

Golden Gate National Recreation Area ITS Pilot Project Evaluation

Christopher Strong, P.E.
Program Manager, Safety and Operations
Western Transportation Institute

Presented at the National Rural ITS Conference
August 14, 2006 – Big Sky, MT

Overview

- Project Overview
- GGNRA Background
- Evaluation
 - Usage of PCMS
 - Shuttle analysis
 - Stakeholder interviews
 - Public surveys
 - Traffic counts
- Lessons Learned



Photos: <http://www.nps.gov>; <http://www.hacked.com/images/TreeBig.jpg>

Overview of Project

Phase 1

- Case Study Approach
- Outreach workshops
- Visitor Surveys
- Develop ITS Themes

Phase 2

- Park outreach video
- Review of ITS measures of effectiveness
- Architecture integration
- 2 Early-winner projects
 - Demonstration
 - Evaluation



Golden Gate Natl. Rec. Area

- Large urban park
 - Alcatraz
 - Marin Headlands
 - Muir Woods
 - Presidio
- Geographically scattered
- 14 million visitors annually



Transportation Problems

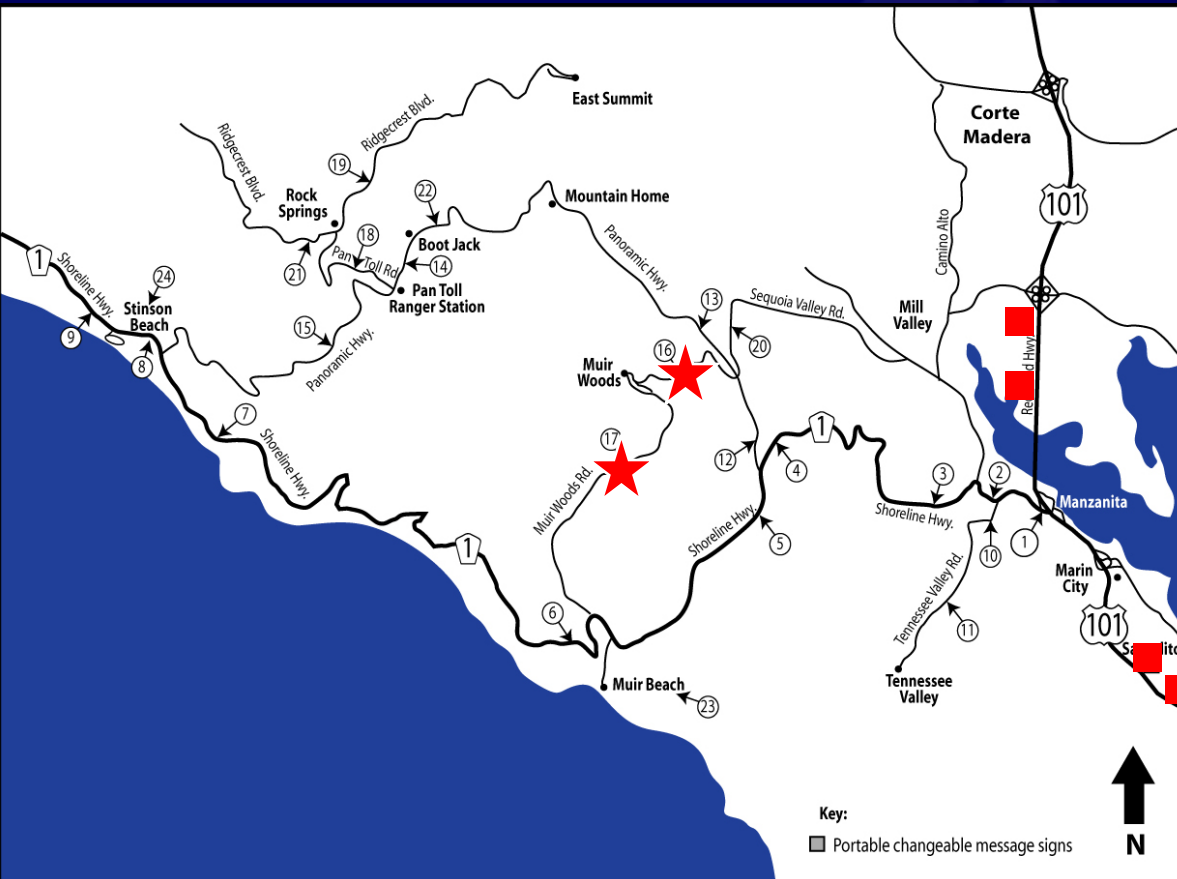


- Roadway congestion
- Inadequate access
- Limited parking
- Improve transit coordination and information
- Lack of planning data
- Traveler information
- Work zones and special events
- Evacuation and emergency response

Early-Winner Project

- One project in GGNRA to...
 - Provide early benefits
 - Demonstrate potential of ITS
 - Provide framework for future ITS investment
 - Build park and regional interest in ITS

GGNRA: Portable CMS



■ Early-Winner ★ Traffic Counters



Evaluation

- System usage
- Shuttle logs
- Stakeholder interviews
- Visitor surveys
- Parking counts / traffic volumes



Usage of PCMS

- Signs deployed July – Sep. 2005
- Used 47 times
- Messages
 - “MUIR WOODS PARKING FULL” (83%)
 - Other “PARKING FULL” messages (12%)
- Time/Day Usage
 - Used 39 days (24 weekend days)
 - Average time was 5.4 hours per day

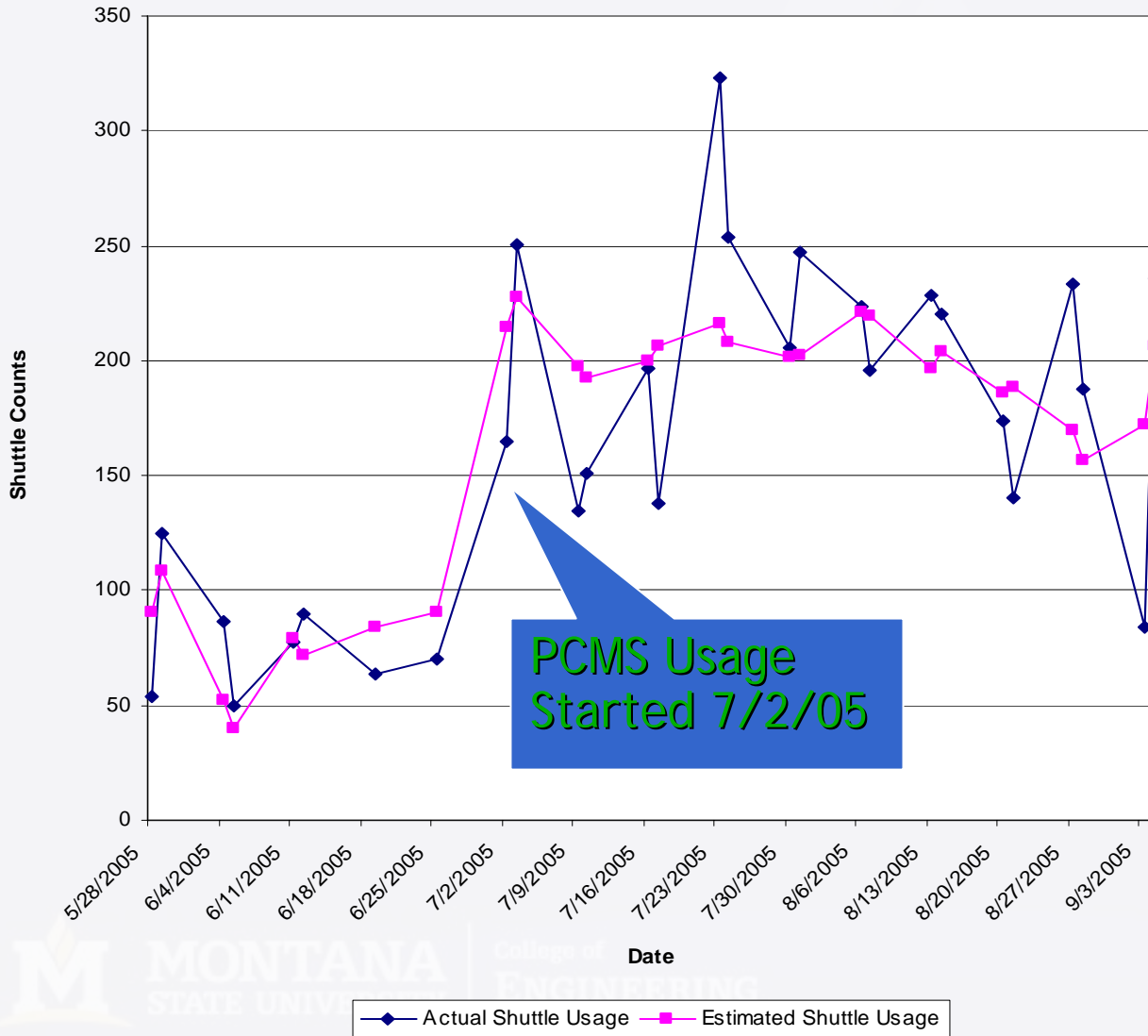


Shuttle Background

- Shuttle started summer 2005
- Shuttle sign after PCMS
- PCMS almost immediate impact on ridership
- Needed extra shuttles in the evenings



Shuttle Usage



- Regression
 - 3.4% of visitors use shuttle
 - PCMS on increases shuttle use by 102 daily riders
 - $R^2 = 0.65$
- Parking still problem

Stakeholder Interviews

| Challenge | Pre | Post |
|---------------------|------|------|
| Parking conflicts | 4.50 | 1.71 |
| Stop-and-go traffic | 4.45 | 1.86 |
| Traffic congestion | 4.27 | 1.57 |
| Park usage | 4.20 | 2.71 |

Pre: 5 = severe challenge, 1 = no challenge

Post: 5 = increase, 1 = decrease

Stakeholder Interviews (cont.)

| Effect on drivers | Pre | Post |
|-------------------------------------|------------|-------------|
| Better information earlier | 4.60 | 4.63 |
| Allows for more efficient decisions | 4.40 | 4.75 |
| Saves time | 4.10 | 3.71 |
| Makes getting to park sites easier | 3.70 | 3.43 |

Stakeholder Interviews (cont.)

- Overall positive effect on operations
- Effective for dealing with congestion and parking challenges
- PCMS save time for agencies
- Problems
 - Software
 - Dial-up difficulties
 - Some customized messages

Public Survey

| Congestion | |
|-----------------------|------|
| Parking Lots | 3.20 |
| US Highway 101 | 2.40 |
| Roads Leading to Park | 2.40 |
| Trails in Park | 2.00 |

5 = very congested, 1 = uncongested

Public Survey (cont.)

- 43% saw PCMS on Highway 101
- 81% indicated that there was a message on the sign
- 50% of those that saw the message could not recall it
- 63% felt the message was useful
- 60% felt PCMS was in a good location
- 85% said PCMS had no effect on trip

Public Survey (cont.)

| PCMS | |
|--------------------------------|-----|
| Information accurate | 4.1 |
| Information current | 3.9 |
| Information easy to understand | 3.9 |
| Information useful | 3.7 |
| I need more information | 2.6 |
| I could not read it | 2.1 |

5 = strongly agree, 1 = strongly disagree

Traffic Count Analysis

- Assume that when the PCMS shows a message regarding Muir Woods:
 - It will affect visitors' decisions
 - Traffic volumes en route to MW will be reduced
- Analysis included:
 - Year to year comparison
 - Year to year comparison with PCMS on versus off
 - Paired t-test
 - Through traffic

Results

- Signs used extensively
- Shuttle usage increased
- Stakeholders were supportive
- Public was generally satisfied
- Traffic and parking volume data inconclusive

Lessons Learned

- Institutional challenges
 - Different priorities
 - Need for a champion
 - MOU development is not easy
 - Data collection
- Communication with shuttle
- Technology challenges
 - Retainage
 - On-site testing and training
 - Installation and maintenance of road tubes

Questions

- Christopher Strong, P.E.
Western Transportation Institute
Montana State University
PO Box 174250
Bozeman, MT 59717-4250
Phone: (406) 994-7351
e-mail: ChrisS@coe.montana.edu