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Does California High-Speed Rail Promote Accessibility for Station Cities?: Case Study of Fresno and Merced

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Introduction

High-speed rail (HSR) provides more frequent service, lower cost, easier station access, greater reliability, and increased safety, and therefore has been regarded as a more effective transportation mode as compared to aviation for distances of up to 425 miles/700 km. California is currently building a high-speed rail system (CHSR), which will run from San Francisco to Los Angeles in 3 hours and will extend to Sacramento and San Diego, totally 800 miles with 24 stations. A city with a HSR station is likely to have higher growth rates of population, employment, and land use. HSR would also increase mobility and accessibility and, therefore, would change the physical landscape and economies around station cities. A station city will not only confront the challenge of increases in demand, but also have to reassess accessibility to urban opportunities for a new daily living sphere. There are no previous empirical studies to date on effects of the CHSR on accessibility to jobs and amenities for valley cities and, therefore, is needed.

Study Methods

To fill this research gap, this study examines how the CHSR would affect the accessibility to jobs, schools, and parks by driving, transit, and walking for Fresno and Merced. A new analytic framework is proposed to examine the effect of the CHSR on accessibility and to compare that accessibility between the two station cities using four perspectives: opportunity costs, conditions for equal accessibility, statistical analysis, and contour mapping. This brief covers the results for the case of Fresno; full results are available in the report.

Findings

The results of the 25- and 45-minute accessibility indicate that individuals can easily access most opportunities in the city. As a result, the CHSR does not seem to matter in terms of accessibility in Fresno if driving is the only mode considered in the city. The results also reveal that both transportation modes (transit and walking) are inefficient in Fresno.

The analysis of opportunity costs for transit and walking (the 25-minutes accessibility) implies that residents living west of Highway 99 and in the first ring outside of downtown are the groups who would benefit most from CHSR because they have lower accessibility compared to other residents.

The results of the 45-minutes accessibility (reference) by transit and walking in Fresno show that better job accessibility clusters downtown, in River Park, and in Clovis; better school accessibility clusters around the city core; and better park accessibility clusters in the city outskirts. The results of the optional accessibility by driving, transit, and walking in Merced through the CHSR simply show that the CHSR would benefit those residents who live closer to the Fresno station. The difference between the reference and optional accessibility suggests that the "winners" of the CHSR are those residents living west of Highway 99. This location is particularly suitable for people who are young and focused on work, and therefore the city can implement high-density housing here to promote compact development for economic equality and environmental sustainability.

CHSR will change the mobility and accessibility for station cities. Good transportation connections and high-density housing around the station can help promote economic equality and environmental sustainability.

The new accessibility by transit and walking analysis reveals that there is an increase in accessibility in the first ring outside downtown. Nevertheless, these increases are small. The statistical analysis indicates the groups who would benefit most from the CHSR project. The spatial pattern of these winners are similar to the results of the reference accessibility, implying that the CHSR does not change the pattern of winners in terms of accessibility in Fresno.

Finally, the contour mapping of the reference (the 45-minutes) and new accessibility provide information for identifying the locations with the same level of accessibility in both cities. These maps are useful for comparisons, especially when a resident considers moving from one station city to another.

Policy/Practice Recommendations

The proposed analytic framework can be used not only in Fresno and Merced but also any other station city to evaluate how the CHSR affects accessibility. Th is study adds to the literature on accessibility and contributes to the practice of active transportation and compact development policies for sustainability.

About the Authors

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To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/2358

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