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Evaluating Financing Mechanisms and Economic Benefits to Fund Grade Separation Projects

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Rail infrastructure improvements have a significant impact on a region's economic development. These improvements require investments that are often limited. This research aims to evaluate financing mechanisms to fund separation of a railroad highway at-grade crossing and further assess the resulting economic benefits (in terms of potential growth in businesses, employment, real estate values, etc.) surrounding the separated crossing. The evaluation could help identify key at-grade crossings that would yield high economic benefits after separation. Separation projects often aim to reduce fatalities resulting from vehicle-to-train collisions at the at-grade crossings. Another motivation is travel time savings, which increase motorists' mobility, especially at crossings that experience heavy vehicular traffic.

The methodology laid out in this research is carried out across twelve railroad-highway at-grade crossings in California. These crossings are located at Francisquito Ave., Willowbrook/Rosa Parks Station, Sassafras St., Palm St., Civic Center Dr., L St., Spring St. (North), J St., E St., H St., Parkmoor West, and Nursery Ave.

Study Methods

This research effort presents key guidance and regulations that generate monetary (and non-monetary) benefits from transportation improvements. The focus is on understanding the benefits and cost implications of railroad at-grade separation projects in California vis-à-vis existing regulations. The work also describes interactions between financing mechanisms (such as value capture) and the extent of investments needed given grade separation projects' costs. Therefore, this research is broadly divided into four sections: (i) exploring existing California laws and legislation on financing an infrastructure project (such as grade separation), (ii) documenting the usual funding mechanisms used for some examples of grade separation projects, (iii) exploring economic models

that are commonly used in assessing railroad projects' impacts, and (iv) presenting a spreadsheet-based tool that practitioners can use to quickly compute benefits-to-cost ratios from separation of a given number of at-grade railroad crossings. The analysis showed that railroad firms funded many grade separation projects completed in the recent past in the United States. Any benefits such as increases in property values and businesses surrounding a separated railroad crossing are often limited to an area of a quarter-mile radius.

Data collection was carried out to gather information on factors and variables that can be used to estimate economic benefits after separating an at-grade railroad crossing. In California, the California Public Utilities Commission (CPUC) provides guidance on prioritizing at-grade crossings for separation. The CPUC policy is based on accident rates and congestion but does not factor in the separation's economic viability. Hence, in this present research, the economic evaluation used three data sets (property values, historical rate of increase in property values, and employment concentration and growth) to estimate revenue generated after grade separation. Data sets were derived from sources that included the Center for Economic Studies and Zillow Research. A basic regression analysis was carried out to determine the correlation between traffic volume passing through an at-grade crossing and the corresponding costs that have been estimated for separation of the grade crossing.

> *With appropriate strategies, railroad at-grade crossing investments could yield returns high enough to pay for their separation.*

Findings

The authors found that the rate of change in employment, property values, and the total number of jobs is relatively high surrounding at-grade crossings in Bay Area counties and in Los Angeles and San Diego. The analysis presented in this research shows that the railroad crossing at Nursery Ave. in Fremont would be ideal for separation. The separation would yield a very high benefits-to-cost

ratio. Benefits would include travel time savings, safety improvements, emissions reductions, and so on. Further, significant property tax revenue could be generated that could be used to fund other railroad at-grade separation projects in California.

Policy/Practice Recommendations

There is a pressing need to understand whether railroad at-grade separation projects could impact neighboring real estate values and whether possibilities exist for leveraging economic benefits to fund grade separation projects through schemes such as value capture techniques. With COVID-19, as current infrastructure spending in California is experiencing a reboot, a benefits-to-cost analysis approach should be explored for such separations. Therefore, including economic factors in the current CPUC guidance would improve the decision-making process for prioritizing an at-grade railroad crossing for separation in California.

About the Principal Investigator

Shailesh Chandra is an associate professor in the Department of Civil Engineering and Construction Engineering Management at California State University, Long Beach. Dr. Chandra specializes in transportation engineering and planning.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/1926

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