



TECHSUMMARY *February 2022*

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The Impact of the Louisiana Grade Crossings: A Synthesis and System Analysis

INTRODUCTION

Louisiana has over 3,000 at-grade crossings of public roads with railroads. The number of private road/driveway crossings is unknown but likely exceeds the number of public crossings. In 2018, the overall number of collisions and the number of grade crossing fatalities across the nation were 2,220 and 273, respectively (Bureau of Transportation Statistics). Simultaneously in Louisiana, 91 grade crossing collisions were recorded, including six fatalities. Although Louisiana has witnessed a decline in highway-rail crossing accidents in recent years, which mirrors national trends, Louisiana is one of the 10 states that have the highest number of grade crossing collisions on average. At-grade crossings of public and private roads with railroads create unique intersections where trains and vehicles and other users meet. These are different modes of transportation with distinct physical and operational characteristics. In addition to present safety concerns, at-grade crossings also hamper railroad operations and efficiency.

OBJECTIVE

The objectives of this research included: investigate the crossing status in the state of Louisiana (both publicly and privately owned), including working with Louisiana Department of Transportation and Development (DOTD) to obtain the existing data and information; conduct a thorough and comprehensive literature review to summarize the current knowledge and practice in the literature; outline the funding sources (such as FHWA and FRA) and programs for improving grade crossing safety; conduct a state-wide survey and interview of stockholders to better understand the concerns, barriers, and solutions particularly in Louisiana, including but not limited to state and local transportation departments and agencies, railroad companies, and rail users in Louisiana; identify incentive programs already being used and potential new programs that offer promise in reducing the number of crossings in Louisiana; develop a model that can predict the priority rating of individual crossings for closure or other decision making.

SCOPE

The ultimate goal of this research is to identify the effectiveness of existing incentive programs and/or new programs for closing railroad grade crossings in Louisiana. To achieve this goal, researchers employed several tools, including literature review, survey, and interview. A comprehensive literature review was conducted through searching TRID database, Google Scholar, ScienceDirect, Web of Science, Google general search, etc. Any online materials that are related to crossings were included, including but not limited to academic publications, technical reports, news articles, etc. However, researchers did limit the literatures to the United States considering the context of this research's goal. Researchers also limited the data collection of the survey and interviews to the state of Louisiana with the same reason.

METHODOLOGY

In order to provide recommendations on incentive programs for crossing closure, this research employed two methods—review and synthesis and survey and interview.

Literature Review and Synthesis. Transportation professionals often face problems in their day-to-day work. The potential solutions may already exist either in documented form in research or as undocumented experiences in practice. However, this information is often fragmented, scattered, and unevaluated. Therefore, full knowledge of what has been learned about a problem is frequently not brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem. To provide a systematic means for assembling and evaluating such useful information together and making it available to the entire highway community, it is critical to search out and synthesize useful knowledge from all available sources and prepare concise and documented reports on specific topics. A review and synthesis reports on current knowledge and experiences in the literature and practice. It provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems. It collects and analyzes available information assembled from numerous sources to (1) locate and assemble documented

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information, (2) learn what practice has been used for solving or alleviating the problems, (3) identify all ongoing research, (4) learn what problems remain largely unsolved, and (5) organize, evaluate, and document the useful information that is acquired.

Survey and Interview. The main themes of the survey were safety and other concerns related to crossings and existing programs and their effectiveness for the closure of crossings. The survey questions were designed based on the knowledge from the literature review. The main questions in the survey included: (1) how much of a concern is safety at railroad grade crossings to your agency, and are there any other issues at railroad grade crossings concerning your agency; (2) do you support closure of railroad grade crossings to reduce your agency's concerns; (3) does your agency offer or administer any incentive programs for the closure of railroad grade crossings and how would you rate the effectiveness of the programs; (4) if you are interested in being interviewed, please provide your contact information. The survey was designed and administrated by using Qualtrics platform, which is an online survey tool that is widely used in research.

CONCLUSIONS

As of 2021, there are 9,077 crossings in Louisiana. Of which, 5,534 crossings are currently active and 3,543 crossings are inactive or closed. Among the active crossings, there are 3,173 public crossings, 2,353 private crossings, and eight unclassified crossings. There could be more private crossings that are not included in the state's database. The majority (92%) of these active crossings are at-grade crossings. Meanwhile, 45.7% of Louisiana's total population live within one mile of an active at-grade crossing; 74.1% of the state's population live within three miles of an active at-grade crossing. There are tons of interactions between trains and road users (automobiles, bikes, pedestrians, etc.) at crossings every day in Louisiana, which create safety risks for the state's multimodal transportation system. Although it has witnessed a decline in highway-rail crossing accidents in recent years, which mirrors national trends, Louisiana is still one of the 10 states that have the highest number of grade crossing collisions on average. This study aimed to investigate incentive programs existed in the literature and perspectives of professionals working in this area to help reduce the number of crossings across Louisiana.

In the literature, a national study identified five incentive programs that were offered by other states in the United States. Among these programs, the study found that cash incentives and nearby crossing improvements were the most popular incentive programs for at-grade road-railroad crossings. In contrast, track relocation and nearby crossing grade separation were the least popular programs due to their high cost of implementations. In terms of effectiveness, track relocation and nearby crossing separation were ranked as the most effective programs, while cash incentive was the least effective. There is a conflict between popularity and effectiveness due to cost. The study also found that states with any incentive program had a higher proportion of at-grade crossings closures. It concluded that the combinations of multiple incentive programs would be more effective.

In this study, researchers also conducted a survey and interview across public and private entities, metropolitan planning organizations, city and parish governments, and planning commissions and policy departments in Louisiana. The results show that the vast majority of agencies were concerned by the safety at railroad grade crossings with only one third of them would support closing crossings to reduce their concerns. Besides safety, three other primary concerns were identified: the condition and maintenance of crossing related facilities and traffic management and access for active transportation (pedestrians and bicycles).

Besides New Orleans Public Belt Railroad, none of DOTD or other local agencies offer any incentive programs for at-grade crossing closure in Louisiana. Most of the respondents did not have any experience with incentive programs. When asked how they would rank provided incentive programs in terms of their effectiveness on closure of railroad grade crossings, the results show that road improvement was ranked as the most effective, followed by nearby crossing grade separation, nearby crossing improvement, cash incentives, and track relocation.

RECOMMENDATIONS

This study aimed to investigate the impact of Louisiana's at-grade railroad crossings in order to reduce the overall number of crossings and ultimately improve the safety and efficiency of the multimodal transportation system in Louisiana. With all the findings from literature, survey, and interview, the following recommendations are provided for the consideration of policymaking:

- While a nationwide study found five popular incentive programs used by other states and their effectiveness ranked as (from the most effective to the least effective): track relocation, nearby crossing grade separation, nearby crossing improvement, road improvement, and cash incentives, professionals in Louisiana ranked them differently as: road improvement, nearby crossing grade separation, nearby crossing improvement, cash incentives, and track relocation. This study recommends that any type of incentive program would work better than no incentive program and the combinations of multiple incentive programs may be more effective than any individual program.
- Among the incentive programs, there seems to be a conflict between popularity and effectiveness due to cost of implementation. This study recommends utilizing federal funding programs and opportunities, such as cash incentives and road improvement.
- As indicated by interviewees, good transportation policies are easily accessible, transparent, and engaging for all stakeholders throughout the whole process. Good transportation policies also need to be context-sensitive, not a one-size-fits-all policy statewide regardless of local context. The approaches that are taken in an urban, suburban, or a rural area may be very different.
- The importance of public education on safety and awareness is emphasized by all professionals. Impatience and carelessness when passing a crossing come from human nature, only education can reduce and change risky behaviors.
- New technologies may provide alternatives and help improve safety and efficiency at railroad at-grade crossings, besides closure of crossings. For example, real-time train and car traffic information feedback at crossings may help improve awareness, reduce congestion, reroute, and manage traffic flow.