Road Weather Management
L01 e-Tool Demo
• This e-tool is based on research conducted in SHRP2: *Integrating Business Processes to Improve Travel Time Reliability* (L01)

• The e-tool is designed to assist agencies in identifying their business processes that effect travel time reliability

• Reliability is dependent on many agencies and processes

• Opportunities exist to reduce the impact of congestion triggers
• **Process** – A series of actions or activities that result in a specific or desired outcome to accomplish a specific goal
  – The method by which an incident is detected (911 call, service patrol call, etc.)

• **Business Process Mapping**
  – Provides a visual representation of steps and connections
  – Identifies areas for improvement
  – Highlights resource needs
  – Identifies additional support needs
Application of e-tool

The e-tool can be used to assess business processes for the following operational areas:

• Incident management
• Work zones
• Planned special events
• Weather/road weather management
• Traffic control/traffic operations
• Capacity/recurring congestion
• Fluctuations in demand
Intended Use of e-tool

Includes an orientation and an application module

• **Orientation module:**
  – Provides background
  – Introduces case studies

• **Application module:**
  – Intended for use in a group setting
  – Ideally, the orientation module has already been completed
STEP 1
IDENTIFYING INFLUENCES
What made it apparent that there is a need to improve a business process in order to improve travel time reliability?

- **TOP DOWN**
- **EVENT DRIVEN**
- **NEEDS BASED**
Top Down

- Also known as “big directive”
- Legislative requirement or management – level directive
- Washington State DOT (WSDOT) Joint Operations Policy Statement and Instant Tow Program
  - Directive came from the governor’s office
  - Work closely with the Washington State Patrol
Event Driven

- Caused by a specific event or hazard, like an accident
- Nevada DOT I-80 Winter Closure Program
  - Significant crash due to weather
  - Major delays
  - There was a need to prevent further instances
Needs Based

• Also known as “opportunity based”
• Evolves over time according to recurring needs
• Influences day-to-day operations
• Florida DOT Road Ranger Program
  – Need to assist distressed vehicles
  – Initially implemented to assist with work zones, later expanded to assist stranded motorists
STEP 2 DEFINING THE SPECIFIC RELIABILITY GOAL
Defining the Specific Reliability Goal

• Used to measure success
• Focuses your efforts
• Assists in the development of benchmarks
  – Reducing incident clearance time
  – Providing 24/7 operations
  – Improving resource efficiency
  – Reducing congestion
  – Reducing delays
NDOT Example

• NDOT identified a problem with truck queues idling on I-80 near the California state line.

• NDOT defined a goal of limiting the number of trucks parked or idling on shoulders by providing advance notice of a closure near the state line.
STEP 3
IDENTIFYING AND DOCUMENTING CURRENT BUSINESS PROCESSES
• A business process:
  – Defines a series of actions or activities that result in a specific or desired outcome to accomplish a specific organizational goal
  – Is most likely something your agency does on a daily basis

• The purpose is to formally document the business process associated with one of the operational areas
Identifying and Documenting Business Processes

• **Benefits**
  – Better understanding of the business process
  – Identifying gaps in communications or data flows
  – Identifying missing stakeholders
  – Formalizing roles and responsibilities to ensure continuity and retaining institutional knowledge
Identifying and Documenting Business Processes

• Demonstrate multiple methods by which a visual representation of an agency’s business process can be developed

• No method is better than another

• Users are referred to the final reports of SHRP2 Integrating Business Processes to Improve Travel Time Reliability (L01) for additional information
• Start with the basics:
  – Which agencies or organizations are key to a successful implementation?
  – NDOT identified the following stakeholders:
    • NDOT Road Operations Center
    • Caltrans
    • Nevada Highway Patrol
    • California Highway Patrol
    • Local law enforcement
    • Freight companies
    • The motorists
Gather all documentation for your management program:

- Standard Operating Procedures
- Formal Memorandums of Understanding
- Informal exchanges of information and data
- Current management methods
- Others

Next, document the process or reverse engineer the current management process

- Data flows
- Decision points
- Process integration points
- Critical input and output
- Responsible entities
- Integration of processes
Next, create a visual representation of the operations process.

There are several approaches to mapping business processes.

In some cases, a sketch may be sufficient.

In other cases, a more comprehensive and complex drawing may be required.
• Business process modeling is more formal than the previous flow chart

• Makes connection between:
  – Those who create the process
  – Those who implement the process
  – Those who perform the process

• Business Process Modeling Notation (BPMN) is detailed in L01 Report
STEP 4 DEVELOPING/CHANGING AND IMPLEMENTING PROCESS
Developing/Changing and Implementing Process

STEP 4: IMPLEMENT PROCESS

STEP 4: DEVELOP/CHANGE PROCESS

STEP 5: ASSESS PROCESS
Develop/Change Process

• Utilize map from Step 3 and influences described in Step 1
• Change business process to reflect changes in:
  – Policy
  – Procedures
  – Decisions made by the group
• Timeframe for moving forward to implementation
  – Depends on agency’s ability to develop/change the current business process
  – Unique for each agency and each situation
  – Formal or informal in nature
Implement Process

• The approach to this step varies
  – Number of agencies involved
  – Depth of process

• Be sure to involve all stakeholders
  – Office managers
  – Operators
  – Field workers

• Timeframe for moving forward to Step 5
  – Needs to be sufficient to allow for stabilization of new process
  – Each iteration of implementation of refined process may reduce time
NDOT Example

• Coordinating agencies established a hierarchy of closure events based on expected duration.
• Motorists are warned of the closure or forced to detour based on the expected duration.
• For very long closures, other neighboring states are also warned.
STEP 5
ASSESSING THE PROCESS
Assessing the Process

Important to determine the effectiveness of the newly developed process
Assessing the Process

• **Necessary Information:**
  - Measure of success
  - Method of continuous evaluation
  - Necessary data

• **Benefits:**
  - Better communication with senior managers and the public
  - Ongoing performance measurement
  - Measurement against pre-implementation conditions
• Recurring nature of events allows for ongoing assessment.

• Collaborating agencies meet to identify opportunities for enhancement.

• Performance measures include public usage, number of notifications issued, and queue length.
STEP 6 DOCUMENTING THE PROCESS
Documenting the Process

• Occurs once the new process has been implemented and proven effective

• Includes:
  – Details of new business process
  – Details of evaluation process
  – Benefits
  – Lessons learned
  – Roles and responsibilities of stakeholders
Documenting the Process

- Helps to demonstrate performance
- Facilitate easier updates

**Example of documentation**
- Internal memorandums
- Informal memorandums of understanding
- User guides
- Agreements between stakeholders

**Other types**
- Evaluation meetings
- Reports
- Flowcharts
• Continual planning meetings with coordinating agencies.

• Tailoring of operational procedures to specific events.

• Formal agreement with Caltrans to activate restrictions and turnarounds in Nevada.
STEP 7 INSTITUTIONALIZING THE PROCESS
Institutionalizing the Process

• The way in which a new or changed process is incorporated into existing policies or management programs

• Starts at the higher levels

• Important to link to firmly established agency goals
• **Stakeholder buy-in**
  
  – Requires more than adoption of operational activities or processes
  
  – Example, effective operation of the I-80 corridor during winter involves multiple state DOTs, interagency cooperation, and established operational procedures.

• **Tangible results**
  
  – Benefits and outcomes must be tangible and directly related to each agency and operating unit
• Developing formal documentation that is accessible and available to everyone
  – Example, inter-agency agreement on a network directory

• Ensure documentation is sustainable
  – Documents such as MOUs that require formal approval have a better likelihood of outlasting informal agreements
NDOT Example

- Long-standing agreement between Caltrans and NDOT established the initial framework.
- Cooperation between the agencies allowed for the installation of necessary infrastructure.
- Collaboration prewinter allows both states to continually review and refine procedures.
- Need to provide information to freight traffic has inspired key enhancements for NDOT.