

California High-Speed Train Project



TECHNICAL MEMORANDUM

Design Terms and Acronyms TM 0.0a

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CALIFORNIA HIGH SPEED RAIL AUTHORITY

ABSTRACT

This technical memorandum establishes an initial summary of common, relevant terms and acronyms that are anticipated to be used in the preparation of design documents for the California High-Speed Train Project (CHSTP). It is intended to promote the consistent use of project nomenclature in the development of CHSTP design documents. The terms and acronyms listed in this technical memorandum have been compiled from the CHSTP program level EIR/S, Caltrans documents, and CHSTP technical memos prepared to date.

Periodic updates to this document are anticipated and a current version will be maintained for use by the program management team.

1.0 INTRODUCTION

1.1 PURPOSE OF THE TECHNICAL MEMORANDUM

This technical memorandum establishes a summary of relevant terms and acronyms that are anticipated to be used in the preparation of design criteria, standard drawings and specifications, and other technical memoranda and design documents prepared for the California High-Speed Train Project (CHSTP). It is intended to promote the consistent use of project nomenclature in the development of CHSTP documents. The terms listed in this technical memorandum have been compiled from the CHSTP program level EIR/S, CALTRANS documents, and project technical memos.

Periodic updates to this document are anticipated and a current version will be maintained for use by the project team.

2.0 DEFINITION OF TECHNICAL TOPIC

As development of the CHSTP advances, new terms and acronyms may be identified by different technical areas where there are several or differing meanings for the same term or acronym. Since design teams are working concurrently on multiple segments of the CHSTP, consistent use of terms and acronyms will promote quality for project deliverables, improve coordination among the design teams, and assist the review of project deliverables.

3.0 ASSESSMENT/ANALYSIS

Not used

4.0 SUMMARY AND RECOMMENDATIONS

It is recommended that consistent nomenclature be issued for use by the CHSTP team in order to promote consistency in the development and review of design documents. It is also recommended that the Design Terms and Acronyms be maintained, updated as new terms and acronyms are identified, and made available for use by the project team.

A glossary comprising a list of design terms, definitions, and acronyms is presented in Section 6.0.

5.0 SOURCE INFORMATION AND REFERENCES

Terms and Acronyms listed herein are based on the CHSTP Program Level EIR/EIS, Caltrans procedures and design standards, and those used in CHSTP documents developed to date. Specific source documents included:

1. Caltrans Project Development Procedures Manual, Chapter 1, Section 3 – December 15, 2007
2. The Manual for Railway Engineering of the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual
3. California High-Speed Rail Program – Statewide Program Environmental Reports EIR/EIS
4. European Technical Specification for Interoperability Relating to Infrastructure Subsystem of the Trans-European High-Speed Rail System (May 2002)

Additional definitions and acronyms information were or may be obtained from other sources, including the following.

www.apta.com/research/stats/rail/definitions.cfm

www.bpa.gov/Corporate/KCC/defn/defnsmal/fgh.htm

www.bpa.gov/Corporate/KCC/defn/defnsmal/no.htm

www.ca.blm.gov/GoldenQueen/pub-glos.htm

http://ceq.eh.doe.gov/nepa/regs/ceq/toc_ceq.htm

www.dot.ca.gov/ser/glossary.htm

www.faa.gov/arp/app600/5054a/5054a1.htm

www.geology.er.usgs.gov/paleo/glossary.shtml

www.octa.net/center/intro/def.asp

www.wrh.noaa.gov/Phoenix/general/glossary/

6.0 DESIGN CRITERIA MANUAL

6.1 DESIGN TERMS AND ACRONYMS

The Program Management Consultant (PMC) has issued the Design Terms and Acronyms technical memorandum for use in the preparation of technical documents supporting the California High-Speed Rail Project. Document authors are responsible for preparing design documents in accordance with the information included in this document. The PMC will maintain the most current version of Design Terms and Acronyms on the CHSTP Project Solve site.

6.1.1 Design Terms

The terms listed in this technical memorandum are the combination of terms used by Caltrans, the California High-Speed Train (CHST) program management team and terminology included in the CHST program level EIR/S. The glossary is a living document and requires regular up-dates.

A

Abatement: Reduction; often used to describe mitigation of noise.

A horizon: The A horizon is the soil zone immediately below surface, from which soluble material and fine-grained particles have been moved downward by water seeping into soil. Varying amounts of organic matter give the A horizon a dark color.

Accessibility: The ease with which a site or facility may be reached by passengers and others necessary to the facility's intended function. Also, the extent to which a facility is usable by persons with disabilities, including wheelchair users.

Alignment: The horizontal and vertical route of a transportation corridor or path.

Americans with Disabilities Act (ADA): Federal regulation establishing legal requirements for accessibility.

Amplitude: The magnitude of a periodic wave; also describes the strength or intensity of a signal that travels in wave form, such as a radio signal.

Approximate Location: Is defined in Government Code, Section 4216 as the "approximate location of subsurface installations" being a strip of land not greater than 600 mm (24 in) on either side of the exterior surface of the subsurface installation. "Approximate Location" does not define depth.

Arc, Arcing: Electrical discharge is said to arc when it jumps across the space between two contacts.

At Grade: At ground surface level; used to describe roadways, river crossings, and track alignments.

Authority: California High-Speed Rail Authority

B

Ballasted Track: Rail lines installed over a specific type of crushed rock that is graded in such a manner that can support heavy loads of the rolling stock.

Ballast-less Track: Rail lines installed over concrete slabs for support.

Barrier: A device intended to contain or redirect an errant vehicle by providing a physical limitation through which a vehicle would not typically pass.

Barrier Offset Distance: The lateral distance from the centerline of the track to the face of the barrier, trackside, or other roadside feature.

Baseline: Foundation or basis to use for comparison purposes.

BTU: British Thermal Unit, equal to the amount of heat required to raise 1 pound of water 1 degree Fahrenheit at 1 atmosphere of pressure.

Buttressing: An action or structure that provides support or stability.

C

California Environmental Quality Act (CEQA): “Legislation enacted in 1970 to protect the quality of the environment for the people of California by requiring public agencies and decision-makers to document and consider the environmental consequences of their actions. CEQA is the state equivalent of the National Environmental Policy Act (NEPA).”

Capital Cost: The total cost of acquiring an asset or constructing a project.

Capitol Corridor: An existing intercity rail alignment approximating the I-80 corridor; carries freight traffic, long distance Amtrak service, and intrastate “Capitol” service.

Catenary Wire: A suspended (overhead) wire system that supplies power from a central power source to an electric vehicle such as a train.

CCS 83: California Coordinate System of 1983 – The system of plane coordinates which has been established by the National Geodetic Survey for defining or stating the positions or locations of points on the surface of the earth within the State of California and which is based on the North American Datum of 1983.

Center Island Platform: Boarding platform that services tracks on each side of the platform.

CEQA: See California Environmental Quality Act.

Check Rail: The guiding rail located between the two running rails, which functions to maintain a derailed wheel in the track alignment. Check rails are installed at 36 cm from the rail and can be placed inside one or both of the running rails.

Class I Trail: A trail within a separate right-of-way designated for exclusive use by bicycles and pedestrians, with cross traffic by motorists minimized.

- Class II Trail:** A trail within a restricted right-of-way designated for semi-exclusive use by bicycles, with traffic by motor vehicles or pedestrians at crossings.
- Class III Trail:** A trail located within a right-of-way designated by signs or permanent markings and shared with pedestrians and motorists.
- Cofferdam:** Watertight enclosure from which water is pumped to expose the bottom of a body of water and permit construction.
- Concourse** Area for accommodating patrons at a high-speed rail station.
- Controlled Area:** Area on the platform side of the fare gates where a valid CHST ticket is required.
- Connectivity:** Describes the degree of “connectedness” of a transportation system such as a transit network, and the ease with which passengers can move from one point to another within the network, or points outside the network.
- Conservation Easement:** An easement created by transferring development rights over a property from a farmer to another entity such as the local jurisdiction or an agricultural protection organization; the land remains in private ownership and may be farmed, but may not be developed with urban uses.
- Construction:** Any activity that directly alters the environment, excluding surveying or mapping.
- Containment Curb:** A low concrete wall along the track that is designed to guide the train wheels back onto its rail if they leave the line.
- Contours:** A variable curve that connects points with the same elevation value used to depict surface elevations on a contour map.
- Contra-flow:** Refers to movement against the general direction of flow.
- Control:** An established point on the earth’s surface with a known coordinate in the X, Y, Z and used for reference and mapping of field surveys.
- Controlled Access:** Full or partial restriction of the access of owners or occupants of abutting land to or from a highway and/or railway.
- Corridor:** A geographic belt or band that follows the general route of a transportation facility (highway, railroad, etc).
- Cut and Cover:** Construction technique in which a trench is excavated, infrastructure is installed, and the trench is closed.
- Cut and Fill:** Construction technique involving excavation or grading followed by placement and compaction of fill material.
- Cut Slope:** A slope that is shaped by excavation or grading. See also **Fill Slope**.

D

Datum: A reference from which measurements are made for establishing horizontal and vertical control.

Decibel (dB): A logarithmic measurement of noise intensity.

Dedicated Corridor: Segment along the CHSTP alignment where high-speed trains operate in a right-of-way that is exclusive of other passenger or freight railroads.

Dedicated Track: Segment along the CHSTP alignment where high-speed trains operate on tracks exclusive of other passenger and freight railroads.

Degree of Curve: The central angle turned by a curve in 100 feet. It is closely approximated by $D_c = 5730 \text{ feet} / \text{Radius}$. Railroad curves are defined by the Chord Definition, in which the length is described by a 100 foot long tangent between two points on the arc of the curve.

Design Guidelines: Provide a preferred but not necessarily required direction for a particular design feature. Guidelines are designated with the word SHOULD.

Design Standard Classifications: The design standards presented in this document will normally be described using three terms:

Desirable- The standard which shall be equaled or exceeded where there are no constraints on the alignment. Desirable horizontal and vertical standards may be used in any combination.

Minimum/Maximum - The standard which shall be equaled or exceeded where constraints on alignment make use of Desirable standards impractical or significantly more expensive than if Minimum standards are used. Where Desirable standards are not obtainable, they shall be approached as nearly as practical. Certain combinations of Minimum horizontal and vertical standards shall not be used, or may be used as an Exceptional condition.

Exceptional - The standard which shall be achieved at the absolute minimum and only where Minimum standards are either unobtainable. Where Minimum standards are not obtainable, they shall be approached as nearly as practical. Certain combinations of exceptional horizontal and vertical standards shall not be used. Approved design variances are required for the use of Exceptional standards.

Design Standards: Indicate a required direction for a particular design feature. Language relating to standards will include the word SHALL. The designer SHALL obtain written approval for any deviation from the standard.

Design Variance: Approved waiver from a CHSTP minimum standard.

Design Variance Request: The formatted information included in a request for approval.

Dewatering: The process of removing water from an area or substance, such as fill material.

Digital Terrain Model: A three-dimensional model of digital surfaces of topographic features.

Dry Utility: A wire, cable, pipeline, and support facility used to convey electricity, natural gas, gaseous chemicals, telecommunications, cable television, or other non-liquid products.

E

Easement: An interest in land owned by another individual or organization that entitles its holder to a specific limited use.

Electromagnetic Field (EMF): The force field that extends outward from any moving electrical current, consisting of both a magnetic field and an electric field.

Electromagnetic Interference: An electrical emission or disturbance that causes degradation in performance or results in malfunctions of electrical or electronic equipment, devices, or systems.

Eminent Domain: A jurisdiction or agency's legal right to take private property for public use in exchange for fair compensation.

Environmental Impact Report (EIR): A detailed informational document that analyzes a project's potential significant effects and identifies mitigation measures and reasonable alternatives to avoid the significant effects. This document is part of the CEQA environmental review process.

Environmental Impact Statement (EIS): A detailed informational document that analyzes a project's potential significant effects and identifies mitigation measures and reasonable alternatives to avoid the significant effects. This document is part of the NEPA environmental review process.

Equilibrium Superelevation: The calculated superelevation that exactly balances the lateral force of the train on the curve at the defined speed. Normally called Balancing Cant or Equilibrium Cant in European publications.

Erosion: Process by which earth materials are worn down by the action of flowing water, ice, or wind.

F

Fare Gate Physical barrier which requires a valid CHST ticket to pass.

Fault: A fracture in the earth's lithosphere (brittle rocky shell) along which movement has occurred.

Feasible: Capable of being implemented.

Feeder route: Branch routes that feed into main (arterial) routes.

Fiber Optic Cable System: A data transmission technology that relies on light rather than electricity, conveying data through a cable consisting of a central glass core surrounded by layers of plastic.

Fill Slope: A slope shaped by the placement and compaction of loose "fill" materials, which may be reused from elsewhere on the construction site or imported.

- Flyover:** A bridge that carries one road or rail alignment aerially over another.
- Footprint:** Area of the ground surface covered by a facility or affected by construction activities.
- Free Area** Area within the station which are open to the general public.
- Frequency:** The number of times a field, such as an electromagnetic field, changes direction in space each second. Also, the number of trains, flights, or other transportation service occurring in a given time period.

G

- G Force:** A force whose magnitude is equal to the gravitational force acting on a body at sea level, expressed as 1.0g.
- Gauss:** Unit of measure describing the strength of a magnetic field. Near the surface of the earth, the earth's magnetic field measures approximately 0.5 gauss (0.1 Tesla). See also **Tesla**.
- General Plan:** A planning document, usually at the city or county level, that encapsulates policies for land use and development over a specified period of time. A general plan may be supplemented by specific plans that address land use and development policies for specific portions of a planning jurisdiction, such as historic districts or areas slated for redevelopment.
- Geographic Information System (GIS):** An information management system designed to store and analyze data referenced by spatial or geographic coordinates.
- Giga:** Prefix meaning one billion.
- Grade Crossing:** The intersection of a railroad and a highway at the same elevation (grade); an intersection of two or more highways; an intersection of two railroads.
- Grade, Gradient:** The slope of changes in elevation, defined in percentage, as feet of rise in 100 feet. Sometimes defined in European publication as millimeters of rise in one meter, in which case it is normally written as ‰.
- Grade-Separated:** At different elevations; on separate levels.
- Grid:** A system of interconnected power generators and power transmission lines that is managed to meet the requirements of energy users connected to the grid at various points.
- Groundwater:** Water contained and transmitted through open spaces within rock and sediment below the ground surface.
- Guard Rail:** A short guidance rail in the track. When a wheel passes over a switch frog in a non-guided section, the opposite wheel is guided by the guard rail, which acts on the back of the wheel flange.

Guideway: A track or riding surface that supports and physically guides transit vehicles specially designed to travel exclusively on it.

H

Headway: The time between buses, trains, or other transit vehicles at a given point. For example, a 15-minute headway means that one bus arrives every 15 minutes.

Hertz: A unit of measure describing frequency, equal to cycles (number of reversals) per second.

High Risk Utility: Utility facilities conducting or carrying specific materials identified in Section 2 of the Caltrans Project Development Procedures Manual, Appendix LL – Utilities. Other utilities that could disrupt the operation of CHSTP.

High-Speed Train: A railroad system utilizing steel-wheel-on-steel-rail technology with a regular operating speed greater than 125 mph (200 kph). High-speed railroad systems that are upgraded from an existing conventional railroad will may have lower operating speeds than new high-speed rail alignments.

I

Impact: A change the condition or function or an environmental resource or environmental value as a result of human activity.

In-Situ: In the original or natural position.

Intermediate Station: A train station that will be between two other previously planned or currently operating stations.

Intermodal: Describes transportation that involves more than one means (walk, bike, auto, transit, taxi, train, bus, air, etc.) during a single journey.

Interoperability: In the context of the European High-Speed Lines, is the aptitude of the European High-Speed lines railway network to allow high-speed trains to run safely and continuously with the specified performances. It is based on the whole of the legal, technical, and operational conditions that must be fulfilled to satisfy to the necessary requirements. For example, a German high-speed train satisfying to the requirements of the Rolling Stock Technical Specification for Interoperability (TSI) is able to run safely and continuously on a French high-speed line of which the infrastructure is satisfying to the different requirements of the different infrastructure Technical Specifications for Interoperability.

Intrusion: An errant vehicle's exit out of its right-of-way and entry into the operating space of another transportation system's right-of-way.

Intrusion Detection: An electronic system that alarms the intrusion event to the Central Control and to the Train Operators. A dedicated detection system may be used for non-vehicular intrusion such as for people or animals.

Inversion: A region where atmospheric temperature increases rather than decreasing with height, suppressing atmospheric mixing and tending to trap pollutants near the ground surface, where their effects on health and materials are greater.

J**K**

Kilo: Prefix meaning one thousand.

Kiss-and-Ride Facility for private vehicles to drop-off or pick-up CHST patrons.

L

Landslide: Movement of earth or rock materials downslope under the influence of gravity.

Leg: A measure of the average noise level during a specified period of time.

Leg(h), dBA: Equivalent or average noise level for the noisiest hour, expressed in A-weighted decibels.

Level of Service (LOS): A rating using qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers.

Liquefaction: A type of ground failure in which soils or sediments lose their internal cohesion, cease to behave as a solid, and flow like a liquid.

Logarithmic Scale: A measurement in which the ratio of successive intervals is not equal to 1 (which is typical for linear scales) but is some common factor larger than the previous interval (a typical ratio is 10, so that the marks on the scale read: 1, 10, 100, 1000, 10000, etc. Logarithmic scales are useful for graphing values that have a very large range.

Longitudinal: A facility located parallel to and within highway or railway right-of-way.

Low Risk Utility: Per Section 2 of the Caltrans Project Development Procedures Manual, Appendix LL - Utilities, all other utilities that are not identified as High Risk Facilities.

M

Magnetic Levitation (Maglev): A high-speed train technology that relies on attractive or repulsive magnetic forces to lift and propel the train along a guideway.

Mainline: A principal highway or railroad, exclusive of connectors, ramps, spurs, etc.

Main Line: The tracks allocated to the high-speed train traffic at normal commercial speed and not normally allowed for stops, shunting, or garage.

Maintenance: Regular activities that are required to support safe operations and the intended use of the HST such as inspection and correction of any deviation from the original design along the track.

Maintenance Siding: A dead end track dedicated to park maintenance trains and connected to a passing track, never to the main line.

Mean High-Water Mark: The elevation reached by the water surface at the mean (average) high water level (average high tide elevation or average flood elevation), often indicated by physical characteristics such as erosion, lines of vegetation, or changes in type of vegetation.

Mitigation: Action or measure undertaken, minimize, reduce, eliminate, or rectify the adverse impacts of a project, practice, action, or activity.

Modal: A transportation system defined on the basis of specific rights-of-way, technologies, and operational features.

Monitoring: The collection of information to determine the effects of resource management and to identify changing resource conditions or needs.

N

NAD 83: North American Datum of 1983 – The horizontal control datum for the United States based on the Geodetic Reference System 1980 and with a geocentric origin.

National Environmental Policy Act (NEPA): Federal legislation requiring federal agencies to consider the environmental impacts of major federal projects or decisions, to share information with the public, to identify and assess reasonable alternatives, and to coordinate efforts with other planning and environmental reviews taking place.”

NAVD 88: North American Vertical Datum of 1988 – The vertical control datum established for surveying elevations in the United States based on the General Adjustment of the North American Datum of 1988.

Non-Electrified Steel-Wheel-on-Steel-Rail Train: Conventional intercity diesel locomotive train equipment (e.g., Amtrak California Corridor trains).

O

Ordinary High-Water Mark: The line on the shore of a body of water established by the fluctuation of water.

Outboard Platforms: Side boarding platforms located directly opposite one another, each serving one track.

Owner: The owner of the underground or above ground utility or its authorized agent.

Ownership: Any interest in land, real estate, or the improvements on it.

P

Park and Ride Facility where CHST patrons can park and leave personal vehicles prior to transfer to CHST.

Pantograph Power Pickup: A device for collecting current from an overhead wire, consisting of a hinged vertical arm operated by springs or compressed air and a wide, horizontal contact surface that slides along the wire.

Parcel: A distinct, continuous portion or tract of land.

Passing Track: Track connected to the main line on both ends and allowing to stop a train for commercial reasons (in station for example), for operating purposes (in order to deal with delayed train or train with technical incident but also to allow train overtaking).

Photogrammetry: The art, science, and technology of obtaining reliable information about physical objects and the environment through process of recording, measuring, and interpreting images and patterns of electromagnetic radiant energy and other phenomena.

Pick-Up and Drop-Off Facility for private and semi-private vehicles to drop-off or pick-up CHST patrons, could include facilities for taxis, private shuttles, rental cars.

Plat: A plan or map of a plot of ground.

Platform Station area adjacent to tracks where trains stop to allow passengers to board and alight.

Pothole / Test Pit: An excavation to expose an underground facility.

Preferred Alternative: The alternative identified as preferred by the lead agencies.

Probe: Rods physically inserted in the ground to mechanically or electronically locate an underground facility without exposing the facility.

Program-Level: Refers to a CEQA or NEPA environmental review that covers the broad spectrum of a large, complex, regionally extensive effort comprised of a number of smaller, regionally focused projects or phases.

Project-Level: Refers to more detailed site-specific environmental analysis focusing on a single project that is part of a larger program.

Public Transportation: Includes bus, trolley bus, streetcar or trolley car, subway or elevated, railroad, ferryboat, and taxicab service.

Q

Quality Level: A level of accuracy scale used for identifying the location of underground and above ground utility facility information needed to develop capital projects, and for acquiring and managing that level of information during the project development process.

Quantm System: A route selection and optimization tool that carries out automated three dimensional alignment searches and corridor screening based on client- or user-specified geometry, constraints, and cost parameters.

Queuing Area Station area where passengers can wait in a line without disrupting other passenger flow.

R

Radio Frequency: The frequency range of the electromagnetic spectrum that is used for radio communication.

Relocations: The removal, rearrangement, reinstallation, or adjustment of a utility facility required by a transportation improvement project.

Richter Scale: A logarithmic scale measuring the severity of earthquakes, based on the magnitude of ground motion.

Ridership: The number of people who ride a transportation system.

Right-of-Way: A legal right of passage over a defined area of real property used for highway, railway, public utility services, or other purposes. In transit usage, refers to the corridor along a roadway or track alignment that is controlled by a transit or transportation agency/authority and is usually the access control line.

Riparian: Relating to, living, or located on the bank of a natural watercourse, lake, or tidewater.

Riprap: Armoring consisting of randomly placed rock or concrete, used to strengthen an embankment or protect it from erosion.

Rolling Stock: Wheeled railway vehicles.

S

Scale: A graduated line representing a proportionate size.

Scenic Corridor: Corridor with landscapes and vistas of high scenic quality.

Sedimentary Rock: Rock resulting from the consolidation of sediment.

Sensitivity Analysis: An analysis that assesses how sensitive the outcomes predicted by modeling are to changes in different model inputs (assumptions or variables).

Service: The portion of the electrical, gas, water, or sewer system that connects a customer, usually at the meter location, to the utility distribution or supply system.

Shared Right-of-Way: A CHSTP alignment where high-speed trains operate in proximity to other transportation systems, including conventional passenger railroads and freight railroads, without sharing tracks. Also includes highways.

Shared Use Corridor: A CHSTP alignment where high-speed trains operate with other passenger railroads (e.g., Caltrain, Metro-Link, and Amtrak) and share the corridor).

Shared Use Track: Segment along the CHSTP alignment where high-speed trains operate with other passenger railroads, i.e., Caltrain, MetroLink, and Amtrak, on the same tracks.

Shared Use Corridor: Segment along the CHSTP alignment where high-speed trains operate on exclusive tracks located along rail corridors or right-of-ways where conventional passenger and freight railroads operate.

Shared Use Track: Segment along the CHSTP alignment where high-speed trains operate with other passenger railroads, and/or temporally separated freight railroads, on the same track.

Sleeve: A pipe in which a pipeline or conduit is inserted.

Special Provision: Specific clauses setting forth conditions or requirements peculiar to the work and supplementary to the projects Standard Specifications.

Spiral: Curve of variable radius used to connect a straight section of track with the radius of the body of the curve. Sometimes call a Transition or a Transition Spiral in European publications.

Strike-Slip Fault: A fault along which the dominant direction of movement is parallel to the fault traces (the expression of the fault on the ground surface).

Stub End: A track that terminates at one end.

Subsidence: Sinking or lowering of the ground surface.

Superelevation: The difference in elevation between the outside rail of the curve and the inside rail of the curve measured between the highest point on each rail head. Normally called Cant in European publications.

T

Take: As defined in Section 3 of the federal Endangered Species Act, “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” To enter into possession, such as a right-of way acquisition.

Terminal Station: The first or last station of a passenger rail route.

Tesla: Unit of measure describing the strength of a magnetic field. See also Gauss.

Topographic Map: A map of the features of the actual surface of the earth considered collectively as to form.

Trainset: A complete unit of rolling stock that makes up a single train.

Transportation Demand Management: The operation and coordination of various transportation system policies and programs to manage travel demand to make the most efficient and effective use of existing transportation services and facilities.

Transportation System Management: Actions that improve the operation and coordination transportation services and facilities to realize the most efficient use of the existing transportation system.

Travel Time: The time spent on the road, in the air, or on a train from a place of origin to a place of destination. Total travel time includes the time required to reach a station or an airport, time spent waiting for the next scheduled train or flight, time spent getting to the boarding area, time spent checking and retrieving luggage, time spent getting a rental car or taxi, as well as time spent to reach the final destination.

Transverse: A facility passing from one side of the right-of-way to the other side of the right-of-way.

Tributary Watercourse: A stream feeding a larger stream or a lake.

Tsunamis: Waves that travel in the open ocean and are caused by an undersea earthquake, landslide or volcanic activity.

U

Unbalance, Unbalanced Superelevation: The difference between the Superelevation and Equilibrium Superelevation. In European publications, Unbalance is called Cant Deficiency if the actual Superelevation is less than the Equilibrium Superelevation and Excess Cant if the actual Superelevation is greater than the Equilibrium Superelevation.

Uplift: The action of a portion of the earth's surface as it rises above adjacent areas. An area of higher elevation than surrounding areas; an area that has been uplifted.

V

Variance: Approved deviation, or exception, from a CHSTP Minimum design criteria or Minimum design standard.

V/C Ratio: Volume to capacity ratio; describes the relationship between the amount of traffic a roadway was designed to carry and the amount of traffic it actually carries. Related to the level of service (LOS) the roadway can provide.

Vertical Curve: The transition between grades is normally parabolic in US and Asian practices and circular arc radii in European practices.

Very High-Speed Train: A railroad system utilizing steel-wheel-on-steel-rail technology with regular operating speeds greater than 125 mph (200 kph).

Viaduct: A bridge that conveys a road or a railroad over a valley often constructed of a series of arches supported by piers.

Volt: Standard unit of measure for electrical potential.

W

Watershed: The area that contributes water to a drainage system or stream.

Watt: Standard unit of measure for electrical power.

Wayside Power: Electrical power provided from the utility grid to the electrified railroad right-of-way at convenient locations from the side of the rail tracks or corridor.

Weir: A small dam that restricts flow in a stream in order to raise water level, or diverts flow into a desired course.

Wet Utility: A pipeline that conveys liquid through gravity and/or pressured systems for public purposes (i.e., water and waste water).

Wetland: An area that is regularly saturated by surface water or groundwater and is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions.

Wildlife Corridor: A belt of habitat that is essentially free of physical barriers such as fences, walls, and development, and connects two or more larger areas of habitat, allowing wildlife to move between physically separate areas.

X

Y

Yard Track: Dead end track dedicated to operation needs and connected to a passing track, never to the main line.

Z

6.1.2 Acronyms

Several acronyms have different definitions depending on the technical area in which they are used. The following list is a combination of the acronyms used by CALTRANS and those identified thus far by the CHSTP.

A

AA	Affected Agency
AACE	Association for the Advancement of Cost Engineering
AADT	Average Annual Daily Traffic
AAR	Association of American Railroads
AASHTO	American Association of State Highway Transportation Officials
AC	Asphalt Concrete; Alternating Current
ACI	American Concrete Institute
ACHP	Advisory Council on Historic Preservation (Federal)
ACR	Assembly Concurrent Resolution
ADA	Americans with Disabilities Act (Federal)
ADT	Average Daily Traffic
A&E	Architectural and Engineering
AIS	Appearance Information Sheet
AC	Asphalt Concrete
ACI	American Concrete Institute
ACHP	Advisory Council on Historic Preservation (Federal)
ACR	Assembly Concurrent Resolution
ACSR	Aluminum Conductor Steel Reinforced
ADA	Americans with Disabilities Act (Federal)
ADAAG	ADA Accessibility Guidelines for Buildings and Facilities
ADT	Average Daily Traffic
A&E	Architectural and Engineering
AEC	Aerial Earth (Ground) Conductor
AIS	Appearance Information Sheet
AISC	American Institute of Steel Construction
ANAC	Approaching Noise Abatement Criteria
ANSI	American National Standards Institute
APCD	Air Pollution Control District
APE	Area of Potential Effects
APEFZ	Alquist-Priolo Earthquake Fault Zone
AQMD	Air Quality Management District
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASC	Accounting Service Center (Caltrans HQ)
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AT	Autotransformer
ATC	Applied Technology Council
AWS	Structural Welding Standards

B

BART	Bay Area Rapid Transit
BCDC	(San Francisco) Bay Conservation and Development Commission

BDA	Bridge Design Aids
BDD	Bridge Design Details
BDP	Bridge Design Practice
BDS	Bridge Design Specifications
BEC	Buried Earth (ground) Conductor
BEES	Basic Engineering Estimating System
BNCF	Burlington Northern Santa Fe Railroad
BMPs	Best Management Plans
BR	Bridge Restoration and Replacement Program (Federal)
BRT	Bus Rapid Transit
BSO	Basic Safety Objective
C	
CA	Certification Acceptance
CAAA	Clean Air Act Amendments (Federal)
CADD	Computer-Aided Design and Drafting
CAH	Controlled Access Highway
CALNET	California Integrated Telecommunications Network
Caltrans	California Department of Transportation
CAM	Cooperative Agreement Manual
CAR	Cooperative Agreement Report
CBC	California Building Code
CBDM	California Department of Transportation - Bridge Design Manual
CCC	California Coastal Commission (State)
CCEM	Capital Cost Estimating Methodology
CCEP	Capital Cost Estimating Program
CCEWG	Capital Cost Estimating Working Group
CCJPA	Capital Corridor Joint Powers Authority
CCO	Contract Change Order
CCS	California Coordinate System
CCTV	Closed Circuit Television
C-D	Collector-Distributor
CDC	CHST Design Criteria
CDF	California Department of Forestry (State)
C-E	Construction Evaluated
CE 1.	Categorical Exclusion (Federal)
CE2.	Categorical Exemption (State)
CEC	Caltrans Encroachment Committee (Obsolete)
CEG	Certified Engineering Geologist
CEQA	California Environmental Quality Act (State)
CES	Customer Emergency Stations
CFR	Code of Federal Regulations
CFS	CHST Facility Standards
CGS	California Geological Survey
CHD	County Health Department
CHP	California Department of Highway Patrol (State)
CHSRA	<i>NOT USED. See Authority under Terms</i>
CHST	California High-Speed Train

CHSTP	California High-Speed Train Project
CIWMB	California Integrated Waste Management Board (State)
CMA	Congestion Management Agency
CMAQ	Congestion Mitigation and Air Quality Program (Federal)
CMP	Congestion Management Program
CO	County
COG	Council of Governments
CP	Control Point
CPH	California Permit Handbook
CPM	Critical Path Method
CPT	Cone Penetration Test
CPTED	Crime Prevention Through Environmental Design
CPUC	California Public Utilities Commission
CRP	Community Relations Plan
CRR	Commuter Rail Program (State)
CSP	Capital Scheduling Plan
CT	Caltrans
CTC	California Transportation Commission (State)
CTP	California Transportation Plan
CTRL	Channel Tunnel Rail Link
CW	Contact Wire
D	
DAF	Damage Assessment Form (Federal)
DARC	District Airspace Review Committee
DB	Design Build
DBA	Decibel-A Scale
DBE	Disadvantaged Business Enterprise; Design Base Earthquake
DBR	Discretionary BR (Federal)
DC	Direct Current
DD	District Director
DDD	Deputy District Director
DED	Draft Environmental Document
DEIR	Draft Environmental Impact Report (CEQA)
DEIS	Draft Environmental Impact Statement (NEPA)
DES	Division of Engineering Service (Caltrans HQ)
DFG	Department of Fish and Game (State)
DHV	Design Hourly Volume
DI	Delay Index
DIS	Design Intent Statement
DOD	Division of Design (Caltrans HQ); Department of Defense (Federal)
DOE	District Office Engineer
DOS	Division of Structures of the ESC (Caltrans HQ)
DOT	Department of Transportation (Federal)
DPM	Design Project Manager
DPR	Draft Project Report
DRIS	Draft Relocation Impact Study/Statement
DSA	Division of State Architect, Department of General Services (State)

DSC	Differing Site Conditions
DSHA	Deterministic Seismic Hazard Analysis
DSMP	District System Management Plan
DTM	Digital Terrain Model
DU	Design Unit
E	
EA 1	Environmental Assessment (NEPA); Expenditure Authorization
EAG	Encroachment Advisory Group
EB	Eastbound
ED	Environmental Document
EDP	Electronic Data Processing
EEM	Environmental Enhancement and Mitigation (State)
EIR	Environmental Impact Report (CEQA)
EIS	Environmental Impact Statement (NEPA)
EM	Engineering Manager
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
EMT	Engineering Management Team
ENR	Engineering News Report
EPB	Earth Pressure Balanced
EPA	Environmental Protection Agency (Federal)
ER	Emergency Relief Program (Federal)
ESAL	Equivalent Single-Axle Loads
ETW	Edge of Traveled Way
F	
F.Y.	Fiscal Year
FA	Fire Agency
FAA	Federal Aviation Administration (Federal)
FAPG	Federal-Aid Program Guide (Federal)
FAS	Federal-Aid Secondary (obsolete)
FAU	Federal-Aid Urban (obsolete)
FCA	Fire Control Agency
FCR	Flexible Congestion Relief Program (State)
FED	Final Environmental Document
FEE	Functional Evaluation Earthquake
FEIR	Final Environmental Impact Report (CEQA)
FEIS	Final Environmental Impact Statement (NEPA)
FEMA	Federal Emergency Management Agency (Federal)
FER	Fault Evaluation Report
F&E System	Freeway and Expressway System
FHWA	Federal Highway Administration (Federal)
FONSI	Finding of No Significant Impact (NEPA)
FRA	Federal Railroad Administration
FRIS	Final Relocation Impact Study/Statement
FSTIP	Federal State Transportation Improvement Program (Federal)
FTA	Federal Transit Administration (Federal)

FTIP	Federal Transportation Improvement Program (Federal)
G	
GBR	Geotechnical Baseline Report
GBR-B	Geotechnical Baseline Report for Bidding
GBR-C	Geotechnical Baseline Report for Construction
GDR	Geotechnical Data Report
GIS	Geographic Information System
GMA	Ground Motion Analysis
GO	General Order
GS	(Department of) General Services (State)
GSHA	Geologic and Seismic Hazards Analysis
GTGM	FHWA Geotechnical Technical Guidance Manual
H	
HD	Hard Drawn
HDM	Highway Design Manual
HDPE	High Density Polyethylene
HES	Hazard Elimination Safety Program (Federal)
HIA	Highway Improvement Agreement
HOV	High-Occupancy Vehicle
HP	Highway Planting
HP&R	Highway Planting and Restoration
HPSR	Historic Properties Survey Report
HQ	Caltrans Headquarters
HSR	High-Speed Rail
HST	High-Speed Train
HV	High Voltage
HW	Hazardous Waste
HWMP	Hazardous Waste Management Plan
I	
IA	Interagency Agreement
IBC	International Building Code
IC	Interstate Completion Program (Federal)
IFA	Involved Federal Agency
IGR	Intergovernmental Review
IM	Interstate Maintenance Program (Federal)
IMP	Impedance Bond
IR	Infrared
IRR	Intercity Rail Program (State)
IRRS	Interregional Road System (State)
IRS	Interregional Road System Program (State)
IS	Initial Study (CEQA)
ISA	Initial Site Assessment
ISRM	International Society for Rock Mechanics
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991 (Federal)
ITMS	Intermodal Transportation Management System

J

JPB Joint Powers Board

K

KP Kilometer Post; Kilometric Point

kPa Kilo Pascal

KPH/kph Kilometers per hour

L

LA Los Angeles (California, USA); Local Agency; Landscape Architect

LAAPS Local Agency Automated Pay System

LADWP Los Angeles Department of Water and Power

LAP Landscape Architecture Program, of the DOD(Caltrans HQ)

LAQMD Local Air Quality Management District

LAUS Los Angeles Union Station

LCC Local Coastal Commission

LCCA Life Cycle Cost Analysis

LDBE Lower-level Design Basis Earthquake

LEDPA Least Environmentally Damaging, Practicable Alternative

LEQ Equivalent Sound Level

LOC Locally Funded State Highway Projects

LOS Level of Service

LOTB Logs of Test Borings

LRFD Load and Resistance Factor Design

LRT Light Rail Transit

LSA Low Sun Angle

LTC Local Transportation Commission

LUSAS Civil Engineering Analytical Software

LV Low Voltage

M

m Meter

MCE Maximum Considered Earthquake

METS Office of Materials Engineering and Testing Services (Caltrans HQ)

MHHW Mean Highest High Water

MIS Major Investment Study

mm Millimeter

MOA Memorandum of Agreement

MOU Memorandum of Understanding

MP Mile Post

MPH/mph Miles per hour

MPO Metropolitan Planning Organizations

MSA Management Systems Activities

MTD Memo to Designers

MTMC Military Traffic Management Command (Federal)

MW Messenger Wire

N

NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NB	Northbound
NBSSR	Noise Barrier Scope Summary Report
ND	Negative Declaration (CEQA)
NEPA	National Environmental Policy Act (Federal)
NEHRP	National Earthquake Hazards Reduction Program
NESC	National Electric Safety Code
NF	Negative Feeder
NFPA	National Fire Protection Association
NGA	Next Generation of Attenuation
NH	National Highway System Program (Federal)
NHI	National Highway Institute
NHS	National Highway System
NIST	National Institute of Standards and Technology
NOD	Notice of Determination (CEQA)
NOI	Notice of Intent (NEPA)
NOP	Notice of Preparation (CEQA)
NPDES	National Pollutant Discharge Elimination System
NPRM	Notice of Proposed Rule Making

O

OA	Obligation Authority (Federal)
OC	Overcrossing
OCS	Overhead Contact System
OHC	Other Highway Construction Program (State)
OJT	On-the-Job Training
OLPPD	Office of Local Programs, Procedures Development
OOE	Office of Office Engineer, of the DES (Caltrans HQ)
OPL	Operability Performance Level
OPR	Office of Planning and Research (State)
OSD	Office of Structure Design, of the ESC (Caltrans HQ)
OSF	Office of Structure Foundations, of the ESC (Caltrans HQ)
OSHA	Occupational Safety and Health Administration
OSM&I	Office of Structures Maintenance and Investigations (Caltrans HQ)
O&M	Operations and Maintenance

P

	Project Approval Report (obsolete); Project Authorization Request (obsolete)
PAR	
PC	Personal Computer
PCC	Portland Cement Concrete
PCR	Project Change Request
PCPT	Piezocone Penetrometer Test
PCJPB	Peninsula Corridor Joint Powers Board
PD	Project Development
PDDM	FHWA Project Development and Design Manual

PDF	Personal Document File
PDPM	Caltrans Project Development Procedures Manual
PDT	Project Development Team
DU	Design Unit
PDWTM	Project Development Workflow Tasks Manual
PE	Project Engineer
PEE	Preliminary Environmental Evaluation
PEER	Pacific Earthquake Engineer Research Center
PEIR	Programmatic Environmental Impact Report
PFDA	Probabilistic Fault Displacement Hazard Analysis
PG&E	Pacific Gas and Electric Company
PHF	Project History File
PID	Project Initiation Document
PIR	Project Information Report
PISA	Project Information Systems and Analysis
PM	Project Manager; Program Manager
PMCS	Project Management Control System
PMP	Project Management Division (Caltrans HQ)
PMPM	Project Management Procedures Manual
PMS	Pavement Management System
PMT	Program Management Team
PPNO	Planning Program Number
P & PPR	Permit and Port Planning Regulations
PR	Project Report
PS	Paralleling Station (with Autotransformer)
PS&E	Plans, Specifications, and Estimate
PSHA	Probabilistic Seismic Hazard Assessment
psig	Pounds per Square Inch Gauge
PSP	Product Safety Plan
PSR	Project Study Report
PSSR	Project Scope Summary Report
PSTIP	Proposed State Transportation Improvement Program
PTZ	Pan-Tilt-Zoom
PUC	Public Utilities Commission (State)
PUMS	PYPSCAN Unit II Monitoring System
PVC	Polyvinyl Chloride
PY	Person Year
PYPSCAN	Person Year and Project Schedule and Cost Analysis
Q	
QL	Quality Level
R	
RAD	Remedial Action Design
RAP	Relocation Assistance Program; Remedial Action Plan
RAS	Rehabilitation and Safety Program (State)
RC	Regional Consultant
RCE	Registered Civil Engineer

RCR	Route Concept Report
RE	Resident Engineer
RFP	Request For Proposal
RFQ	Request For Qualifications
RI	Remedial Investigation
RICS	Remote Irrigation Control System
RIS	Relinquishment Information Sheet
RM	Regional Manager
ROD	Record of Decision (NEPA)
RON	Resolution of Necessity
ROW	Right-of-Way
ROWM	Right-of-Way Manual
RPA	Rule of Particular Applicability
RR	Railroad
RRR	Resurfacing, Restoration, Rehabilitation (3R)
RRRR	Resurfacing, Restoration, Rehabilitation, Reconstruction (4R)
RSTP	Regional Surface Transportation Program (Federal)
RTIP	Regional Transportation Improvement Program
RTL	Ready to List
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
RTRI	Railway Technical Research Institute
RU	Responsible Unit
R/W	Right of Way
RWQCB	Regional Water Quality Control Board (State)

S

SAM	State Administrative Manual
SAVE	Society of American Value Engineers
SB	Southbound
SCE	Southern California Edison (Electric Company)
SCR	Senate Concurrent Resolution
SCADA	Supervisory Control and Data Acquisition
SCPE	Seismic Capacity and Performance Evaluation
SCRRA	Southern California Regional Rail Authority
SDB	System Duct Bank
SDC	Seismic Design Criteria
SDG&E	San Diego Gas and Electric Company
SDNR	San Diego Northern Railroad
SDOF	Single Degree of Freedom
SDR	Site Damage Report
SEE	Safety Evaluation Earthquake
SER	Standard Environmental Reference
SFPC	Special Funded Project Coordinator
SFY	State Fiscal Year
S&H Code	Streets and Highways Code (State)
SHA	Seismic Hazards Analysis
SHELL	State Highway Extra Legal Load

SHOPP	State Highway Operation and Protection Program (formerly HSOPP)
SHPO	State Historic Preservation Officer (State)
SHS	State Highway System
S&I	Service and Inspection
SI	Site Investigation; Safety Index
SIP	State Implementation Plan
SJRRA	San Joaquin Regional Rail Authority
SLC	State Lands Commission (State)
SLTPP	State/Local Transportation Partnership Program (State)
SMARA	Surface Mining and Reclamation Act (State)
SPL	Safety Performance Level
SPT	Standard Penetration Test
SR	Senate Resolution
SRRA	Safety Roadside Rest Area
SRSS	Square Root of Sum of Squares
SRTTP	Short Range Transit Plan
SSC	Seismic Safety Commission
SSI	Soil Structure Interaction
SSP	System Safety Plan
SST	Traction Power Supply Station (with HV Utility Supply)
STA	Stationing
STIP	State Transportation Improvement Program
STP	Surface Transportation Program (Federal – formerly FAU or FAS)
STRAIN	Structures Replacement And Improvement Needs
SVRT	Silicon Valley Rapid Transit
SWPPP	Storm Water Pollution Prevention Plan
SWS	Switching Station (with Autotransformer)
T	
TASAS	Traffic Accident Surveillance Analysis System
TBM	Tunnel Boring Machine
TCI	Transit Capital Improvement Program (State)
TCS	Transportation Corridor Study
TEA	Transportation Enhancement Activities Program (Federal)
TESC	Temporary Erosion and Settlement Control
THSR	Taiwan High Speed Rail
TI	Traffic Index
TIP	Transportation Improvement Program
TGV	Train à Grande Vitesse
TM	Technical Memorandum
TMP	Transportation Management Plan
TPSS	Traction Power Supply Station
TRAMS	Transportation Accounting Management System
TRB	Transportation Research Board
TSDP	Transportation System Development Program
TSI	Technical Specifications Interoperability
TSIP	Transportation System Information Program (Caltrans HQ)
TSM	Traffic Systems Management

TSMP	Traffic Systems Management Plan
TTY	Teletypewriter
TVM	Ticket Vending Machine
U	
US	United States
USC	United States Code
UBC	Universal Building Code
UC	Undercrossing
UFC	Uniform Fire Code
UIC	Union Internationales des Chemins de fer (International Union of Railways)
UNPAR	Un-Project Authorization Request
UrEDAS	Urgent Earthquake Detection and Alarm System
URR	Urban Rail Transit Program (State)
USC	United States Code (Federal)
USCE	United States (Army) Corps of Engineers
USCG	United States Coast Guard
USCS	United Soil Classification System
USGS	United States Geologic Survey (Federal)
V	
VA	Value Analysis
VE	Value Engineering
VHS	Very High Speed
VST	Vane Shear Test
W	
WASHTO	Western Association of State Highway Transportation Officials
WB	Westbound
WBE	Women's Business Enterprise
WBS	Work Breakdown Structure
WMATA	Washington Metropolitan Area Transit Authority