Golden Gate National Recreation Area ITS Pilot Project Evaluation

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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.nps.gov); [http://www.haacked.com/images/TreeBig.jpg](http://www.haacked.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

Map: [http://www.nps.gov](http://www.nps.gov)
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

Key:
- Portable changeable message signs

Early-Winner

Traffic Counters

Photos: Paul Bignardi, GGNRA/NPS
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

Source: Paul Bignardi
Shuttle Background

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

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking conflicts</td>
<td>4.50</td>
<td>1.71</td>
</tr>
<tr>
<td>Stop-and-go traffic</td>
<td>4.45</td>
<td>1.86</td>
</tr>
<tr>
<td>Traffic congestion</td>
<td>4.27</td>
<td>1.57</td>
</tr>
<tr>
<td>Park usage</td>
<td>4.20</td>
<td>2.71</td>
</tr>
</tbody>
</table>

Pre: 5 = severe challenge, 1 = no challenge

Post: 5 = increase, 1 = decrease
## Stakeholder Interviews (cont.)

<table>
<thead>
<tr>
<th>Effect on drivers</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better information earlier</td>
<td>4.60</td>
<td>4.63</td>
</tr>
<tr>
<td>Allows for more efficient decisions</td>
<td>4.40</td>
<td>4.75</td>
</tr>
<tr>
<td>Saves time</td>
<td>4.10</td>
<td>3.71</td>
</tr>
<tr>
<td>Makes getting to park sites easier</td>
<td>3.70</td>
<td>3.43</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Congestion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Lots</td>
<td>3.20</td>
</tr>
<tr>
<td>US Highway 101</td>
<td>2.40</td>
</tr>
<tr>
<td>Roads Leading to Park</td>
<td>2.40</td>
</tr>
<tr>
<td>Trails in Park</td>
<td>2.00</td>
</tr>
</tbody>
</table>

5 = very congested, 1 = uncongested
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.)

<table>
<thead>
<tr>
<th>PCMS</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information accurate</td>
<td>4.1</td>
</tr>
<tr>
<td>Information current</td>
<td>3.9</td>
</tr>
<tr>
<td>Information easy to understand</td>
<td>3.9</td>
</tr>
<tr>
<td>Information useful</td>
<td>3.7</td>
</tr>
<tr>
<td>I need more information</td>
<td>2.6</td>
</tr>
<tr>
<td>I could not read it</td>
<td>2.1</td>
</tr>
</tbody>
</table>

*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

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