

Grade Crossing Evaluation Tools and Risk Assessment

FRA develops tools to assist agencies, analysts and policymakers in assessing safety risks and potential changes to highway-rail grade crossings. FRA has developed a GIS grade crossing viewer, a crossing improvement decision tool, and is working on a risk assessment methodology for high-speed grade crossings.

Grade Crossing Risk Assessment Methodology

The FRA has guidelines that recommend certain grade crossing warning systems for high-speed passenger service at train speeds of 79 miles per hour and higher. At train speeds in excess of 125 miles per hour, these guidelines recommend grade separation or closure as the only acceptable treatment. The risk assessment methodology examined the risk to motor vehicle occupants and railroad passengers and crew posed by these guidelines in order to provide a quantitative basis for specifying the nature of improvements to be made at crossings. The assessment considered the risks and costs associated with alternative warning device options as a function of train speed, train type, collision type, and crossing characteristics such as highway traffic volume and type of existing warning device. The analytical model developed to assess the risks of various warning and train protection alternatives were applied to crossings in the Empire Corridor as a case study titled, [Assessment of Risks for High-Speed Rail Grade Crossings on the Empire Corridor Next Generation High-Speed Rail Program](#) (DOT/FRA/RPD-00/05) .

Further research will continue in other states as well as New York as the state develops its grade crossing improvement proposals. Additional initiatives include applying the methodology to the California high-speed corridor and combining it with a cost-benefit methodology to develop a prototype generic application as a user-friendly tool for evaluating proposed improvements to high-speed corridors.

Example of Technology solutions risk consideration

The use of impenetrable barriers is another topic of research that has a number of advantages and disadvantages:

- Advantages: Barriers limit risk to passengers and employees on high speed trains; wireless communication may reduce installation costs; obstacle detection systems enable the train to stop if the crossing is blocked.
- Disadvantages : Barriers must close well in advance of train arrival to confirm crossing is clear and permit train to stop if necessary; mechanical systems will be costly and must be maintained; barriers may damage motorists' vehicles who ignore the warnings.