Indiana Department of Transportation (INDOT) Program Development Division.

Bridge Management Process
Purdue Road School
March 30, 2005

INDOT, Bridge Management Process
“Major Functions”

INDOT Bridge Management process is an ongoing series of activities that includes but not limited to the following tasks:

1- Develop, Maintain & Operate the Indiana Bridge Management System (IBMS) software.
2- Bridge Improvement Projects.
3- Monitoring Bridge Projects.
4- Bridge Preventive Maintenance Program.
INDOT, Bridge Management Process Cont’d

1- Develop, Maintain & Operate the Indiana Bridge Management System (IBMS).

- Developed by Joint INDOT & Purdue University, Civil Engineering Dept. through JTRP as a research project using federal (SPR) funds.

- National Bridge Inspection (NBI) data as input.

- 43 input items from NBI data.

- Output of each module is Input for the next module.

INDOT, Bridge Management Process Cont’d

- IBMS Modules:
  - Decision Tree (Dtree), Cost, Rank and Optimization Modules
  - Deterioration models with predictions for different bridge components and road classes.
  - Ranks projects based on Total Disutility and Cost Effectiveness.
  - Recommends different alternatives with cost at any given year within the analyses limits including Do Nothing.
**INDOT, Bridge Management Process Cont’d**

Prior to the Stage I of the INDOT, Program Development Process-State (PDP-S) or, “call for projects”:
- IBMS Operation
- Perform Analyses
- Generate Report w/recommendations
- District Bridge Engineers
  - Review/Comments/Considerations
- Re-evaluations.

**INDOT, Bridge management process, Cont’d**

2- Bridge Improvement Projects:
As part of the PDP-S Process Stage II or, Project Management Group (PMG) process includes:

- **Review:**
  - Bridge Inspection/inventory data/pictures
  - Support documents (FA3)
  - Duplications
  - Location / Kn.

- **Prioritize:**
  - Needs
  - Scope, Rehab Min. (2-3) / Replace (5 years)
  - FY Workload / Fund Availability.
INDOT, Bridge Management process, Cont’d

3- Monitoring :

- Annual District/Design/Program Development Divisions Meetings
  * Check Status
  * Change/pull/push projects
  * Update information (uniformity)

- Other Involvements:
  Provides comments and facilitate/coordinate meetings to assist project advancements.

INDOT, Bridge Management process, Cont’d

- Engineering Assessments/ Environment Sections
  * Design Division.
  * Land Acquisition Division
  * Budget & Fiscal Management Division.
  * FHWA.
  * DNR.
  * Consultants
INDOT, Bridge Management process, Cont’d.

4- Bridge Preventive Maintenance Program
   - Additional Assistance to District Bridge Crew; that IBMS is not recommending.
   - FHWA, agreement
     * STP, funds
     * $ 500,000/contract/district/year
     * Limited work items
     * Documents developed in-house (No consultant)
   - September 2001- July 2003
     * 8 contracts (data available)
     * Total 171 bridges
     * Average cost, $ 18,652.42/bridge.

Results:
- Prevents Further Deterioration,
  * Minor work will not become major reconstructions,
  * Avoid unexpected Traffic/lane restrictions,
  * Drop in number of bridge rehabilitation projects that normally done through consultants,
  * Extended Service life 3-5 years,
  * Cost saving while maintaining the network’s health.
INDOT, Bridge Rehabilitations and Replacement History

Funds VS. Sufficiency Ratings.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fund ($M)</th>
<th># Of Bridges (INDOT)</th>
<th>&lt;50% Poor</th>
<th>50-80%</th>
<th>% Marginal-Fair</th>
<th>80-100%</th>
<th>% Good-Excellent</th>
<th>Ave. Suff.</th>
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<td>1996</td>
<td>$121</td>
<td>N/A</td>
<td>N/A</td>
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<td>2.1</td>
<td>674</td>
<td>13.1</td>
<td>4358</td>
<td>84.8</td>
</tr>
</tbody>
</table>

N/A – Not Available
INDOT's Overall Bridge Conditions, in Term of Sufficiency Ratings

- 2.90% 2.70% 9.50%
- 18.40%
- 66.50%

INDOT Bridge Improvement Projects
(Capital vs Conditions)

- Year 1996: 121
- Year 1997: 127.5
- Year 1998: 118
- Year 1999: 154
- Year 2000: 153.5
- Year 2001: 136.5
- Year 2002: 101.4
- Year 2003: 94.5
- Year 2004: 104
- Year 2005: 100
- Year 2006: 100
- Year 2007: 100

Funds In $M: 86.6, 86.98, 87.76, 88.13, 88.45, 89.78, 89.35, 89.42, 89.65, 90.0
Average Sufficiency Rating: 86.96, 87.76, 88.45, 89.78, 89.35, 89.42, 89.65, 90.0, 90.0, 90.0

R² = 0.8866
R² = 0.3985
INDOT, Bridge Management Process, cont’d.

Comments, Questions?

Jaffar Golkhajeh, P.E.
Bridge Management Engineer,
Indiana Department of Transportation,
Program Development Division.
Tel: (317)232-5453.
E-mail: jgolkhajeh@indot.state.in.us