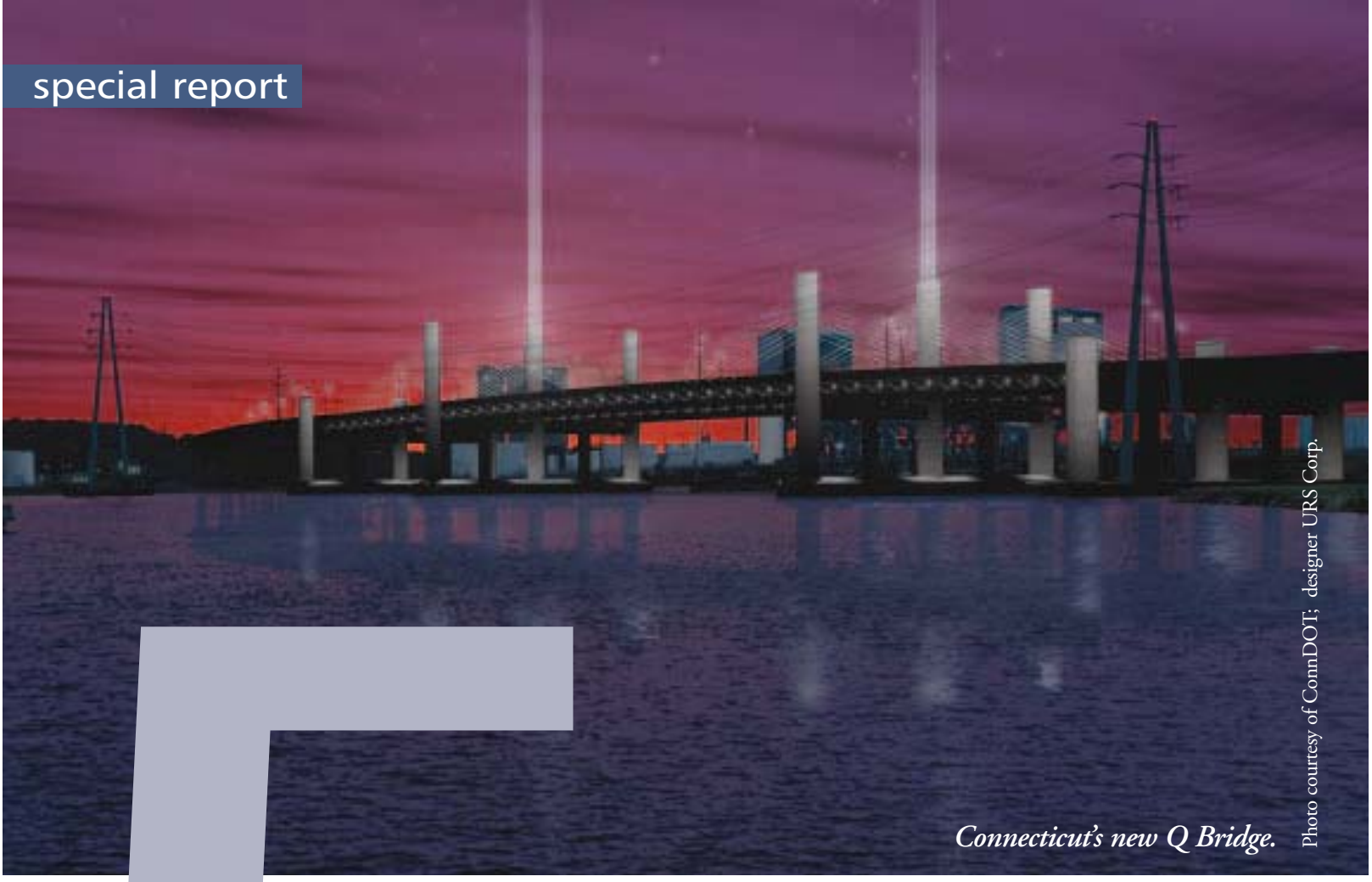

Connecticut's new Q Bridge. Photo courtesy of ConnDOT; designer URS Corp.

5 DOTs and the Future Under SAFETEA-LU

By Roseann McGrath Brooks and Linda DiBiasio

In August, 2005, U.S. President George Bush signed The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), a transportation reauthorization bill that will provide more than $200 billion in funding for highway and safety programs through the year 2009.

For this Primavera Special Report, we talked with five State Departments of Transportation to assess their initiatives and progress in light of SAFETEA-LU.

1 South Carolina: '27-In-7' Every Day

Completing 27 years worth of work in seven.

In 1999, the South Carolina Department of Transportation (SCDOT) initiated a program called "27-In-7," whereby it was charged with completing work that normally would have taken 27 years in just seven. Today, the program is nearing completion – there are only about 20 projects still to be finished out of 200 – but with the new SAFETEA-LU funding, the temporary "27-In-7" workload will soon be the norm at SCDOT.

"Before the "27-In-7" program, we were at roughly $300 million a year in construction projects. Now we're over $600 to $700 million a year and that's going to be maintained due to the new bill," says Director of Construction Danny Shealy.

A lot to handle

Shealy explains that in order to meet the original "27-In-7" mandate, SCDOT determined that they would handle 100 of the projects, but for the other hundred, they would need help. SCDOT then divided the state and contracted with two outside firms, which the DOT calls Construction Resource Managers (CRMs) – Fluor Daniel handled the western part of the state, and Parsons Brinckerhoff handled the eastern part. Both CRMs were using Primavera for their project management, and says Shealy, "We learned from them and we said, 'That's just what *we* need.'"

By 2002, Shealy had begun implementing Primavera to track construction projects. "I initially wanted to use it to track the progress of the contractors, to be able to forecast when I would need consultant help for Construction, Engineering & Inspection (CE&I) work when we couldn't handle it with our own forces, and to forecast payments for contracts that we had under construction.

"But when the Preconstruction group saw what I was trying to do, they realized that it would be helpful to them as well. Preconstruction then set up a Programs Control Unit, and ultimately shifted the group's focus to project delivery."

Coordinating its efforts

Shealy explains that prior to Primavera, SCDOT didn't have a solution for managing CE&I work. "Preconstruction had its own in-house program, but they were the only ones using it and we wanted something that would cover all aspects – preconstruction, construction and even maintenance in the future. Now with Primavera, we can see what's coming down the pike to us in construction."

Every day is '27-In-7'

The new SAFETEA-LU transportation funding is going to require SCDOT to manage programs like it did under the "27-In-7" program. Again, most of the project management and design will be handled by the DOT, and the rest will be undertaken with the help of consultants. "And, they will all be working cooperatively via Primavera software," says Shealy.

Today, the Project Controls Unit has all the projects in the DOT's five-year Statewide Transportation Improvement Plan loaded into Primavera. "We want to have all these projects updated in Primavera by our environmental group, our road design group, bridge design, right of way – all the preconstruction areas to get the plans developed and ready to go to construction."

The CRMs will update their schedules using the dashboard in Primavera, and those schedules will then be submitted to Program Controls where they will be downloaded into Primavera.

An urban diamond interchange – Routes I-26 and US 378.

Going forward, all consultants and contractors will be able to access the dashboard and all data will be housed in one database managed by SCDOT.

"Anything over $5 million is now required to be done in Primavera," says Shealy. "Contractors' schedules must indicate pay items and line items, they must be resource loaded and they have to produce a payout curve."

SCDOT will also be relying on Primavera for documenting a history of where each project started, where it is currently, and where it will finish.

"What used to be a best guess has now become measurable data that allows us to forecast real numbers." »

Texas: Driving On-Time Delivery

Using Primavera to help meet deadlines.

The Texas Department of Transportation (TxDOT) was ready for SAFETEA-LU.

TxDOT produces a funding document, updated annually, to plan construction projects on a 10-year cycle. In its most recent update, the DOT used the government's proposal of SAFETEA-LU as a planning assumption. As a result, "there was very little impact to our funding document when SAFETEA-LU was passed at a slightly higher level," says Brian Barth, director of transportation in Planning and Development with the TxDOT Dallas District. "The Texas legislature in the past two sessions also gave TxDOT new funding and project delivery tools to help get additional transportation infrastructure constructed."

Photo courtesy of TxDOT

Dallas' High Five construction project is 10 months ahead of schedule.

Says Scot Smith, district design engineer for the Fort Worth District of TxDOT, about SAFETEA-LU: "It reinforces the innovative funding mechanisms the state legislature has already provided us, which may result in our working on larger, more complex projects."

To manage the development of many of its current design projects, the Fort Worth District has been using Primavera software for 10 years. "We track projects from concept to the completion of a set of plans," says Smith, "for everything from traffic signal installation to new freeway construction."

Fort Worth includes several design steps in its planning system. "We need input from sections of our organization such as environmental, right-of-way, utilities, bridge design, traffic-signal design and roadway design," says Smith. "All have activities and responsibilities that they can schedule and access via Primavera software."

Although each section manager can modify only his or her own plan, Primavera lets managers view all other schedules. "This allows us to come together in project meetings and focus the discussion on how key items are progressing," says Smith. "Each section can see how a scheduled activity occurring now can affect its step in the process. This lets us set realistic deadlines."

The Fort Worth District used the Primavera Software Development Kit (SDK) to create a wizard to help managers schedule projects. "Without the wizard, there would be a steep learning curve," admits Smith. "A project manager may put together a schedule for one project and then not have to create another schedule for two more years. The wizard reduced time to develop a schedule from two days to 45 minutes, increasing our efficiency."

Also in Dallas

The Dallas District is also developing what it calls a "Project Development Scheduling System," which comprises Primavera software and a front-end wizard. As in Fort Worth, project designers will run the wizard – also developed with the Primavera SDK – which takes them through a series of questions about their projects. The wizard creates a schedule in the Primavera database. The designer can then edit the schedule, if needed, directly from Primavera, and enter status using time sheets.

In the past, the Dallas District used

critical path method (CPM) for scheduling just the construction phase of the projects. With Primavera, the organization can also use CPM scheduling in the project development phase to help the DOT meet the letting date, the date at which TxDOT accepts bids from contractors.

Previously, each designer managed his or her own project development schedules, explains Barth. Thus, the organizations handled problems reactively instead of having the ability to proactively address issues before they became problems and affected the overall schedule. The Dallas District anticipates that Primavera software will help managers "identify bottlenecks in the development process and fix them, manage manpower resources better in each design office, enable design offices to handle additional work, and identify under- or over-performing offices," says Barth. In addition, having the database housed centrally enables management to view the entire district's schedules in one screen.

Anticipating SAFETEA-LU

Barth expects Primavera software to help his organization manage a greater volume of work anticipated by SAFETEA-LU and "develop projects systematically and coordinate resources agencywide," he says. Although the Dallas District is still implementing the software, it hopes to expand its scheduling capabilities with additional licenses of Primavera. "If successful," Barth points out, "other districts may be interested in adopting it." »

3 South Dakota: Advance Planning

The need for accurate project communication.

South Dakota has 7,857 miles of state-owned roads for which its transportation workers have to plan projects for maintenance, upgrade and construction. In addition, there are nearly 76,000 miles of local roads that require coordination with local governments for similar work.

"Planning highway projects and preparing a set of construction plans can take anywhere from three months to 15 years, depending on the type of project," explains Tim Bjorneberg, project development engineer with the Office of Project Development at the South Dakota Department of Transportation (SDDOT). "We need a reliable system for scheduling resources for the 1,200 projects that are going on concurrently."

Paving concrete on the recently completed highway to Mt. Rushmore.

SDDOT is counting on Primavera software to provide that reliable system. The agency is in the process of implementing the software to schedule its staff members and their tasks for the planning and engineering processes of all highway-related

construction projects. Such projects include seal coating existing highway to preserve a stretch of road, building a full interchange for a freeway in an urban area, and developing a new four-lane expressway. The DOT intends for the software to manage scheduling from initial planning through the hiring of construction and maintenance contractors.

Until recently, the DOT used its 25-year-old mainframe for project scheduling. "It has served us well," says Bjorneberg, "but it doesn't allow for dynamic scheduling. The static monthly reports it lets us produce are not up with the times."

SDDOT wants to record and report on scheduling activity in real time. Up to 150 people may be working on various planning aspects of one project at once. Some may be purchasing properties for new highway space, others may be dealing with utilities companies, and still others may be addressing political or environmental concerns. "Primavera will provide a better communication tool for all of us to see which phases of which jobs have been completed and which still need to be done," says Bjorneberg.

Scheduling – and more scheduling

The need for accurate communication and scheduling will become even more important with the advent of SAFETEA-LU. According to Bjorneberg, the additional funding provided in SAFETEA-LU will allow for the implementation of more projects in the mix of already-planned highway construction. "Primavera will help us answer questions such as 'How will we get these new projects done with the resources we have?'" he says. The DOT may uncover a need for external resources, for example.

One of the DOT's missions is to spend funds wisely to meet the expectations of the state government and its citizens. SDDOT often needs approvals from external groups such as the transportation commission, which oversees how the DOT spends its funds. "We have a long history of accomplishment," Bjorneberg says. "Dynamic-scheduling software gives us the ability to communicate that we are on track and, in turn, spending wisely, and can show us where we need to change things if we need to get back on schedule."

Bjorneberg sees the DOT as a self-supporting engineering firm with diverse needs. Each project is different, he says: "It's not a cookie-cutter situation. There may be a project that involves 30 miles of highway and one that is just an intersection. Our goal is to coordinate those projects for clear communication of project planning." »

4 Connecticut: Massive Reconstruction

Planning for the first extradosed bridge.

Connecticut's Pearl Harbor Memorial Bridge spans the Quinnipiac River and is known by local residents as the "Q Bridge." It opened for operation in 1958 to accommodate 80,000 vehicles daily, but today, that volume has increased to 120,000 and is expected to grow to 140,000 by the year 2015.

To address the growing need for expanded roadways and bridges, the Connecticut Department of Transportation (ConnDOT) has undertaken a massive construction project – the I-95 New Haven Harbor Crossing Corridor Improvement Program (NHHC or Q Corridor) – that includes reconstruction of I-95 through Branford and East Haven, as well as a brand new crossing of the Q River. "We're planning to build a signature 10-lane extradosed cable stayed bridge – the first of its kind in the United States – in there. The project also includes reconstruction of the interchanges of I-91, I-95, and Route 34," says Mark Rolfe, construction division chief for ConnDOT.

The proposed new Pearl Harbor Memorial Bridge, better known as the Q Bridge, is a $300 million project.

Primavera a mainstay

ConnDOT has been using Primavera scheduling software for a number of years as its scheduling platform. "We have an installed base here and we write Primavera into our major construction projects, requiring the contractors to use the software to put together their baseline schedules and regular updates using Primavera," says Rolfe.

"We've been using it for a long time and have now extended it to the Q Corridor projects. In addition, we've now embraced and incorporated the Expedition contract and document management software [now called Primavera Contract Manager] into the way we do business. We had used it earlier for a couple of our larger projects, but it was then a standalone version, and our in-house information systems security people had concerns about putting that software on our network and allowing third-party access to it.

"When Primavera Web enabled the software, it changed the ballgame for us. We then were able to allow the third-party access because now we have a Web host separate from our network where people can go to get the access that they need."

Ramping up for the Q Bridge

ConnDOT is currently using the Primavera Contract Manager software on several introductory projects that will lead into the Q Bridge reconstruction. "As long as we continue to have success with it, we're going to write it into the Q Bridge reconstruction, which is a $300 million project, as well as the interchange reconstruction, which is about a $225 million project," says Rolfe. "We are hoping to advertise for bids on the bridge project in the coming calendar year. If the project progresses as planned, we'll look to expanding the use of the software to other major projects in the future."

With so much on its plate, Rolfe says that the impact of SAFETEA-LU on ConnDOT is still an unknown. "We are still trying to digest it. It's a huge, huge bill. It's about 1,200 or 1,400 pages and contains a number of new initiatives."

In the meantime, ConnDOT is moving forward on its massive NHHC project. When completed, the Corridor will incorporate coordinated color and design elements for easier driving, and its streamlined engineering and construction will provide a new level of safety for the residents and visitors of Connecticut. »

New Jersey: Building for the Future

A regional overview of projects.

With nearly 8.7 million people living in 8,722 square miles, New Jersey is among the most densely populated states in the union. Daily, many of those people – and their guests – travel state and local roadways.

"Our job is to enable drivers to get around smoothly," says John Maida, a project manager with the New Jersey Department of Transportation (NJDOT). To support that job, among its various construction projects the DOT continually widens roads, resurfaces highways and replaces bridges.

Since 1996, NJDOT has used Primavera software to plan and schedule both the design and construction of capital projects.

Then and now

Before Primavera, the DOT had no central database for these projects, and designers and contractors often submitted printed Gantt charts to provide scheduling information. The scheduling process was manual, which delayed reporting and could introduce errors.

Today, critical data for the lion's share of the DOT's projects resides in Primavera. The data – schedule and budget information for the design process as well as schedules for the construction process – includes information from both in-house and contract designers and builders. Schedulers update design schedules monthly, unless more frequent updates are needed. "The project engineers then have read-only access to the planning information, which they can use to determine the next steps in projects as well as to produce reports," explains Maida. "Primavera shows how long a particular process will take and can reveal when and where conflicts could arise."

The software also enables managers to have a regional overview of projects throughout the state. Thus, says Maida, on a program-wide basis, upper management can view when projects will complete, which allows them to set fiscal programs and ensure that funding is in place.

Because projects exist on a timeline in Primavera, they can be tracked and their progress closely monitored. This enables more timely construction, allows for efficient use of staff because the information reveals who is doing what when, avoids multiple projects occurring on the same area of road, and provides quicker and more accurate information for reporting to government agencies. By eliminating delays and enabling funding to be requested for projects as needed, electronic scheduling enables the DOT to save costs.

Burlington County's damaged Race Street Bridge was redesigned and constructed with the help of Primavera.

"This is the most important factor for us, as we are a government agency receiving federal funding for our work on the state highway system," says Maida.

Because funding is a key element of SAFETEA-LU, Maida predicts that for whatever new projects are added as a result of the new transportation bill, the DOT will use Primavera to handle its project management. •

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