U.S. Department of Transportation

Federal Railroad Administration
Federal Highway Administration

Highway-Railroad Grade Crossings

A Guide To Crossing Consolidation And Closure

July 1994

Cover photograph provided by the Florida Department of Transportation

U.S. Department
of Transportation
**Federal Railroad
Administration**

Office of the Administrator

400 Seventh St., S.W.
Washington, D.C. 20590

July 20, 1994

Dear Colleague:

The consolidation of redundant and unnecessary highway-rail grade crossings is a key element in the Department of Transportation's Action Plan to improve grade crossing safety.

To put the case for crossing consolidation in perspective, there are 280,000 public and private at-grade crossings in the United States. In some localities there is literally a crossing every block. Unnecessary and redundant crossings strain both the public funds for crossing safety warning devices and the resources of the law enforcement agencies that enforce the traffic laws on highway-rail grade crossings.

The *Guide to Crossing Consolidation and Closure* addresses the main obstacle to the rationalization of redundant crossings, namely local opposition. Almost any proposal that involves the closure of a grade crossing is met with local concern about emergency vehicle response time, traffic delays, neighborhood impacts and public convenience. The *Guide* provides a model for working effectively with local communities to successfully implement a grade crossing consolidation project.

The *Guide* is based on a DOT staff study of grade crossing consolidation and closure projects. The *Guide* reflects the key elements of the best strategies being used by individual state, federal, and railroad officials to win local support for crossing consolidation projects.

We encourage officials who are responsible for highway-rail crossing safety to use the *Guide*.

We also support the efforts underway in several states to adopt laws that facilitate the elimination of grade crossings, and we encourage all states to make the elimination of unnecessary and redundant grade crossings a priority public safety issue.

Sincerely,

Jolene M. Molitoris
Federal Railroad Administrator

Sincerely,

Rodney E. Slater
Federal Highway Administrator

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FOREWORD

This guide is about highway-railroad grade crossing consolidation and closure--an effective, but often overlooked, option for improving grade crossing safety.

The concept of closing unnecessary and hazardous crossings is not new. However, the advent of the systems or corridor approach to evaluating crossing safety and the need to address the persistent problem of accidents at low volume crossings have increased attention on crossing consolidation and closure.

The benefits of consolidating unnecessary grade crossings include:

- fewer intersections at which collisions between motor vehicles and trains can occur;
- removal of a potential safety hazard at a cost that is often only a fraction of the cost of warning signals and gates;
- redirection of limited resources to the remaining crossings which have the greatest public necessity; and
- a reduction in the number of at-grade crossings which may need costly improvements or grade separation in the future to accommodate high speed rail operations.

The Federal Railroad Administration is encouraging states, political subdivisions and railroads to reduce the 280,000 public and private grade crossings by 25 percent. In support of this initiative, the FRA developed case studies of actual grade crossing consolidation and closure projects.

This guide is derived from the case studies. The guide condenses the lessons learned from both the successful and unsuccessful projects. It was prepared to disseminate information to state transportation agencies, Metropolitan Planning Organizations, and railroads on how to gain local support for grade crossing consolidation and closure projects.

The case studies unequivocally demonstrate that the primary impediment to the rationalization of redundant crossings is local opposition to the closing of almost any crossing. Meritorious crossing consolidation proposals consistently fail to win approval from local governing bodies because concerns about community impacts are not addressed to the satisfaction of local officials.

Even when formal approval from the local government is not required by law, local endorsement of the project (or at a minimum the absence of local opposition) is often a de facto requirement.

The focus of this guide is a model approach for working with local communities to reach voluntary agreement to consolidate unnecessary crossings and a checklist of the factors commonly found in the successful projects.

1. GRADE CROSSING CONSOLIDATION

Throughout this guide, grade crossing consolidation is used as the descriptive term for the closure of unnecessary grade crossings.

In almost all cases, the closing of a public grade crossing on an active rail line is, in reality, a grade crossing consolidation project. At a minimum, a proposal to close a crossing should consider the impact on the connecting streets and the characteristics of the alternative crossings. If needed, the consolidation project will include street improvements and the upgrading of one or more adjacent crossings.

Terms such as "crossing closure" and "crossing elimination" have two shortcomings:

1. they convey an incomplete image of what is involved in closing a crossing; and,

2. they generate connotations of something being taken away.

Therefore, crossing consolidation more positively characterizes projects that reduce the number of unnecessary and hazardous crossings and reroute traffic to adjacent crossings that have been improved.

2. HOW CROSSINGS ARE SELECTED

A rail corridor crossing safety improvement review by a diagnostic team is one of the best means to identify crossings for consolidation. Crossing diagnostic teams are organized by state officials and include representatives from the operating railroad. Officials from the Federal and local governments may also be invited to participate.

When the recommendation to consolidate redundant crossings is one element of a rail corridor safety improvement plan, the proposal for consolidation is often more acceptable than the targeting of a single crossing for closure.

However, not all states have adopted the corridor approach. The case studies showed that proposals for crossing consolidation and closure projects can originate as a byproduct of a highway or railroad construction project, or a recognition of the hazards associated with a specific crossing. Suggestions for crossing consolidation projects have come from the following sources:

- review by a diagnostic team of a rail corridor;
- recommendation by Federal or state safety inspectors;
- signalization of an adjacent crossings;
- response to a serious accident or series of accidents;
- planning of a track rehabilitation project;
- reports by train engineers of "near misses";
- suggestions from Operation Lifesaver volunteers;
- planning for high-speed passenger service;
- request by a town or city for crossing upgrades; and
- recommendation by railroad safety committees.

There is no dearth of opportunity for crossing consolidation. Many transportation officials contend that literally thousands of redundant at-grade crossings could be consolidated without significantly affecting travel times or public convenience. **However, it is important that proposals for closing crossings be reviewed by qualified professionals to ensure that public safety is not diminished as a result of rerouting highway traffic.**

3. WHY LOCAL APPROVAL IS CRITICAL

The consolidation and closure of highway-rail grade crossings is very much a state and local government issue. The Federal government exercises no regulatory authority over the closing of existing grade crossings or the opening of new crossings.

To help explain the process of closing public grade crossings, states can be divided into two groups:

1. States that have broad authority to order a crossing closed on any public road; and

2. States that reserve for political subdivisions the exclusive authority to close crossings on locally maintained roads.

Although many states have authority over crossings on their own state system roads, the majority of the opportunities to consolidate crossings are on local streets and roads, not state highways.

The case studies have demonstrated that the fundamental strategy for winning approval to consolidate crossings is similar whether or not the state has authority over crossings on locally maintained roads. The reason is that even states that have the legal authority to close crossings on local streets and roads seldom exercise this state power in the face of local opposition.[1]

To close a public crossing, local agreement--or at a minimum the absence of local opposition--is the key.

[1] The National Conference of State Rail Officials has established an ad hoc committee to promote crossing consolidation. One of the committee's goals is to develop a series of "provisions" that could be incorporated into new state legislation to facilitate the closure of unnecessary crossings.

4. PRO AND CON ARGUMENTS

Analysis of the case studies shows that the pro and con arguments regarding crossing closure are strikingly similar from case to case. This is true for projects in rural areas, as well as crossing projects on commuter rail lines in metropolitan areas. The chart below indicates the typical opposing positions.

The usual arguments for crossing consolidation seldom result in the closing of unnecessary crossings. Even when these arguments are made before an administrative law judge or hearing officer at the state level, the outcome often is in favor of a local government's position to keep the crossing open.

In order to obtain approval for crossing consolidation projects, state agencies, railroads and Federal regional offices have developed their own strategies to win local support. These strategies tend to be a mix of crossing safety education, incentives for closing crossings, and--where state law and state policies permit-- judicious use of the implicit threat to invoke state authority to close unnecessary crossings.

Individuals, who have negotiated with local political subdivisions over the closure of redundant crossings, are virtually unanimous in their assessment that the threat of the state government ultimately closing an unnecessary crossing is a significant advantage in gaining the cooperation of local officials.

However, the first step in developing an effective strategy to consolidate unnecessary crossings is to recognize that the approval process is essentially a process of negotiation. Therefore, the concerns of the local community must be addressed.

PRO AND CON ARGUMENTS

FOR CROSSING CLOSURE	AGAINST CROSSING CLOSURE
Crossing is unnecessary. More than 4 crossings per mile. Low highway traffic counts.	Residents and businesses in immediate area rely on crossing. Emergency vehicle response time will be increased. Closure will increase travel time for residents. Alternative route needed when trains block crossings. Closure will negatively impact area businesses and industry.
Safety will be improved. Crossing has undesirable characteristic such as sight restriction, steep approach or multiple tracks.	There have been no accidents at the crossing. Signals and gates will improve safety. Crossings do not present a danger to safe drivers. Town should make its own decisions.
Efficient use of public crossing safety funds.	Citizens pay taxes and should see the benefits.
Railroad or state will pay the closing cost.	Barricades become unsightly dumping grounds.
Savings in crossing maintenance costs.	Private gain (the railroad's) at public expense (loss of municipal roadway).
Closure is a community improvement. Reduction in train whistle noise.	Closure will isolate the neighborhood. Splits the town in half.

5. MODEL APPROACH TO CROSSING CONSOLIDATION

Patience and persistence are characteristic of successful projects. Successful projects invariably require a time horizon of one to two years before completion.

A town or city council may bring up a crossing consolidation proposal at several successive hearings. These public forums require the time of state agency and railroad staffs to explain the crossing consolidation proposal and respond to concerns about the impact.

City or town councils may offer alternative crossing consolidation proposals during the approval process. Such counter proposals from elected officials may ignore prior negotiations with non-elected public officials or may be inferior from an engineering perspective. However, the case studies indicate that such counter proposals should be evaluated objectively. Otherwise, the entire crossing consolidation project may be rejected. Adjustments to the original project design, which are consistent with an improvement in grade crossing safety, should be accepted when feasible. Refusal to negotiate further during the approval process has caused a failure to consolidate redundant crossings in several communities.

The recommended model approach to crossing consolidation and closure projects described in the following pages is derived from case study analysis of more than two dozen crossing closure projects and interviews with the principals in these projects. Analysis of the case studies shows that each element is important. **The case study projects that failed to win approval typically lacked one or more of the components of the recommended model.**

OUTLINE OF THE MODEL APPROACH

SCREEN PROJECTS

Check for Both Safety and Redundancy

Evaluate Traffic Safety Impact

COORDINATE STATE & RAILROAD EFFORTS

Work as a Team

Emphasize the Safety Corridor Approach

Use the State Agency as the Public Advocate

KNOW THE COMMUNITY

Prepare a Profile of the Local Community

BUILD COMMUNITY SUPPORT

Brief Local Public Works Officials

Coordinate with Emergency Response Personnel

Cite State Guidelines (if applicable) & FHWA Grade Crossing Handbook Guidelines

Utilize Operation Lifesaver Volunteers

INCLUDE INCENTIVES

Offer Community Improvements and/or Financial Incentives

Be Creative and Flexible in Developing Incentives

SCREENING PROJECTS

Safety and Redundancy -- Determining whether a strong justification can be made on the basis of both safety and redundancy is a good test to screen potential consolidation projects. The case studies have shown that approval to close a crossing is seldom granted based solely on crossing safety. The projects that are most likely to succeed are projects that provide a good alternate route. Officials who make decisions regarding crossing closure proposals consistently give considerable weight to public convenience and necessity. This means that a viable alternate route is an essential part of a request to close a crossing. Generally, the threshold for public convenience is measured in seconds for average incremental trip time. **A hazardous crossing, that is not also a redundant crossing, is extremely difficult to close.**

Traffic Safety -- A proposal to close a crossing involves more than removing the crossing surface. Since the primary objective of the consolidation proposal is to enhance safety, it is important that the motor vehicle traffic be diverted to either a better engineered crossing, or a crossing with a higher level of warning device, or a grade-separated crossing. Equally important, the connecting road must be adequate for the projected traffic. Traffic engineering is a critical element in screening virtually all proposals.

COORDINATING RAILROAD/STATE EFFORTS

Railroad and State Cooperation -- There is a positive correlation between the probability that a crossing consolidation project will be successful and the degree to which railroad and state officials work in tandem to support grade crossing consolidation.

Safety Corridor Approach -- A safety corridor approach is a characteristic of many successful consolidation projects. Often the corridor is defined by the boundaries of a political subdivision. For example, a town may have 15 crossings and the proposal may be to close five and improve the remaining crossings. The corridor approach would involve a diagnostic team of state officials accompanied by railroad representatives examining all 15 crossings. It is also advisable to invite local public works officials to participate in the corridor review.

State Agency Advocacy -- As the entity responsible for public safety and statewide transportation planning, the state transportation or public utilities agency is the most appropriate authority to make the case for crossing consolidation. Only a public transportation agency can speak authoritatively about the safety consequences of rerouting motor vehicle traffic.

Local citizens or businesses often argue that they will be inconvenienced or otherwise harmed by the closing of a crossing. Elected officials of political subdivisions are in a better position to concur with the recommendation of a state public safety agency than the request of a privately-owned railroad.

The railroad is headquartered in another city and has few if any local employees (or voters). Railroads have a financial interest in reducing crossing maintenance costs. And, local officials may have outstanding complaints against the railroad over whistle noise or blocked crossings that can result in an otherwise meritorious crossing consolidation proposal being held hostage, until these tangential issues are resolved.

KNOWING THE LOCAL COMMUNITY

Profile of the Local Community -- There are certain variables that are necessary to consider in each crossing consolidation project. Whether a state official or a railroad official is developing the proposal, it is important to invest the time to learn the critical factors that are unique to each crossing consolidation project including:

- layout of local streets,
- traffic patterns and amount of traffic,
- emergency vehicle routes (fire, police, rescue),
- impact on neighborhoods, businesses, and schools,
- community perception of the railroad (favorable, unfavorable, neutral),
- warning devices at adjacent crossings,
- form of local government and administrative procedures,
- local needs (incentives the railroad or state can offer in exchange),
- alternative crossings for closure, and
- miscellaneous information such as background of key decision-makers, local culture and practices (formal or informal), etc.

Clearly, the time spent learning about the local community greatly enhances the probability of successfully consolidating and closing unnecessary crossings. Some officials describe this step as "driving the town." Admittedly, this requires staff time to complete. **However, failure to be prepared to address any one of these community factors may result in local rejection of a meritorious proposal.**

BUILDING LOCAL SUPPORT

Local Public Works Officials -- Virtually all the principals in the case studies report that prior to meeting with elected officials, they approach public works staff officials regarding proposals to consolidate and close crossings.

On-site inspections of the crossings are typically part of the process of presenting the closure proposal to local public works officials. Inspection visits provide an opportunity to explain the "corridor approach" and the benefits of crossing consolidation to local officials. Citing examples of crossing consolidations in other communities also is useful.

Some railroads and states present local public works officials with a proposal to close a percentage of the crossings in a community, such as 30 percent, and then work with these officials to identify which individual crossings should be closed to meet the goal. The objective is to win the endorsement of the county or city engineer and other department heads before the proposal is formally presented to the elected officials.

Emergency Response Personnel -- Emergency vehicle response time is a critical issue in all crossing closure proposals. A successful proposal requires a statement from the police and fire departments that emergency vehicle response time will not be materially affected by the crossing consolidation.

If the plan to divert motor vehicle traffic does not satisfy local concerns that emergency vehicles will not be adversely affected, then it is a virtual certainty that the crossing will remain open.

Elected Officials -- Concentrate on the city or county council members whose districts have had the most accidents or will receive the majority of the improvements. Some members may never accept the project no matter how hard you try to win their approval.

State and FHWA Guidelines -- Make local officials aware of state crossing guidelines, if any, and Federal guidelines for crossings that should be closed. U.S. Department of Transportation guidelines are contained in the Federal Highway Administration **Railroad-Highway Grade Crossing Handbook** - Second Edition, FHWA-TS-86-215, September 1986. Note that the Federal guidelines have been in place since 1986.

Operation Lifesaver Volunteers -- Only one railroad that participated in the case studies used Operation Lifesaver volunteers to assist in grade crossing consolidation and closure projects. However, the case studies show that the Nebraska Operation Lifesaver organization, the Union Pacific Railroad and the Nebraska Department of Roads have developed an effective team approach to closing crossings, especially in small towns.

Volunteers have an advantage because they are not viewed as having a corporate self-interest in the outcome. The volunteer is there strictly to relay the safety message. With proper training and orientation, Operation Lifesaver volunteers can undertake much of the preparatory work and develop community support for crossing consolidation projects.

INCLUDING INCENTIVES

Community Improvements & Financial Incentives -- Consolidation proposals are more likely to be favorably received **when the net impact of the overall project is perceived as a community improvement and the community benefits from the consolidation.**

Public grade crossings have value to the community. The convenience associated with multiple crossings, even if they are redundant, is not readily surrendered.

If a proposal to close a crossing is submitted without a financial incentive payment or other community improvement being offered as part of the package, then the perception often becomes that there is a private gain (the railroad's) at public expense (the closing of a street).

The closing of the crossing, itself, is often not viewed as benefiting the community, because the crossing may not be seen as a significant public safety hazard. Frequently, there is the perception that motorists, who are involved in crossing accidents, either were not driving attentively, or took an unacceptable risk on their own accord. In many cases, the perception is accurate. However, public safety improvements are routinely made when the benefits exceed the costs, even if poor judgement or risk-taking contributes to the hazard.

A proposal to close one or more grade crossings is often favorably received, if the effect of the overall project is viewed as a community improvement. That is, there is a tangible community benefit, in addition to the enhancement of crossing safety. Therefore, incentives are a critical part of successful proposals.

The railroad and the state generally share the cost of the community improvement that is offered in conjunction with the crossing consolidation project. The relative share varies considerably. Among the eleven states covered by the case studies, Nebraska was unique in having a financial incentive program that permitted a cash payment, with a railroad match, to a community in exchange for agreement to close a crossing. Typically, the state provides transportation-related community improvements.

The railroads have more flexibility than the states in offering incentives. For example, railroads have provided parcels of railroad-owned land; they have reimbursed communities for the local share of improvements at adjacent crossings; and they have provided cash incentive payments for closing crossings.

Incentives that were offered in the case study projects included:

- cash payments that could be applied to any community project;
- upgrading of adjacent crossings without any cost to the town;
- transfer of land parcels from the railroad to the town;
- street improvements;
- construction of connecting roads to link remaining crossings; and
- training for school and local public safety officials to give Operation Lifesaver presentations.

The case studies show that **local officials regularly expect improvements at the adjacent crossing which will absorb the rerouted traffic, and sometimes expect compensation for the closing of a crossing.**

6. GRADE CROSSING CONSOLIDATION CHECKLIST

Grade Crossing Consolidation Project

Location of Project: _____

Date Checklist Completed: _____ **Date Checklist Updated:** _____

Inventory

	Printouts from crossing inventory, for crossing to be closed and adjacent crossings.
	Update inventory information as needed.
	Accident history for crossing and adjacent crossings.
	Average annual daily traffic count.

Source of Recommendation for Consolidation

	Safety corridor review by diagnostic team. - Copies of diagnostic evaluation form. - Recommendations of diagnostic team.
	Other than diagnostic team: - Project suggested by (description of source): _____ - Copy of project description.

State Guidelines - FHWA Guidelines

	Crossing to be closed meets state guidelines (if applicable).
	Crossing meets FHWA Grade Crossing Handbook guidelines. - Main Line: more than 4 crossings within a 1 mile segment. - Branch Line: less than 2,000 AADT; more than 2 trains per day; alternate crossing within 0.25 mi.

Plans for Signalization

	Crossing is on priority list; future signalization likely.
	Unlikely to be signalized.
	Crossing is signalized.

Preliminary Reviews - Screening

	Review by Railroad Public Projects Unit.
	Review by State DOT Rail Safety Unit and/or State PUC Rail Safety Unit.
	Assessment of highway safety impacts; including connecting roads and adjacent crossings.
	Redundancy of crossing: - Estimated change in average trip time: _____. - Number of crossings per mile in corridor (community): _____.

State\Railroad Coordination

	Go/No-Go decision that is based on safety impacts and redundancy of crossing closing.
	What incentives will the railroad and/or the state offer the community to close the crossing(s)? - Warning device upgrade and surface improvements for adjacent crossings, without any cost to the town; State ____ RR ____. - Construction of connecting road to link crossings; State ____, RR ____. - Transfer of land parcels to the town; State ____, RR ____. - Cash Incentives; State _____, RR _____. - Other:_____. State___, RR___.

Profile of the Local Community

	Physical inspection of the community to determine: - Layout of local streets and traffic patterns. - Potential impact of closing crossing(s) on neighborhoods, businesses, and schools; - Warning protection installed at adjacent crossings.
	Community's perception of the railroad (favorable, unfavorable, neutral).
	The form of local government and administrative procedures.
	Alternate crossings that could be closed, if original proposal is unacceptable.
	Community needs: incentives or community improvements the railroad or state could offer in exchange for closing a crossing.

Coordination with Local Public Works\Emergency Response Personnel

	Identify emergency vehicle routes--fire, police, rescue.
	- Coordinate with fire and police officials to ensure that they can support the crossing consolidation proposal.
	Brief appropriate city, town or county public works officials and their staff on the crossing consolidation proposal, prior to meeting with elected officials.
	Arrange on-site inspections of the crossings with local government staff. - Explain the "corridor approach" and the benefits of crossing consolidation. - Emphasize crossing consolidation as the operative term, and avoid focusing exclusively on "crossing closure" or "crossing elimination." - Cite examples of crossing that have been consolidated in other communities. Share information about what other towns and communities have gained as a result of crossing consolidation. - Ask local officials to identify and explain which crossings are essential and which are least necessary. - Seek the endorsement of the county or city engineer and other department heads before the proposal is formally presented to the elected officials for vote. - Be prepared to negotiate and compromise. - Talk about crossing safety, i.e. how long it takes a train to stop; percent of crossing accidents that are fatal.

Formal Proposal to Consolidate Crossings

	Whenever possible, the state agency makes the application (instead of a railroad).
	Ask city engineer, police chief, and fire and rescue chief to participate in presentation.
	Ask Federal Railroad and Federal Highway Administration personnel to participate in presentation.
	Provide a copy of diagnostic team report.
	Use pictures taken of the crossings affected by the proposal, placed on display boards, in all presentations.
	Advise the political authority that a decision is needed within a prescribed period. Recognize that a project can take one or two years before approval is given.

Operation Lifesaver

	Is state Operation Lifesaver organization involved in this crossing consolidation?
	- If yes: Use OL for community education on crossing safety.

For more information on FRA's highway-rail crossing safety and trespass prevention programs, contact:

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