April 2009

Regional Concept for Transportation Operations Fosters Planning For Operations in the Tucson Metropolitan Area

Operator-Focused Planning For Operations

The Tucson metropolitan region embarked on developing a regional concept for transportation operations (RCTO) in 2005 as part of a Federal Highway Administration demonstration initiative to advance regional collaboration for operations. The RCTO is a management tool that operators and planners use to strategically plan for improving operations in their region. Through the development of the RCTO, the Pima Association of Governments (PAG) led a group of operations participants in identifying specific objectives and performance measures for arterial management, traveler information, and work zone management. These objectives guided Tucson's selection of management and operations strategies and the approaches for implementation. The RCTO group identified specific operations projects to be included in the PAG transportation improvement program (TIP) and funded through a half-cent transportation sales tax, which passed in 2006.

Introduction

In 2005, the Federal Highway Administration (FHWA) launched a demonstration initiative to encourage regions in the U.S. to increase multi-agency collaboration through the development and implementation of a regional concept for transportation operations (RCTO). An RCTO is a management tool that provides a strategic framework to guide collaborative efforts to improve transportation system performance through management and operations strategies. By developing an RCTO, collaborating agencies develop operations objectives and strategies to meet those objectives, both of which can feed directly into the regional transportation plan. The RCTO is an emerging tool that came out of a broad-based FHWA and Federal Transit Administration (FTA) working group in 2000 and 2001 that was tasked to identify ways to better link transportation planning and operations.

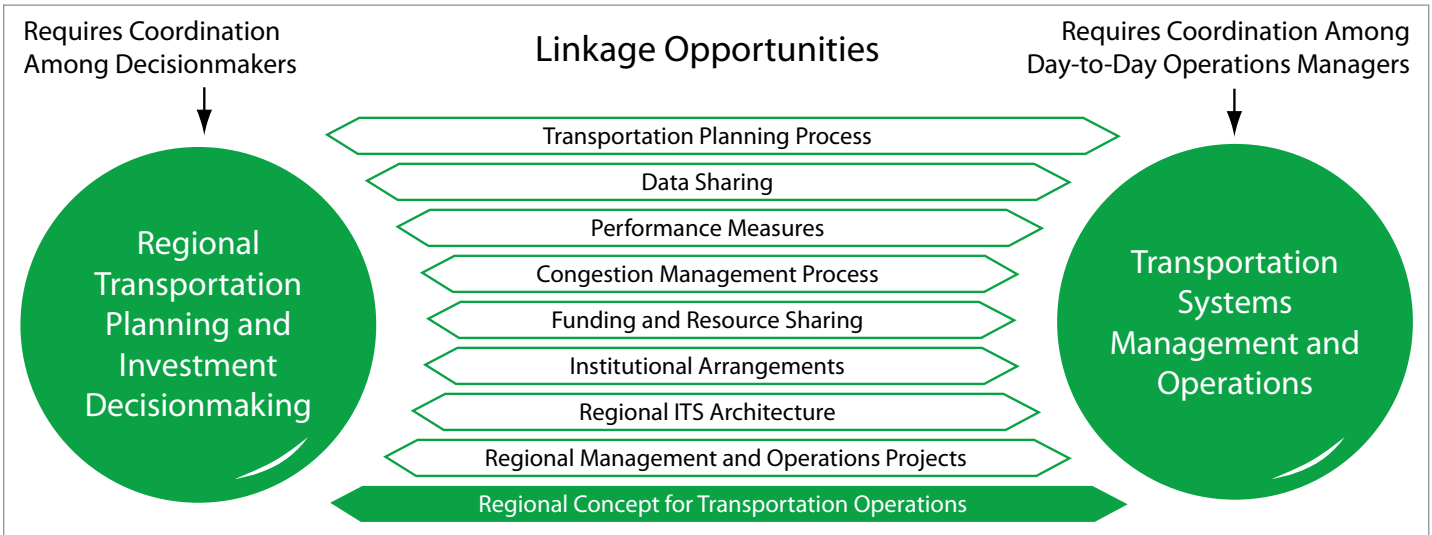

Figure 1. The regional concept for transportation operations is one of the many opportunities to link regional transportation planning and decision making to management and operations.

FHWA awarded grants to develop and implement an RCTO over 2 years to three metropolitan regions: Portland, Oregon; Tucson, Arizona; and Detroit, Michigan. The Tucson area metropolitan planning organization, the Pima Association of Governments (PAG), embarked on this demonstration project to build upon existing collaborative efforts in the region and prepare for major reconstruction of Interstate 10, a highway that traverses Tucson. The Tucson metropolitan region has a population of approximately 1 million and is experiencing rapid population growth. There was a 60 percent increase in population between 1982 and 2003. Planners and operators in the region acknowledge that advancing transportation operations on a regional level is needed to keep up with the influx of people and vehicles. Ongoing collaboration between operators already occurs in the form of the PAG Transportation Systems Subcommittee, the group that is responsible for the regional intelligent transportation systems (ITS) architecture.

The Tucson area demonstration initiative was led by PAG with its member agencies, including the City of Tucson, Arizona Department of Transportation (DOT), the Pima County Department of Transportation, the Pima County Office of Emergency Management, the U.S. Department of Homeland Security, the Towns of Marana, Oro Valley and Sahuarita, the Pascua Yaqui Tribe, and the Tohono O'odham Nation. The individual who served as the leader and convener for the RCTO was a senior planner from PAG. Through the FHWA grant, PAG hired a consultant to assist in facilitating the multi-agency meetings, synthesize and document the input of the participants, and work one-on-one with the RCTO leader to propose elements of the RCTO for discussion. PAG formed an RCTO working group drawing primarily from members of the Transportation Systems Subcommittee to develop the RCTO.

Development Process

As one of the first regions in the U.S. to develop an RCTO, the path was not always clear and PAG, along with the other sites, had to try out development techniques with the RCTO participants and make adjustments depending on the outcome. Because of the trial nature of the process, the development of the RCTO took approximately 2 ½ years. The process was divided into two phases: the focus and assessment phase and then the action plan phase.

PAG kicked off the RCTO development process by holding a workshop with the Tucson area operations stakeholders to define the mission and vision for their RCTO effort. This helped to get the stakeholders on the same general page regarding their purpose, including the final product.

The PAG leader and consultant then assessed the current state of operations in the region, operator needs, and opportunities to improve regional transportation operations. This process consisted of interviewing transportation operating and public safety agencies in the

Figure 2. Pima Association of Governments' RCTO Development Process Overview.
Source: PAG.

region and documenting the existing policies, procedures, and practices in the areas of traffic incident management, work zone management, traveler information, freeway management, and arterial management. Through this inventory, PAG identified potential members of the regional operations table and discovered areas of common need such as traffic signal retiming and access to real-time traveler information. Additionally, PAG learned where multi-agency activities such as traffic incident management could be improved and where there were opportunities for equipment sharing such as bucket trucks and variable message signs.

During a series of facilitated RCTO working group meetings, 17 operations objectives and related performance measures were developed for a fairly comprehensive set of operations areas including arterial, work zone, traffic incident, freeway, transit/multimodal management and traveler information. These objectives and performance measures would allow the RCTO participants to chart their progress in improving regional operations. The performance measures selected were a combination of outputs and outcomes with an attempt to make the measurement process as practical and affordable as possible while still being informative. While the RCTO working group tried to keep to a 3 to 5 year timeframe for the objectives, they realized that some of the objectives would require significant resources allocated through the region's TIP process so a number of objectives were extended to 5 or 10 years.

During the process of establishing objectives, stakeholder enthusiasm and participation began to wane in part due to the conceptual nature of the process but also because the group now had the daunting task of trying to develop and implement strategies to reach 17 different objectives in 6 operations areas. Sensing difficulties ahead, the RCTO leadership worked with the participants to narrow the scope of the RCTO to the three areas they were most interested in making near-term improvements: arterial management, traveler information, and work zone management.

The PAG stakeholders then shifted into specific discussions about what actions were needed to achieve the objectives as part of the action plan phase. They developed several "action plans" that specify the need for action, the institutional arrangements, roles and responsibilities, resources required/estimated costs, and funding mechanism. As part of the action plans, stakeholders identified specific operations projects to be included in the TIP or compete for sales tax dollars. The stakeholder agencies recognized that submitting operations projects supported by multiple agencies provided advantages to competing for regional funds in the planning process.

Resulting RCTO

The Pima Association of Governments RCTO working group fully developed an RCTO for specific aspects of their three target areas of operations: arterial management operations, traveler information, and work zone management.

Arterial Management Operations

Arterial roads dominate the transportation system in the Tucson region. As one of the primary freeways in Tucson undergoes reconstruction, the arterial system will become even more vital. The operations objectives decided upon by the PAG RCTO stakeholders for improving arterial management operations include:

1. *Provide more predictable travel times and reduce traveler delay due to both recurring events and non-recurring incidents on Tucson metropolitan arterials by:*
   - *improving traffic signal timing, coordination, and management across all jurisdictional boundaries.*

- *improving traffic incident management.*
- *improving coordination among traffic, public safety, and transit agencies.*

2. *Improve traveler safety.*

The RCTO stakeholders delved into two specific programs or activities that would help them reach their objectives: creating a regional traffic signal operations program and multi-jurisdictional sharing of traffic management resources such as dynamic message signs.

During the development of the regional signal program section of the RCTO, PAG and the RCTO stakeholders helped to secure funding for the program from local taxes through the Regional Transportation Authority funding program for the first 5 years; the RCTO group plans to apply for TIP funding following that time.

Figure 3. Tucson metropolitan area arterial.
Source: PAG

Traveler Information

During the development of the PAG ITS Strategic Deployment Plan, PAG's Transportation Systems Subcommittee developed a vision for the ideal traveler information system in the Tucson metropolitan region. The RCTO was an appropriate and timely mechanism for stakeholders to realize this vision in a strategic and collaborative manner. The Tucson metropolitan area has access to several traveler information resources, including a local resource called TransView.org, the statewide Arizona 511 system, and private companies that relay information through the radio and the Internet. During the RCTO development, the stakeholders recognized the need to coordinate traveler information systems in the region, reduce duplicative efforts, and make better use of the existing systems in disseminating information.

Specifically, the Tucson area RCTO working group agreed upon the following objectives for traveler information:

1. *Reduce traveler delay by improving the quality, quantity, accessibility, and use of multi-modal traveler information services in the region.*
2. *Improve the data management and storage of traveler information.*
3. *Educate roadway users to improve driver habits.*
4. *Provide current and accurate information to Tucson metropolitan area traveler information services (work zones, incidents, other closures).*

The RCTO indicates specific actions with agency responsibilities in reaching these objectives. Activities include improving the Tucson area maps in the statewide system and increasing the quantity and quality of the work zone information that is input into that system. Additionally, they plan to integrate filtered computer aided dispatch (CAD) information from public safety agencies, import information from Transview into Arizona 511 using a regional archived data server, and improve the availability of transit information.

Work Zone Management

The RCTO working group found another high priority need in work zone management as a result of the initial interviews and working group meetings. Construction in the Tucson area is performed by individual agencies with no formal way to enable agencies to schedule their work in ways that minimize the impact on travelers. With the 2006 passage of a 20-year Regional Transportation Authority Plan and ½ cent excise tax to fund the plan, there will be a significant increase in new construction projects throughout the region. The Regional Transportation Authority Board has made it a policy to:

> "(1) encourage construction planning and phasing which limits the impacts of construction on parallel routes, and (2) encourage planning and phasing of safety, intersection, ITS and other program improvements so that they may be in place in advance of major construction on a nearby parallel corridor so as to facilitate traffic flow that may be impacted by construction of the corridor."[1]

In addition, the RCTO stakeholders have placed a high priority on increasing safety within work zones.

Stated objectives within the RCTO for work zone management are:

1. *Improve multi-agency coordination for large-scale work zones. Reduce the potential for parallel work zones.*
2. *Reduce traveler delay due to work zones.*
   - *Improve speed management and travel time reliability within work zones.*
3. *Maintain/improve work zone safety.*
   - *Reduce the number of traffic-related incidents within work zones.*
   - *Minimize impact of work zones on emergency response routes.*

The action plan for work zone management includes regular regional construction coordination meetings between representatives of each jurisdiction from the appropriate department to provide updates on construction project status to other jurisdictions. The RCTO stakeholders have identified the need for a full-time staff person to help coordinate projects and maintain a geographic information system (GIS) database of active, pending, and future projects. To improve safety, the RCTO includes plans for implementing regular training and certification for the Work Zone Safety and Mobility Rule.

Benefits of the Approach

The agencies participating in the PAG RCTO have already begun to realize benefits associated with developing common operations objectives and performance measures and implementing a strategic approach for coordinated operations. The RCTO has enabled the region to reflect on its operational needs and make realistic decisions on what they should focus their efforts on to make improvements. Since large amounts of capital funds would not be available in the short term, the RCTO stakeholders focused on efforts that would allow agencies to find solutions that are more efficient by combining common needs and centralizing services, such as with the traffic signal program. Additionally, PAG agencies found ways to get more use out of resources such as dynamic message signs by sharing. Finally, coordination of existing practices such as traveler information and work zone management is allowing agencies to provide better service to travelers. By developing a written strategy for operations and identifying responsibilities and performance measures, the stakeholders have a greater chance of maintaining the momentum toward achieving their objectives.

[1] Pima Association of Governments, *Regional Concept for Transportation Operations Final Report*, July 5, 2007.

Late in the demonstration project, regional operations and emergency service stakeholders chose to apply the RCTO approach to preparing and organizing for incident management within a 5-mile I-10 construction project through the urban core. Stakeholders identified goals and objectives related to incident management activities during the construction and identified many actions and needs as a result of examining this operations issue more closely. Much of the benefit of this examination came from a tabletop workshop exercise that was organized among key agencies. The workshop resulted in open dialogue among key agencies involved in traffic incident management activities and has led to a greater understanding of the plan of action for the multiple agencies involved in incident management for the I-10 corridor and the construction zone. The dialogue led to significant clarification of agency roles and responsibilities and helped improve relationships, especially between the transportation and emergency service communities. The workshop resulted in participants identifying a desire to establish a regional traffic incident management program that includes regular exercises such as the one conducted.

Initial key achievements:

- PAG has secured funding for regional traffic signal program.
- Multi-jurisdictional coordination of work zones is already beginning to take place through meetings between construction representatives from multiple agencies.
- PAG has now been identified as an effective regional table for operations collaboration and is now being used to help coordinate and improve traffic incident management for the I-10 reconstruction project.
- ADOT and local agencies in Tucson have already been able to work through roadblocks to sharing and coordinating traveler information.

Challenges and Lessons Learned

Obtaining Support from Decisionmakers Including Agency Leadership

The objectives of the RCTO and action plans originated among mid-level operators within most agencies participating in developing the PAG RCTO. While these individuals were adept at identifying crucial needs and strategies to address these needs, agency commitment of staff, funding, or equipment had to come from the upper levels of agencies or departments. Gathering the necessary commitment is still a work in progress in Tucson, but there were a couple of strategies that the RCTO group used to gather support from agency leadership. The primary champion of the RCTO, a senior planner at PAG, made use of a monthly breakfast meeting between regional leaders to brief the leaders on ideas arising from the RCTO working group, such as the traffic signal program. The second technique that the RCTO working group used was to have the agency representative in the working group advocate for the RCTO objectives and action plans to their management.

Defining Performance Measures that are both Reasonable to Measure and Provide Adequate Information

The PAG RCTO working group struggled to commit to performance measures that were outcome-oriented because of the effort required to obtain and analyze the necessary data. Participating agencies did not feel that they could commit to the resources that would be required for some of the performance measures. As a result, the RCTO working group maintained the performance orientation, but developed a mix of outcome and output-style performance measures that did not require a major investment in new data collection. This is what was determined to be realistic for the region at that time.

Obtaining Funding through the Transportation Improvement Program for the Near Future

The PAG stakeholders recognized that there were some operations activities specified in the RCTO that would need funding through the TIP. Because TIP funding was not immediately available and had to be applied for years in advance, the PAG stakeholders had to extend the overall timeframe for reaching some of the objectives to 5 to 10 years. The stakeholders were successful in accessing funding for regional projects supported by multiple jurisdictions. Regional support was important in helping operations compete with infrastructure projects for TIP funding.

Moving Forward

The implementation of the PAG RCTO is moving forward with the PAG Transportation Systems Subcommittee and the RTA Safety Working Group as the primary forums for coordination. In the area of traveler information, ADOT and City of Tucson staff have committed to make modifications to their respective systems in order to be consistent with the regional vision for traveler information.

Improvements are being made to the City of Tucson's TransView.org website so local agencies can enter in their upcoming construction projects and have them displayed on a common map. The PAG stakeholders see the RCTO as a template to be used for other operations areas in the future, such as traffic incident management. PAG embarked on a major update to their congestion management process in 2008. The agency looks to the RCTO to provide substantial input on management and operations strategies, objectives, and performance measures.

References

Pima Association of Governments, *Regional Concept for Transportation Operations Final Report*, July 5, 2007.

FHWA, Telephone and In-Person Interviews with Paul Casertano, Pima Associations of Governments, 2005 - 2008.