

HIGHWAY-RAIL CROSSING INVENTORY
INSTRUCTIONS AND PROCEDURES MANUAL

for the

**Federal Railroad Administration
Highway-Rail Crossing Inventory
Data Maintenance Program**

December 1996

prepared for:

**U.S. Department of Transportation
Federal Railroad Administration
Office of Safety
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1.0 INTRODUCTION

1.1 Purpose

The purpose of this manual is to set forth the instructions and procedures to provide a useful, up-to-date and accurate data base for the National Highway-Rail Crossing Inventory Data File maintained by the Federal Railroad Administration (FRA) for use by States and railroads.

The procedures for updating the National Highway-Rail Crossing Inventory Data File in this manual are applicable upon completion of the basic inventory, they are to be used for providing data to the FRA and they may be used by States and railroads for maintaining separate files.

This manual is a combination of all previous procedures and update manuals published since 1974 and other instructions periodically prepared.

1.2 Goal

The major goal of the National Highway-Rail Crossing Inventory Program is to provide information to Federal, State, and local governments as well as the railroad industry for the improvement of safety at highway-rail crossings. Good management practices necessitate maintaining the data base on a current basis. The data will continue to be useful only if maintained and updated as inventory changes occur.

The Federal-Aid Highway Act of 1973 (Section 203) required that each State highway agency maintain an inventory of all crossings. According to the implementing instructions contained in the Federal-Aid Policy Guide (FAPG), maintaining the National Inventory will satisfy the legislative requirement for a State inventory (23 CFR Part 924 (a) (1)). A primary purpose of the National Inventory is to provide for the existence of a uniform inventory data base which can be merged with accident files and used to analyze information for planning and implementation of crossing improvement programs by public and private agencies responsible for highway-rail crossing safety.

1.3 Project History

In August, 1972, the U.S. Department of Transportation submitted a report to Congress entitled: *Railroad-Highway Safety Part II: Recommendations For Resolving The Problem*. The primary goal of this report was to provide recommendations for alternative courses of action which would lead to a significant reduction in accidents, fatalities, personal injuries and property damage at highway-rail crossings.

The report recommended the development of an adequate information system. Although various local, State, and Federal agencies had collected and maintained information about highway-rail crossings, most crossing information systems were fragmented and incomplete.

Certain site-specific information was necessary to provide for a systematic approach to the planning and evaluation of programs for the improvement of highway-rail crossing safety at both the State and Federal level.

The report further recommended that :

- a. The Federal Railroad Administration issue requirements for the railroads to assign and display identification numbers at all highway-rail crossings based upon a uniform national standard to be prescribed by the Department of Transportation. Further, it required FRA to contract with all railroads to provide site-specific inventory data for all crossings on their respective lines, and to annually provide information updating this inventory following inventory standards established jointly by the Federal Highway Administration and the Federal Railroad Administration and working with appropriate railroad and State representatives.
- b. The Federal Railroad Administration expand the current highway-rail crossing accident reporting by the railroads to include **all** train-involved public and private crossing incidents.

NOTE: The terms "accident" and "incident" are used interchangeably in this manual. The current preferred term for "accidents" is often "collisions" or "crashes."

- c. The National Highway Traffic Safety Administration (NHTSA) give early attention and emphasis to implementation of a plan to have all highway-rail crossing accidents reported through a central State agency. Also, NHTSA should require the inclusion of the crossing identification number on the accident report form used by police officers when reporting highway-rail crossing accidents to permit correlation of railroad and police reports with the crossing inventory.

Following the submission of the report, the Federal Railroad Administration assumed principal responsibility for the development of the National Highway-Rail Crossing Information System.

The Federal Railroad Administration entered into a contract with the Association of American Railroads to develop a "Comprehensive National Highway-Rail Crossing

Information and Numbering System." The project was established as a cooperative effort between all the nation's railroads and the U.S. Department of Transportation with the cost of the project to be funded equally by the railroads and the U.S. Department of Transportation.

The railroad companies, with direction and guidance from the Association of American Railroads and the American Short Line Railroad Association, were assigned the responsibility for making a site-specific inventory of each highway-rail crossing and for installing a unique identifying number at each location. The railroads were also identified as being responsible for periodic update of certain inventory information and maintenance of the crossing number.

The State highway departments assisted in the project by providing site-specific highway location and use data. State public utility commissions and other State and local governmental agencies also participated in the project. The responsibility for the updating of certain highway information data items was determined to be through the efforts of these agencies.

1.4 Data Files

There are two types of data files maintained by the FRA. These two data files are the Inventory Data File and the Accident Data File.

The Inventory Data File is a record of grade crossing location, physical, and operational characteristics to provide information for the administration and statistical analysis of crossings. This information is reported to the FRA on the U.S. DOT-AAR Crossing Inventory Form (see Figure 1-1). Each State and railroad is responsible for maintaining its respective inventory file. In order for the files to serve as an effective data base, the States and railroads maintaining their own file should immediately update them. States can maintain the National Data File in lieu of their own file.

The Accident Data File is a record of all train-involved crossing accidents or incidents. The Federal Railroad Administration now requires the reporting of all train-involved crossing accidents and incidents which includes the DOT-AAR Crossing Identification Number. The form used to report all train-involved crossing accidents or incidents is the Highway Grade Crossing Incident Report (see Figure 1-2). Effective 1/1/97, there will be a new version of this form.

Routinely, the highway-rail crossing accident data is integrated with inventory data and the information from the combination is used for the development of Federal programs, funding alternatives for crossing improvement, studies related to railroad safety programs, effectiveness of warning devices, high-speed railroad corridors, accident costs, public awareness and driver training, and other safety program development and research opportunities.

The Federal Railroad Administration's Office of Safety, Highway-Rail Crossing and Trespasser Programs Division, serves as the National Highway-Rail Crossing Information Center. The address is:

Federal Railroad Administration
Office of Safety
Highway-Rail Crossing and Trespasser Programs Division
400 7th Street, S.W., (RRS-23)
Washington, D.C. 20590

1.5 Definitions of Highway-Rail Intersections

For the National Crossing Inventory purposes, the following definitions apply for all public, private and pedestrian crossings, with or without crossing signs or active warning devices.

A highway-rail crossing is the intersection (at grade or grade separated) of a roadway (including associated sidewalks and pathways) and one or more railroad tracks. A crossing at a dual or multi-lane roadway is reported as a single crossing. Also, a crossing is reported as a "single crossing" even where there are multiple tracks within the limits of a single set of crossing signs or warning devices and even if the individual tracks belong to more than one railroad company or track owner. (For further discussion of this latter point, see Section 2.3 of this manual.) As a minimum, all at-grade crossings of public and private roads and streets with railroad tracks across are assigned an inventory number if any railroad operations are conducted.

As a general rule, and if no other agreement exists, a crossing that is located (usually equally) on a State, county and/or city boundary line should be considered to be geographically located in the jurisdiction that is South or East of the crossing.

NOTE:

49 CFR Part 234.5(a) provides the following definition:

"Highway-rail grade crossing means a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade."

For the purposes of the Inventory only, the following definitions apply:

A. Public Crossing.

A **public crossing** is the location where railroad tracks intersect a roadway which is part of the general system of public streets and highways, and is under the jurisdiction of and maintained by a public authority and open to the general traveling public.

Public crossings can be at-grade or grade separated. If they are at-grade, usually both highway approaches are maintained by a public authority, or the public authority accepts the responsibility for the roadway maintenance. (Highway is a word used here to include highways, streets and roads into a single word.)

NOTE:

23 CFR Part 460.2 provides the following definitions:

"Public road means any road under the jurisdiction of and maintained by a public authority and open to public travel."

"Public authority means a Federal, State, county, town or township, Indian tribe, municipal or other local government or instrumentality thereof, with authority to finance, build, operate or maintain toll or toll-free highway facilities."

"Open to public travel means that the road section is available, except during scheduled periods, extreme weather or emergency conditions, passable by four-wheel standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight, or class of registration. Toll plazas of public toll roads are not considered restrictive gates."

"Maintenance means the preservation of the entire highway, including surfaces, shoulders, roadsides, structures, and such traffic control devices as are necessary for its safe and efficient utilization."

1. Discussion.

A crossing shall be classified as public if, and only if, the roadway is deemed **apublic road** in accordance with 23 CFR Part 460.2. In

general, a roadway across railroad track for which both approaches are maintained by a public authority and which is open to the public is considered a "public" crossing. These are roadways that are part of the general system of public streets and highways. Some jurisdictions accept a crossing as "public" when only one approach is publicly maintained. If a public authority accepts a crossing as "public," it is a public crossing. All others are considered "private."

Therefore, public crossings are those on roadways which meet the following three conditions:

- a. The roadway is part of the general system of public streets and highways, and
- b. Under the jurisdiction of and maintained by a public authority, and
- c. Open to the general traveling public.

2. Access to Public Facilities.

If the primary function of the road is to provide public access to a publicly owned facility for the principal purpose of on-site use by the public, then the facility may be deemed a logical terminus of a public roadway.

Thus, crossings which exist for the primary purpose of **providing** public access to publicly owned and operated facilities such as fairgrounds, parks, schools, libraries, hospitals, clinics, airports, bus terminals, beaches, piers, boat launching ramps, recreational facilities, **etc.**, which permit access to or invite use by the general traveling public would satisfy the definition "open to public travel," even if the entrance thereto is equipped with gates to effect seasonal or periodic closures (such as overnight), or limit access, or require an entry fee for use.

3. Determined by Empowerment.

In situations where a State has empowered a public agency (such as the State DOT, State Highway Department, Public Utility Commission, State Commerce Commission, **etc.**) to make determinations as to whether crossings are public or private, such determinations will govern for Inventory purposes.

B. Private Crossing.

1. Definition.

A private crossing is a highway-rail crossing which is not a public crossing. (A public crossing is defined as the location where railroad tracks intersect a roadway which is under the jurisdiction of and maintained by a public authority and open to public travel. See Par. 1.5.A.)

2. Discussion.

A private crossing is one that is on a private roadway which may connect to part of the general system of public streets and highways but is not maintained by a public authority. Usually, it is a crossing where the property on both sides or at least one side of the railroad tracks is private property. It may also be on a roadway that is publicly owned but which is either restricted or not intended for use by the general public. Private crossings are generally intended for the exclusive use of the adjoining property owner and the property owner's family, employees, agents, patrons and invitees. Crossings are classified as private where the normal need or use is for residential, farm, recreation/cultural, industrial or commercial activities.

Most private crossings exist by virtue of railroad charter provisions, deed covenants, State statute or other prescriptive rights. If none of these apply, the railroad may require an agreement with the private property owner whereby the railroad may install and maintain the crossing proper and any necessary signs or signals at the property owner's expense, and the property owner will assume liability for the crossing and provide coverage via a liability insurance policy.

In some instances, changes in land use have resulted in an expansion of crossing use to the extent that a previously private crossing has some attributes of a public crossing, whether or not any public agency has accepted responsibility for maintenance or control of the use of the roadway over the crossing. The railroad company and highway agency should make every effort to mutually resolve and agree on the appropriate classification (either public or private) of such a questionable crossing.

3. Private Crossings with Public Access.

A private crossing may exist with permitted or limited public access for the primary purpose of providing public access to facilities (either public or privately owned) such as shopping centers, fairgrounds,

parks, golf courses, zoos, museums, schools, libraries, hospitals, clinics, airports, bus terminals, beaches, piers, boat ramps, recreational facilities, etc. Such crossings permit access or invite use by the general public, but usually restrict or discourage general public use by requiring permits, or charging admission or other fees to gain entry or use of the facility.

For such crossings, the primary roadway use is to gain entry to the facility. The entrance may even be equipped with gates to effect seasonal or periodic closures. These crossings generally do not qualify as being "open to the general traveling public" and should not be deemed as a public crossing.

Crossings which exist primarily to provide access to publicly owned facilities for "authorized personnel only", such as military bases, ports, equipment yards, maintenance/storage facilities, water or sewerage treatment plants, landfills, levees, service and/or maintenance only entrances, or other facilities, are not normally intended for on-site use by the general public and should be deemed as a private crossing.

4. Private Crossing with No Public Access.

A private crossing with no public access would include, for instance, the crossing within a secured industrial complex or between farm fields where public access to the complex or fields is precluded.

5. Responsibilities.

The railroad should ensure that each crossing is listed in the National Inventory.

C. Pedestrian Crossing.

A pedestrian crossing is a separate designated intersection where pedestrians, but not vehicles, cross a track. Sidewalk crossings contiguous with, or separate but adjacent to, public road crossings, and in the public road right-of-way, are presumed to be part of the public roadway crossing and are not assigned a separate crossing number.

An area where pedestrians trespass is not considered a crossing. The designation of a crossing may be made by a sign, device, or filled materials between the rails.

Pedestrian crossings may also be classified as public pedestrian crossings or private pedestrian crossings, similar to vehicle crossings. The determination is based on whether or not a public agency has jurisdiction over and maintains the sidewalk (or walkway) on either side of the track and whether the crossing is intended for use by the general public. The distinction may be shown on the Inventory Form by inserting "PUB" for public or "PVT" for private in the field for Item 10. - Street or Road Name.

D. Special Situations.

An area where vehicles or pedestrians trespass is not considered a crossing. Vehicles or persons that cross railroad tracks without railroad permission at other than defined crossings are considered trespassers.

Crossings used only by railroads (such as in a railroad yard or terminal) do not need to be reported, but it is best to assign at least one crossing number to the entire location so that a crossing accident, if it occurs, can be properly identified to that location. Also, where multiple private industrial crossings exist within the same restricted-access industrial plant or facility, the railroad should report all such crossings but may report them under a single crossing number. Any accidents, if they occur, would be reported under that single crossing number.

Crossings created to serve specific temporary (six months or less) activities, such as construction sites, do not need to be assigned a crossing number and reported.

E. Open Crossing.

An active or open crossing is one where railroad operations and highway traffic occur or could occur on a regular or irregular basis.

F. Closed Crossing.

A closed crossing is one where the crossing has been physically removed or where railroad operations or highway traffic are not possible.

Examples are where the crossing has been barricaded and highway crossing surface material removed, or where the railroad tracks have been cut or barricaded, physically removed, or a connecting turnout has been removed, or where rail operations are not possible because the railroad tracks are paved over, etc. Crossings along such inactive railroad lines should be reported as closed. (Crossing records reported as closed remain in the National Inventory File for at least five years.)

G. Crossings on Abandoned Track.

Crossings along railroad lines that have been placed in a railroad "abandoned" category, are seasonal in usage, or might be considered temporarily out-of-service (no railroad operations occur) should remain in an open status as long as track remains in place and there is a reasonable possibility that the line will be used again. This condition may exist even if the particular line is physically separated from the balance of the railroad operating system. For example, if a railroad abandons a line which may very possibly be turned into a commuter line as soon as the appropriate political and financial conditions are resolved, the crossings along the line do not need to be reported as closed in the Inventory. While these crossings remain active and open in the Inventory, the railroad traffic numbers should be reduced to zero in the Inventory until the line becomes active again. The ownership will also probably change to the new property owner. If progress toward reactivating the line does not proceed within a reasonable period of time (about 2 years), then the crossings should be reported as closed and re-opened at a later date using the same crossing numbers. "Rail-banked" crossings, those which may be on-hold by a State or other governmental body for possible future use, would be in this category.

H. Standards and Regulations.

The current Federal regulation that applies to highway-rail crossings is the Code of Federal Regulations, Title 49 CFR Part 234, *Grade Crossing Signal System Safety*, effective January 1, 1995. This regulation imposes minimum maintenance, inspection and testing standards for highway-rail grade crossing warning systems. This Regulation (Part) also prescribes standards for the reporting of failures of such systems and prescribes minimum actions that railroads must take when such warning systems malfunction. This Part does not restrict a railroad from adopting and enforcing additional or more stringent requirements not inconsistent with this Part. Effective August 19, 1996, FRA amended 49 CFR Part 234 to clarified the Rule as originally published on September 30, 1994.

Additionally, there are Regulations (FHWA) to prescribe policies and procedures for advancing Federal-aid projects involving railroad facilities including projects for elimination of hazards, adjustments required by highway construction, and other financial reimbursement and audit procedures. These are contained in Title 23 CFR Part 646.2, *Subpart B - Railroad-Highway Projects*. Specifically, Part 646.214 *Design* refers to the conditions where installations are to include automatic gates with flashing light signals.

Sign and warning device standards are delineated in the *Manual on Uniform Traffic Control Devices* (MUTCD) published by the Federal Highway Administration. Part VIII of the MUTCD deals with highway-rail crossings.

Also, the *Railroad-Highway Grade Crossing Handbook* provides general information on the physical and operational conditions of crossings for safe and efficient use by both highway and rail traffic.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

**HIGHWAY GRADE CROSSING
INCIDENT REPORT**

FORM APPROVED
OMB NO. 0494033

1 NAME OF REPORTING RAILROAD		1a. Alphabetic Code		1b. Railroad Incident No.	
2 NAME OF OTHER RAILROAD INVOLVED IN TRAIN INCIDENT		2a. Alphabetic Code		2b. Railroad Incident No.	
3 NAME OF RAILROAD RESPONSIBLE FOR TRACK MAINTENANCE (single entry)		3a. Alphabetic Code		3b. Railroad Incident No.	
4 U.S. DOT AAR GRADE CROSSING IDENTIFICATION NUMBER		5 DATE OF INCIDENT month day year		6 TIME OF INCIDENT am <input type="checkbox"/> pm <input type="checkbox"/>	
LOCATION					
7 NEAREST RAILROAD STATION		8 COUNTY		9 STATE (two letter code) CODE	
10 CITY (if in state)		11 HIGHWAY NAME OR NUMBER (if private crossing, no state)			
INCIDENT SITUATION					
12 HIGHWAY USER INVOLVED			13 RAILROAD EQUIPMENT INVOLVED		
12 TYPE 1. Auto 3. Truck-Trailer 6. Motorcycle 2. Truck 4. Bus 7. Pedestrian 5. School Bus 8. Other (specify)			13 EQUIPMENT 1. Train (units pulling) 4. Cars (moving) 7. Light locomotives (standing) 2. Train (units pushing) 5. Cars (standing) 8. Other (specify)		
13 SPEED (estimated mph at impact)		14 DIRECTION (groupings of) 1. North 3. East 2. South 4. West		17 POSITION OF CAR/LIGHT IN TRAIN	
15 POSITION 1. Stopped on crossing 2. Stopped on crossing 3. Moving over crossing			18 CIRCUMSTANCE 1. Train struck highway user 2. Train struck by highway user		
19 Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway user 2. Rail equipment 3. Both 4. Neither CODE					
ENVIRONMENT					
20 TEMPERATURE (specify if unusual) °F		21 VISIBILITY (single entry) 1. Dawn 3. Dusk 2. Day 4. Dark		22 WEATHER (single entry) 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow	
TRAIN AND TRACK					
23 TYPE OF TRAIN 1. Freight 3. Mixed 5. Yard/switching 2. Passenger 4. Work 6. Light locomotives			24 TRACK TYPE USED BY TRAIN INVOLVED 1. Main 3. Siding 2. Yard 4. Industry		
25 TRACK NUMBER OR NAME		26 FRA TRACK CLASSIFICATION		27 NUMBER OF LOCOMOTIVE UNITS	
28 NUMBER OF CARS		29 TRAIN SPEED (recorded speed, if available) MPH Est Recorded		30 TIME TABLE DIRECTION 1. North 3. East 2. South 4. West	
CROSSING WARNING					
31 TYPE (place X in appropriate box(es)) 1. Gates 5. Hwy. Traffic Signals 9. Watchman 2. Cantilever FLS 6. Audible 10. Flagged by crew 3. Standard FLS 7. Crossbucks 11. Other (specify) 4. Wig Wags 8. Stop Signs 12. None				32 SIGNALLED CROSSING WARNING Was the signaled crossing warning identified in item 31 operating? 1. Yes 2. No CODE	
33 LOCATION OF WARNING 1. Both sides 2. Side of vehicle approach 3. Opposite side of vehicle approach		34 CROSSING WARNING INTERCONNECTED WITH HIGHWAY SIGNALS 1. Yes 2. No 3. Unknown		35 CROSSING ILLUMINATED BY STREET LIGHTS OR SPECIAL LIGHTS 1. Yes 2. No 3. Unknown	
MOTORIST ACTION					
36 MOTORIST PASSED STANDING HIGHWAY VEHICLE 1. Yes 2. No 3. Unknown			37 MOTORIST DROVE BEHIND OR IN FRONT OF TRAIN AND STRUCK OR WAS STRUCK BY SECOND TRAIN 1. Yes 2. No 3. Unknown		
38 MOTORIST 1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Other (specify) 5. Unknown CODE					
39 VIEW OF TRACK OBSCURED BY (groupings of items) 1. Permanent structure 2. Standing railroad equipment 3. Passing train 5. Vegetation 7. Other (specify) 4. Topography 6. Highway vehicles 8. Not obstructed CODE					
HIGHWAY VEHICLE PROPERTY DAMAGE/CASUALTIES					
40 HIGHWAY VEHICLE PROPERTY DAMAGE (incl. trailer damage)		41 DRIVER WAS 1. Killed 2. Injured 3. Uninjured		42 WAS DRIVER IN THE VEHICLE? 1. Yes 2. No CODE	
43 TOTAL NUMBER OF OCCUPANTS KILLED		44 TOTAL NUMBER OF OCCUPANTS INJURED		45 TOTAL NUMBER OF OCCUPANTS (incl. driver)	
46 IS A RAIL EQUIPMENT INCIDENT REPORT BEING FILED? 1. Yes 2. No CODE					
47 TYPED NAME AND TITLE		48 SIGNATURE		49 DATE	

FORM FRA F 6180-57 (5-74) REPLACES FORM FRA F 6180-13 (10-67) WHICH IS OBSOLETE

Figure 1-2. Highway Grade Crossing Incident Report

2.0 HIGHWAY-RAIL CROSSING INVENTORY NUMBER

2.1 Background

In 1974, an effort was undertaken to inventory and assign a unique number to all public and private highway-railroad intersections and pedestrian crossings in the United States. As a part of the original inventory, data were collected for all public, private, and pedestrian crossings, both at grade and grade separated, including location, operational, physical and classification information.

A National Advisory Committee having representation from all involved parties was appointed to provide technical guidelines for the implementation of the inventory. The Advisory Committee determined the type and extent of the data to be collected. In general, the data elements to be included in the inventory were selected on the basis of their significance to the computation of a priority index for grade crossing improvements.

The railroad industry and each of the States participated in the initial inventory. Following an agreed procedure, the States and railroads continue to submit new and updated crossing information to the Federal Railroad Administration. The FRA, through its contractor, updates and maintains the National Data File. This information is available for public use and may be obtained through the FRA Office of Safety.

In addition to these data, some States and some railroads maintain additional crossing information in their data files. However, these data are not generally available to the public and may be obtained only through the State or railroad maintaining the supplemental information.

In many ways the National Highway-Rail Crossing Inventory number, placed at all public, private, and pedestrian crossings, is similar to a credit card or bank account number. Important information is assigned to the number by State agencies and railroads. Police, accident investigators, project engineers, utilities, States and railroads are but a few of those who refer to these numbers and the connecting data regularly.

The need for accurate information assigned to the appropriate crossing is important in any decision to upgrade existing warning devices. The number of accidents, motor vehicles and trains using the crossing, and the type of warning device are but a few of the data elements that are critical in the computation of a "hazard index" for individual grade crossings. Not only is it important that these data be kept current, but it is also critical that the information be assigned to the proper crossing via the identification number.

In addition to the assignment of data regarding the physical and operational characteristics of a crossing, the inventory number is used on all FRA grade crossing accident reports and warning device malfunction reports. Many States and local jurisdictions use the crossing

number on reports of accidents at or near crossings even when not involving a rail vehicle. All railroads and States use the inventory number on crossing improvement project documents, and railroad crews report near misses and other information regarding a crossing by the inventory number. Some utility companies even use the number to locate rail crossings. All of these factors require the need for displaying the number at the crossing to insure that the information is being assigned to the correct location.

2.2 Uniqueness and Calculation

The crossing inventory numbering system was designed to reduce the possibility of error by insuring that crossing data is recorded for the correct location. The crossing identification number, which consists of a maximum of six numeric digits with a single alpha check character, is placed at crossings on number boards along with the "U.S. DOT-AAR" designation. The number assigned to each highway-rail intersection is unique. It is important for proper identification to have the crossing number permanently displayed and mounted on a number board (Figure 2.1) and it is strongly recommended that it be displayed on both sides of the track at each and every crossing. By referencing this number, ail inventory and accident data on file, including data collected by State and local agencies and railroad companies, will have a common link. The identification number serves as a communication reference between railroad companies and public agencies, as well as between individual railroad companies regarding specific crossings.

A simple numeric system requiring the use of a maximum of six digits was adopted by the National Advisory Committee. Some exceptions were made in the numbering system. For example, numbers having the same digit repeated consecutively three or more times were eliminated (e.g., 7777). Also, numbers having three digits or less were not used, and some may have leading zeros. The crossing **identification** number, with its six numeric digits, has a single alpha check character at the end of the number sequence.

This alpha check character is another feature of the National Inventory number that makes it similar to a credit card. When the inventory numbers are generated, they are accompanied by the check character. Therefore, every time a number is used, it can be validated by the check character. The check is performed as follows:

- a. Add the six individual numbers which result from the products of each of the **first** six digits times the digit's position in the number stream, with position one being the left-most digit (see Step 1 below).
- b. Subtract multiples of 22 from this total until the remainder is less than 22 (see Step 2 below).
- c. The remainder is then compared against Table 2-1 to find or verify the alpha code.

4.0 INVENTORY UPDATE PROCEDURES

4.1 General

The procedures for updating the National Inventory File are applicable to public, private and pedestrian crossings, whether at grade or grade separated. These procedures are designed to insure availability and use of an up-to-date highway-rail crossing data base with uniform and consistent data collection criteria and a uniformity in the procedures used by States and railroads.

The procedures are based on the concept that the **State transportation agency should be the party who forwards all data item changes for any and all crossings to the FRA. This is consistent with the sequence of steps followed during the initial inventory. The steps are railroad to State to FRA. Or in situations where the State agency (rather than a railroad) initiates crossing changes, the sequence is State to railroad to State to FRA.**

The process requires a continuing, cooperative effort between the States and railroads because only one may have changes to report, **yet both need to review and update their respective crossing records.** Channels of communication need to be established whereby such information is provided to the appropriate individuals in the railroad companies and the State transportation agencies.

There are five types of update formats which may be submitted. These are:

- a. U.S. DOT-AAR Crossing Inventory Form
- b. Mass Update Form
- c. Inventory Computer Printout
- d. Magnetic Tape
- e. GX Computer Program

Examples of the different types of forms upon which changes and corrections may be submitted are shown in Figure 4-1. At the top is the "Inventory Computer Printout," on the right in the middle of the page is the "U.S. DOT-AAR Crossing Inventory Form," and the fill-in-the-blanks Mass Update Form is at the bottom. Section 5.0 of this manual addresses the use of the Mass Update Forms. Use of the Inventory Computer Printout for mark-up is discussed and illustrated at the end of this section. Section 6.0 of this manual explains how updates may be submitted on magnetic tape.

Changes may also be submitted on floppy disk using the GX computer program. If the changes are submitted on the GX disks by a railroad, the railroad should send a copy of the transmittal letter to the State (contact person) and the FRA to notify them that a change has been submitted via GX disk. This notifies the State that in 2 or 3 months they can receive a

U.S. DOT-AAH CROSSING INVENTORY INFORMATION PAGE 3

AS OF 06/19/87
FOR THE STATE OF ALASKA

CROSSING NUMBER: 840295P EFFECTIVE BEGIN-DATE OF RECORD: 01/01/79

PART I LOCATION AND CLASSIFICATION OF ALL CROSSINGS-

RAILROAD: ALASKA RAILROAD DIVISION: COUNTY: VALDEZ-CORDOVA
 STATE: ALASKA CITY: WHITTIER COUNTY MAP REF. NO. 1
 STREET OR ROAD NAME: PETROLEUMTERMINAL RAILROAD I.D. NO.: F FRA OR REF. NO.: WINGC
 NEAREST RR TIMETABLE STN.: BRANCH OR LINE NAME: MAIN LINE RAILROAD MILEPOST: 0062.20
 CROSSING TYPE AND PROTECTION: PUBLIC AT GRADE

PART II DETAILED INFORMATION FOR PUBLIC VEHICULAR AT GRADE CROSSINGS

TYPICAL NUMBER OF DAILY TRAIN MOVEMENTS: 0 DAY THRU 25 DAY SWITCHING 0 NIGHT THRU 25 NIGHT SWITCHING
 SPEED OF TRAIN AT CROSSING: MAXIMUM TIMETABLE SPEED 10 TYPICAL SPEED RANGE OVER CROSSING FROM 00 TO 04 MPH
 TYPE AND NUMBER OF TRACKS: 0 MAIN 1 OTHER YARD DOES ANOTHER OR OPERATE A SEPARATE TRACK AT CROSSING? NO
 DOES ANOTHER OR OPERATE OVER YOUR TRACK AT CROSSING? NO
 TYPE OF WARNING DEVICES AT CROSSING: 0 STANDARD HIGHWAY STOP SIGNS 0 OTHER STOP SIGNS 0 OTHER SIGNS
 TRAIN ACTIVATED DEVICES: NONE SPECIAL WARNING DEVICES NOT TRAIN ACTIVATED: NONE
 IS COMMERCIAL POWER AVAILABLE? YES DOES CROSSING SIGNAL PROVIDE SPEED SELECTION FOR TRAINS? YES
 METHOD OF SIGNALING FOR TRAIN OPERATION: 10 TRACK EQUIPPED WITH SIGNALS? NO

PART III PHYSICAL DATA

TYPE OF DEVELOPMENT: INDUSTRIAL 00 TO 90 DEGREES
 SMALLEST CROSSING ANGLE: 1
 NUMBER OF TRAFFIC LANES CROSSING RAILROAD: 1
 ARE TRUCK PULLOUT LANES PRESENT? NO
 IS HIGHWAY PAVED? NO PAYMENT MARKINGS
 PAYMENT MARKINGS: NO
 ARE OR ADVANCE MARKING SIGNS PRESENT? NO
 CROSSING SURFACE: NO FULL WIDTH PLANE
 DOES TRACK RUN DOWN A STREET? NO
 NEARBY INTERSECTING HIGHWAY? NO

PART IV HIGHWAY DEPARTMENT INFORMATION

HIGHWAY SYSTEM: NON-FEDERAL-AID
 IS CROSSING ON STATE HIGHWAY SYSTEM? NO
 FUNCTIONAL CLASSIFICATION OF ROAD OVER CROSSING: RURAL/LOCAL
 ESTIMATED AADT: 00000
 ESTIMATED PERCENT TRUCKS: 10

U.S. DOT - AAH CROSSING INVENTORY FORM

A. RAILROAD AGENCY
 BUREAU STATE

C. REASON FOR UPDATE
 CHANGES IN EXISTING CROSSING DATA
 NEW CROSSING

E. EFFECTIVE DATE
 1 2 3 4 5 6 7 8 9 0

B. CROSSING NUMBER

Part I Location and Classification of All Crossings (Used for Computations)

1. Railroad Crossing Category: A. Road B. Street C. Other
 2. Railroad Stop or Sign: A. Advance Stop Sign B. Advance Stop Sign with Flashing Lights C. Advance Stop Sign with Flashing Lights and Stop
 3. Railroad Protection of Street: A. None B. Advance Stop Sign C. Advance Stop Sign with Flashing Lights D. Advance Stop Sign with Flashing Lights and Stop
 4. Street or Road Name: A. Street B. Road C. Other
 5. Railroad I.D. No.: A. None B. Other
 6. FRA or Ref. No.: A. None B. Other
 7. Branch or Line Name: A. None B. Other
 8. Railroad Milepost: A. None B. Other
 9. State: A. None B. Other
 10. County: A. None B. Other
 11. City: A. None B. Other
 12. State Highway System: A. None B. Other
 13. Road or Lane Name: A. None B. Other
 14. National Highway System: A. None B. Other
 15. Type of Crossing: A. None B. Other
 16. Type of Protection: A. None B. Other
 17. Type of Sign: A. None B. Other
 18. Type of Signal: A. None B. Other
 19. Type of Surface: A. None B. Other
 20. Type of Track: A. None B. Other
 21. Type of Street: A. None B. Other
 22. Type of Highway: A. None B. Other
 23. Type of System: A. None B. Other
 24. Type of Classification: A. None B. Other
 25. Type of Estimated AADT: A. None B. Other
 26. Type of Estimated Percent Trucks: A. None B. Other

Part II Detailed Information for Public Vehicular at Grade Crossings

1. Typical Number of Daily Train Movements: A. Day Thru 25 Day Switching B. Night Thru 25 Night Switching
 2. Speed of Train at Crossing: A. Maximum Timetable Speed B. Typical Speed Range Over Crossing
 3. Type and Number of Tracks: A. Main B. Other Yard
 4. Does Another or Operate a Separate Track at Crossing? A. Yes B. No
 5. Does Another or Operate Over Your Track at Crossing? A. Yes B. No
 6. Type of Warning Devices at Crossing: A. Standard Highway Stop Signs B. Other Stop Signs C. Other Signs
 7. Train Activated Devices: A. None B. Special Warning Devices Not Train Activated
 8. Is Commercial Power Available? A. Yes B. No
 9. Does Crossing Signal Provide Speed Selection for Trains? A. Yes B. No
 10. Method of Signaling for Train Operation: A. Track Equipped with Signals B. No

Part III Physical Data

1. Type of Development: A. Industrial B. 00 to 90 Degrees
 2. Smallest Crossing Angle: A. 1
 3. Number of Traffic Lanes Crossing Railroad: A. 1
 4. Are Truck Pullout Lanes Present? A. No B. Yes
 5. Is Highway Paved? A. No B. Yes
 6. Payment Markings: A. No B. Yes
 7. Are or Advance Marking Signs Present? A. No B. Yes
 8. Crossing Surface: A. No Full Width Plane
 9. Does Track Run Down a Street? A. No B. Yes
 10. Nearby Intersecting Highway: A. No B. Yes

Part IV Highway Department Information

1. Highway System: A. Non-Federal-Aid B. Federal-Aid
 2. Is Crossing on State Highway System? A. No B. Yes
 3. Functional Classification of Road over Crossing: A. Rural/Local B. Other
 4. Estimated AADT: A. 00000 B. Other
 5. Estimated Percent Trucks: A. 10 B. Other

If there are no changes and the crossing still exists, show an effective date of January 1 of the current year (01/01/??) in red pen on the inventory printout, cross out the old date and return. Simple changes (i.e. numbers, etc), closings and ownership changes may also be indicated on these sheets. Use red pen and return.

If data elements have changed, use the 4-part Inventory Form. Circle only the changed data, circle the changes in red ink and indicate the effective date.

CROSSINGS SOLD BY THE STATE OF MISSISSIPPI WHICH ARE OWNED, TRANSFERRED, OR SOLD

FULL-IN-THE-PLANES LIST UPDATING CROSSING STATUS OR OWNERSHIP

PAGE 22/27

IN THE SOUTHERN DIVISION, CANTON	SUBDIVISION, IN THE STATE OF MISSISSIPPI	DATE SOLD	ST. CITY	RAILROAD	LOCATED	CITY	DIVISION	SUBDIVISION	BRANCH	MILEPOST
2907710	PARLSON	20 000 100	PARLSON	14	STIMMELAND	SOUTHERN	CANTON	719.67		
2907720	PARLSON	20 000 100	PARLSON	10	STIMMELAND	SOUTHERN	CANTON	719.97		
2907730	PARLSON	20 000 100	PARLSON	14	STIMMELAND	SOUTHERN	CANTON	719.73		
2907740	PARLSON	20 000 100	PARLSON	10	STIMMELAND	SOUTHERN	CANTON	720.62		
2907750	PARLSON	20 000 100	PARLSON	NEAR	FOUNDALE	SOUTHERN	CANTON	720.65		
2907760	PARLSON	20 000 100	PARLSON	NEAR	FOUNDALE	SOUTHERN	CANTON	721.23		
2907766	PARLSON	20 000 100	PARLSON	NEAR	FOUNDALE	SOUTHERN	CANTON	721.41		
2907770	WINGC	20 000 100	WINGC	NEAR	JACKSON	SOUTHERN	CANTON	721.62		
2907780	WINGC	20 000 100	WINGC	NEAR	JACKSON	SOUTHERN	CANTON	722.21		
2907787	WINGC	20 000 100	WINGC	NEAR	JACKSON	SOUTHERN	CANTON	722.69		

If there are mass changes in ownership, closings, or other data elements (e.g. train counts, AADT's), the "mass update computer format" can be requested and used.

Figure 4-1. The Procedures/Forms Used for Reporting Changes

GX update of this material after it has been added to the National File. The same applies to a State that submits changes. The State should notify the railroads involved and the FRA by sending a copy of the transmittal letter. Section 7.0 of this manual describes the use of the GX Programs.

This section, Section 4 of this manual, emphasizes the procedures involved for submitting updates via the U.S. DOT-AAR Crossing Inventory Form.

4.2 Inventory Form

The U.S. DOT-AAR Crossing Inventory Form FRA F6180.71 (OMB-004-R4039) (see Figure 1-1) is used for providing data to initiate new crossings or changes to the Highway-Rail Crossing Inventory. The inventory forms are four-part forms with a self-carbon feature. This form is used for reporting all types of changes, including the establishment of a new crossing, closing of an existing crossing, or changes in the characteristics of a crossing. Detailed instructions for completing the form are given in Section 3.0. The form does not provide space for comments. Should comments or explanation regarding a crossing be considered necessary or useful, a separate sheet should be used and attached to the form.

While changes and corrections may be submitted using other formats, new crossings must always be submitted on the Inventory Form. When Parts I, II and III have been completed by the railroad, the top three copies must be forwarded to the State for completion of Part IV. It is suggested that FRA be sent a copy of the transmittal correspondence.

Railroads and State highway agencies may obtain needed forms from the FRA. The address is:

Federal Railroad Administration
Office of Safety
Highway-Rail Crossing and Trespasser Programs Division
400 7th Street, S.W. (RRS-23)
Washington, D.C. 20590

4.3 Data Items

Each data element contained on the inventory form is considered to be one of three categories: administrative, physical, or operational. The following tables contain the data elements comprising the three categories. The tables also indicate the agency that is expected to be most aware of any changes to those data elements and which would normally initiate the update process.

Table 4-1 lists the administrative data elements, which pertain to the management and jurisdiction of the crossing. Changes in administrative data elements (such as division, subdivision names, etc.) usually occur because of an administrative action by a railroad. A State agency may also make decisions that would result in changes in certain administrative elements. Thus, the appropriate agency should initiate the update process when changes occur.

Item No.	Element Name	Agency
I-4	State	State Highway or Railroad
I-5	County	State Highway or Railroad
I-6	County Map Reference	State Highway or Railroad
I-7	City	State Highway or Railroad
I-8	Nearest City	State Highway or Railroad
I-9	Highway Number	State Highway or Railroad
I-10	Street or Road Name	State Highway or Railroad
IV-1	Highway System	State Highway
IV-2	Crossing on State System	State Highway
IV-3	Functional Class	State Highway
I-1	Railroad Company	Railroad
I-2	Railroad Division	Railroad
I-3	Railroad Subdivision	Railroad
I-11	Railroad I.D. Number	Railroad
I-12	Timetable Station	Railroad
I-13	Branch or Line Name	Railroad
I-14	Railroad Milepost	Railroad
II-5	Another Railroad?	Railroad
I-15	Pedestrian Crossing	State Highway or Railroad
I-16	Private Vehicle Crossing	State Highway or Railroad
I-17	Public Vehicle Crossing	State Highway or Railroad

Table 4-1. Administrative Data Elements

The physical items describe the crossing configuration. Changes to physical characteristics generally occur as a result of construction activity by a railroad or State. The authority for the work usually is in the form of a contract, work order, etc. An update must be submitted by the proper agency when any of these data elements change. Table 4-2 lists the physical data elements.

Item No.	Element Name	Agency
II-3	Type, Number Tracks	Railroad
II-4	Separate Track/Other Railroad	Railroad
II-6	Type of Warning Device	Railroad or State Highway
II-7	Commercial Power?	Railroad or State Highway
II-8	Speed Selection Provided	Railroad
II-9	Signals for Train Control	Railroad
III-8	Crossing Surface	Railroad or State Highway
III-1	Development	State Highway
III-2	Crossing Angle	State Highway or Railroad
III-3	Number Traffic Lanes	State Highway or Railroad
III-4	Truck Pullout Lanes	State Highway
III-5	Is Highway Paved?	State Highway or Railroad
III-6	Pavement Markings	State Highway or Railroad
III-7	Advance Warning Signs	State Highway

Table 4-2. Physical Data Elements

The operational items pertain to the use of the crossing by railroads. It is recognized that the values of the operational data elements (e.g., number of trains, speeds, etc.) may change over a period of time. Whenever the changes are made or become known, the data elements should be updated. Table 4-3 lists the operational data elements.

Item No.	Element Name	Agency
II-1	Daily Train Movements	Railroad
II-2	Maximum Train Speed/Crossing	Railroad
IV-4	Estimated AADT	State Highway
IV-5	Estimated Percent Trucks	State Highway

Table 4-3. Operational Data Elements

4.4 Railroad and State Agency Update Submission Procedures

There are three situations which require the reporting of changes by a railroad or State highway agency. These situations are as follows:

- a. When one or more of the physical, operational, or administrative characteristics of an existing crossing change,
- b. When a new crossing is opened, and
- c. When an existing crossing is closed.

IMPORTANT NOTE: In all cases when an update form is prepared, the items in Table 4-4 must be provided in addition to the items being updated.

Section	Item No.	Item
Heading	A	Initiating agency
Heading	B	Crossing number
Heading	C	Type of update
Heading	D	Effective date
Part I	1	Railroad operating company
Part I	4	State
Part I	5	County

Table 4-4. Required Update Items

Only the data items being updated, i.e., those items for which a value is being changed from the existing records, are to be entered in the appropriate place on the form. These items should then be circled.

The steps necessary to process an update are shown in Figures 4-2 and 4-3. The primary responsibility for submitting the data changes to the FRA lies with the State agencies; however, the railroad has responsibility for submitting updates to the State. The sequence for submitting updates is shown in Figures 4-2 and 4-3, depending upon whether the update is initiated by the railroad or the State agency.

RAILROAD INITIATED

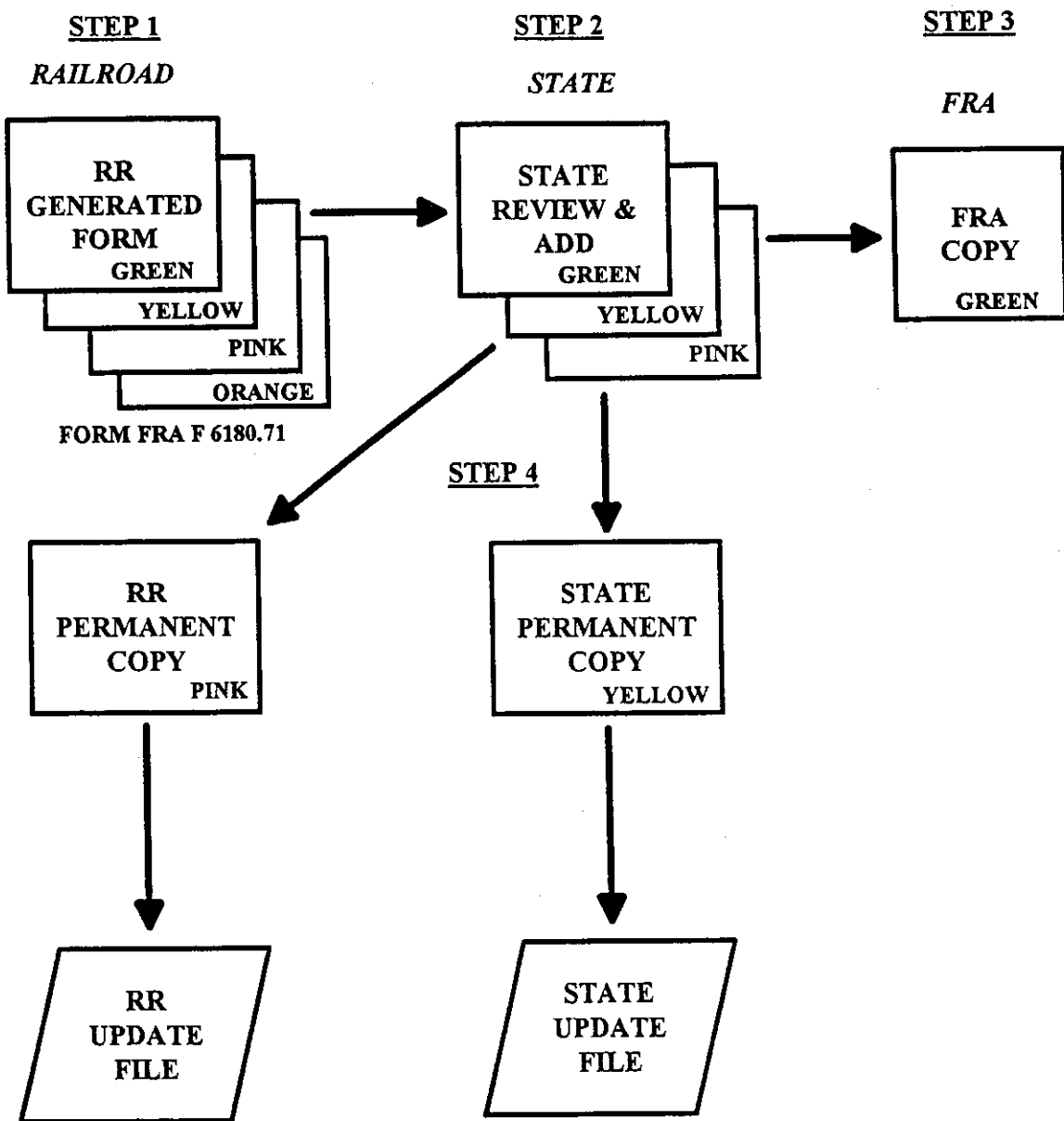


Figure 4-2. Railroad Initiated Update

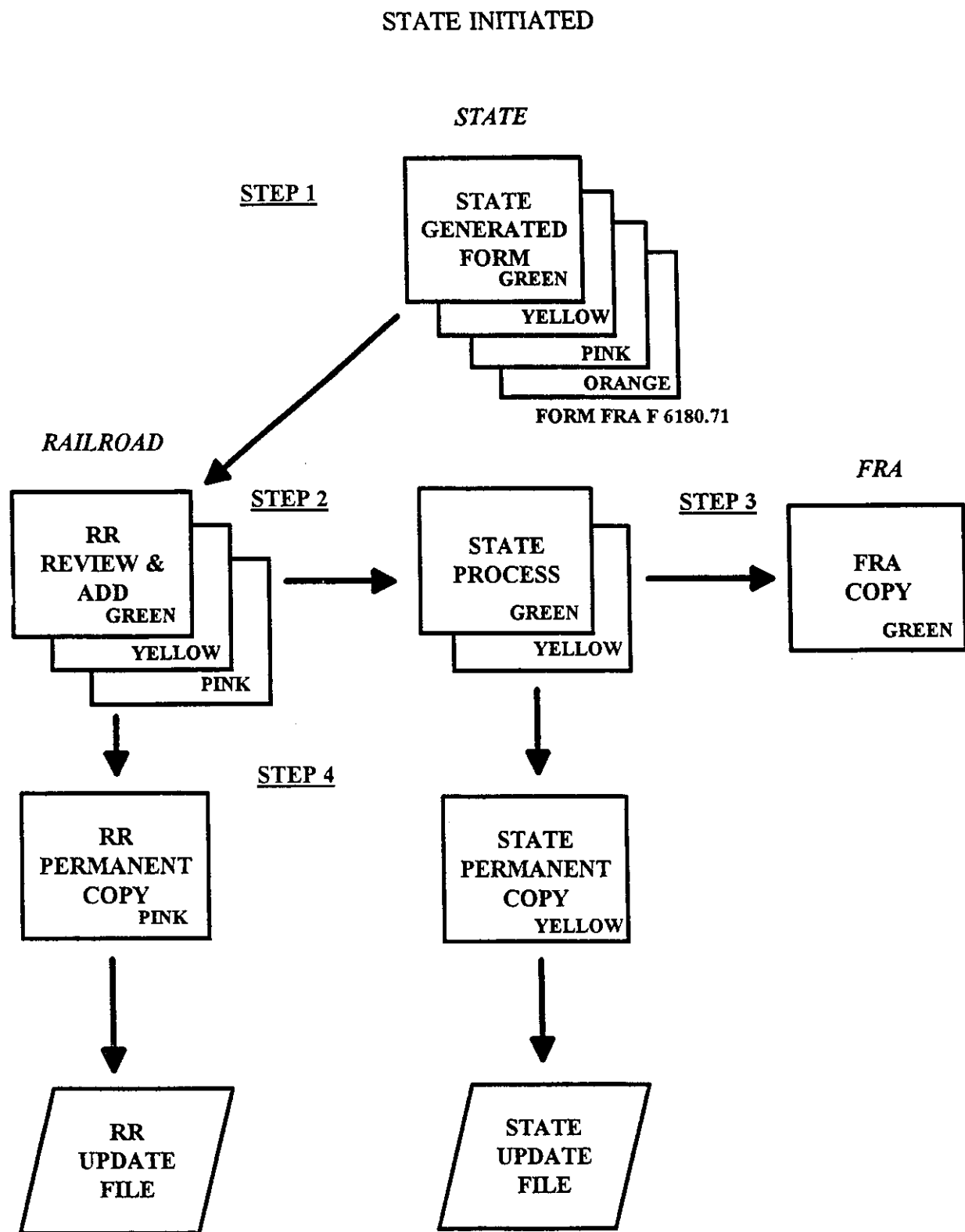


Figure 4-3. State Agency Initiated Update

Depending upon the data **element(s)** involved (see Tables 4-1, 4-2, and 4-3), either a State or a railroad should initiate the update form. Unless otherwise mutually agreed by the State and the railroad, the party initiating an update should be in accordance with these tables.

As has previously been explained, an update form should be initiated when one or more of the physical, operational, or administrative characteristics change (see Tables 4-1, 4-2, and 4-3). Physical characteristic changes generally occur as a result of a construction activity. Changes in administrative data elements usually occur because of an administrative action on the part of the State highway agency or a local jurisdiction. Operational data elements may change significantly annually or over a period of time (e.g., traffic counts, percent trucks, pavement markings, etc.). **The procedures of the State should be such that these items are updated at least every 3 years. However, whenever the changes become known, the data elements should be immediately updated.**

When a new crossing is opened, Form **FRA F 6180.71** must always be used to report the inventory information. The process is the same as for the process just described for reporting changes. The **railroad/State** needs to complete an update form for the new crossing and assign a valid crossing number. Crossing numbers can be obtained from the FRA (see Section 2.0). The **railroad/State** must also install the crossing identification number at the crossing and it is strongly recommended that it be installed on **both** sides of the crossing. **If the crossing is public, the form must be completely filled out.** If the crossing is private or grade separated, only Part I of the form must be completed. The **railroad/State** should initiate the update by completing a form and routing it according to Figure 4-2 or 4-3, whichever applies.

The sequence of steps to be followed when a crossing is reported closed is the same as for the submissions for changes and additions.

When a railroad initiates an update submission, the flow process is as pictured in Figure 4-2. **The railroad will complete a four-part form, retaining the bottom (orange) copy, and forwarding the top three copies to the appropriate State agency (Step 1). The State agency will review the form, adding any changes necessary, and return a copy (pink) to the railroad for use in updating its records (Step 4). The top copy (green) will be forwarded by the State agency to FRA for processing into the National File.**

The State agency should carefully review the forms to insure that the location information is correct and that the State concurs in the railroad's classification of the crossing as public or private. The State agency and the railroad must reach agreement regarding the crossing classification, prior to forwarding the inventory form to the FRA.

The State highway agency should review other parts of the completed form for a new public crossing to insure that the data shown agrees with its records.