



High-Speed Rail Around the World

Countries worldwide have demonstrated how high-speed rail can transform communities. While the benefits are similar, the systems all differ greatly in how they were produced based on geography, political systems, engineering requirements, and environmental regulations.

International Success

Successful high-speed rail systems are seen around the world. The following 14 countries have at least one high-speed rail system operating at a top speed of 300 km/h (186 mph) or more.

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|-------------------|------------------------|
| Belgium – 186 mph | Netherlands – 186 mph |
| China – 217 mph | Saudi Arabia – 186 mph |
| France – 198 mph | South Korea – 189 mph |
| Germany – 186 mph | Spain – 186 mph |
| Italy – 186 mph | Taiwan – 186 mph |
| Japan – 198 mph | Turkey – 186 mph |
| Morocco – 198 mph | UK – 186 mph |



Chūō Shinkansen Rail, Japan



Beijing-Shanghai High-Speed Railway segment between Shanghai and Nanjing, built on the soft soils of the Yangtze Delta, 2015. creativecommons.org/licenses/by-sa/4.0/



Construction of the Sants-Sagrera tunnel connecting Barcelona-Sants to the future Barcelona-Sagrera station for Spain's AVE network. 2012. creativecommons.org/licenses/by-sa/4.0/



Construction site of the Chuo Shinkansen Jinryo Emergency Exit in Kasugai City, Aichi Prefecture, Japan, 2019. creativecommons.org/licenses/by-sa/4.0/



HS2 excavation work at St James's Church burial ground, London, 2018. creativecommons.org/licenses/by-sa/4.0/

California's System in Context

The following table compares the overall length, planning and build time, cost, and barriers of California high-speed rail with other high-speed rail systems around the world.

Project	Route Length	Planning + Build Time	Cost per Mile (2025 Prices)	Funding Type	Barriers
 California High-Speed Rail (Phase 1)	~500 mi	22+ years	~\$212M	Federal funding accounts for less than 10 percent of the program's total budget.	Complex terrain, seismic zones, strict environmental reviews (CEQA and NEPA)
 HS2 (UK, Phase 1)	140 mi	24+ years (est. 2033)	~\$613M+	100 percent funded by the national government as a long term investment and government backed borrowing.	Tunnels under London/Birmingham, ecological opposition
 Chūō Shinkansen (Japan)	178 mi	20+ years (ongoing)	~\$562M+	50 percent funded by national government. The rest funded and financed by the railroad with local support.	90% tunnels
 Taiwan High Speed Rail	214 mi	17 years	~\$134M	Total government related ownership is about 63 percent, with the remainder held by private investors and institutions.	Narrow corridor, seismic/typhoon resilience
 Madrid-Barcelona AVE (Spain)	385 mi	16 years	~\$75M	Funded 35 percent by the national government, 25 percent by the European Union, and 40 percent financed by the European Investment Bank and use of green bonds.	Mountainous terrain, archaeological protections
 Beijing-Shanghai High-Speed Railway (China)	819 mi	7 years	~\$61M	Highly centralized funding model has leveraged state-backed financing and bond issuance while incurring hundreds of billions of dollars in debt.	Heavy use of viaducts

Key Takeaways

Other countries benefit from dedicated funding streams and centralized planning, which have enabled rapid network expansion, reduced delivery risk, and operational profitability.

Like the United Kingdom and Japan, California faces long planning timelines due to democratic processes, public consultation, and environmental protections. Similar to Taiwan and Japan, California must navigate seismic zones, mountains, and sensitive ecosystems, requiring extensive viaducts and tunnels.

Looking Ahead

By adopting global best practices while addressing uniquely American challenges, California's high-speed rail will not only reshape mobility within the state but also set a precedent for future high-speed rail projects across the United States.

California's complexity makes implementing a high-speed rail system more complicated compared to other countries, but it also positions the state as a leader in sustainable, future-focused infrastructure.



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