

# DRAFT

## ALTERNATIVES EVALUATION CRITERIA

The California High-Speed Rail Authority (Authority) and the Federal Railroad Administration (FRA) have developed a range of potential High-Speed Train (HST) Alternative alignments and station location options through review of the statewide California HST Program Environmental Impact Report/Environmental Impact Statement (Authority and FRA, 2005), previous studies, and scoping comments as well as an engineering evaluation of alignment alternatives and station location options within the most promising potential routes through the Bay Area to Central Valley corridor. This range of HST alignment alternatives and station location options are evaluated according to the following factors and criteria to identify those alternatives that are practicable and best meet the purpose and need of the proposed action.

The evaluation of the potential HST alignment alternatives and station location options within viable corridors considers the following factors that differentiate the alternatives.

- **Construction:** Substantial engineering and construction complexity as well as excessive initial and/or recurring costs will be considered criteria for project impracticability because they present logistical constraints.
- **Environment:** A high potential for considerable impacts to natural resources including waters, streams, floodplains, wetlands, and habitat of threatened or endangered species will be considered a criterion for failing to meet project objectives.
- **Land Use Compatibility:** Substantial incompatibility with current or planned local land use as defined in local plans will be considered a criterion for failing to meet project objectives.
- **Transit Oriented Development (TOD):** The potential for and local support of TOD near HST stations will be considered an evaluation criterion to best meet ridership and land use objectives.
- **Right-of-Way:** A lack of available right-of-way or extensive right-of-way needs that would result in excessively high acquisition costs for a corridor, technology, alignment, or station will be considered criteria for project impracticability.
- **Connectivity/Accessibility:** Limited connectivity with other transportation modes (aviation, highway and/or transit systems) that would impair the service quality and could reduce ridership of the HST system will be considered a criterion for failing to satisfy the project purpose.
- **Ridership/Revenue:** Longer trip times and/or suboptimal operating characteristics that would result in low ridership and revenue will be considered criteria for failing to satisfy the project purpose.

The relationship between purpose, need, and objectives with criteria to be applied in the evaluation of alignment alternatives and station location options is shown in Table 1. The evaluation criteria focus on cost and travel time as primary indicators of engineering viability and ridership potential. Estimated capital costs and travel times for alignment alternatives and station location options will be considered. Other engineering criteria such as operational, construction, and right-of-way issues will be evaluated qualitatively. These evaluation criteria are consistent with the criteria applied in the Authority's previous environmental studies. The criteria related to HST operations are based on accepted engineering practices, the criteria and proven standards of other railway and HST systems, and the comments of HST manufacturers.

**Table 1  
High-Speed Rail Alignment and Station Evaluation Objectives and Criteria<sup>1</sup>**

Objective	Criteria
Maximize ridership/revenue potential	Travel time Population/employment catchment area Ridership and revenue forecasts
Maximize connectivity and accessibility	Intermodal connections
Minimize operating and capital costs	Length Operational issues Construction issues Capital cost Right-of-way issues/cost
Maximize compatibility with existing and planned development	Land use compatibility and conflicts Visual quality impacts Transit oriented development potential
Minimize impacts on natural resources	Water resources impacts Floodplain impacts Wetland impacts Threatened and endangered species impacts
Minimize impacts on social and economic resources	Environmental justice impacts (demographics) Farmland impacts
Minimize impacts on cultural and parks/wildlife refuge resources	Cultural resources impacts Parks and recreation impacts Wildlife refuge impacts
Maximize avoidance of areas with geologic and soils constraints	Soils/slope constraints Seismic constraints
Maximize avoidance of areas with potential hazardous materials	Hazardous materials/waste constraints

These objectives and criteria encompass the breadth of the purpose and need related to the proposed action and the potentially affected environment, reflect the objectives of National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), and are consistent with the objective of the Clean Water Act Section 404(b)(1) to provide consideration of alternatives to minimize impacts on waters of the U.S. The environmental constraints and impacts criteria focus on environmental issues that can affect the location or selection of alignments and stations.

To identify potential impacts, a number of commonly available Geographic Information System (GIS) digital data sources will be used along with published information from federal, state, regional, and local

<sup>1</sup> “Constructability” issues refer to substantial engineering and construction complexity as well as excessive initial and/or recurring costs that present logistical constraints. “Connectivity” relates to how well a station site links with other modes of transportation (transit systems, aviation, and/or highways) and “accessibility” relates to how well the station site is located for serving the surrounding population. “Compatibility” relates to how well a station site fits within current or planned local land uses as defined in local plans.

planning documents and reports. Alignment and station rights-of-way needs as dictated by engineering requirements will be used to identify, in general terms, the study area for sensitive environmental resources within each alignment segment.

The Bay Area to Central Valley HST alignment alternatives are generally configured along or adjacent to existing rail transportation facilities and highways instead of creating new transportation corridors. While a wide range of options have been considered, the Authority's initial conceptual approach, previous corridor evaluations, and the evaluation conducted as part of the previous Statewide Program EIR/EIS have consistently shown a potential for fewer substantial environmental impacts along existing highway and rail facilities than on new alignments through both developed and undeveloped areas. Although increasing the overall width of existing facilities could affect and disturb a similar amount of land as new corridors, creating new facilities would potentially introduce impacts from incompatibility and severance issues in both urban communities and rural settings (farmlands, open spaces).

The station location options have been generally identified and represent the most likely sites based on current knowledge, consistent with the objective to serve the state's major population centers. The Authority considered a critical tradeoff between accessibility of the system to potential passengers and the resulting HST travel times (i.e., more closely spaced stations would lengthen travel times for local service as well as express services). Station locations have been generally spaced approximately 50 mi (80 km) apart in rural areas and 15 mi (24 km) apart in the metropolitan areas. Additional or more closely spaced stations would negatively affect travel times and the ability to operate both express and local services.

The Authority and FRA intend to focus future project development and analysis on alignments and station options selected in this program environmental process. Site-specific location and design alternatives of the preferred alignment and station options, including avoidance and minimization design options, will be fully investigated and considered during project level environmental review.