

**OHIO RAIL DEVELOPMENT COMMISSION**

**HIGHWAY/RAILROAD**

**CROSSING SAFETY IMPROVEMENT PROGRAM**

**Warning Device Upgrades**

**Project Development Process and Procedures**

**Ohio Rail Development Commission**  
**1980 West Broad Street**  
**Columbus, Ohio 43223**

**(614) 644-0307 (telephone)**  
**(614) 728-4520 (fax)**  
**<http://www.rail.ohio.gov>**

***DRAFT***  
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## ORDC PROGRAMS

### I. INTRODUCTION

The Ohio Rail Development Commission (ORDC) *Railroad Grade Crossing Safety Program* provides funding for highway-railroad grade crossing safety improvement projects. It is the practice of the ORDC to administer Highway-Railroad Grade Crossing Projects for the Hazard Elimination Program (e.g. 130 program) in compliance with 23 USC 130, 23 CFR 646 and 23 CFR 924 and to develop and maintain procedures to ensure full compliance.

**Programs:** The ORDC Railroad Grade Crossing Safety Program is divided into five (5) programs based on the type of project and method of project identification. The five (5) programs are:

- Formula-based upgrade program (warning device)
- Corridor-based upgrade program (warning device)
- Constituent-identified program (warning device)
- Preemption program (warning device with traffic signal interconnection)
- Surface reconstruction program

### II. FORMULA-BASED UPGRADE PROGRAM

The *Formula-Based Upgrade Program* is a partnership between the ORDC and the PUCO to select warning device upgrade projects based on a priority list that ranks all railroad-highway grade crossings statewide in order of risk of crash. A calculation of the most hazardous crossings is generated periodically and reviews of each location are conducted to determine whether warning device improvements may be expected to improve motorist safety.

The Railroad Information System (RRIS), updated by the PUCO and the ORDC, includes a crossing inventory that includes every railroad crossing in Ohio and is available for public access. In addition, the RRIS generates a crash prediction value that is used to determine the hazard ranking of each crossing within the state. The crash prediction value is calculated using a formula created by the Federal Railroad Administration (FRA) and incorporates variables such as: the crash history at the crossing, the average daily traffic, the maximum speed of trains, the number of tracks, the existing warning devices, the angle of the crossing and the number of trains per day. A sample database sheet from the public crossing inventory is attached as Appendix 1 and a sample database sheet from the internal hazard ranking is attached as Appendix 2. Hazard rankings fluctuate as conditions change at grade crossings statewide. Changes in vehicular and train traffic volumes and the occurrence of a crash will often dramatically change the hazard rankings.

**Project Identification:** At the start of each state fiscal year, and often in late winter of each year, ORDC asks PUCO to identify a specific number of candidate projects based on the funding ORDC has budgeted for this program. PUCO staff uses the hazard rankings from the RRIS to identify the most hazardous crossings statewide and generates a list.

**Project Evaluation, Selection, and Development:** Once PUCO staff generates the initial list, the train data is confirmed with the railroads and the list is sent to ORDC. ORDC staff conduct desk and field reviews to confirm the rail conditions, train speed, train count, and average daily traffic data. Once ORDC accepts the list, PUCO staff schedule diagnostic reviews. The ORDC, as the lead funding agency, administers the diagnostic review. For the Formula-Based Upgrade Program, the diagnostic review team assumes that a light and gate installation will be recommended for the location (due to the hazard ranking) unless the crossing's geometry indicates that lights and gates cannot physically be installed at the location. If red flags are identified during the diagnostic review, the review team is asked to consider whether other remedies might be available. The team does not, however, change its recommendation based on the red flags.

In some cases, information arising from the diagnostic review will determine that no upgrade is necessary or that the location is a potential closure candidate. If no upgrade is necessary, the crossing will be excluded from upgrade at that time, although if conditions change at the crossing it may be reconsidered at a later date. If a crossing is a potential closure candidate, the diagnostic team should make recommendations on whether improvements are necessary in the event that closure cannot be negotiated. The ORDC will initiate contact with the local highway authority to determine whether closure can be negotiated. If significant progress towards closure is not achieved within twelve months, the alternate recommendation of the diagnostic team should be implemented or a new diagnostic review convened.

**Program Availability:** ORDC initiates project selections through the Formula-Based Upgrade Program at least once per year, and often a second time if funding permits.

### **III. CORRIDOR-BASED UPGRADE PROGRAM**

ORDC's *Corridor-Based Upgrade Program* provides a framework for systematically considering, identifying, and prioritizing projects that have public safety benefits at multiple grade crossings along a railroad corridor. ORDC's *Corridor-Based Upgrade Program* involves a strategic approach to the development of multiple crossing upgrade projects along a segment of a rail corridor. While the *Corridor-Based Upgrade Program* identifies multiple crossings for improvement, smaller groups of crossings or individual crossings within the identified corridor are advanced as stand-alone projects using the project development process described in detail in the following sections of this document.

The intent of ORDC's *Corridor-Based Upgrade Program* is to more effectively upgrade multiple crossings. Costs may be reduced when multiple crossings are improved concurrently. Corridor improvements usually include cost contributions by the railroad, a local community, and/or other state and federal funding sources. The economy of scale achieved from corridor based upgrades includes engineering and design efficiencies, better crew utilization during construction, and economy of orders and delivery of material and supplies. These economies of scale enable funding for more grade crossing improvements than would have been otherwise possible.

Candidate corridor projects are generally initiated by railroads. Railroads may identify a corridor for different reasons including: increases in train traffic (or anticipated increases in train traffic) or infrastructure improvements like burying pole lines or adding Electra-Code. *Corridor Based Upgrades* are developed in consultation with representatives from the local highway authority (LHA), the railroads, Public Utilities Commission of Ohio (PUCO) and ORDC. Representatives from the Federal Railroad Administration (FRA) and Federal Highway Administration (FHWA) have also been involved in corridor project development. ORDC will conduct an evaluation of the railroad corridor and its crossings and will develop a *Corridor Crossing Safety Upgrade Plan*. The plan will identify potential street closures, modified traffic flows, realignment of streets, crossing circuitry upgrades, traffic signal interconnection issues, relocation or installation of lights and gates, and/or the construction of other miscellaneous improvements, including the installation of pavement markings and advanced warning signs.

**Project Identification:** Historically, the proposal of a corridor for the *Corridor-Based Upgrade Program* has been made by an operating Class 1 railroad. The potential partner identifies an opportunity or need along a specific corridor. At the end of FY2011 there were four corridors in progress under this program. The Norfolk Southern (NS) B Line, nearing completion; the NS CJ Line, in progress; and the NS Heartland and CSX Transportation Galion to Union City corridors, selected and pending Memorandums Of Understanding (MOU).

For future projects, ORDC will conduct a letter solicitation to railroads operating in Ohio, inviting them to identify corridors along which operational changes have resulted or may result in increased hazards at railroad-highway grade crossings. Operational changes could include increased train volumes, modifications to train operations, and infrastructure improvements that result in higher train speeds. In order to increase the volume of improvements being completed, the letter solicitation will require that the railroad propose at least a 25% matching share for the corridor.

**Corridor Evaluation, Selection, and Development:** The ORDC evaluates and prioritizes candidate corridors and selects corridors for funding under the *Corridor-Based Upgrade Program* as follows:

- ORDC validates the information presented by the railroad proposing the corridor;
- ORDC reviews the grade crossing inventory and hazard ranking index for each crossing in the identified corridor;
- ORDC selects corridors for upgrade if it determines that the stated improvement is beneficial from a safety and cost benefit analysis standpoint. Items under evaluation will include, as appropriate, but not be limited to:
  - Average hazard ranking for all crossings in corridor
  - Average hazard ranking for all crossings in corridor with passive warning devices
  - Average hazard ranking for all crossings with flashers only
  - Average hazard ranking for all crossings with flashers and gates
  - Number of crossings that could readily be closed as determined by ORDC office review
  - Average number of trains per year for past 3 years as provided by the applicant railroad
  - Railroad projection for average number of trains per year for next 3 years as analyzed by ORDC using information supplied by applicant railroad
  - Timetable speed of corridor trains at present
  - Timetable speed for corridor trains after corridor project is completed
  - Number of 60 MPH freight trains and 79 MPH passenger trains in the corridor at present

- Number of 60 MPH freight trains and 79 MPH passenger trains in corridor after corridor project is completed
- If multiple corridors are available for selection, selection will be based on average hazard ranking of the crossings within the corridor and available ORDC resource to progress the corridor;
- Once a corridor is selected for upgrade, ORDC enters into an MOU outlining the funding split and the procedures that will be used to advance the improvements;
- ORDC conducts diagnostic reviews at each crossing along the corridor to identify hazardous conditions;
- ORDC selects and prioritizes improvements at individual locations (single or multiple crossings) based on hazard ranking indices and conditions in the field;
- ORDC and the railroad enter into individual letter agreements or subsidy agreements for the prioritized improvements; and,
- ORDC seeks federal authorization for logical segments along the corridor (single and/or multiple crossing locations).

The advancement of individual projects (either as single or multiple crossings) within a corridor selected under the *Corridor-Based Upgrade Program* is based on the timeline of the agreement (generally several years), the prioritization of improvements along the corridor, and community involvement, as closures are generally sought as part of the *Program*.

**Program Availability:** This program is part of ORDC’s Safety Programs and is publicized via ORDC’s website, ORDC staff, public outreach, the HSIP report, and in the ORDC performance report. In addition, ORDC will seek future potential corridor projects via a letter solicitation to Ohio railroads.

#### IV. CONSTITUENT-IDENTIFIED UPGRADE PROGRAM

The *Constituent-Identified Upgrade Program* considers project referrals from a number of sources and makes selections based on hazard rankings, extenuating conditions, and funding availability. Also considered under this program are locations that are the site of fatal vehicle-train crashes and requests to provide local share matching funds for projects offered funding by the Public Utilities Commission (PUCO).

**Project Identification:** Locations are identified for consideration under this program in three ways:

*Location Referrals:* Requests for projects can come from a number of sources including:

- County Grade Crossing Safety Task Forces
- Railroads
- Local Governments
- County Engineers
- ODOT Districts
- ORDC Project Managers
- Angels on Track and other safety advocacy organizations
- Members of the general public

In addition, ORDC sends a letter annually to the ODOT Districts, the County Engineers of all counties with public, at-grade crossings, and the ORDC Project Managers that asks them to recommend two crossing locations within their jurisdictions for warning device improvements. These officials are asked to consider factors of the FRA crash prediction value formula (average daily traffic, train traffic, existing warning devices, crossing angle) along with the existence of extenuating circumstances at those locations.

*Fatal Crash Locations:* A crossing is considered for upgrade when a car/train crash occurs resulting in a fatality. ORDC staff monitors statewide news sources to receive notification of fatal crashes and coordinates with the PUCO on crashes reported under federal regulations.

*Local Share Funding Requests:* The state, through the statutory authority of the PUCO, permits the cost of a crossing upgrade to be shared between the local government, the state, and the railroad (State Grade Crossing Protection Fund, Ohio Revised Code Section 4907.472). The PUCO assesses the severity of need and allocate funding based on an objective matrix measuring both the seriousness of the hazard and other conditions at the crossing.

The railroad share of all safety upgrades is usually 10 percent of the total cost to upgrade the crossing. Under local share projects, depending upon a variety of factors including the amount of daily train or motor vehicle traffic at the crossing, municipalities are usually required to cover from 30 to 70 percent of the cost of the project.

Following its determination, the PUCO will extend a financial assistance proposal to the LHA for agreement. The LHA may, in turn, ask ORDC to fund some or the entire local share. When local share funding is provided, ORDC will assume financial responsibility and advance the project development process to improve the crossing in accordance with federal guidelines.

**Project Evaluation and Selection:** Locations identified in this program receive automatic priority if a grade crossing closure is offered by a community in exchange for an upgrade to the warning devices at another.

Locations are further considered as follows:

*Referred Locations:* ORDC considers crossing locations that are referred to ORDC for improvement in a bifurcated process. First, the vehicular and train traffic data in the Railroad Information System (RRIS) is evaluated to ensure that it is current. The Funds Management Committee of ORDC (comprised of the Executive Director, Secretary-Treasurer, Safety Programs Manager, and Safety Programs Assistant Manager) considers the current hazard ranking of the crossing and any mitigating circumstances that the referring party has identified. These considerations may include, but are not limited to:

- Limited sight distances due to parked railroad cars, structures, or other obstructions off of railroad property;
- School bus traffic at the crossing;
- Truck traffic at the crossing;
- Pedestrian and/or bicycle usage; roadway geometry; and,

- Anticipated changes in vehicular or train traffic that are not yet reflected in the RRIS.

The Funds Management Committee of ORDC will make a determination as to whether to proceed to a diagnostic review, although the committee has established a policy that any crossing with a hazard ranking of less than 750 will be advanced to a diagnostic review. The diagnostic review and all considerations of Step 1 of the Project Development Process are completed. The Funds Management Committee then reconsiders the location to determine whether improvements should be made at the crossing. Considerations primarily include funding availability.

*Fatal Crash Locations:* In addition to confirming the RRIS data and considering the current characteristics and hazard ranking of a fatal crash location, the ORDC Researcher also obtains the Police Crash Report, County Coroner Report, and Railroad Crash Report. A diagnostic review is conducted and the Funds Management Committee considers the location to determine whether improvements should be made at the crossing. In addition to the installation of new lights and gates, circuitry upgrade and other supplemental safety measures are also considered by the diagnostic review team.

*Local Share Funding Requests:* The Funds Management Committee of ORDC reviews the PUCO determination, the current hazard ranking, and any mitigating circumstances that have been identified to exist at the crossing. Unless there are mitigating circumstances, ORDC will fund the local share as follows (subject to funding availability):

Hazard Ranking	ORDC Share of Project
0-1,500	100% of Local Share
1,501-3,000	75% of Local Share
3,001-4,500	50% of Local Share
4,501+	25% of Local Share

Once selected for funding, projects proceed through the standard Project Development Process.

**Program Availability:** The program is available on an ongoing basis, with identified locations reviewed at least quarterly by the Funds Management Committee. In addition, ORDC solicits project referrals annually from the ODOT Districts, the County Engineers of all counties with public, at-grade crossings, and the ORDC Project managers.

## V. PREEMPTION PROGRAM

The *Preemption Program* upgrades warning devices and traffic signals to establish appropriate traffic signal preemption when a train approaches a crossing that has a traffic signal in close proximity. A location must be preempted if a crossing is located within 200 feet of a highway traffic signal or, possibly, if highway traffic queues over the railroad crossing.

In order to establish traffic signal preemption, railroad and circuitry timing requirements are identified, an Intelligent Transportation System (ITS) form will be completed and reviewed to

ensure that the circuitry interconnect plan meets the state standard, and the timing changes will be implemented. Upgrades to the traffic signal circuitry and/or the railroad warning device circuitry may be needed in order to establish the interconnection under the provisions of the Highway-Rail Grade Crossing Interconnection Standard. The requirements of the standard are incorporated into the Traffic Engineering Manual (TEM), chapters 8 and 4, which is available at [www.dot.state.oh.us/divisions/operations/traffic/publications2/tem/pages/default.aspx#](http://www.dot.state.oh.us/divisions/operations/traffic/publications2/tem/pages/default.aspx#).

This program addresses only existing locations where preemption is warranted and does not include those that are identified as part of a grade crossing warning device upgrade project or those that are created by the installation of a highway traffic signal project. Preemption needs for grade crossing warning device upgrade projects will be addressed during the development of the warning device project.

**Project Identification:** In 2009, ORDC and ODOT began a partnership to establish a statewide preemption standard, identify locations that have preemption or need preemption, to evaluate and determine whether corrective actions are necessary to establish fully-functional preemption, and to implement those corrective actions to improve motorist safety. Locations were solicited from ODOT district staff, ORDC staff, and local highway authorities (cities, county engineers, and townships). The locations were catalogued and are being reviewed for preemption needs and/or corrective action. Occasionally, a local highway authority implements improvements that include installation of traffic signals in proximity to grade crossings without making provision for railroad preemption. In these cases, the location will be added to the list and ranked by formula.

**Project Evaluation, Selection, and Development:** As part of this ongoing program, ORDC is developing a formula that incorporates a number of variables to rank the hazardousness of intersections that require preemption. Once all locations are identified and surveyed (expected to be completed in March of 2012), ORDC will fund corrective actions at the locations on the list based on the ranking, complexity, and fiscal constraints.

**Program Availability:** ORDC has budgeted \$2 million per year for corrective action preemption projects starting in FY 2012. Once all locations are addressed (as identified through this program), the program may be eliminated.

## VI. SURFACE UPGRADE PROGRAM

# IN DEVELOPMENT

## Warning Device Upgrades Project Development Process and Procedure

### II. INTRODUCTION

This section outlines the various project development steps associated with implementing warning device upgrades funded under ORDC's safety program. All of ORDC's warning device upgrade projects fall under one of the following three categories:

- Standard Crossing Upgrades;
- Corridor Based Upgrades; and,
- Crossing Consolidation and Closures.

#### Standard Crossing Upgrades

For the purpose of this document a standard upgrade is a single project at one or more adjacent highway-railroad crossings where the warning devices are upgraded. Standard upgrade projects involve a majority of the safety improvements implemented by ORDC. Standard upgrades are not unusual and require little or no deviation from the project development process outlined below. However, if a potential crossing upgrade project is determined to have an environmental issue or engineering requirement that raises it to a higher level of complexity, then the crossing is considered to have a *red flag*. Red flags will require that additional steps be taken to resolve these issues prior to advancing the project. The six different red flags that may be associated with potential crossing upgrade projects are identified and described under Step 1 in the development process below.

#### Corridor Based Upgrades

ORDC's *Corridor Based Upgrade Program* involves a strategic approach to the development of multiple crossing upgrade projects along a segment of a rail corridor. Under the Corridor Program, a corridor may extend for hundreds of miles with many crossings, or it may extend just a short distance through a small town or village with just two or more crossings. While *Corridor Based Upgrade Program* advances multiple crossings at the same time, the project development process for each individual crossing is identical to that for standard crossing warning device upgrades, described in detail in the following sections of this document.

The intent of ORDC's *Corridor Based Upgrade Program* is to more effectively upgrade multiple crossings. Costs may be reduced when multiple crossings are improved at the same time. The economy of scale achieved from corridor based upgrades includes engineering and design efficiencies, better crew utilization during construction, and economy of orders and delivery of material and supplies.

Corridor projects are initiated for different reasons including: increases in train traffic, railroad reconstruction or capacity expansion, or the desire by a local government or highway authority to

improve multiple crossings within its community. *Corridor Based Upgrades* are developed in consultation with representatives from the local highway authority (LHA), the railroads, Public Utilities Commission of Ohio (PUCO) and ORDC. ORDC will conduct an evaluation of the railroad corridor and its crossings and will develop a *Corridor Crossing Safety Upgrade Plan*. The plan will identify potential street closures, modified traffic flows, realignment of streets, crossing circuitry upgrades, traffic signal interconnection issues, relocation or installation of lights and gates, or the construction of other miscellaneous improvements.

### **Crossing Consolidation and Closures**

There are railroad-highway grade crossings that are infrequently used or redundant. In some instances, it may be possible to close crossings to vehicular access without compromising the mobility of local residents or the ability of emergency vehicles to serve the citizenry.

By consolidating and closing redundant crossings ORDC can focus its limited safety funds on upgrading the warning devices at other more hazardous and heavily traveled highway crossings. With the cooperation of communities and local highway authorities throughout Ohio, many crossings have been improved or upgraded under the Consolidation Program while other crossings may be completely eliminated.

The *Grade Crossing Consolidation Program* is no longer a separate program, instead, closure opportunities are considered within all program categories. The ORDC Safety Section staff will partner with local officials to determine which roads might be closed without significant negative traffic impacts. The PUCO or ORDC may provide funding for safety improvements at other crossings as an incentive to close a crossing. Railroads will be invited to participate in closure negotiations.

### **III. STANDARD CROSSING UPGRADE – PROJECT IDENTIFICATION**

All potential standard warning device upgrade projects are identified and considered for project development in one of three ways:

- Formula pick based projects, selected based on hazard ranking;
- Requested by constituents, including: railroads, the public, LHA, County Task Forces, County Engineers, ODOT Districts and ORDC Project Managers); or
- Advanced because a recent fatal crash occurred at the crossing.

#### **Projects Selected by Formula**

The ORDC in partnership with the PUCO selects Ohio highway-railroad crossings for federally-funded upgrades based on a priority list that ranks the crossing in order of risk of accident. Criteria used in ranking each crossing relative to the risk of accident include: the crash history at the crossing, the average daily traffic, the maximum speed of trains, the number of tracks, the existing warning devices, the angle of the crossing and the number of trains per day. The formula, created by the Federal Railroad Administration (FRA) generates a crash prediction value which is used to determine the ranking of all crossings within the state.

The crossing inventory includes every railroad crossing in Ohio and is available on-line for the public to review. The hazard ranking for Ohio's crossings is available only to ORDC and PUCO staff. A sample database sheet from the public crossing inventory is attached as Appendix 1 and a sample database sheet from the internal hazard ranking is attached as Appendix 2.

The database list of priority crossing projects will change as conditions at the crossing site change. For example, growing traffic volumes or the sudden occurrence of a crash will raise the priority ranking of a crossing. Ultimately, the Federal Highway Administration (FHWA) must make the final approval and obligate the funding for the crossing improvements. Following Federal obligation, the railroad is ordered by the PUCO to install the improvement within one year.

### **Projects Requested by Constituents**

Crossings that are not selected under the formula process may be reviewed for upgrade based on information received from constituents. Constituents include: railroads, the public (individuals or groups), LHA, County Task Forces, County Engineers, ODOT Districts, and ORDC Project Managers. These projects, if eligible, may be selected for improvements using 100% federal funds.

State Program: An additional avenue exists for grade crossing improvements requested by an LHA. The state, through the statutory authority of the PUCO, permits the cost of the crossing upgrade to be shared between the local government, the state, and the railroad. The PUCO assesses the severity of need and allocate funding based on an objective formula measuring both the seriousness of the hazard and other conditions at the crossing.

The railroad share of all safety upgrades is usually 10 percent of the total cost to upgrade the crossing. Under the State Program projects, depending upon a variety of other factors including the amount of daily train or motor vehicle traffic at the crossing, municipalities are usually required to cover from 30 to 70 percent of the cost of the project.

Following its determination, the PUCO will extend a financial assistance proposal to the LHA for agreement. The PUCO will provide options for funding the local share, including the potential use of ORDC funding. When local share funding is requested, ORDC may assume financial responsibility and will advance the project development process to improve the crossing in accordance with federal guidelines.

### **Standard Upgrade Projects Identified by the Occurrence of a Fatal Crash**

A crossing is also considered for upgrade when a car/train crash occurs resulting in a fatality at that crossing. However, prior to advancing the project development process, the ORDC Researcher will obtain and review the following:

- Police Crash Report
- County Coroner Report
- Railroad Crash Report

- Causes of the crash
- PUCO publically available crossing data sheets
- Hazard ranking
- Existing warning devices
- Potential activation failure

Following the review of the above information, if it is found that an engineering improvement or crossing warning device upgrade is warranted, then this crossing will be advanced for project development.

#### IV. STANDARD CROSSING UPGRADE – PROJECT DEVELOPMENT PROCESS

This section of the document describes the development process for a *Standard Crossing Warning Device Upgrade Project*.

##### Step 1: Project Initiation and Project Scope

- Start Crossing Upgrade Project File: Following the identification of a crossing for consideration for potential upgrade, the *ORDC Safety Section Project Manager* responsible for that region of the State where the crossing is located will initiate a file for the potential project. The designated *Safety Section Project Manager* responsible for the particular region will manage the project development process for all crossing upgrade projects within his region. The five *ORDC Grade Crossing Safety Regions* are illustrated in Appendix 3.
- Initiate Crossing Diagnostic: Following the identification of a potential project, the *ORDC Researcher*, or in the case of formula pick projects or State Program projects the *PUCO*, will organize and schedule the on-site field review of the crossing. The diagnostic team, as defined by the *CFR 23 Section 646.204*, includes representatives from the railroad, the *LHA*, the *PUCO*, and the *ORDC*. The *Researcher* will notify all of the diagnostic team members of the crossing location, survey date and time.

Prior to the on-site meeting of the diagnostic team, the *Diagnostic Team Coordinator* will request that the *LHA* representative be prepared to report the average daily traffic count and school bus routes using the crossing, and the railroads are asked to update the train volumes and train speeds at the crossing. The *Diagnostic Team Coordinator* will also arrange for *Ohio Utilities Protection Service (OUPS)* to mark the location of known utilities.

- Diagnostic Team Recommendation and Delineation of Project Scope: The most important outcome from the diagnostic review process is the team's recommendation concerning the crossing upgrade. The *Diagnostic Team Recommendation* is determined by consensus of all members of the team. If the diagnostic team recommends upgrade, then the development of the project moves forward; if the team does not recommend a

crossing upgrade, then the project does not move forward and the *Diagnostic Team Recommendation* is maintained under file for this crossing. If a passive grade crossing is recommended for active warning devices, the LHA will be provided with an *Interim Use of Stop Signs at Grade Crossing Projects* form (included in Appendix 4).

During the field survey, the diagnostic team will complete the *Diagnostic Review Team Survey* form which includes the elements identified in 23 CFR Section 646.2143i. This form identifies the team recommendation along with the names of the team members and details of the crossing's characteristics including: type of warning devices; railroad characteristics, roadway conditions and railroad traffic characteristics; adjacent land uses; utility information; and specific field dimensions and site measurements. From these details the preliminary scope of the potential safety improvement and its configuration is determined and the degree of project complexity is established. The *Diagnostic Review Team Survey* form is attached as Appendix 4.

The project scope will be entered into Ellis in Step 2 of the PDP. Warning device projects include all elements needed to ensure functionality of the warning devices and MUTCD compliance. A sample scope for a standard light and gate project is:

*“Installation of flashing lights and roadway gates, including any ancillary work to make warning devices function as designed, MUTCD compliant, and visible to roadway user.”*

- **Determination of Complexity of Potential Upgrade and Identification of Red Flags:** If as a result of the diagnostic review, a potential crossing upgrade is determined to have an engineering issue, closure opportunity, or another requirement that raises it to a higher level of complexity, this crossing is considered to have a red flag. Crossing improvement projects are only advanced as “Standard Upgrades” if they do not have any apparent red flag associated with it. Red flags will require that additional steps be taken to resolve project development issues.

There are six types of red flags or six different conditions that would necessitate a higher level of consideration of project development issues. These six issues include:

- Traffic signal preemption;
- Potential closure;
- Right-of-way issues;
- Utility issues;
- Environmental reviews higher than “Exempt”; and,
- Crossing upgrade projects having multiple funding sources.

1. **Red Flag - Traffic Signal Preemption Candidate:** A potential crossing upgrade is a candidate for *traffic signal preemption* if it meets one of these two criteria: 1) the crossing is located within 200 feet of a highway traffic signal, and 2) highway traffic cues over the railroad crossing. If the diagnostic team determines that either of these two criteria are met then the project development process needed to complete the upgrade will likely include traffic signal preemption. Traffic signal preemption will require more involvement by the LHA, the railroad, along with

consultants who have an expertise in interconnected highway/railroad signals and circuits. In most cases a preemption field review will be scheduled at a later date.

The project development process for a preemption candidate is summarized as follows:

- b) The LHA will identify the railroad timing requirements associated with the needs of the highway traffic circuitry at the crossing;
- c) The LHA will establish the circuitry timing requirements and develop a specification to send to the railroad;
- d) The ORDC Project Manager or preemption consultant will complete an Intelligent Transportation System (ITS) Form. This form is used to define the communication needs and establish a plan for the design of interconnected circuits which will link the activation of the railroad crossing lights and gates to the highway traffic signals;
- e) The ORDC will forward the ITS form to ODOT Traffic Engineering (Senior ITS Engineer), who will review the form to ensure that the circuitry interconnect plan meets conformity; and,
- f) ITS forms must be completed and submitted to the ODOT prior to receiving Federal Authorization in the PDP Step #2 below.

An example of the *Railroad Circuitry Timing Form* is attached as Appendix 5, and an *ITS Form* is attached as Appendix 6.

2. Red Flag – Closure or Crossing Consolidation Candidate: The diagnostic team will also determine if the crossing is a candidate for potential closure. If it is, then the complexity of the crossing upgrade project is elevated. The following provides a brief description of the process used to determine if a crossing should be considered for closure or consolidation:
  - a) A potential warning device upgrade project is a candidate for closure or consolidation if it meets these conditions:
    - The highway has relatively low volumes of vehicular traffic;
    - Alternative routes and other nearby vehicular crossings exist that provide vehicular access and egress;
    - The adjacent or nearby highway crossings and warning devices also require some degree of safety upgrade or improvement; and,
    - The crossing closure would not cut-off access to private property or public uses, or create areas that are “land-locked”.
  - b) The ORDC Project Manager responsible for the crossing will continue to investigate the potential closure by coordinating with the LHA, local public officials, the PUCO and the railroad.
  - c) In addition to the initial field survey of the crossing, the diagnostic team will also survey the other adjacent highway crossings to assess the safety hazards and condition of the warning devices.

- d) The ORDC Project Manager will develop a consolidation or closure plan for the crossing(s) and will coordinate with the LHA and the railroad to determine the financial participation or shares in the cost of the upgrade.
  - e) Negotiations will take place and public hearings will be held on the proposed plan.
  - f) Agreements will be signed by all parties and the PUCO will issue orders to the railroads to close the crossing and, if applicable, construct the warning device upgrades at the other crossings.
3. Red Flag – Real Estate or Right-of-way Issues: The crossing diagnostic team may identify potential right-of-way concerns associated with improved warning devices. If it is observed in the field that the railroad or public right-of-way may be constrained and that the construction of new warning devices may impede upon adjacent private property then it is important to resolve any outstanding right-of-way issues during the *Preliminary Engineering* (PE) Process (Step #4).

As the railroads advance PE, they will identify the property boundaries, the exact location of the warning devices and any related impacts on adjacent private property. If property acquisition is required, then this would escalate the environmental reviews to a higher level. The environmental review process is described below.

4. Red Flag – Utilities: The crossing diagnostic team may also observe the need to relocate utilities in order to construct the project. Utility relocations could include power lines, fiber optic lines, sewer or water lines, all of which may be affected by the construction of the new warning device upgrades. The railroad is responsible for resolving utility relocation design and construction issues during the PE Process (Step #4). Large scale utility relocation requirements are likely to delay the construction of the warning device upgrades and increase the cost.

As the railroads advance PE, they will identify the exact location of the utilities, the impact on the project, costs for utility relocation and other impacts related to the construction of warning device upgrades. It is important that the railroad communicate effectively with the affected utility companies and continue to coordinate during the construction of the crossing upgrades.

5. Red Flag – Environmental: The environmental review process is governed by the *Programmatic Categorical Exclusion Agreement, September 13, 2010*, that details the environmental review requirements under Exempt and CE1 through CE 4. The required environmental review of a crossing upgrade will be initiated immediately following the identification of the potential crossing upgrade project and must be completed prior to requesting federal authorization. ORDC's Safety Section *Environmental Coordinator* is responsible for completing the environmental reviews.

- a) A majority of the warning device upgrade projects in Ohio do not cause significant environmental impact and will be “exempt.” Upon determining that the crossing meets this criterion, the ORDC *Environmental Coordinator* will complete a *CE Exempt Project Form Memo-to-File* and will make the appropriate notation in Ellis. The Environmental Review Documents are attached in Appendix 7.
  - b) For projects that do not qualify under the Exempt category, the Environmental Coordinator will follow the environmental review requirements under Exempt as well as CE 1. Consolidation projects will require a minimum CE1 level of environmental clearance. CE1 clearance requires public involvement and cultural resources to be documented and included in the submission.
  - c) Certain environmental impacts, or the existence of multiple environmental impacts, may elevate the environmental process higher than CE1. Examples include: land acquisition, utility reconstruction, new crossings, and grade separations. For these relatively unique instances the Environmental Coordinator should refer to the Programmatic Categorical Exclusion Agreement.
6. Red Flag – Multiple Funding Sources and LHA Participation: When there are multiple parties providing a share of project funding, the level of complexity of a project increases. The state, through the PUCO, allows the cost of the crossing upgrades to be shared between the local government, the state, and the railroad involved. Under these projects the PUCO assesses the severity of need and allocates funding based on an objective formula measuring both the seriousness of the hazard and other conditions at the crossing. Municipalities are usually required to cover from 30 to 70 percent of the cost of the project.

The PUCO will extend a financial assistance proposal to the LHA for agreement and will provide options for funding the local share, including the potential use of ORDC funding. When local share funding is granted by ORDC, the appropriate Project Manager will assume responsibility for the implementation of the upgrade and will implement the project development process to improve the safety at the crossing.

The determination of project selection, its program category and when it will be programmed, will be made by the ORDC *Funds Management Team*. This decision will be based on the results of the diagnostic survey, hazard ranking, crossing specific extenuating conditions, fiscal constraints and any relevant regulatory and policy concerns.

## Step 2: Federal Authorization and ODOT Purchase Order

All upgrade projects must follow 23 CFR 646.216. Under this step, the FHWA will authorize the crossing upgrade so that it may be funded, and ODOT will issue a *Purchase Order* to fund the capital costs of the improvements.

In order to receive approval ORDC staff will perform the following tasks (refer to Process Flow Diagram, appendix 21):

- Enter the upgrade project in Ellis. The Ellis Program will generate the Project Identification Number (PID).
- Request a State Job Number (SJN) from ODOT Finance and Forecasting, Office of Payroll & Project Accounting, Project Accountant ([sjnrequest@dot.state.oh.us](mailto:sjnrequest@dot.state.oh.us)) via email correspondence.
- Request federal authorization through ODOT Finance and Forecasting, Office of Payroll & Project Accounting, Project Accountant. A copy of the Federal Authorization Request Form is included in Appendix 8. The starting estimated cost used as a placeholder for a standard crossing upgrade is \$190,000.
- Projects with multiple funding sources where the percentage is not determined should be entered with the maximum allowable federal share. Once the percentage is determined, adjustments may be made. The federal share may be decreased but may not be increased. Other parties may be entered initially with a zero dollar value, or entered later as a new funding event.
- Receipt of the Federal Agreement from ODOT Finance and Forecasting, Office of Payroll & Project Accounting, Project Accountant (Heidi Mertler). An example of a Federal Agreement is included under Appendix 9.
- Submit a *Preliminary Encumbrance Request*, using an Interoffice Correspondence (IOC), through ODOT Project Accountant ([encrequest@dot.state.oh.us](mailto:encrequest@dot.state.oh.us)). Multiple SACS may be required if there are multiple scope elements, e.g. warning device (4FP7) and other improvement (4FN7) projects. The Interoffice Communication to ODOT Office of Payroll & Project Accounting, for an Encumbrance Request is attached as Appendix 10.
- Check Ellis for the approved encumbrance estimate and place a copy in the file. The ODOT Purchase Order is attached as Appendix 11.
- Complete the ODOT GASB34 Asset management Information Form prior to the project close-out under Step 9. The GASB34 Asset Management Form is provided as Appendix 12.

ORDC Fiscal Specialist maintains the Safety budget. As projects are identified by the Safety Programs Manager they are added to the budget. The budget is monitored at least weekly for encumbrances entered into the system. Changes in encumbrance amounts are entered into the budget. ORDC Fiscal also monitors previous years' budgets to update the project close out data.

### **Step 3: Railroad Agreements**

This development step involves finalizing the agreements with the railroad:

- In accordance with 23 CFR 646.216 (d) the *Master Railroad Agreements* are on file for Ohio's Railroads.
- A *Letter Agreement*, which is typically between ORDC or PUCO and the railroad, will begin the upgrade project agreement process. If a *Railroad Master Agreement* is not on file then one must be entered into between ORDC or the PUCO and the Railroad. A sample *Railroad Master Agreement* is attached as Appendix 13.
- The *Letter Agreement* will reference the *Railroad Master Agreement* and will identify the specific location of the crossing upgrade. A sample *Letter Agreement* is attached as Appendix 14.
- For more complicated projects such as consolidation and closure projects or corridor based upgrade projects, *Subsidy Agreements* will be executed and signed by ORDC, the railroad and other involved parties such as PUCO and LHA. A *Subsidy Agreement* will reference safety improvements, the process needed to resolve the engineering and construction, and the financial responsibility of the parties for the agreed upon shares of the project. A sample Subsidy Agreement is attached as Appendix 15.

After the Railroad and ORDC have signed the *Letter Agreement*, the *PE* process can be initiated.

### **Step 4: Preliminary Engineering (PE) Authorization**

The PE process can occur with or without a PUCO Order. The ORDC will generally authorize a railroad to proceed with site plans and estimates and, once PE is received and approved, a construction-only PUCO Order is requested via Inter-Office Communication (IOC). PE is due within 90 days of the PE authorization. In some cases a PUCO Order is requested that includes both PE and construction. An example of the IOC is attached as Appendix 16.

### **Step 5: PE Review and Field and Office Checks**

On receiving the completed PE from the railroad the ORDC Project Manager will coordinate the engineering reviews to ensure that the design is in compliance with relevant MUTCD engineering standards.

The Project Manager will perform an engineering review that involves going to the site, verifying the existing conditions in the field, and reviewing the list of materials and costs estimates. If the plans, cost estimates and material list are acceptable, then a registered Professional Engineer reviews the plans and Stamps them for Approval. The engineering reviews will identify any utility conflicts and the Project Manager will confirm that the marked utilities are consistent with the railroad's PE. If ORDC determines that the railroad's PE is unacceptable, then the Project Manager will request that the railroad revise the plans to include the requested changes to the PE. If the changes required to the PE are not significant then they may be noted in the Construction Authorization Letter sent to the railroads under Step #7 below.

Following the review of the PE, the Federal Authorization Process will continue and ORDC staff will make the following cost modifications if necessary:

- Update Ellis by either creating a new funding event or increasing/decreasing the existing event. Check that all information is correct. Make any changes to scope.
- Submit a request via email to ODOT Finance and Forecasting, Office of Payroll & Project Accounting, Project Accountants for the amount of any increase.
- Receive a revised Federal Agreement from ODOT Finance and Forecasting, Office of Payroll & Project Accounting, Project Accountants.
- Submit an encumbrance request, using an IOC for the amount of the increase or decrease to ODOT Finance and Forecasting, Office of Payroll & Project Accounting, Project Accountant.
- Confirm approval of the Purchase Order for the modified amount.

ORDC staff will then request a PUCO Order.

#### **Step 6: Public Utilities Commission (PUCO) Order**

Upon receipt of ORDC's request, the PUCO will issue the Order to the railroads. An example of a PUCO Order is attached as Appendix 17.

One of the primary goals is to complete the construction of the upgrades within one year, therefore the project timelines are included in the PUCO Order. The Order currently includes the following:

- Authorization for PE within 90 days (if the Order is for both PE and construction) and a construction deadline of up to one year for the project.
- Submission requirements for site plans and cost estimates, if applicable.
- Provision for electric service at the crossing.
- Notification of the construction schedule.
- Notification of any changes to the scope of work or other changes to the plans or cost estimates.

#### **Step 7: Construction Authorization**

The ORDC Project Manager will send an authorization letter to the railroad directing them to initiate construction. If there are minor changes to the PE documents, then the ORDC Project Manager will note these in the authorization letter.

#### **Step 8: Construction Oversight**

All upgrade projects must be inspected at critical stages and labor and materials used documented by ORDC staff during field reviews. The railroad is required to give the ORDC Project Manager five (5) working days notification to allow inspections at the construction process as required.

The ORDC Project Manager will maintain an accurate and up-to-date log of all activity at the project site. The Project Manager will record the site conditions, including observation of activities anything that have occurred since the last site inspection. The Project Manager will complete the Inspection Log with every site visit. Force account labor and final inspection must also be documented. It is the responsibility of the railroads to coordinate with local highway authorities to ensure that proper signage, detours and channelization is in place at the work zone for the duration of construction. ORDC Project managers include MUTCD compliance in their Inspection Logs. The Inspection Log is included as Appendix 18.

### **Step 9: Project Billing and Project Closeout**

During the project development process the ORDC Project Manager works to ensure that the project invoices received from the railroads accurately reflect the costs for the upgrade and the equipment used. Only eligible expenses can be reimbursed. The Project Manager will typically receive between two and eight invoices for each project. Each invoice must be reviewed and approved by the Project Manager and sent to ODOT Accounting for payment. The ODOT AU10 Invoice Approval Form must be completed by the Project Manager to approve each invoice. ORDC Fiscal staff review and sign-off the AU10. The AU10 Invoice Approval Form is attached as Appendix 19.

The following steps are taken to closeout an upgrade project:

- The ORDC Project Manager will identify the final railroad invoice.
- The final invoice along with its AU10 Invoice Approval Form will signal to ODOT Accounting that it is time to close-out the ODOT PO.
- The Project Manager will conduct one final site visit to take photographs of the constructed upgrades. The photos will be included in the project file and the Project Manager will update the Crossing Data Base with new photos and modifications.
- The Project Manager will check the project file for completeness and ensure that all required items on the Project Checklist are included in the file. The Project Checklist for Safety Projects is attached as Appendix 20.