



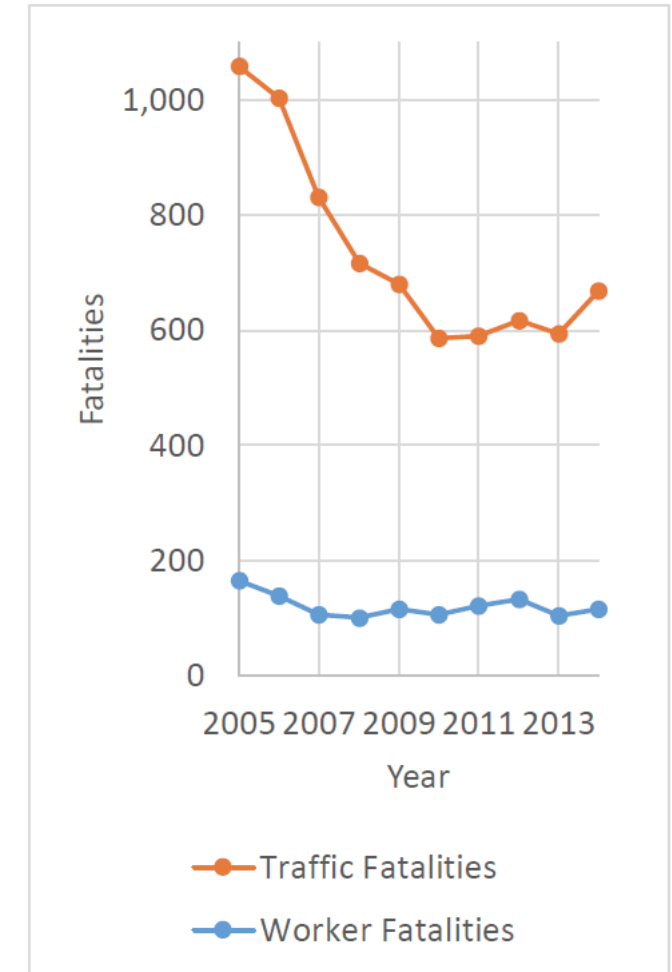
# Effective Post Construction Evaluation Practices for Work Zone Management Strategies

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2017 Mid-Continent Transportation  
Research Symposium

# 2016 FHWA Work Zone Safety Training Grant

- 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.



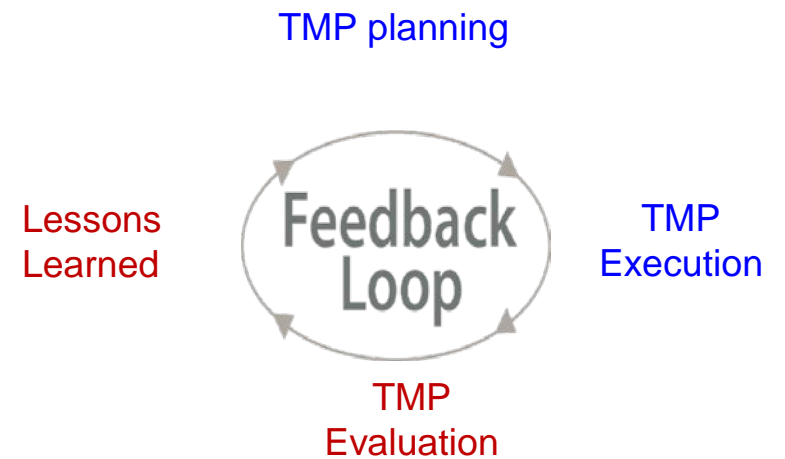
US work Zone Fatalities by Year

# 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

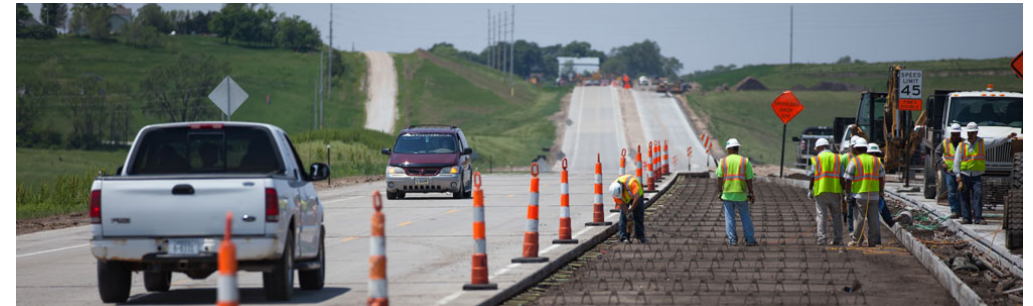


# Overview of a TMP

- 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 of TMPs

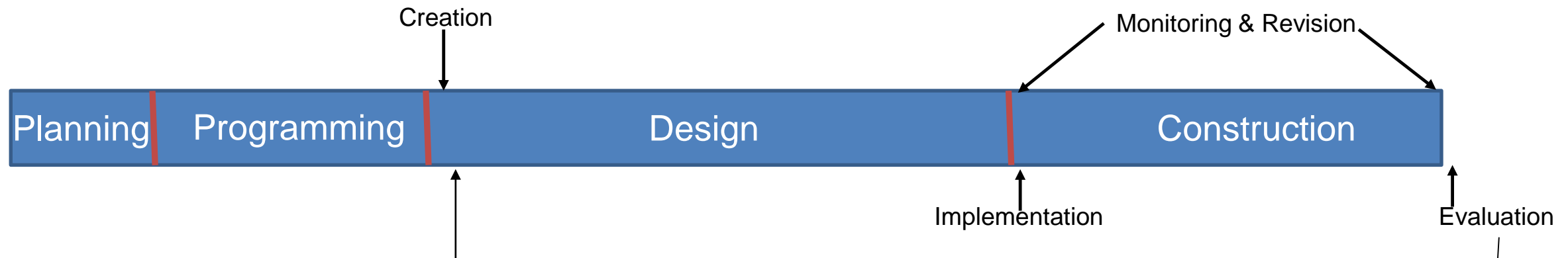
- Typically Three Types of TMPs.
  - Significant Project
  - Non-Significant Projects
  - Maintenance Projects without Serious Impacts
- New Mexico
  - Major
  - Intermediate
  - Basic
- California
  - Major
  - Minor
  - Blanket
- Virginia
  - C
  - B
  - A



[www.mdt.mt.gov/visionzero/people/workzone-mobility.shtml](http://www.mdt.mt.gov/visionzero/people/workzone-mobility.shtml)

# 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.





# Monitoring and Revision

- Performance Measures are used to determine if the TMP needs revision

Safety Performance Measures	Mobility
Number of Crashes	Queue Length
Crash Frequency	Duration of Queue
Worker Casualties	Level-of-Service
Inspection Scores	Travel Time
Work Zone Intrusion Frequency	User Complaints

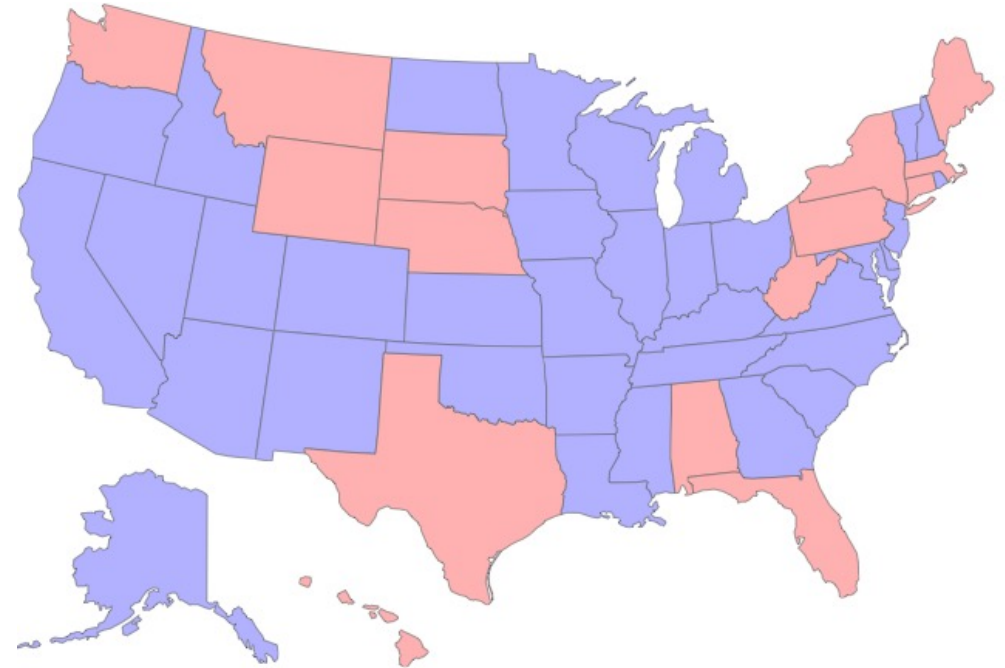


# Post Project Evaluation

- 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



Have Data ————  
Do not have Data ————

# Data Analysis

- Created tables based on practices observed
- Project Evaluation
- Agency Evaluation
- Quantification

$$-\sum_{i=0}^n w_i * p_i$$

- Points assigned to Practices
- 3 Tiers



<https://www.ngdata.com/what-is-data-analysis/>

## 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



[http://www.heraldextra.com/news/local/udot-sets-up-new-office-to-encourage-work-zone-safety/article\\_816d4872-9592-5acb-b03c-33b96a5abece.html](http://www.heraldextra.com/news/local/udot-sets-up-new-office-to-encourage-work-zone-safety/article_816d4872-9592-5acb-b03c-33b96a5abece.html)

# 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

Tier	State DOTs
Top Tier	Alaska, California, Colorado, Connecticut, Illinois, Kansas, Kentucky, Missouri, New Mexico
Middle Tier	Arizona, Arkansas, District of Columbia, Delaware, Indiana, Iowa, Minnesota, New Hampshire, North Dakota, South Carolina, Vermont, Virginia
Bottom Tier	Georgia, Idaho, Michigan, Mississippi, Montana, North Carolina, Oklahoma, Tennessee, Utah, Wisconsin

# 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

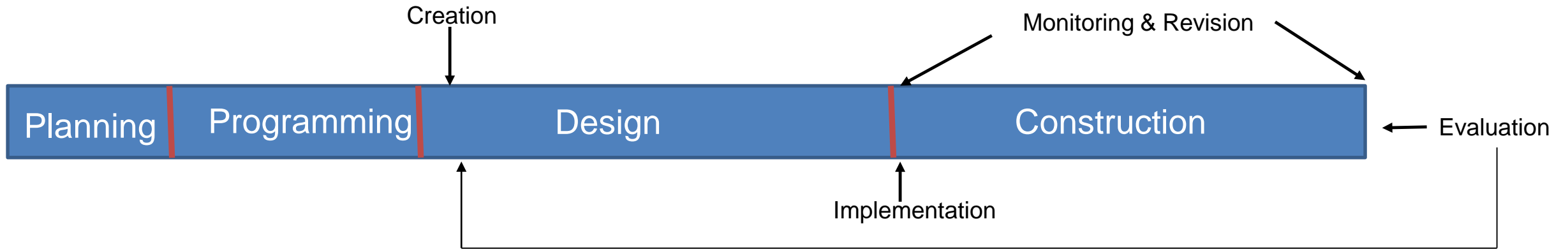
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# Best Practices

- 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



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



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



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

# 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