“Full” System Engineering Approach to ITS in Bay Region, Michigan

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HNTB
Topics covered

- Update from last year’s case of a Rural ITS
- Master ITS Plan
- The "\" of the “Vee” in Bay
- Some of the “Vee” in Genesee Cty
- 13 counties
- 7000 sq miles
- Farmland, industrialized, mid size urban 50k
- Total pop. 1.2M
- Retreat areas here and north
- Variety of transportation characteristics
Area ITS work timeline

- Genesis Arch (2001)
- Genesis Design (2007)
- Bay Design – Part I (2008)
- Probe Traffic Data (2009)
- Bay Design – Part II (2009)
- ATMS in Grand and MITS (2010)
Concept of Operations

High Level Requirements

Detailed Requirements

High Level Design

Detailed Design

Bay Region ITS Master Plan

Bay Region Phase I
Challenge – Make a concept that fits designs already done

Develop ConOps that addressed design
Characterization of traveler in need

- Tourist

- Weekend commuter

- Friday afternoon – North; Sunday evening – South
What were the requirements

- Critical needs
- Complex alternate routes
- Multiple destinations – not one stands out
- TRAVEL TIMES
The work so far:

- Concept of Operations
- High Level Requirements
- Detailed Requirements

Bay Region ITS Master Plan
 ITS Deployment Analysis System (IDAS) from FHWA

 Level of service

 Safety risk factor

 Vote and consensus
LOS in the past

Volume-to-Capacity Ratios in 2002

- LOS A
- LOS D
- LOS B
- LOS E
- LOS C
- LOS F
LOS in the future
Used recent deployment costs from Genesee County

<table>
<thead>
<tr>
<th>Bay Region ITS Corridor</th>
<th>b/c</th>
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<tbody>
<tr>
<td>I-69</td>
<td>19.9</td>
</tr>
<tr>
<td>I-75 / US-23</td>
<td>14.1</td>
</tr>
<tr>
<td>US-127</td>
<td>8.3</td>
</tr>
<tr>
<td>US-10</td>
<td>7.2</td>
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<tr>
<td>M-61</td>
<td>2.8</td>
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</table>
Final Master Plan

Bay Region ITS Master Plan

- Concept of Operations
- High Level Requirements
- Detailed Requirements
- High Level Design
Fig 1.7. View northwest from I-75 / US-23

Fig 1.8. View south on I-75 / US-23
<table>
<thead>
<tr>
<th>Site Name</th>
<th>US10 / M20 CCTV</th>
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<tbody>
<tr>
<td>Type of Device</td>
<td>Remote Surveillance System</td>
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<tr>
<td>Device Location</td>
<td>This device is proposed at the M-20 and US-10 Interchange</td>
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<tr>
<td>Surveyors</td>
<td>MJ  HP  SS  RJ  JMR</td>
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<td>Date</td>
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<td>Latitude</td>
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<td>Longitude</td>
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<tr>
<td>Distance to Power</td>
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<td>Transformer Present</td>
<td>Y</td>
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</table>

**Pros**

The proposed location is excellent for viewing both M-20 and US-10. Wide open area available that will ease construction.

**Cons**

Power is an issue at this location. Will have to directional bore a long distance to get power to the proposed site.

**General Observations**

This site will require clearing.
Genesee County

ITS Arch, Deployment Plan, ConOps, Design, Bid, Build

A lil’ glossy on some of the regional impacts

Field observations, design changes

Always assuring that original intent is met.
 System Manager Approach
 Sys Mgr writes System Requirements Document
 This guides contractor’s integration plan
 Testing plan is derived from this
- When planning – cast a wide regional net
- Try to avoid the details before the plan
- Do not deploy ITS for its own sake
Thank you

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