5:00 – 6:00 PM	17.3	13.1	-4.2	-24%

## Comparison of 2011/2012 to 2013 Ramp Data

### Vehicles merging on to Highway 101 during afternoon peak hour



	Bridgeway	Highway 1	Seminary Dr	Blithedale Loop	Tiburon Blvd Diagonal	Tamalpais EB Loop	Tamalpais WB Diagonal
■ 2011/2012 Data	1280	652	405	859	888	670	541
■ 2013 Data	1238	584	330	965	1243	750	585

# US 101 Northbound Ramps

NB MRN-101 Ramp Metering

Blithedale Ave / Tiburon Blvd Diagonal

FREQ Origin/on-ramp #5



 On-ramp storage upstream of limit line

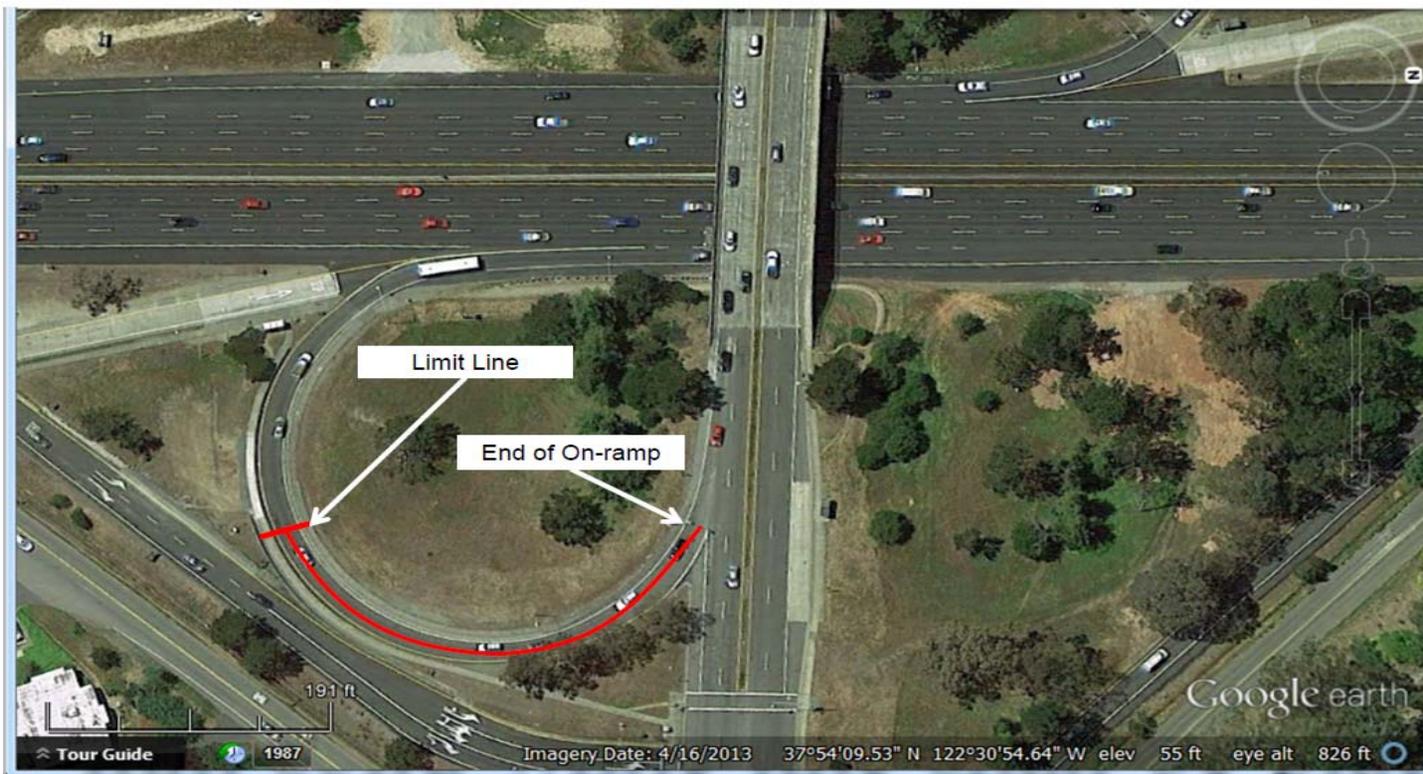
Based on Widening Plan with HOV bypass on-ramp  
22 vehicles (660 ft) to end of on-ramp  
44 vehicles (1,320 ft) total storage (2-lane on-ramp)

# US 101 Northbound Ramps

NB MRN-101 Ramp Metering

Blithedale Ave / Tiburon Blvd Loop

FREQ Origin/on-ramp #4



— On-ramp storage upstream of limit line

Based on Ramp Metering Equipment Drawing  
11 vehicles (330 ft) to end of on-ramp  
22 vehicles (660 ft) total storage (2-lane on-ramp)

## US 101 Northbound Ramps



## Phase 1 Implementation Schedule

Environmental Phase – Complete

Design Phase – Completion early 2015

Construction – Spring 2015

Ramp Metering Activation – Early 2016

## Ramp Metering Outreach

- MTC Prepared Informational Fact Sheets Short Video
- TAM will Distribute Materials and Contact Local Business Association or other Interested Organization as part of an Informational Outreach Effort
- TAM will host an Informational Workshop on November 20<sup>th</sup> at the Mill Valley Community Center beginning at 5:30

- [Preview Ramp Metering Video](#)
- Questions