





The Implementation of Open Road Tolling on the Illinois Tollway

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Some years ago, former Illinois governor George Ryan proposed, with much fanfare, the removal of tolls from the Illinois Tollway system. Not long afterward, the *Chicago Tribune* and WGN-TV commissioned a major survey of the state to measure public support for the proposal. Contrary to expectations, the majority of survey participants were opposed to removing tolls and felt the Tollway provided “good value” to users (see the sidebar “Illinois Finds Value in Tollway”). When asked what their perceived biggest problem with tolling was, only 13 percent cited the cost of the toll, while 66 percent cited having to stop to pay tolls. It became clear that people didn’t want the tolls removed, they simply wanted the toll plazas removed.

Under current governor Rod Blagojevich, the Tollway (also known as the Illinois State Toll Highway Authority) embarked upon a multibillion-dollar congestion-relief program (CRP), called Open Roads for a Faster Future. The first priority was converting the Tollway’s 20 mainline toll plazas to nonstop high-speed collection areas for the 80 percent of Tollway patrons using I-PASS, the Illinois Tollway’s electronic toll collection system. This article discusses the unique challenges overcome in making the massive conversion as quickly as possible.

The ORT Initiative

With a vision of providing nonstop travel for commuters and getting drivers to their destinations more quickly, the Illinois Tollway in 2005 began converting its 20 mainline toll plazas to open road tolling (ORT). When implementation was complete, in October 2006, Illinois became the first state in the nation to convert all of its mainline toll plazas to open road tolling just 22 months after the project began. In so doing, it delivered quicker, easier, and safer travel for its 1.3 million daily drivers.

Delivering ORT lanes at 20 plazas in less than two years required exceptional collaboration.

The ORT initiative is a major part of the Tollway's multiyear CRP, which was designed to reduce travel times by rebuilding and reconstructing most of the Tollway system. This work included widening and adding lanes to nearly half the system, converting the mainline toll plazas to ORT within the first two years of the program, and extending the North-South Tollway (I-355) south through Will County to I-80.

Delivering ORT lanes at 20 plazas in less than two years required exceptional collaboration between the Illinois Tollway and the project's Program Management Office, and between those two entities and the multiple engineering and construction firms engaged in the CRP's design and construction. Coordinated management between the main players was key.

Coordinated Management

The Illinois Tollway's engineers, under the leadership of then-chief engineer Jeff Dailey and then-program manager Paul Kovacs, were tasked with implementing ORT as part of the CRP. With Chicago-area drivers experiencing a 25 percent increase in congestion from 1998 to 2001, agency engineers began the ORT conversion with a sense of urgency to help reduce congestion, improve mobility, and help strengthen the economic outlook in the 12 counties the Tollway serves.

To help meet the aggressive schedule of its capital program and ORT conversion, the Tollway added engineering and planning firm HNTB Corp. to its team as the PMO. This collaboration was instrumental to the success of such a complex program.

The HNTB Program Management Office (PMO) is integrated within Tollway management, and includes subconsultants. By creating a unified management team, the PMO is

designed to leverage the expertise and experience of a broad range of professionals, extending the Tollway's reach and augmenting its technical resources.

The PMO has become an integrated member of the Tollway's management team, serving as an extension of staff and providing leadership, resources, and expertise in key areas. In addition to assuming a leadership role in the day-to-day management of the CRP and its component projects, the PMO evaluates project implementation and management mechanisms with the objective of refining and improving the manner in which projects are executed.

As the manager of the CRP, the PMO oversaw the ORT project

planning, design, and construction and recommended approaches throughout every phase of the conversion. The PMO also oversaw the ORT project's scope, schedule, and cost to ensure that the Tollway obtained the most cost-effective solutions. Creativity was encouraged among PMO members, which brought high-quality work and additional value to the overall program.

The PMO worked closely with agency leadership in its work on the ORT conversion and focused on activities necessary to achieve the project objectives. Monthly reviews of all active projects were instituted through "project book meetings." These meetings, chaired by the PMO, provided a venue for early identification of project schedule and budget

ILLINOIS FINDS VALUE IN TOLLWAY

The poll conducted by the *Chicago Tribune* and WGN-TV earlier this decade showed overwhelmingly that motorists don't mind paying for tolls as much as they mind having to stop for them. When asked what their perceived biggest problem with tolling was, only 13 percent cited the cost of the toll, while 66 percent cited having to stop to pay tolls. It became clear that people didn't want the tolls removed; they simply wanted the toll plazas removed.

But the survey also found that 58 percent of all survey participants consider tollways a good value for the money, and that 71 percent of users of I-PASS, Illinois's electronic toll collection system, feel this way.

Well more than a third (41 percent) of all *Tribune*/WGN poll respondents said they disapprove of former governor George Ryan's plan to eliminate tolls on the Illinois Tollway, with more than half (54 percent) of regular Tollway users panning the proposal. When it comes to state fuel taxes, a full 74 percent of respondents oppose increasing the tax in an effort to turn the Tollway into a freeway, with only 16 percent favoring the idea.

Today, as the Illinois Tollway found in its own, January 2006 survey, users of the Tollway's new ORT system are echoing the positive attitudes of the *Tribune*/WGN poll respondents when it comes to the value of tolls.

challenges and allowed the quick development of alternative solutions to stay on schedule. The PMO also developed a detailed ORT plan complete with objectives, scope-of-activity schedules, and staffing requirements. After the ORT conversion began, the PMO reviewed its progress against established targets and provided regular project updates.

A Balanced Schedule

In delivering ORT, the PMO established and followed a master schedule that balanced numerous safety, operational, and public concerns and priorities. The PMO also evaluated the Tollway's processes and procedures to identify any challenges to project delivery and developed innovative solutions to eliminate those challenges. To help with its work, the PMO team enlisted toll-road experts from around the country.

Designs were put out to bid as quickly as possible, with design details continuing to be developed during the bid period. The PMO team talked with potential contractors during this period and used their questions and suggestions to refine the design plans. Prebid meetings were also held, to address questions and concerns before the bids were submitted.

Keeping in mind the goal of delivering the ORT lanes in two years, the PMO streamlined the guidelines and processes for construction scheduling, in the process revamping the Tollway's standard schedule specifications. The new specifications require contractors to continually assess the project status and submit monthly schedules and critical-path reports. The PMO required construction managers to provide a detailed review of each of these updates and offer options for correcting schedule delays to ensure that projects would be completed on time. Contractors were required to plan for adverse weather and justify any request for time extensions through an analysis of their construction plan.

The schedule for converting the toll plazas to ORT was coordinated to keep as many I-PASS-only lanes open as possible during the changeover, so that customers could enjoy ORT's benefits as soon as possible. (I-PASS has integration with the Interagency Group E-ZPass consortium. Currently,



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as noted above, 80 percent of Illinois Tollway customers use I-PASS, among the highest electronic-usage rates in the country.) ORT allows I-PASS users to pay tolls electronically while traveling at highway speeds on the mainline. Each plaza has as many ORT lanes as there are mainline lanes leading into or exiting the plaza. Vehicles without I-PASS must keep to the right to pay cash to toll collectors, located in smaller toll plazas, so as not to impede the free-flow of traffic on the mainline.

The PMO revamped the master program schedule, which predicts obligations and cost projections, to include additional details required to manage the program. These included tracking critical design milestones and other project details that often cause project delays and changes, such as the timely attainment of rights-of-way, relocations of utility interferences, design checks, and collaboration with outside agencies. The enhanced master schedule allowed the team to quickly develop various resequencing scenarios for the program or for a particular portion of a corridor as needed and helped executive management review the impact of critical decisions.

Breaking Ground

The designs for the 20 toll plazas were divided among eight design firms, which were charged with developing detailed plans. Each firm participated in design charrettes to discuss concepts and alternatives. The charrettes yielded several ideas for the new plazas, including placing plaza operations above the plazas instead of in tunnels below; having smaller control buildings that would fit in the right-of-way; and installing updated roadway signs at the plazas.

Conversion of the toll plazas to ORT was broken down into 24 design and construction engineering packages and 30 construction contracts. For the primary firms designing the ORT plazas, the challenge was to balance the need for consistency, and its resulting economies of scope and scale, with the unique requirements of each plaza location.

During construction, the Tollway used a standard procedure for installing automatic vehicle classification sensor loops in the ORT zones to ensure consistency and quality. The agency worked with lane paving contractors to produce optimal pavement conditions

to ensure that the loops would operate accurately. In all of the ORT zones, the loops were cut into concrete, which is more durable than other roadway materials such as asphalt. (The concrete in the ORT zones is continuously reinforced with rebar, but care was taken to leave metal-free areas of concrete in which the rebar won't interfere with the loops' inductance capability.)

Staying on Budget, and on Time

With construction pricing increasing substantially in recent years, the PMO has worked to ease the effect on the CRP. The team has actively communicated with the contracting industry to promote contract opportunities and schedule bid advertisements. During the ORT conversion, the PMO held monthly meetings with members of the Illinois Road and Transportation Builders Association to review bid schedules and asked other entities that were planning building projects to supply their bid schedules so that the many projects throughout the Chicago area would not compete with each other. The PMO also held the aforementioned monthly project book meetings, which provided a forum in which all parties—contractors, construction managers, designers, and others—could update the PMO and each other on their progress. This ongoing collaboration was necessary



to stick to the aggressive schedule and to remain within the budget. Such extensive contractor coordination and outreach reduced project costs and encouraged a more competitive bid environment.

To help expedite the ORT conversion, the team advertised projects within the ORT program prior to the completion of the design documents, leading to more construction changes than would normally be anticipated. Fortunately, the PMO had anticipated these change orders and set aside an adequate budget to accommodate them. Change orders amounted to an increase of approximately 8.4 percent above the original contract award amount, which is still within the program budget of \$730 million. This percentage was also well within the 10 percent of change orders anticipated.

Under the CRP, escalation rates have been much higher than initially presumed. The original capital plan budget estimates were based on a

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4 percent escalation figure carried through the program, based on January 1, 2004, dollars. The budget, however, has accommodated additional expenditures not originally anticipated for the CRP, including the cost of the migration to electronic toll collection to integrate the latest technology and enhance toll collection; the cost of unanticipated ramp plaza work to align ramp plazas with the mainline system; and other ORT enhancements.

Commitment to Customers

In addition to compressing the time frame for completion of the ORT conversion and working to contain project costs, the Tollway required that every part of the ORT project be infused with a commitment to the customer. That meant delivering benefits as quickly as possible while minimizing inconveniences for motorists.

To minimize delays and maintain traffic flow, the Tollway in all but one location kept the same number of lanes open during construction as was available prior to construction. Construction that required additional

lane closures was performed at night or during off-peak hours whenever possible, and construction zones were limited to areas where active work was under way.

The Illinois Tollway's ORT system continues to exhibit a commitment to the customer post-construction, in its operation, by using one, centralized computer, known as a zone controller, to handle all the lanes in a zone. This is an improvement over the older, express tolling model, which relied on several computers. In addition, ORT offers better data handling with increased speeds and processing, the ability to increase the number of lanes in an ORT zone, and advanced software to better handle and frame transactions.

The advent of ORT brought the early electronic tolling model to the next stage by eliminating the need for drivers to slow down to between 5 mph and 25 mph in a designated electronic tolling lane. The new, ORT plazas provide mainline lanes in the middle to allow nonstop travel for I-PASS users, with tolls collected electronically via transponders mounted on vehicle windshields, bumpers, or roofs.

A Culture of Quality

The PMO has led efforts for the Tollway to receive and maintain ISO certification through three successful audits, underscoring the culture of quality and continuous improvement at the agency. (The Illinois Tollway is the first tollway in the nation to receive ISO certification and the only state-level highway agency to receive it for program management.) With a quality management system that conforms to ISO 90001:2000 standards, the Tollway ensures that all its processes and services promote quality, safety, reliability, and efficiency, and does so economically. As a result, the Tollway conducts its efforts under the highest international standards for roadway planning, design, and construction.

Other CRP management efforts have included developing a geographic information system (GIS) portal to access, analyze, and manage important data needed for day-to-day operations such as sharing maps, retrieving historical plans, tracking the status of rights-of-way acquisitions, and viewing how projects impact and overlap with other government jurisdictions.

In coordination with the Tollway's finance department, the PMO also has developed new, streamlined processes to allow CRP projects to be closed within 120 days of the project completion date, thus allowing remaining funds to become available to complete other

projects. As a result of higher than anticipated construction inflation in 2006, all remaining projects in the CRP were re-estimated to determine how the effects of the increased cost of construction affected the CRP. The team used numerous cost escalation, scope, and scheduling scenarios to develop a menu of options for review by the Tollway's executive management to set a new course for the CRP. This process will establish new goals for the balance of the program and begin to develop the needs of the Tollway's next capital program.

Total Team Effort

As related throughout this article, the successful implementation of the Illinois Tollway's ORT system can be attributed to the collaborative relationship between the agency's leadership and the Tollway's Program Management Office, a collaboration that fostered accountability and substantial business efficiencies.

The Tollway gained transportation efficiencies during the ORT conversion by separating the low-speed cash-paying traffic from the high-speed ORT traffic, which now is in direct alignment with the Tollway's mainline. In some cases, ingress to and egress from the plaza were designed to parallel that of traffic coming on and off the interchange ramps. In addition, some plazas were relocated to a spot on the new right-of-

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way to enhance toll collection operations and improve roadway performance.

Some of the key benefits the ORT conversion realized include:

- Improved safety for motorists because of the elimination of traffic backups and the separation of high- from low-speed traffic;
- Improved travel times due to the reduction of congestion and backups at plazas; and
- Improved safety at plazas due to reduced traffic volumes in the cash lanes.

Additionally, the ORT plazas produced time-savings for motorists almost immediately, according to an Illinois Tollway survey conducted in January 2006. More than half (53 percent) of those responding to the survey said they saved up to 10 minutes on a one-way trip thanks to ORT.

One-fourth (27 percent) said they saved 15 minutes or more per trip, and an overwhelming majority (71 percent) said their trips have improved as a result of ORT. Toll processing has improved from an average of 400 vehicles per hour in a staffed tollbooth to 2,300 vehicles per hour in an ORT lane.

In addition to forced-response questions, the survey posed an open-ended question about whether ORT had made a difference in the quality of life of Tollway customers. Many of the responses mentioned a reduction in hassles for travelers, increased safety, decreased road rage, and, above all, savings in trip time. In an age when governmental agencies are often viewed with skepticism by their constituents, it is heartening to note that two-thirds of those completing the Tollway survey offered positive responses.

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