

1110 Railroad Grade Crossings and Right-of-Way

1110.1 General

Railroads are a surface transportation mode that must be considered during the design of highway, bicycle, and pedestrian facilities. Designs for such facilities must address how to safely permit vehicles, bicycles, and pedestrians to cross the railroad tracks given that trains have the right-of-way at railroad grade crossings and typically require a substantial distance to come to a stop. While the most significant railroad design considerations will occur when these facilities cross railroads by an at-grade or a grade-separated design, railroad impacts can come into play whenever there is maintenance or construction on or adjacent to railroad right-of-way.

Each railroad will use its own personnel or contractors to undertake construction or modification of at-grade crossings at the project's expense because the crossings are considered part of the railroad's track structure. Railroads may also require railroad flagging protection (performed by a railroad employee), railroad safety training, and railroad protective insurance, all at a project expense, dependent upon the vicinity of the track in relation to the project work activity. Railroads may impose significant restrictions on projects by limiting the hours when construction activity may occur near heavily used rail lines. When making design decisions, it is advisable to minimize, or if possible avoid, design choices that will impact railroads.

1110.1.1 Will Your Project Impact a Railroad?

Railroad impacts can come in many forms. While the most obvious are railroad grade crossings or highway overpasses and underpasses, other impacts are not as apparent. Examples include permanent use of railroad right-of-way, utility crossings, temporary construction access, field survey, railroad flagging during maintenance or construction, and actual or potential encroachments on the railroad's dynamic envelope and/or foul zones. Generally, any use of railroad right-of-way for roadways, pathways, or related drainage or utilities must be approved by the railroad and typically will involve completing a license agreement with the railroad to allow such uses of its property.

Mitigation to railroad impacts could include avoidance, railroad-required flagging protection, safety and engineering monitoring, railroad safety training, design or engineering review/approval, and additional insurance. Railroads have Federal Railroad Administration (FRA) rules to follow when protecting trains and workers (Roadway Worker Protection-On Track Safety) which, by railroad policy, is expanded to third-party workers such as highway construction contractors. Safety and the protection of all workers and transportation modes is the ultimate goal.

1110.1.2 Highway-Railroad Grade Crossings

Projects involving highway-railroad grade crossings can have significant impacts and require substantial coordination. Grade crossings are the intersection of two modes of transportation with very different physical and operational characteristics. Many variables influence a motorist's ability to react appropriately at grade crossings, including the information available as the driver approaches the crossing and human factors such as competing decisions, distractions, and impaired driving. Primary factors in the design of grade crossings are roadway and railroad track geometry, available sight distance, highway and railroad speeds, competing decisions or visual distractions, and the types of warning devices at the grade crossing.

Another aspect of grade crossing design is the coordination of highway traffic signal operations with grade crossing active warning devices (railroad preemption) when signalized highway intersections are located near grade crossings. In such instances, railroad crossing signal preemption is designed to clear the tracks of any vehicles that may be stopped as a result of the nearby highway traffic signal when a train is approaching the grade crossing.

Grade crossings are also unique due to their multijurisdictional nature. Highway authorities and railroad companies are each legally responsible for different elements at grade crossings. The New Mexico Department of Transportation (NMDOT) Rail Bureau not only is the steward of NMDOT-owned railroad property, but also can assist project managers in coordinating with the railroad company impacted by the project.

The degree of project coordination will depend on the location and scope of the project. For example, establishing new crossings, altering existing crossings, or closing crossings on NMDOT-owned rail infrastructure requires approval from the NMDOT Secretary of Transportation. Similarly, the New Mexico Public Regulation Commission (NMPRC) has authority over crossings that involve non-NMDOT-owned railroads and non-NMDOT-owned roads, as defined in [18.14.2 NMAC](#). Railroad companies will also typically have their own process, standards, and requirements for work occurring within their right-of-way that may differ slightly from one another. Therefore, highway projects that include a grade crossing will generally require close coordination with both the NMDOT Rail Bureau and the railroad company.

1110.1.3 General Occupation of Railroad Right-of-Way

Other projects that include any occupation of railroad right-of-way, such as roadway overpasses or parallel alignments, will generally require execution of construction and maintenance agreements between the NMDOT and the respective railroad company. These agreements specify the design elements of the project as approved by the railroad, railroad flagging work that the railroad will perform on behalf of the project, payment terms, and legal provisions.

1110.1.4 The NMDOT Rail Bureau's Role

The NMDOT Rail Bureau issues railroad certifications for Federal Highway Administration (FHWA)-funded projects when there is no impact to a railroad or when any potential or actual impacts have been satisfactorily addressed and approved by the respective railroad. The Rail Bureau can assist engineers in determining what railroad impacts may or will occur and methods to address the impacts, and can put the designer in touch with the appropriate railroad contacts. Designers shall not determine the impact to a railroad without first coordinating with the NMDOT Rail Bureau.

Coordination, document reviews, and application approvals from a railroad company may take several months. The NMDOT Rail Bureau must be contacted early in the design phase so that all necessary design and agreement coordination can be completed according to project schedules, and so that issuance of a Rail Certification for a project will not be unnecessarily delayed.

1110.2 References

1110.2.1 Federal/State Laws and Codes

- [23 Code of Federal Regulations \(CFR\) Part 646, Subparts A and B.](#)
- [49 CFR, Subtitle B, Chapter II, Parts 200-299.](#)
- [18.14.2](#) and [18.14.4](#) New Mexico Administrative Code (NMAC).

1110.2.2 National References

- A Policy on Geometric Design of Highways and Streets (Green Book). American Association of State Highway and Transportation Officials (AASHTO), current edition
- Communications & Signals Manual: Volume 1, Section 3 - Highway-Rail Grade Crossing Warning Systems, American Railway Engineering and Maintenance-of-Way Association (AREMA), current edition.
- [Guidance on Traffic Control Devices at Highway-Rail Grade Crossings, Highway/Rail Grade Crossing Technical Working Group \(TWG\)](#), United States Department of Transportation (USDOT) and FHWA, 2002.

- [Guidelines for Railroad Grade Separation Projects](#), Union Pacific Railroad (UP) and BNSF Railway (BNSF), 2016.
- Manual for Railway Engineering, AREMA, current edition.
- [Manual on Uniform Traffic Control Devices \(MUTCD\)](#), Parts 8 and 9, United States Department of Transportation (USDOT) and FHWA, 2009.
- [Railroad-Highway Grade Crossing Handbook](#), FHWA, 2007.

1110.2.3 NMDOT References

- New Mexico Standards and Procedures for Railroad Right-of-Way Access or Construction, NMDOT Rail Bureau, June 2016.
- NMDOT [Standard Specifications for Highway and Bridge Construction](#), current edition.
- [New Mexico State Rail Plan, Chapter 2: Rail System Inventory and Review](#), NMDOT, 2014.
- Railroad Bridge Safety Management Program (NMDOT - owned infrastructure), Version 7.0, NMDOT, November 2014.
- New Mexico Section 130 Federal-Aid Highway-Rail Grade Crossing Safety Improvement Program Procedures and Guidelines Manual, NMDOT, December 2014.

1110.2.4 Additional References

- [Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings, Version 6-10-04](#), Texas Department of Transportation.
- [NMRX Grade Crossing Pedestrian & Bicyclist Safety Study: Safety Devices, Crossing Evaluation Form and Standard Applications Toolbox](#), Rio Metro Regional Transit District, April 2016.
- Rio Metro Regional Transit District. [New Mexico Rail Runner Express System](#) Google Map, 2015.

1110.3 Procedure Guidance

The State of New Mexico and the NMDOT have developed extensive resource documents to facilitate the development of projects involving private railroads and NMDOT rail assets. Described below are the four primary guidance documents.

1110.3.1 New Mexico State Rail Plan

The [State Rail Plan](#) documents New Mexico's rail system inventory, defines goals and objectives for rail in New Mexico, articulates the existing and future role of freight and passenger rail within New Mexico, identifies potential rail improvement projects, and prioritizes future investments as part of a long-range service and investment program. The State Rail Plan satisfies the requirements of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), necessary to make New Mexico eligible for intercity passenger rail federal funding.

1110.3.2 Railroad Right-of-Way Access or Construction

The NMDOT Standards and Procedures for Railroad Right-of-Way Access or Construction documents the procedures, requirements, and fees for most utility and minor roadway projects that cross railroads owned by the NMDOT. Significant coordination is required throughout the design and construction process. Early coordination including submission of application and license is encouraged to ensure agreements and permits are in place for construction. Additional requirements are imposed on the contractor for insurance and traffic control.

1110.3.3 Section 130 Guidelines

Most at-grade public highway-railroad crossing improvements are funded through the Highway-Rail Grade Crossing Safety Improvement Program, a subdivision of the Highway Safety Improvement Program (HSIP), also known as the Section 130 Program. The Section 130 program is a federally funded program dedicated to the elimination of hazards at existing public highway-rail grade crossings.

In addition to the project selection procedures, the New Mexico Section 130 Federal-Aid Highway-Rail Grade Crossing Safety Improvement Program Procedures and Guidelines Manual also provides the program's minimum recommended installation guidelines.

1110.4 Design Coordination

All projects with federal or state funding and/or projects near railroad right-of-way and/or easements must be coordinated with the NMDOT Rail Bureau to determine the degree to which safety or railroad operations are affected. Coordination shall be made through the NMDOT Rail Facilities Manager (contact information to right) and shall include project number, control number, route and roadway mile markers, United States Department of Transportation (USDOT) railroad crossing number (if applicable), and scope of work. It is important for designers to contact the NMDOT Rail Bureau and not assume that a project will not have an impact.

Early coordination with the NMDOT Rail Bureau is highly encouraged as the impacts for construction costs and schedules can be significant. High costs result from the addition of new railroad grade crossing active warning signals (flashing lights and gate arms), crossing surface installation or rehabilitation, railroad flagging protection of trains and workers, and highway traffic control required during construction.

The NMDOT Rail Facilities Manager can provide details on existing infrastructure, project needs, required permits, and rail certifications, if required. Rail coordination, project need, and design requirements shall be documented in the rail section(s) of the Phase IA/IB Report, the project Scoping Report, and/or the project file. Rail projects shall follow the environmental coordination process outlined in Chapter 130 of the Design Manual.

Coordination with the NMDOT Rail Bureau will continue through preliminary design but will vary depending on the intensity of the rail impacts and design required. In addition, the rail certification is required as part of the project certification process for any federally funded project.

**NMDOT Rail
Facilities Manager**

(505) 827-5133
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Rail Facilities Section
P. O. Box 1149
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1110.5 At-Grade Crossing Evaluation Guidance

Due to the significant safety issues surrounding at-grade crossings, representatives from all associated parties should participate in site visits, operations analyses, and the development of recommendations.

Railroad grade crossings have unique considerations and evaluation procedures. The FHWA [Railroad-Highway Grade Crossing Handbook](#) is a single reference document on prevalent and best practices as well as adopted standards relative to highway-rail grade crossings. The handbook provides general information on highway-rail crossings, characteristics of the crossing environment and users, and the physical and operational improvements that can be made at highway-rail grade crossings to enhance the safety and operation of both highway and rail traffic over crossing intersections. The guidelines and alternative improvements presented in this handbook are primarily those that have proved effective and are accepted nationwide.

Guidance for traffic control devices at grade crossings are provided in the MUTCD Part 8: Traffic Control for Railroad and Light Rail Transit Grade Crossings. Additional guidance for bicycle crossings is found in Part 9 of the MUTCD.

While much of the national design is applicable to NMDOT rail projects, the NMDOT [Standard Specifications for Highway and Bridge Construction](#) provide local design guidance.

Additionally, the Rio Metro Regional Transit District published the [NMRX Grade Crossing Pedestrian & Bicyclist Safety Study: Safety Devices, Crossing Evaluation Form and Standard Applications Toolbox](#) in April 2016, which provides design guidance and evaluation forms for safe at-grade bicycle and pedestrian crossings.

1110.6 Roadway Design Guidance

Design guidance for at-grade crossing roadway design is provided by the American Railway Engineering and Maintenance-of-Way Association, BNSF and UP.

Specific to grade-separated crossing facilities, the joint standards of BNSF and UP are provided in the Guidelines for Railroad Grade Separation Projects.

1110.7 Documentation

The following documentation may be required for NMDOT projects involving railroad impacts as appropriate to the scope of the project:

- Rail certification request
- Application for wireline crossing
- Application for pipeline crossing
- Application for roadway or pathway crossing
- Work permit application
- Drawings, plans, and profiles
- As-builts
- Traffic control plan
- Temporary occupancy application
- Signal preemption calculations
- Safety plan
- Railroad safety certification cards

