

The Japanese Shinkansen

Case Study for California High Speed Rail Implentation

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Introduction

California has been in the mist of a tranist evolution. So much so that there has been a move to provide rapid rail transit. In the passed couple of decades, the California High Speed Rail Authority has aimed to provide a rail link between Los Angeles and San Francisco however no such model exists in the state and the development of the CA HSR has been delayed numerous times. However, one global model may be used as a reference to ideal high speed rail development for California.

Goal

The purpose of this study is to analyze Japan's rail development and innovations to form recommendations for development in California.

Methods

- **Study Area:** Japan's Shinkasen Network - Tokyo to Osaka Route (309 miles)
- **Comparison:** California's LA/OC-SF Routes (~383 miles)

Data Type (Mixed Use)

- **Quantitative:** Ridership Statistics, Travel times, Fares, and Economic Impacts
- **Qualitative:** Historical Documentation, Public Perceptions, Cultural Analysis, and Policy
- **No Fieldwork:** Secondary Data and Study



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Japanese Shinkansen Opening Ceremony (1964)

Discussion

Comparative Framing / Context

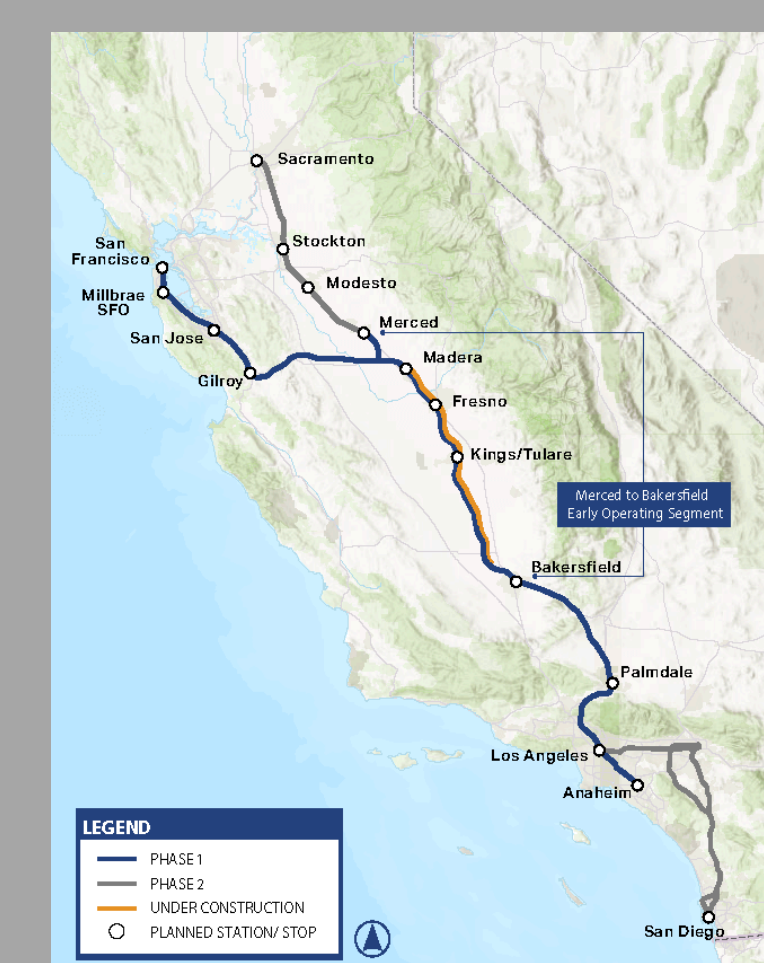
- CA VS Japan: Similar Routes
- Travel Time Analysis: CA HSR has the **protentional to cut travel times** for the different modes of travel.
- Projected Travel time from LA/OC-SF to under or **about 3 hours**.
- The Shinkansen **utilizes a seismic design** that allows early detection, relevant for CA earthquake conditions.

History of The Shinkansen

- **Launched operations in 1964** in conjunction with the Japan Olympics and has since been operated by the **JR Group (Private Sector)**
- Has seen **over 6.4 Billion riders** and counting since operations began.
- In **over 50 years** of service the Shinkansen **has not seen a single fatality** and continues to **pride itself for service and safety standards**.
- Trains in service (E5 and H5 Models) can reach a **top speed of 198 mph**, but will slow down in certain communities and corridors.
- **9 major active lines** with **3 planned for expansion**.

Urban and Economic Impacts

- System integration in Japanese cities **stimulated TOD and promoted local business growth**
- Dense urban areas that accepted Shinkansen operations saw a **reduction in land/housing costs**.
- Tourism activity and local commerce boosted with the expanded range that came the Shinkansen network.
- Created **extended transit connections** to both ends of the country



Proposed
CA HSR
Route
Phase 1
(2024)



CALIFORNIA
High-Speed Rail Authority

Fresno Station
Rendering-CA HSR

Travel Times (LA/OC-SF)			Travel Times (Tokyo - Osaka)		
Mode	Mile	Time	Mode	Mile	Time
Rail (Multiple Services)	383	~12hr 16mins	Rail (Tokaido Shinkansen)	309.4	~2hr 16mins
Bus	383	~6hr 55mins	Bus	309.4	~7hr 20mins
Drive	383	~5hr 43mins	Drive	309.4	~6hr 20mins
Air	383	~1hr 30mins	Air	309.4	~1hr 35mins

Travel Time
Analysis CA
vs Japan



Current Shinkansen Lines as of March 2025

Recommendations

Recommendations for the CA HSR Authority to Consider

- To combat project debt the CA HSRA should consider **leveraging Public-Private Partnerships** following the example of the Shinkansen as Japan National Railways shifted to private using this method and have since expanded the system.
- In order to maintain an equitable system CA HSRA must take measures to **ensure fares are equitable** and resemble the same tiered fare structure Japan utilizes.
- Given the current perception of the project the CA HSRA needs to build public trust through transparency and results.
- **Adopt Earthquake resilient technology and battery car system.**
- **Integration with member agencies** (Metro, BART, Etc.) in the LA-SF Corridor should be prioritized to utilize local and regional transits existing assets for maximum connection.

Conclusion

- The Japanese Shinkansen is the premier global model of safe, efficient and rapid transit in the world with an extensive history of development and expansion.
- The State of California and CA HSRA has the potential to replicate such a system through the means of safety, strong policy, and TOD practices similar to that of Japan and their denser areas.
- Ensuring financial resilience and securing public support are critical to development of the system.
- Following the recommendations provided and learning from the lessons learned in Japan CA HSRA can redefine transit in CA.