



# Reliability Project L01

## A Guide to Improving Travel Time Reliability by Integrating Business Processes

MAY 2011

**A** goal of Reliability research in SHRP 2 is to identify ways to reduce traffic congestion by improving highway operations and travel time reliability. Reliability Project L01 addressed opportunities to employ operational efficiencies by making it easier for transportation and other agencies to coordinate their activities. The project produced a Guide, summarized here, and a final report that synthesizes successful practices. *The research was conducted by Kimley-Horn and Associates, Inc. in association with PB Americas; the project was managed by SHRP 2 Senior Program Officer David Plazak, who can be contacted at [dplazak@nas.edu](mailto:dplazak@nas.edu).*

### Policy in Action

A crash on the roadway may bring traffic to a standstill, but the incident scene itself will be a busy place. Fire and emergency medical services may be there to aid victims, police, towing services, and transportation agency responders will investigate and clear the incident, manage traffic, establish detours, and provide traveler information. The crash scene is an extreme example that illustrates how the procedures and policies of many agencies interact in four dimensions. To a large extent, the effectiveness of this interaction affects how reliably travelers can estimate the time it takes to reach a destination.

### Two-Level Integration

The research conducted in SHRP 2 Reliability project L01 produced a Guide to help transportation agency managers assess, develop, and integrate key business processes and, by doing so, improve travel time reliability. The Guide was developed from analysis of 10 case studies, a workshop with participants from federal, state, and local planning and operations agencies, and from a review of the literature. The case studies, part of the project final report that will be published on the TRB website, included:

- Washington State Joint Operations Policy Statement and Instant Tow Program, Washington State DOT
- Florida Road Rangers Freeway Service Patrol Program, Florida DOT
- United Kingdom Active Traffic Management, UK Highways Agency
- North Carolina DOT Traffic and Safety Operations Committee
- Michigan DOT Work Zone Traffic Control Modeling
- Kansas Speedway Special Event Traffic Management, Kansas DOT and Kansas Highway Patrol

- The Palace at Auburn Hills Special Event Traffic Management, Road Commission of Oakland County, Michigan, and Auburn Hills Police Department
- I-80 Winter State Line Closures, Nevada DOT
- AZTech™ Regional Archived Data Server, Maricopa County (Arizona) DOT
- San Pablo Avenue Signal Retiming, Metropolitan Transportation Commission (San Francisco Bay Area, California)

The analysis showed that process integration to support travel time reliability must take place within two distinct levels of each organization. At the *operations level* there is often a direct link between the process and the outcome; the activities evolve and are coordinated among those with responsibility for them. These processes are often detailed and unique to each application. At the *programmatic or institutional level*, process integration becomes more complex and requires more formal adoption procedures and higher levels of decision makers.

## Stepping Through the Process: From Influence to Institutionalization

The Guide focuses mostly on the programmatic level. It identifies influences that initiate process integration and common obstacles to implementation and it describes steps that lead to successful business process integration. The steps include defining specific reliability goals, documenting current processes, developing, implement-

ing, documenting, integrating, and institutionalizing new processes.

The approach to process integration developed by the research team is summarized here and an example of each step is provided.

### Influences

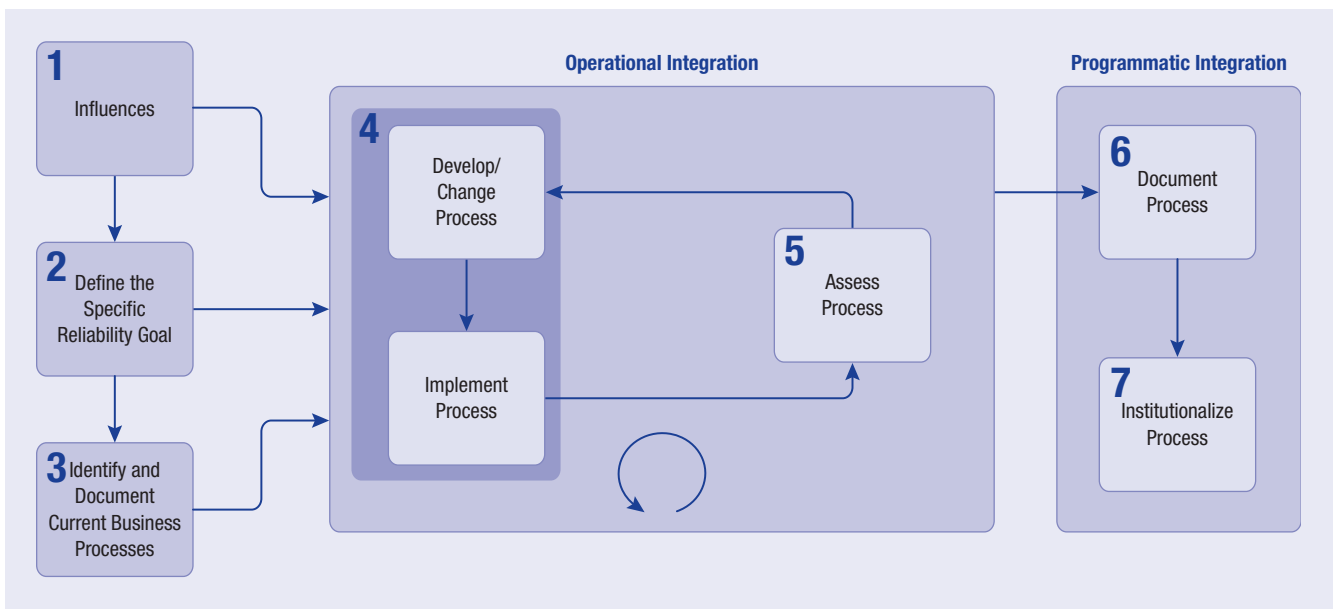
These are the catalysts that initiate the need for improved business process. They can occur as top down, event driven, or needs based. Examples of an influence are directives from senior management or elected officials, a significant natural disaster that exposes gaps in current agency processes or response plans, or just a recognized need for the improvement.

Big directive influences may be legislative requirements or management directives related to safety concerns, economic parameters, or larger government accountability initiatives. Directives tend to greatly accelerate process development, integration, change and accountability of implementers. Event-driven influences prompt process integration, but risk erosion after the first occurrence of the event. Needs or opportunity-based influences evolve over time. They typically affect day-to-day operations and begin at the grassroots level.

*Example: Nevada DOT I-80 Corridor*

*Local NDOT staff were encouraged to investigate alternative ways to disseminate road condition information after a serious crash in eastern California stranded travelers for several hours in locations where amenities were not available.*

## Overview of the integration approach



### **Defining the Specific Reliability Goal**

By establishing goals, the focus is pushed toward the problem at hand regardless of any specific process. Defined goals help to develop benchmarks that an agency can use to determine how well the process is meeting the need. Achieving goals such as reducing incident clearance time, providing 24/7 operations, or improving response efficiency often requires that multiple processes work together. A key challenge is when processes from multiple agencies are involved.

In recent years, agencies have begun to adopt more performance measures and goals to demonstrate the needs for projects and the effectiveness or impact of completed projects. Establishing goals that align with the agency's mission can drive the development of effective processes to improve the performance of the employees, projects, programs, and ultimately, the agency itself.

*Example: North Carolina DOT Traffic and Safety Operations Committee*

*The NCDOT Work Zone Traffic Control section regularly establishes goals, objectives, and strategies for all projects. A committee is formed for significant projects so the impacts and effectiveness of the work zone plans can be continuously monitored throughout construction. Strategies are developed in response to some of the issues observed.*

### **Identify and Document Current Business Processes**

This step often is not performed by agencies, but thinking through the current business procedures in a very systematic way can identify gaps or potential issues. This step also can identify key components of a more efficient process, enabling stakeholders to see the connections between the different components of the process.

There are risks in not documenting the existing or baseline processes. Without documentation, an agency increases the possibility of overlooking critical roles, available resources, or operation activities that may enable a more efficient process. Although this information may be known by staff members, documentation ensures that the knowledge remains with the organization.

*Example: North Carolina DOT Traffic and Safety Operations Committee*

*The NCDOT Committee looks at processes continuously throughout the life of a construction project. Each issue that arises is analyzed by the committee and a strategy is proposed to mitigate the issue. Solutions are monitored and adjusted as needed until an effective result is achieved.*

### **Process Development and Implementation**

This step is driven by a particular *Influence* identified in the first step. This step typically occurs at the grass-roots level

of an organization by staff or champions who are at the center of the activities involved. The implementation can be formal or informal depending on the complexity of the process and the agencies involved. Once the process has been implemented, it is assessed or evaluated against the identified goals. The process is refined based on the performance against the goals in an iterative approach.

During process integration, it is important to involve all of the appropriate stakeholders. Buy-in is important from those who will provide inputs to the process and those who are affected by the process. All stakeholders are critical, whether they are in the field or in a central office, and their input needs to be an integrated part of the overall process.

*Example: The Palace of Auburn Hills, Michigan*

*Prior to determining a new event management plan for the facility, the Auburn Hills Police Department, The Palace of Auburn Hills, the Road Commission for Oakland County, and MDOT assessed the current traffic management plans along with an assessment of the road network in the vicinity of the facility.*

### **Assess the Process**

Some level of assessment is important to determine the effectiveness of a process. This step is one element of the 3-part operational loop that continuously adapts and evaluates business processes, along with developing/changing and integrating the process. The type of assessment is often commensurate with the complexity of the process, but it is important to determine a measure of success, a method for continuous evaluation, and the data needed for the evaluation. The evaluation and measured benefits will provide a means of communicating the effectiveness of the process to senior-level managers.

*Example: United Kingdom Active Traffic Management*

*In the UK, the Highway Agency monitored the impacts of an active traffic management deployment on the roadway network. The results of an evaluation survey showed an improved journey time and decreased accident rate. Such benefits have helped to gain support of government ministers and industry.*

### **Document the New Process**

Agencies differ in the complexity of their documentation processes. Documentation can be as simple as an interagency agreement or as complex as a multi-volume operations manual. Regardless of the type of documentation, it should capture details of the business process, the evaluation process, the stated benefits and lessons learned. It should also include the roles and responsibilities of the stakeholders and the performance measures associated with the overall process.

### Documentation Examples:

*The Palace at Auburn Hills documents their processes through evaluation meetings.*

*WSDOT and the UK Highway Agency produce performance monitoring reports that state the benefits and lessons learned from the process.*

*The MTC produces a report at the end of the process which is then incorporated into an annual report provided to the Federal Highway Administration.*

*The WSDOT Joint Operations Policy Statement Agreement call for a report that documents the performance measure developed to help the agency define how data are collected and reported.*

### **Institutionalize the Process**

This is the final step of the business process integration. Institutionalization requires buy-in and support from upper management as well as additional stakeholders who have a vested interest in the outcomes of the business process. This step will have a direct impact on the long-term survival of a process within an organization due to changes in staff. The most successful examples rely on linking processes to firmly established agency goals, objectives, or mission-critical activities; this helps to establish the priority among multiple operational entities.

### Example: Michigan DOT Work Zone Traffic Control Modeling

*MDOT has developed a tool to model work zones. Translation of the output is still being formatted, but once complete, the tool will allow construction managers to make modifications based on changing work zone configurations or schedules. This relationship between the planners and construction engineers demonstrates an important integration point.*

## **Intended Audience**

The Guide will be useful to managers within state and local agencies that are responsible for overseeing operations programs for traffic management, maintenance, traveler information, and incident response and management. The content and context of operational processes described are tailored for managers who are responsible for developing programs, liaising with internal and external departments within a department of transportation or law enforcement agency, and who can influence programmatic components. This includes recommending training needs, recommending or developing policy, or requesting funding through programming processes.

The Guide and the project final report will be available under the Publications tab of the SHRP 2 website. Please visit [www.TRB.org/SHRP2](http://www.TRB.org/SHRP2).

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