Photos courtesy of FHWA

SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

Improving Business Processes for More Effective Transportation Systems Management and Operations (TSMO) – Work Zone Management

Texas DOT

October 24, 2018

U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Workshop Overview

Purpose:
Learn how to apply business process improvements to enhance transportation systems management and operations (TSMO)

Objectives:

- Understand business processes in the context of TSMO
- Understand how enhanced business processes can lead to improved TSMO and Work Zone Management activities
- Apply available tools to develop or improve a specific Work Zone Management business process
- Understand how to apply these principles and tools to enhance other business processes in the future

Agenda

- Welcome and Introductions
- Business Process Applications and Tools for TSMO and Work Zone Management
- Improving Business Processes
- TxDOT Business Process Improvement:

  Implementing Smart Work Zones
- Lunch Break (off-site)
- Business Process Mapping Exercise
  - Report-Out and Discussion
  - Action Planning
- Applying What You've Learned and Next Steps

SHRP2 Overview

Background on SHRP2 and Reliability Research

- Pat Zelinski, AASHTO

Welcome and Introductions

Self-Introductions by Participants

- Anyone not at the yesterday's workshop?
- A few volunteers to share one thing you'd like to learn from this workshop

Feel Free to Comment or Ask Questions at Any Time

Pre-Workshop Poll

Your first TEST!

1. **How often do you think you use business processes in your work?**

2. **How important do you think business processes are in your work?**

Pre-Workshop Poll

Go to **www.menti.com** and use the code **27 15 6**

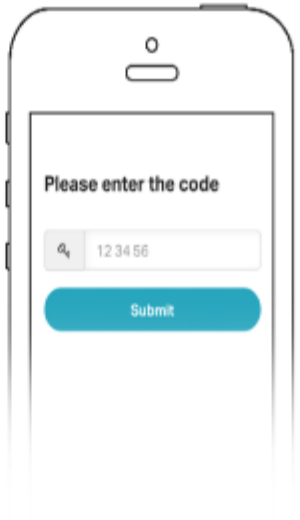
1

Grab your phone

www.menti.com

2

Go to www.menti.com



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Enter the code 68 93 70 and vote!

Pre-Workshop Poll

Use and Importance of Business Process

Participant Poll Results

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Business Processes and Application to TSMO

Business Process and Application to TSMO

Overview of Business Process

What is a Business Process?

A series of logically related activities or tasks performed together to produce a defined set of results.

What is a Business Process?

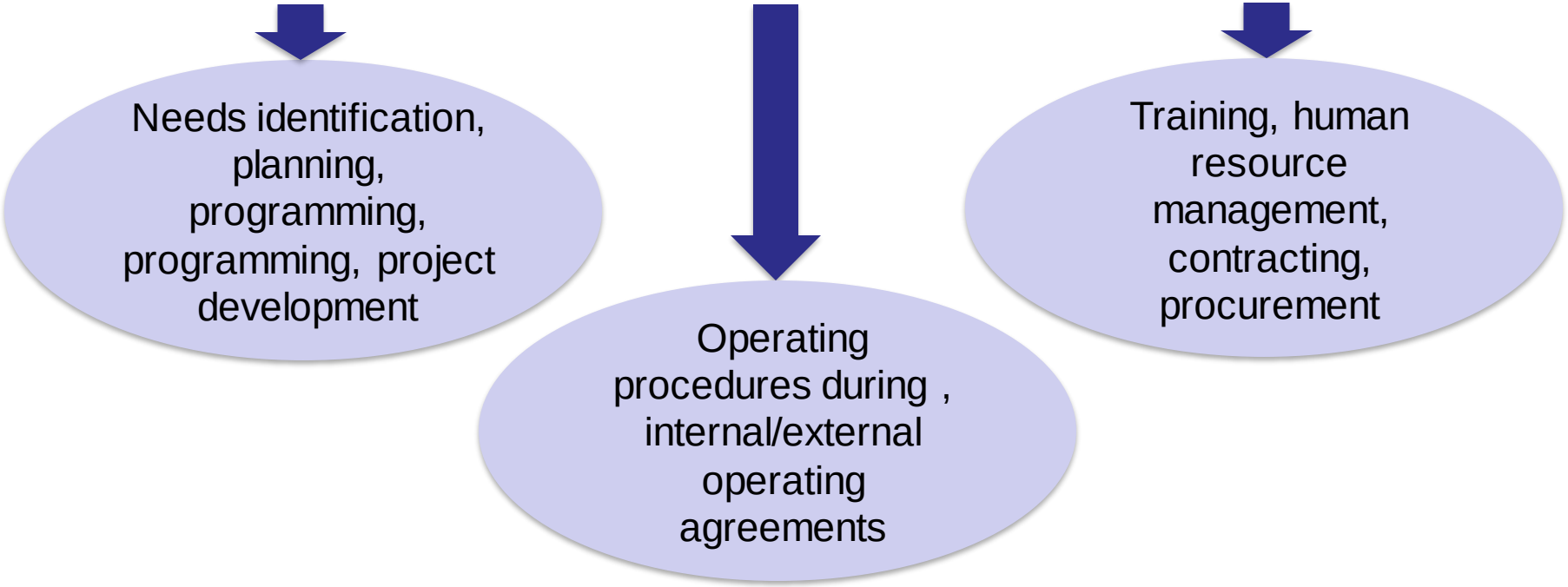
Process Matters!

Several "processes" may be in place, but may not be followed

Change is ever-present (e.g., staff, leadership, technology, operations, reporting needs)

Types of Business Processes

Management Processes	Operational Processes	Supporting Processes
Govern the overall functioning of the agency's TSMO effort	Define how the organization performs TSMO	Put in place to support the core operational processes



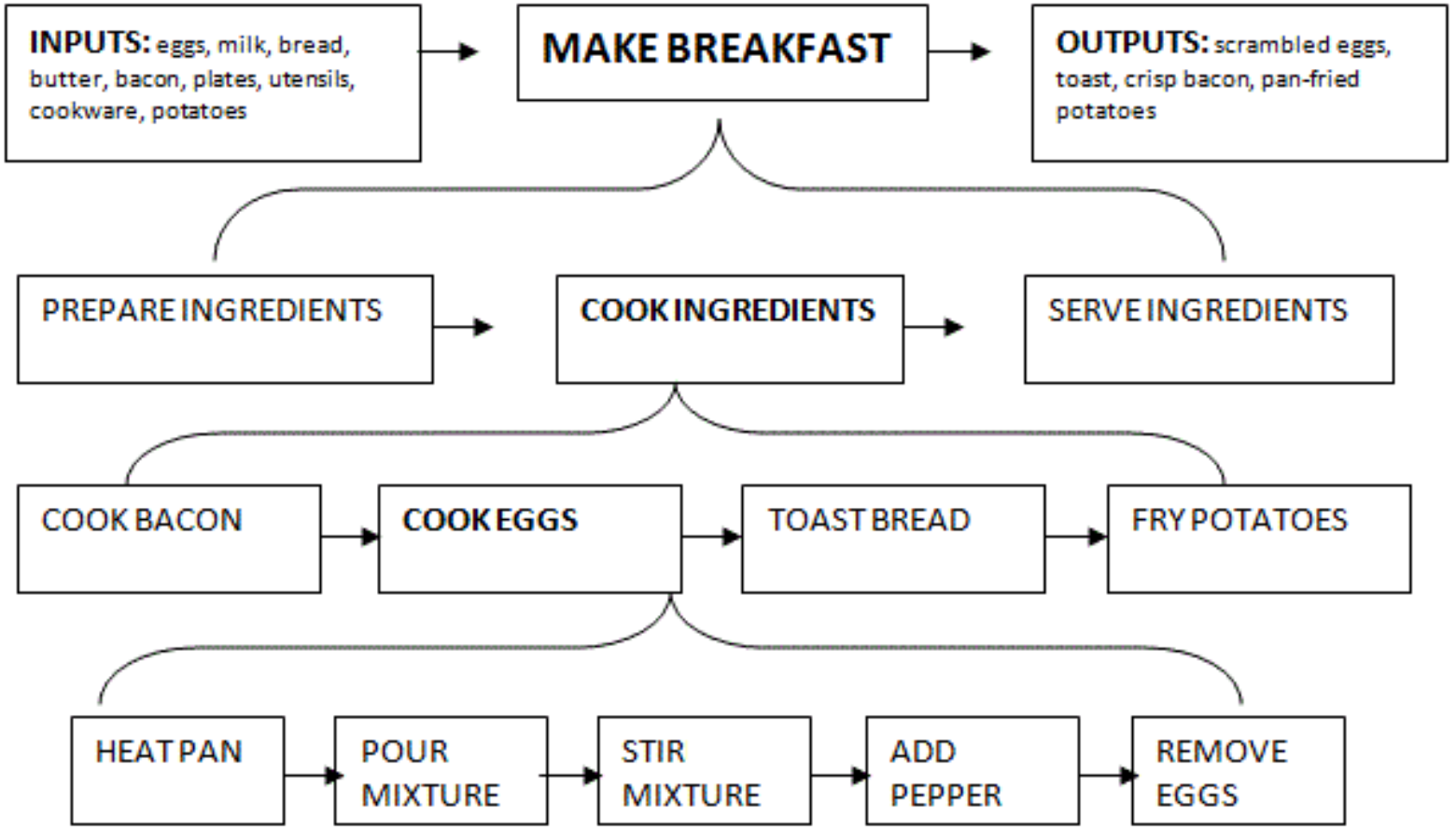
Source: *Integrating Business Processes to Improve Transportation System Performance* Technical Brief, FHWA-HOP-17- 053, FHWA, Dec. 2017

Business Processes Mapping

Business Process Mapping

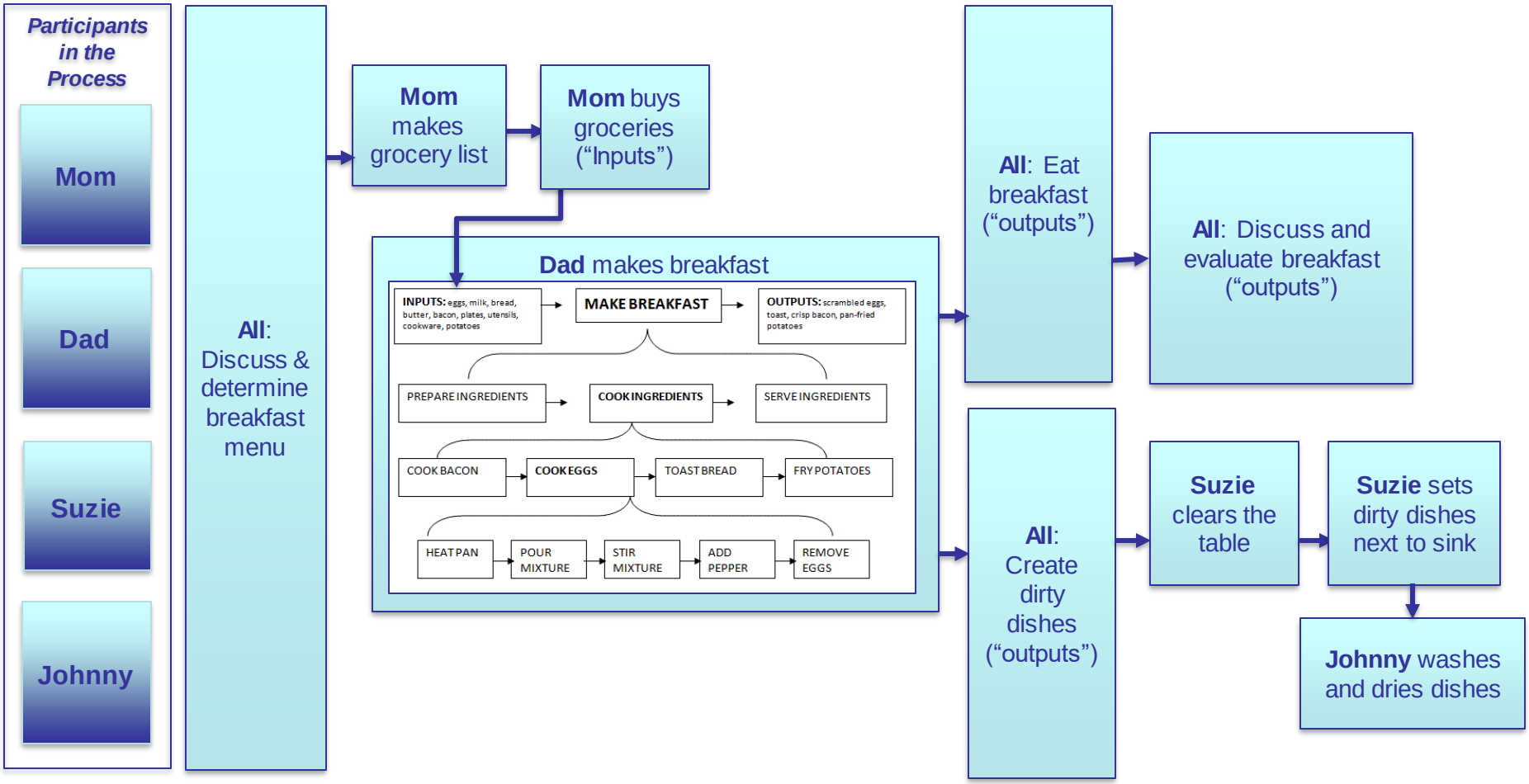
- **Visual representation** of steps, connections, information flows, and responsibilities from start to finish
- Concise picture of the **sequences of tasks** needed to bring a service from genesis to completion
  - Indicates **decision points**
  - Identifies **when** the process takes place, **why** it takes place, and **who** is involved in the process & responsible for decisions
- A good business process map:
  - Can be **validated**
  - Helps identify **where delays exist**, where smooth handoffs are not taking place, and what steps may be eliminated
  - Helps to **improve** processes

Business Process Mapping Example



Scottsm1991

Business Process Mapping Example (with interactions)



Business Process
Application to TSMO and Work Zone Management

Application to TSMO

Transportation Systems Management and Operations (TSMO)

"**Integrated strategies** to **optimize the performance** of existing infrastructure through the implementation of **multimodal and intermodal, cross-jurisdictional systems**, services, and projects designed to **preserve capacity** and **improve mobility, safety, and reliability of the transportation system.**"

Supported by ITS technologies

Application to TSMO

TSMO Strategies

- Traffic incident management
- Road weather management
- Planned special events
- **Work zone management**
- Traveler information (511)
- Arterial management
- Managed Lanes
- Integrated Corridor Management (ICM)
- Active Traffic Management (ATM)
- Transportation Demand Management
- Ramp metering

Application to TSMO

Examples: Work Zone Management Strategies

- Innovative contracting approaches
- Increased stakeholder engagement
- Transportation Management Plans (TMPs)

Technology / ITS / Smart Work Zones:

- Queue warnings
- Variable speed limits
- Speed detection and feedback
- Dynamic merge
- Traveler information - alternate routes, trip times, lane closures, work zone limits

Why are Business Processes Important to TSMO?

- **Successful operational activities** and relationships are highly dependent upon effective business practices.
- Helpful in **breaking down organizational barriers**, improving **coordination**, and increasing **efficiency**.
- Documentation of business processes **enables efficient transition with staff turnover** and new organizational partners.
- **Lack of effective business processes** can **hinder an agency's capacity** to advance more complex operational strategies.

Why are Business Processes Important to TSMO?

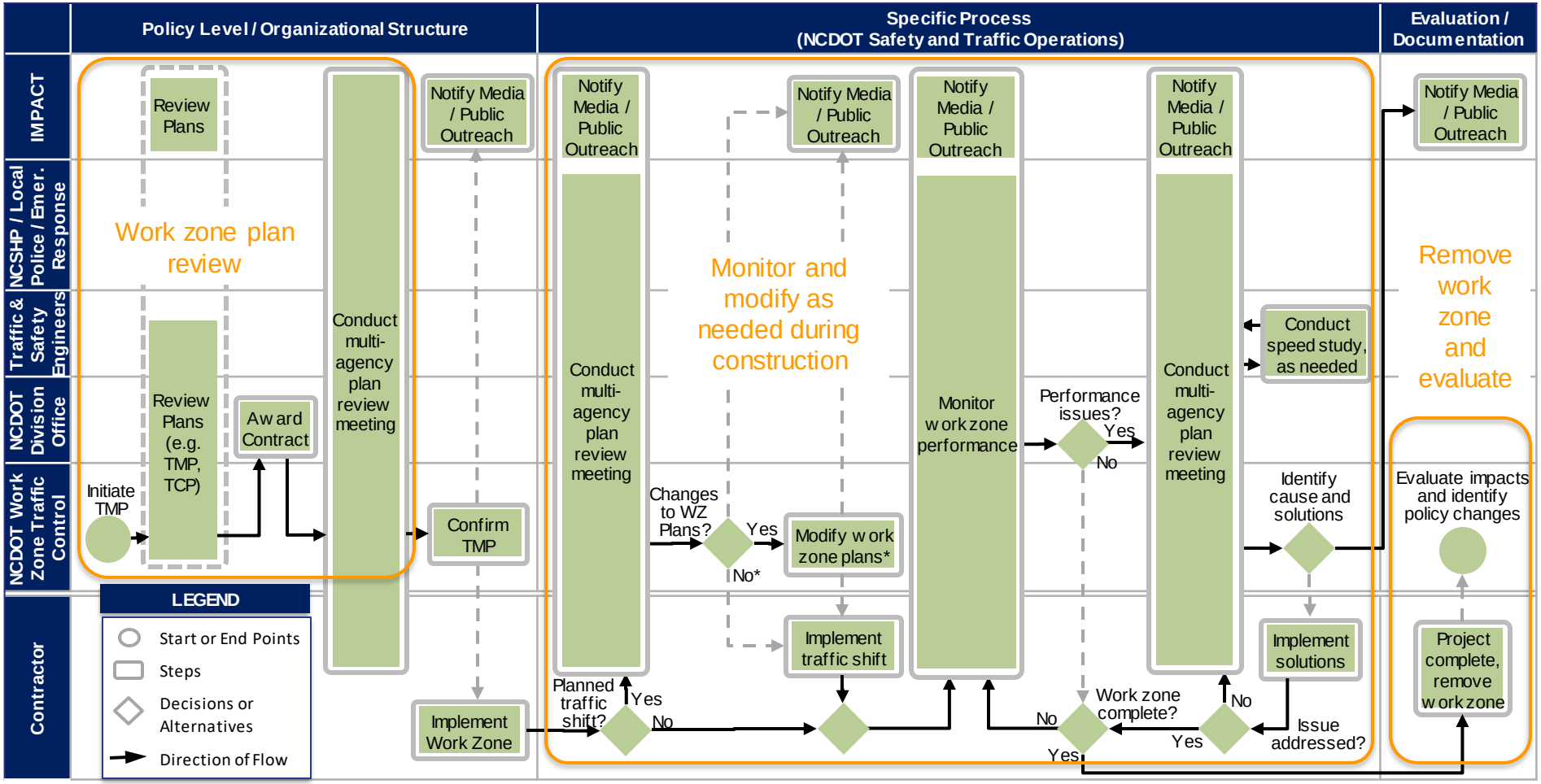
Goal to move from one level to the next

	1 - Performed	2 - Managed	3 - Integrated	4 - Optimized
Business Processes				
Systems & Technology				
Performance Measurement				
Culture				
Organization & Staffing				
Collaboration				

Examples of TSMO Business Processes

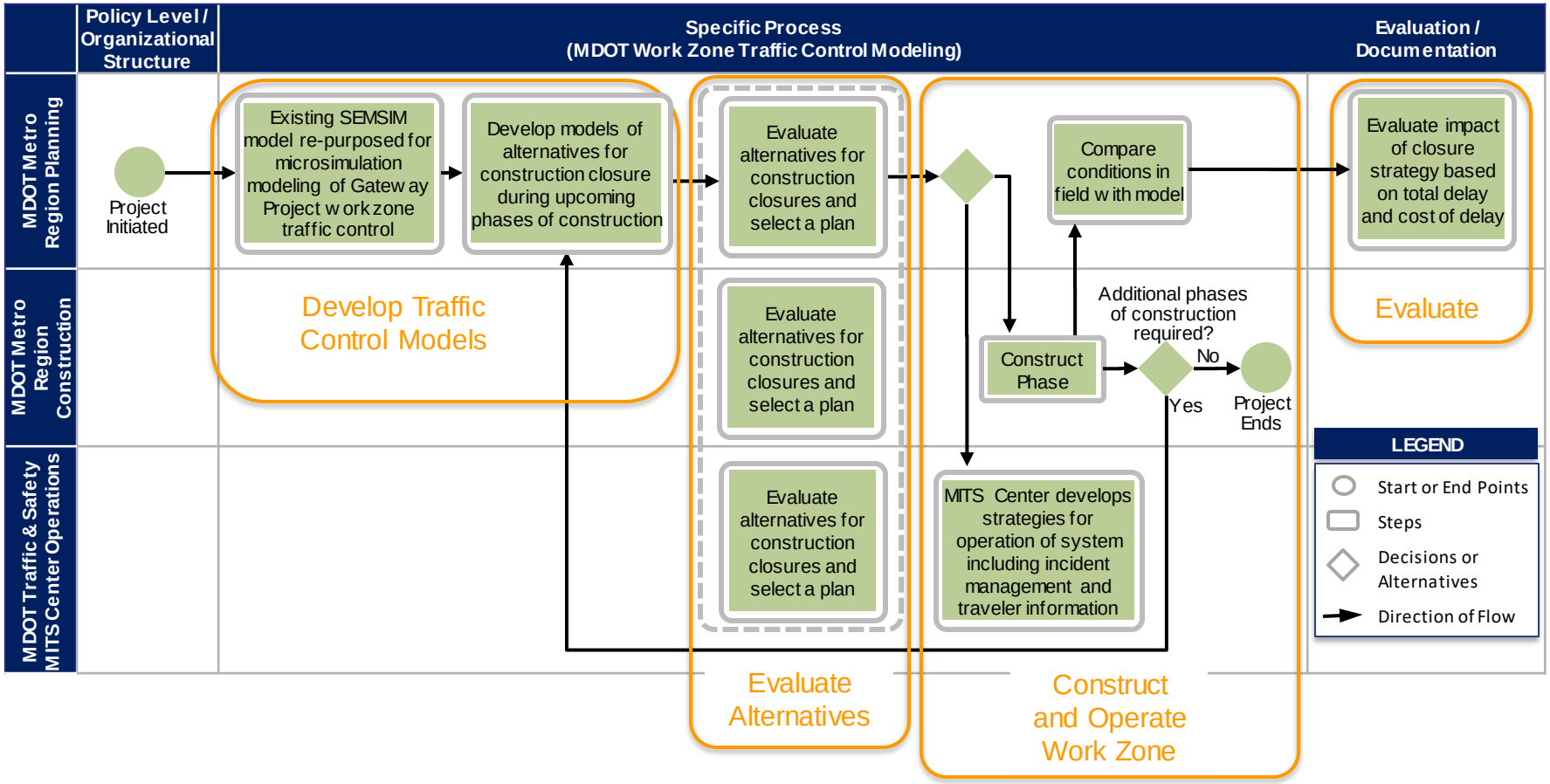
- TSMO in **planning and programming** processes
  - Work Zone Management strategies in agency-wide plans, policies, budgets
  - Coordination among divisions (e.g. design and construction for WZs)
- Establish **lines of communication** internally and with stakeholders
  - Internal and external communication protocols
  - Statewide or project-specific committees (RWM, TIM, major WZs)
- Develop **agreements** with partners and stakeholders
  - Resource sharing – e.g. fiber, data
  - Define working relationships – local agencies, law enforcement
- Enhance **organizational support** to accommodate TSMO
  - TSMO divisions established, operations-focused training in place
- Evaluate and revise **operating procedures & processes**
  - Standard operating procedures (SOPs) for integrating camera systems
  - Statewide innovative contracting procedures

Work Zone Planning and Monitoring by NCDOT Traffic & Safety Operations Committee



Source: *E-tool for Business Processes to Improve Travel Time Reliability* Final Report, 2014. www.fhwa.dot.gov/goshrp2/Content/Documents/Factsheets/SHRP2_L34_Final_Report1401.pdf

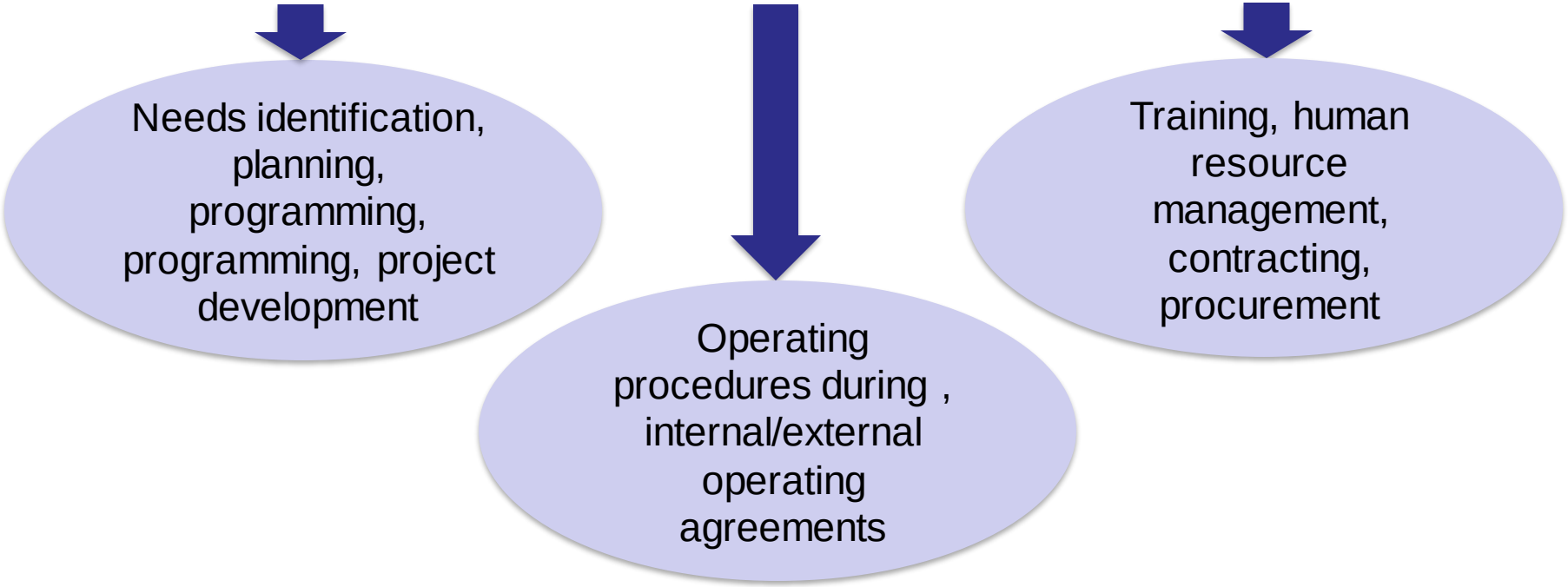
Michigan DOT Work Zone Traffic Control Modeling



*Source: *E-tool for Business Processes to Improve Travel Time Reliability* Final Report, 2014. www.fhwa.dot.gov/goshrp2/Content/Documents/Factsheets/SHRP2_L34_Final_Report1401.pdf

What Business Processes Do You Use in Your Work?

Management Processes	Operational Processes	Supporting Processes
Govern the overall functioning of the agency's TSMO effort	Define how the organization performs TSMO	Put in place to support the core operational processes



Source: *Integrating Business Processes to Improve Transportation System Performance* Technical Brief, FHWA-HOP-17- 053, FHWA, Dec. 2017

Issues and Challenges

- Business processes and changes **can be developed at a relatively low cost!**
- However they can be difficult to accomplish:
  - Requires input of multiple individuals
  - Current processes are often entrenched
  - Some processes may be beyond the control of DOT
  - People generally don't like change
  - Need to make the case for business processes

Issues and Challenges

No two agencies or regions are alike

- Unique **institutional policies and cultures**
- Different **organizational structures** and **reporting relationships**
- Variation in **stakeholders**
- Varying and sometimes changing **levels of institutional readiness** and **leadership support** for TSMO
- Different **TSMO strategies** require different types of business processes

Tools for Developing Business Processes

Tools for Developing Business Processes

There is no one-size-fits-all solution to developing and improving business processes…

But there are tools agencies can use to IDENTIFY / DEVELOP / IMPROVE business processes within unique environments

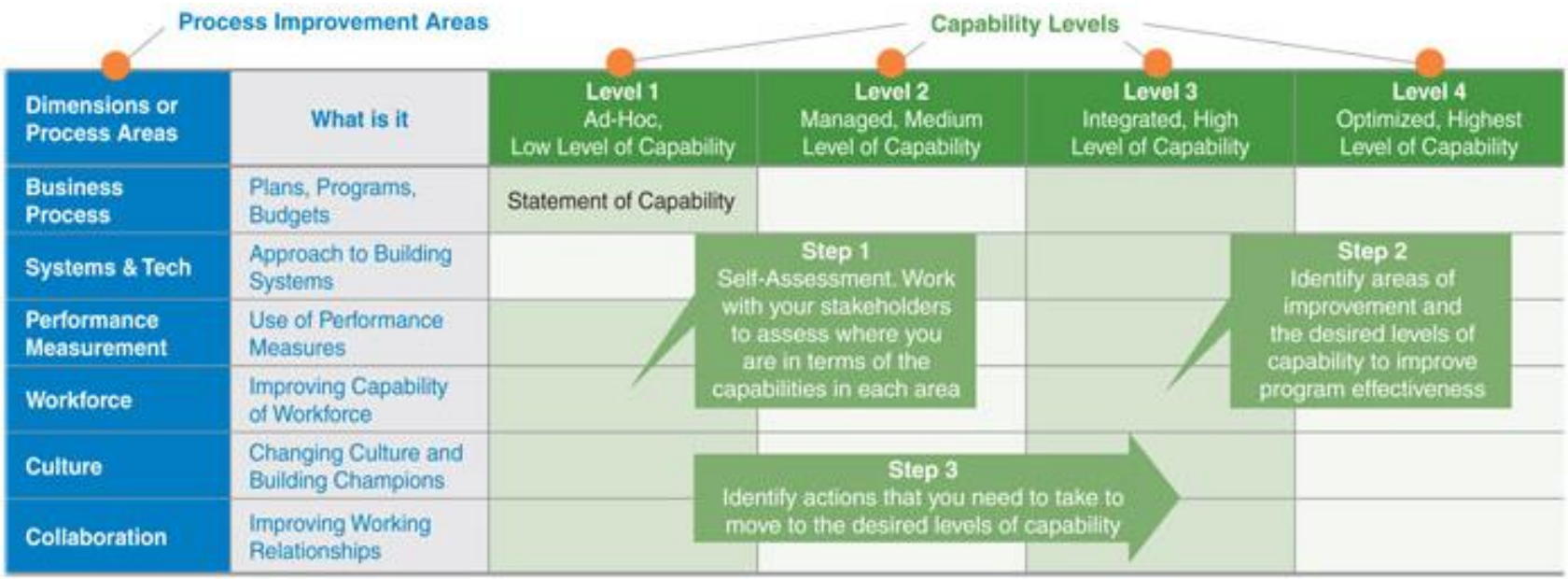
Tools for Business Processes

- **FHWA Capability Maturity Frameworks (CMF)**
  - Assess various aspects of an operations program
  - Online self-assessment tools to identify actions & business process improvements
- **Primer: *"Improving Business Processes for More Effective Transportation Systems Management and Operations"***
  - Developed under the Second Strategic Highway Research Program (SHRP2) L01 (Businesses Processes for Reliability)
  - Guidance with 7-step approach to improve business processes
- **E-Tool for Business Processes to Improve Travel-Time Reliability**
  - For use in group setting, to create or improve a business process

Capability Maturity Frameworks

Assess capabilities, identify improvements, select actions

Online Assessments: Work Zone Management, Traffic Management, Signal Management, Special Event Management, Incident Management, Road Weather Management

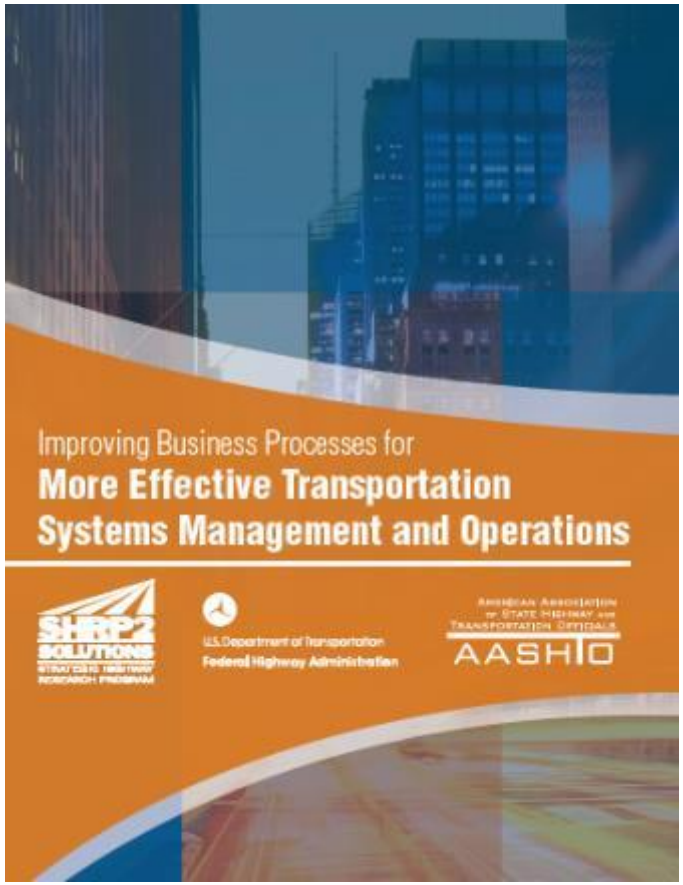


Available at: https://ops.fhwa.dot.gov/tsmoframeworktool/index.htm

TSMO Business Process Primer

Helps transportation agencies accomplish the following:

- Understand the **importance of developing sustainable business processes** to effectively advance TSMO as a mainstream, core agency function
- Assess agency **business processes related to TSMO**
- Identify **constraints and gaps** within agencies' current business processes
- Engage **the right stakeholders** to identify needs and develop actions and strategies that can improve business processes to support more effective TSMO programs



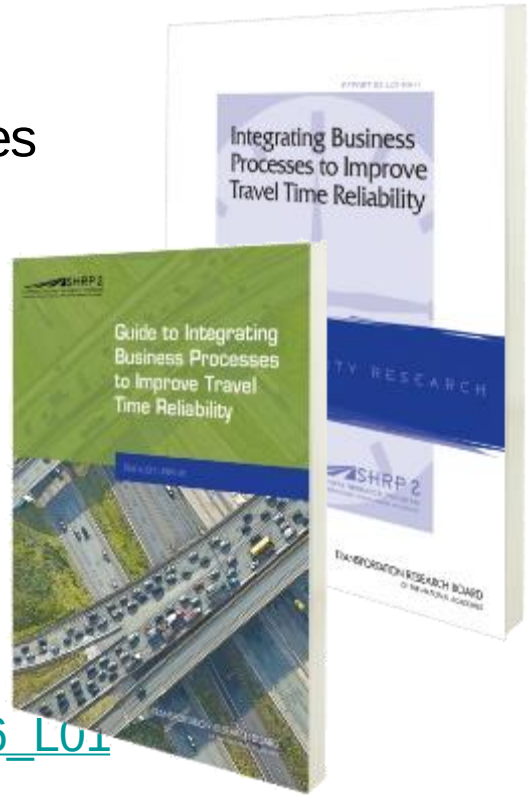
TSMO Business Process Primer

1. Introduction
2. Business Process Development
3. Traffic Incident Management
4. **Work Zone Management**
5. Planned Special Events
6. Road Weather Management
7. Traffic Management
8. Checklist for Getting Started
9. Available Resources

- Business process issues
- Case studies
- Example questions to consider in identifying specific business process issues
- Business process challenges
- Potential stakeholders

Introduction to E-Tool

- Developed as a follow-up to SHRP2's *Integrating Business Processes to Improve Travel Time Reliability (L01)* research
- E-tool used as a discussion guide to:
  - Define and evaluate current business processes
  - Identify improvements to enhance operations
  - Help remove barriers to implementing and maintaining improved processes
  - Capture inputs and action items
- Orientation module and application module
- Available at: http://www.fhwa.dot.gov/goshrp2/Solutions/Available/L06_L01_L31_L34/Organizing_for_Reliability_Tools

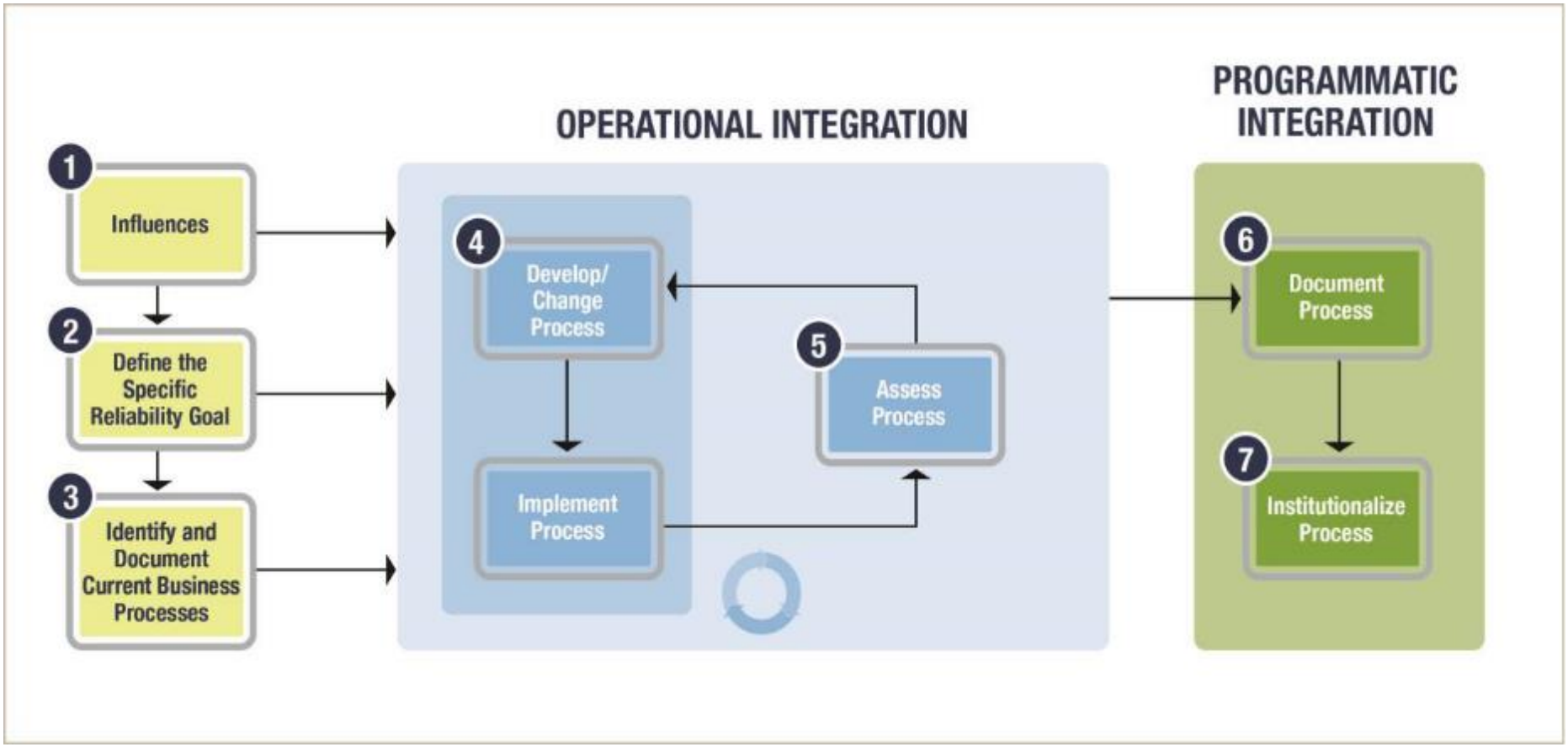


Business Processes and Application to TSMO

Preparing for Business Process Improvement

- **Engage Stakeholders**
  - Critical for effective process improvements
  - Involving multiple perspectives can raise awareness of potential or actual issues that might not otherwise be identified
- **Assemble Relevant Materials**
  - Planning documents (TSMO plans, ITS architecture, long-range plans)
  - Organizational structures (org charts, levels of authority)
  - Agency mission statement, goals, and objectives
  - Performance measures and data
  - Agreements, policies, guidelines
  - Current operating procedures
- **Facilitate a forum for examining business processes**
  - Workshop or structured discussions

7-Step Approach for Improving Business Processes



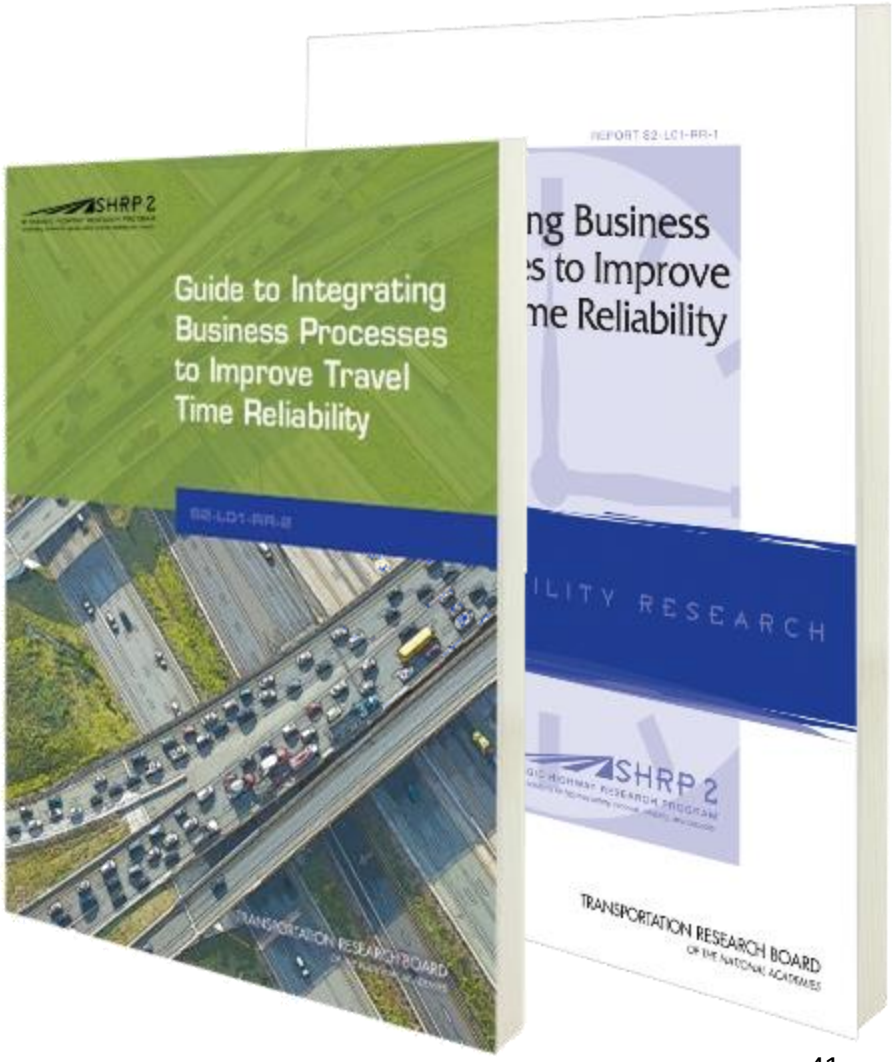
Step 1 - Identify Influences

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 Influences

- Also known as “big directive”
  - Legislative requirements
  - Directives from agency management
  - New venues or expansions driven by elected officials
    - Need for coordinated special event management with new event facilities
    - Need for signal retiming with new development

Event Driven Influences

- Caused by a specific event or hazard
  - Fatality in a construction work zone
  - Weather event causing significant impacts to travelers
  - Major incident with significant closure times and traffic disruption
  - May be accompanied by media and public perception impacts

Needs Based Influences

- Also known as “opportunity based”
  - Initiated at grass-roots level
  - Evolves over time according to recurring needs
  - Influences day-to-day operations
  - E.g. Florida DOT Road Rangers Highway Assistance Program
    - Initially implemented for work zones
    - Later expanded to assist stranded motorists

2 – Define Goals

- Used to measure success
- Focuses your efforts
- Assists in developing benchmarks
  - Reducing incident clearance time
  - Providing 24/7 operations
  - Improving resource efficiency
  - Reducing congestion
  - Reducing delays

2 – Define Reliability Goals

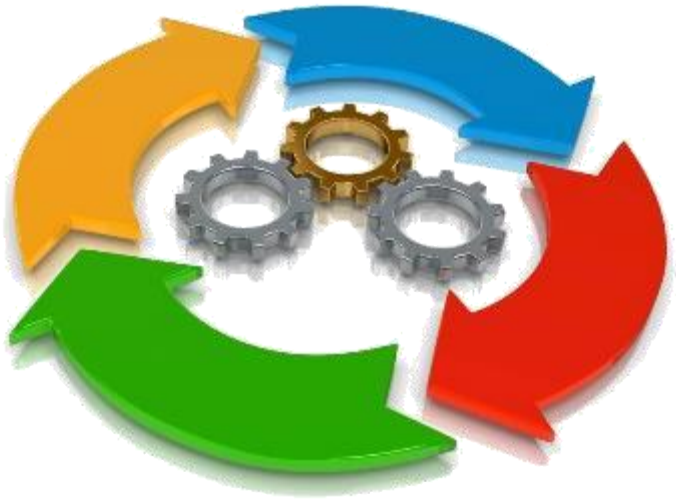
Examples:

- Provide incident clearance within 60 minutes for major freeway incidents
- Achieve on-time performance service within 5% of scheduled times for major transit bus routes
- Reduce delays through work zones by providing information about alternate routes
- Achieve actual travel times through work zones within 10% of anticipated travel times

3 - Identify and Document Current Business Processes

- As previously discussed, a **business process:**
  - Defines a series of actions or activities that result in a specific or desired outcome to accomplish a goal
  - Is likely something your agency does on a daily basis

- This step documents the existing business process



3 – Identify and Document Current Business Processes

Why?

- Better understand your current process
- Identify appropriate stakeholders
- Identify gaps in communications or data flows
- Identifies roles and responsibilities to:
  - Ensure continuity
  - Retain institutional knowledge

4a – Develop/Change Process

Change or develop new business process to reflect:

- Influences, goals, policy, procedures
- Input from stakeholders
- How could the process be improved?

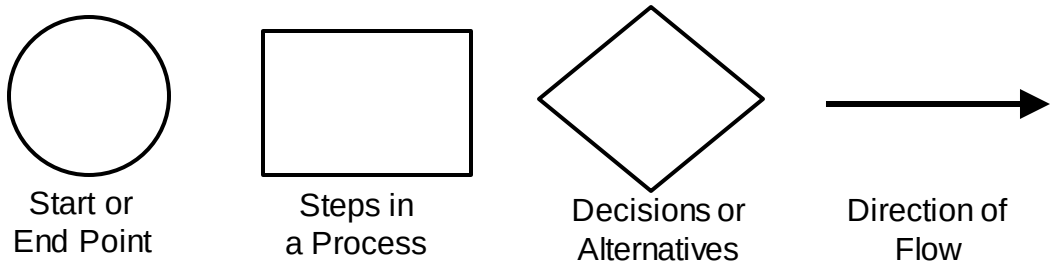
4a – Develop/Change Process

- Document the process or reverse engineer the current process
  - Data flows
  - Decision points
  - Process integration points
  - Critical input and output
  - Responsible entities
  - Integration of processes
- Create a visual representation of the process

Business Process Mapping

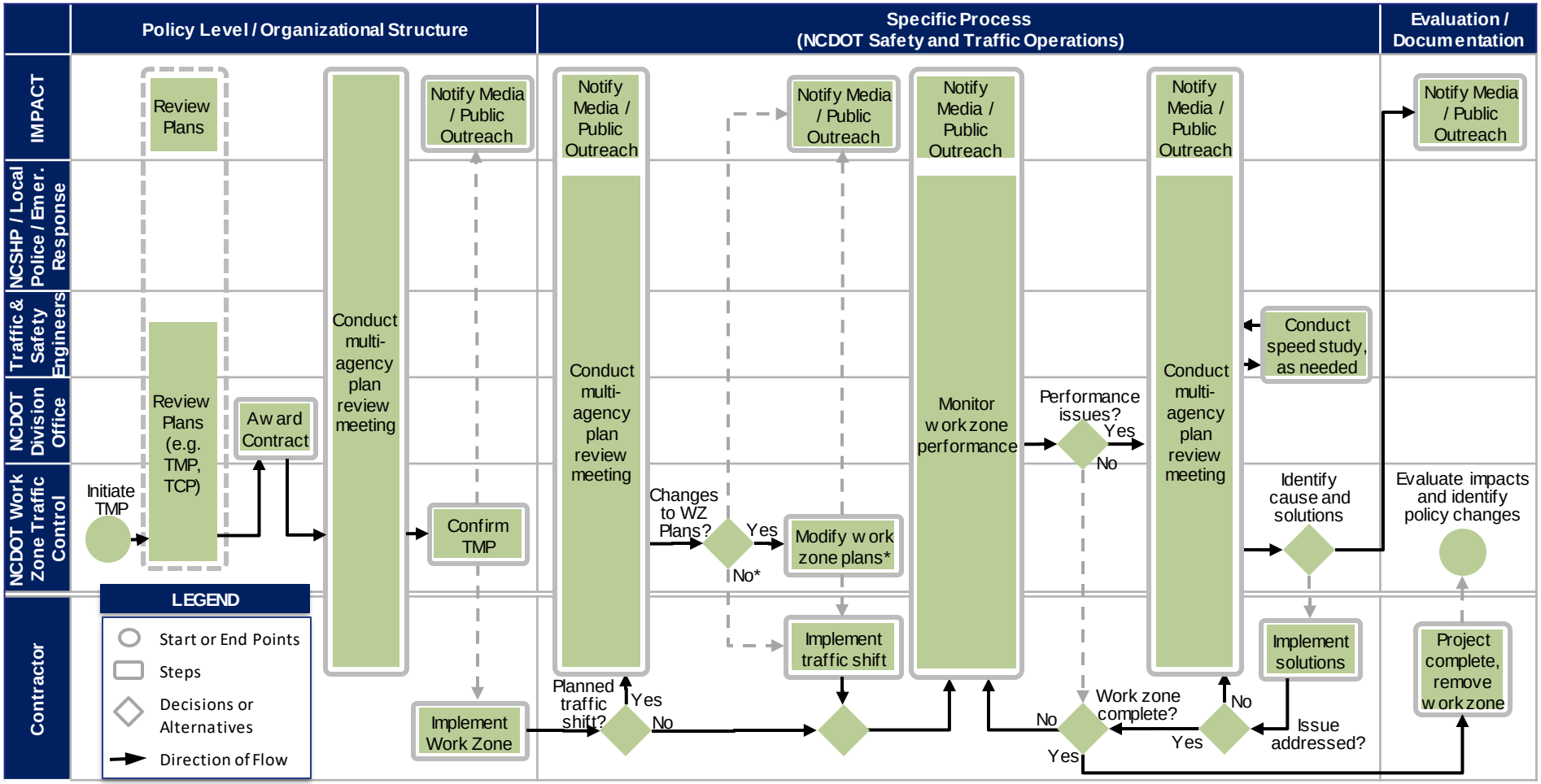
4a – Develop/Change Process

Business Process Mapping – Symbols



3 – Identify and Document Business Processes

Work Zone Planning and Monitoring – NCDOT Traffic and Safety Operations Committee



4b - Implement Process

- **The approach to this step varies:**
  - Number of agencies involved
  - Depth of process
- **Involve all stakeholders**
- **Timeframe for implementation**
  - Depends on agency's ability to develop/change the current business process
  - Needs to be sufficient to allow stabilization of new process
  - May include more than one iteration to implement/assess

5 – Assessing the Process

Important to determine the effectiveness of the newly developed process

5 – Assessing the Process

- **Assessment:**
  - Identify measures of success
  - Outline methods of continuous evaluation
  - Identify data needed
  - Review results against the defined goals
- **Benefits:**
  - Better communication with stakeholders
  - Opportunity for ongoing performance measurement
  - Comparison to pre-implementation conditions

6 – Documenting the Process

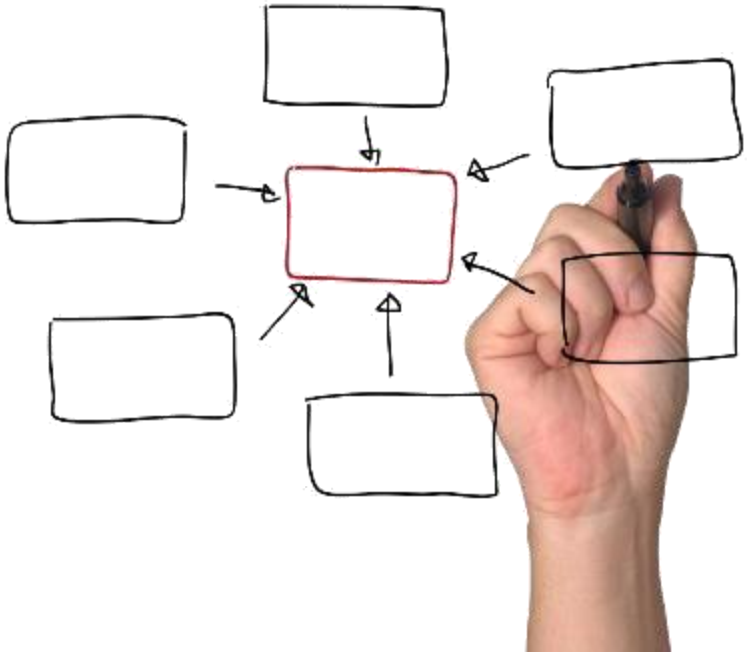
- Formal documentation occurs once the process has been implemented and proven effective
- Includes:
  - Details of the business process
  - Assessment procedures
  - Benefits
  - Lessons learned
  - Roles and responsibilities

6 – Documenting the Process

- Facilitates updates to processes as conditions change
- Examples of documentation:
  - Internal memoranda
  - Memoranda of understanding
  - Agreements between stakeholders
  - User guides
  - Reports
  - Flowcharts

7 - Institutionalizing the Process

- Process is embedded into existing policies or programs
- Starts at higher levels and survives changes in management
- Linked to established agency goals
- Documentation is key!



7 - Institutionalizing the Process

- Strategies for Institutionalizing Process
  - Obtain buy-in and ongoing support
  - Link to agency goals
  - Make documentation accessible and available
  - Maintain documentation – keep it current
  - Communicate performance to inform management and decision-making

TxDOT Business Process

"Implementing Smart Work Zones"

Resources for TxDOT Smart Work Zones

Henry Wickes, TxDOT and John Song, AECOM

SMART WORK ZONE STANDARDS DEVELOPMENT

John Song, PhD, PE

AECOM

Agenda

- General process for standards development
  - Smart Work Zone Systems Considered
- Smart Work Zone Specifications
- Smart Work Zone Guidelines
  - Selection criteria for the Smart Work Zone Systems
- Smart Work Zone Standard Drawings
- Next Step

General Process

- State of the Practice Review
- State District/Division Surveys
- Initial Recommendations
- Initial Standard Sheet, Specs and Design Guidelines Development
- State Districts and Vendor/Manufacturer Comments
- Revised Standard Sheets, Specs and Design Guidelines Development
- State Spec Committee Approval
- **Submittal to Outside Agencies and other State Entities - Finalizing**

General Process

State District/Division Surveys:

- Intended to solicit District input on operational needs and requirements.
- Distributed to all Districts 8/23/17.

Standard Sheet, Specs and Design Guidelines Development:

- Distributed to Districts and Vendors 12/1/17 for review.
- Focused on 6 proposed work zone ITS systems.
- Received responses from 12 districts, TRF, and 5 vendors/integrators.
- Proposed Specs were submitted to CST - Specification Committee
- All six proposed specs approved with comments at February 2018 Spec Committee meeting.
- CST to submit to AGC, FHWA, etc. for review.
- Addressed comments from review

General Process

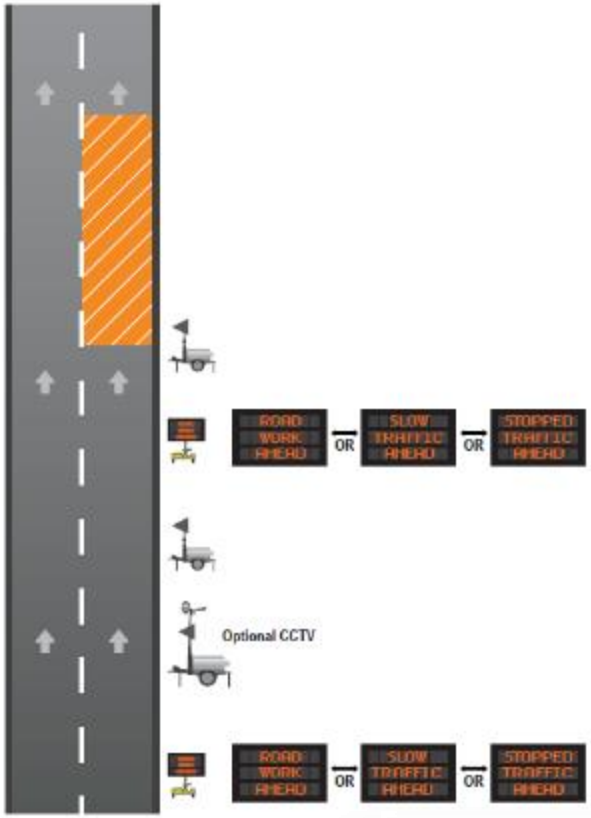
Systems Considered:

- Temporary Queue Detection System (End of Queue Warning System)
- Temporary Travel Time System
- Temporary Construction Equipment Alert System
- Temporary Incident Detection and Surveillance System
- Temporary Over-height Vehicle Warning System
- Temporary Speed Monitoring System

Smart Work Zone Scope:

- Specifications
- Guidelines
- Standard Drawings

Temporary Queue Detection System



Problem Statement:

- Incoming vehicle being confronted with slowed or stopped traffic in work zone

Countermeasure:

- A system with queue detector, messaging feature, and a network to link the two and TMC
- Increase situational awareness

Temporary Speed Monitoring System

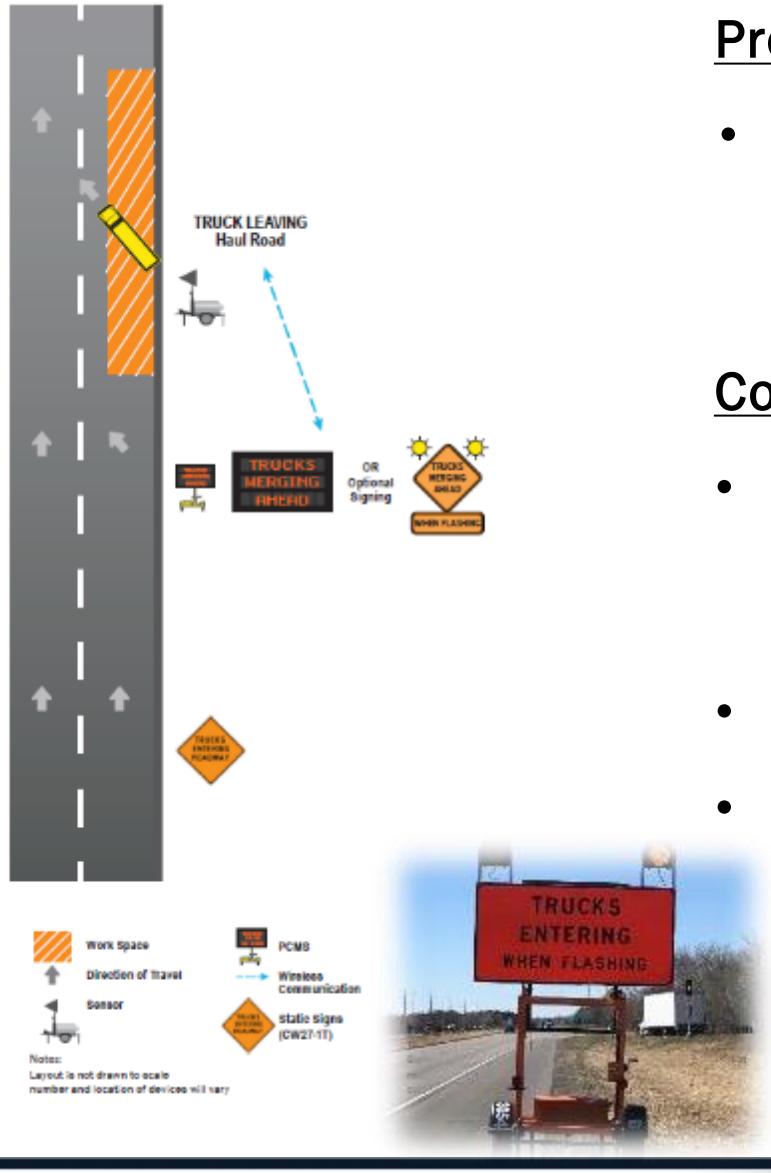
Problem Statement:

- Excessive, unsafe speed in work zone
- Non-uniformity of speed (high or low)

Countermeasure:

- Basic system: trailer mounted radar detector with 2-digit LED message board
- Advanced: speed compliance system
- Improve speed compliance

Temporary Construction Equipment Alert System



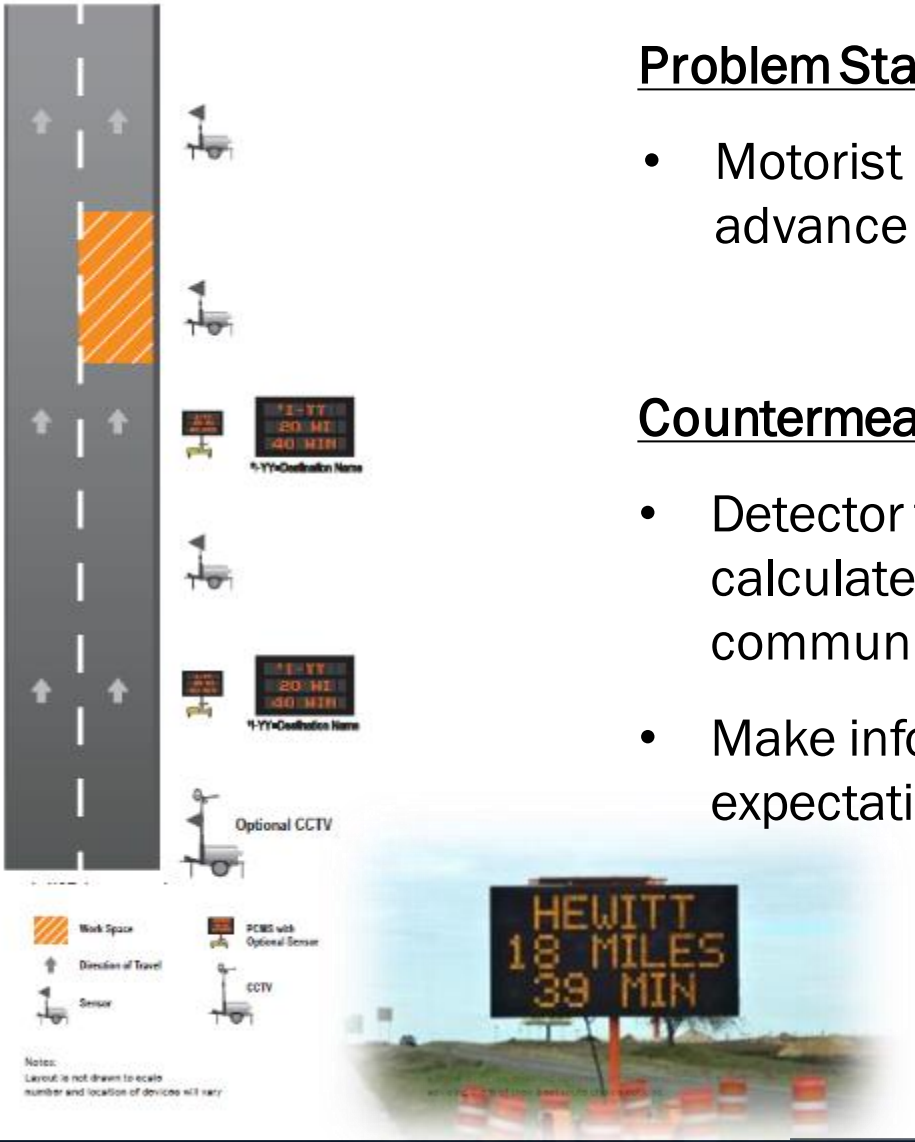
Problem Statement:

- Construction vehicle merging to traffic stream from work zone

Countermeasure:

- Truck detector, a message board and wireless communication to trigger the sign
- No link to TMC required
- Inform approaching vehicle

Temporary Travel Time System



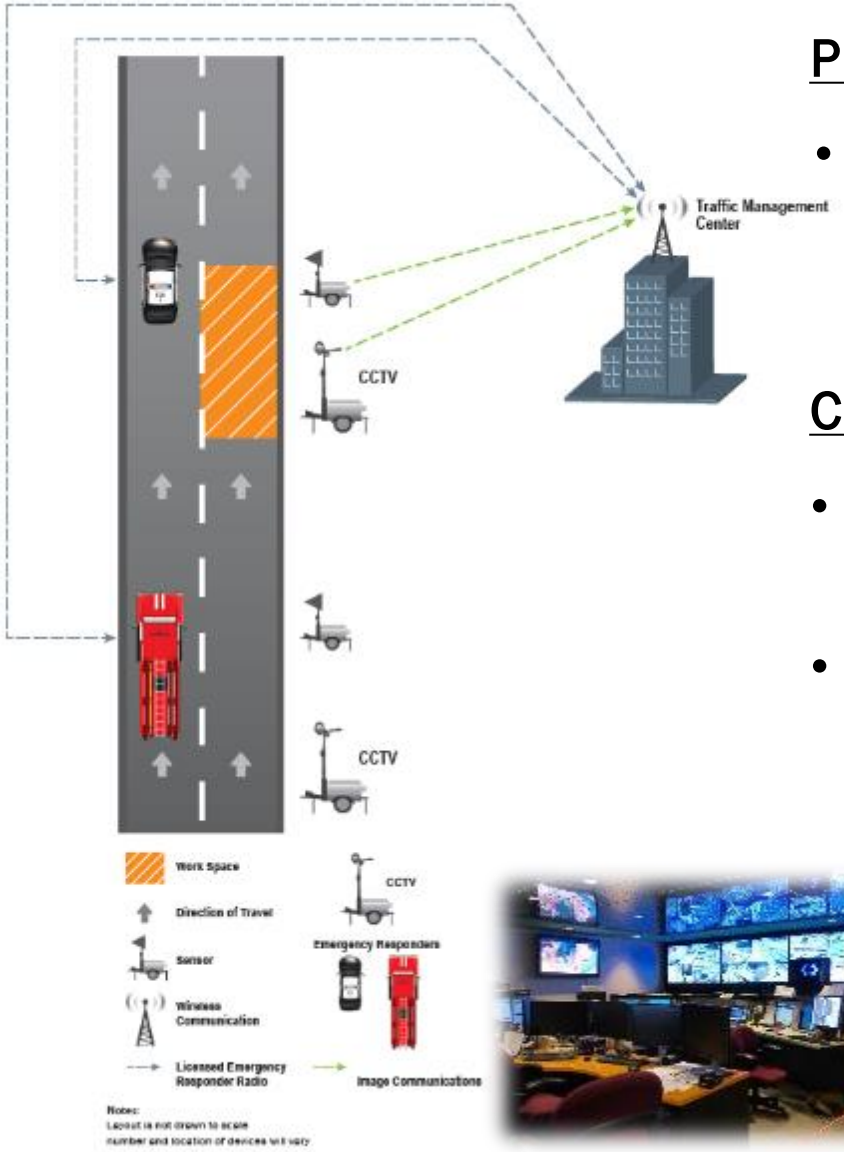
Problem Statement:

- Motorist need travel time / delay in advance work zone

Countermeasure:

- Detector throughout the work zone to calculate travel time, message board and communication links
- Make informed decision, set realistic expectation, encourage diversion

Temporary Incident Detection and Surveillance System



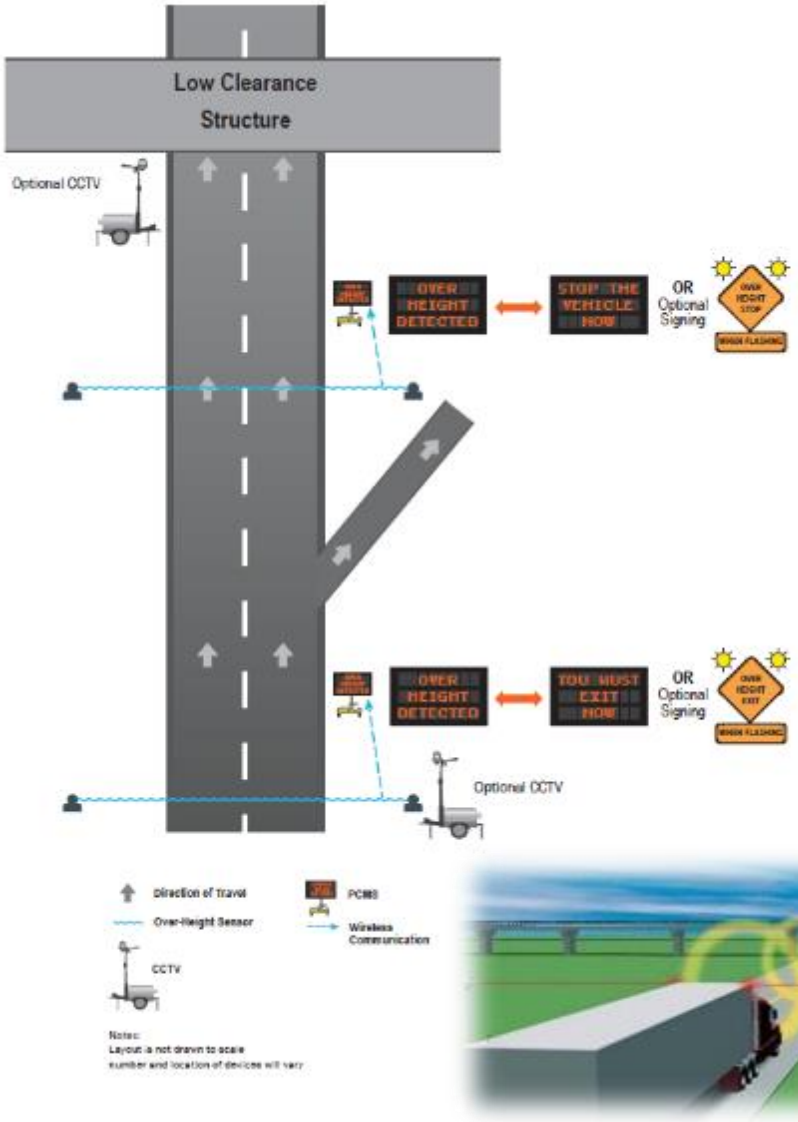
Problem Statement:

- Higher than normal incident risk in most work zones and worse impact

Countermeasure:

- Speed detector, CCTV and communication links
- Reduce the time to detect, respond and clear incidents

Temporary Over-Height Vehicle Warning System



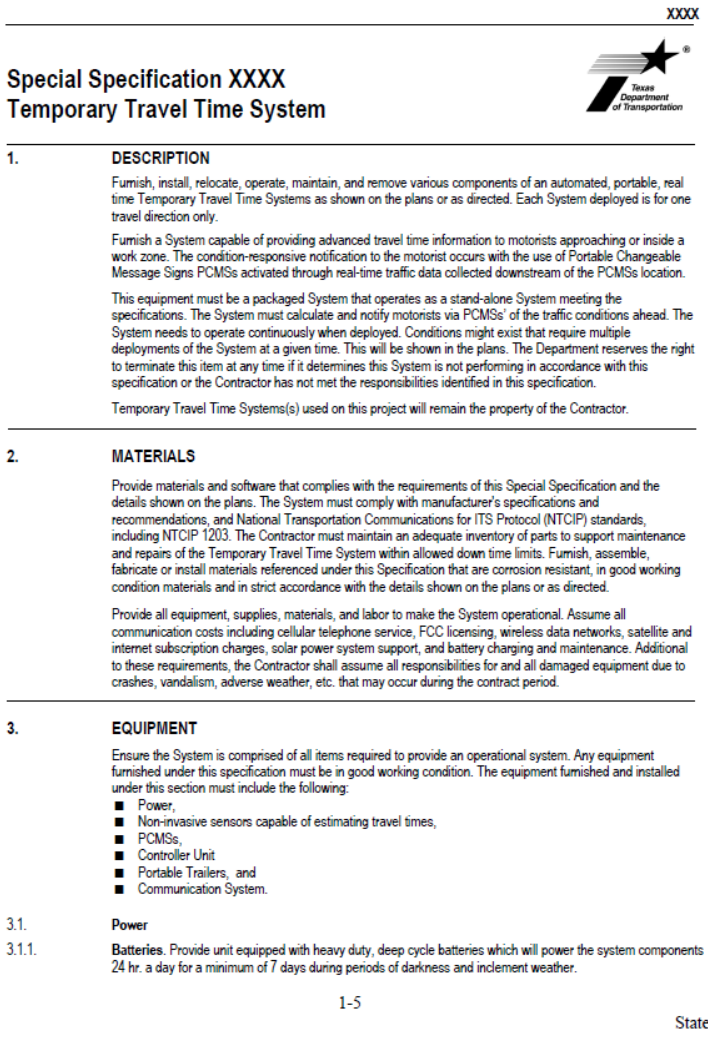
Problem Statement:

- Higher than normal incident risk in most work zones and worse impact

Countermeasure:

- Speed detector, CCTV and communication links
- Reduce the time to detect, respond and clear incidents

Specifications



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Special Specification XXXX
Temporary Travel Time System

Texas Department of Transportation

1. DESCRIPTION

Furnish, install, relocate, operate, maintain, and remove various components of an automated, portable, real time Temporary Travel Time Systems as shown on the plans or as directed. Each System deployed is for one travel direction only.

Furnish a System capable of providing advanced travel time information to motorists approaching or inside a work zone. The condition-responsive notification to the motorist occurs with the use of Portable Changeable Message Signs PCMSs activated through real-time traffic data collected downstream of the PCMSs location.

This equipment must be a packaged System that operates as a stand-alone System meeting the specifications. The System must calculate and notify motorists via PCMSs' of the traffic conditions ahead. The System needs to operate continuously when deployed. Conditions might exist that require multiple deployments of the System at a given time. This will be shown in the plans. The Department reserves the right to terminate this item at any time if it determines this System is not performing in accordance with this specification or the Contractor has not met the responsibilities identified in this specification.

Temporary Travel Time Systems(s) used on this project will remain the property of the Contractor.

2. MATERIALS

Provide materials and software that complies with the requirements of this Special Specification and the details shown on the plans. The System must comply with manufacturer's specifications and recommendations, and National Transportation Communications for ITS Protocol (NTCIP) standards, including NTCIP 1203. The Contractor must maintain an adequate inventory of parts to support maintenance and repairs of the Temporary Travel Time System within allowed down time limits. Furnish, assemble, fabricate or install materials referenced under this Specification that are corrosion resistant, in good working condition materials and in strict accordance with the details shown on the plans or as directed.

Provide all equipment, supplies, materials, and labor to make the System operational. Assume all communication costs including cellular telephone service, FCC licensing, wireless data networks, satellite and internet subscription charges, solar power system support, and battery charging and maintenance. Additional to these requirements, the Contractor shall assume all responsibilities for and all damaged equipment due to crashes, vandalism, adverse weather, etc. that may occur during the contract period.

3. EQUIPMENT

Ensure the System is comprised of all items required to provide an operational system. Any equipment furnished under this specification must be in good working condition. The equipment furnished and installed under this section must include the following:

- Power,
- Non-invasive sensors capable of estimating travel times,
- PCMSs,
- Controller Unit
- Portable Trailers, and
- Communication System.

3.1. **Power**

3.1.1. **Batteries**. Provide unit equipped with heavy duty, deep cycle batteries which will power the system components 24 hr. a day for a minimum of 7 days during periods of darkness and inclement weather.

1-5

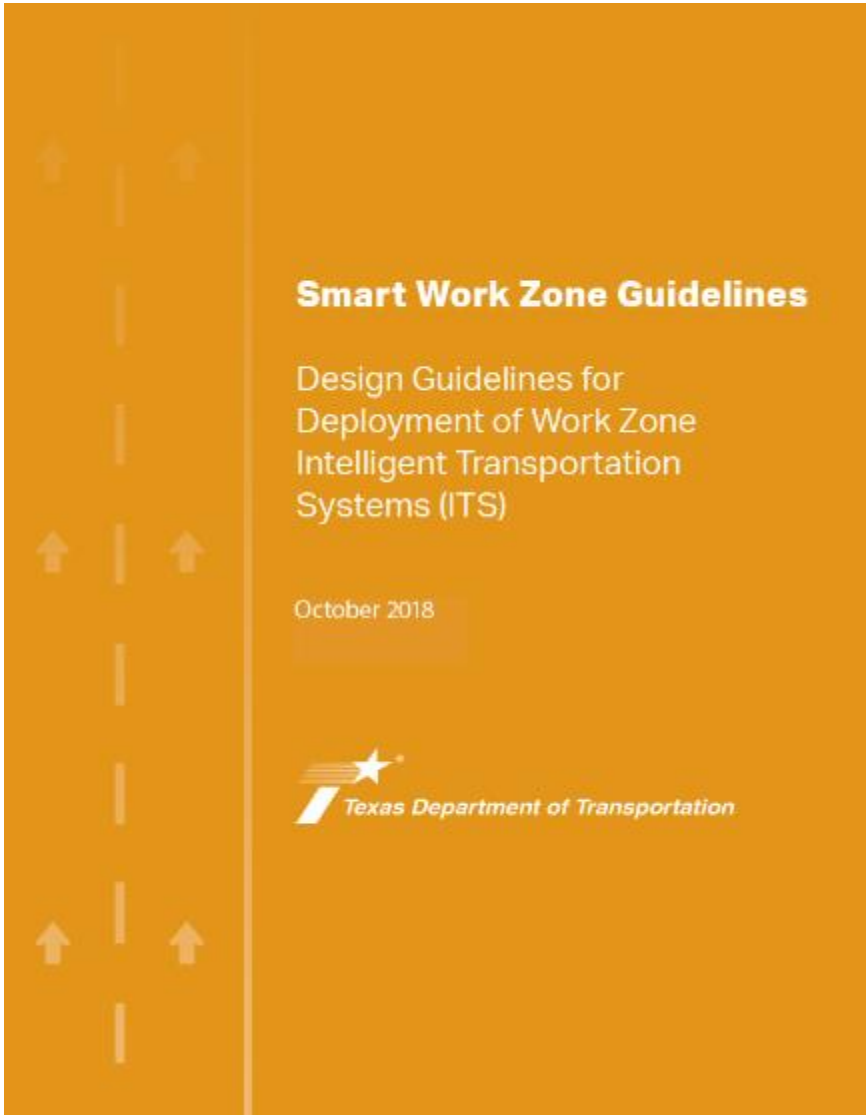
Statewide

Performance based Specifications

- Statewide Specifications
- Materials requirement
- Equipment requirement (hardware, communications, and etc.)
- Performance requirement
- System Coordinator duties
- Measurement of the item
- Payment including deductions for failed systems

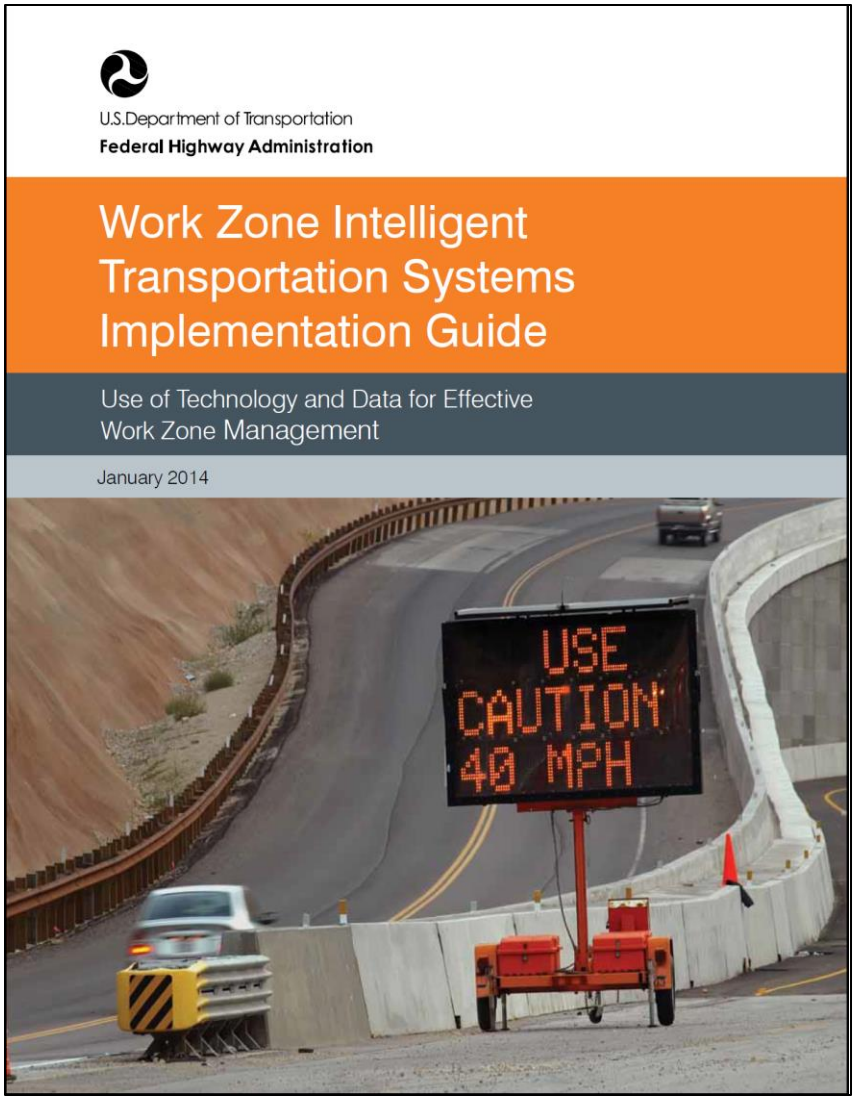
Guidelines

- Description of each system
- Identification of data needs
- Conceptual layout drawings for each system
- Criteria and selection process for determining feasibility
- Design guidelines, metrics



Selection Criteria

- Example scoring criteria to establish feasibility of WZ ITS -- FHWA document (page 25).
- Similar Proposed Scoring criteria were developed in guidelines document.
- Go/No-Go Decision Tool for each of the Smart Work Zone system is available in:
  - Excel Spreadsheet
  - Printable version in Guideline Appendix



Source: FHWA "Work Zone Intelligent Transportation Systems Implementation Guide" (Page 25)
https://ops.fhwa.dot.gov/publications/fhwahop14008/index.htm

Selection Criteria

Factors considered are:

- Duration of work zone
- Road Functional Class
- ADT
- Local Generators
- Alternate routes availability
- Estimated queue lengths
- Other issues are expected (e.g. Extreme weather, Complex traffic control layouts, Merging conflicts, Speed variability…)

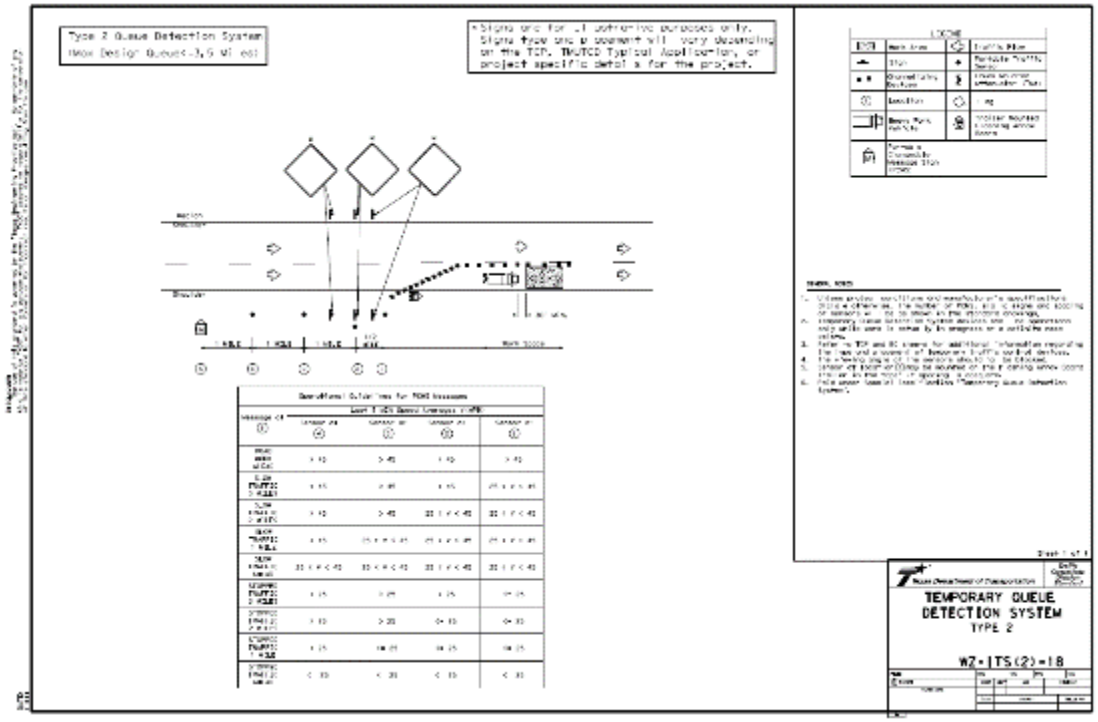
Go/No-Go Decision Tree for Temporary Queue Detection System

Project Number:	
County:	
CSJ:	
Highway:	
Date Form Completed:	
Completed by:	

Scoring Factors	Scoring Range Criteria	Score
Impact from local traffic generators	Significant-local facilities are large enough to have official destination signs on the Interstate highway such as conference centers, sports arenas etc., so they produce large surges in traffic before/after large events **(20 points)** Moderate-Local businesses or public facilities generate traffic volumes that routinely backup the on/off ramps such as morning and evening rush hours **(10 points)** Minimal-Any circumstance that causes occasional backups on the on/off ramps such as congested local arterials or rail crossings **(5 points)** None **(0 points)**	
Estimated Queue Length (Calculated, or see Max Queue Length tab for rough estimate)	> 7 miles **(130 points)** 3.5 to 7 miles **(110 points)** 0 to 3.5 miles **(85 points)** None **(0 points)**	
Sight Distance at back of Queue	Sight distance issues exist where the back of queue will likely occur. **(30 points)** Not applicable **(0 points)**	
Existing traffic issues	Higher than normal crash rates, gridlock or frequent exit ramp backups **(30 points)** Not applicable **(0 points)**	
Availability of Alternate routes	Convenient alternate routes with capacity are available. **(3 points)** No alternate routes available **(0 points)**	
Merging conflict or hazards on the approach to work zone	External merging conflicts or hazards on the approach to or within the work zone. **(15 points)** Not applicable **(0 points)**	
Complex traffic control layout	Multiple crossovers, sharp curves or lane splits **(3 points)** Not applicable **(0 points)**	
Adjacent/consecutive project	There are adjacent active projects effectively creating a mega-project that totals… longer than 10 miles or longer than 2 years **(3 points)** between 5 to 10 miles or between 1 and 2 years **(2 points)** between 2 to 5 miles or between 6 months to 1 year **(1 point)** less than 2 miles or less than 6 months **(0 points)**	
Scattered/short term project	The project includes multiple short term lane restricting activities that are scattered across the state. (ex. bridge painting) **(3 points)** Not applicable **(0 points)**	
Extreme weather condition	Work zone has a known history of sudden extreme weather condition, sandstorm, etc. Or project duration covers several harsh weather season. **(3 points)** Not applicable **(0 points)**	
Connected vehicle	>5% **(3 points)** <5% **(0 points)**	
Existing ITS Systems	Project falls inside an existing Advanced Traffic Management System? The TMC has the intent to incorporate the travel time and delay estimating system into the TMC operations? The TMC can remotely control their existing advance traveler information systems? **(Each question worth 1 point)**	
Heavy vehicles	>12% **(3 points)** >9% **(2 points)** >6% **(1 point)** <=6% **(0 points)**	
Raw Score		0
Normalized Score (0 to 100)		0

Standard Sheets

- Temporary Queue Detection System
- Two Types of System:
  - Estimated Queue <=3.5 mile
  - Estimated Queue <=7.5 mile
- Layout of Smart Work Zone Devices
- Guideline for PCMS Messages



Next Step

- Smart Work Zone Standards Training Workshop
  - On-site meeting with WebEx option
  - Recorded session
  - December 2018

Questions?

Contact

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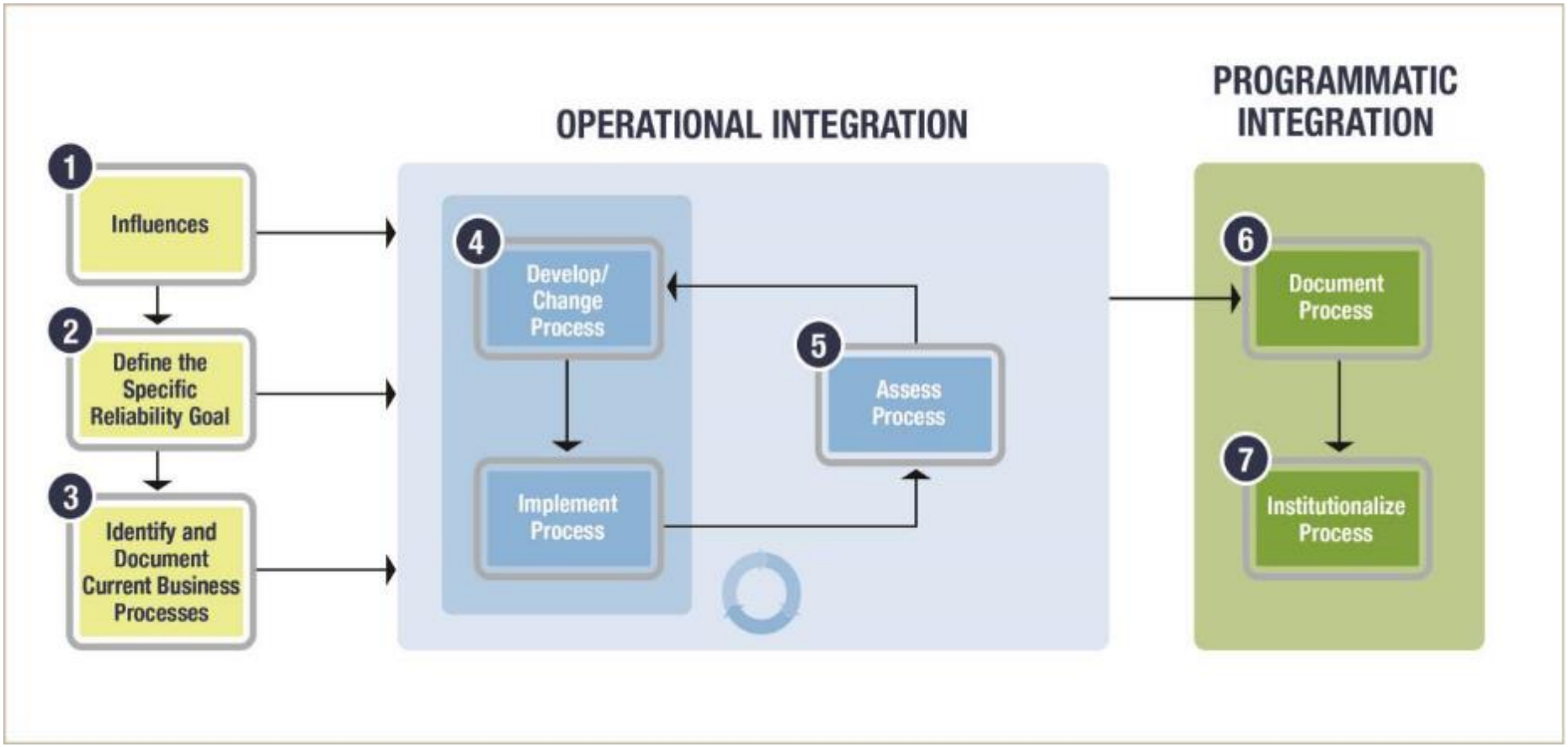
Applying the 7-Step Approach to Implementing Smart Work Zones

Applying the 7-Step Approach



Applying the 7-Step Approach
Implementing Smart Work Zones

Implementing Smart Work Zones:

- Focus on business process from planning through procurement

Overview of Steps:

Large Group

Step 1: Identify Influences

Step 2: Define Goals

Step 3: Identify Current Process

- Existing TxDOT project development process in place
- Use of Smart Work Zones is ad-hoc, roles not clearly defined

Step 4a: Develop New Process

- ***Large group*** – discuss initial planning considerations
- ***Small breakout groups*** - map out process for using Smart Work Zone guidelines and resources – 3 scenarios
- ***Large group*** - reconvene for reports from small groups

Large Group

Steps 5-7: Assess, Document, Institutionalize the Process

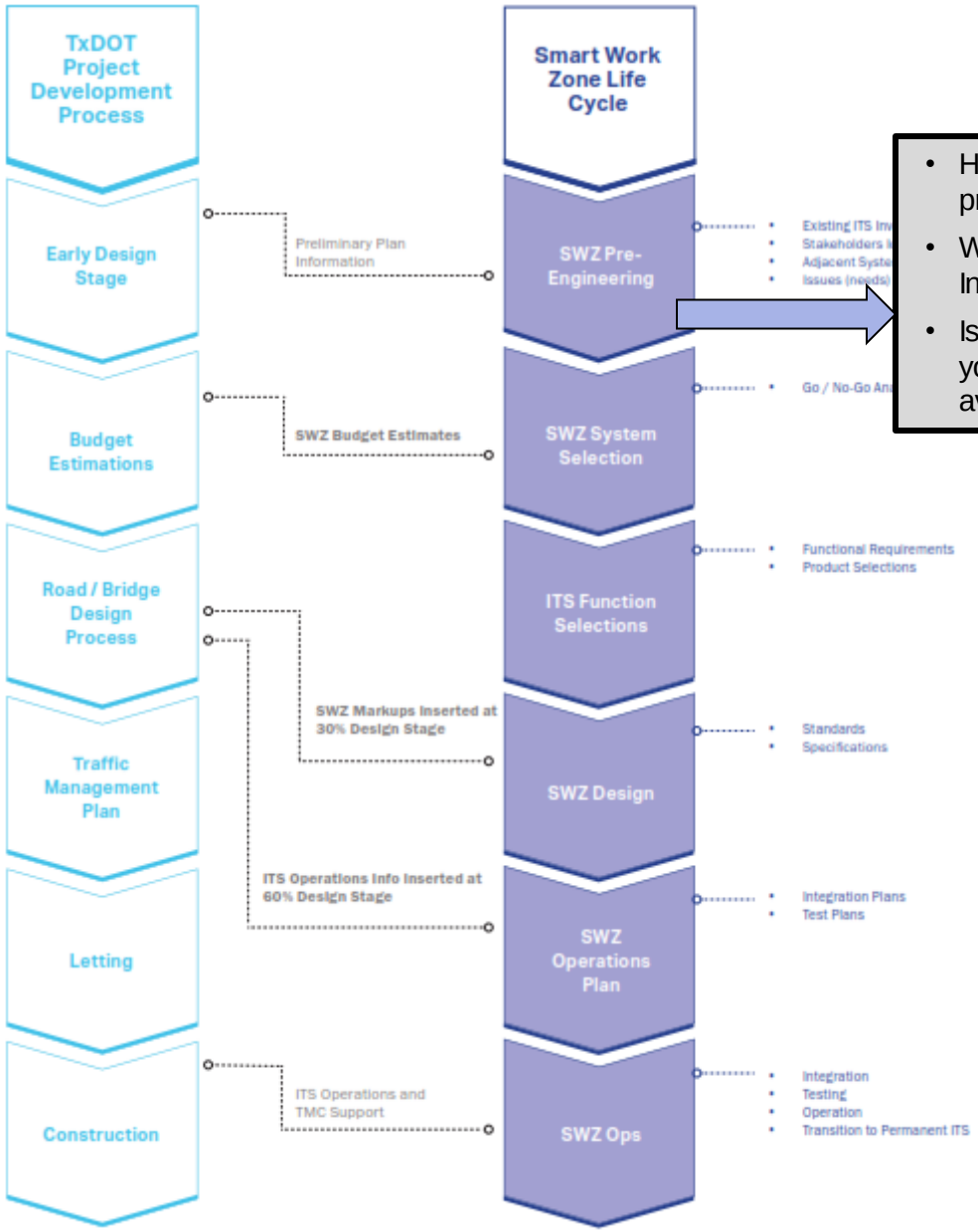
Current Project Development Process

TxDOT Project Development Process:

- Early Design Stage
- Budget Estimations
- Road/Bridge Design Process
- Traffic Management Plan
- Letting
- Construction

Using the new Guidelines and Resources, Smart Work Zones are considered early in the planning and procurement process.

Implementing Smart Work Zones

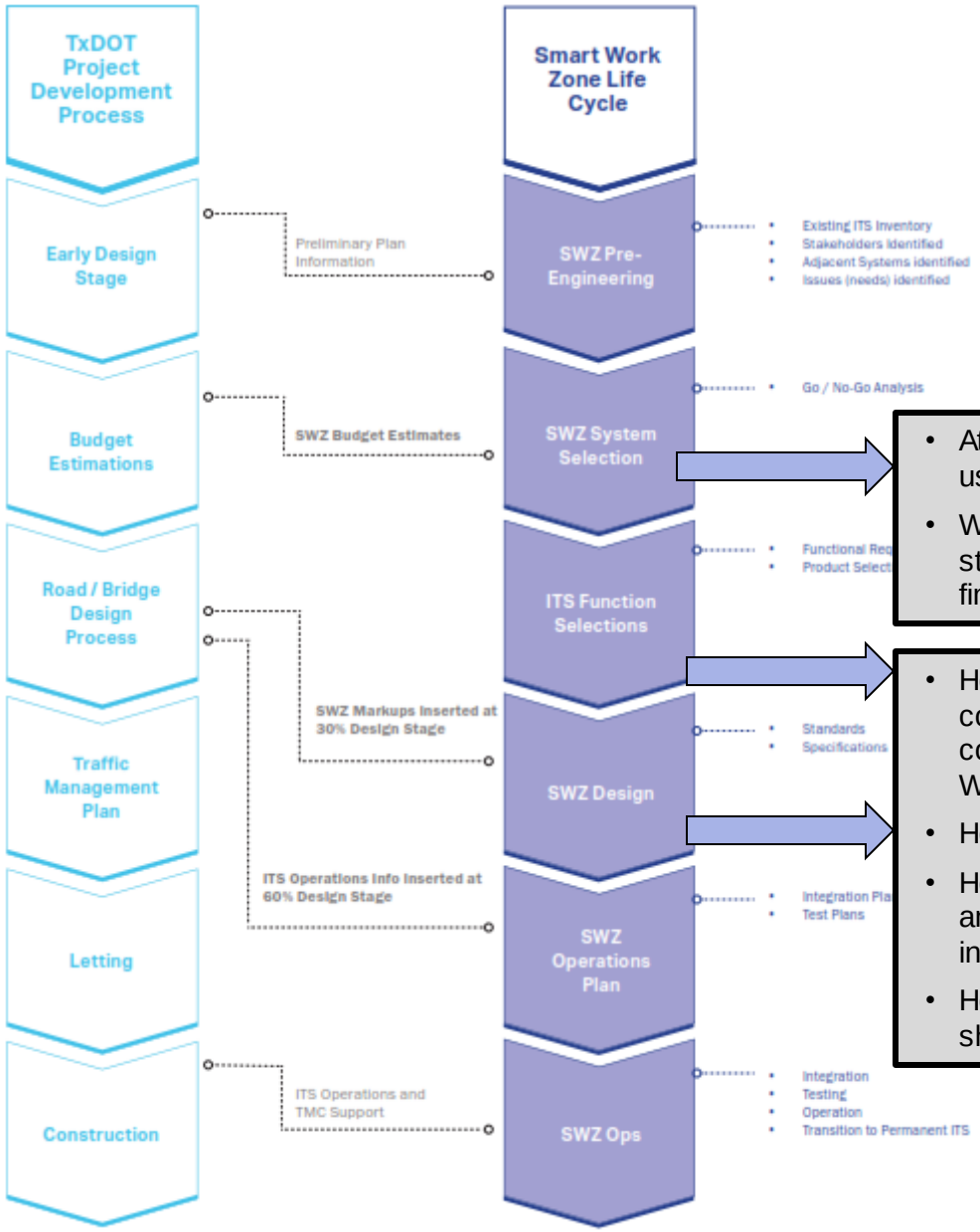


Initial Planning Considerations:

- How are SWZ strategies considered early in the planning process for construction projects? By whom?
- What stakeholders are involved in planning for SWZs? Internal and external?
- Is the data needed for assessment/scoring available in your district? Gaps? How to obtain data if not readily available?

Large Group

Implementing Smart Work Zones



Business Process Mapping Exercise:

- At what point in the process are the SWZ Guidelines used? By whom?
- Who is responsible for selecting the Smart Work Zone strategies? Are any checks or approvals required? How is final decision made?

Small Groups

- How will the selected temporary SWZ system be connected to in-place TMC systems (e.g. ATMS, communications infrastructure)? How is this coordinated? Who is involved?
- How are optional system features determined?
- How are data collection needs from Guidelines determined and incorporated into contract documents? Who is involved?
- How will resources for contracting (special specs, plan sheets) be accessed and incorporated?

Steps 1-2: Influences and Goals

Influences and Goals (Large Group):

- Step 1 - Influences
- Step 2 – Define Goals

Step 3 – Current Process

TxDOT Project Development Process:

- Early Design Stage
- Budget Estimations
- Road/Bridge Design Process
- Traffic Management Plan
- Letting
- Construction

  - Use of Smart Work Zones is ad-hoc, roles not clearly defined
  - Using the new Guidelines and Resources, Smart Work Zones are considered early in the planning and procurement process.

Step 4a: Develop Process
Initial Planning Considerations

Initial Planning Considerations (Large Group):

- How will SWZ strategies be considered early in the planning process for construction projects? By whom?
- What stakeholders should be involved in planning for SWZs? Internal and external?
- Is the data needed for assessment/scoring available in your district? What are the data gaps? How to obtain data if not readily available?

Step 4a – Develop Process
Business Process Mapping Exercise

- **After lunch, we will convene back for instructions**
- **Then break into small groups**

- **Consider a construction project:**
  - Map out process from initial planning to procurement
  - Includes a Smart Work Zone in one of the following:
    1. Urban/metro scenario
    2. Rural freeway scenario
    3. Rural non-freeway scenario

Lunch Break (Off-site)

Business Process Mapping Exercise

Instructions and Small Group Breakouts

Step 4a – Develop Process
Business Process Mapping Exercise

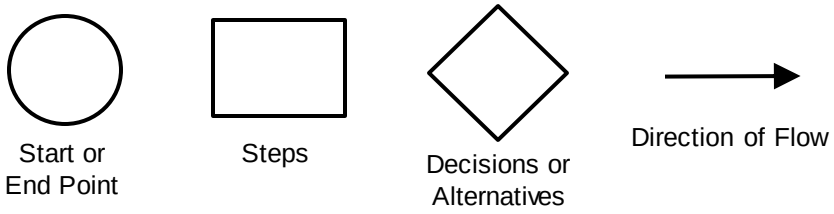
INSTRUCTIONS for Business Process Mapping Exercise:

- **Break into small groups**

- **Consider a construction project:**
  - Map out process from initial planning to procurement
  - Includes a Smart Work Zone in one of the following:
    1. Urban/metro scenario
    2. Rural freeway scenario
    3. Rural non-freeway scenario

Step 4a – Develop Process
Business Process Mapping Exercise

- **Create a process map (using flip chart paper)**
  - Identify key stakeholders
  - Identify start and end points
  - Show key inputs, outputs, steps, and decision points
  - Indicate who is responsible for each step and when that occurs within the existing process for construction planning, design, and operations



Step 4a – Develop Process
Business Process Mapping Exercise

- During process mapping, consider the boxes and questions on your handout

Identify work zone	**Gather data**	**Analyze data**	**Select Smart Work Zone**	**Engage stake-holders**	**Integrate SWZ with TMC**

- ***NOTE: Assign a reporter who will provide an overview of the process map created during report-outs***

Step 4a – Develop Process
Business Process Mapping Exercise

REMINDERS:

- Visual representation of steps & connections
- Concise picture of sequence of tasks
  - Identify when each step takes place and who is responsible
  - Call out decision points
- A good business process map should:
  - Show where improvements can be made
  - Where smooth handoffs are not taking place
  - What steps may be eliminated

Small Group Breakouts

(60 minutes)

Re-Convene in Large Group to Review Mapping

Step 4a - Re-convene to Review Mapping

Re-Convene in Large Group:

- Report-out from Small Groups
  - Share process maps: key steps, responsibilities, decision points
- Discussion
  - Similarities and differences among process maps?
  - What do you like about each map?
  - Does the process change for metro, rural freeway, rural non-freeway? How?
  - Should maps be merged?

Looking Ahead

Looking Ahead

Continue documenting 7-Step Approach:

- Step 4b – Implement the Process
- Step 5 – Document the Process
- Step 6 – Document the Process
- Step 7 – Institutionalize the Process

Action Planning

Action Planning

- **Small Group Breakouts**
  - Develop action items
  - Bring top 3 actions back to large group
- **Groups Report Out**
  - Recommend your group's top 3 action items
- **Large group discussion**
  - Prioritize and document highest priority action items

Applying What You've Learned and Next Steps

Additional Business Process Improvements for Implementing Smart Work Zones

Other Aspects of Implementing Smart Work Zones

- Do TxDOT field staff have adequate expertise to oversee Smart Work Zone strategies in the field?
- How are issues and lessons learned identified from Smart Work Zone deployments? How are these communicated to facilitate future improvements?
- How is work zone data evaluated and archived?
- What additional outreach/training is needed?

Next Steps and Wrap-Up

- PDH Tracking Form
- Workshop Evaluation

Next Steps:

- Workshop Summary Report – to be distributed to agency champion
  - Business process map
  - Action items

Closing Comments

THANK YOU for your participation!