Traffic Control System Management
L01 e-Tool Demo
Introduction

- 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
Introduction

• 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

- 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
- San Pablo Avenue Signal Retiming
  - Identified as key by the SMART Corridor Program
  - Funded through the Metropolitan Transportation Commission (MTC) Regional Signal Timing Program (RSTP)
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
San Pablo Example

- Identified a need for a revised signal timing plan
- Goal of addressing recurring congestion and improving travel time reliability
STEP 3
IDENTIFYING AND DOCUMENTING CURRENT BUSINESS PROCESSES
Identifying and Documenting 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
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?
- The San Pablo Corridor Project has the following stakeholders:
  - Metropolitan Transportation Commission (MTC)
  - Alameda County Congestion Management Association (ACCMA)
  - SMART Corridor Program
  - Alameda County Costa Transit District
  - The motorists
Identifying and Documenting Business Processes

• 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
San Pablo Example

- Will work with new Program for Arterial System Synchronization (PASS)
  - Group signals into logical segments
  - Develop new signal timing plan
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
San Pablo Example

- Improved corridor timing plans will maximize the corridor capacity during normal operating procedures.
- Emergency vehicle preemption will minimize impacts on travel times during major incidents, allowing emergency vehicles to arrive at a scene more quickly.
- Transit signal priority improves the travel time reliability for the transit users.
Each corridor has seen increases in capacity and travel time reliability

MTC has seen a 10 percent improvement in travel time and 10 percent increase in speed for the entire region
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
• 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
• Final report to MTC requires
  – Improvements to travel times
  – Fuel savings
  – Emission reductions
  – Benefit-cost analysis
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
Strategies and Considerations

• **Stakeholder buy-in**
  
  – Requires more than adoption of operational activities or processes
  
  – Example, strong initial buy-in from Florida DOT and FHP for Road Ranger program was key to its continuing operations

• **Tangible results**
  
  – Benefits and outcomes must be tangible and directly related to each agency and operating unit
Strategies and Considerations

• 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
San Pablo Example

- Significant funding needed to interconnect communication between all signals
- Until funding is found, GPS/time clocks are installed in corridors within multiple jurisdictions
- Have established a well-integrated regional signal timing plan