Effective Post Construction Evaluation Practices for Work Zone Management Strategies

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• Traffic volumes and congestion continue increasing while limited growth is expected in roadway capacity.
• Number of work zones continues increasing due to aging roadways
• It is imperative that roadway construction and rehabilitation activities should be conducted in a manner that optimizes safety while maintaining the acceptable level of mobility.
• The goal of this FHWA grant is to develop a series of training (face-to-face and online) programs to disseminate the best practices for enhancing workzone safety while maintaining the acceptable level of mobility.

US work Zone Fatalities by Year
Introduction and Background

• The Final Rule on Work Zone Safety and Mobility was published on September 9, 2004, and mandated compliance by October 12, 2007.

• Regulated state and local governments use Transportation Management Plans (TMPs).

• Transportation Management Plans are required for federally funded and significant projects.
Introduction and Background

- TMP Evaluation has multiple scopes, during implementation and construction, post project and agency level process levels.
- Working feedback loop is necessary for continuous improvement of TMP
Overview of a TMP

• A compilation of strategies used to mitigate the mobility effects of a work zone on the traveling public and to increase the safety of the workers and public.

  – Three Components
    • Temporary Traffic Control Plan (TTC)
      – Traffic in the work zone
      – Worker Safety
    • Public Information Plan (PIP)
      – Expected delays
      – Location of Detours
    • Transportation Operations Plan (TOP)
      – Traffic in the Corridor
Life of a TMP

Designation → Creation and Implementation → Monitoring and Revision → Evaluation: Project and Agency
Designation of TMPs

• Typically Three Types of TMPs.
  – Significant Project
  – Non-Significant Projects
  – Maintenance Projects without Serious Impacts

– New Mexico
  • Major
  • Intermediate
  • Basic

– California
  • Major
  • Minor
  • Blanket

– Virginia
  • C
  • B
  • A
Creation and implementation of TMP

• Developed early in the design phase of a project.
• Living document constantly revised.
• Supervision of implementation to ensure compliance with TMP.
• Performance Measures are used to determine if the TMP needs revision

<table>
<thead>
<tr>
<th>Safety Performance Measures</th>
<th>Mobility</th>
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<tbody>
<tr>
<td>Number of Crashes</td>
<td>Queue Length</td>
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<tr>
<td>Crash Frequency</td>
<td>Duration of Queue</td>
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<tr>
<td>Worker Casualties</td>
<td>Level-of-Service</td>
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<tr>
<td>Inspection Scores</td>
<td>Travel Time</td>
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<tr>
<td>Work Zone Intrusion Frequency</td>
<td>User Complaints</td>
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</tbody>
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Monitoring and Revision

[Diagram showing the process of Planning, Programming, Design, and Construction, with Monitoring & Revision and Implementation phases indicated]
Post Project Evaluation

• Post Project Evaluations are used to identify strengths and weaknesses of TMPs
• Post Project Evaluations Processes vary widely across DOTs
• Reasons for variance in Post Project Evaluation
  – Agencies have different needs and resources
  – FHWA does not require Post Project Evaluation on every project
  – Different Standards for the Post Project Evaluation
Literature Review

• Searched DOT websites
  – Traffic Manuals
  – Engineering Manuals

• Interviewed State DOTs
  – Iowa, Minnesota, Ohio, Louisiana
• Created tables based on practices observed
• Project Evaluation
• Agency Evaluation
• Quantification
  \[ \sum_{i=0}^{n} w_i \times p_i \]
  – Points assigned to Practices
  – 3 Tiers

Tiers
1. Top Tier: top 25%
2. Middle Tier: 50%
3. Bottom Tier: bottom 25%
Agency Level Evaluation

- Required by the *Final Rule on Work Zone Safety and Mobility*
- Must be performed at least every two years
- Have three options for evaluation
  - Work zone data at agency level
  - Randomly selected projects
  - A combination of random projects and work zone data
Agency Level Evaluation

• Common Practices
  – Multi-disciplinary review team
  – Review Random Projects Across State

• Best Practices
  – Review Each Region Separately
  – Annual Reviews
  – Work Zone Inspections

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<td>Alaska, California, Colorado, Connecticut, Illinois, Kansas, Kentucky, Missouri, New Mexico</td>
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<tr>
<td>Middle Tier</td>
<td>Arizona, Arkansas, District of Columbia, Delaware, Indiana, Iowa, Minnesota, New Hampshire, North Dakota, South Carolina, Vermont, Virginia</td>
</tr>
<tr>
<td>Bottom Tier</td>
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Project Level Evaluation

- Common Practices
  - Appointment of Work Zone Safety Coordinator
  - Use of Performance Measures

- Best Practices
  - Departmental Employee as Work Zone Safety Coordinator
  - Written Report for all Projects

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Best Practices

• Project Evaluation
  – Reporting for Each Individual Project
  – Prioritize Community Input and Feedback
  – Work Zone Crash Reviews
  – Daily Work Zone Logs

• Agency Level Evaluation
  – Annual Process Reviews
  – Conferences for Promotion of Work Zone Safety and Mobility
  – Annual Work Zone Reports: Crash Data and Traffic Control Devices
  – Process Reviews for each District
Ideal Practices

Planning | Programming | Design | Construction

Creation

- Project Significance defined
- Performance Measures Selected
- Impact of work zones predicted

Implementation

- Designation of Personnel Responsible for monitoring of TMP
- Work zone logs or diaries are filled out
- Performance Measures are monitored
- TMP revised as necessary

Monitoring & Revision

- Statement of Usefulness
- Lessons Learned
- Public Reaction Summarized
- Actual vs predicted Performance measures compared

Evaluation
Conclusions

• Monitoring is essential for Post Project Evaluation
• Reviewing each project is best
• Review each district individually
• Continuation of Research
  – Conduct interviews with DOTs
  – Conduct a web based national survey
  – Perform case studies of best DOTs
Comments and Questions