

Using *Railroad-DOT Mitigation Strategies* SHRP2 Case Study



Working with Railroads as Part of Alternative Contracting – Recipes for Success

As more states turn to alternative contracting methods to design and construct their highway projects, interaction and coordination with intersecting or adjacent railroads are important considerations. The use of Design-Build (DB), Construction Manager/General Contractor (CMGC), and Public-Private Partnerships (P3s) are now common in several states and the Rail Divisions in their respective state Departments of Transportation (DOTs) are working to ensure these projects are successful and meet the needs of railroads and contractors alike.

This case study looks at the processes being used in four state DOTs to help alleviate delays or reduce risks in alternative contracting scenarios. Although their approaches are somewhat different, they share a common thread – communicate as early as possible with all involved.

“We see a rapid rise in DB projects with railroad involvement in the Southeast, and we recognized early that it is becoming a preferred process,” said CSX Public Projects Manager, Troy Creasy.

Rail Highway Section Director Robert Travis of the Texas Department of Transportation (TxDOT) Rail Division, found that, “Design-Build contractors may not know the [railroad] process and can short-circuit the schedule or create delays when working with the railroad. Rail coordination is as much – if not more – critical with alternative delivery methods.”

North Carolina DOT’s “Smart” Questionnaire

To address the growing number of projects using DB in its state, the North Carolina DOT (NCDOT) tried to answer the question: Where can we reduce delays and make it easier to contract out these projects?

Railroad-DOT Mitigation Strategies (R16)

Through the second Strategic Highway Research Program (SHRP2), a series of strategies were developed to improve coordination and collaboration between and among DOTs and their respective railroads.

The resulting product, *Railroad-DOT Mitigation Strategies* (R16), identifies seven areas where performance can be improved, saving money and time while improving safety by accomplishing enhanced and streamlined project delivery.

The Community of Interest (COI) was developed as part of R16 product implementation. The COI represents 20 states, six Class 1 railroads, one regional rail/short line holding company owning numerous railroads, the Federal Railroad Administration, the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the American Association of Short Line Railroads. Its members meet regularly in person and via webinars and conference calls to share best practices and identify common problem areas.

“Our goal was to get as much information from the railroad as possible to give to the consultant team during the proposal stage,” said NCDOT’s Assistant State Structures Engineer Kevin Fischer, Program Management and Field Operations Structures Management Unit. “That way they can use it in their assumptions. It provides everyone with the same information, levels the playing field, and helps provide a baseline for the selected contractor on which they can work.”

In 2016, NCDOT and one of its Class 1 railroad partners, CSX, began working to develop a detailed questionnaire that the railroad could complete prior to developing the DB proposal package. CSX, through its consultant Arcadis, initially worked with the South Carolina DOT in the early 2010s to develop a similar questionnaire and saw that it was successful in that state.

“NCDOT approached us with the goal of reducing costs, less back and forth, and to ensure that the DB contractors had a clearer understanding so that they could provide a higher quality project,” Creasy said.

The Project

In 2015, NCDOT was requesting proposals for a large DB project that included a CSX and Norfolk Southern (NS) railroad underpass bridge over Blue Ridge Road in Raleigh. In this project, the track is owned by the North Carolina Railroad and is used both by CSX and NS, adding additional complications to the project. Each has one set of tracks that will be built as part of the project; there is also an adjacent siding. According to Creasy, it required a very complex signal redesign.



Visualization of future grade separation concept, Blue Ridge Road Project

Photo Courtesy NCDOT Rail Division

The Questionnaire

The 24-question [Request for Railroad Information for NCDOT Design-Build Project](#) begins with preliminary drawings generated by the NCDOT. It asks for project site-specifics such as utilities within the right-of-way, flooding issues, existing signals, existing agreements, daily freight and passenger train counts, current design standards, clearances, restrictions, right-of-entry requirements, and soil requirements. Another set of questions relates to temporary construction such as detours. Information on various construction requirements, estimated costs for preliminary engineering reviews and other required railroad services (such as flaggers or training requirements) is also requested.

For the Blue Ridge Road project, the questionnaire was completed by CSX and returned to NCDOT in three months, much sooner than expected. CSX’s responses to the questionnaire were included in the proposal package.

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Troy Creasy, CSX Public Projects Manager

As part of the overall project, NCDOT had an engineering design firm develop a temporary detour track plan that was also sent to CSX for review and approval. “The developer isn’t bound by the plan; however, it was approved by the railroad so is readily available for them to use,” Fischer said.

“NCDOT still does a lot of upfront coordination, such as preparing environmental documents, line, and grade, but with this railroad information, it levels the playing field and makes the work transparent for all the bid teams. This helps both the railroad and the DB contractor. If nothing else, it gets the railroad thinking about the project much earlier in the planning stages,” Fischer said. “If a railroad wants to deviate from the requirements they identified in the questionnaire, it gives some protections to the contractors. It helps with risk management. Once the contract is awarded to the DB team, the DB team is responsible for railroad interaction and force account.”

“Today we are much better off than we would be without these questions,” Creasy said. “I feel this will be the template we work from going forward. This reduces speculation and the need for change orders and claims against the highway agency. It also cuts down on calls to me from prospective contractors. Contractors don’t have to try and read between the lines.”

Creasy said the CSX Public Projects team is looking at adding a DB chapter in its Public Projects Manual sometime in 2019. “It could be a national model; it doesn’t matter which railroad or DOT, all have similar problems and so similar solutions will work.”

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Colorado DOT’s Experience with Alternative Contracting Methods

Unlike NCDOT, the Colorado DOT (CDOT) has not created a special process for getting railroad approvals on its DB projects. Instead, it has tried to increase communications, including full disclosure of all risks to make sure all proposers know the facts.

For standard Design-Bid-Build (DBB) projects as well as for Construction Manager General Contractor (CMGC) projects, requests to the railroad for Railroad Cost Estimates occur at the 30 percent design level of the project, assuming no substantive changes are anticipated to the design of railroad elements. The Railroad Cost Estimate can also be requested later than 30 percent design level, if there is reason to believe the design involving the railroad elements may be revised. Railroads usually provide their estimates in 90 to 180 days, depending upon the complexity of the project. Progress against this timeline is updated monthly and is accounted for in the project schedule.

For DB or P3 projects where the contractor or concessionaire team provides both design and construction at an accelerated pace, the need for early action on the railroad elements is critical. The DB and P3 contractors and CDOT’s project teams must prioritize the final railroad design elements as early as possible, and to a point of no substantive changes, in order to request a Railroad Cost Estimate and finalize the lengthy contracting process. This reduces the overall risk to the DB and P3 contractors. The 90- to 180-day railroad estimate timeline should be accounted for in the project schedule.

“Railroads in a DB project aren’t a fatal flaw; they just have to be managed properly with putting as much information into the Request for Proposal (RFP) as possible,” said CDOT’s Alternative Delivery Program Manager Matthew D. Pacheco. “Generally, a DB project goes to bid with 5 percent to 30 percent of the design complete; the railroad portion should be 30 percent to 90 percent complete, depending on how the project is managed.”

CDOT's Railroad and Utility Program Manager Scott Hoftiezer, concurs. "Every time there is a railroad [in an alternative-contracting scenario], it raises an immediate red flag to ensure early coordination or early workshopping prior to the delivery of the final Request for Proposals," he said. "These types of projects are very important to CDOT. There is an advantage to having a single procurement. It enables us to manage risk better and tap into resources we might not otherwise have."

The Projects

Several of the largest projects CDOT has undertaken in the last few years have been accomplished through alternative contracting. They include the \$1.67 billion Transportation Expansion Project (T-REX)



Photo Courtesy transportation-finance.org

in southwest Denver; and a \$150 million program to increase capacity on I-25, the Colorado Springs Metro Interstate Expansion (COSMIX).

Hoftiezer said that CDOT has an approved Master Agreement Contract with the Union Pacific Railroad (UPRR) that allows task orders to be written for each project.

When a task order is executed, the specific scope of work is approved under the Master Agreement. The task order does not have to be reviewed by the railroad's legal department, because the standard language of the agreement has already been agreed to, saving time in the task order approval process.

If a project requires a new shoofly (temporary railroad detour), it is the responsibility of the railroad to shift the alignment. Then the DB contractor will do its work, and the railroad shifts it back. This information is included in the RFP as well. The CDOT [Railroad Manual](#), Section 2.7, Railroad Alternative Project Delivery Methods, goes into some detail about the project delivery process.

"Our industry is still at the learning stage for DB since Railroad Clearance is always something the DOT handled," said Pacheco. "We've seen some smaller contractors on scaled-down DB projects having some confusion about the railroad portion. In some instances, they may not have known how complicated it would be. We just try to address this, project by project."

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How Texas DOT Works With DB and CDA

Texas DOT (TxDOT) has three DB projects currently under construction. As with the other states, the overall goal behind TxDOT's DB railroad program is to accelerate project delivery and reduce interface risks. But TxDOT found that DB contractors may not know the process and may inadvertently short-circuit the typical railroad coordination process and create delays in working with the railroad.

Travis, TxDOT's Rail Highway Section Director, said that DB contractors may not always recognize that the railroad has specific rules and procedures that must be followed. "The more information that can be provided to the contractor up front, the better," he said.

TxDOT has decentralized its project management to 25 districts; the Rail Division provides technical support and typically signs the rail agreements on behalf of TxDOT. New guidelines require railroad

coordination when a project that may impact a railroad is first proposed, involving the District Rail Coordinators, the Rail Division, and the designer to reduce delays or other problems. The Rail Division reviews proposed specifications and augments coordination, including partnering with the railroad at the onset of a project. This includes sharing base schematic plans, executing preliminary engineering agreements with the affected railroad, and then obtaining railroad review and approval of the schematic plans that then become part of the DB packet. For projects that involve underpass work or the need for a railroad shoefly, TxDOT and the railroads aim to develop 60 percent of the track design as part of the schematic review and approval process. This information is also included in the DB packet.

The TxDOT Rail Division works with two types of projects – DB and Comprehensive Development Agreement (CDA), which is similar to a P3. In some instances, the DB contractors will take the project over at 20 percent to 30 percent of design completion, build the project, and turn it over to TxDOT. For a

“Bottom line, rail coordination is even more critical with alternate delivery methods.”

Robert H. Travis,
TxDOT Rail Division

CDA involving the construction of toll lanes with railroad impacts, after 10 percent of plan is determined, the developer is responsible for acquiring all funding for construction, constructing, and maintaining the project for a defined term (usually 52 years). The developer manages the toll facility and then turns it over to the state after the term

is completed. Since the state is the ultimate owner, TxDOT is involved in all the railroad-related agreements.

“Because the design builder/developer is constructing on our right of way and we will own the roadway [if a typical DB project], the state is signatory to any agreement that includes the railroad, design-builder, and TxDOT. The railroad also prefers having TxDOT as a signatory,” said TxDOT’s Travis.

“We involve the railroad as early as possible; at the schematic or concept phase; and prior to working with any potential design builders/developers. When the proposal packets are sent to the DB bidders, the railroad rules and guidelines are included; for example, scope of worksheet, guidelines, flagging, payment, or railroad specific requirements. Then, the awarded contractor will enter into its own preliminary engineering agreement with the railroad, to include paying for project-related costs, and can use the template construction and maintenance agreement we provide, send it to the Rail Division for its concurrence, and then submit to the railroad for its approval and execution,” Travis said.

Approximately 75 percent of TxDOT’s DB projects involve UPRR. With UPRR, TxDOT may enter into a two-party agreement between the state DOT and railroad only, using existing template agreements. The advantage is that all the terms are already agreed to by both parties. The agreement will reference the DB contractor, but the contractor must have its own separate contractor right-of-entry agreement with UPRR and the previously mentioned engineering agreement.

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Utah DOT Steps into DB

Utah has only one Class 1 railroad, UPRR. DB is used extensively in the state on the DOT’s bigger projects. At least five of these projects in the last five years have had railroad impacts.

“We work as early as possible in the planning stage. We are more prescriptive in the sections where railroads are involved. UPRR requires a plan to be 100 percent complete before agreements can be signed; but with DB, at RFP initiation we are only at 30 percent design,” said UDOT Statewide Railroad and Utilities Director Alana Spendlove. “As a result, we have the project procurement group identify a

situational layout. Where no master agreement exists with UPRR, we will work on a construction and maintenance agreement or at-grade agreement as soon as possible.

“Once the plans are at 100 percent, it can take 12 weeks for the railroad to review and find it acceptable,” Spendlove said. UDOT uses a standard form for the railroad report. “I find that CMGC works better [for us] with the railroads and their scheduling constraints.”

The Project

Utah is using DB on certain sections of a new freeway being constructed on the west side of Salt Lake and Utah counties, referred to as the Mountain View Corridor. One recently completed segment crossed two rail lines owned by UPRR. The rail lines were also used by short line railroad companies. The project included six highway bridges over the railroad in both north/south directions including a pedestrian bridge over the tracks.



For the Mountain View Corridor project, the finished girder placement is over the Bacchus Spur, owned by UPRR.

Photo courtesy UDOT

“The project went well,” Spendlove said, “given the prescriptive nature of this segment. Our procurement team produced a 30 percent situation and layout plan that UPRR agreed to, signing the agreement and easement based on that level of design. The DB team was responsible for finishing and submitting the plans to UPRR for its approval, as well as requesting right of entry.” Although the agreement process took a bit longer than originally anticipated, no official delay was reported by the DB contractor.

The project was advertised in 2015-2016. The initial railroad agreement was in place by December 2015 and then construction was initiated in 2016 and completed in 2017.

Spendlove said securing a master agreement with UPRR is the key to more manageable DB contracting where railroads are involved. UDOT is currently in discussions with UPRR to accomplish this agreement. “Then, if we have all the legal terms approved by UPRR and UDOT, regardless of the type of project, all the project team would need is to do a scope, schedule, and budget amendment. We would not have to go through legal and wait.” She, like all the others, said that it is critical to begin working with the railroad at the earliest stage possible.

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For more information on ***Railroad-DOT Mitigation Strategies*** (R16), go to http://shrp2.transportation.org/Pages/R16_RailroadDOTMitigationStrategies.aspx or contact Kathleen Hulbert at FHWA, Kathleen.Hulbert@dot.gov; or Kate Kurgan at AASHTO, kkurgan@ashto.org or Pam Hutton at AASHTO, phutton@ashto.org.