Understanding Modal Access/Egress for California High-Speed Rail Stations

Advancing understandings of modal access/egress to future California High-Speed Rail stations for corridor planning

WHAT IS THE NEED?

The California High-Speed Rail Authority (CHSRA) is responsible for planning, designing, building, and operating North America’s first High-Speed Rail (HSR) system. HSR tends to be best suited for journeys between one and four hours (or between 150 and 500 miles), a medium-distance travel which HSR can compete or outperform commercial aviation, conventional rail, and automobiles, in terms of travel times.

On the one hand, HSR can offer faster door-to-door travel than air for medium-distance range, since HSR stations tend to be located in city centers, generally closer to travelers’ origins and destinations; whereas airports are typically located farther away. On the other hand, HSR can be competitive with car for medium-distance range, considering trains travel much faster than cars, on a dedicated right-of-way, uninhibited by traffic congestion.

Numerous countries in Europe and Asia have developed HSR to connect mega regions. However, the vast majority of HSR deployments tend to be in higher-density regions with more robust public transit service, and lower automobile use. A key unanswered question is how Californians will access and egress HSR in the following aspects:

1. Varied similarities and differences of the HSR system in relation to airports and conventional rail systems;

2. Historic dependence on auto travel in the United States and California;

3. Innovations in urban mobility, including shared transportation modes, for example, Ridesourcing (drivers do not share a destination with their passenger and the driver’s motivation is income), Microtransit (privately operated transit system), and e-Hail (ride sharing smartphone application) and the potential future impact of automated and shared automated vehicles.

A key aspect for researchers to understand is the impact of future mobility trends on the need for dedicated parking at HSR stations, as well as shuttle services to transport travelers to and from parking structures. Notable policy
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**WHAT ARE WE DOING?**

The research will include the following tasks:

1. Coordinating with Caltrans and CHSRA to develop an in-person survey and expert interview protocols.

2. Conducting a literature review of existing modal split at key California rail stations and airports, on top of applicable case studies. The literature review will contain other relevant topics, such as lessons learned and/or best practices from European and Asian HSR access and egress modes.

3. Conducting 10-15 expert interviews with airport and rail operators, public agencies, and/or key stakeholders to obtain additional relevant information on modal split to and from airports, HSR, and long-distance conventional rail systems.

4. Conducting an in-person user survey at three planned HSR stations - San Francisco Bay Area, Central Valley, and Southern California. Possible stations might include San Jose, Fresno, and Burbank.

5. Constructing a discrete choice travel behavior analysis using the in-person survey data collected from the three stations noted above.

6. Working closely with Caltrans and CHSRA to host a half-day stakeholder workshop to review the survey and discrete choice travel behavior analysis results for input, feedback, and refinement.

7. Developing a final report, which summarizes the results of the six steps of the research outlined above, and provides recommendations for Caltrans to incorporate HSR, especially access and egress, in planning scenarios.

**WHAT IS OUR GOAL?**

In the future, Caltrans may consider adopting the HSR system and HSR stations, and evaluate the impact on station areas in corridor planning. The goal of this research is to inform Caltrans and CHSRA of best practices for integrating HSR with existing and future modal uses, including, but not limited to: intercity/commuter/regional rail systems, shared mobility and active transportation modes, and planning for appropriate parking based on modal share for shared modes, as well as leveraging opportunities for shared parking, managed in real-time.

**WHAT IS THE BENEFIT?**

Understandings from this project will assist Caltrans and CHSRA to guide investment and design decisions that support first- and last-mile connections, enhanced connectivity, and seamless accessibility from trip origin to trip destination. In addition, this study should provide useful information regarding the potential reductions in greenhouse gas (GHG) emissions associated with first- and last-mile connectivity to HSR, and to inform station and station area plans and policies designed to meet GHG emission reduction mandates, such as The Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375).

Additionally, this study aligns with Caltrans' new mission to "Provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability." The outcome of this research will also help to advance Caltrans' California Transportation Plan 2040, with the goal of improving public transit, including HSR-fare integration, coordinated transfers, and multi-modal integration.

**WHAT IS THE PROGRESS TO DATE?**

This study was executed on July 6, 2017 and the Project Panel (Panel) "kickoff" meeting occurred on September 11, 2017. The result of this meeting was input from the Panel on the impacts of Ridesourcing/Transportation Network Companies on high-speed rail modal access and station design; future parking needs; and goals for the prospective
user intercept survey encompassing modal choice, and prospective rider preferences on topics such as multimodal payment technologies and traveler information services. Additionally, it was determined that the Panel members and the research team have access to a Novell FILR, a shared file system used by Caltrans, to retrieve or add documents for review and analysis.

The Panel meeting held on October 10, 2017 provided participants the opportunity to give feedback on the HSR station typologies and user profiles to guide the prospective user survey development. Prior to the following Panel meeting held on November 28, 2017, it was determined that additional representatives from the Central Valley would be added to the Panel roster. Besides, the Principal Investigator polled Panel members regarding knowledge gaps for station access planning.

On the November 28, 2017 meeting, the Panel members agreed to focus the station surveys at three locations: Kings/Tulare, Fresno, and San Jose (Diridon) concurring with the CHSRA's recommendations. The Panel proposed a list of potential secondary locations to survey for a follow-on study, given prior discussion of a number of sites of interest. San Francisco International Airport (SFO)/Millbrae, Gilroy, Palmdale, and Los Angeles were identified as potential recommendations for any future survey.

Through the end of calendar year 2017, the researchers conducted a literature review and internet search to amass greater understanding of airport, HSR, and conventional rail access/egress modal preference, lessons learned, and best practices. The literature review highlighted the developments in shared and automated mobility with respect to station access from across the U.S. and abroad. Furthermore, the researchers developed the prospective user intercept survey, which was implemented at the three identified HSR station communities, representatives of different land use and built environments, and collected a minimum of 2,000 user surveys across the three locations. The stated response survey was designed to provide key inputs into the discrete choice travel behavior analysis. The research team also conducted statistical analysis of the survey results to uncover trends and patterns associated with the existing travel behavior to airports and train stations, and planned future travel behavior based on respondent feedback and the expected impacts of shared modes and future trends. The researchers utilized descriptive statistics, cross-tab analysis, and regression analyses, as appropriate, to analyze the survey results.

**Continuing work:** During January, February, and March of 2018, the research team continued the literature review. The literature review identified what is known, as well as gaps in the literature that may be discussed during the expert interviews. The research team developed two expert interview protocols (one for general HSR station access knowledge, and another for experts with specific knowledge of the three selected California HSR stations). The researcher team filed for and received Institutional Review Board’s (IRB) approval to commence expert interviews, and developed a potential list of interviewees. Moreover, the researchers conducted a few expert interviews and have scheduled additional interviews for May and June 2018. Additionally, the research team completed multiple teleconferences with Mr. Jeff Morales, former CEO of CHSRA, to obtain his feedback on recruitment methods and questions for the expert interviews and the intercept survey, since the three study locations have been selected. The Panel will meet in May 2018 to discuss potential survey methodologies and decide on appropriate methods to be implemented at each site, including the most effective way for the research team to obtain survey or focus group data from the sites, as appropriate.

**IMAGES**