

Using *Railroad-DOT Mitigation Strategies* SHRP2 Case Study



The Power of Master Agreements as Part of *Railroad-DOT Mitigation Strategies* (R16)

Using Master Agreements to Improve Project Delivery, Saving Time and Money

Each year, thousands of public agency highway projects are constructed over, under, or parallel to railroad rights-of-way. Using master agreements to do this work is a proven strategy for state departments of transportation (DOTs) and their partner railroads and can save time and money for each entity. Accelerating the upgrade of grade crossings and other railroad improvements also increases public safety.

Master agreements can streamline the development of agreements for routine project activities such as regular roadway maintenance and bridge inspections, flagging services, or construction involving at-grade crossings.

A master agreement includes standard provisions to which both parties agree. It covers language that is redundant from project to project, such as conflict of interest standards, disadvantaged business enterprise language, and Federal Aid Policy circulars, and details the process for advancing projects.

The master agreements improve contractor practices by implementing standard agreements for provisions for insurance, indemnification, flagging, and rights-of-entry. They can include standard bid terms and conditions to be used when contractors are working in railroad rights-of-way, resulting in consistent bids that result in fewer delays or change orders.

To illustrate how master agreements can be effectively developed and implemented, this case study looks at three entities – the states of North Carolina and Texas, and the BNSF Railroad Company (BNSF) railroad – using master agreements or similar standardized vehicles to address different aspects of DOT/railroad coordination.

Thousands of highway projects intersect with railroad crossings. By using the tools included in *Railroad-DOT Mitigation Strategies* (R16), public agencies and railroads can identify and work through possible sources of conflict and develop agreements to advance these projects in a timely manner.

This product includes a collection of railroad-DOT model agreements, sample contracts, an innovation library with examples from state departments of transportation and several Class 1 railroads, manuals, and standardized best practices.

This product uses a collaborative approach and identifies strategies in seven areas to improve performance. They include strategies to:

- Improve coordination
- Improve the project delivery process
- Streamline the process of reviewing and signing agreements
- Improve flagging
- Improve grade crossing safety and funding of crossing projects
- Improve training and knowledge transfer
- Improve administration processes

North Carolina's Grade Crossing Signalization Program

The North Carolina Department of Transportation (NCDOT) has streamlined the formal agreement process for grade crossing signalization, and, as a result, has experienced significant time savings by eliminating the need to draft and execute individual agreements for each project location. NCDOT's Rail Division oversees more than 3,475 public railroad grade crossings. Annually, the agency completes 25 to 30 crossing signalization projects, using master agreements designed specifically to streamline the administrative process for and construction of these new or upgraded warning devices.

NCDOT began using master agreements for signalization projects in the late 1970s. Today, it has railroad-specific master agreements with two Class 1 railroads – CSX and Norfolk Southern – and 19 short line railroads that are operating in North Carolina. Because of its past success, NCDOT developed and implemented master agreements for crossing surface work beginning in 2016.

"In North Carolina's case, master agreements allow us to streamline the agreement process on crossing projects throughout the state. It has a cascading, time-saving effect – we are able to get crossing signals installed much more quickly."

Richard Mullinax, Rail Signals Engineer, Rail Division, NCDOT

What does this agreement cover and how does it work?

NCDOT's master agreement for grade crossing signalization can be used to perform work on a wide range of projects – from the simple installation of warning devices with no road improvements to a roadway widening project, or for a new road being installed that would create a new grade crossing. These master agreements are specifically for crossing signalization work and do not pertain to other work elements that may also be necessary.

Every master agreement was reviewed, approved, and executed both by NCDOT and the respective railroad. They detail NCDOT's and the railroad's specific processes needed to move a project from concept, to design, and to construction and final acceptance. Another key part of the master agreements is the reimbursement process between NCDOT and the railroads.

The master agreements have no termination dates, and are funded through various sources and administered by NCDOT. Either NCDOT or the railroad can terminate the agreement by providing 60-days-notice to the other; however, none have been terminated since their inception, demonstrating the mutual benefit of the master agreements for both NCDOT and the railroad.



Construction of crossing signalization with traffic signal preemption installed under NCDOT's master agreement with Norfolk Southern Railway as part of a roadway widening project along NC 42 in Clayton, Johnston County, North Carolina.

Photo courtesy NCDOT

For crossing signal projects, the process begins with location selection by NCDOT based on program criteria followed by an investigation of the location. NCDOT prepares a concept plan, showing the desired protection devices and their placement. The concept plan is transmitted to the railroad along with a letter authorizing them to prepare a preliminary engineering package, which includes detailed plans, specifications, cost estimate, and materials list. Under terms of the master agreement, the railroad is to “make a best effort” to return these documents within four months.

NCDOT staff reviews the engineering packet to ensure the intent of the concept plan is met and evaluates the cost estimate for completeness and reasonableness. The railroad also must include a signed Authorization for Construction form. Internally, NCDOT will review the project cost estimate against the programming budget to align the project’s construction with funding availability. Once the Authorization for Construction is approved by NCDOT, the railroad makes a “best effort” to begin construction of the project within six months. Upon final NCDOT acceptance of the project, the completed devices are placed under the custodial care of the railroad to operate and maintain.

Reimbursement Procedures

The reimbursement process and the associated cash flow are thoroughly covered in the master agreements. Once a project is authorized, the railroad may submit up to 85 percent of its total estimate to reflect actual work progress. Upon acceptance, the railroad has up to nine months to submit a final invoice, although this is reduced to six months for short line railroads. After this period has expired, invoices are subject to rejection.

Work Completed on Municipal Roadways

On municipal-owned roads, NCDOT reimburses the railroad and then seeks reimbursement from the municipality for its share of the project. This process is covered under a separate agreement between the NCDOT and the municipality for each location and the railroad is not a party to these agreements. A municipality does have the right to reject a selected project at its discretion on its streets.

Change Orders

Change orders can be submitted if changes are required that were not identified during the design stage. If changes are needed, the railroad revises its plan quantities’ list, and the Authorization for Construction form, and submits these to NCDOT for approval. Supplemental agreements to the master agreements may also be issued to reflect special conditions. Only two, however, have been issued as of February 2018 – one for an evaluation of a vehicle detection system desired by NCDOT, and the other to address legislative mandates and technical updates.

For more information on NCDOT’s program, contact: Richard E. Mullinax, NCDOT Rail Signals Engineer, remullinax@ncdot.gov.

Lessons Learned in Texas

The Rail Division of the Texas Department of Transportation (TxDOT) administers a \$25 million annual budget and oversees more than 300 agreements on construction and maintenance projects related to more than 50 freight and commuter railroads throughout the state. Of these, approximately 200 (67 percent) involve simple construction and maintenance work, and TxDOT partnered with its Class 1 railroads to streamline the master agreement process used for these projects. The master agreement has not been finalized, but the concepts and partnership have enabled a maintenance letter to be sent to the railroad in lieu of an agreement.

TxDOT is decentralized with 25 separate districts, so when working with the railroads, it is imperative to reduce redundancy and ensure consistency across all districts as much as possible. Each of these 25 districts select their own projects and conduct initial consultations with the railroads. The district coordinator then works with the Rail Division to finalize the agreement on behalf of the state. An operations manual, sample agreements, exhibits, and other information are [on the TxDOT website](#) so they can be easily accessed by TxDOT staff.



How TxDOT Uses its Partnering to Streamline Maintenance

Flagging was one area where the partnering effort led to the development of a two-page simple maintenance letter. Historically in Texas, railroads used their own employees for flagging; however, during the partnering meetings, it was determined that using third-party, approved vendors could save both entities time and money while ensuring safety as road work was being performed.

Now, through the standard provisions and scope of a work sheet, the state's construction contractor engages directly with the flagging vendor and the contractor is reimbursed as part of the normal payment process. No additional agreement is needed; a standard letter is signed by TxDOT and sent electronically to the railroad notifying them of the project. The contractor will hire the flagger directly and the railroad will email TxDOT with its concurrence, providing the agency with a folder number or real estate management system number that can be used by the contractor when applying for a right-of-entry and related insurance, thereby significantly reducing the time needed in the schedule. Also, because of this process, no direct payments are made from the state of Texas to the railroad for flagging and the construction contractor has control of the flagging schedule, reducing delay claims related to flagging.



Photo Courtesy TxDOT

TxDOT's Maintenance Letter Process Enabled a Quick Response to a Major Incident

On a Friday afternoon over the Fourth of July weekend, two trains collided and damaged a major Texas highway bridge. One of the tracks was 14 feet from the centerline of the pier and the other was about 25 feet. Because of the existing maintenance letter and flagging vendor, the railroad was able to lift up the bridge so it could remove the cars and get the tracks back in service.

Concurrently, representatives from TxDOT were addressing how to fix the bridge and install a crash wall to protect the piers. TxDOT Rail Division staff obtained clearance for a contractor to do this work with the recently approved maintenance letter and flagging vendor process. The contractor completed the work within 45 days of the accident, and the bridge was opened up just as Hurricane Harvey struck. This highway was one of the evacuation and recovery routes.

The streamlined maintenance letter covers only pavement planning, filling, and seal coat work; signing and striping of a roadway; bridge maintenance and inspection; and common ditch and vegetation work. It is not used for bridge deck replacement, shoulder widening at a crossing for safety enhancements, or other changes to the licensed area within the railroad property; those are separately negotiated.

For more information on TxDOT's program, contact Robert Travis, TxDOT's Rail Highway Section Director, robert.travis@txdot.gov or the Rail Highway Section of the [TxDOT Rail Division website](#).

The Railroad Perspective – BNSF's Master Agreement Process

BNSF operates the largest freight railroad network in North America, with 32,500 miles of rail across the western two-thirds of the United States. Its Public Projects Department oversees agreements related to warning device upgrades, grade separations, crossing closures, quiet zones, line relocations, roadway widenings, and private crossing permits.

To reduce the risks inherent with at-grade crossings and to deter trespassing on its property, BNSF uses a number of strategies, including closure and consolidation of crossings, grade separations, modifications using Section 130 funding, right-of-way fencing, sight distance improvements, and public and agency education.

Master agreements with state DOTs are a key element used by BNSF to achieve these strategies and expedite project timelines while still protecting all parties. The agreements include standard language that can be used for multiple purposes and can be referenced in subsequent agreements to reduce redundancy and review timelines. The Agency reviews the design and scope of projects or existing construction and maintenance agreements to see if or where language could be incorporated into a master agreement.

Requirements that BNSF includes in a master agreement:

- Indemnification language
- Safety requirements
- Contractor requirements on right of way
- Flagging requirements when on BNSF property
- Where and when a qualified employee is needed to oversee contractors and others working under the right of way
- Invoicing and reimbursement language
- Specific railroad and DOT obligations

"We want to see these master agreements executed so that all parties can be successful while ensuring the safety of the project."
Taylor Smith, Manager of Public Projects, BNSF

Construction and maintenance agreements typically include railroad, DOT agency, and joint obligations; indemnification language; insurance; signatures; and any exhibits needed. Exhibits include the approved plan; permanent and temporary easements; contractor requirements; agreements between the railroad and contractor; costs estimates for railroad work; final written approval from BNSF's manager of public projects; BNSF bridge requirements; and the total project estimate for eliminating grade separations and at-grade crossings.

Generally, BNSF has a preconstruction meeting with all parties after executing the agreement, including the contractor, subcontractors, and utility representatives, as well as the state DOT. During the meeting, required safety credentials are discussed as well as on-site badging requirements. Each contractor must have a safety action plan in place and all construction submittals must be reviewed and approved prior to any work.

BNSF also recommends completion of a checklist for any construction in the right-of-way. This would ensure that all the following required items are secured, including:

- The executed construction and maintenance agreement;

- Confirmation that the contractor has proper insurance in hand;
- The preconstruction meeting; a notice to proceed to BNSF;
- Safety credentials that ensure the contractor’s crews have eRailsafe credentials and have taken the required contractor safety orientation;
- A safety action plan; and,
- Approval of all construction submittals

Although these requirements are not unique to BNSF, they came as a direct result of several incidents on BNSF property that occurred when the contractor made changes to the work plan after it was submitted and approved. Six incidents occurred across the BNSF system in the last two years. Some common themes surfaced from these incidents:

- Contractor made changes to the work plan after the plan was approved and the contractor did not resubmit the work plan.
- Contractor did not stop work to rebrief BNSF and the construction team when changes were made.
- Cranes were overloaded past specifications.
- Contractor improperly calculated or did not calculate load weights.



Crane Accident, La Pine, Oregon. August 2016
Photo Courtesy BNSF

Currently, BNSF requires unified agreement language; expects all parties to understand expectations throughout the design and agreement phase; requires significant ownership by all parties; and requires specific closeout and the application of best practices.



Successful BNSF Crossing Reconstruction, Havre, Montana - Co Rd. 403 – Before and After
Photo Courtesy BNSF

For more information on BNSF’s program, contact Taylor Smith, BNSF Manager of Public Projects, taylor.smith@bnsf.com.

Summary of Master Agreement Advantages

In conclusion, because of a master agreement’s standardized requirements and established protocols for all parties, significant savings in both schedule and costs can be achieved.

Strategies to Streamline the Process of Reviewing and Signing Agreements

During the research phase of the SHRP2 program, several specific strategies were identified that would improve coordination and speed project delivery, if used consistently by transportation agencies and railroads. Strategies relating to master agreements and flagging are listed below. The full document can be found in the [SHRP2 R16 Innovation Library](#).

- Adopt master agreements in which both parties agree to standard provisions within all projects to streamline the project agreement process. (Provisions of what should be included in master agreements can be found on pages 61-62 in [Strategies for Improving the Project Agreement Process between Highway Agencies and Railroads](#). Examples of master agreements can be found in the [SHRP2 R16 Innovation Library](#)).
- Streamline agreement processing of routine projects such as routine maintenance and bridge inspections that are less than \$25,000 or routine maintenance and inspection activities that only require flagging services.
- Develop a list of noninvasive projects (into the railroad space) and share with the railroads ahead of the project start date. These projects do not require flagging services and the railroads are aware that they will not be in their space.
- Improve contractor practices by implementing standard agreements or provisions for insurance, indemnification, flagging, and rights-of-entry. Update standard bid specifications to be used when contractors are working in railroad rights-of-way. The contractor will be required to have proper insurance in place before entering the right of way.

Strategies to Improve Flagging

- Simplify projects and separate those that do not need flagging services and share the list of such projects six months or a year ahead to eliminate the review time and expedite project work.
- Chart out the annual need for flagging by project and schedule and share with the railroad six months in advance of the need.
- Write (or rewrite) general flagging provisions to be consistent with certain railroad union requirements.

For more Information:

To learn more about *Railroad-DOT Mitigation Strategies* (R16), contact Jessica Rich at the Federal Highway Administration (FHWA), jessica.rich@dot.gov; Kate Kurgan at the American Association of State Highway and Transportation Officials (AASHTO), kkurgan@aaashto.org; or Pam Hutton at AASHTO, phutton@aaashto.org.

FHWA GoSHRP2 Railroad-DOT Mitigation Strategies (R16) Webpage:

FHWA's product page includes presentations from various workshops, links to source documents, and a map showing which states are participating in the IAP program to implement *Railroad-DOT Mitigation Strategies* (R16).

AASHTO SHRP2 Railroad-DOT Mitigation Strategies (R16) Webpage:

AASHTO's product page offers case studies, training modules, presentations, factsheets, reference documents, and innovation library, and a list of other states implementing the R16 product.

Other References

- Examples of state and railroad master agreements in the [SHRP2 R16 Innovation Library](#).
- The Transportation Research Board's R16 research report, [Strategies for Improving the Project Agreement Process Between Highway Agencies and Railroads](#), outlines recommended practices and offers eight different model documents to expedite negotiations. Provisions for what should be included in master agreements can be found on pages 61-62.
- EDC-3 Improving DOT and Railroad Coordination ([SHRP2 Railroad-DOT Mitigation Strategies](#)).
- Federal-Aid Essentials for Local Public Agencies on the [FHWA website](#).